

ThermoHybrid – A High-Accuracy Process Temperature Sensor by Rüeger SA

The Swiss manufacturer Rüeger SA is introducing its new *ThermoHybrid*, a high-precision temperature sensor for process applications. This modern version of a constant-volume gas thermometer uses a thin-film pressure gauge to measure the pressure in an Argon-filled cartridge acting as the sensing element, to which it is connected via a stainless steel capillary. This combination yields an accuracy which is significantly better than that of thermocouples, and even better than the accuracy of most Pt100's.

The measurement range may cover any range between -180°C and $+750^{\circ}\text{C}$ (with special ranges up to 1050°C) and is easily adapted to the customer needs by adjusting the initial filling pressure. The size of the gas cartridge and the length of the capillary are both customized to the application.

High Accuracy

In the high-temperature range around 750°C , the *ThermoHybrid* achieves an accuracy of $\pm 1^{\circ}\text{C}$ at a temperature of 750°C which makes it about four times more accurate than a thermocouple. For a measurement range of up to 150°C , accuracy can be increased to $\pm 0.1^{\circ}\text{C}$ which puts it into competition with a Pt100 class 1/10 DIN. Moreover, the *ThermoHybrid* shows an extremely small drift over time.

Spatial Averaging

The *ThermoHybrid* is the ideal device for a measurement of average temperatures (over a cross section or along a defined path), as the indicated temperature always corresponds to the average temperature of the gas cartridge. The length of the gas cartridge can easily be adapted to the application and may range from several centimeters to several meters.

Alternative Measurement Principle

For critical applications in terms of safety (SIL), the ThermoHybrid provides an alternative measurement principle to PT100s or thermocouples, without having to compromise accuracy. Moreover, no electric leads are introduced into the measurement location.

Analog or Digital Output

Signal output is either analog (4-20 mA or 0-10 V) or digital (RS485 or CAN-Bus).