

PRODUCT RANGE

PRODUCT RANGE



OVERVIEW

FOR ALL TYPES OF ENERGY

The increase of energy efficiency gains an important value since the rise of the commodity prices. Not only does this involve the electric current but most importantly the flows of liquids, water, steam and gases.

Since the introduction of an energy management system is important, its base is the energy data that is done by a precise and trusted measuring equipment.

We focus on professional and competent service with individual consultations from planning up to the ongoing operation.

METRA-Energie-Messtechnik GmbH has been a competent partner in the field of flow and energy measurement technology for more than 30 years.

Our devices are used for the following Applications:

- Steam, flow and energy measurements
(balancing and billing measurements)
- Energy measurements for water, condensate, thermo-oils, etc.
- Flow and energy measurements for technical gases, e.g.
air or nitrogen (balancing and billing measurements)
- Cold capacity measurements for water and cooling media

We also focus on competent and individual advisory service from planning to full operation.

Necessary services, such as calibration, commissioning or maintenance work, are carried out in Germany by our respective International representatives.



STEAM

STEAM MEASUREMENTS



„autarkon“
EWZ 120.1 compact



„autarkon“ EWZ 1x7.1 remote



„autarkon“ EWZ 150.1

Steam measurement – Applications

- from the simple steam measurement for internal accounting to highly accurate steam measurement acc. to DIN ISO 5167 between to parties
- bi-directional steam measurement and combined steam/condensate-measurement

Flow- and energy meter „autarkon“ with orifice/crossprobe

- highest accuracy, large measuring range and high long term stability, because of automatical hydraulic zero balance and self-test
- calculation unit with current outputs (0)4-20 mA, with pulse outputs, with M-Bus/Modbus and comprehensive data logger functions
- with pressure- and temperature compensation
- all parts contacted with fluid of stainless steel

Differential pressure transmitter with calculation unit

- highest accuracy, large measuring range and long term stability, because of automatically hydraulic zero balance and self-test
- with integral calculation for flow and energy
- very suitable for subsequently range extension of already installed-steam measurements with existing pressure differential devices

Flow- and energy meter „autarkon“ with classical venturi tube

- calculation unit with current outputs (0)4-20 mA, with pulse outputs, with M-Bus/Modbus and comprehensive data logger functions
- traceable standardized measurement, based on international valid rules and regulation DIN ISO 5167
- plausibility and accuracy test during operation
- very short needed inlet pipe (typical 4x DN). No outlet pipe required
- Small residual pressure loss (typical approx. 100 mbar)
- large measuring range up to 30:1 (in relation to the mass flow)
- small uncertainty ($\pm 1\%$ of the measured value)
- insensitive against wear and contamination (venturi effect)
- highest accuracy, large measuring range and long term stability, because of automatically hydraulic zero balance and self-test

STEAM

HYDRAULIC ZERO BALANCING

Flow- and energy meter „trikon“ with vortex

- calculation unit with current outputs (0)4-20 mA, with pulse outputs, with M-Bus/Modbus and comprehensive data logger functions
- vortex meter, suitable for Ex proof areas
- insensitive against pulsation, pressure surges and temperature shocks
- all wetted parts in stainless steel



„trikon“ EWZ 427

Differential pressure transmitter with hydraulic zero balance

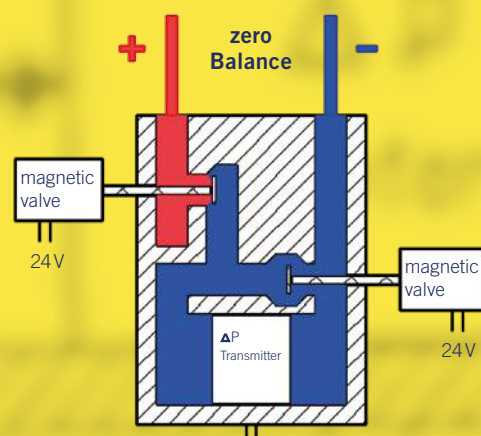
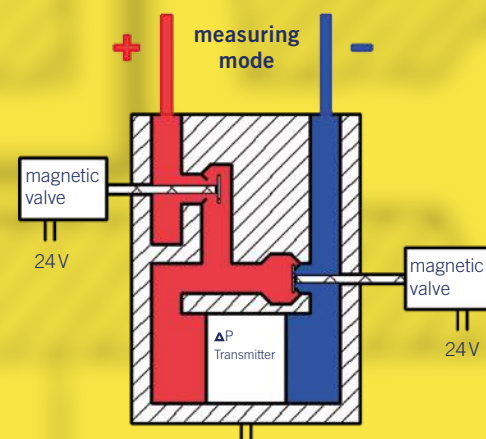
- high resolution
- elimination of external disturbances (aging, pressure, temperature) because of the automatic self-calibration of the sensor cell
- zero stability at very low differential pressures
- significant enlargement of the measuring range
- significant reduce of the uncertainty over the whole measuring range
- long-term stability

