PRODUCT OVERVIEW

- HUMIDITY
- DEW POINT
- MOISTURE IN OIL
- MASSFLOW
- CO₂ MEASUREMENT
- AIR VELOCITY
- CALIBRATION SERVICES













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Sensor Technology for Your Success

TRANSMITTERS FOR INTRINSICALLY SAFE APPLICATIONS

- » Measurement of humidity, temperature and moisture in oil
- » Applicable in gas and dust-Ex areas
- » Direct installation in areas with highest explosion danger (zone 0 / 20)
- » Suitable for applications up to 20bar (300psi)
- » Stainless steel housing and probe ensure optimal protection in harsh industry environment
- » Two analogue outputs with 4...20mA

FLOW METERS

- » Thermal measurement principle
- » Highest accuracy due to factory adjustment at working pressure
- » DN15 to DN700 (1/2" to 28")
- » Patented solution for easy and safe installation without flow interruption
- » MODBUS RTU and M-Bus interface
- » Integrated consumption meter



- » High accuracy and long term stability
- » Cable and plug versions
- » Highly insensitive to pollution
- » Encapsulated electronics
- » Sensing elements protected by E+E coating and underfiller

MODBUS CO₂ PROBE; DIGITAL CO₂ MODULE

- » Dual wavelength measuring principle for demanding OEM applications
- » Highly insensitive to pollution
- » Outstanding temperature compensation
- » Low power consumption down to 60µA
- » Ideal solution for handheld devices, data loggers and wireless versions
- » Measuring range up to 10,000 ppm

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EE060



EE871 / EE893







EE300EX



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HUMIDITY AND TEMPERATURE MEASUREMENT

Humidity Measurement Competence at E+E Elektronik

E+E Elektronik's history goes hand in hand with the development of highly accurate humidity measuring devices. This has been based on continuous research and development in the thin-film sensor technology, evaluation electronics as well as humidity measurement engineering and adjustment.

The manufacturing of capacitive humidity sensor elements in thin-film technology started in 1990, which are employed also in a comprehensive range of E+E humidity, dewpoint and moisture in oil measuring devices. An important lead throughout the entire E+E history is the commitment to highest quality standard as documented in the certificates according to ISO 9001:2008 and ISO TS 16949:2009.

The manufacturing takes place in state-of-the-art clean rooms and assembly facilities at E+E Elektronik headquarters in Engerwitzdorf, Austria. The excellent reputation of the E+E calibration laboratory is reflected in E+E being awarded the Austrian National Standard for humidity and air velocity. Additionally, the E+E calibration laboratory is accredited for mass flow, temperature and pressure.

Humidity Measurement Products

The E+E product portfolio includes humidity measurement devices for most applications. E+E humidity measuring elements are well proven at major OEM customers in the automotive industry. Humidity, dewpoint and moisture in oil transmitters for process control are available in an industrial, sturdy design. Other humidity transmitter lines are optimized for demanding climate control, meteorology or for cost-effective building automation.

OEM transmitters, probes and modules are tailored to specific customer requirements. The E+E product spectrum is rounded at by hand-held instruments, data loggers and wireless sensors.

A humidity calibrator based on the 2-pressure – 1 temperature reactor principle offers unparalleled accuracy and speed. Being independent of the ambient temperature, it can be used for both laboratory and on-site calibration.



TRANSMITTERS FOR PROCESS CONTROL

- **»** Temperature compensated for high accuracy over entire T-range
- Sensor protection against corrosive and electrically conductive contamination »
- Heated sensor/probe for best performance in applications with permanent high humidity or » chemical contamination
- Temperature range -40...180°C (-40...356°F), remote probe up to 20m (66ft) and pressure tight » probes up to 100bar (1450psi), intrinsically safe versions
- Calculation of physical quantities such as dew point or absolute humidity »
- Outputs can be configured and scaled to specific requirements »
- Optional display, relay output, integrated power supply, RS485 or Ethernet interface »

TRANSMITTERS FOR DEMANDING CLIMATE CONTROL

- Hard wired and wireless versions available $((\mathbf{1}))$ »
- Highest accuracy for humidity and temperature measurement **»**
- Temperature range -40...120°C (-40...248°F) »
- Replaceable probes for easy maintenance »
- » Easy on-site (loop) calibration
- Optional metal housing, display and relay output »
- Remote probes up to 20m (66ft) »

