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Product overview

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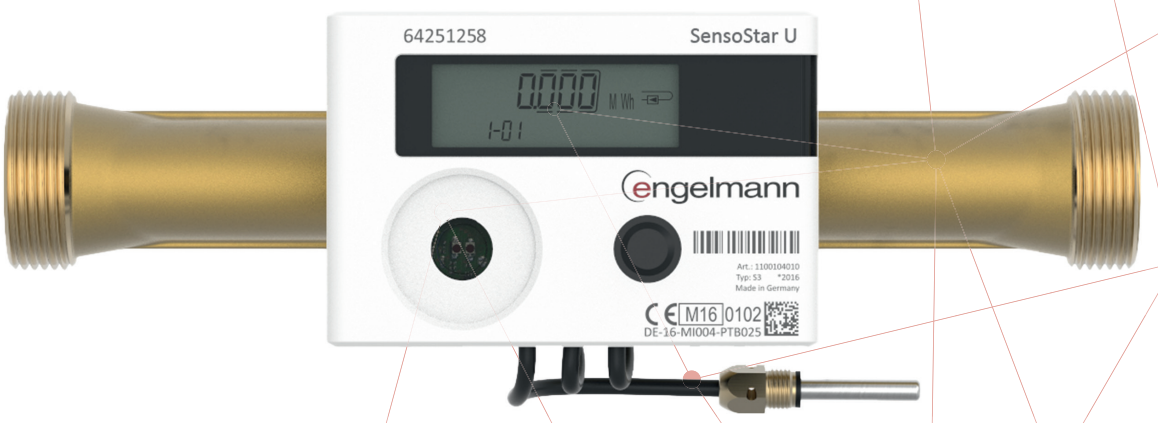
Engelmann Ultrasonic Thermal Energy Meter

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

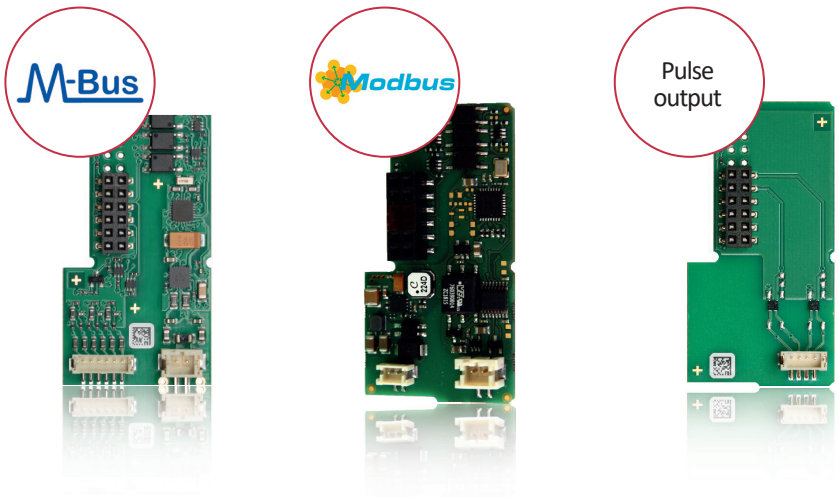
The SensoStar U is a high-precision measuring device that uses ultrasonic measurement technology to record heat or cooling energy. This meter offers the right solution for every installation situation or requirement. The comprehensive range covers installation lengths, temperature sensor and communication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

SensoStar U

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)

SensoStar U

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)

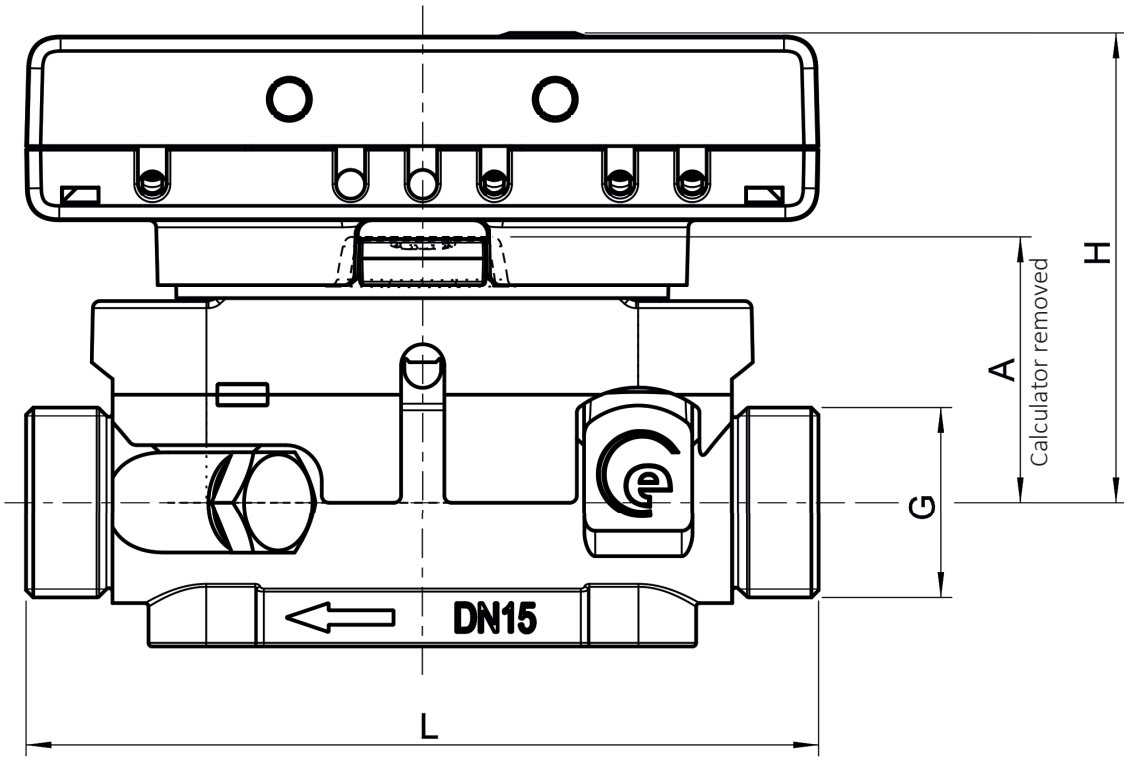
Platinum precision resistor		Pt 1000
Sensor diameter	mm	UTS: 5; 5.2; 6; AGFW: 27.5; 38
Connection cable length	m	1.5; 3; 6
Installation type		asymmetrical; symmetrical

