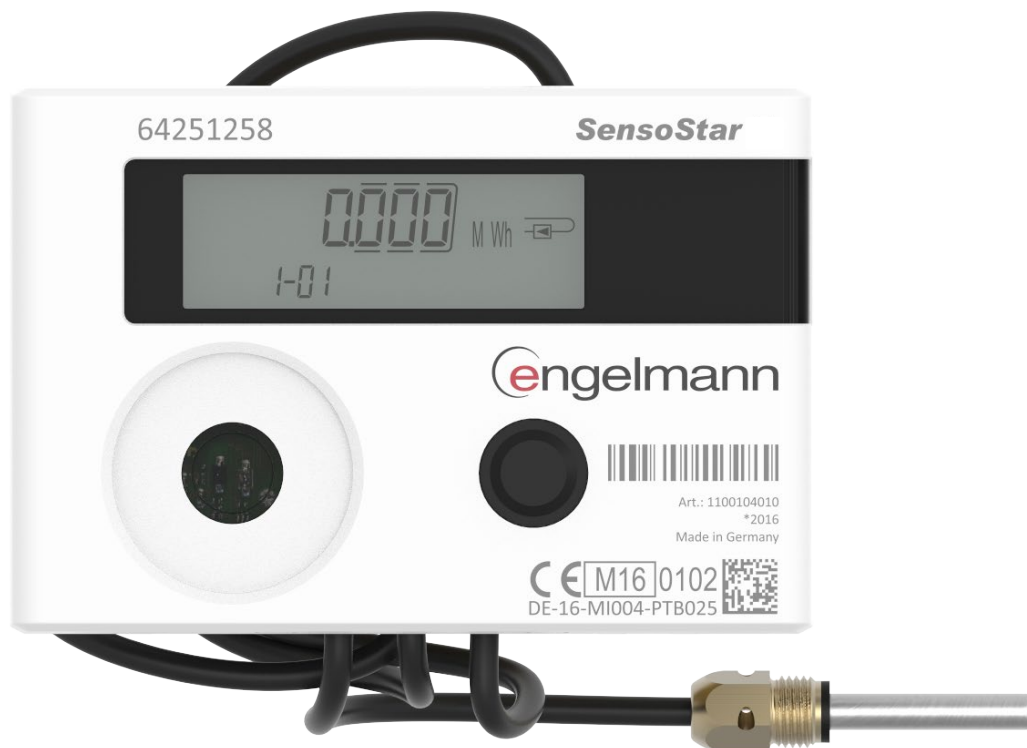


## Engelmann Compact Heat Meter

# SensoStar I / T / M

### Multi-jet flow sensor for installation points IST, TE1, M60

(IST: for Ista heat meters; TE1: for Techem heat meters; M60: for Minol heat meters)



- Detection of back flow
- Measuring cycle temperature, dynamic: 2 / 60 s
- Outlet flow and inlet flow can be set on site
- Detachable calculator unit, pulse cable length 50 cm (optional)
- Communication interfaces:
  - wireless M-Bus;
  - wireless M-Bus + 3 pulse inputs;
  - M-Bus;
  - M-Bus + 3 pulse inputs;
  - 1 pulse output;
  - 2 pulse outputs