TRANSMITTERS FOR BUILDING AUTOMATION

- » Room, wall or duct-mounted devices and condensation monitors
- Exceptional price/performance ratio in elegant enclosure »
- Accuracy of 2% or 3% RH »
- Modbus RTU and display versions »
- » Available also as OEM products

TRANSMITTERS FOR METEOROLOGY

- Highest humidity and temperature measuring accuracy »
- Compact probe and remote probe version »
- Integrated sensor heater for fast response time under condensation conditions **»**
- E+E sensor coating protects against environmental influences »
- Suitable for long-term measurement under permanent high humidity conditions »
- Appropriate radiation shields available »
- Modbus RTU versions »



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OEM PRODUCTS

- » Customized for high performance and cost-effective solutions
- Sensing elements and electronics from a single source »
- Extensive E+E experience in OEM products design »
- Designed according to customer specifications »
- Available from as little as 200 units **»**
- » Various analogue and digital outputs

HAND-HELD INSTRUMENTS / DATA LOGGERS

- Accurate measurement of humidity, temperature, air flow, CO₂ and pressure »
- » Capacitive touchscreen in TFT quality
- User friendly interface »
- Data logging function & USB connectivity »
- Comprehensive range of probes for various application »





OMNIPORT30

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Tane & Reel

CAPACITIVE HUMIDITY SENSORS

- Millions of manufactured units for over 20 years »
- Easy processing with standard reflow method »
- Outstanding long-term stability and excellent chemical resistance »
- Unaffected by condensation »
- High sensitivity and outstanding linearity »
- Excellent reproducibility of sensor characteristics »
- Available as preadjusted version no humidity adjustment required »

HUMIDITY CALIBRATOR

- Fundamental 2 pressure 1 temperature calibrator »
- Highest accuracy »
- Compliant to international standards »
- Automatic calibration »
- Independent from ambient temperature »
- » Extremely fast stabilisation time









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DEW POINT MEASUREMENT

Accurate dew point (Td) monitoring in compressed air and gas networks, dryers, plastics and other industries is a prerequisite for optimizing the process and the product quality.

The E+E dew point transmitters feature an auto-calibration procedure which allows for accurate Td measurements from -60° C to 60° C.

Furthermore, they include the E+E monolithic humidity and temperature sensor specially designed for this application.

TRANSMITTERS FOR INDUSTRIAL USE

- » Dew point measurement from -60°C to 60°C Td (-76...140°F Td)
- » Auto-calibration for high measuring accuracy
- » Available with remote probe or as compact version
- » Sturdy housing for use in harsh industrial environments
- » Freely scaled and configured analogue or switching outputs
- » Available as OEM version
- » Measuring accuracy ±2°C Td (±3.6°F Td)
- » Pressure rated up to 100bar (1450psi)
- » Installation with ball valve possible



The combination of both humidity and temperature sensor on one substrate leads to exceptional thermal uniformity of the entire sensor structure. This is the key for an accurate and highly repeatable auto-calibration process resulting in long term performance.



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MOISTURE IN OIL MEASUREMENT

oil is an important factor in maintaining the functional reliability of be specified in absolute terms, as water content [ppm] or in relative equipment and machines in the long term.

The moisture content in transformer oil, for example, has a E+E measuring instruments are certified in accordance with considerable influence on insulating capabilities.

Continuous monitoring of moisture levels is therefore essential in in maritime applications. daily operation.

Online monitoring of moisture content in lubricating and insulation In the same way as moisture in gas, the moisture content in oil can terms as water activity [aw].

Germanischer Lloyd (GL) guidelines, making them suitable for use

TRANSMITTERS AND HAND-HELD INSTRUMENTS

- Online monitoring of lubrication, insulation and hydraulic oils »
- Output as water content [ppm] or as water activity [aw] »
- Input of oil-specific parameters for water content output »
- » Remote probe and compact versions
- Intrinsically safe version (Ex) »
- Sturdy housing for demanding operating conditions »
- GL certified a prerequisite for use in maritime applications »
- Temperature range -40°C...180°C (-40°F...356°F) »
- Installation with ball valve possible »
- Outputs can be scaled and configured to specific requirements »



OILPORT



MASS FLOW MEASUREMENT

The E+E mass flow transmitters measure highly accurate mass flow, volumetric flow, standard flow and consumption of compressed air, nitrogen, helium, argon, oxygen or other non-corrosive gases. The devices can be employed in a wide range of temperatures and pressures.