4. Meter dimensions

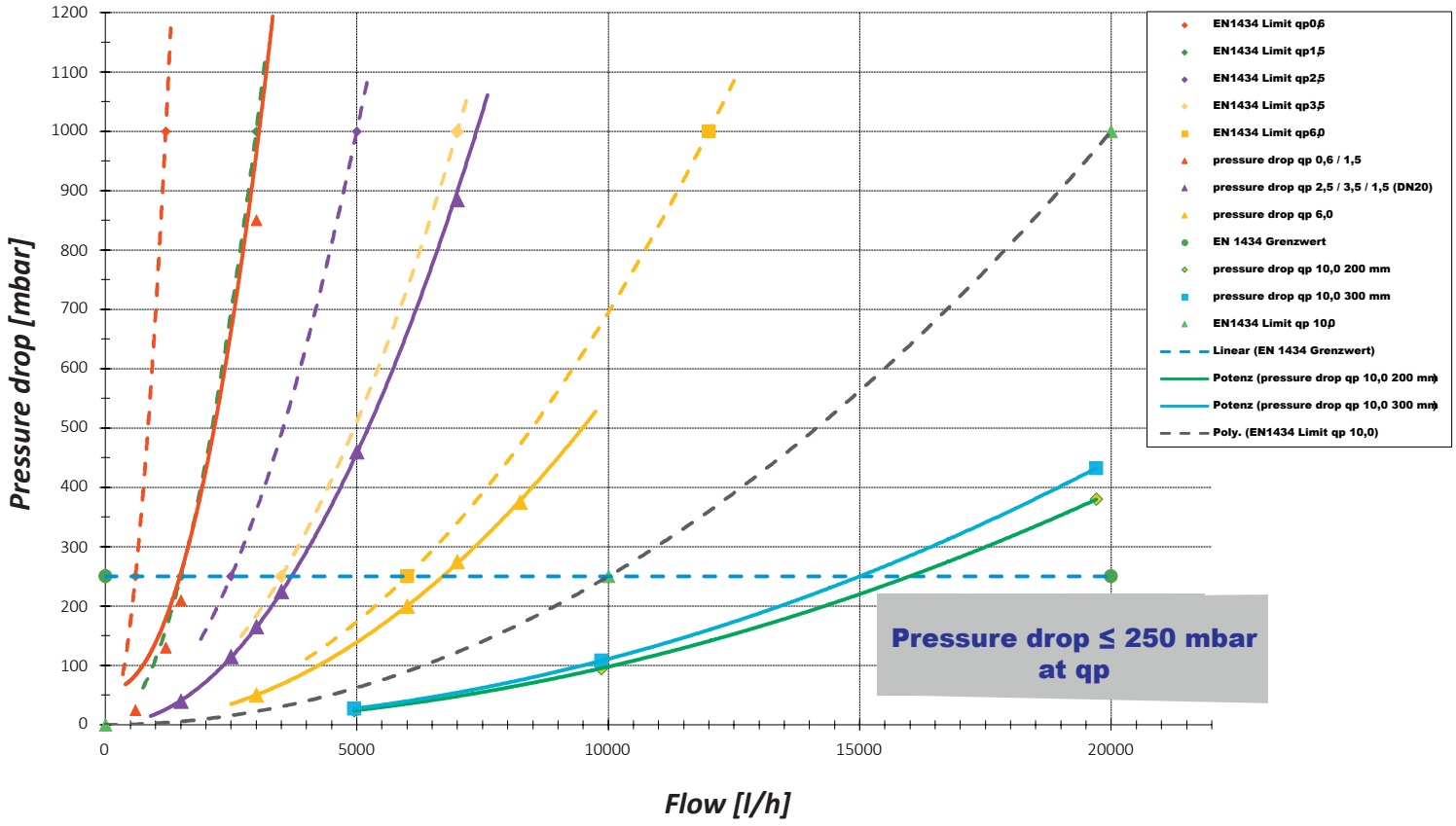
Qp (m³/h)	Nominal diameter	G (“)	L (mm)	H (mm)	A (mm)	Weight standard version (kg)
0.6	DN 15	G3/4B	110	65	38.5	0.600
0.6	DN20	G1B	190	65	38.5	0.770
1.5	DN 15	G3/4B	110	65	38.5	0.600
1.5	DN 20	G1B	105	66	39.5	0.650
1.5	DN 20	G1B	130	66	39.5	0.680
1.5	DN 20	G1B	190	65	38.5	0.770
2.5	DN 20	G1B	105	66	39.5	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

SensoStar U

TECHNICAL DATA



PRESSURE DROP SENSOSTAR U



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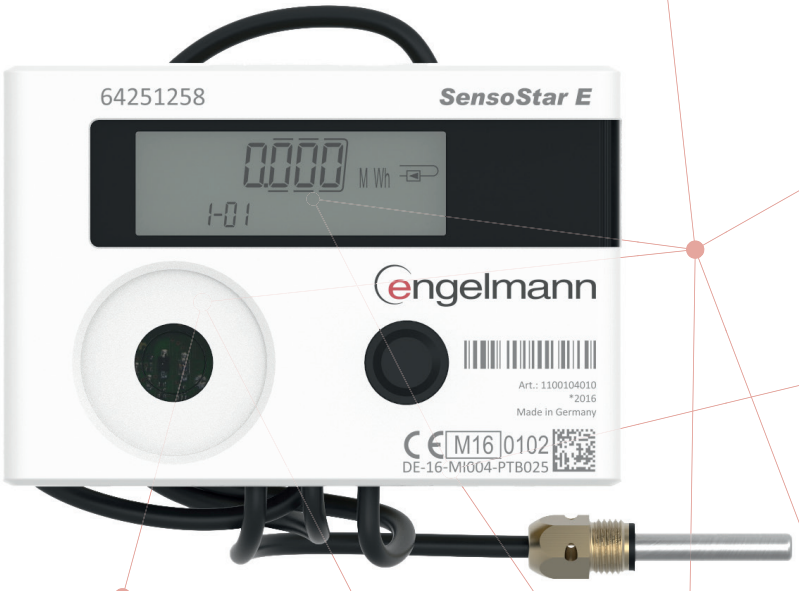
Engelmann Heat Meter

SensoStar E

Mechanical flow sensor for inline installation points



- Most accurate measurement results using the single-jet principle
- Various installation options due to a large selection of interfaces and options
- Flexible communication based on modular system
- Fast response due to dynamic temperature measurement cycle

Status 2023/12/01 Subject to technical change!
Engelmann Sensor GmbH I Rudolf-Diesel-Straße 24- 28 I 69168 Wiesloch, Germany

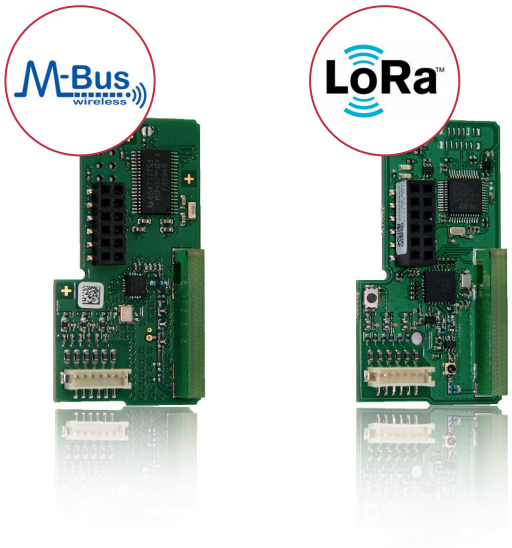
Precise heat/cooling measurement

The SensoStar E is a high-precision measuring device that uses inductive sensing 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.

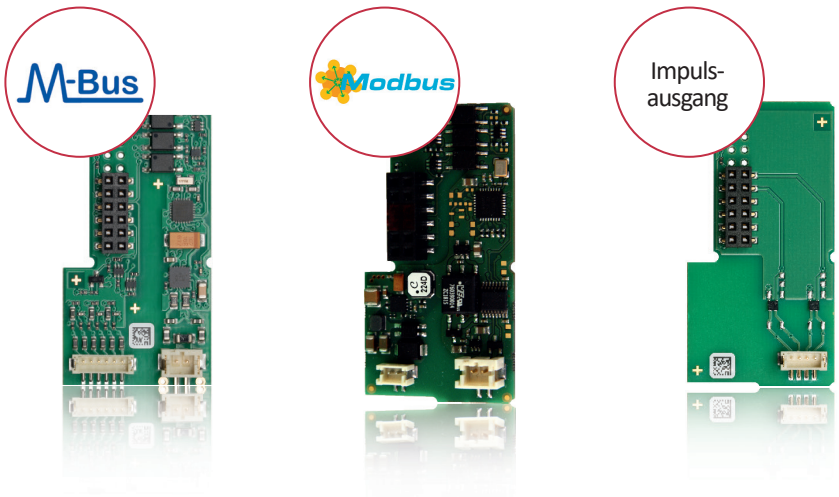
We speak your language

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

RADIO MODULES



WIRED MODULES



Features

- Meters from qp 0.6 to qp 2.5
- Sizes: DN 15 and DN 20
- Installation lengths: 110 mm and 130 mm
- Vertical or horizontal installation
- Installation point and display unit adjustable on site
- Automatic return flow detection
- Detachable calculator with 0.50 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.

