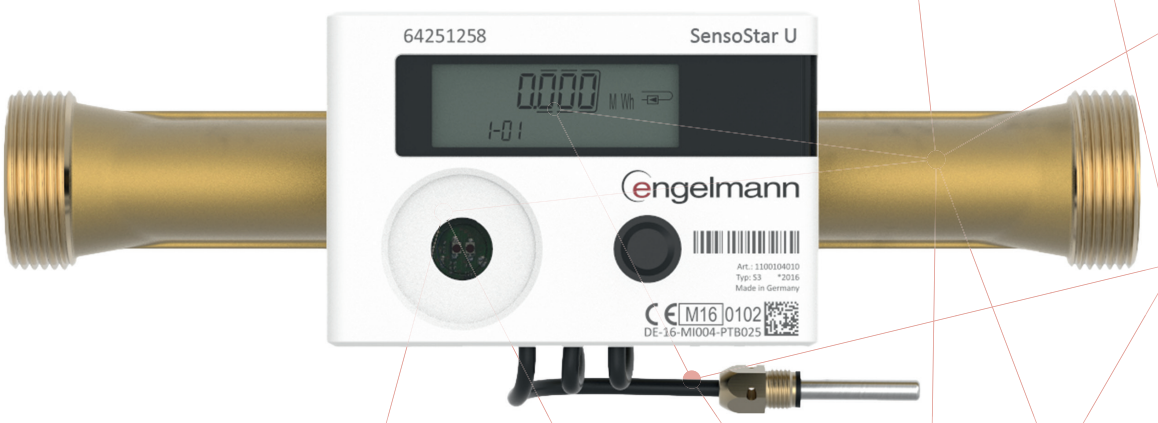
engelmann
smartest metering technology

Engelmann Ultrasonic Thermal Energy Meter

SensoStar U

Ultrasonic flow sensor for inline installation points



- Most accurate measurement results in any installation position
- Various installation options due to a large selection of installation lengths
- Flexible communication based on modular system
- Fast response due to dynamic temperature measurement cycle

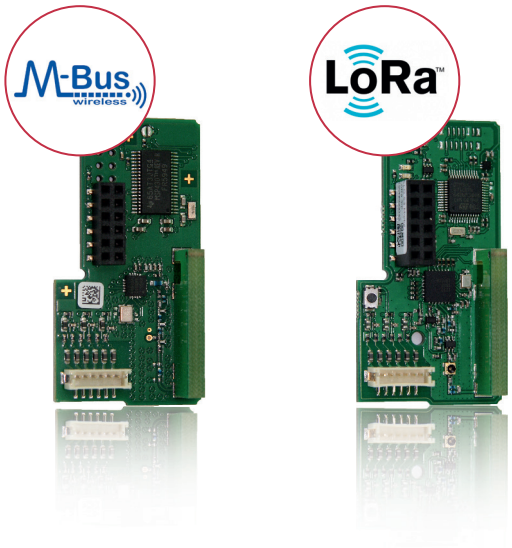
Precise heat/cooling measurement via ultrasound

The SensoStar U is a high-precision measuring device that uses ultrasonic measurement technology to record heat or cooling energy. This meter offers the right solution for every installation situation or requirement. The comprehensive range covers installation lengths, temperature sensor and communication variants.

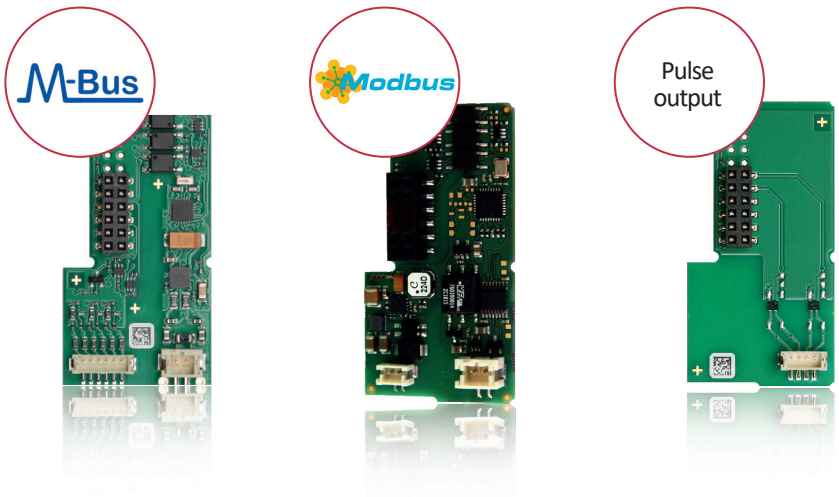
We speak your language

The continuously growing portfolio of communication modules offers you a wide range of remote readout options.

