

Engelmann Calculator for Combined Heat Meters

SensoStar C



- **Compact design**
- **Battery easy to exchange; calculator prepared for 3 V power pack**
- **Inlet flow and outlet flow can be set on site**
- **Communication interfaces; can be added later to every device:**
 - wireless M-Bus;**
 - wireless M-Bus + 3 pulse inputs;**
 - M-Bus;**
 - M-Bus + 3 pulse inputs;**
 - Modbus RTU;**
 - LoRaWAN + 3 pulse inputs;**
 - 1 pulse output;**
 - 2 pulse outputs**

Technical Data:

Calculator

Temperature range medium heat	°C	0 – 150
Temperature range medium cooling	°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 temp. difference $\Delta\theta$ cooling	K	< -0,05
Minimum temperature difference	K	> 0,5 / < -0,5
$\Delta\theta_{HC}$ heat / cooling		
Resolution temperature	°C	0,01
Measuring cycle energy in normal operation	s	60 with a lifetime of 10 years; 30 with a lifetime of 6+1 years (optional); 2 using a power pack
Pulse values, optional	l/Imp	1; 2,5; 10; 25; 100; 250; 1000; 2500; adjustable (TX version)
Display		LCD – 8 digits + special characters
Decimal places		up to 3 after comma
Units		MWh, kW, m ³ , m ³ /h (kWh, GJ); 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; Modbus RTU; LoRaWAN + 3 pulse inputs; 1 pulse output; 2 pulse outputs
Power supply		exchangeable 3 V lithium battery; prepared for 3 V power pack (input voltage 230 V; 24 V AC)
Estimated lifetime	years	10 (no option: 1 pulse output); 6+1
Data storage		nonvolatile memory
Reading dates		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
2 tariff registers		can be set individually; adding up energy or time
Storage of maximum values		flow, power and temperatures (inlet, outlet, $\Delta\theta$), plus the respective maximum values of the last 15 months
Protection class		IP54
CE		yes
Mechanical / electromagnetic class		M2 / E2
Pulse input interface		microcontroller CMOS input class IB according to EN 1434-2:2015 (D)
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)
Weight	kg	0,350
W x H x D	mm	150 x 130 x 35

Flow meter requirements

Class of pulse output device		according to EN 1434-2:2015: OA (reed contact); OC (open collector)
Maximum input frequency	Hz	10
Pulse length and pulse pause		at least 25 ms pulse length; at least 50 ms pulse pause

Temperature sensor requirements

Platinum precision resistor		Pt 500
Length of cables (unshielded)	m	up to 10 m in 2-wire technique; (3 and 10 available at Engelmann)
Installation		direct mounted; in temperature pockets