SensoStar E

TECHNICAL DATA

1. Flow sensor

Sizes	**Nominal flow rate qp**	m³/h	0.6	1.5	1.5	2.5
	Low flow threshold value	horizontal	3.5 l/h	7 l/h	7 l/h	10 l/h
		vertical	4 l/h	7 l/h	7 l/h	10 l/h
	Minimum flow qi	l/h	24	60	60	100
	Maximum flow qs	m³/h	1.2	3	3	5
Pressure drop Δp at qp		bar	0.155	0.210	0.225	0.165
Pressure drop Δp at qs		bar	0.660	0.840	0.910	0.675
Nominal diameter		mm	DN 15	DN 15	DN20	DN20
Connection thread		inch	G3/4B	G3/4B	G1B	G1B
Installation length		mm	110	110	130	130
Dynamic range qi/qp		-	1:25	1:25	1:25	1:25

Measuring method		bidirectional inductive scanning system
Metrological class (MID)		Class 3
Nominal pressure PN	bar	16
Temperature range medium heat	°C	15 – 90
Temperature range medium cooling (qp 1.5 (DN 15) and qp 2.5)	°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		horizontal/vertical
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)

2. Calculator

Temperature range medium	°C	0 – 150 heat / 0 – 50 cooling (qp 1.5 (DN 15) and qp 2.5)
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

SensoStar E

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; needle sensor: 3.5 x 75
Connection cable length	m	1.5; 3; 6
Installation type		asymmetrical; symmetrical

4. Weights

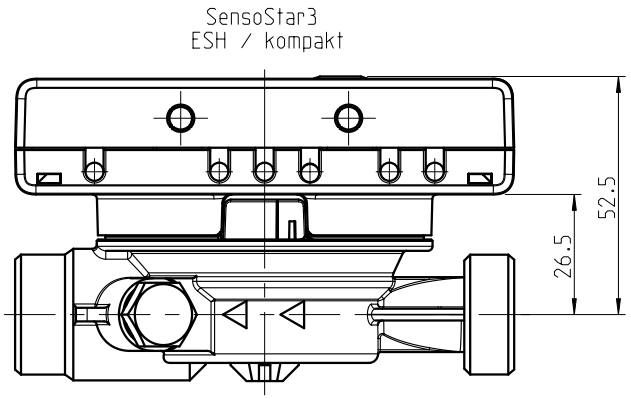
Weight (standard version in kg)	qp 0.6 / qp 1.5 (DN 15)	qp 1.5 (DN 20) / qp 2.5
Calculator not detachable	0.755	0.795
Calculator detachable	0.840	0.880

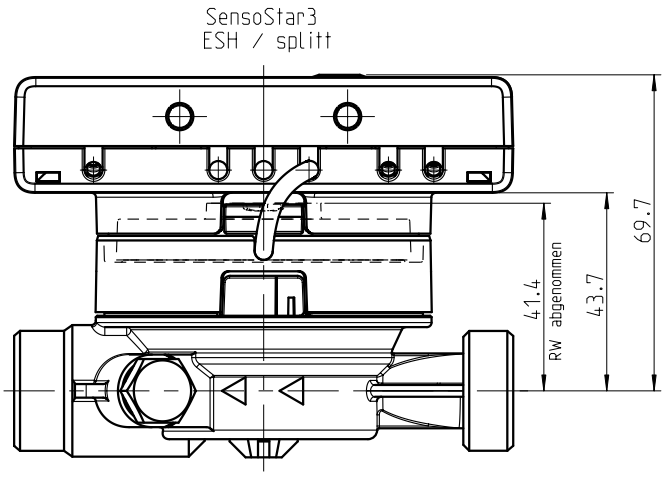
5. Dimensions

Pulse cable length (only separable version)	m	0.50
Calculator housing (H x W x D)	mm	75 x 110 x 34.5
Connection thread	G3/4“, DN 15: qp 0,6 / qp 1,5	G1“, DN 20: qp 1,5 / qp 2,5

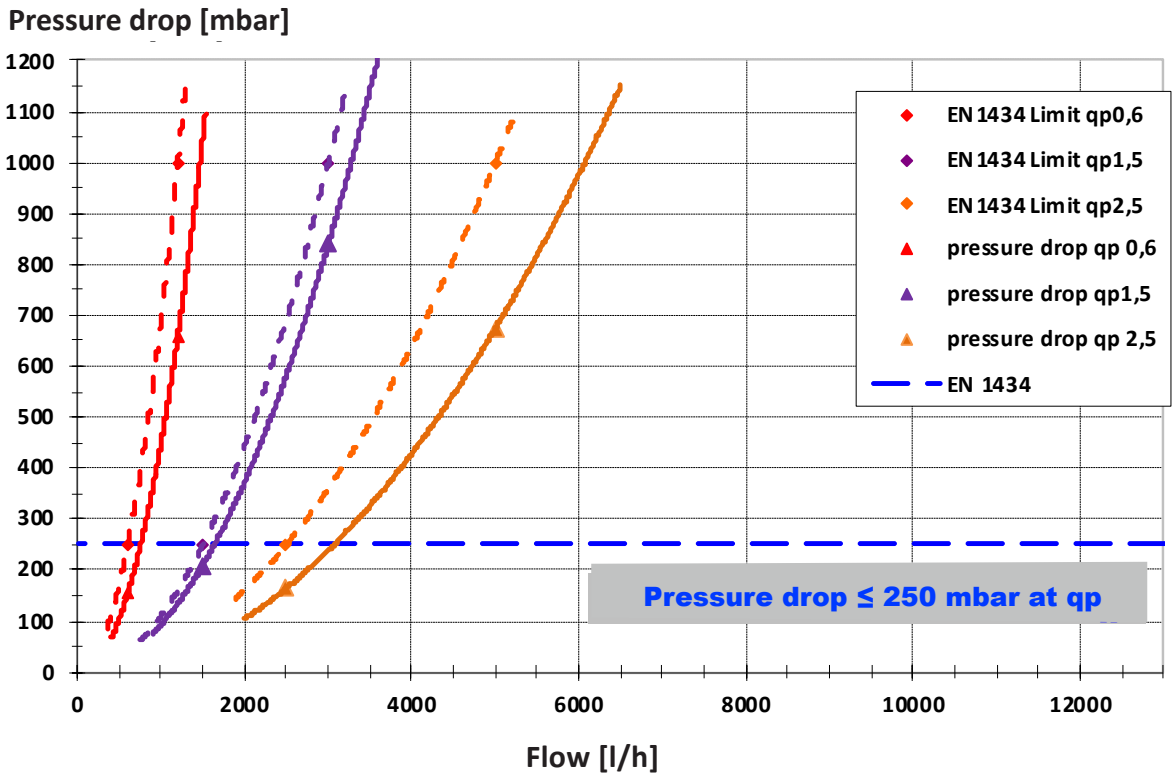
SensoStar E

TECHNICAL DATA





PRESSURE DROP SENSOSTAR E



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Engelmann Heat Meter Calculator

SensoStar C

- Various application options due to a large selection of variants and setting options
- User-friendly mounting system for easy connection of flow and temperature sensors
- Flexible communication based on a modular system
- Connection of an external power pack enables direct monitoring of your system

