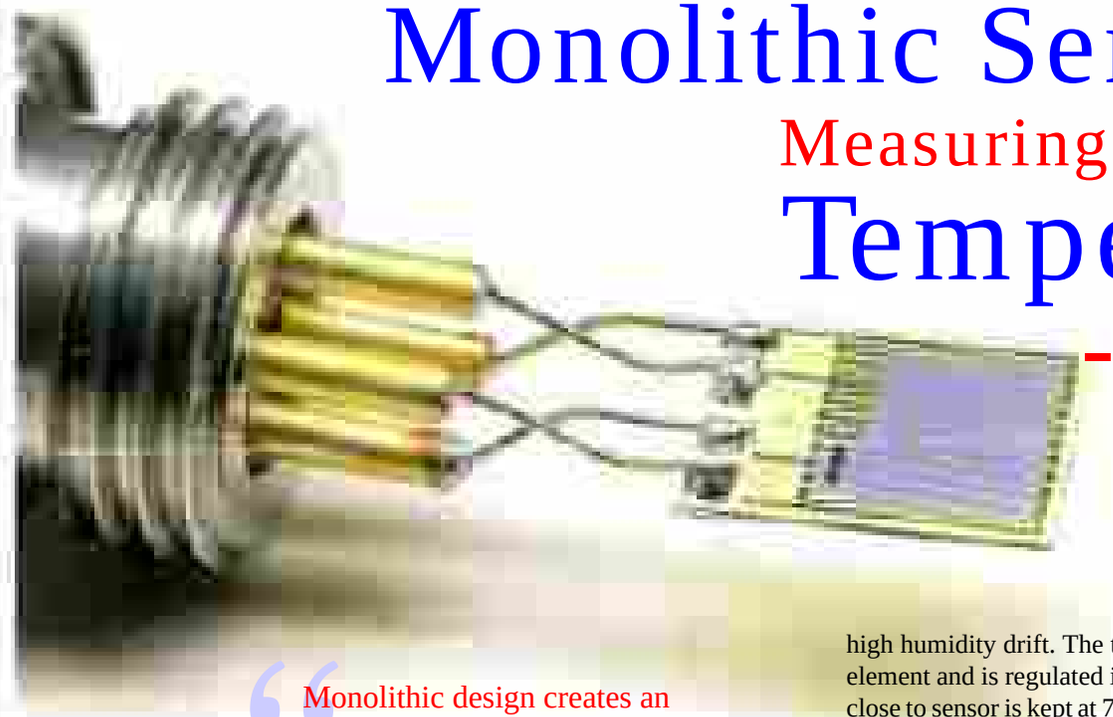
Monolithic Sensor for Measuring Humidity & Temperature - HMCO1



> "Monolithic design creates an exceptional thermal connection between the humidity and temperature element"

E+E Elektronik GmbH (Austria) has succeeded in producing the first ever true monolithic humidity I temperature sensor — the HMCO1. The HMCO1 design is extraordinary, because on one and the same thin glass substrate the temperature sensor and directly above the humidity sensor is located. Conventional combined humidity / temperature sensors always consist of two substrates glued together, each with one sensor. This causes several practical and technical measurement problems. For example, if the two substrates separate over time the thermal connection between the two elements, which is very important to the accuracy, will be lost.

Because of its true monolithic design, the HMCO1 combines the outstanding properties of the high-quality capacitive humidity sensor, for which E+E Elektronik is well known, with the additional function of a temperature sensor on a single substrate, providing a number of technical advantages.

The HMCO1 has been designed for stable and accurate humidity and temperature measurements in demanding industrial applications. The monolithic design creates an exceptional thermal connection between the humidity and temperature element, allowing for extremely accurate measurements in moderate to high levels of humidity. For measurement in continuous high humidity with even the risk of condensation, the sensor can be operated in a controlled heating mode to prevent high humidity drift. The temperature sensor is used as a heating element and is regulated in such a way that the relative humidity close to sensor is kept at 76 %RH. In this manner the sensor is not subjected to stress caused by high humidity. With the HMCO1 the local sensor temperature can be determined exactly, which allows for an accurate calculation of the dew point temperature. With measuring the ambient temperature with an additional external temperature sensor the relative humidity is determined. As a result measurements in high humidity conditions are even more accurate indeed. Because condensation on the sensor element is prevented continuous and reliable measurement is possible, even under conditions of condensation. The foundation for this is the innovative design of the HMCO1, which guarantees outstanding temperature homogeneity on the active sensor surface.

The temperature sensor can also be used to regularly heat up the humidity sensor to high temperatures for regenerating it. This function is beneficial in demanding applications in industrial processes where there are high concentrations of chemicals, solvents or cleaning agents. Heating up the sensor expels foreign molecules and the humidity sensor will be cleansed, so to speak. A possible measurement drift will be corrected. The humidity sensor returns to its original calibration and quickly starts to deliver accurate measurements again. The HMCO1 is a new type of high-quality sensor and forms the core of the new and recently launched humidity I temperature transmitters of the EE32 I EE33 series for demanding applications. The features described, such as self-cleaning in chemical environments, are already integrated in these transmitters for humidity, temperature and dew point temperature.