

Why should you use approved cooling meters?

Cold generation for building air-conditioning or cooling generates a significant proportion of building operating costs. The measurement of cooling energy is therefore crucial in optimising energy and causer-based cost distribution. This is another reason why the law stipulates meters with cold approval. Conventional heat meters are not really suitable for cooling metering. Coolant circuits are more challenging for the measurement system and must fulfil the reinforced test criteria of PTB K7.2 in order to function consistently reliably in practice.

Analogue-digital conversion of calculators

INTEGRA Metering calculators offer the ultimate in precision when it comes to analogue-digital conversion and energy calculation. This achieves better results than are required for approval in accordance with EN 1434-1 (2007) ($\pm 1.5\%$ for the approved minimum temperature differential for the calculator).

No problems with dynamic status changes

Another decisive influential factor is the measurement interval for the calculator. This is about the speed of the temperature measurement and recalculation (increment) of volumes and therefore energy consumption. In order to minimise these discrepancies, INTEGRA Metering mains-powered calculators work with a measurement interval of 1 second, meaning that even very dynamic status changes in cooling systems can be precisely recorded and forwarded.

Flow sensors - high-resolution and best protection

INTEGRA Metering's calculators can be combined with all conventional flow sensors and measurement techniques (e.g. ultrasound, magnetic-inductive, impeller wheel). INTEGRA Metering flow sensors have obtained the demanding Class 2 metrological approval in accordance with EN 1434-1. The starting signal for the volume of the heat carrier is provided in high-resolution form, even for the mechanical flow sensors. Depending on the model of the flow sensor, media with frost protection additives can also be metered. The specific heat capacity and density figures are compared to those for water, and the connected calculator then automatically compensates for these throughout the temperature range. In terms of cooling metering, there are exacting demands on device protection class because of the external strain provided by condensation. The magnetic-inductive AMFLO[®] MAG Smart and AMFLO[®] MAG Pro are protection class IP67, considerably surpassing the requirements of IP65 for approval.

The compact design means that the AMFLO[®] MAG Smart can be completely fitted and isolated within pipe systems.

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Measurements in cooling systems

Causer-based distribution of cooling costs



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The new generation of calibration-compatible cool meters have a wide range of benefits:

- Cost control and accurate cost distribution thanks to high precision levels and reproducibility
- Optimising system efficiency by means of continuous monitoring of key figures
- Measurement points with no moving parts, so no maintenance costs

<https://integra-metering.com>

INTEGRA Metering

The reference for energy billing

Energy data management system for automated remote meter reading of electricity, gas, water and energy meters. Data can be recorded via network interfaces or optical or wireless connections.

Cold metering made easy

- The flow meter, temperature sensors and calculator are all tailored to one another to measure cooling.
- Complies with German standards defined in PTB K7.2.
- Approved in accordance with Measuring Implements Directive 2004/22/EU (MID)

Compliance with norms protects investment

- Low lifecycle costs
- Minimum pressure losses

Simple to integrate into building / cooling distribution and readout systems

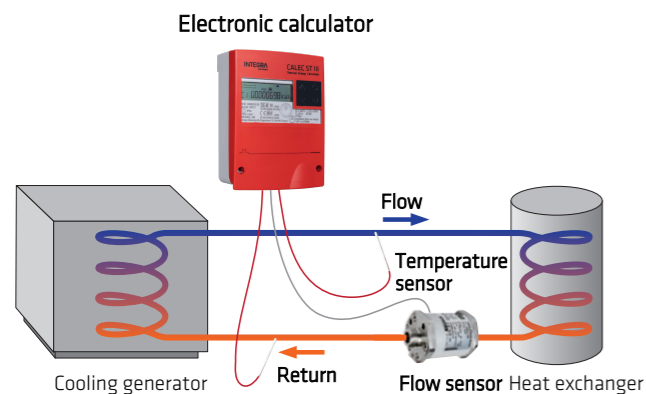
- Allows continuous monitoring of performance levels of cooling systems.
- Open standard interfaces such as M-Bus, LON, Modbus RTU, N2Open and BACnet.
- Integration of heat, water and electricity meters
- CALEC[®] is also suitable for combined heating/cooling metering

Excellent temperature precision

- Temperature resolutions exceeds the requirements of the EN 1434 standard
- Temperature sensors calibrated in pairs for very small differential measurements
- 24 bit analogue digital conversion

Ideal for process cold

- Minimum temperature measurement to -50 °C
- Industrial coolant (e.g. glycol)



AMBUS[®], CALEC[®], AMTRON[®] and AMFLO[®]

Ideal for energy metering

AMBUS[®] CMe3100

CMe3100 is a fixed network M-Bus Metering Gateway for up to 512 meters, compatible with the M-Bus standard protocol and Elvaco's CMe/CMEx series. Easily configured through its web interface, it supports integration protocols like ModBus, DLMS, JSON, and REST.



AMBUS[®] Weblog 250

The new WebLog 250, with a touch screen and 1GB memory, adapts flexibly to your needs like no previous Relay data logger. It can drive 250 meters and manage up to 1000 meters. The internal database lets you organize M-Bus data according to your requirements.



CALEC[®] ST III Standard / Smart

Energy calculator for battery operation (service life >6 years) or mains power. Existing interfaces to higher-level energy management systems, such as M-Bus, LON, Modbus, N2Open and BACnet, can be used. Two measurements for "heating and cooling" in a single unit.



CALEC[®] ST III Advanced

The CALEC[®]ST III Advanced, designed on the basis of the CALEC[®]ST III Smart, is equipped with an extension that enables it to incorporate superior functionality and connectivity.



AMTRON[®] SONIC D

AMTRON[®] SONIC D is a fully-electronic compact heat meter for measuring thermal energy in heating and cooling plants used in facility management systems, local and district heating systems. With wireless M-Bus (Radio) or M-Bus all possibilities of communication are open.



AMFLO[®] SONIC UFA-113

Ultrasonic flow sensor for use with energy calculators for heating and cooling applications.



AMFLO[®] MAG Smart

Compact magnetic-inductive flow meter for the metering of electrically conductive coolants. DN 15 to 25, 12 l/h to 7 m³/h, IP67, and DN 32 to 100, 48 l/h to 120 m³/h, IP67.



AMFLO[®] MAG Pro

Magnetic-inductive flow meter for the metering of electrically conductive liquids. DN 25 to 1000, 16 m³/h to 28,500 m³/h, IP68.



Temperature sensors

The range of temperature sensors calibrated in pairs, for 2 and 4 wire systems. A range of mechanical designs are also available to guarantee optimum fitting.

