



# DATASHEET ULTRAHEAT® T450 | ULTRACOLD® T450

STATIC ULTRASONIC HEAT AND COOLING METER



## Application

The T450 is a universal ultrasonic heat, cooling or combined heat and cooling meter. By its precision, reliability and flexibility it covers both the requirements in the field of domestic technology and district heat / cooling perfectly. All of this is accomplished with a high degree of economy.

## Key Facts

- Module slot for communication module
- Metrological logbook - metrologically relevant changes possible in the field
- Logbook with 44 monitored functions
- Battery life up to 20 years
- Battery lifetime calculation
- Power-over-M-Bus
- Firmware update in the field
- Developed and Manufactured in Germany

## Technical Data

### General

Measuring accuracy	Class 2 or 3 (EN 1434)
Environment class	C (EN 1434)
Mechanical class	M2 (2014/32/EU)
Electromechanical class	E1 (2014/32/EU)
Ambient humidity	< 93 % rel. humidity at 25 °C, without condensation
Max. height	2000 m above sea level
Storage temperature	-20 ... 60 °C

### Electronic unit

Ambient temperature	5 ... 55 °C
Housing protection class	IP 54 / IP 68 optional (EN 60529)
Power supply	1 - 4 AA cell batteries for 6 - 20 years
Operation threshold $\Delta T$	< 0.2 K
Temperature difference $\Delta T$	3 K ... 120 K
Temperature measurement range	0 ... 180 °C
LCD	8 digit
Optical interface	Standard (EN 62056-21)
Communication	Optional, e.g. M-Bus, wM-Bus
Separability	Always, cable length 1.5 m / 5 m

### Temperature sensors

Type	Pt 500 or Pt 100 (EN 60751)
Connection type	2-wire technology
Cable length acc. approval	Max. 10 m
Construction types and temperature range available	Type PS $\varnothing$ 5.2 x 45 mm, 1.5 m, 150 °C; Type PS $\varnothing$ 5.2 x 45 mm, 5.0 m, 150 °C; Type DS, M10 x 27,5 mm, 1.5 m, 150 °C Type DS, M10 x 27,5 mm, 2.5 m, 150 °C

### Volume measuring tube

Protection class	IP 54 / IP65 / IP 68 optional (EN 60529)
Mounting place	Hot side / cold side parameterizable
Installation position	Any
Flow straightening	None
Measuring range	1:100
Temperature range	5 ... 130 °C *)
Recommended for...	
... heat metering	10 ... 130 °C
... cold metering	5 ... 50 °C
Maximum overload	2.8 x $q_p$
Nominal pressure	PN16 (PS16), PN25 (PS25)

\*) National type approvals may be different

$q_p$ m <sup>3</sup> /h	Overall length and connection		
0.6	110 mm (3/4")	—	190 mm (1")
1.5	110 mm (3/4")	130 mm (1")	190 mm (1")
2.5	—	130 mm (1")	190 mm (1")



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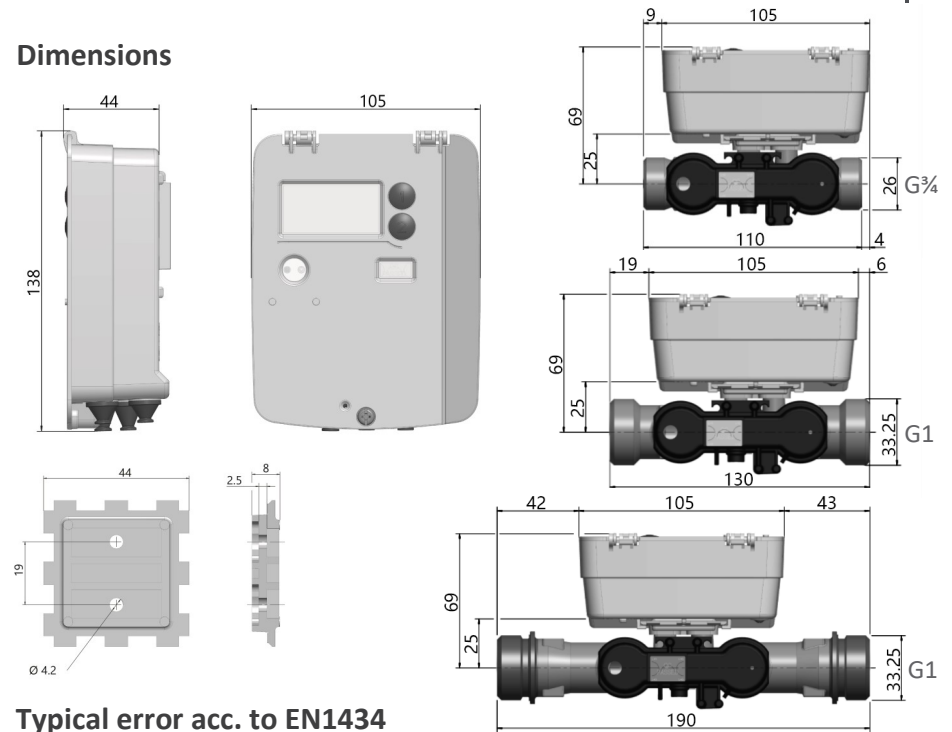
STATIC ULTRASONIC HEAT AND COOLING METER