The E+E thermal flow meters feature the well proven E+E sensor element operating on the thin film anemometer principle. Factory adjustment at working pressure in a high-precision mass flow calibration facility ensures outstanding measurement accuracy.

Due to their innovative construction, the E+E mass flow meters are very easy to install, calibrate and service. Interchangeable intelligent probes can be replaced within seconds.

Ball valve mounting systems allow for installing and replacing the devices with only short interruption of the process, while with multicontroller units the transmitters can be installed and removed even without process interruption.

TRANSMITTERS

- » Measuring accuracy ±2.5% of measured value over a measuring range of 1:400
- » Maximum sensitivity even at minimal flow rates
- » Service-friendly, the device can be replaced during operation
- » Integrated USB interface for easy configuration
- » Remote probe option
- » Exceptional reproducibility
- » Various outputs: analogue, switch, pulse or consumption
- » Available as OEM versions





CO₂ MEASUREMENT

The E+E years of experience in sensors and thin-film technology lead to highest quality NDIR CO_2 measuring cells. The cells with goldplated light path are assembled in state-of-the-art clean rooms and represent the prerequisite for highly accurate and long term stable CO_2 measurement.

For Demanding Applications

The E+E CO₂ sensors for demanding applications feature the dual wavelength/dual detector NDIR principle. One detector is tuned to 4.2µm wavelengths, which is absorbed by CO₂, the second detector on 3.9mµ, which is not affected by any gas. For every single measurement the CO₂ concentration is calculated from the outputs of the two detectors.



This procedure is highly insensitive to pollution. A multiple point CO_2 and temperature adjustment procedure leads to excellent CO_2 measurement accuracy over the entire temperature working range.

For Building Automation

The E+E CO_2 sensors for building automation feature the patented auto-calibration procedure based on a 2-source/single wavelength NDIR. One IR source is used for taking measurements every 15 seconds. The other IR source serves as a reference for auto-calibration and activated only twice in 24h.



Due to minimal operating time, the aging of the reference source is virtually zero and therefore negligible. During the autocalibration procedure the signal from the measurement source is brought in line with the reference signal.

Applications:

» Stables, incubators, greenhouses, industrial process control

Applications:

» Demand controlled ventilation, indoor air quality



TRANSMITTERS FOR DEMANDING CLIMATE CONTROL

- Hard wired and wireless versions ((1)) »
- Outstanding temperature compensation for agriculture and outdoors »
- Remote probe or wall-mounted versions »
- Replaceable sensors for easy maintenance »
- Auto-calibration for long-term measurement stability »
- High measuring accuracy »
- Sturdy housing for use in demanding environment »

TRANSMITTERS FOR DEMAND CONTROLLED VENTILATION

- Hard wired and wireless versions ((1)) »
- Room, wall and duct-mounted devices »
- Elegant housing with an optional display »
- CO₂, temperature and humidity measurement in one unit »
- **OEM** versions available **»**





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OEM PROBES AND MODULES

- Optimized measuring cell for demanding applications »
- Modbus or E2 interface for simple integration in customer applications »
- Low power consumption down to 60µA **»**
- Settable measurement interval »
- Compact design »
- Exceptional price/performance ratio **»**









AIR VELOCITY MEASUREMENT

Measuring Method

E+E air velocity sensors operate on the hot-film anemometry principle which makes use of E+E thin-film technology specially developed for the automotive industry.

Due to their small mass and dimensions, the E+E air velocity sensors offer highest sensitivity even close to 0 m/s air speed. The innovative design of the sensor head around the sensing elements allows reliable measurement up to 40m/s (131ft/s).

Air velocity transmitters from E+E Elektronik fulfill the accuracy, long term stability and reproducibility requirements of various industries, from building automation and ventilation to clean rooms, laminar flow monitoring and industrial process control.





