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Harmonized standards applied: EN 1434-1:2007, EN 1434-2:2007, EN 1434-2:2007/AC:2007, EN 1434-3:2008, EN 1434-4:2007, EN 1434-4:2007/AC:2007, EN 1434-5:2007.

Additionally documents applied:

WELMEC 7.2 – Software guide (Issue 5).

The measuring instrument must correspond with the following specifications:

1 Design of the instrument

1.1 Construction

Heat meter PolluStat consists of the primary flow sensor and the calculator with type approved pair of temperature sensors with Pt500 elements.

Flow sensor consists of brass housing with the installed ultrasound transducers. The flow sensor inseparably connected to the calculator via 1,2 m length screened cable (2,5 m and 5 m – by special order) . The flow sensors $q_p = (0,6...6,0)$ m³/h has intended place for temperature sensor installation.

The calculator can be mounted directly on the flow sensor or separately.

The heat meter is operated by 3,6 V lithium battery, or by (12...42) V DC or (12...36) V AC main power supply.

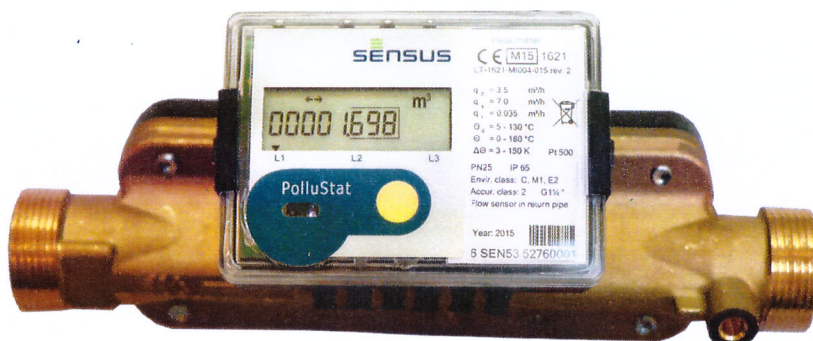


Fig.1. Heat meter PolluStat (calculator and flow sensor)

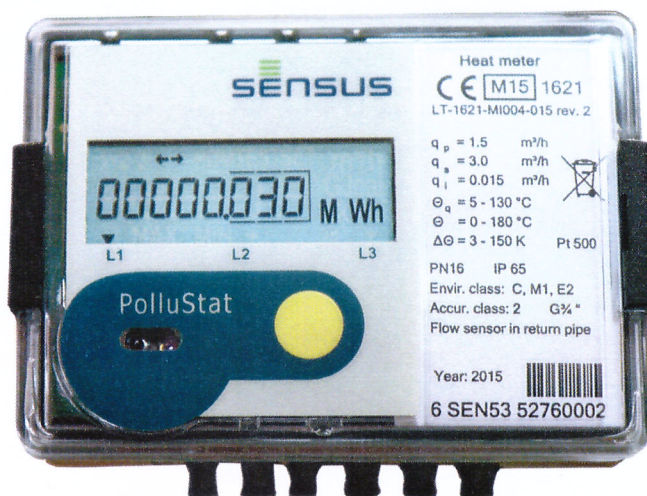


Fig.2. Calculator of the heat meter PolluStat

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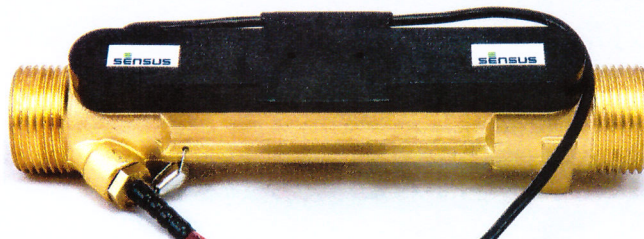


Fig.3. Flow sensor of the heat meter PolluStat $q_p = 0,6/1,0/1,5/2,5 \text{ m}^3/\text{h}$
(threaded end connections)

