Humidity/Temperature Sensor 8091

Sensor Shelter 8141.6
(optional)

Features

- precision measuring instrument for high-quality use in building services, industry etc.
- capacitive humidity measuring element
- temperature measuring element: Pt100
- signal output humidity: 0...100 % r. h. = 4...20 mA
  resp. 0...100 % r. h. = 0...10 VDC
- signal output temperature: -30...+70 °C = 4...20 mA
  resp. -30...+70 °C = 0...10 VDC
- special resistance to air pollutants
- high long term stability
- maintenance free

Function

The sensor 8091 is a precision measuring instrument for measuring relative humidity and air temperature.

Special resistance to air pollutants is achieved by the use of a high-quality capacitive measuring element which, in combination with the sophisticated electronics, guarantees outstanding measuring accuracy.

The combined sensor 8091 is designed for high-quality use in building services, industry etc.

Putting into operation

The sensor 8091 will be connected to an external power supply and signal processing circuit with the open cable end.

Choice of the installation place

For climatological measurements the sensor should be mounted at a representative place.

Inside a room you should avoid a place near heatings, windows and cold outer walls.

The temperature/humidity sensor must be protected against water splashes and rain. As a suitable weather and protection screen we recommend the Lambrecht sensor shelter version 8141.6 (Id-No. 00.8141.600000).

Sensor shelter

Mounting at the mast

Electrical connection

Incorrect voltage supplies and overloading of the outputs can destroy the probe.

For the connection of sensor the 4x (resp. 6x) AWG 20 C UL - cable is used.
Cable lengths of about 100 m are possible.

Measurements

The measuring probe is adjusted by delivery. For putting into operating another readjustment is normally not required.

The probe is ready for use half a second after being switched on.

Before a reliable measurement can be made, the measuring probe and medium to be measured must be in temperature and humidity equilibrium.

The necessary adjustment time, which can last up to 30 minutes, depends upon several factors:

- Size of the humidity and temperature deviation of probe and medium before start of measurement
- Change of the measured values during the adjustment time.

The humidity measurement delivers a better picture of the progress of acclimatization since it reacts much more quickly and more sensitively than the temperature measurement. The 1/10 percent display is therefore very suitable as a trend display. If the display oscillates about mean value, then adjustment is completed.

Sources of error

Humidity measurements are very sensitive to various influences:

- **Temperature errors**
  due to too short adjustment time, sunshine during the measurement, heating, cold outer wall, air draft (e.g. fans), radiating hand and/or body heat etc..
- **Humidity errors**
  due to steam, water splashes dripping water or condensation on the sensor etc.. Repeatability and long-term stability in operation are not impaired by this even if the probe has been exposed to high humidity or saturation with water vapor over a lengthy period.
- **Contamination**
  of the humidity sensor can be largely avoided by using a corresponding filter. The filters must be cleaned or replaced periodically depending upon the degree of contamination of the measuring site.

The sensor is insensitive to chemicals, when they occur in normal concentrations (MAK values = maximum workplace exposure). At higher concentrations or possibilities of contact with liquid chemicals, the manufacturer must always be consulted!

Guarantee

Please refer to the «General terms and conditions» for details.

Definitions

Calibration = Control measurement with a humidity standard.

Adjustment = Calibration + additional readjustment of the probe to the setpoint value.

Temperature

The probe is adjusted before delivery. A temperature readjustment is normally not required. In case of doubt please contact the producer.

Humidity

The sensor is adjusted before delivery so that the results are in optimum accuracy over the full measuring range.

We recommend to **check the sensor at least once a year**.

Please use only the original humidity standards for this.

The humidity standards consist of unsaturated salt solutions which can be kept indefinitely.

The humidity standards are not normally dangerous to humans, but can irritate sensitive skin. In the case of contact with the skin or the eyes, the solution must be washed out immediately and thoroughly with plenty of water. The humidity standards must not be consumed!

The calibration device for calibration and adjustment and the required humidity standards are obtainable as an accessory.

Cleaning

Contaminated filters can cause measuring errors and prolong the adjustment time. Depending upon the degree of contamination of the filter, this must be cleaned or if necessary replaced periodically.

In order not to damage the sensors, unscrew the filter for cleaning.

Clean the filter with soapy water, alcohol or a cleaning agent suitable for removing contamination and rinse thoroughly with water.

Do not screw the filter back onto the probe until it is completely dry.