RADIO MODULES



WIRED MODULES



Features

- Sizes: DN 15 to DN 40
- Meters from qp 0.6 to qp 10
- Lengths: 105 mm to 300 mm
- Horizontal / vertical / overhead installation
- Installation point and display unit adjustable on site
- Return flow and air detection
- Detachable calculator with 0.85 m or 2.85 m connection cable
- Battery life of up to 20 years

wM-Bus, LoRaWAN and M-Bus can also be equipped with 3 pulse inputs to connect other devices.

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TECHNICAL DATA

1. Flow sensor

Sizes	**Nominal flow rate qp**	m³/h	0.6	0.6	1.5	1.5	2.5	2.5	3.5	3.5	6	10
	Low flow threshold value	l/h	6	6	6	6	12	12	14	14	30	50
	Minimum flow qi	l/h	12	12	12	12	25	25	28	28	60	100
	Maximum flow qs	m³/h	1.2	1.2	3	3	5	5	7	7	12	20
Pressure drop Δp at qp		bar	0.03	0.03	0.21	0.04	0.12	0.12	0.21	0.21	0.20	0.11
Pressure drop Δp at qs		bar	0.13	0.13	0.85	0.17	0.46	0.46	0.89	0.89	0.80	0.43
Nominal diameter		mm	DN 15	DN20	DN15	DN20	DN 20	DN 25	DN 20	DN 25	DN 25	DN 40
Dynamic range qi/qp		-	1:50	1:50	1:125	1:125	1:100	1:100	1:125	1:125	1:100	1:100

Measuring method		ultrasound; Time-of-Flight
Accuracy class (MID)		Class 2
Nominal pressure PN	bar	16
Temperature range medium heat	°C	15 – 90 15 – 130 high temperature (150; for max. 2000 h) (optional)
Temperature range medium cooling (from qp 1.5 to qp 10)	°C	5 – 50
Temperature range medium heat / cooling	°C	15 – 90 heat 15 – 120 high temperature (optional) 5 – 50 cooling
Point of installation		outlet flow and inlet flow; can be set when the amount of energy is still ≤ 10 kWh
Mounting position		any position (horizontal, vertical, overhead)
Protection class		IP65

2. Calculator

Temperature range medium	°C	0 – 150 heat / 0 – 50 cooling (from qp 1.5 to qp 10)
Ambient temperature in the field	°C	5 – 55 at 95 % relative humidity
Transport temperature	°C	-25 – 70 (for max. 168 h)
Storage temperature	°C	-25 – 55
Temperature difference range ΔΘ heat	K	3 – 100
Temperature difference range ΔΘ cooling	K	-3 – -50
Minimum temperature difference ΔΘ heat	K	> 0.05
Minimum temperature difference ΔΘ cooling	K	<-0.05
Minimum temperature difference ΔΘ 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
Measuring cycle flow	s	2
Calculator housing dimensions (H x W x D)	mm	75 x 110 x 34.5
Length of connecting cable calculator–flow sensor	m	0.85 (optional: 2.85)

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TECHNICAL DATA

Display		LCD – 8 digits + special characters
Displayed thermal energy		up to 3 decimal places
Units		MWh, kW, m³, m³/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 communication:* radio: wireless M-Bus*, LoRaWAN*; wired: M-Bus*, Modbus, 2 pulse outputs
Power supply		easily replaceable 3 V lithium battery; preparation for 3 V power pack available (input voltage 230 V / 24 V)
Estimated lifetime	years	20 without communication module; 16 with M-bus hourly readout; 15 with M-Bus 10 minute readout; 10 with others e.g. wM-bus, Modbus, LoraWAN
Data storage		24 monthly and semi-monthly values
Billing dates		freely selectable annual reference date; 15 monthly and semi-monthly values via display or radio (compact mode); 24 monthly and semi-monthly values via optical interface or M-Bus
2 tariff registers		individually adjustable; store energy or time
Storage of the maximum values		flow, power and temperatures (inlet, outlet, ΔΘ) as well as the respective maximum values of the last 15 months
Protection class		IP65
CE		yes
EMC		EN 1434

* Optional with 3 pulse inputs.