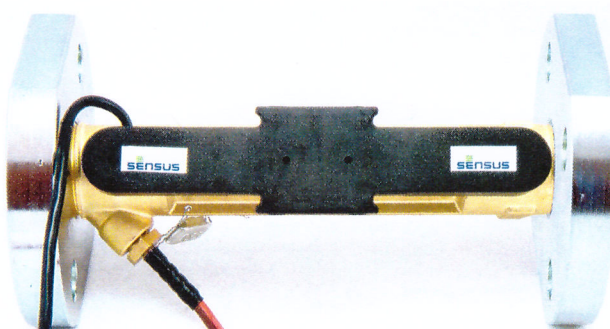


Fig.4. Flow sensor of the heat meter PolluStat $q_p = 0,6/1,0/1,5/2,5 \text{ m}^3/\text{h}$
(flanged end connections)

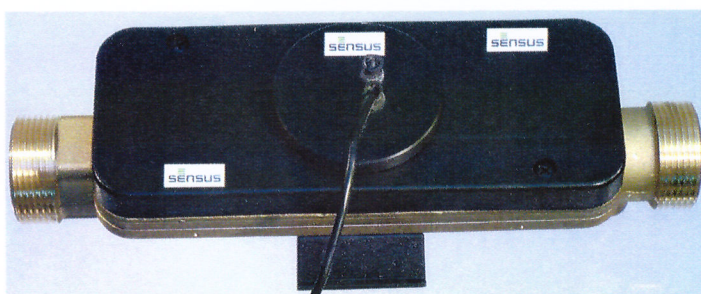


Fig.5. Flow sensor of the heat meter PolluStat $q_p = 3,5/6,0 \text{ m}^3/\text{h}$
(threaded end connections)

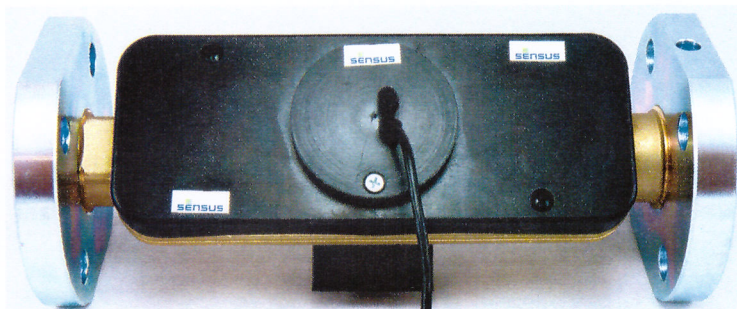


Fig.6. Flow sensor of the heat meter PolluStat $q_p = 3,5/6,0 \text{ m}^3/\text{h}$ (flanged end connections)

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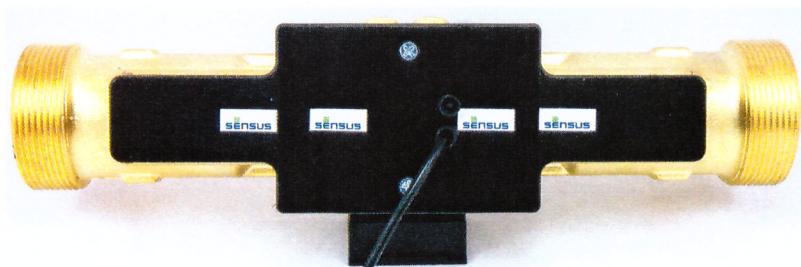


Fig.7. Flow sensor of the heat meter PolluStat $q_p = 10,0 \text{ m}^3/\text{h}$ (threaded end connections)

