Standards and documents applied:
LST EN 1434-1:2022;
LST EN 1434-2:2022;
LST EN 1434-4:2015+A1:2019;
LST EN 1434-5:2022;
WELMEC 7.2:2015.

The measuring instrument must correspond to following specifications:

1 Design of the instrument

1.1 Construction

The thermal energy meter QALCOSONIC E3 can be produced in two design options:

- complete meter, consisting of a flow sensor and calculator with inseparably connected temperature sensors Pt 500;
- combined meter, consisting of a flow sensor and calculator with connected type approved temperature sensor Pt 500 pair.

In both cases, the flow sensor is inseparably connected to the calculator by 1,2 m length cable (optional - 2,5 m ; 5,0 m or 10 m). Flow sensor q_p = (0,6 – 6,0) m³/h has intended space for temperature probe installation.
The calculator of the meter can be mounted directly on the flow sensor or separately on the wall or on a standard DIN rail.
The meter can be powered by:

- 3,6 V DC lithium battery;
- remote 12 V to 42 V DC or 12 V to 36 V AC power source;
- 230 V AC mains.



Fig.1.Thermal energy meter CALCOSONIC E3

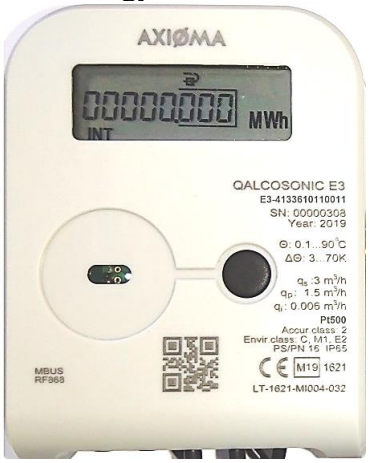


Fig.2. Calculator of the thermal energy meter QALCOSONIC E3

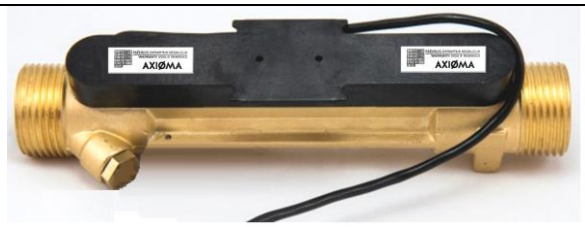
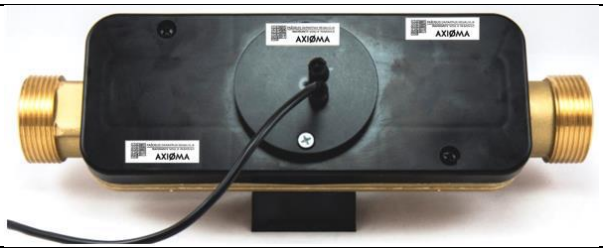
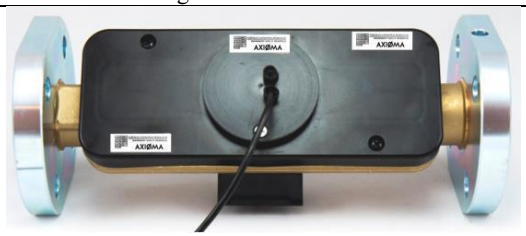
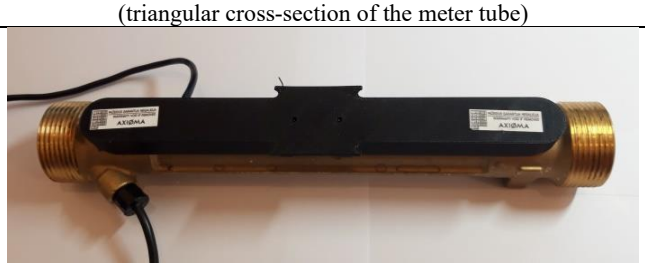
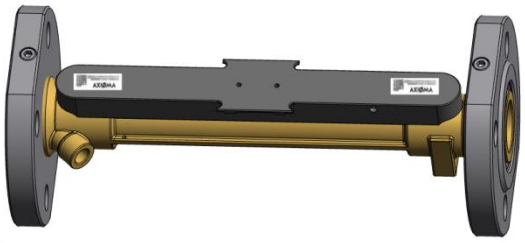
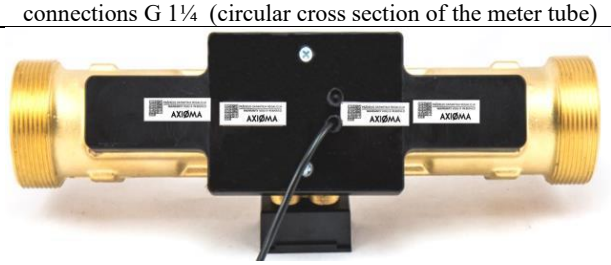
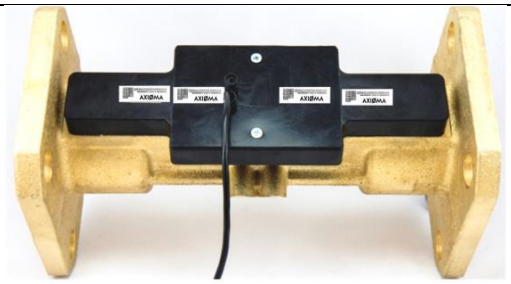
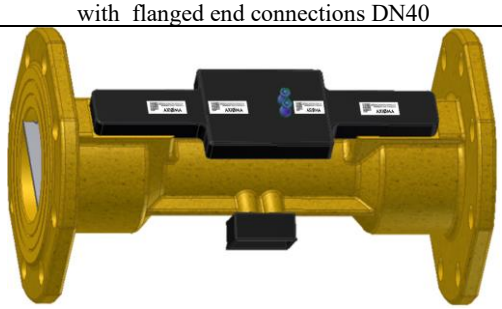
	