TRANSMITTERS FOR INDUSTRIAL USE

- » Highly accurate air speed measurement 0.06m/s...40m/s (12...8000ft/min)
- Rated for a pressure up to 10bar (145psi) and temperature up to 120°C (248°F) »
- Temperature measurement and calculation of volume flow »
- Small probe dimensions »
- Variable housing concept for easy installation and maintenance **»**
- USB interface for easy configuration »

TRANSMITTERS FOR BUILDING AUTOMATION

- Measuring range 0.15 ... 20m/s (0...4000ft/min) »
- Special versions for clean room and laminar flow monitoring »
- Installation largely independent of direction »
- High measurement accuracy »
- » Compact version available for confined space
- Available as OEM product »
- Outstanding price/performance ratio »

HAND-HELD MEASURING INSTRUMENTS

- Data logging function & USB interface »
- Internal memory for 2 million measurement values »
- Total of 22 physical quantities **»**
- Capacitive LCD touch screen »
- » Display measurands simultaneously
- Real-time HOLD/MIN/MAX/AVG readout **»**
- Integrated air pressure sensor »
- Free data management software »
- Probes for HVAC & industrial environments »



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CALIBRATION SERVICE

National Standards

Sophisticated metrology is one of the fundamental pre requisites for quality and progress in trade, industry, science, health and environmental protection. "National standards" are at the pinnacle of the hierarchy of measuring equipment.

Every industrial nation has an authority that provides this measurement standard and verifies its accuracy by international comparison measurements.

In Austria this is the task of BEV - the National Metrology Institute. E+E Elektronik, as a "designated laboratory" is commissioned to provide and further develop the national etalon for humidity and air velocity.

Thanks to the direct traceability to а NMI (Natio-BEV nal Metrology Institute), а certificate is of particular interest to accredited calibration authorities.

Based on the agreements between the members of EA (European Cooperation for Accreditation) and ILAC (International Laboratory Accreditation Cooperation), calibration certificates issued by E+E conform to worldwide recognized standards.

Calibration at E+E

The E+E OEKD laboratory is accredited in accordance with DIN EN ISO/IEC 17025. OEKD certificates are issued for measuring instruments that require a certain level of reliability (e.g. works standards) or wherever traceability of measured values is required. Certificates for the following measured variables can be issued by E+E OEKD accredited laboratory:

- » Flow
- » Pressure
- » Air Velocity
- » Temperature
- » Humidity
 - Dew point
 - Relative humidity
 - Mixing ratio
 - Specific humidity
 - Volume fraction
 - Water vapour density









E+E ELEKTRONIK -YOUR PARTNER IN SENSOR TECHNOLOGY.

E+E Elektronik GmbH, with headquarters in Engerwitzdorf/ Austria, belongs to Dr. Johannes Heidenhain GmbH. Established in 1979, E+E Elektronik is now one of the leading manufacturers of sensors and transmitters for a multitude of measurements. Its extensive product portfolio is supplemented by data loggers, hand-held meters, calibration systems and calibration services.

Reliable. Well-engineered metrology, outstanding long-term stability and optimum production quality are unmistakable traits of all E+E products - as is advanced understanding of customerspecific requirements.

Versatile. Sensors and transmitters from E+E Elektronik are used in all manner of applications the world over, including in building services engineering, industrial metrology and the automotive industry.

Flexible. In-house clean room sensor production, combined with tailor-made electronics and a sophisticated alignment system, maximise flexibility. A benefit which is greatly valued by the firm's many OEM customers.

Certified. E+E Elektronik has an established and certified quality management system conforming to ISO 9001 and ISO/TS 16949. The company is also certified in accordance with environmental standard ISO 14001. The in-house ÖKD calibration laboratory is accredited to EN ISO/IEC 17025.

International. E+E Elektronik is at its customers' side internationally with wholly-owned subsidiaries in China, Germany, France, Italy, Korea and the USA. It also boasts a world-wide network of retailers.

www.epluse.com

E+E measurements at a glance:

- HUMIDITY
- TEMPERATURE
- DEW POINT
- MOISTURE IN OIL
- FLOW
- CO2
- AIR VELOCITY

To find out everything you need to know about the E+E Elektronik calibration service, go to **www.eplusecal.com**.



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