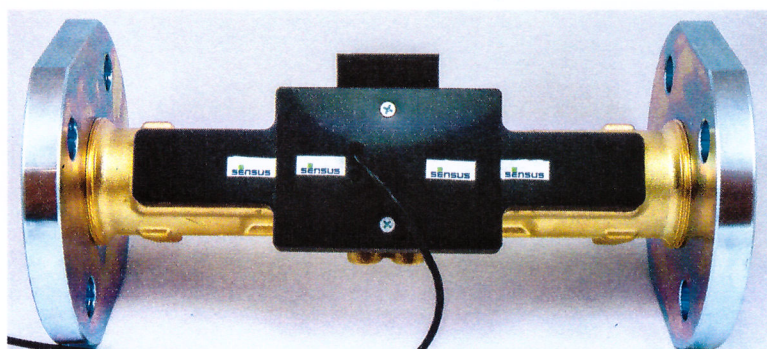


Fig.8. Flow sensor of the heat meter PolluStat $q_p = 10,0 \text{ m}^3/\text{h}$ (flanged end connections)

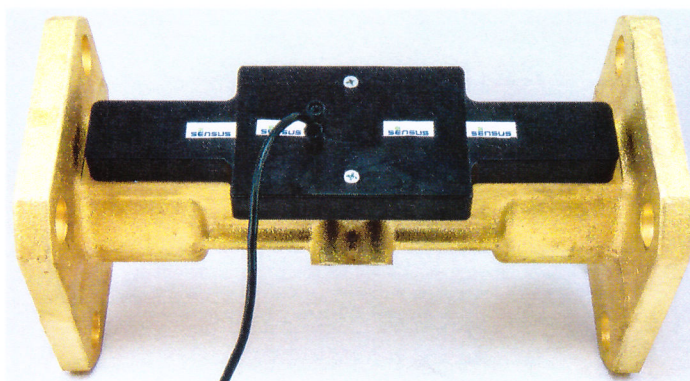


Fig.9. Flow sensor of the heat meter PolluStat $q_p = 15,0 \text{ m}^3/\text{h}$

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Type number combination of the heat meter PolluStat

[illegible]**Remarks:**

1. * - for meter $q_p = 1,5 \text{ m}^3/\text{h}$; $q_p = 2,5 \text{ m}^3/\text{h}$; $q_p = 6 \text{ m}^3/\text{h}$; $q_p = 10 \text{ m}^3/\text{h}$; $q_p = 15 \text{ m}^3/\text{h}$ only.
2. Type number code of the meter is used for order numbering.

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1.2 Measurand sensor

The heat meter hardware consists of an ultrasonic flow sensor and heat meter calculator with the connected temperature sensors. The calculator measures the resistance of type approved pair of temperature sensors with Pt500 elements and converts it to temperature according to formulas of EN 60751:2008. The calculator also measures the volume of the heat-conveying liquid by processing signals, received from the ultrasound transducers of the flow sensor.

1.3 Measurand 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.

1.4 Indication of the measurement results

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

1.5 Optional equipment and functions subject to MID requirements

Not applicable.

1.6 Technical documentation

- Ultrasonic meter for heating and cooling PolluStat – Technical description, user manual: PEPolluStatV03, 07-2015;
- Heat meter PolluStat – Mounting and Operating instruction: MH 4200, 07-2015.

Other reference documents on which basis this certificate is issued, are stored in a file No. LEI-12-MP-033.15.

1.7 Integrated equipment and functions not subject to MID

The heat meter can be without communication module or equipped with one of the following modules:

- M-Bus module;
- CL module;
- 868 MHz Rf radio module;
- MODBUS RS485 module;
- LON module;
- MiniBus module.

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

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



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2.1.2 Measurement range

For calculator:

- limits of the temperature Θ : 0 °C...180 °C;
- limits of temperature differences $\Delta\Theta$: 3 K...150 K.