## Technical data:

### Flow sensor

|                  |                                                                |         |                                                                                                                                                                                              |      |      |
|------------------|----------------------------------------------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|
| Measuring method |                                                                |         | bidirectional inductive scanning system                                                                                                                                                      |      |      |
| Sizes            | Nominal flow $q_p$                                             | $m^3/h$ | 0,6                                                                                                                                                                                          | 1,5  | 2,5  |
|                  | Low flow threshold                                             | $l/h$   | 4                                                                                                                                                                                            | 4    | 5,5  |
|                  | Minimum flow $q_i$                                             | $l/h$   | 30                                                                                                                                                                                           | 30   | 50   |
|                  | Maximum flow $q_s$                                             | $m^3/h$ | 1,2                                                                                                                                                                                          | 3    | 5    |
|                  | Pressure drop $\Delta p$ at $q_p$                              | bar     | 0,03                                                                                                                                                                                         | 0,2  | 0,24 |
|                  | Pressure drop $\Delta p$ at $q_s$                              | bar     | 0,1                                                                                                                                                                                          | 0,74 | 0,92 |
|                  | Dynamic range $q_i/q_p$                                        |         | 1:20                                                                                                                                                                                         | 1:50 | 1:50 |
|                  | Accuracy class (MID)                                           |         | class 3                                                                                                                                                                                      |      |      |
|                  | Nominal pressure PN                                            | bar     | 16                                                                                                                                                                                           |      |      |
|                  | Temperature range medium heat                                  | °C      | 15 - 90                                                                                                                                                                                      |      |      |
|                  | Temperature range medium cooling<br>( $q_p$ 1,5 and $q_p$ 2,5) | °C      | 5 - 50                                                                                                                                                                                       |      |      |
|                  | Point of installation                                          |         | outlet flow and inlet flow; can be set when the amount of energy is still $\leq 10$ kWh                                                                                                      |      |      |
|                  | Mounting position                                              |         | any position                                                                                                                                                                                 |      |      |
|                  | Protection class                                               |         | IP65                                                                                                                                                                                         |      |      |
|                  | Medium                                                         |         | water; optional, without approval*: water with a propylene glycol or ethylene glycol percentage rate of 20 %, 30 %, 40 % or 50 % (* type and concentration of glycol can be set at any time) |      |      |

### Calculator unit

|  |                                                                      |       |                                                                                                                                                                     |  |  |
|--|----------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|  | Temperature range medium heat                                        | °C    | 0 – 150                                                                                                                                                             |  |  |
|  | Temperature range medium cooling<br>( $q_p$ 1,5 and $q_p$ 2,5)       | °C    | 0 – 50                                                                                                                                                              |  |  |
|  | Ambient temperature in the field                                     | °C    | 5 – 55 at 95 % relative humidity                                                                                                                                    |  |  |
|  | Transport temperature                                                | °C    | -25 – 70 (for maximal 168 h)                                                                                                                                        |  |  |
|  | Storage temperature                                                  | °C    | -25 – 55                                                                                                                                                            |  |  |
|  | Temperature difference range $\Delta\theta$ heat                     | K     | 3 – 100                                                                                                                                                             |  |  |
|  | Temperature difference range $\Delta\theta$ cooling                  | K     | -3 – -50                                                                                                                                                            |  |  |
|  | Minimum temperature difference $\Delta\theta$ heat                   | K     | $> 0,05$                                                                                                                                                            |  |  |
|  | Minimum temperature difference $\Delta\theta$ cooling                | K     | $< -0,05$                                                                                                                                                           |  |  |
|  | Minimum temperature difference<br>$\Delta\theta_{HC}$ heat / cooling | K     | $> 0,5 / < -0,5$                                                                                                                                                    |  |  |
|  | Resolution temperature                                               | °C    | 0,01                                                                                                                                                                |  |  |
|  | Measuring cycle temperature; dynamic                                 | s     | 2 / 60; using a power pack: 2 s permanent                                                                                                                           |  |  |
|  | Display                                                              |       | LCD - 8 digits + special characters                                                                                                                                 |  |  |
|  | Decimal places                                                       |       | up to 3 after comma                                                                                                                                                 |  |  |
|  | Units                                                                |       | MWh, kW, $m^3$ , $m^3/h$ (kWh, GJ, MMBTU, Gcal);<br>unit of energy can be set when the amount of energy is still $\leq 10$ kWh                                      |  |  |
|  | Interfaces                                                           |       | optical interface (M-Bus protocol);<br>optional: wireless M-Bus; wireless M-Bus + 3 pulse inputs;<br>M-Bus; M-Bus + 3 pulse inputs; 1 pulse output; 2 pulse outputs |  |  |
|  | Power supply                                                         |       | exchangeable 3 V lithium battery; all types prepared for 3 V power pack (input voltage 230 V / 24 V)                                                                |  |  |
|  | Estimated lifetime                                                   | years | 10 (no option: 1 pulse output); 6+1                                                                                                                                 |  |  |