Precise heat/cooling measurement

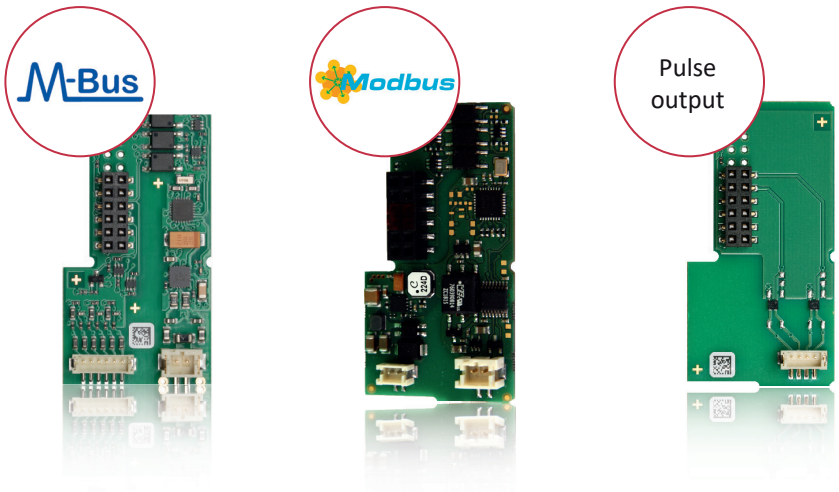
The SensoStar C is a flexible calculator for recording heat or cooling energy that offers a suitable solution for every installation situation. Specially designed for the measurement of large volume flows, the calculator can be easily combined with all standard flow sensors. The range is rounded off by a wide selection of retrofittable communication modules as well as the option of an external power pack for direct system monitoring.

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

- Available for heating and cooling applications
- Wide range of variants for different requirements
- Installation point and display unit adjustable on site
- Battery life of up to 20 years
- Automatic adjustment of the temperature measurement cycle by using external power supply

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

SensoStar C

TECHNICAL DATA

Calculator

Temperature range medium		°C	0 – 150 heat / 0 – 50 cooling
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
Temperature measurement cycle in normal operation		s	30 with a lifetime of 6+1 years; 60 with a lifetime of 10 years (optional); 2 by using a power pack
Pulse values, optional		l/Imp	1; 2.5; 10; 25; 100; 250; 1000; 2500
Display		LCD – 8 digits + special characters	
Displayed thermal energy		up to 3 decimal places	
Units		MWh, kW, m³, m³/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 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 AC)	
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 billing 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		IP54	
CE		yes	
Mechanical / electromagnetic class		M2 / E2	
Pulse input device		microcontroller CMOS input of 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	

* Optional with 3 pulse inputs.

Flow sensor requirements

Encoder type class (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
Connecting cable length (unshielded)	m	up to 10 m in 2-wire technology; (3 and 10 available at Engelmann)
Installation type		direct immersion; in thermowells

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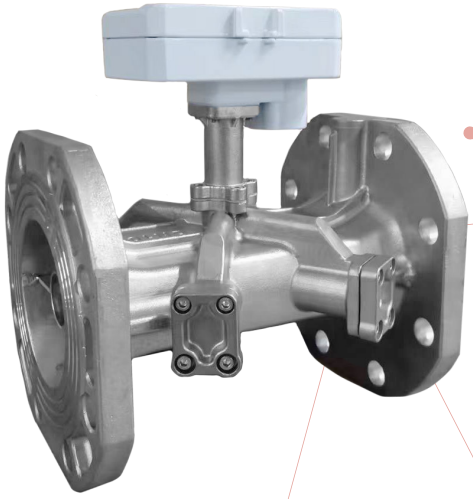
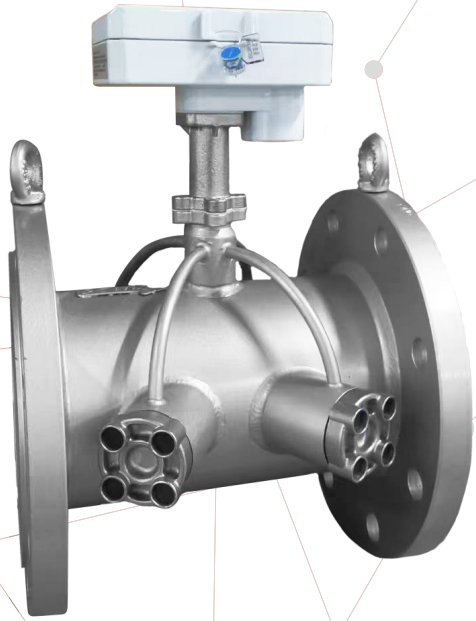
Engelmann Flow Sensor

FlowStar U

Ultrasonic flow sensor



DN 50 – DN 100



DN 125 – DN 300

Precise flow measurement with double channel ultrasonic measuring

High quality with stainless steel body & flange for DN 50 to DN 100

Measuring components in aluminum housing

Overview

FLOWSTAR U

The FlowStar U impresses with its flexible usability and high temperature range. With a temperature range of 1 – 130 °C, the flow sensor fulfills all requirements. This makes it an ideal solution for a wide range of applications and demanding environments. From DN 50 to DN 300, it is the ideal extension to the compact meters SensoStar U.

The FlowStar U flow sensor records the flow rate using high-precision ultrasonic measurement technology, guaranteeing you reliable and accurate volume measurement that meets the highest demands. In combination with the SensoStar C calculator and the temperature sensors, the thermal energy can be calculated precisely and efficiently. This enables comprehensive and exact energy control and billing.

Features

- Sizes: DN 50 to DN 300
- Meters from Qp 15 to Qp 600
- Horizontal / vertical / overhead installation
- Pressure classes PN16/PN25
- Connection cable with 10 m length
- Battery life of up to 12 years

General

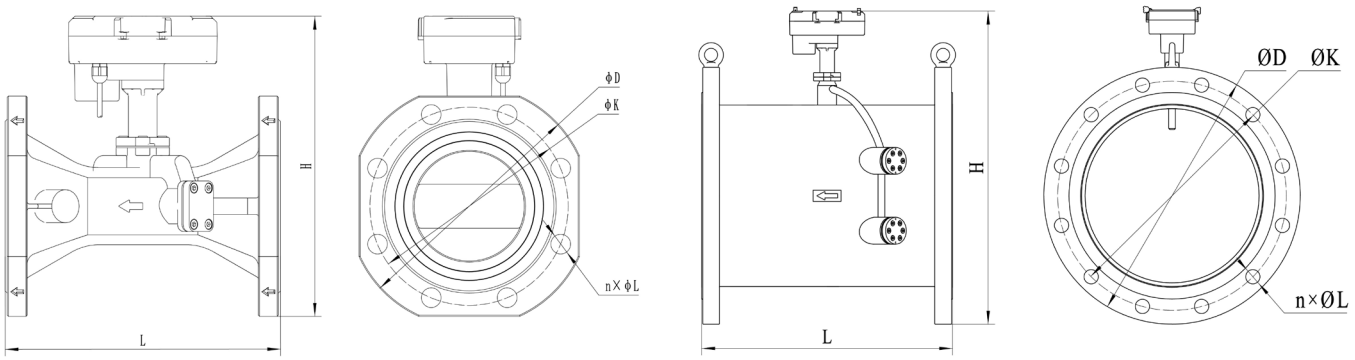
Measuring method		ultrasonic; double channel
Accuracy class (MID)		class 2
Mechanical class (MID)		M2 – EN1434
Electromagnetic class (MID)		E2 – EN1434
Protection class		IP68
Medium		water
Calming section		U3D0
Approvals		DE-18-MI004-PTB018; CE
Mounting position		any position
Installation		backflow / forward flow; consider configuration of the calculator
Lifetime	years	up to 12
Battery supply	V	3.6
Temperature measurement range medium	°C	1 – 130 (150 within 2000 hours)
Storage and transport temperature range	°C	-25 – 55
Ambient temperature in the field	°C	5 – 55
Maximum height of installation point	m	2000 above mean sea level