Technical data of heat meter flow sensor are presented in Table 1:

Table 1

End connections	Flow-rate, m ³ /h			Overall length, mm
	Permanent q_p	Maximum q_s	Minimum q_i	
G $\frac{3}{4}$	0,6	1,2	0,006	110
G1 or DN20	0,6	1,2	0,006	190
G $\frac{3}{4}$	1,0	2,0	0,010	110
G1 or DN20	1,0	2,0	0,010	190
G $\frac{3}{4}$	1,5	3,0	0,006	110
G1 or DN20	1,5	3,0	0,006	190
G $\frac{3}{4}$	1,5	3,0	0,015	110
G1 or DN20	1,5	3,0	0,015	190
G1	1,5	3,0	0,015	130
G1	2,5	5,0	0,010	130
G1 or DN20	2,5	5,0	0,010	190
G1	2,5	5,0	0,025	130
G1 or DN20	2,5	5,0	0,025	190
G1 $\frac{1}{4}$ or DN25	3,5	7,0	0,035	260
G1 $\frac{1}{4}$ or DN25	6,0	12,0	0,024	260
G1 $\frac{1}{4}$ or DN25	6,0	12,0	0,060	260
G2 or DN40	10,0	20,0	0,040	300
G2 or DN40	10,0	20,0	0,100	300
DN50	15,0	30,0	0,060	270
DN50	15,0	30,0	0,150	270

Temperature limits of heat conveying liquid Θ_q : 5 °C...130 °C.

2.1.3 Accuracy class

Accuracy class - 2 according to EN 1434-1:2007.

2.1.4 Environmental conditions / Influence quantities

Ambient temperature	:	5 °C to 55 °C;
Humidity level	:	condensing;
Installations	:	indoor;
Mechanical environment	:	class M1;
Electromagnetic environment	:	class E2.

2.2 Other operating conditions

2.2.1 Maximum admissible working pressure

The maximum admissible working pressure of heat meter is 16 bar (PN16) or 25 bar (PN25).



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2.2.2 Mounting position of the flow sensor of the heat meter

Flow sensor can be mounted either vertically or horizontally.

3 Interfaces and compatibility conditions

3.1 Compatibility conditions

2 pulse inputs with programmable pulse value, class of pulse input device –IB according to EN 1434-2:2007.

2 temperature measurement channels for connecting temperature sensors with Pt500 sensing elements. Connection of the temperature sensors according to the two-wire scheme.

3.2 Interfaces

Integrated optical communication interface according to EN 62056-21:2002 requirements.

2 pulse outputs. Class of pulse output device - OB in operating mode, OD in test mode according to EN 1434-2:2007.

4 Requirements on production, putting into use and utilization

4.1 Requirements on production

At the end of the manufacturing and adjustment process the heat meters shall be tested according to the requirements of the EN 1434-5:2007. Errors of indication shall not exceed the maximum permissible errors, described in Annex MI-004 of Directive 2004/22/EC section 3.

The flow sensor of the heat meter can be tested with cold water (25 ± 5) °C.

4.2 Requirements on putting into use

The heat meter PolluStat must be installed and used in accordance with the requirements of document PEPolluStatV03 or MH 4200, listed in section 1.6.

The straight pipelines for flow sensor installation in upstream and downstream are not necessary.

4.3 Requirements for utilization

The heat meter must be utilized in accordance with the requirements of document PEPolluStatV03 listed in section 1.6.

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

5.1 Documentation of the procedure

No special requirements identified.

5.2 Special equipment or software

No special requirements identified.

5.3 Identification of hardware and software

Identification of hardware:

- see Fig.1 - 9 of this certificate;
- identification mark on the meter electronics wiring plate is SKU3-v12R8.

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Identification of software: version number of the software is "Soft 0.07". This number on demand can be shown on the display.

5.4 Calibration-adjustment procedure

Heat meter flow sensor and calculator errors determination test shall be carried out when TEST mode is activated as indicated in section 6.4 of the document PEPolluStatV03 noted in section 1.6 of the present appendix.

Determination of the error of the flow sensor shall be carried out using pulse output within each of the flow rate ranges appointed in section 5.2 of EN 1434-5:2007.

