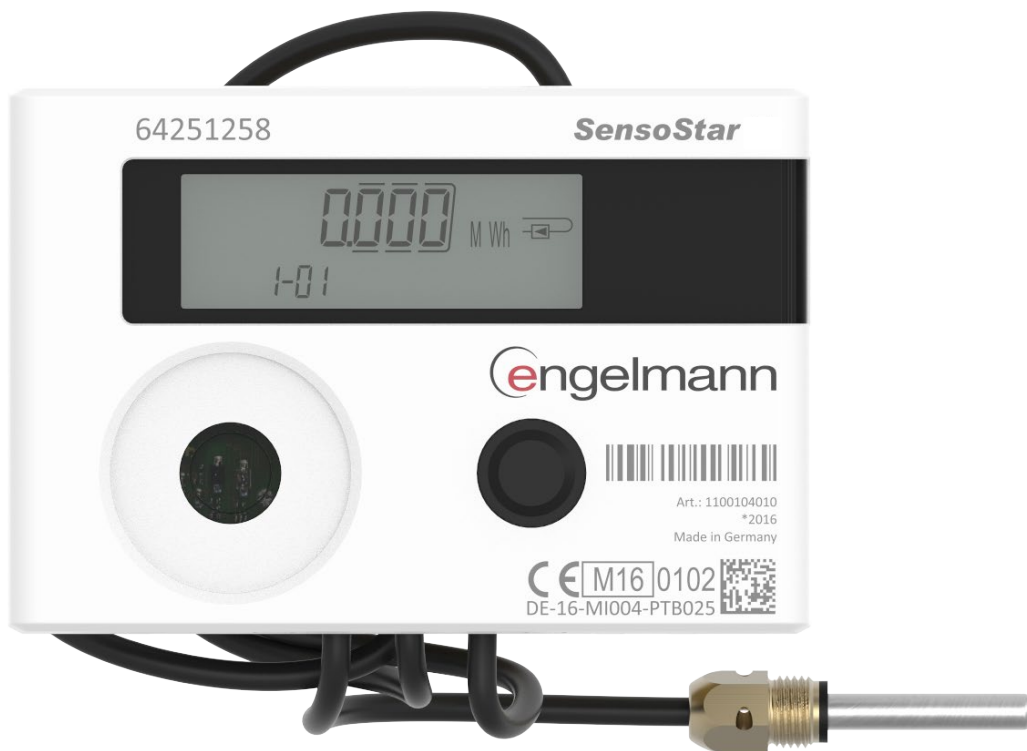


Engelmann Compact Heat Meter

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	3,5	4	5,5
	Minimum flow q_i	l/h	12	30	50
	Maximum flow q_s	m^3/h	1,2	3	5
	Pressure drop Δp at q_p	bar	0,03	0,2	0,24
	Pressure drop Δp at q_s	bar	0,1	0,74	0,92
	Dynamic range q_i/q_p		1:50	1:50	1:50
	Accuracy class (MID)		class 3		
	Nominal pressure PN	bar	16		
	Temperature range medium heat	$^{\circ}C$	15 - 90		
	Temperature range medium cooling (q_p 1,5 and q_p 2,5)	$^{\circ}C$	5 - 50		
	Point of installation		outlet flow and inlet flow; can be set when the amount of energy is still ≤ 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	$^{\circ}C$	0 – 150		
	Temperature range medium cooling (q_p 1,5 and q_p 2,5)	$^{\circ}C$	0 – 50		
	Ambient temperature in the field	$^{\circ}C$	5 – 55 at 95 % relative humidity		
	Transport temperature	$^{\circ}C$	-25 – 70 (for maximal 168 h)		
	Storage temperature	$^{\circ}C$	-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 $\Delta\theta_{HC}$ heat / cooling	K	$> 0,5 / < -0,5$		
	Resolution temperature	$^{\circ}C$	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); unit of energy can be set when the amount of energy is still ≤ 10 kWh		
	Interfaces		optical interface (M-Bus protocol); optional: wireless M-Bus; wireless M-Bus + 3 pulse inputs; 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

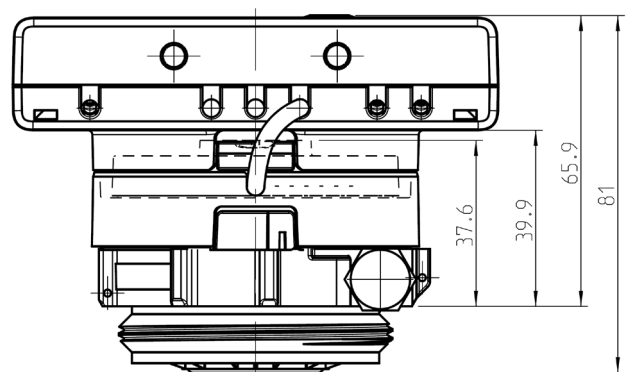
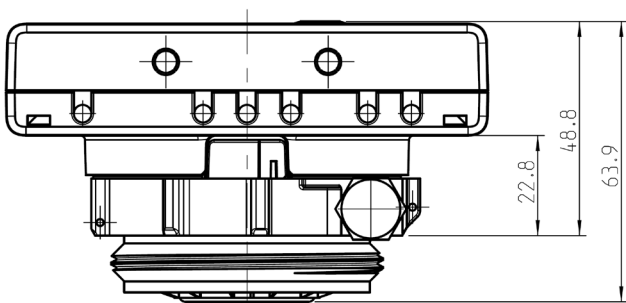
Weight (basic version, kg)	Type I	Type T	Type M
Calculator not detachable	0,655	--	--
Calculator detachable	0,700	0,780	0,700

Dimensions

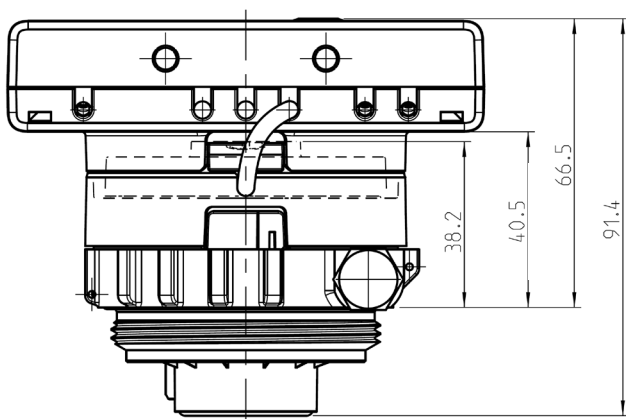
Pulse cable length (only separable version)	m	0,50	
Calculator housing (H x W x D)	mm	75 x 110 x 34,5	
Thread	Type I: 2"	Type T: M62 x 2	Type M: M60 x 1,5

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

SensoStar I



SensoStar T



SensoStar M