FlowStar U

TECHNICAL DATA

Pulse output according to EN 1434-2

Class		open collector (OC)
Cable length	m	10
Min. pulse length	ms	50
Volume pulse maximum input voltage	V	12 DC
Volume pulse maximum input current	mA	10



Flow values

Nominal diameter	mm	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200	DN 250	DN 300
Nominal flow Qp	m³/h	15	25	40	60	100	150	250	400	600
Low flow threshold value	m³/h	0.01	0.02	0.03	0.05	0.08	0.1	0.2	0.3	0.4
Minimum flow Qi	m³/h	0.15	0.25	0.4	0.6	1	1.5	2.5	4	6
Maximum flow Qs	m³/h	30	50	80	120	200	300	500	800	1200
Pulse value	l/pulse	25	25	100	100	100	250	250	1000	1000

Max. operation pressure PN16

Nominal diameter	mm	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200	DN 250	DN 300
Length (L)	mm	200/270	200/300	225/300	250	350	350	350	400	450
Diameter (D)	mm	165	185	200	220	250	285	340	405	460
Height (H)	mm	221	232	253	273	360	390	450	510	565
Hole circle (K)	mm	125	145	160	180	210	240	295	355	410
Number screw x diameter	mm	4x18	4x18	8x18	8x18	8x22	8x22	12x22	12x26	12x26

Max. operation pressure PN25

Nominal diameter	mm	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200	DN 250	DN 300
Length (L)	mm	200/270	200/300	225/300	360	500	350	350	400	450
Diameter (D)	mm	165	185	200	235	270	300	360	425	485
Height (H)	mm	221	232	253	282	370	400	450	520	575
Hole circle (K)	mm	125	145	160	190	220	250	310	370	430
Number screw x diameter	mm	4x18	4x18	8x18	8x22	8x26	8x26	12x26	12x30	12x30

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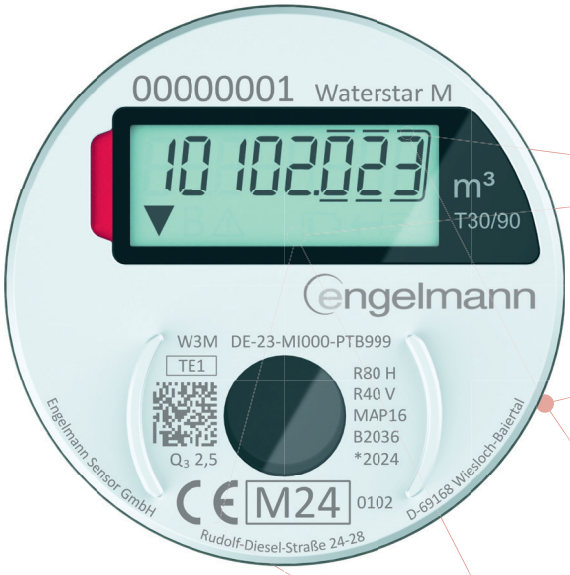
Engelmann Radio Water Meter

WaterStar M

The radio-integrated electronic water meter
for all common installation points



- Most accurate measurement results for any installation points
- Various installation options
- Leakage and manipulati on detecti on for maximum reliability
- Individually configurable
- Flexible adjustment of the radio settings via software or app

WATERSTAR M

The perfect choice for accurate and reliable measurement and transmission of your water consumption

The radio-integrated water meter is the perfect solution for recording your water consumption. With a wide range of single-jet and multi-jet flow sensors for cold and hot water applications, the meter is suitable for all common installation points and applications.
The integrated wireless M-Bus radio in accordance with the OMS standard enables the secure and reliable transmission of your consumption data at all times. Thanks to the automatic detection and transmission of leakage and manipulation notifications, you can keep an eye on your system at all times and react immediately if needed.

Gateway / AMR

Read-out software

Features

- Available as inline meters and measuring capsule meters in all common variants
- Integrated wireless M-Bus communication interface
- Easily readable LCD display
- Inductive impeller scanning
- 12 years battery life
- Return flow detection
- Leakage and manipulation detection

General data

Measuring method		inductive scanning
Ambient temperature in the fie	°C	5 – 55 at 95 % relative humidity
Temperature range storage and transport	°C	-25 – 70
Display		LCD – 8 digits + special characters; display can be rotated 360°
Unit		m³
Interfaces		wireless M-Bus; optical interface for configuration and readout
Radio mode		adjustable: C1; T1
Power supply		3 V lithium battery
Estimated lifetime	years	12 (depending on radio settings)
Billing dates		freely selectable annual billing date; 15 monthly values via radio; 15 monthly and semi-monthly values via optical interface
Mechanical class		M1
Electromagnetic class		E1
Environmental class		B
Protection class		IP68

TECHNICAL DATA

Type-specific data

Inline meters

Type	DN15	DN15	DN15	DN15	DN15	DN20	DN20
Installation length [mm]	80	110	115	115	130	130	130
Q3 [m³/h]	2.5	2.5	2.5	2.5	2.5	2.5	4.0
Thread	G3/4“	G3/4“	G3/4“	G3/4“ – G7/8“	G3/4“	G1“	G1“
Mounting position	Horizontal Vertical						
Ratio Q3/Q1	R160 H / R80 V						
Temperature range	T30 (0.1 – 30 °C) T30/90 (30 – 90 °C)						
Nominal pressure	MAP16						

Measuring capsule meters

Type (ISO 4064)	IST	MET	MOC/MOE	TE1	A34
Q3 [m³/h]	2.5	2.5	2.5	2.5	2.5
Thread	G2“	M64x2	M65x2	M62x2	M77x1.5
Mounting position	Horizontal Vertical				
Ratio Q3/Q1	R80				
Temperature range	T30 (0.1 – 30 °C) T30/90 (30 – 90 °C)				
Nominal pressure	MAP16				

Measuring capsule meters with converter

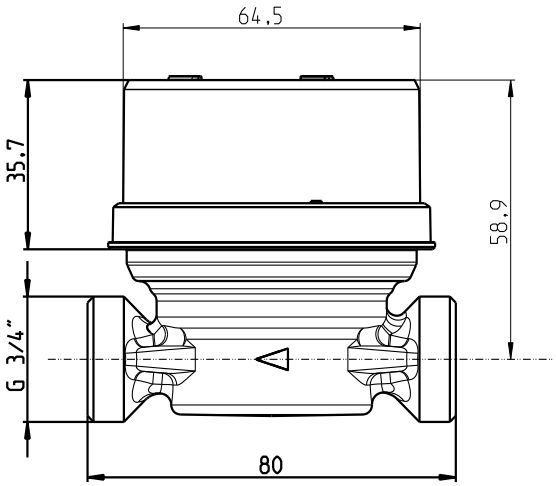
Type (ISO 4064)	MUK	DM1	HT2	MB3	WE1	WGU
Q3 [m³/h]	2.5	2.5	2.5	2.5	2.5	2.5
Thread	G2¼“	M60x2	M66x1	M76x1.5	M78x1.5	M66x1.25
Mounting position	Horizontal Vertical					
Ratio Q3/Q1	R80					
Temperature range	T30 (0.1 – 30 °C) T30/90 (30 – 90 °C)					
Nominal pressure	MAP16					