a) Flow sensor of the meter q_p = 0,6/1,0/1,5/2,5 m³/h with threaded end connections G ¾ or G 1	b) Flow sensor of the meter q_p = 0,6/1,0/1,5/2,5 m³/h with flanged end connections DN20
	
c) Flow sensor of the meter q_p = 3,5/6 m³/h with threaded end connections G 1¼ or G 1½ (triangular cross-section of the meter tube)	d) Flow sensor of the meter q_p = 3,5/6 m³/h with flanged end connections DN25 or DN32 (triangular cross-section of the meter tube)
	
e) Flow sensor of the meter q_p = 3,5/ m³/h with threaded end connections G 1¼ (circular cross section of the meter tube)	f) Flow sensor of the meter q_p = 3,5 m³/h with flanged end connections DN25 or DN32 (circular cross section of the meter tube)
	
g) Flow sensor of the meter q_p = 10 m³/h with threaded end connections G 2	h) Flow sensor of the meter q_p = 10 m³/h with flanged end connections DN40
	
i) Flow sensor of the meter q_p = 15 m³/h with flanged end connections DN50	j) Flow sensor of the meter q_p = 25/40/60 m³/h with flanged end connections (DN65/DN80/DN100)

Fig.3. Flow sensor of the thermal energy meter

Structure of type number of the thermal energy meter QALCOSONIC E3*

QALCOSONIC E3 - □ □□ □ □ □ □ □ □ □ □□ □

Accuracy class	Ratio of the flow rates (q_p/q_i):	The lower limit of the temperature difference:	Code
2	100	2 K	1
	250**	2 K	2
	100	3 K (standard)	3
	250**	3 K	4
3	100	2 K	5
	250**	2 K	6
	100	3 K	7
	250**	3 K	8

Flow sensor:

q_p, m³/h	L, mm	End connections	Code	q_p, m³/h	L, mm	End connections	Code
0,6	110	G ¾	11	3,5	260	DN32	50
1	110	G ¾	12	3,5 ***	260	G1 ¼	41
1,5	110	G ¾	13	3,5 ***	260	G1 1/2	42
1,5	165	G ¾	14	3,5 ***	260	DN25	43
1,5	130	G1	21	3,5 ***	260	DN32	44
2,5	130	G1	22	6	260	G1 ¼	45
0,6	190	G1	31	6	260	G1 1/2	46
0,6	190	DN20	32	6	260	DN25	47
1	190	G1	33	6	260	DN32	48
1	190	DN20	34	10	300	G2	51
1,5	190	G1	35	10	300	DN40	52
1,5	190	DN20	36	15	270	DN50	61
2,5	190	G1	37	25	300	DN65	71
2,5	190	DN20	38	40	300	DN80	81
3,5	260	G1 ¼	40	60	360	DN100	92
3,5	260	DN25	49				

Communication interface:

Type:	Code	Type:	Code
None	0	RF 868 MHz (wM-Bus)	2
M-Bus	1	M-Bus ir RF 868 MHz (wM-Bus)	3

Design option of the meter/Power supply:

Design option:	Power supply:	Code
Complete meter	Internal battery (1 pc)	1
	Remote 24 V AC/DC power source	2
	230V AC main power supply	3
	Internal battery (2 pc)	4
Combined meter	Internal battery (1 pc)	5
	Remote 24 V AC/DC power source	6
	230V AC main power supply	7
	Internal battery (2 pc)	8

Connection cable length of flow sensors:

Cable length:	Code	Cable length:	Code
1,2 m (standard)	1	5 m	3
2,5 m	2	10 m	4

Additional communication interface:

Type:	Code	Type:	Code
None	0	BacNet RS485	5
M-Bus	1	RF 868 MHz (LoRa)	6
MODBUS RS485	2	RF 868 MHz (wM-Bus)	7
CL	3	RF 868 MHz (LoRa+wM-Bus)	8
MiniBus	4		

IP code/ Nominal pressure PN:

IP code/ Nominal pressure PN:	Code	IP code/ Nominal pressure PN:	Code
IP65 / PN16	1	IP65 / PN25 (standard)	4
IP67 / PN16	2	IP67 / PN25	5
IP68 / PN16	3	IP68 / PN25	6

Limits of temperature range; additional pulse inputs/outputs:

Limits of temperature range:	Additional pulse inputs/outputs:	Code
0 °C to 90 °C	None	1
	Available	2
0 °C to 130 °C	None	3
	Available	4
0 °C to 180 °C (standard)	None	7
	Available	8

Cable length of temperature sensors:

Cable length:	Code	Cable length:	Code
None	0	3 m	4
1,5 m (standard)	1	5 m	5
2 m	2	10 m	6
2,5 m	3		

Meter configuration profile:

Configuration profile:	Code
Standard	01
Transport mode off	04

Measuring medium (type of heat-conveying liquid):

Measuring medium:	Code
Water	1

Notes:

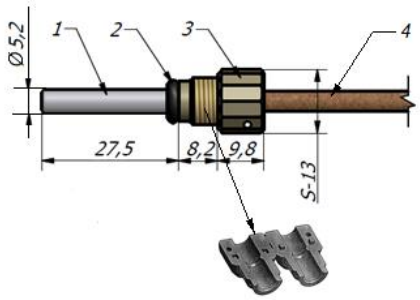
1. * - the described type number code is used for marking the meter. For meter order numbering extended code is used, which is described in the document PLEv06.
2. ** - with the exceptions of flow sensor q_p = 3,5 m^3/h (with triangular cross-section of the meter tube), q_p = 0,6 m^3/h and q_p = 1,0 m^3/h.
3. *** - flow sensor with triangular cross-section of the meter tube.