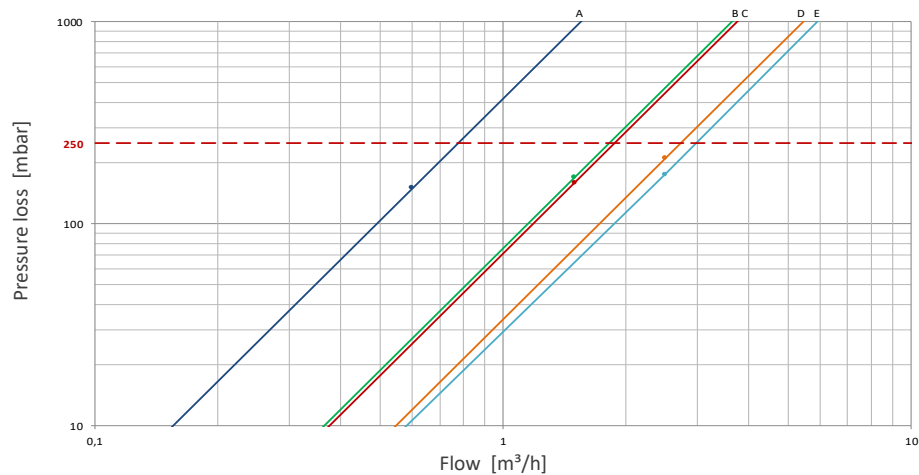
## Technical Data

Nominal flow $q_p$	0.6	0.6	1.5	1.5	1.5	2.5	2.5	[m³/h]	
Overall length	110	190	110	130	190	130	190	[mm]	
Connection	G¾	G1	G¾	G1	G1	G1	G1		
Maximum flow rate $q_s$	1.2	1.2	3	3	3	5	5	[m³/h]	
Minimum flow rate $q_i$	6	6	15	15	15	25	25	[l/h]	
Operation threshold $q_a$	2.4	2.4	6	6	6	10	10	[l/h]	
Pressure loss $q_p$	150	150	170	160	160	175	210	[mbar]	
Kv-Factor at $\Delta p$ 1bar	1.5	1.5	3.6	3.8	3.8	6.0	5.3	[m³/h]	
Graph in diagram	A	A	B	C	C	E	D		
Weight	0.8	1.1	0.8	0.8	1.1	0.8	1.1	[kg]	
Packing Dimensions	Length	15.5	22.5	15.5	15.5	22.5	15.5	22.5	[mm]
	Width	13.5	18.5	13.5	13.5	18.5	13.5	18.5	[mm]
	Height	12.0	11.3	12.0	12.0	11.3	12.0	11.3	[mm]

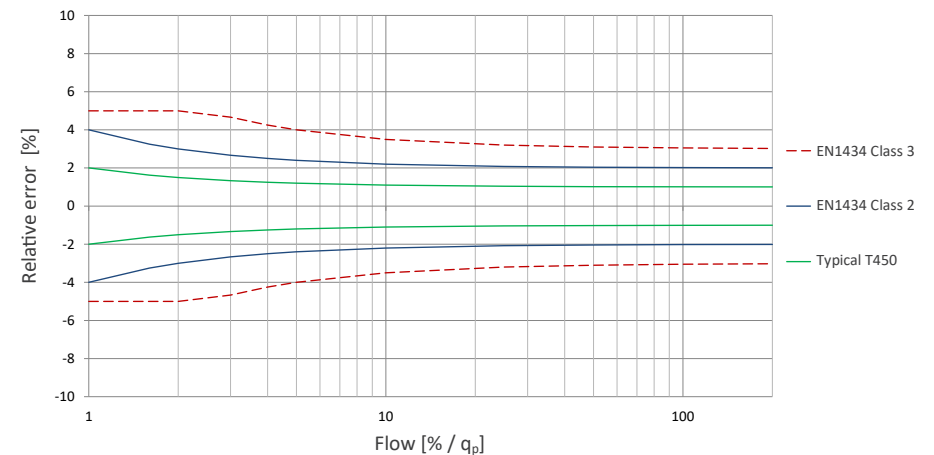
## Dimensions



## Pressure loss diagram



## Typical error acc. to EN1434





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## Communication (optional)

M-Bus	
Standard	EN 13757-2 / EN 13757-3 / OMS
Separation	Galvanic Connected
Connection	Double terminal
Power consumption	Max. 1 M-Bus load (1.5 mA)
Address	Primary or secondary
Transmission rate	300 Bd and 2400 Bd with automatic baud rate detection
Reading interval	> 1 min @ 2400 Bd > 1 h @ 300 Bd

wM-Bus	
Standard	Open Metering System Specification Vol.2 Issue 4.1.2:2016 EN 13757-4:2018; EN13757-4:2019
Mode	T1 or C1
Frequency	868,95 MHz (min. 868.90 MHz - max. 869.00 MHz)
Transmission Power (ERP)	min. 3.16mW (5dBm) to max. 25 mW (13.9 dB)
Transmission interval	6 s - 24 h adjustable
Encryption	None Security profile A (Encryption Mode 5) Security profile B (Encryption Mode 7)

Pulse output	
Standard	OB / OC (acc. to EN1434-2)
Output type	Open Drain
Voltage	max. 30 V
Current	max. 30 mA
Dielectric strength	500 V <sub>eff</sub> against ground
Voltage Drop	0.9 V @ 30mA (OB) / 0.1 V @ 0.1 mA (OC)
Channels	2 (default setting CE / CV)

Pulse input	
Standard	Class IB / IC (acc. to EN1434-2)
Max. cable length	10 m
External connection	Open Drain
Current	max. 30 mA
Max. Pulse frequency	Max. 3 µA
Min. Pulse length	Min. 10 ms
Polarity	Active Low
Channels (Devices)	2