Determination of the heat energy error shall be carried out using internal volume simulation in TEST mode, while value of energy measured shall be read directly from display or by counting energy pulses from pulse output. Supply and return flow temperatures should be simulated using precise resistors. Test should be carried out in accordance with section 5.4 of EN 1434-5:2007.

Errors of indication shall not exceed the maximum permissible errors, described in Annex MI-004 of Directive 2004/22/EC section 3.

6 Security measures

6.1 Sealing

The following heat meter calculator sealing is provided:

- manufacturer adhesive seal - sticker on the access to the adjustment activation jumper (Fig.10, pos.1) and on the fixer of the cover protecting electronic module (Fig.10, pos.2);
- after installation the case and cover of the calculator (Fig.10, pos.3) are sealed with two hanged seals of heat supplier.

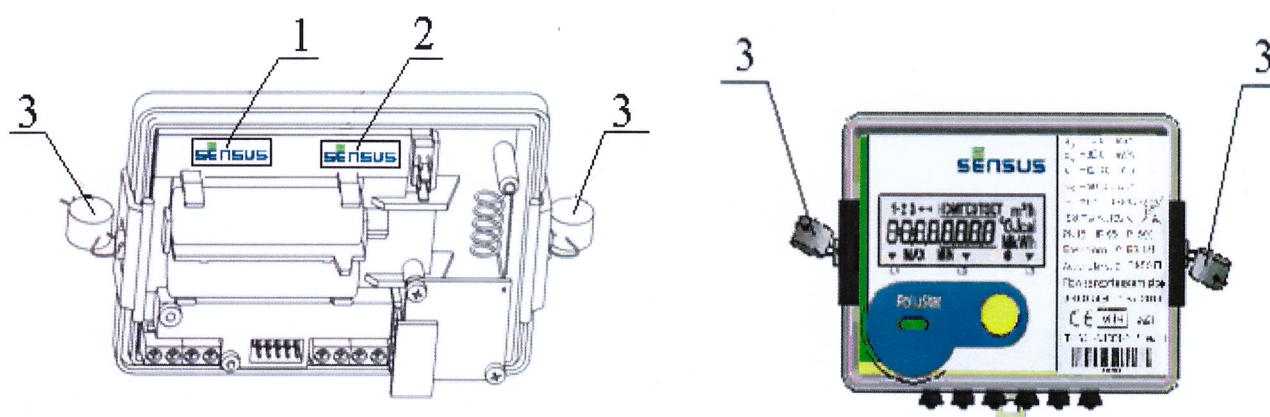


Fig.10. Sealing of the calculator of the heat meter PolluStat

The following flow sensor sealing is provided:

- manufacturer's adhesive seal - sticker on the bolts of the cover (Fig.11, Fig.12, Fig.13, Fig.14);

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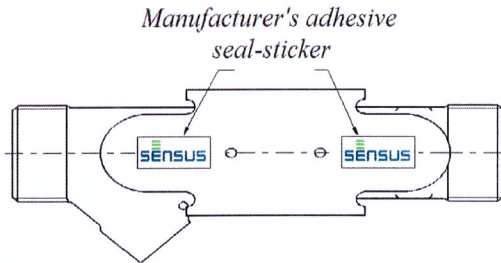


Fig. 11. Sealing of flow sensor of the heat meter
PolluStat $q_p = 0,6/1,0/1,5/2,5 \text{ m}^3/\text{h}$

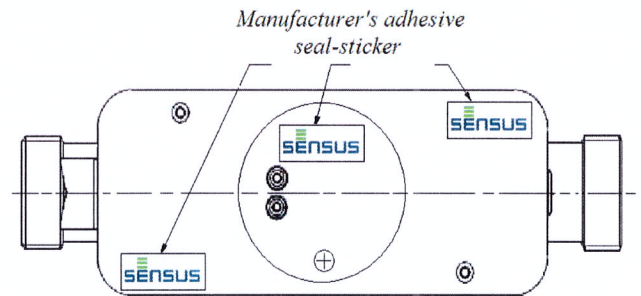


Fig. 12. Sealing of flow sensor of the heat meter
PolluStat $q_p = 3,5/6,0 \text{ m}^3/\text{h}$