1.2 Sensor

Thermal energy meter hardware consist of an ultrasonic flow sensor and calculator with inseparably connected resistance temperature sensors Pt 500 or with connected type approved temperature sensor Pt 500 pair.

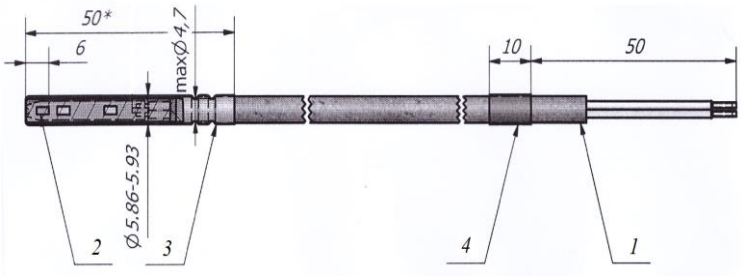
For the meters q_p = (0,6 – 6,0), direct mounted DS design type temperature probes according to LST EN 1434-2 are used. In case of large size meters, pocket mounted PL design type temperature probes according to LST EN 1434-2 are used. The pocket installation length can be 85; 120 or 210 mm.

The design and main dimensions of the temperature probes are shown in Fig. 4.



1- protective sheath
2- sealing ring
3- nut
4- connected cable

a) temperature probe type DS



1 - connected cable
2 – temperature sensing element
3 – protective sheath
4 – thermal tube

b) temperature probe type PL

Fig.4. Design and main dimensions of the temperature probes

1.3 Measurement value processing

The energy, consumed for heating, is calculated by integrating the temperature difference and the volume of the heat-conveying liquid over time. The temperature difference is calculated from the resistance of the temperature sensors pair connected to the calculator and converts it to temperature according to formulas of LST EN 60751.

1.4 Indication of the measurement results

The accumulated quantity of thermal energy is presented on the LCD display in the MWh. Other units (Gcal, GJ) can be chosen too as an option.

1.5 Optional equipment and functions subject to MID requirements

None.

1.6 Technical documentation

Ultrasonic thermal energy meter QALCOSONIC E3. Technical description, user manual: PLE3v06, 21-07-2025.
Test instruction of the heat meter QALCOSONIC E3, 01-2020.
Labeling label with the distributor's „Ambiductor" brand, 09-2021.
Labeling label with the distributor's „EVN" brand, 03-2023.
Labeling label with the distributor's „Oventrop" brand, 11-2026.
Labeling label with the distributor's „Heitland" brand, 12-2023.
Labeling label for the Macedonian market, 11-2026.
Labeling label for the Kazakhstan market, 11-2026.
Labeling label for the Mongolian market, 11-2026.

Other reference documents on which basis this certificate is issued, are stored in a file Nr. LEI-12-MP-007.26.

1.7 Integrated equipment and functions not subject to MID

Optical interface according to the requirements of LST EN 62056-21, integrated in the meter, is intended for data reading, meter parameters setting and optical pulse output in test mode.

Two pulse outputs for energy and volume pulses (optional). Class of pulse output device according to LST EN 1434-2: OB in operating mode, OD in test mode.
Two programmable pulse inputs for volume pulses (optional). Class of pulse input device – IB according to LST EN 1434-2.
When the complete meter has a pulse input/otput function, it is supplied with inseparably connected 1,5 m input/output cable.
The meter can be without a communication interface or equipped with one or both of the following communication interfaces:

- M-Bus;
- 868 MHz RF (wM-Bus).

The meter can be equipped with one of the following additional communication interfaces:

- M-Bus;
- CL (current loop);
- RS485 (MODBUS or BacNet);
- MiniBus;
- 868 MHz RF (wM-Bus, LoRa, or wM-Bus+LoRa).

The meter can be used also for cooling energy measurement under rated operating conditions, listed in section 2.1.

2 Technical data

2.1 Rated operating conditions

2.1.1 Measurand

Thermal energy, calculated from the measured volume of water and the measured difference of water temperature in flow and return pipes.

2.1.2 Measurement range

Limits of the temperature Θ / limits of temperature differences $\Delta\Theta$:

0 ºC to 130 ºC / 2 K* to 110 K, or 3 K to 110 K;
0 ºC to 90 ºC / 2 K* to 70 K, or 3 K to 70 K;
0 ºC to 180 ºC** / 2 K* to 175 K**, or 3 K to 175 K**.

Notes:

1. * - for meters with the lower limit of the temperature difference 2 K the requirements of the Directive 2014/32/EU are not applied.
2. ** - can only be applied to a combined heat meter with a separately connected type approved temperature sensor pair.

The technical characteristics of the heat meter flow sensor are given in Table 1.

