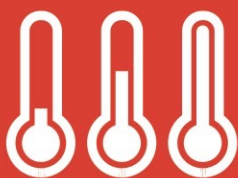


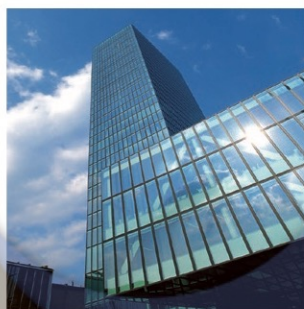


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everything that counts



Selection guide for thermal energy measuring



3 steps to the individual energy measuring point

1. Selection of the flow meter
2. Selection of the energy calculator
3. Selection of the temperature sensors

3 steps to the individual energy measuring point

1

Selection of the flow meter

(see table 1, part 1 - 3)

What to measure?	<input type="checkbox"/> Heating-Energy
	<input type="checkbox"/> Cooling-Energy
	<input type="checkbox"/> Heating- & Cooling-Energy
Which medium is being used?	<input type="checkbox"/> Water
	<input type="checkbox"/> Water / Glycol
	<input type="checkbox"/> Water / Glycol
	<input type="checkbox"/> Thermo-Oil
What are the operation conditions?	Volume [m ³ /h] <input type="text"/>
	Temperatures [°C] <input type="text"/>
	Operating pressure [bar] <input type="text"/>
How should the flow sensor be installed?	Installation position flow sensor <input type="checkbox"/> horizontally <input type="checkbox"/> vertically
	Flow direction <input type="checkbox"/> upwards <input type="checkbox"/> downwards
What is the needed accuracy?	<input type="checkbox"/> 0.5% <input type="checkbox"/> 2% <input type="checkbox"/> 3%
Is an approval needed (Custody transfer)?	<input type="checkbox"/> MID <input type="checkbox"/> PTB K7.2 <input type="checkbox"/> domestic

2

Selection of the energy calculator

(see table 2)



How should the calculator be powered?	<input type="checkbox"/> Battery
	<input type="checkbox"/> Low voltage
	<input type="checkbox"/> Mains voltage
What should be calculated?	<input type="checkbox"/> Heating energy
	<input checked="" type="checkbox"/> Cooling energy
	<input type="checkbox"/> Combined heating and cooling BDE (bidirectional energy)
	<input type="checkbox"/> Bidirectional flow BDV (charge / discharge)
What kind of temperature sensor is used?	<input checked="" type="checkbox"/> Pt100 <input type="checkbox"/> Pt500 <input type="checkbox"/> 2-wire <input type="checkbox"/> 4-wire
What kind and how many communication interfaces are needed?	<input type="checkbox"/> M-Bus <input type="checkbox"/> LON <input type="checkbox"/> Modbus <input type="checkbox"/> BACnet <input type="checkbox"/> N2Open
	<input type="checkbox"/> KNX <input type="checkbox"/> M-Bus Wireless (as of 07.17) <input type="checkbox"/> LoRa (as of 07.17)
What kind and how many outputs are needed?	<input type="checkbox"/> Analog output [0/4 - 20mA] active, passive
	<input type="checkbox"/> Digital output (Puls, Alarm)
Are tariffs needed?	<input type="checkbox"/> If YES, how many? <input type="text"/>
Must readings be logged?	<input type="checkbox"/> If YES, how often? <input type="text"/>
Is an approval needed (Custody transfer)?	<input type="checkbox"/> MID <input type="checkbox"/> PTB K7.2 <input type="checkbox"/> domestic

3

Selection of the temperature sensors

(see table 3)

Type Pt100 or Pt500?	<input type="checkbox"/> Pt100 <input type="checkbox"/> Pt500
Distance to the energy calculator?	Cable sensors length: <input type="checkbox"/> 2.5 m <input type="checkbox"/> 10 m
	Head sensors with 4-wire cabling: <input type="text"/>
	Max. cable length defined by the energy calculator
Nominal width of the pipe DN?	Immersion depth temperature sensor: <input type="text"/>
Is an approval needed (Custody transfer)?	<input type="checkbox"/> MID <input type="checkbox"/> PTB K7.2 <input type="checkbox"/> domestic