3. Temperature sensors (2-wire technology)

Platinum precision resistor		Pt 1000
Sensor diameter	mm	UTS: 5; 5.2; 6; AGFW: 27.5; 38
Connection cable length	m	1.5; 3; 6
Installation type		asymmetrical; symmetrical

4. Meter dimensions

Qp (m³/h)	Nominal diameter	G (“)	L (mm)	H (mm)	A (mm)	Weight standard version (kg)
0.6	DN 15	G3/4B	110	65	38.5	0.600
0.6	DN20	G1B	190	65	38.5	0.770
1.5	DN 15	G3/4B	110	65	38.5	0.600
1.5	DN 20	G1B	105	66	39.5	0.650
1.5	DN 20	G1B	130	66	39.5	0.680
1.5	DN 20	G1B	190	65	38.5	0.770
2.5	DN 20	G1B	105	66	39.5	0.650
2.5	DN 20	G1B	130	66	39.5	0.680
2.5	DN 20	G1B	190	66	39.5	0.790
2.5	DN 25	G1 1/4B	260	66	39.5	1.080
3.5	DN 20	G1B	130	66	39.5	0.680
3.5	DN 20	G1B	190	66	39.5	0.790
3.5	DN 25	G1 1/4B	150	66	39.5	0.820
3.5	DN 25	G1 1/4B	260	66	39.5	1.080
6.0	DN 25	G1 1/4B	150	68.5	42	0.820
6.0	DN 25	G1 1/4B	260	68.5	42	1.080
10.0	DN 40	G2B	200	73	46.5	1.530
10.0	DN 40	G2B	300	73	46.5	1.970