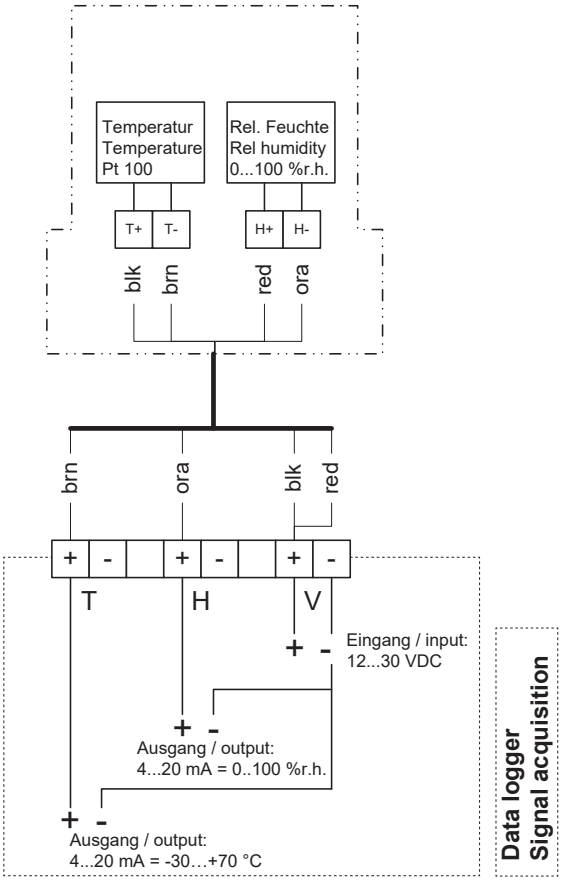
Warranty

Please note the loss of warranty and non-liability by unauthorised manipulation of the system. You need a written permission from LAMBRECHT meteo GmbH for changes of system components. These activities must be operated by a qualified technician.

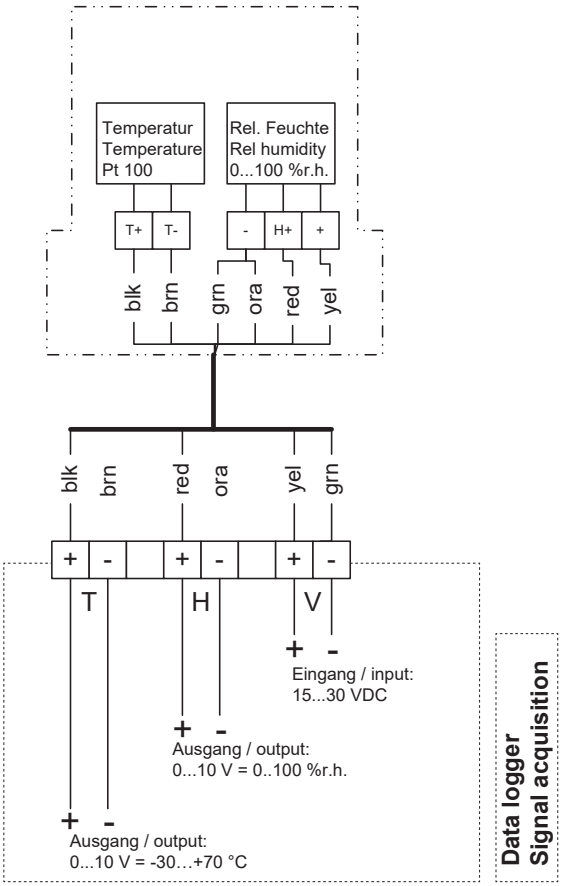
The warranty does not cover:

1. Mechanical damages caused by external impacts (e. g. icefall, rockfall, vandalism).
2. Impacts or damages caused by over-voltages or electromagnetic fields which are beyond the standards and specifications in the technical data.
3. Damages caused by improper handling, e. g. by wrong tools, incorrect installation, incorrect electrical installation (false polarity) etc.
4. Damages which are caused by using the device beyond the specified operation conditions.