Table 1

End connections	Flow-rate, m³/h			Pressure loss at q_p, kPa	Overall length, mm
	Permanent q_p	Maximum q_s	Minimum q_i		
G ¾	0,6	1,2	0,006	7	110
G 1 or DN20	0,6	1,2	0,006	0,9	190

End connections	Flow-rate, m³/h			Pressure loss at q_p, kPa	Overall length, mm
	Permanent q_p	Maximum q_s	Minimum q_i		
G ¾	1,0	2,0	0,010	11,3	110
G 1 or DN20	1,0	2,0	0,010	2,5	190
G ¾	1,5	3,0	0,006	17,1	110
G ¾	1,5	3,0	0,006	17,1	165
G 1 or DN20	1,5	3,0	0,006	5,8	190
G ¾	1,5	3,0	0,015	17,1	110
G ¾	1,5	3,0	0,015	17,1	165
G 1 or DN20	1,5	3,0	0,015	5,8	190
G 1	1,5	3,0	0,015	7,2	130
G 1	2,5	5,0	0,010	19,8	130
G 1 or DN20	2,5	5,0	0,010	9,4	190
G1	2,5	5,0	0,025	19,8	130
G 1 or DN20	2,5	5,0	0,025	9,4	190
G 1¼, or G 1½, or DN25, or DN32	3,5	7,0	0,035	4*	260
G 1¼, or DN25, or DN32	3,5	7,0	0,014	9**	260
G 1 ¼, or DN25, or DN32	3,5	7,0	0,035	9**	260
G 1¼, or G 1½, or DN25, or DN32	6,0	12,0	0,024	10	260
G 1¼, or G 1½, or DN25, or DN32	6,0	12,0	0,060	10	260
G 2 or DN40	10,0	20,0	0,040	18	300
G 2 or DN40	10,0	20,0	0,100	18	300
DN50	15,0	30,0	0,060	12	270
DN50	15,0	30,0	0,150	12	270
DN65	25,0	50,0	0,100	20	300
DN65	25,0	50,0	0,250	20	300
DN80	40,0	80,0	0,160	18	300
DN80	40,0	80,0	0,400	18	300
DN100	60,0	120,0	0,240	18	360
DN100	60,0	120,0	0,600	18	360

Notes:

1. * - flow sensor with triangular cross-section of the meter tube.
2. ** - flow sensor with circular cross section of the meter tube.

Temperature limits of heat-conveying liquid Θ_q:

- when the calculator is mounted on the flow sensor : 0,1 ºC to 90 ºC;
- when the calculator is mounted separately : 0,1 ºC to 130 ºC.

2.1.3 Accuracy class

Accuracy class : 2 or 3*according to LST EN 1434-1.

Note: * - only meters with a permanent flow rate q_p from 0,6 m³/h to 6 m³/h can also be of accuracy class 3.

2.1.4 Environmental conditions / Influence quantities

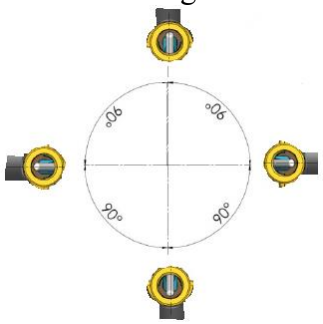
Ambient temperature	:	5 ºC to 55 ºC;
Humidity level	:	condensing;
Installations	:	indoor;
Mechanical environment	:	class M1;
Electromagnetic environment	:	class E2;
Protection class	:	IP65 (IP67 or IP68 – optional).

2.1.5 Maximum admissible working pressure

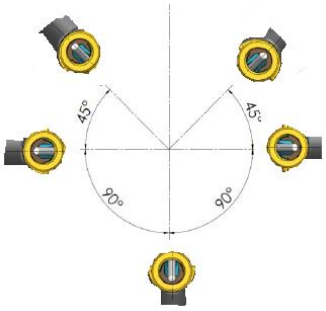
The maximum admissible working pressure/nominal pressure (PS/PN) of the meter is 16 bar or 25 bar.

2.1.6 Mounting position of the flow sensor

Flow sensor of the meter can be mounted either horizontally, vertically or inclined.
In case of installation horizontally or inclined, flow sensors with end connections G ¾, G 1 or DN20 can be rotated about the mounting axis at any angle (Fig. 5a)). Larger size flow sensors must by rotated about the mounting axis as shown in Fig. 5 b).



a) for flow sensors with end connections G ¾, G 1 or DN20



b) for flow sensors other sizes

Fig.5. Mounting positions of the flow sensor relative to the longitudinal axis

3 Interfaces and compatibility conditions

The combined meter has two temperature measurement channels for connecting Pt 500 temperature sensors. Connection of the temperature sensors is according to the two-wire scheme.

Communication interfaces of the meter are presented in section 1.7 of this appendix.

4 Requirements on production, putting into use and utilization

4.1 Requirements for production

At the end of the manufacturing and adjustment process the meters shall be tested according to the requirements of the LST EN 1434-5. Errors of heat meters shall not exceed the maximum permissible errors, described in Annex VI (MI-004) of Directive 2014/32/EU.
The flow sensors can be tested with cold water (25 ± 5) °C.

Note: the energy measuring error determination test shall be carried out when the flow sensor is installed in inlet and when the flow sensor is installed in outlet (in both cases).

4.2 Requirements for putting into use

The thermal energy meter must be installed in accordance with the requirements of technical description listed in section 1.6.
Before the putting into use, the meter can be supplied in transport mode (this is indicated by the „<->“ symbol on LCD display). In this mode, the configuring of the meter parameters (referred to the technical description, section 5.2.1) by means of a button or via the optical interface using the E3-CONFIGURATOR software is possible without affecting the seals on the meter (see section 6.1.1 of this appendix).
Transport mode switches off itself after 0,001 m³ of water volume passed through the meter, or it can be switched of by means via the optical interface using the E3-CONFIGURATOR software.

For flow sensors with nominal diameter DN65 to DN100 necessary straight pipelines lengths are: upstream $\geq 5 \times$ DN, downstream $\geq 3 \times$ DN. For flow sensors of other sizes the straight pipelines installation in upstream and downstream the sensor are not necessary.