		TOPAS	RUBIN
		PMG 	WMS 
Measurement principle	Mechanical	● Multi-jet	● Woltman
	Ultrasonic		
	Electromagnetic		
Field of application	Heating	●	●
	Cooling	●	●
	Heating & cooling	●	●
	Solar	●	✗
	Limitations	Pressure shocks	Pressure shocks
Medium	Water	●	●
	Water / Glycol	●	●
Technical specifications	Nominal diameter DN [mm]	15 - 20	50 / 80 / 100
	Max. operating pressure PN [bar]	16	16
	Pressure loss	moderate	low
	Temperature range [°C]	0 - 130(120)	0 - 90
	Accuracy	+/- 3%	+/- 3%
	In- and outlet section	none	0x / 0x DN ¹⁾
	Installation position	↕	↕ ↑↓
Approvals		MID	MID
Prize-indication	Prizeindication on all nominal width range, but max DN 200	B	C

● Suitable

✗ Not suitable





Prize-Indication: **A** = Low Cost ; **D** = High End

All positions



Only vertically upwards or downwards

¹⁾ No sudden section reduction behind the counter

		AMFLO® SONIC			
		UFA 113 	UFA 280 	Dry X 	Smart 
Measurement principle	Mechanical				
	Ultrasonic	● 1-track	● 2-track	● Clamp-On	● 1-track
	Electromagnetic				
Field of application	Heating	●	●	●	●
	Cooling	partly suitable	●	●	●
	Heating & cooling	partly suitable	●	●	●
	Solar	✗	●	●	✗
	Limitations	Air	Air	Air	Air
Medium	Water	●	●	●	●
	Water / Glycol	✗	●	●	✗
Technical specifications	Nominal diameter DN [mm]	15 - 100	50 - 1200	32 - 250	20 - 40
	Max. operating pressure PN [bar]	16 / 25	16 / 40	16 / 40	40
	Pressure loss	moderate	none	low	low
	Temperature range [°C]	5 - 130	0 - 200	0 - 130	0 - 150
	Accuracy	+/- 2%	+/- 2%	+/- 2%	+/- 2%
	In- and outlet section	none	10x / 3x DN	none	none
	Installation position	↕	↕	↕	↕
Approvals		MID	MID	MID	MID
Prize-indication	Prizeindication on all nominal width range, but max DN 200	B	D	C	B

● Suitable

✗ Not suitable

Prize-Indication: **A** = Low Cost ; **D** = High End




All positions



Only vertically upwards or downwards



Only horizontally

		AMFLO® MAG		
		Smart	Basic	Pro
				
Measurement principle	Mechanical			
	Ultrasonic			
	Electromagnetic	●	●	●
Field of application	Heating	partly suitable	partly suitable	partly suitable
	Cooling	●	●	●
	Heating & cooling	partly suitable	partly suitable	partly suitable
	Solar	partly suitable	partly suitable	●
	Limitations	Air / Magnetite	Air / Magnetite	Air / Magnetite
Medium	Water	●	●	●
	Water / Glycol	●	●	●
Technical specifications	Nominal diameter DN [mm]	15 - 100	125 - 250	25 - 1000
	Max. operating pressure PN [bar]	16	16	16 / 40
	Pressure loss	low	none	none
	Temperature range [°C]	0 - 50	0 - 80	-20 - 150
	Accuracy	+/- 0,5%	+/- 0,5%	+/- 0,4%
	In- and outlet section	none	3x / 2x DN	3x / 2x DN
	Installation position	↕	↕	↕
Approvals		MID / PTB K7.2	MID / PTB K7.2	MID / PTB K7.2
Prize-indication	Prizeindication on all nominal width range, but max DN 200	B	B	C