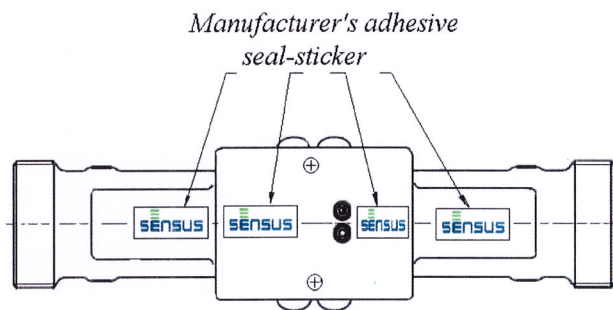


Fig. 13. Sealing of flow sensor of the heat meter
PolluStat $q_p = 10,0 \text{ m}^3/\text{h}$

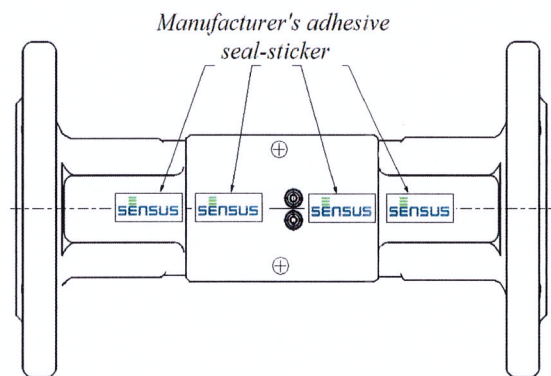


Fig. 14. Sealing of flow sensor of the heat meter
PolluStat $q_p = 15,0 \text{ m}^3/\text{h}$



Fig. 15. Example of the manufacturer's adhesive seal-sticker

6.2 Data logger

Archive data retention time is at least 12 years.

7 Marking and inscriptions

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

The following information shall appear in legible and indelible characters on the heat meter calculator casing and his label:

- EC-type examination number (LT-1621-MI004-015 rev. 2);
- manufacturer's mark or name;
- type designation;
- year of manufacture and serial number;
- limits of the temperature;
- limits of temperature differences;

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- limits of heat conveying liquid temperature;
- type of temperature sensors (Pt500);
- limits of flow-rate: maximum q_s , permanent q_p and minimum q_i ;
- the maximum admissible working pressure;
- flow sensor to be installed in the flow (supply) or return;
- accuracy class;
- climatic class;
- electromagnetic class;
- mechanical class.

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

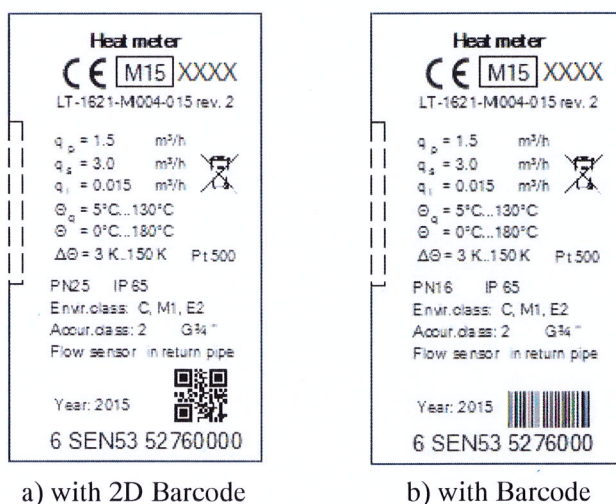


Fig. 16. Examples of the calculator marking labels

7.2 Conformity marking

In addition, the label of heat meter calculator 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.

Drawings are not added.

