**Harmonized standards applied:** EN 1434-1:2007, EN 1434-2:2007/AC:2007, EN 1434-3:2008, 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. The flow sensors $q_p$ = (0,6 ÷ 2,5) 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.

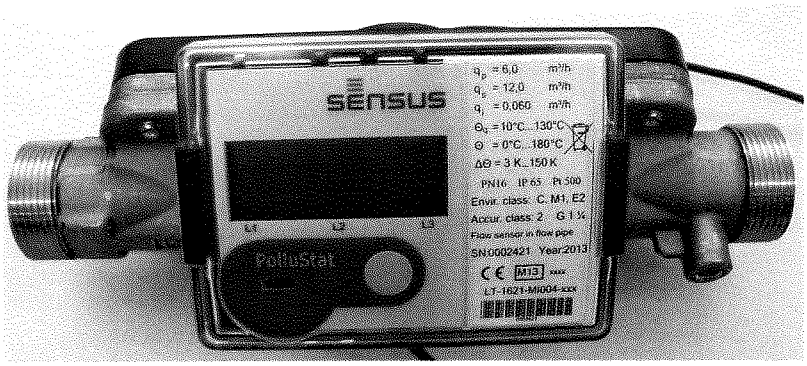


Fig.1.Heat meter PolluStat (calculator and flow sensor)

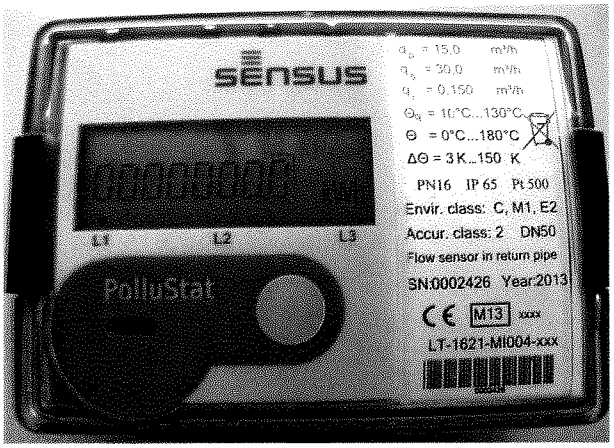


Fig.2. Calculator of the heat meter PolluStat

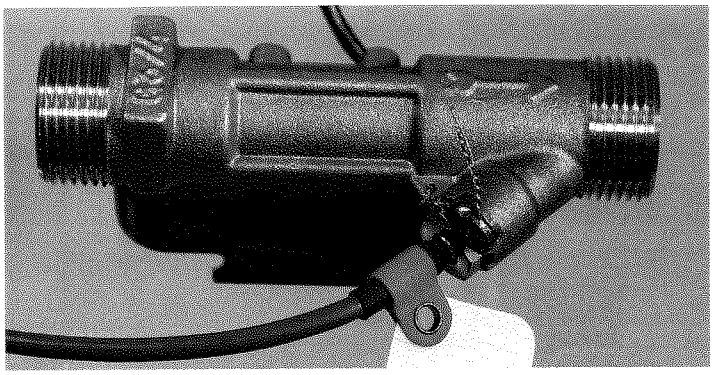

Fig.3. Flow sensor of the heat meter PolluStat $q_p$ = 0,6/1,0/1,5/2,5 m³/h

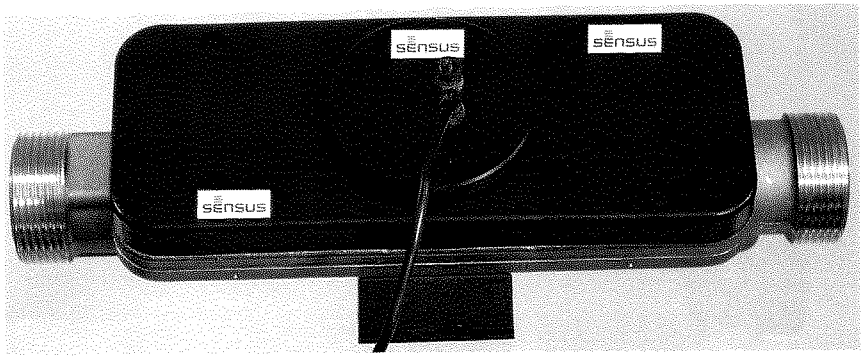


Fig.4. Flow sensor of the heat meter PolluStat $q_p$ = 3,5/6,0 m³/h (threaded end connections)


Fig.5. Flow sensor of the heat meter PolluStat $q_p$ = 3,5/6,0 m³/h (flanged end connections)