● Suitable

✗ Not suitable

Prize-Indication: **A** = Low Cost ; **D** = High End

All positions







Only vertically upwards or downwards



Only horizontally

2 Selection aid energy calculator




		AMTRON®	CALEC®		
		X50 	ST Battery 	ST II 	energy master 
Power supply	Battery	●	●	✗	✗
	15 VAC	●	✗	●	✗
	12 VDC	●	✗	●	✗
	24 VDC	●	✗	●	●
	230 VAC	●	✗	●	●
Input signals	Calculation cycle	1 s	20 s	1 s	1 s
	Flow meter pulse	max. 20 Hz	max. 200 Hz	max. 200 Hz	max. 12.5 kHz
	Flow meter analog	✗	✗	✗	●
Temperature- inputs	Pt100	●	●	●	●
	Pt500	●	●	●	✗
	2-wire connection	●	●	●	●
	4-wire connection	●	●	●	●
	Max. length 4-wire connection	15	15	100	100
Interfaces	M-Bus	1	2	2	2
	LON	✗	●	●	✗
	Modbus	✗	●	●	✗
	BACnet MS/TP	✗	●	●	✗
	N2Open	✗	●	●	✗
	Analog passive	✗	✗	2	max. 5x2 *
	Analog active	✗	✗	✗	max. 5x2 *
	Puls output	max. 2	max. 2	max. 2	max. 5x2 *
	Puls input	max. 2	max. 2	max. 3	max. 5x2 *
Additional features	Heating and cooling BDE	✗	●	●	●
	Bidirectional flow BDV	✗	✗	✗	●
	Glykol	✗	●	●	●
	Tariffs	✗	✗	2	8
	Logger values	31	60	500	100
	Approvals	MID / PTB K7.2	MID / PTB K7.2	MID / PTB K7.2	MID / PTB K7.2
Prize- indication		A	C	C	D

● Suitable

✗ Not suitable

* In any combination but total maximum of 5 modules

Prize-Indication: A = Low Cost ; D = High End

		Cable sensors		Head sensors
		DS-PSC	PLC	PLH
				
Type	Pt100	●	●	●
	Pt500	●	●	✗
	2-wire connection	●	●	✗
	4-wire connection	●	●	●
Dimensions	Ø [mm]	5	6	6
	Length sensor [mm]	45	105 - 230	105 - 230
	Length cable [m]	2.5 / 10	2.5 / 10	any ¹⁾
Mounting	Ball valve	●	✗	✗
	Sensor pocket	●	●	●
Applications	Heating	●	●	●
	Cooling	●	●	partly suitable ²⁾
	Heating & cooling	●	●	partly suitable ²⁾
Pocket type	SP-M, 1/2" brass	●	✗	✗
	SP-E, 1/2" Stainless steel	✗	●	●
	Direct mounting ball valve	●	✗	✗
Approvals		MID / PTB K7.2	MID / PTB K7.2	MID
Prize-indication	Prizeindication on all nominal width range, but max DN 200	A	B	C

● Suitable

✗ Not suitable

¹⁾ Max. cable length defined by the energy calculator²⁾ Penetration of condensation must be avoided

Prize-Indication: A = Low Cost ; D = High End

Calibration and services

Aquametro AG is an authorised, recognised certification point for Switzerland and Germany and maintains an independent, pan-European accredited calibration station for heat, water and oil volumes in accordance with ISO/IE 17025.

Aquametro has one of the few cold water test beds which are able to test volume measurement parts up to a nominal diameter of 250 mm and a maximum flow rate of 1200 m³/h. The performance range includes the following areas:

ISO/IEC 17025 standard

- Neutral calibration by independent head of SCS077 calibration station
- All meters can be adjusted and calibrated by Aquametro AG
- The benefits of the calibration lab are clear: expertise, flexibility and short delivery times

Repairs

After repairs/adjustments at major measuring stations, Aquametro recommends SCS calibration if specific calibration is not required. The benefits to you:

- Known measurement results
- Error as set out by energy suppliers
- Quality control (calibration)

Calibration

If a measurement point has been calibrated, it needs to be recalibrated every 5 years by law. Recalibration always follows statutory inspection or repair.

The benefits to you:

- Fair distribution of costs
- Sustainable use of meter fleet and protection of investment

Classification inspection

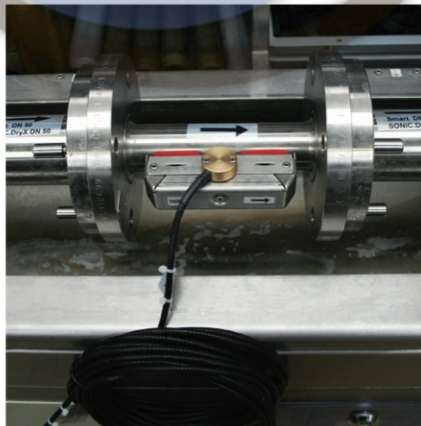
Certified measurement calibration for international type classifications in the energy metering sector. The benefits to you:

- You know that the device complies with the statutory service life and the defined tolerances.
- You have the peace of mind that the meter complies with the required measurement accuracy throughout the calibration validity period defined.

Heating and cooling meter setup in accordance with PTB TR – K09

Expert set-up with approval protocol. The benefits to you:

- Set-up in accordance with statutory regulations
- Official approval protocol



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