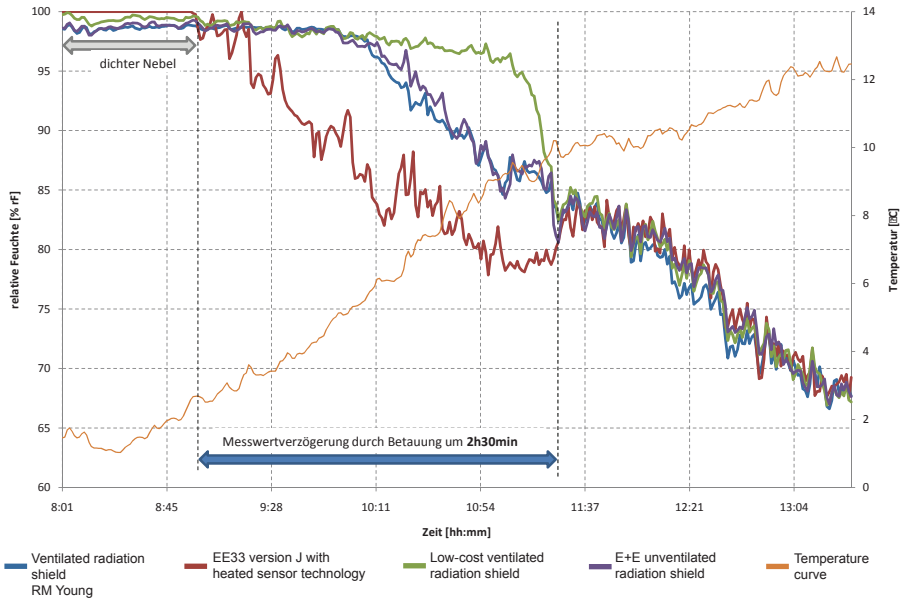
HUMIDITY MEASUREMENT IN METEOROLOGY

Air humidity and temperature play an important role in meteorology. Highly accurate measurements of these climate parameters form the basis of accurate forecasts and meaningful records.

For sophisticated applications such as ice warning systems for road traffic it is essential to avoid delays in measurement due to condensation and to prevent false measurements due to icing. The EE33 fulfils these requirements, as both the probe and the sensor element are heated. The version K transmitter provides the dewpoint temperature as the initial measurement. With version J, all the calculated humidity parameters are available via the additional temperature sensor.

Comparison of the EE33 with other measuring transducers



To ensure precise measurements, the probe is always installed in a radiation shield. Condensation on the probe in early morning mist or in fog results in incorrect measurements due to delayed measurement when the weather conditions change due to sunlight or if the fog lifts.
In this case, a ventilated radiation shield does not provide any improvement, as it cannot prevent condensation on the sensor.

The EE33 series humidity and temperature sensor is the only one on the market which is equipped with a double-heated probe. Both the sensor tube and the sensor element are heated. Condensation on the probe is prevented even under the most extreme conditions and the values measured always correspond to the actual conditions.

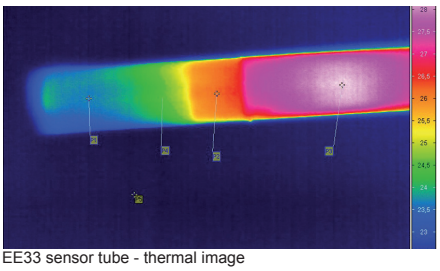
How does the heated measurement probe work?

Double probe heating means that both the sensor tube and the sensor element are separately heated. A monolithic MNC01 humidity / temperature sensor is used as the sensor element. This is operated in a controlled heating mode.
The image made with a thermal imaging camera clearly shows how the sensor tube heater works. The front section of the probe is heated to an excess temperature of 5 – 7°C which reliably prevents condensation.

The primary parameter which is measured is the dewpoint, which is always independent of the excess temperature due to the probe and

sensor heating. All other humidity parameters derived can be calculated by the use of an additional temperature probe.

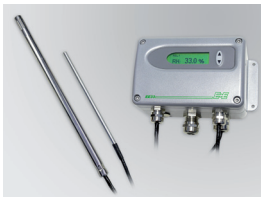
The additional temperature probe is positioned so that the humidity probe heater does not affect the temperature measurement. Very accurate measurement results are obtained if the probes are installed in two separate radiation shields.


EE33 sensor tube - thermal image

• Application conditions

Measurement range:	0...100% rel. hum.; -40...180°C
Output:	0...1 / 5 / 10 V or 0 / 4...20 mA
Accuracy:	± 1.3% rel. hum. ± 0.2□

• E+E solution



EE33-J
Humidity measuring transducers for high-humidity and chemical applications

High accuracy measurement of relative humidity, dewpoint and temperature even at high humidity close to the condensation or with high chemical contamination.