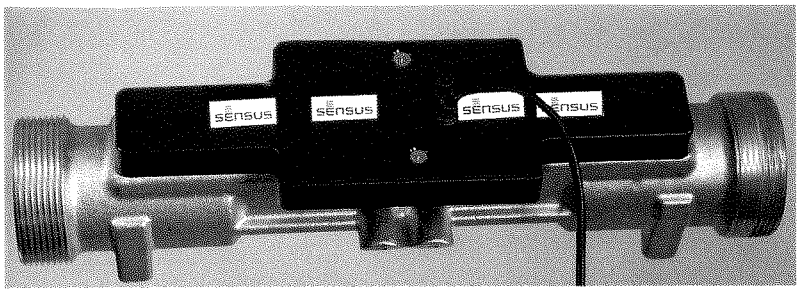


Fig.6. Flow sensor of the heat meter PolluStat $q_p$= 10,0 m³/h (threaded end connections)

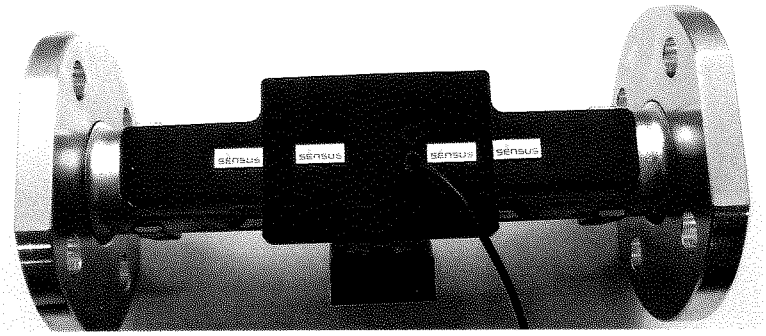


Fig.7. Flow sensor of the heat meter PolluStat $q_p$= 10,0 m³/h (flanged end connections)

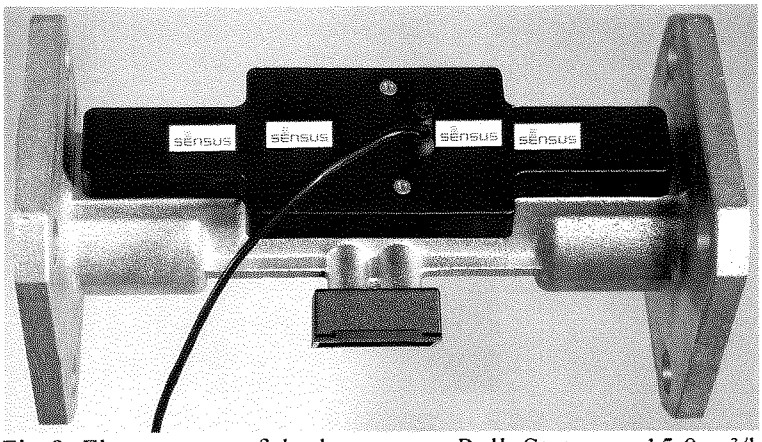


Fig.8. Flow sensor of the heat meter PolluStat $q_p$ = 15,0 m³/h

## Type number combination of the heat meter PolluStat

**PolluStat - □*-□*-□*-□* -□* -15***

**Type**

| Installation of the flow sensor: | Code |
|---|---|
| In supply pipe | 1 |
| In return pipe | 2 |

| Destination of the heat meter: | Code |
|---|---|
| Meter for heating (for measuring heating energy only) | 1 |
| Meter for heating and cooling (for measuring heating and cooling energy) | 2 |

| Ratio of the flow rates ($q_p$/ $q_i$) | Limits of temperature differences | Code |
|---|---|---|
| 100 | 3K...150 K | 3 |
| 250** | 3K...150 K | 4 |

**Flow sensor:**

| Permanent flow-rate, $m^3/h$ | Overall length, mm | End connections | Code |
|---|---|---|---|
| 0,6 | 110 | G¾ | 1 |
| 1,0 | 110 | G¾ | 2 |
| 1,5 | 110 | G¾ | 3 |
| 2,5 | 130 | G1 | 4 |
| 3,5 | 260 | G1 ¼ | 5 |
| 6,0 | 260 | G1 ¼ | 6 |
| 10,0 | 300 | G2 | 7 |
| 10,0 | 300 | DN40 | 8 |
| 15,0 | 270 | DN50 | 9 |
| 3,5 | 260 | DN25 | A |
| 6,0 | 260 | DN25 | B |

| Communication module | Code |
|---|---|
| None | 0 |
| M-Bus module | 1 |
| CL module | 2 |
| RF 868 MHz module | 4 |

**Length of temperature sensors connection cable, m (1,5; 3 or 5 m), example 1,5 m**

Remarks:
1.* - marked numbers are used only for order numbering;
2.**- for meters $q_p$ = 1,5 m³/h; $q_p$ = 2,5 m³/h; $q_p$ = 6,0 m³/h; $q_p$ = 10,0 m³/h; $q_p$ = 15,0 m³/h only.

