Engelmann Ultrasonic Thermal Energy Meter

SensoStar U

Ultrasonic heat meter for inline installation points

- Detection of back flow and air
- High temperature resistant for district heating
- Measuring cycle temperature, dynamic: 2 / 60 s
- Detachable calculator unit: 85 cm pulse cable length (2,85 m 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			ultrasonic; time-of-flight							
Sizes	Nominal flow q_p	m³/h	0,6	1,5	1,5	2,5	3,5	3,5	6,0	10,0
	Low flow threshold	l/h	6	6	6	12	14	14	30	50
	Minimum flow q_i	l/h	12	12	12	25	28	28	60	100
	Maximum flow q_s	m³/h	1,2	3,0	3,0	5,0	7,0	7,0	12,0	20
Pressure drop Δp at q_p		bar	0,03	0,21	0,04	0,12	0,21	0,21	0,20	0,11
Pressure drop Δp at q_s		bar	0,13	0,85	0,17	0,46	0,89	0,89	0,80	0,43
Nominal diameter		mm	DN 15	DN 15	DN 20	DN 20	DN 20	DN 25	DN 25	DN 40
Thread		inch	G3/4B	G3/4B	G1B	G1B	G1B	G1 1/4B	G1 1/4B	G2B
Length		mm	110	110	130	130	130	150	150; 260	200; 300
Dynamic range q_i/q_p		-	1:50	1:125	1:125	1:100	1:125	1:125	1:100	1:100

Accuracy class (MID)		class 2
Nominal pressure PN	bar	16
Temperature range medium heat	°C	15 – 90 15 – 130 high temperature (150; for maximal 2000 h) (optional)
Temperature range medium cooling (from q_p 1,5 to q_p 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
Protection class		IP65

Calculator unit

Temperature range medium	°C	0 – 150 heat 0 – 50 cooling (from q_p 1,5 to q_p 10)
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 *ΔΘ* heat	K	3 – 100
Temperature difference range *ΔΘ* cooling	K	-3 – -50
Minimum temp. difference *ΔΘ* heat	K	> 0,05
Minimum temperature difference *ΔΘ* cooling	K	< -0,05
Minimum temperature difference $\Delta\Theta_{HC}$ 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
Measuring cycle flow	s	2
Display		LCD - 8 digits + special characters
Decimal places		up to 3 after comma
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: 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		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		IP65
CE		yes
EMC		EN 1434

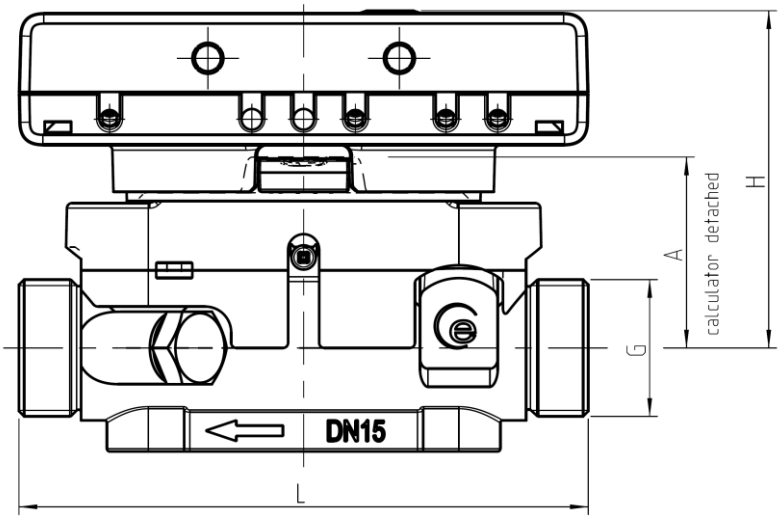
Temperature sensors (2-wire technique)

Platinum precision resistor		Pt 1000
Diameter	mm	5; 5,2; 6; AGFW 27,5; 38; needle sensor 3,5 x 75
Length of cable	m	1,5; 3; 6
Installation		asymmetrical; symmetrical

Dimensions calculator unit

Calculator housing (H x W x D)	mm	75 x 110 x 34,5

Dimensions meter



Qp (m³/h)	Nominal diameter	G (“)	L (mm)	H (mm)	A (mm)	Weight (basic version in kg)
0,6	DN 15	G3/4B	110	65	37	0,720
1,5	DN 15	G3/4B	110	65	37	0,720
1,5	DN 20	G1B	130	65	37	0,770
2,5	DN 20	G1B	130	65	37	0,770
3,5	DN 20	G1B	130	65	37	0,770
3,5	DN 25	G1 1/4B	150	65	37	0,930
6,0	DN 25	G1 1/4B	150	67,5	39,5	0,930
6,0	DN 25	G1 1/4B	260	67,5	39,5	1,200
10,0	DN 40	G2B	200	73	45	1,580
10,0	DN 40	G2B	300	73	45	2,050

pressure drop SensoStar U