TECHNICAL DATA

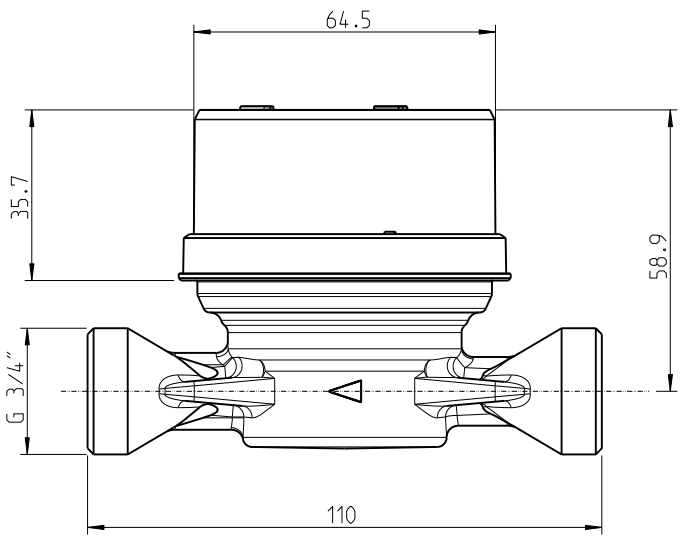
Dimensions

Inline meters

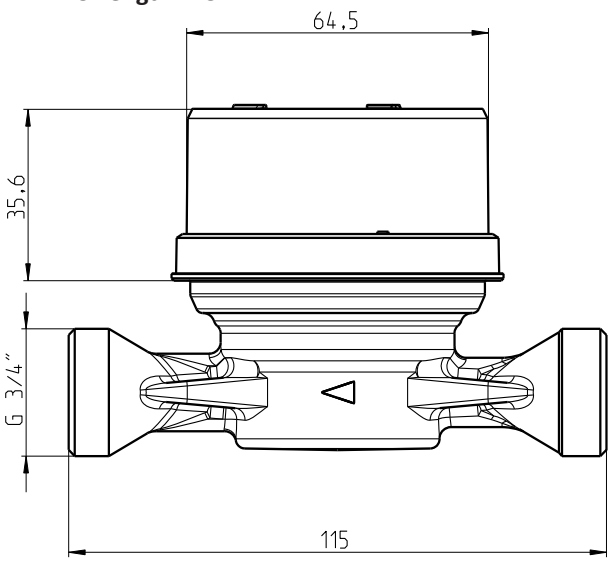
DN15 Length 80 mm



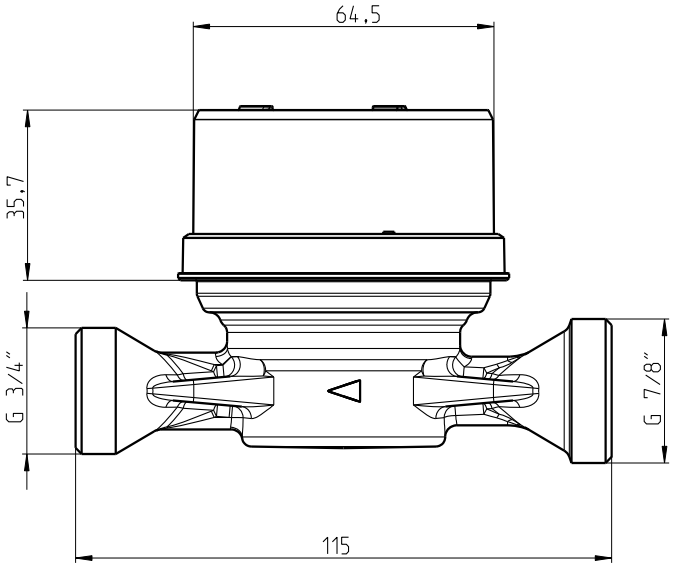
DN15 Length 110 mm



DN15 Length 115 mm

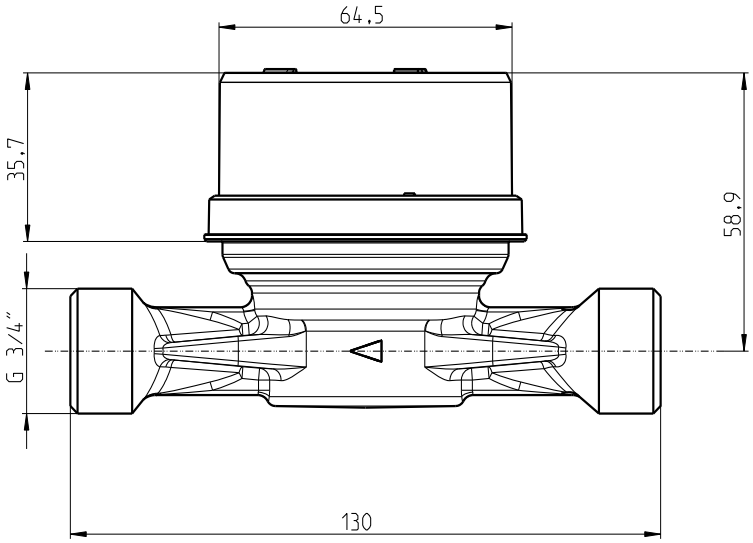


DN15 Length 115 mm

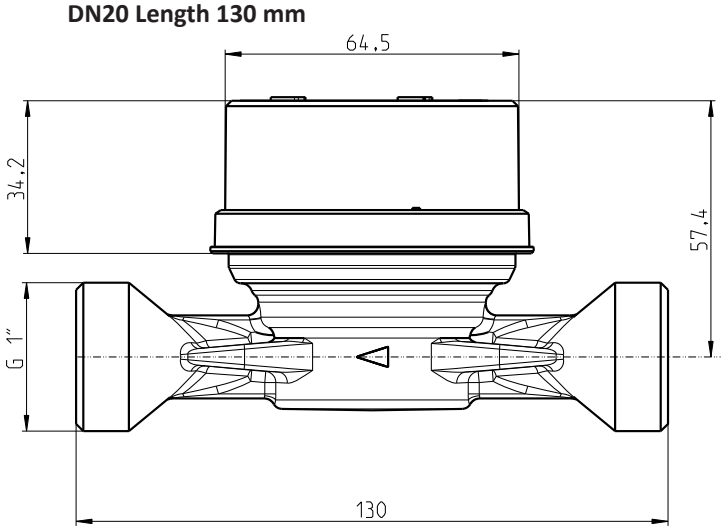


TECHNICAL DATA

DN15 Length 130 mm



DN20 Length 130 mm



Engelmann Heat Cost Allocator

HCA e2

Heat cost allocators record the heat consumption of the individual radiators in a billing unit (building) and thus enable the individual billing of heat energy per user unit (apartment).

- Simple installation due to integrated seal
- Storage of all monthly and semi-monthly values over the entire lifetime
- Radio transmission times fully customizable to your needs and readout infrastructure
- Flexible use due to remote sensor that can be fitted and removed at any time
- Seamless integration into the Engelmann system landscape

Overview

HCA e2

Flexible in use due to individual setting options for billing and radio transmission parameters.
The Engelmann heat cost allocator thus provides you with the basis for future-proof consumption data recording.

The heat cost allocator is a recording device for the consumption-based calculation of heating costs. Unlike a heat meter, for example, it does not measure the amount of heat, but provides dimensionless units that reflect the temporal summation of the temperature difference between the radiator temperature and the room temperature. Ultimately, the individual consumption of the individual users is determined by calculating the ratio of the recording results of all heat cost allocators installed in the billing unit.