### 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 (cooling), 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 kWh. Other units (MWh, 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: PEPolluStatV01, 07-2013.
Other reference documents on which basis this certificate is issued, are stored in a file Nr.LEI-12-MP-018.13.

### 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;
- RF 868 MHz module.

## 2 Technical data

### 2.1 Rated operating conditions

#### 2.1.1 Measurand

Thermal (cooling) 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

For calculator:

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

For flow sensor:
Temperature limits of heat conveying liquid:
- for meters $q_p \leq 2{,}5$ m$^3$/h $\quad \Theta_q = 5$ °C...130 °C;
- for meters $q_p \geq 3{,}5$ m$^3$/h $\quad \Theta_q = 10$ K...130 °C.

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

Table 1

| End connections | Flow-rate, m³/h | | | Overall length , mm |
|---|---|---|---|---|
| | Permanent $q_p$ | Maximum $q_s$ | Minimum $q_i$ | |
| G¾ | 0,6 | 1,2 | 0,006 | 110 |
| G¾ | 1,0 | 2,0 | 0,010 | 110 |
| G¾ | 1,5 | 3,0 | 0,015 | 110 |
| G¾ | 1,5 | 3,0 | 0,006 | 110 |
| G1 | 2,5 | 5,0 | 0,025 | 130 |
| G1 | 2,5 | 5,0 | 0,010 | 130 |
| G1 ¼ or DN25 | 3,5 | 7,0 | 0,035 | 260 |
| G1 ¼ or DN25 | 6,0 | 12,0 | 0,060 | 260 |
| G1 ¼ or DN25 | 6,0 | 12,0 | 0,024 | 260 |
| G2 or DN40 | 10,0 | 20,0 | 0,100 | 300 |
| G2 or DN40 | 10,0 | 20,0 | 0,040 | 300 |
| DN50 | 15,0 | 30,0 | 0,150 | 270 |
| DN50 | 15,0 | 30,0 | 0,060 | 270 |

### 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 : non condensing;
Location : closed;
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).

### 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/AC:2007.
2 temperature measurement channels for connecting temperature sensors with Pt500 sensing elements. Connection to the calculator – according to the two-wire scheme.

### 3.2 Interfaces

Integrated optical communication interface according to EN 62056-21:2002 requirements.
2 pulse outputs for remote data reading. Class of pulse output device - OB according to EN 1434-2:2007/AC: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 EN 1434-5 requirements. The 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, listed in section 1.6.
Necessary straight line length for flow sensor installation in pipeline:

| | |
|---|---|
| $q_p \leq 6$ m$^3$/h | no requirements for straight pipeline length in upstream and downstream |
| $q_p > 6$ m3/h | upstream straight pipeline length ≥ 5×DN and downstream ≥ 3×DN |

### 4.3 Requirements for utilization

The heat meter PolluStat must be utilized in accordance with the requirements of document 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 - 8 of this sertificate;
- identification mark on the meter electronics wiring plate is SKU3-v12R4.

Identification of software: version number of the software is "Soft 0.06". 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.

For activation of TEST mode the jumper must by set up on the connector express contacts in the calculator as indicated in section 6.4 of the document noted in section 1.6 of the present certificate.

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 (see Fig.9, pos.1) and on the fixer of the cover protecting electronic module (see Fig.9, pos.2);
- after installation the case and cover of the calculator (see Fig.9, pos.3) are sealed with 2 hanged seals of heat supplier.

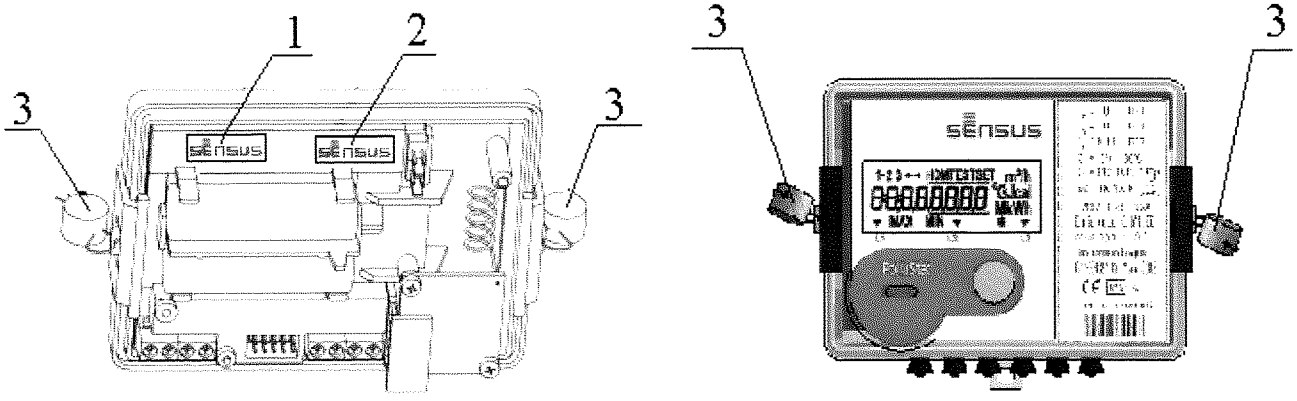


Fig.9. Sealing of the calculator of the heat meter PolluStat

The following flow sensor sealing is provided:

- manufacturer adhesive seal - sticker on the bolts of the cover (see Fig.10, Fig.11, Fig.12, Fig.13);

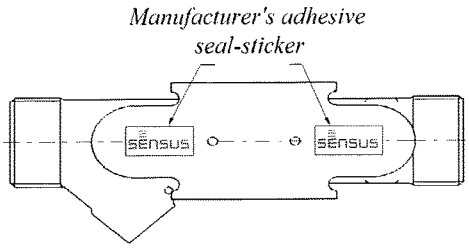


Fig. 10. Sealing of flow sensor of the heat meter PolluStat $q_p$ = 0,6/1,0/1,5/2,5 m³/h

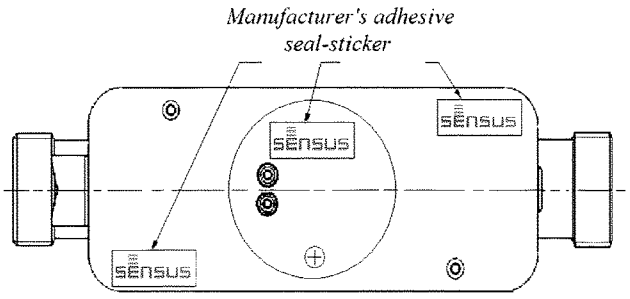


Fig. 11. Sealing of flow sensor of the heat meter PolluStat $q_p$ = 3,5/6,0 m³/h

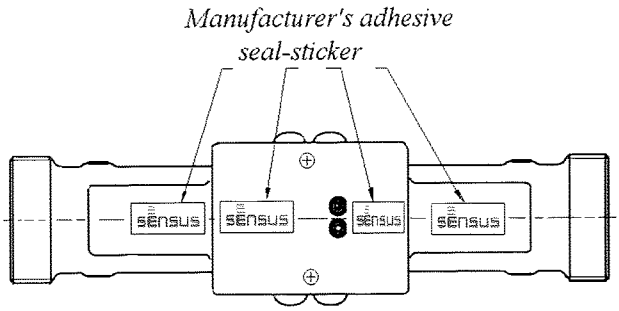


Fig. 12. Sealing of flow sensor of the heat meter PolluStat $q_p$ = 10,0 m³/h

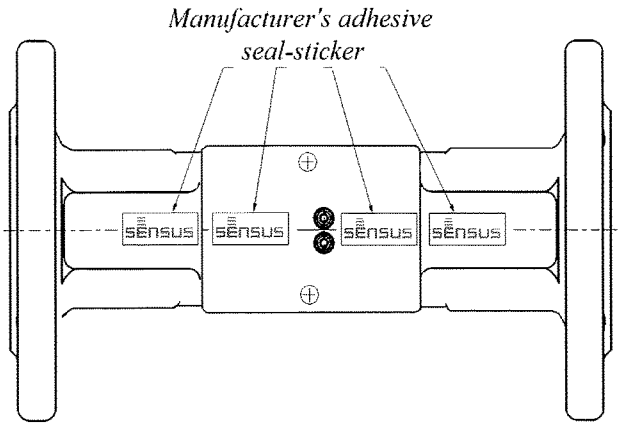


Fig. 13. Sealing of flow sensor of the heat meter PolluStat $q_p$ = 15,0 m³/h

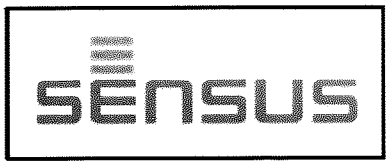


Fig.14. Example of the manufacturer adhesive seal-sticker

### 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 or his label:

- EC-type examination number (LT-1621-MI004-015);
- name of the supplier or this trade mark;

- type designation;
- year of manufacture and serial number;
- limits of the temperature;
- limits of temperature differences;
- 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 or return;
- accuracy class;
- climatic class;
- electromagnetic class;
- mechanical class.

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

### 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 Nr. | Date | Description |
|---|---|---|
| LT-1621-MI004-015 | 31-10-2013 | Type examination certificate first issued |