Connecting diagram (4...20 mA)



Connecting diagram (0...10 V)



Operating Instructions
Humidity/Temperature Sensor (8091)

Technical data

Measuring elements

Humidity: capacitive
Temperature: Pt100 Class B acc. to DIN IEC 751

Measuring ranges

Humidity: 0...100 % r. h.
Temperature: -30...+70 °C

Response Time T_{90} at 1 m/s

Humidity: < 1 min
Temperature: < 1 min

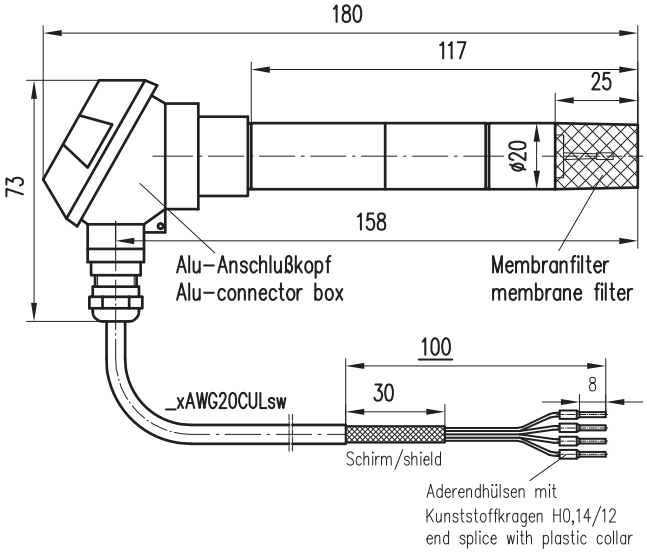
CE/ EMV: DIN 50082-2 and 55011 Kl. B

Housing: aluminium • grey-white • lacquered • IP 65 • membrane filter IP 30

Weight: 0.34 kg

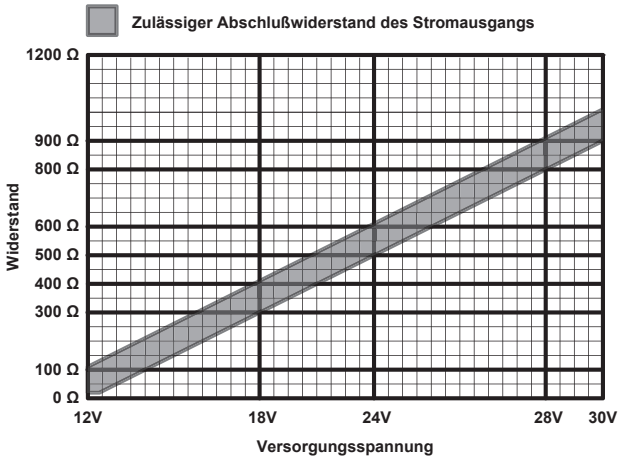
Sensor protection: membrane filter

Dimensional drawing



	Humidity/Temperature Sensor 8091 Id-No. 00.08091.000 042	Humidity/Temperature Sensor 8091 Id-No. 00.08091.000 012
Signal output H:	0...100 % r. h. = 4...20 mA	0...100 % r. h. = 0...10 VDC
Signal output T:	-30...+70 °C = 4...20 mA	-30...+70 °C = 0...10 VDC
Accuracy H:	± 2 % r. h. (5...95 % r. h. at 10...40 °C)	± 2 % r. h. (5...95 % r. h. at 10...40 °C)
Accuracy T:	± 0.3 °C (4...20 mA) plus ± 0.007 K/K (<10 °C, >40 °C); self-heating coefficient Pt100 (v = 2 m/s in air) 0.2 K/mW	± 0.2 °C plus ± 0.007 K/K (<10 °C, >40 °C); self-heating coefficient Pt100 (v = 2 m/s in air) 0.2 K/mW
Minimum air velocity (cross to sensor) [1]:	≥ 1.5 m/s	≥ 0.5 m/s
Supply voltage:	12...30 VDC	15...30 VDC
Current consumption:	max. 45 mA	max. 5 mA
Cable: (not included in delivery)	4 x AWG 20 C UL sw (Id-No. 67.01002.056 041)	8 x AWG 20 C UL sw (Id-Nr. 67.01002.056 081)
Load resitance:	---	≥ 10 kOhm
Load:	see diagram	---

Load for 4...20 mA [1]:



The load has to be adjusted corresponding to the supply voltage. At a supply voltage of e. g. 24 V the load should not be higher than 600 Ω and not lower than 500 Ω. [1]

[1] The stated minimum air velocity and the load which has to be adjusted to the supply voltage should be kept. Deviations can cause additional errors due to self-heating.

Subject to change without notice.
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