The electronic heat cost allocator HCA e2 is fully integrated into the Engelmann system landscape. The consumption data of the installed heat cost allocators are conveniently read out by the respective reception technology used (walk-by or Automatic Meter Reading – AMR). The Engelmann HCA e2 itself provides the basis for flexible adaptation to your individual readout management via its variable radio setup settings. If necessary, the most important data can also be read manually via the high-contrast display.

Even if you are currently still using walk-by readout, the seamless integration into the Engelmann system landscape makes it easy to switch to stationary readout (AMR/gateway), as no adjustments (setup changes) to the heat cost allocator are necessary.

The new integrated seal as well as an extension and deepening of the rear weld stud mount ensure quick and easy assembly.

Features

- Approved according to EN 834:2013 and compliant with the HKVO
- Type approval: A1.01.2013 according to HKVO
- Storage of 132 monthly and 132 semi-monthly values
- Clip-on remote temperature sensor
- Communication interfaces optical and wireless MBus according to EN 13757-4
- o AMR (compliant with OMS)
- o Walk-by readout
- Radio transmission of 15 monthly and 15 semi-monthly values via wireless M-Bus
- Flexibility in encryption mode (Mode 5 / Mode 7) and encryption type (ES master, customer master or individual encryption per device)

Thanks to further development in the area of assembly and installation, which we are constantly making easier and more effective, and the possibility of making the determined consumption data available safely and quickly, regardless of the selected readout technology, the HCA e2 is the first choice for use in your estate.

HCA e2

TECHNICAL DATA

General

Device type		2-sensor device; adjustable measuring mode: 2-sensor mode or 1-sensor mode	
Estimated lifetime	years	11 + 1	
Scaling		unit scale or product scale	
Clip-on remote sensor		cable length: 2 m; 5 m	
Temperature range	°C	2-sensor mode: 35- 95 (with remote sensor up to 105); 1-sensor mode: 55- 95 (with remote sensor up to 105)	
Ambient temperature	°C	-25 – 60	
Minimum temperature difference ΔΘ (counting start of temperature difference)	K	4,5	
Interfaces		wireless M-Bus and optical interface (M-Bus protocol)	
Display		LCD – 7 digits + special characters	
Displayed values		current consumption, billing (due) date, billing date value, checksum	
Billing date options		annually variable (except 29.02.); monthly variable (1st - 28th day)	
Stored monthly values		132 monthly and 132 semi-monthly values	
Measuring free summer months		May-June-July-August-September: freely selectable	
Detection of manipulation		break contact	
Power supply	V	3; lithium battery	
Protection class		IP41 (mounted)	

Wireless M-Bus radio interface (* factory setting)

Radio protocols		“short telegram” compliant with the OMS (AMR) (current consumption, billing (due) date, billing date value, hint flag); “long telegram” for walk-by readout (factory setting) (current consumption, billing (due) date, billing date value, 15 monthly and 15 semi-monthly values, hint flag)	
Transmission power (maximum)	dBm	10	
Transmission frequency	MHz	868	
Operating modes according to EN 13757-4		S1; T1; C1*	
Encryption		AES 128 / Engelmann Master Key*	
Start date of radio transmission		annually variable (except 29.02.)	
Transmission times (UTC+1)		transmission interval:	2 - 240 min (2 min)*
		transmission times per day:	12 a.m. - 12 p.m. (8 a.m. - 6 p.m.)*
		transmission days per week:	Mon - Sun (Mon - Sun)*
		transmission weeks per month:	1 - 4 (1 - 4)*
		transmission months per year:	Jan - Dec (Jan - Dec)*

Wireless M-Bus radio interface OMS 4 Mode 7 (* factory setting)

Radio protocols		“short telegram” compliant with the OMS (AMR) (current consumption, billing (due) date, billing date value, hint flag)	
Operating modes according to EN 13757-4		T1; C1*	
Encryption		AES 128 / individual key per device*	
Transmission times (UTC+1)		transmission interval:	2 - 240 min (15 min)*
		transmission times per day:	12 a.m. - 12 p.m. (12 a.m. - 12 p.m.)*
		transmission days per week:	Mon - Sun (Mon - Sun)*
		transmission weeks per month:	1 - 4 (1 - 4)*
		transmission months per year:	Jan - Dec (Jan - Dec)*

engelmann
smartest metering technology

Engelmann Connect

Gateway GPRS

Data collector for wireless M-Bus devices

- Fulfillment of the interoperability required by the HKVO
- Seamless integration into the Engelmann AMR system landscape
- Simple remote parameterization
- Flexibility during installation and operation

Status 2023/12/01 Subject to technical change! Engelmann Sensor GmbH I Rudolf-Diesel-Straße 24- 28 I 69168 Wiesloch, Germany

Overview

GATEWAY GPRS

Flexible in use – strong in performance! With the Engelmann gateway, you are ideally equipped for the digital future of consumption data recording.

The GPRS gateway is a battery-operated data collector for easy remote readout of wireless M-Bus devices for consumption data recording. Thanks to its wide range of configuration options, it can be individually adapted to your needs and fits seamlessly into the Engelmann AMR system landscape, which impresses with its modularity and allows you to use the gateway independently of the system. You can have the consumption data sent in various formats to an FTP server or to an email address. Optionally, the GPRS gateway can be combined with the Engelmann platforms and the Configuration App to form a digital trio. This all-in-one solution from Engelmann makes commissioning and (data) management of AMR systems child's play.

Features

- Data collector for easy remote readout
- Installation mode – success control directly on site
- Flexible setting of transmission and reception times
- Remote parameterization from your desk
- Battery operation for location-independent installation
- Up to 1000 devices in battery operation
- Up to 1500 devices in mains operation
- Battery life of up to 10 years
- Optional integration into Engelmann platforms

General

Interfaces (standard)		USB (configuration), wireless M-Bus (data collect), GSM/GPRS (data forwarding, firmware update)
Antennas wireless M-Bus and GSM/GPRS		internal, optional: external antennas, can be retrofitted in the field
Configuration		configuration software (Device Monitor), text message (SMS), GMP (Gateway Management Platform)
Data storage		non-volatile FLASH memory
Filter		whitelist for desired devices (wildcard possible) blacklist for not-desired devices (wildcard possible)
Forwarding data format		CSV; XML; RAW
Data transmission		e-mail dispatch; FTP upload
Optional: Data Service Platform (DSP)		Data Platform for providing and bunding all received consumption data including device status
Optional: Configuration App (CAPP)		Android App for quick and easy setting of all important installation parameters and for direct detection of devices immediately during assembly on site
Ambient temperature in the field	°C	-20 to 60 (battery operation) -20 to 30 (mains operation)
Devices		up to 1000 (battery operation) up to 1500 (mains operation)
Protection class		IP65

Gateway GPRS

TECHNICAL DATA

Power supply Orderable or retrofittable options are battery or mains supply.		
Battery supply for submetering (visible location)	V	6; lithium battery
Mains supply for monitoring and submetering	V	100 – 240 (0.25 A), primary 5 (2 A), secondary
Supply cable (no connector plug)	m	2

Battery lifetime: 1 battery

Number of devices	Format	SMS	Frequency of data collects	Frequency of data transmission	Lifetime
400	RAW	Daily 15 min	3 x a month	3 x a month	10 years
1000	RAW	Daily 15 min	2 x a month	2 x a month	10 years
400	CSV	Daily 15 min	2 x a month	2 x a month	5 years
200	XML	Daily 15 min	2 x a month	2 x a month	5 years

Battery lifetime: 2 batteries

Number of devices	Format	SMS	Frequency of data collects	Frequency of data transmission	Lifetime
400	RAW	Daily 15 min	7 x a month	7 x a month	10 years
1000	RAW	Daily 15 min	5 x a month	5 x a month	10 years
1000	CSV	Daily 15 min	2 x a month	2 x a month	5 years
400	XML	Daily 15 min	2 x a month	2 x a month	5 years