4.3 Requirements for consistent utilization

No special requirements identified.

5 Checking of instruments which are in operation

5.1 Documented procedure

Test instruction of the thermal energy meter QALCOSONIC E3, 01-2020.

5.2 Special equipment or software

- optical reading head according to standard LST EN 62056-21;
- service software **E3-CONFIGURATOR**.

5.3 Identification of hardware and software

Identification of hardware:
- see Fig. 1, Fig. 2 and Fig. 3 of this appendix.

Identification of software: version number of the software is **0.01**. This number can be displayed on the device's display according to the request.

5.4 Calibration-adjustment procedure

The tests are carried out according to the test instruction of the thermal energy meter QALCOSONIC E3 given on pages 15 to 17 of this appendix in accordance with the requirements of the LST EN 1434-5.

6 Security measures

6.1 Sealing

6.1.1 Sealing of the meter calculator

The newly manufactured complete meter calculator shall not be subject to additional sealing. Access to the calculator cover release latch (Fig. 6, pos. 1), the parameter change and test mode activation contacts (Fig. 6, pos. 2) and adjustment data activation contacts (Fig. 6, pos. 3) is protected by easy break-out screens.
When the abovementioned casing screens are break-out (after opening the calculator casing, changing the meter parameters, adjusting the meter or activation the test mode), open slots are sealed with metrological seal-stickers (Fig. 6, pos. 1 and pos. 3) and with the protective seal-sticker of heat supplier (Fig 6, pos. 2).

For the combined device, additional metrological seals shall be used to seal access to the protective cap mounting screw (Fig. 7, pos. 1) and the activation contacts for the adjustment data if the protective screen (Fig. 7, pos. 2) has been broken.

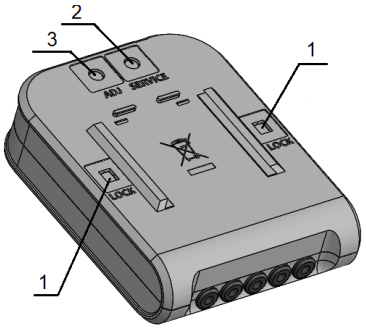


Fig.6. Sealing the calculator of the meter

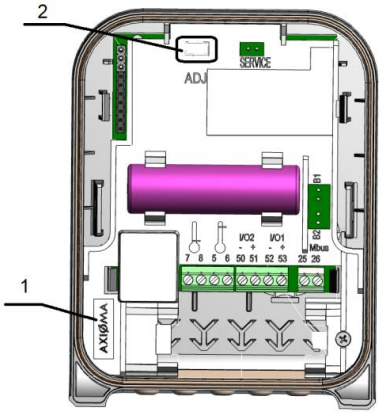
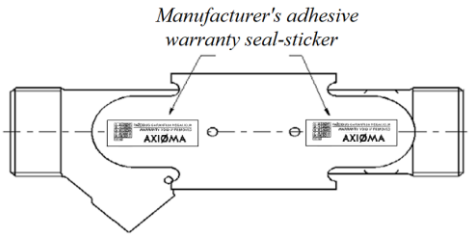


Fig.7. Additional sealing of the combined device calculator

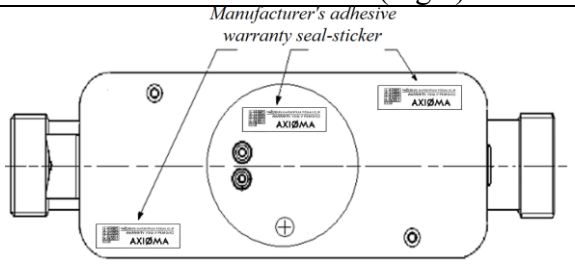
6.1.2 Sealing of the flow sensor

Sealing of the flow sensor of the meter:

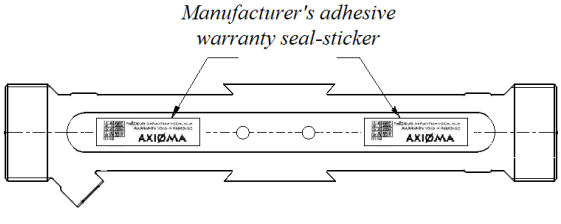
- the manufacturer's adhesive warranty seal - sticker on the bolts of the cover (Fig.8).



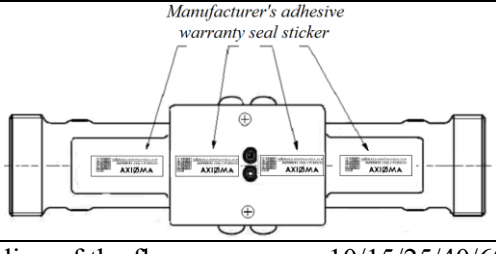
a) sealing of the flow sensor q_p = 0,6/1,0/1,5/2,5 m³/h



b) sealing of the flow sensor q_p = 3,5/6 m³/h (triangular cross-section of the meter tube)



c) sealing of the flow sensor q_p = 3,5 m³/h (circular cross-section of the meter tube)



d) sealing of the flow sensor q_p = 10/15/25/40/60 m³/h

Fig.8. Sealing of the flow sensor



a) Manufacturer‘s adhesive seal-sticker



b) Manufacturer‘s adhesive warranty seal-sticker

Fig. 9. Manufacturer’s protective seals

6.1.3 Sealing of the temperature sensor pair

The temperature sensors must be sealed with hanged seal of heat supplier to ensure that after the temperature sensors have been installed, it is not possibility of dismantle, remove or altering the sensors without evident damage on the sensors or the seal (Fig. 10 and Fig. 11).

