

High-Temperature Humidity Sensor GHS-HT350

Description:

Our humidity sensors have been specially developed for cooking, baking, drying and humidification processes above 100 °C (1 Atm). Therefore the humidity is shown as absolute humidity. This absolute humidity value has the advantage that above 100 °C the measured value remains the same for the same amount of water in the process chamber (e.g. cooking chamber). The humidity control can therefore be independent of the temperature control. The output is carried out as a percentage of 100% in relation to the maximum absolute humidity of 597.7 g/m³ in air. The sensor can also be used in gas mixtures other than air. Calculation for air (1013,25 mbar) :

e.g. measured value = 17 % follow -> Abs.Hum = (597,7 / 100) * 17 = 101,61 g/m³



Measuring principle:

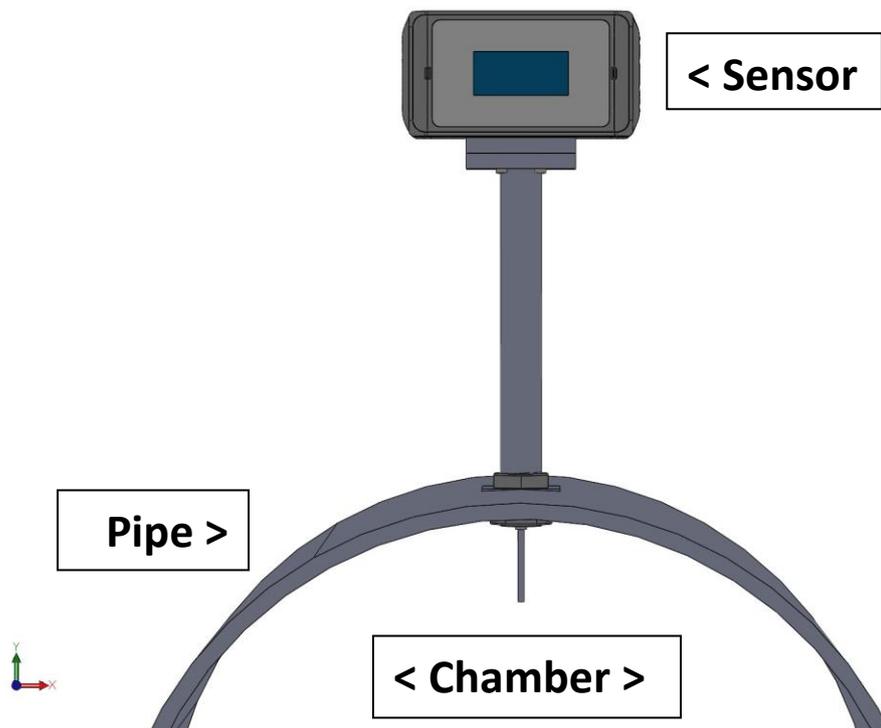
The humidity sensor should reliably display the humidity influence of the process chamber (e.g. cooking chamber) on moist objects (e.g. food to be cooked) in order to control the humidity in the process area. Furthermore, the humidity sensor must be robust and insensitive to contamination. In addition, the sensor should behave exactly as the food which is cooked, but at the same time react quickly to changes in humidity. For this reason, we have combined the dew point principle with the enthalpy principle (heat content). For this purpose, we use a heat pipe in the process area, which is covered by a stainless steel sleeve. This heat pipe is cooled so that the heat pipe in the process room always dew safely (even at 350 °C). An amount of the heat content in the process room is removed from the process space by the heat pipe, and the required energy for this is measured. An independent temperature

sensor (it can also be a temperature value from the existing control) measures the temperature in the process room. The evaluation electronics can now subtract the proportion of the temperature from the heat content (enthalpy) so that the absolute humidity remains. So, the bedewed heat pipe represents the moist food to be cooked and the energy dissipation in the heat pipe correlates to the energy consumption in the food. A practical side effect is that the air movement also has an influence on the measurement result. Because moving moist air brings a greater heat input as well as more moisture in the food. That is why our humidity sensor also shows more humidity when the air movement increases significantly.

Mounting:

The sensor should be mounted with the measuring tips pointing downwards.

The maximum angle of inclination to the vertical must not exceed 45°.



Technical Specifications:

Technical Specifications	
Supply voltage	12 V DC
Current consumption	8,5 A
Measuring range humidity	0 - 100 % from 100°C
Measuring range temperature	0 - 350 °C
Temperature range electronics	5 - 60 °C
Accuracy at 20 % max. abs. humidity	± 3,5 %
Accuracy at 90 % max. abs. humidity	± 1,5 %
Accuracy at 100 °C	± 1 K
Accuracy at 350 °C	± 2 K
Output humidity	0 - 10 V or 4 - 20 mA
Output temperature	0 - 10 V or 4 - 20 mA
Output operating device	RS485 Interface

Power Supply (BU1)		Color
1	12 V DC 8,5A	brown
2	GND	black

RS485 Interface (BU2)		
1	5V (OUT)	red
2	B	green
3	A	yellow
4	GND	white
Analog output		
1	0 - 10 V / 4 - 20 mA -> 0 - 100 %	brown
2	GND	gray
3	0 - 10 V / 4 - 20 mA -> 0 - 350 °C Temp	blue
4	GND	gray