Uncertainty analysis

METRA differential pressure transmitter with hydraulic zero balance as compared with transmitters of other competitor

(all measurement uncertainties relate to the current value and not as in generally usual on the programmed full scale value)

operating point	METRA transmitter with hydr. zero balance (\pm current value $\times 0,1\%$ $+0,05$ mbar)	transmitter A (competitor) ($\pm 0,1\%$ to scale value)	transmitter B (competitor) ($\pm 0,3\%$ to scale value))
500 mbar	0,11 %	0,10 %	0,30 %
100 mbar	0,15 %	0,50 %	1,50 %
50 mbar	0,20 %	1,00 %	3,00 %
10 mbar	0,60 %	5,00 %	15,00 %
1 mbar	5,90 %	50,00 %	150,00 %



STEAM

STEAM MEASUREMENTS ACC. TO ISO 5167

Steam billing measurements, consisting of a differential pressure with meter run and pressure transmitter station, provide high-level accuracy and turn down. The differential pressure meter run is designed in accuracy with ISO 5167 and can be additionally wet calibrated at an accredited test bench if desired. The measuring transmitter station consists of a differential pressure transmitter, an absolute pressure transmitter, a manifold and a flow computer. It is fully factory assembled and tested and can be easily and cost-effectively adapted to the differential pressure device and meter run at the operator's site.

Special features:

- Flow- and energy meter
- all types of differential pressure devices available
- legal certainty due to traceability to International standards (ISO 5167)
- plausibility control possible, during operation
- long-term stability due to hydraulic zero-balancing of the measuring transmitter (dp)
- uncertainty calculation according VDI/ VDE 2040 for the complete measurement
- suitable for liquids, water, steam and gases
- calibration at the complete measurement, realistically at an accredited test bench



measurement with venturi
measuring section, for billing of steam

Technical data „Steam measurement“	
Nominal Size	up to DN 2000
Temperature range	up to 550 °C
Pressure max.	up to 100 bar
Turn down	up to 50:1
Measuring uncertainty	up to $\pm 0,5\%$ of measured value
Approvals/Standards	ISO 5167

STEAM

STEAM MEASUREMENT

Steam billing measurement with Vortex meter with high accuracy requirements. The complete measurement consisting of Vortex meter, inlet pipe and outlet pipe, pressure- and temperature-transmitter, Flow- and Energy calculator is tested by an accredited test bench. The direct linear relationship between Vortex shedding and flow velocity, in a certain Reynolds number range, allows an easy further processing of the signals. The inlet pipe and outlet pipe are required as integral of the complete measurement. The measurement is suitable for highest requirements of measurement accuracy and dynamic range.

Special features:

- Flow- and energy meter
- calibration of the complete measurement at an accredited test bench.
- Vortex "trikon" with tandem transmitter and adaptive filter technique
- particularly insensitive to pipe vibration
- uncertainty assessment in accordance with the VDI /VDE 2040 for the complete measurement
- suitable for liquids, water, steam and gases
- suitable for Ex- applications

measurement with vortex measuring section,
for billing of steam



Technical data „Billing measurement with Vortex meter“	
Nominal Size	up to DN 300
Temperature range	up to 300 °C
Pressure max.	up to 100 bar
Turn down	up to 30:1
Measuring uncertainty	up to ±0,5% of measured value

HEAT

HEAT QUANTITY MEASUREMENTS



„ultrakon“ EWZ 837

Heat measurements – Applications

- from efficiency measurements in power plants on internal balances of energy costs to gauged measurements for custody transfer
- preferably for measuring of heat water, magnetite-containing heating
- water, demineralized water (deionized water) and thermo oil
- bi-directional flow- and heat measuring

Heat meter „ultrakon“ with 2-path ultrasonic technique

- calculation unit with current outputs (0)4-20 mA, with pulse outputs, with M-Bus/Modbus and comprehensive data logger functions
- short needed inlet and outlet pipe
- large measuring range (100:1)
- no residual pressure loss (straight pipe)
- independent of the conductivity of the medium
- insensitive to magnetite deposits