9 Certificate history

Issue	Date and reference No.	Description
1	2	3
LT-1621-MI004-015	31-07-2013, No. LEI-12-MP-018.13	Type examination certificate first issued



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1	2	3																																								
LT-1621-MI004-015 Revision 1	15-05-2014, No. LEI-12-MP-024.14	<p>1.Meter is supplemented with following flow sensor modifications:</p> <table><tr><th>End connections</th><th>Permanent flow-rate q_p, m³/h</th><th>Minimum flow-rate q_i, m³/h</th><th>Overall length, mm</th></tr><tr><td>G1 or DN20</td><td>0,6</td><td>0,006</td><td>190</td></tr><tr><td>G1 or DN20</td><td>1,0</td><td>0,010</td><td>190</td></tr><tr><td>G1 or DN20</td><td>1,5</td><td>0,006</td><td>190</td></tr><tr><td>G1 or DN20</td><td>1,5</td><td>0,015</td><td>190</td></tr><tr><td>G1 or DN20</td><td>2,5</td><td>0,010</td><td>190</td></tr><tr><td>G1 or DN20</td><td>2,5</td><td>0,025</td><td>190</td></tr><tr><td>DN25</td><td>3,5</td><td>0,035</td><td>260</td></tr><tr><td>DN25</td><td>6,0</td><td>0,024</td><td>260</td></tr><tr><td>DN25</td><td>6,0</td><td>0,060</td><td>260</td></tr></table> <p>2. Energy units kWh, MWh, Gcal, GJ displayed by heat meter calculator are changed into MWh, Gcal, GJ.</p> <p>3. Document PEPolluStatV01, issued 07-2013, is replaced by two following documents:</p> <ul style="list-style-type: none">- PEPolluStatV02, issued 04-2014;- MH 4200, issued 01-2014.	End connections	Permanent flow-rate q_p , m³/h	Minimum flow-rate q_i , m³/h	Overall length, mm	G1 or DN20	0,6	0,006	190	G1 or DN20	1,0	0,010	190	G1 or DN20	1,5	0,006	190	G1 or DN20	1,5	0,015	190	G1 or DN20	2,5	0,010	190	G1 or DN20	2,5	0,025	190	DN25	3,5	0,035	260	DN25	6,0	0,024	260	DN25	6,0	0,060	260
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LT-1621-MI004-015 Revision 2	31-07-2015, No. LEI-12-MP-033.15	<p>1. Additional modifications of the connection cable between flow sensor and calculator: 2,5 m or 5 m.</p> <p>2. Additional modification of the meter power supply: (12...42) V DC or (12...36) V AC main power supply.</p> <p>3. Energy units MWh, Gcal, GJ displayed by heat meter calculator are changed into kWh, MWh, Gcal, GJ.</p> <p>4. The heat meter additionally can be equipped with one of the following communication modules:</p> <ul style="list-style-type: none">- MODBUS RS485 module;- LON module;- MiniBus module. <p>5. Meter is supplemented with following flow sensor modification:</p> <table><tr><th>End connections</th><th>Permanent flow-rate q_p, m³/h</th><th>Minimum flow-rate q_i, m³/h</th><th>Overall length, mm</th></tr><tr><td>G1</td><td>1,5</td><td>0,015</td><td>130</td></tr></table> <p>6. The maximum admissible working pressure 16 bar (PN16) is changed in to 16 bar (PN16) or 25 bar (PN25).</p>	End connections	Permanent flow-rate q_p , m³/h	Minimum flow-rate q_i , m³/h	Overall length, mm	G1	1,5	0,015	130																																
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1	2	3
		<p>7. The straight pipelines for flow sensor installation in upstream and downstream are not necessary.</p> <p>8. Document PEPolluStatV02, issued 04-2014 and document MH 4200, issued 01-2014 are replaced by following documents:</p> <ul style="list-style-type: none">- PEPolluStatV03, issued 07-2015;- MH 4200, issued 07-2015. <p>9. New meter software version „Soft 0.07“.</p>