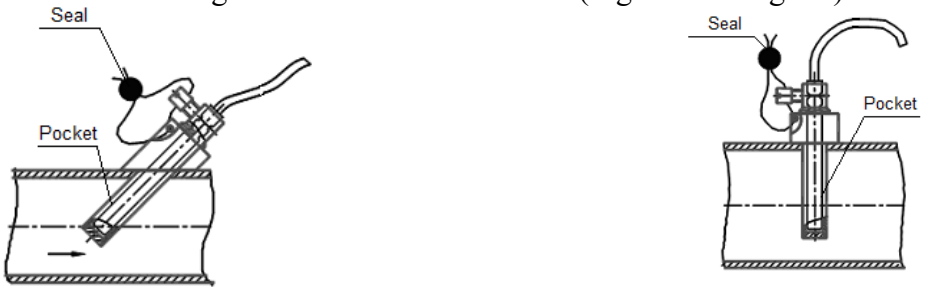
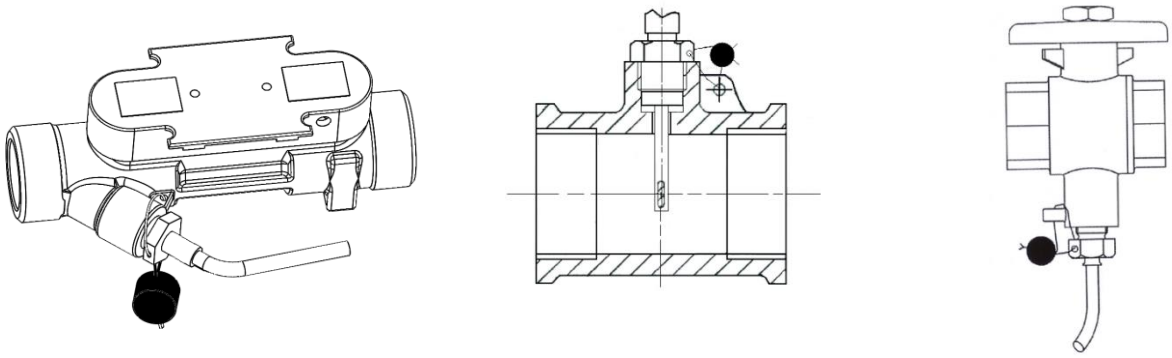


Fig. 10. Sealing of the PL type temperature probes



a) Sealing of the temperature probe, mounted in the flow sensor body

b) Sealing of the temperature probe, mounted in the three-way fitting

c) Sealing of the temperature probe, mounted in the ball valve

Fig. 11. Sealing of the DS type temperature probes

7 Marking and inscriptions

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

At least the following information shall appear on the meter calculator label:

- EU-type examination certificate number;
- manufacturer’s mark or name;
- distributor’s logo (if applicable);
- type designation and type number;
- year of manufacture and serial number;
- limits of the temperature;
- limits of temperature differences;
- limits of flow-rate: maximum q_s, permanent q_p and minimum q_i;
- the maximum admissible working pressure/nominal pressure (PS/PN);
- voltage level for external power supply;
- accuracy class;
- climatic class;

- electromagnetic class;
- mechanical class;
- IP code.

Information about the location of the meter's flow sensor is shown on the device's LCD indicator: when the flow sensor is installed in inlet – the  sign, when the flow sensor is installed in outlet – the  sign.

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

For the complete heat meter, the supply line temperature probe cable is marked with a red plastic tube and the outlet temperature sensor cable must be marked with a blue color plastic tube.

Pockets, in which the PL type temperature probes are fitted, must be marked with the mark „EN 1434".

7.2 Conformity marking

In addition, the meter calculator label should contain the following marking:

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

8 List of the drawings attached to the certificate.

Labeling label with the distributor's „Ambiductor" brand, 09-2021.
Labeling label with the distributor's „EVN" brand, 03-2023.
Labeling label with the distributor's „Oventrop" brand, 11-2026.
Labeling label with the distributor's „Heitland" brand, 12-2023.
Labeling label for the Macedonian market, 11-2026.
Labeling label for the Kazakhstan market, 11-2026.
Labeling label for the Mongolian market, 11-2026.

9 Certificate history

<table>
<tr><th>Issue</th><th>Date and reference №</th><th>Description</th></tr>
<tr><td>1</td><td>2</td><td>3</td></tr>
<tr><td>LT-1621-MI004-032</td><td>24-04-2018, No. LEI-12-MP-061.17</td><td>Type examination certificate first issued</td></tr>
<tr><td>LT-1621-MI004-032 Revision 1</td><td>15-11-2019, Nr. LEI-12-MP-090.19</td><td>1. The heat meter has been supplemented with the following modifications of the flow sensor with a circular cross-section meter tube:
<table>
<tr><th rowspan="2">End connections</th><th colspan="3">Fow-rate, m³/h</th><th rowspan="2">Pressure loss at q_p, kPa</th><th rowspan="2">Overal length, mm</th></tr>
<tr><th>q_p</th><th>q_s</th><th>q_i</th></tr>
<tr><td>G1 ¼ or DN25 or DN32</td><td>3,5</td><td>7,0</td><td>0,014</td><td>9</td><td>260</td></tr>
<tr><td>G1 ¼ or DN25 or DN32</td><td>3,5</td><td>7,0</td><td>0,035</td><td>9</td><td>260</td></tr>
</table></td></tr>
</table>