Technical data „Heat measurement“	
Nominal Size	up to DN 1000
Temperature range	up to 360 °C
Pressure max.	up to 40 bar
Turn down	up to 100:1
Measuring uncertainty	up to $\pm 0,5\%$ of measured value
Approvals/Standards	PTB/MID

HEAT

HEAT QUANTITY MEASUREMENTS

Flow- and energy meter „autarkon“ with classical venturi tube

- calculation unit with current outputs (0) 4-20 mA, with pulse outputs, with M-Bus/Modbus and comprehensive data logger functions
- traceable standardized measurement, based on international valid rules and regulation DIN ISO 5167
- plausibility and accuracy test during operation
- very short needed inlet pipe (typical 4x DN). No outlet pipe required
- small residual pressure loss (typical approx. 100 mbar)
- large measuring range up to 30:1 (in relation to the mass flow)
- small uncertainty ($\pm 1\%$ of the measured value)
- insensitive against wear and contamination (venturi effect)
- high accuracy, large measuring range and long term stability, because of automatically hydraulic zero balance and self-test
- all wetted parts in stainless steel
- optional silicone-free design

Special features:

- long-term stable, self-calibrating measuring system
- minimised pressure loss
- plausibility control possible on site and during operation
- high long-term stability due to hydraulic zero-balancing
- PTB-approved as a heat meter for water
- suitable also for thermal oil up to 350°C



„autarkon“
EWZ 157.1



„autarkon“ EWZ 211.7
with crossprobe

COLD

COLD ENERGY MEASUREMENTS



„epykon“ EWZ 617



„autarkon“ EKZ 211.7
with crossprobe

Cold energy measurements – Applications

- Cold meters are mainly used for cold energy measurements of water in temperature range from 6 to 12 °C. Furthermore, cold meters are being increasingly used for industrial refrigeration in temperatures ranging from approx. 0 to -50 °C (water-glycol mixtures)
- The measuring task focuses on the precise measurement of the volume flow and the very small temperature difference
- for air conditioning of buildings and process cooling equipment for cooling systems and industrial purposes

Cold meter „epykon“ with magn.-inductive transducer

- calculation unit with current outputs (0)4-20 mA, with pulse outputs, with M-Bus/Modbus and comprehensive data logger functions
- large measuring range
- very small residual pressure loss
- PTB-approval as a cold meter
- flow computer can be installed in a cabinet or on a wall
- required minimum conductivity > 5 µs/m

Cold meter „autarkon“ with cross probe and remote calculation unit

- plausibility control possible on site and during operation
- high accuracy, large measuring range and long term stability, because of automatically hydraulic zero balance and self-test
- all wetted parts in stainless steel
- optional silicone-free design

Technical data „Cold measurement“	
Nominal Size	up to DN 1000
Temperature range	-50 °C to 70 °C
Pressure max.	up to 40 bar
Turn down	up to 100:1
Measuring uncertainty	up to ±0,5% of measured value

FLOW COMPUTER

„AUTARKON“ ERW 700

Calculation unit – Applications

The ERW 700 is a communication-capable flow and energy computer for sophisticated measuring tasks. The flow computer can be operated with various flow and temperature sensors.

- various models available (compact model, cabinet installation, 19" plug-in module, etc.)
- high-precision process calculation of the density, enthalpy and compressibility based on equations or tables with fluid data
- logger functions for test day, monthly values, periodic memory, parameter memory and min/max memory
- PTB/MID approval as a Heat and Cold calculator
- M-BUS/Modbus interface

Special features:

- calculations for gas, liquids and steam
- can be used with all common flow sensors (differential pressure, vortex, turbine, ultrasonic, electro-magnetic flow meter, PD meter, Coriolis, Woltmann, etc.)
- calculation standards: water steam tables, real gas equation, ISO 5167, etc.
- compensation input for density signal
- parameterisation and operation via PC software and / or manually via a keyboard
- detachable LC display
- extensive modular extensions for inputs and outputs
- numerous special functions, such as condensate measurement,
- bi-directional measurement, tariff and fault meters



„autarkon“ ERW 700

TECHNICAL GASES

COMPRESSED AIR



„autarkon“ EWZ EWZ 150.1 compact

Compressed air measurements – Applications

Of all the technical (non-combustible) gases, such as compressed air, carbon dioxide, nitrogen, argon etc., compressed air plays the most significant role. The measurement and recording of a company's compressed air consumption for balancing and billing purposes is a key element for cost and energy optimisation.