Wireless M-Bus		
Operating frequency	MHz	868
Protocol		wireless M-Bus according to EN 13757-3,-4
Selectable modes		S1 / T1 (Frame Format A) C1 (Frame Format B)
Telegrams		conform to OMS 2.0.0, 3.0.1, 4.0.2
Encryption		AES: Advanced Encryption Standard; 128 bit: key length
Highly sensitive receiver		LTE interference filtering
GSM/GPRS		
Frequency bands	MHz	850, 900, 1800, 1900
Class		quad-band GPRS class 10
SIM chip slot		mini-SIM, size 2FF
SIM-chip-capable		yes
Output power		class 4 (2 W, 33 dBm) @ 850, 900 MHz class 1 (1 W, 30 dBm) @ 1800, 1900 MHz
Sensitivity	dBm	-107

Weights		
Gateway (standard version, without batteries)	kg	0.520 + packaging
Battery (two per gateway as standard)	kg	0.240 + packaging
Power pack (optional)	kg	0.220 + packaging
Dimensions		
H x W x D	mm	250 x 194 x 42

Engelmann Repeater

Repeater

Signal amplifier for wireless M-Bus devices

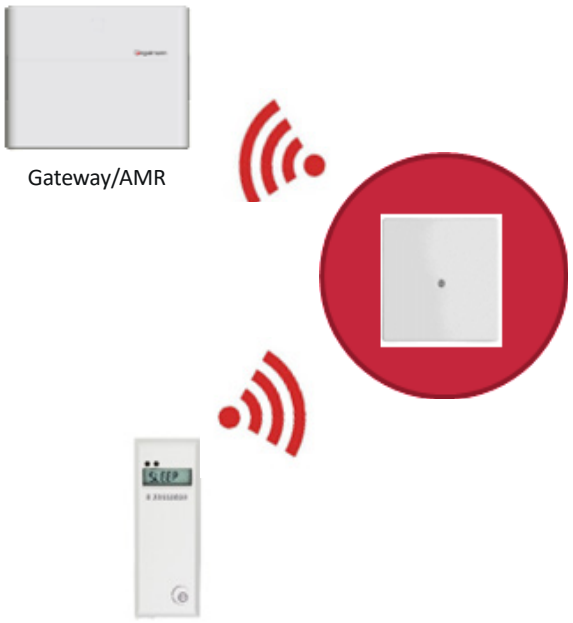
- Signal amplifier for bridging long radio links
- Can be used immediately in conjunction with the Engelmann factory setting
- Automatic device detection
- Installation mode for easy commissioning
- Battery operation for location-independent installation

Overview

REPEATER

A repeater is used to support a gateway in collecting device data. If the device signal is weak or absent, the repeater acts as a signal amplifier for the gateway.

The repeater is supplied as a single-hop version and can be used immediately in conjunction with the Engelmann factory settings. This means you can simply install the repeater and get started straight away – no complicated settings are required. For multi-hop operation (max. 4 hops) or to change the Engelmann settings, we also offer a dongle with corresponding software.



Features

- Automatic meter installation
- Radio operation wireless M-Bus (OMS)
- Single-Hop
- Max. 932 devices can be received
- Installation mode: 60 minutes
- Battery life approx. 10 years (with the Engelmann settings)
- Casing cover protected with security screw TORX T20H + pin

Repeater

TECHNICAL DATA

Casing

Repeater casing (H x W x D)	mm	150 x 150 x 53
Protection class		IP40
Material		UL 94 HB; flame-retardant, UV resistant PC/ABS

General

Voltage	V	3.6 DC; lithium battery (lifetime approx. 10 years with Engelmann default settings)
Ambient temperature	°C	operation: 0 … 50; storage: -10 … +55
Antenna		2 internal antennas
Conformity		2014/53/EU, 2011/65/EU, EN 301489, EN 62368-1, EN 61000-6-1
Hop version (max. 4 Hops)		Single-Hop (factory setting) Multi-Hop (dongle required for configuration)

Radio characteristics

Radio operation		OMS (Open Metering System)
Radio chipset		to wireless M-Bus (wM-Bus) M-Bus RF [EN 13757-3/4]
Frequency	MHz	T-, C-mode: 868.95; S-mode: 868.3 (additional software is required for operation)
Receive mode		T/C combined (factory setting)
Transmit mode		C (factory setting) or selectable: T
Output power		maximum +14 dBm
Sensitivity		up to -105 dBm
Received devices		max. 932

Control elements

Magnetic switch	activation: installation, configuration mode
Dongle (optional, art. no. 0500000079)	required for configuration
Engelmann-Default-Settings	Single-Hop receive mode: T/C (simultaneous) transmit mode: C listen time: 25 min / Mon. - Sun. start time: 08:00 AM UTC (corresponds to winter time 09:00 AM) magnetic timer: 60 minutes automatic meter installation battery connected clock activated

Engelmann Radio Module

FAW

Radio Module Wireless M-Bus for Water Meters with Modularis System

- **Plug-on detection**
- **Direct mounted (no cable)**
- **Detection of manipulation: removal; magnet**
- **Back flow detection**
- **Estimated lifetime:** **12 + 1 years**
- **Communication interfaces:** **wireless M-Bus;**
  optical interface

Technical data:

FAW

Temperature range medium	°C	0 – 105
Storage temperature / ambient temperature in the field	°C	1 – 55
Transport temperature minimum	°C	-20 for seven days
Transport temperature maximum	°C	70 for 24 hours
Interfaces		optical interface (M-Bus protocol), wireless M-Bus
Power supply	V	3; lithium battery
Estimated lifetime	years	12 + 1
Data storage		nonvolatile memory; once daily
Protection class		IP68

Technical data wireless M-Bus radio interface

Telegrams		short telegram in conformity with OMS (AMR) (serial number FAW / water meter, total volume, information message, serial number FAW), long telegram for walk-by read-out* (serial number FAW / water meter, reading date volume, reading date, 15 monthly values, total volume, information message, serial number FAW)
Transmission power (maximum)	dBm	13
Frequency	MHz	868
Selectable modes according to EN 13757-4		S1; T1; C1
Encryption		AES 128 (factory setting: Engelmann Master Key)
Radio activation date		01.01. - 31.12. (day.month) (not 29.02.)
Transmission period		transmission interval: 2 – 240 min (4 min)* transmission period: 0 h – 24 h (8 am – 6 pm)* weekdays: Mo – Su (Mo – Fr)* weeks in a month: 1 – 4 (1 – 4)* months: Jan – Dec (Jan – Dec)* * factory setting

Weight

Weight	kg	0,54 (package with 10 pcs)

Dimensions

Additional housing above display of water meter	mm	14

Engelmann Smoke Detector

Smoke Detector C1

- Approved according to DIN EN 14604
- Type C according to DIN 14676-1
- Designed service life of 10 years

Technical data:

Smoke Detector C1

Supply voltage	V	3; lithium battery
Lifetime; designed	years	10 + 1

Radio characteristics

Protocol		wireless M-Bus according to EN 13757-3, -4
Operating mode		868-MHz, C1-mode
AES encryption		Engelmann master key
Transmission interval	2	minutes

Testing according to DIN 14676:2018-12

Regular function test:

- Obstacle test via ultrasonic (with three US sensors)
  Double smoke entry monitoring via infrared
  - Entry into the housing
  - Entry into the smoke chamber
- Testing of alarm buzzer
- Testing Battery status
- Testing of the smoke detector removal

Housing

Housing (Ø x T)	mm	132 x 46
Protection class		IP32
Weight	g	250

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