1	2	3
		2. The document PLE3V01, issued 08-03-2018, has been replaced by the document PLE3V02, issued 06-09-2019.
LT-1621-MI004-032 Revision 2	27-02-2020, Nr. LEI-12-MP-095.19	1. The meter has been supplemented by a design option – flow sensor and calculator with connected type approved temperature sensor Pt 500 pair. 2. The meter is additionally marked with a type number code. 3. The maximum cable length between the flow sensor and the calculator has been increased to 10 m. 4. Additional sealing of the combined device calculator. 5. Additional meter communication interfaces: - 868 MHz RF (LoRa); - RS485 (BacNet). 6. The document PLE3V02, issued 06-09-2019, has been replaced by the document PLE3V03, issued 16-01-2020. 7. New meter test instruction, issued 01-2020.
LT-1621-MI004-032 Revision 3	04-05-2020, Nr. LEI-12-MP-103.20	1. Additional data in the meter type number code. 2. Meters can be manufactured in accuracy class 2 or 3*. Note: * - only meters with a permanent flow rate q_p from 0,6 m³/h to 6,0 m³/h can also be of accuracy class 3. 3. The document PLE3V03, issued 16-01-2020, has been replaced by the document PLE3V04, issued 17-04-2020.
LT-1621-MI004-032 Revision 4	27-01-2021, Nr. LEI-12-MP-112.21	The label of the meter may be supplemented by the information note „Eigentum des Messstellenbetreibers“ (labeling drawing N1.1902.00.00.SB, 25-01-2021).
LT-1621-MI004-032 Revision 5	27-08-2021, Nr. LEI-12-MP-117.21	Temperature and temperature difference measurement limits of the meter have been extended (optional): limits of the temperature Θ : 0 ºC to 180 ºC; limits of temperature differences $\Delta\Theta$: 2 K to 175 K, or 3 K to 175 K.
LT-1621-MI004-032 Revision 6	07-10-2021, Nr. LEI-12-MP-121.21	1. The name of the meter has been changed from „heat meter” to „thermal energy meter”. 2. Additional data in the meter type number code. 3. New labeling label with the distributor’s „Ambiductor” brand. 4. The document PLE3V05, issued 14-07-2021, has been replaced by the document PLE3V06, issued 28-09-2021.

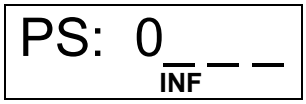
1	2	3
LT-1621-MI004-032 Revision 7	24-03-2023, Nr. LEI-12-MP-002.23	1. New labeling label with the distributor's „Oventrop" brand. 2. New labeling label with the distributor's „EVN" brand.
LT-1621-MI004-032 Revision 8	03-01-2024, Nr. LEI-12-MP-007.23	1. The labeling label with distributor's „Oventrop" brand has been replaced. 2. Labeling drawing N1.1902.00.00.SB has been replaced by a labeling label with the distributor's „Heitland" brand. 3. Document PLE3v06, issued on 28-09-2021, has been replaced by document PLE3v06, issued on 07-06-2023.
LT-1621-MI004-032 Revision 9	22-10-2025, Nr. LEI-12-MP-004.25	1. Additional data in the meter type number code. 2. New meter additional communication interface 868 MHz RF (wM-Bus, LoRa or wM-Bus+LoRa) (if applicable). 3. Document PLE3v06, issued on 07-06-2023, has been replaced by document PLE3v06, issued on 21-07-2025.
LT-1621-MI004-032 Revision 10	11-11-2026, Nr. LEI-12-MP-007.26	1. Replaced labeling label with distributor's „Oventrop" brand. 2. Labeling labels for meters intended for the markets of Macedonia, Kazakhstan, Mongolia.

Test instruction of the thermal energy meter QALCOSONIC E3

1. Activation of the test mode
The test mode can be activated in one of the following ways:

1.1. Activation of the test mode with the button
The test mode is activated by the meter's control button according to the following procedure:

- long press the button, on the meter's LCD select page „**INF**";
- short press the button, select „**tEST on Wh**" (when it is necessary to activate the energy pulse output via the optical interface) or „**tEST On m³**" (when it is necessary to activate the volume pulse output via the optical interface);
- long press the button, open the 4- digits security password input window:



- short press the button, select digit in the first position, after that long press the button and go to the next position;
- after selecting the digit in the fourth position, long press the button, the massage „**PASS**" appears briefly (when the password entered correctly) and the meter switches to test mode – the sign „**TEST**" appears;
- if the password was entered incorrectly, the message „**FAIL**" appears briefly and the meter returns to the operating mode, and the procedure for turning on the test mode must be repeated initially;
- the password value is fixed: **0001**.

NOTE: when the test mode is activated by the button, the volume and energy accumulated in the test mode are added to the meter's energy and volume readings in operating mode (after turning off the test mode).

1.2. Activation of the test mode by short-circuiting the contacts
Remove the screen „SERVICE" on the back of the calculator or, if the screen has already broken down, a protective seal-sticker is removed (Fig. 6, pos. 2 of this appendix), or, for a combined device, opens the calculator box. By short-circuiting the contacts „SERVICE", the SERVICE mode is activated, symbol „<->" and sign „**TEST**" are displayed on the LCD.
In this mode:

- volume pulses are generated via the optical interface of the meter. The button can be used to toggle the energy pulse output by selecting the menu item "tEST on Wh";
- the energy pulses are generated in the 1st pulse output and the volume pulses in the 2st pulse output (when the meter is supplied with a connected pulse input/output cable or the meter is combined);
- it is possible to simulate volume pulses for determination the energy measurement errors;
- it is possible to change the parameters of the meter configuration.