Data storage  
Reading dates

2 tariff registers  
Storage of maximum values

Protection class  
CE  
EMC

### Temperature sensors (2-wire technique)

Platinum precision resistor

Diameter mm

Length of cable m

Installation

nonvolatile memory

selectable yearly reading date;

15 monthly and semimonthly values via display or wireless M-Bus (compact mode);

24 monthly and semimonthly values via optical interface or M-Bus

can be set individually; adding up energy or time flow, power and temperatures (inlet, outlet,  $\Delta\theta$ ), plus the respective maximum values of the last 15 months

IP65

yes

EN 1434

Pt 1000

5; 5,2; 6; AGFW 27,5; 38; needle sensor 3,5 x 75

1,5; 3; 6

asymmetrical; symmetrical

### Weights

Weight (basic version, kg)

Type I

Type T

Type M

Calculator not detachable

0,655

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Calculator detachable

0,700

0,780

0,700

### Dimensions

Pulse cable length (only separable version)

m

0,50

Calculator housing (H x W x D)

mm

75 x 110 x 34,5

Thread

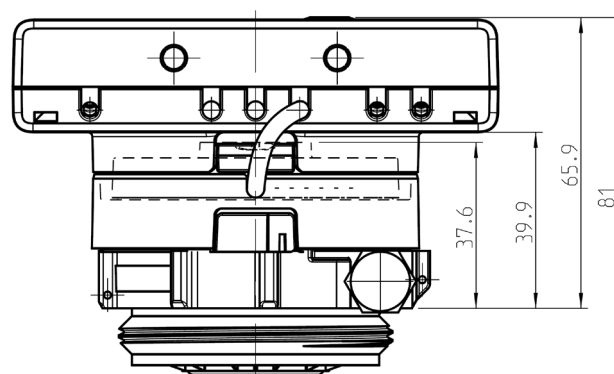
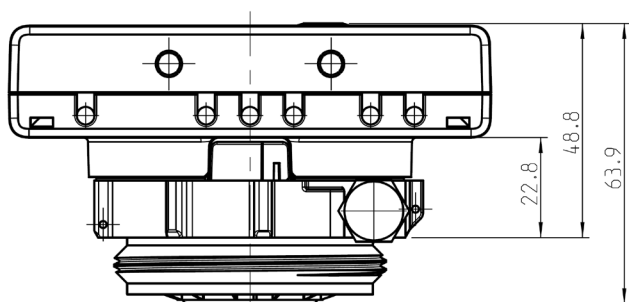
Type I: 2"

Type T: M62 x 2

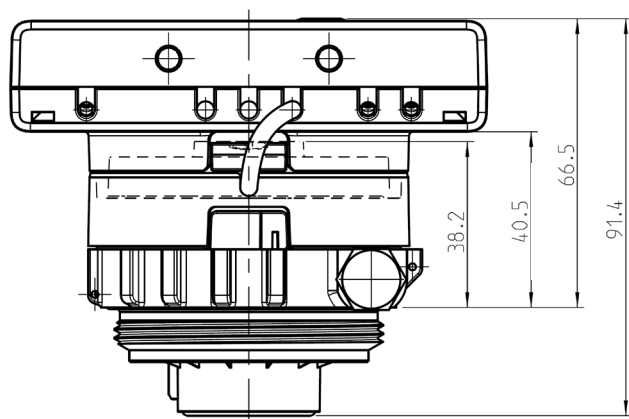
Type M: M60 x 1,5

(these types are available; only the type top left does not have a detachable calculator)

### SensoStar I



### SensoStar T



### SensoStar M