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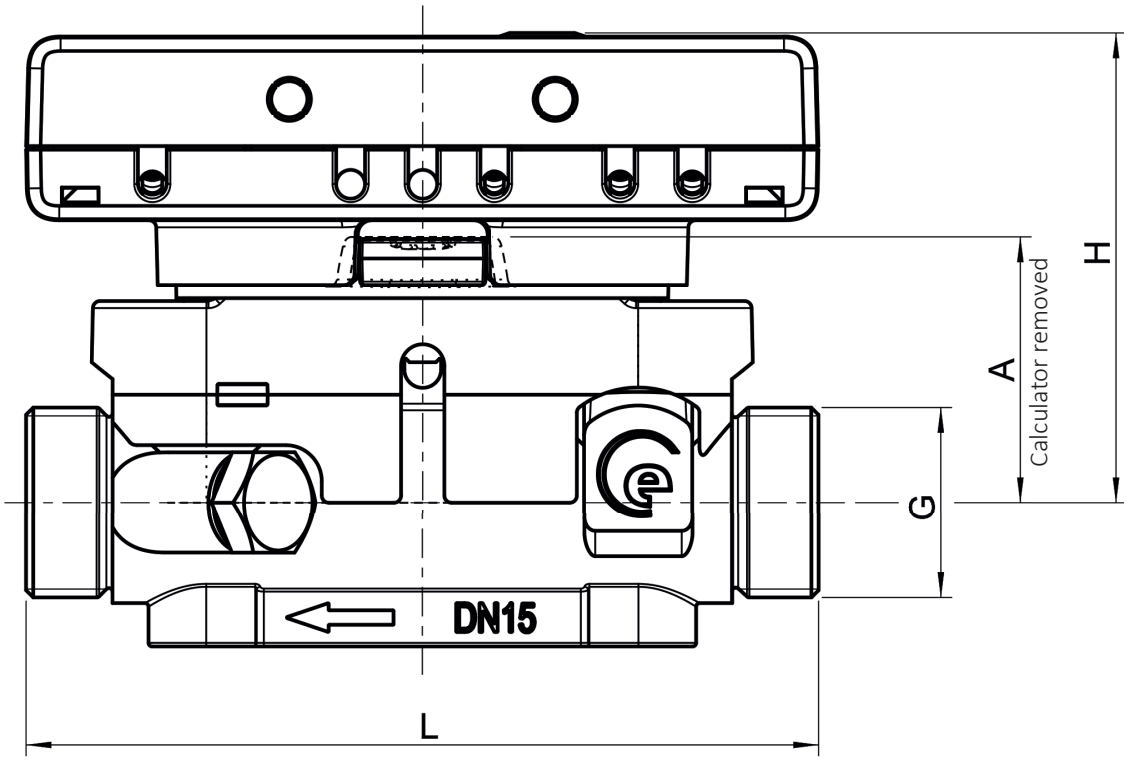
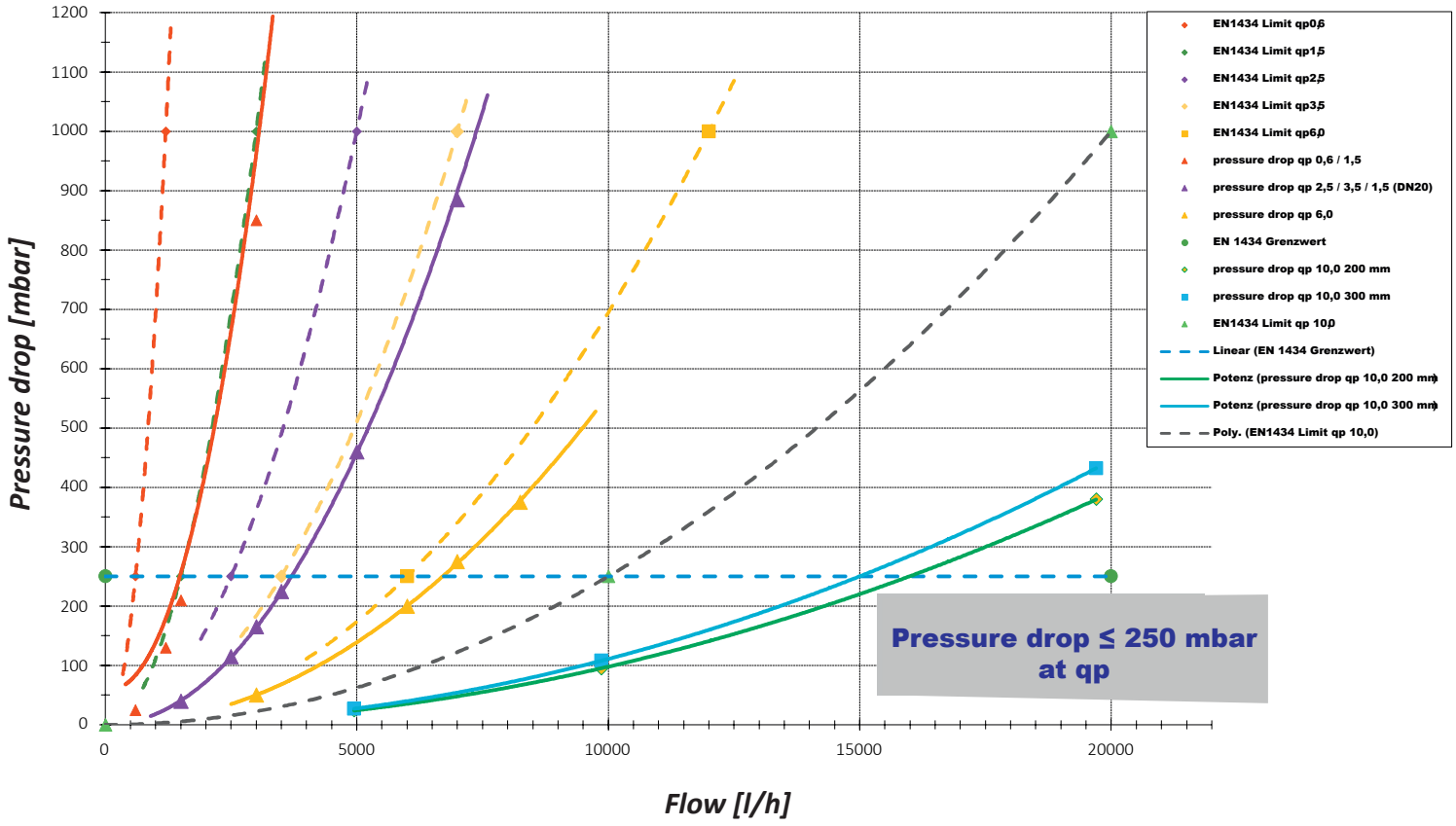


PRESSURE DROP SENSOSTAR U



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