NOTE: when the test mode is activated by short-circuiting the contacts "SERVICE", the volume and energy accumulated in the test mode are not added to the meter's operating mode volume and energy readings.

1.3. Activation of test mode with software E3-CONFIGURATOR
The test mode can be activated via the optical interface using the software E3-CONFIGURATOR and optical scan head in accordance with LST EN 62056-21 standard. In this case, optionally volume or energy pulses are generated via the optical interface of the meter.

2. Determination of measurement errors of the meter

2.1. Volume measuring errors determination test
The detyermination of volume measurement errors shall be carried out in the hydrodynamic test bench in the following order:

1) The test mode is activated in accordance with section 1.1, 1.2, or 1.3 of this instruction;

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2) The volume measuring errors should be evaluated at control flow rates specified in LST EN1434-5. The volume of water, passing through the meter can be read directly from the indicating device (with resolution 1 ml), via meter optical output, using the optical reading head according to LST EN 62056-21 or trough wired volume pulse 2nd output (for a complete meter with a connected pulse input /output cable and for a combined meter activated in test mode according to p.1.2 of this instruction);
3) Volume pulse values in test mode are presented in table 1p:

Table 1p

Permanent flow-rate q_p of the heat meter, m³/h	Volume pulse value in test mode, litre/pulse
0,6 and 1,0	0,002
1,5	0,004
2,5	0,005
3,5 and 6	0,02
10; 15 and 25	0,05
40 and 60	0,2

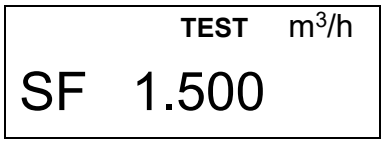
2.2. Energy measurement errors determination test

The energy measurement error of a calculator with temperature sensors pair shall be evaluated by immersing the temperature sensors in a temperature regulated baths. The test shall be performed in the following order:

1) The test mode is activated in accordance with section 1.2 of this instruction;
2) The meter temperature sensors are immersed in thermostatic baths, which form the supply and return line temperature and temperature difference values specified in LST EN 1434-5.

NOTE: for a combined meter, the energy measurement error determination may be performed separately for a calculator with a flow sensor. In this case, the temperature and temperature differences of the supply and return line specified in LST EN 1434-5 are simulated by connecting the reference resistors to the calculator terminals No.5;6;7;8.

3) Long press the button (for more than 5 seconds) activates the simulation of the volume pulses (the meter display periodically shows "SF" with the nominal flow rate of the meter, m³/h):



4) After 2,5 min. the volume simulation is completed, the sign „**SF**“ turns off. To calculate the energy measurement error, the simulated volume and energy readings shall be visually read from the meter display;
5) The amount of volume or energy can be read through the wired pulse output (if it is equipped in the meter);
6) The amount of volume or energy can be read through the meter's optical interface output using an optical scan head that complies with LST EN 62056-21;
7) Energy pulse values in test mode are presented in table 2p:

Table 2p

Permanent flow-rate q_p of the heat meter, m³/h	Energy pulse value based on displayed energy units:		
	„kWh“, „MWh“	„GJ“	„Gcal“
0,6 and 1,0	0,1 Wh/pulse	0,5 kJ/ pulse	0,1 kcal/ pulse
1,5	0,2 Wh/ pulse	1 kJ/ pulse	0,2 kcal/ pulse
2,5	0,5 Wh/ pulse	2 kJ/ pulse	0,5 kcal/ pulse
3,5 and 6	1 Wh/ pulse	5 kJ/ pulse	1 kcal/ pulse
10; 15 and 25	2 Wh/ pulse	10 kJ/ pulse	2 kcal/ pulse
40 and 60	5 Wh/ pulse	20 kJ/ pulse	5 kcal/ pulse
0,6 and 1,0	10 Wh/ pulse	50 kJ/ pulse	10 kcal/ pulse

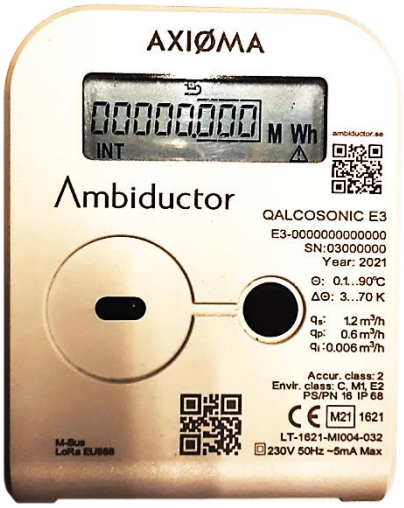
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3. Turn off the test mode

The test mode can be turned off in one of the following ways:

- long press the button select page „**INF**“on the meter’s LCD → short presses the button select „**tEST off**“ on the LCD → long press the button and the test mode is turn off, there is no sign „**TEST**“ on the screen (when the test mode is activated in accordance with section 1.1 of this instruction);
- by short-circuiting the contacts “SERVICE”, (when the test mode is activated in accordance with section 1.2 of this instruction);
- via the optical interface, using the software E3-CONFIGURATOR and optical head that complies with LST EN 62056-21 standard (when the test mode is activated in accordance with section 1.1 or 1.3 of this instruction);
- the meter switches to the operating mode by itself 12 hours after activation the test mode.

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Labeling label with distributor's „Ambiductor" brand



Labeling label with distributor's „EVN" brand



Labeling label with distributor's „Oventrop" brand



Labeling label with distributor's „Heitland" brand



Labeling label for the Macedonian market



Labeling label for the Kazakhstan market



Labeling label for the Mongolian market

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