Typical measuring tasks are:

- creation of demand analyses
- in-house, cost centre/consumption-oriented allocation of distribution quantities
- performance checks of compressors

Flow- and energy meter „autarkon“ with classical venturi tube

- calculation unit with current outputs (0)4-20 mA, with pulse outputs, with M-Bus/Modbus and comprehensive data logger functions
- traceable standardized measurement, based on international valid rules and regulation DIN ISO 5167
- plausibility and accuracy test during operation
- very short needed inlet pipe (typical 4x DN).
- Small residual pressure loss (typical approx. 100 mbar)
- large measuring range up to 30:1 (in relation to the mass flow)
- small uncertainty ($\pm 1\%$ of the measured value)
- insensitive against wear and contamination (venturi effect)
- all wetted parts in stainless steel
- optional silicone-free design

TECHNICAL GASES

COMPRESSED AIR

Thermal mass flow meter

Measuring and registering of the standard volume, volume or mass of industrial gases such as air, nitrogen, carbon, dioxide, etc. with temperature compensation

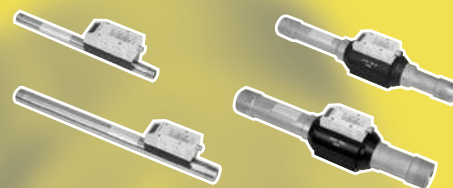
Application

- compressed air consumption measurement
- flow measurement in passivating gases
- consumption measurement of pneumatic tools
- consumption measurement of air-operated machines
- compressed air energy metering and leak detection
- measurement of pure gases (N₂, Ar etc.)
- CO₂ measurements in breweries
- injection molding machines
- pneumatic conveying systems
- painting systems
- insulating materials
- compressed air monitoring
- gas monitoring in process
- registration of gas consumption

Special features:

- small permanent pressure loss
- easy to install
- cost-effective measurement system

Technical data „Compressed air“	
Nominal Size	DN15 up to DN1,000
Temperature range	up to 120 °C
Pressure range	up to PN40
Measuring uncertainty	± 3%



„thermikon“ EDZ 910



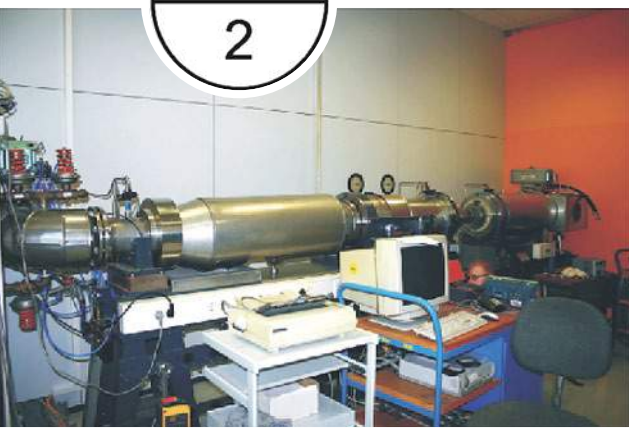
„thermikon“ EDZ 920



„thermikon“ EDZ 930

CALIBRATION

TEST BENCHES



German state approved heat meter test station (KK 2)

The test station is used to calibrate heat meters and their sub-assemblies. Furthermore, the test bench is used to calibrate any volume measuring devices.

- test medium hot water
- measuring uncertainty $\pm 0,15$ to $0,3\%$ of the measured value
- nominal connection size DN 15 to DN 250
- flow range up to 450 m³/h
- calibration of heat meters
- calibration of sub-assemblies (flow computer, hydr. transducer)
- special calibration for heat meters not being appropriate for verification



Test station Master Meter 3

The Master Meter test bench is used to calibrate vortex meters, differential pressure device metering section, oval wheel meters and turbine meters.

- test medium water
- measuring uncertainty $\pm 0,03\%$ of the measured value.
- nominal connection size DN 15 to DN 250
- flow range up to 600 m³/h



Test station bidirectional pipe prover loop

The prover loop is used to calibrate vortex meters, differential pressure devices, differential pressure device metering section, oval wheel meters and turbine meters.

- test medium oil 2.5 mm²/s
- measuring uncertainty $\pm 0.06\%$ of the measured value
- nominal connection size DN 100 to DN 400
- flow range up to 1200 m³/h

SALES AND SERVICE

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