

OPERATION MANUAL



Humidity-Temperature probe with standard Signal FF-GLT-Series

Description



Type INT
for duct mounting,
probe installed



Type EXT
with cable,
probe sold



Type AF
for wall mounting,
probe sold

Characteristic features

- Standard signal 0...10 V or 4...20 mA
- Linearised and temperature compensated humidity measurement
- High long term stability, innovative technique
- Probe with stainless steel housing 1.4571
- High quality housing enclosure IP 65
- Probe head with PE Sinter filter

Areas of application

- Building instrumentation
- Industrial measurement and controlling systems
- Meteorology
- Drying systems

Application range

In the area of building instrumentation, there is a requirement for reasonably priced measuring probes which are suitable for continuous operation and protected against over voltage and transients. Further aspects are DC/AC supply, high long term stability as well as a good measuring accuracy in the application. The B+B humidity probes of -GLT series are developed for these requirements and are specially suitable for application in this area due to the modern sensor technology and innovative construction with an ASIC.

The measurement of relative humidity is done with a precise and long term stable capacitive polymer sensor element with industrial rating. The processing of measured value is linearised and temperature compensated. For measurement of temperature (optional), a platinum resistance is used whose values are also converted into a standard signal. The voltage supply for the 0 ... 10 V model can be done alternatively with AC or DC supply. The 4... 20 mA model is meant for only DC supply. The sensor which is made up of high quality stainless steel has a fine pored PE protection filter and is made pressure tight (up to 500 mbar) against ambient pressure at the sensor head with a Teflon tube. Because of this, the probe can also be operated at pressure difference and higher flow rates, for example in ventilation ducts. Because of the large connecting area inside the housing and the documented connecting clamps a fast connection is guaranteed.

Attention: Do not use the humidity-/ temperature probes in an environment of aggressive or corrosive gases or steams.

OPERATION MANUAL



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Technical data

| Humidity measurement | |
|---|--|
| Measuring range | 0...100 % RH, without condensation |
| Accuracy | ±2% RH (from 30...90% RH) |
| Response time t_{90} | Approx. 25 sec. (with protection filter) |
| Output scaling | 0...100% RH |
| Temperature measurement (only Type TE1) | |
| Measuring range | -30...+70 °C |
| Accuracy | ±0.5 °K (from 0...50°C) |
| Output scaling | -30...70 °C |
| General | |
| CE-Conformance | 2004/108/EG |
| EMV Noise emission | EN 61000-6-3:2011 |
| EMV Noise immunity | EN 61000-6-1:2007 |
| Probe dimensions | See drawing |
| Probe housing | Stainless steel 1.4571 Type -AF: polyamide |
| Protection filter | PE-Sinter filter 25 µm |
| Electronics housing | Plastic |
| Connection | Screw terminals 0.75 mm ² |
| Connection cable | 3000 mm (Type -EXT) |
| Operating voltage | Type -10V: 12 ... 24 V AC/DC Type -20MA: 12 ... 24 V DC |
| Over voltage protection | Varistor and RC-Filter |

Supply

For 4 ... 20 mA model, only DC supply is possible. The 0... 10 V model can be alternatively fed with either DC or AC voltage and also with unfiltered rectified voltage.

In case of AC supply, the neutral point of the transformer must be connected to signal ground and the connection of further probes must be absolutely done with phase balance. In case of supply with rectified unfiltered voltage, the minus must be connected to reference ground and plus to be connected to +DC/AC 24 V. Wrong connection leads to malfunctioning or can cause damage to the electronics!

Calibration

The measuring sensors are calibrated with reproducibility of PTB National standard. Calibration certificate as per ISO 9000 standard is also available with some extra charges.

For re-confirming measuring accuracy by the end user, reference cells are available for specific humidity values. For conformance to specifications, we recommend check-up at regular intervals.

Setting

The sensors are long term stable and are maintenance free in a clean environment. Hence, a re-calibration is not required as per practice. For the temperature and humidity channel, always a potentiometer is provided on the motherboard by which the upward gradient can be re-adjusted, if required. For the humidity channel, use of our humidity reference cells is recommended as a calibration standard. The adjustment of temperature channel is done with a reference thermometer. The calibration work presupposes relevant knowledge and is only recommended if required experience and equipment are available!

Measurement of signal voltage

In order to avoid measuring error in the 0...10 V model, due to line resistance and current flow through the grounding wire, a separate grounding wire is to be employed for the signal voltage. The voltage measurement should be with a four wire system.

Protection filter

The humidity probe is supplied with a 40 µm PE sinter filter as a standard package. Other filters, including hydrophobic special filters are available as special accessories.

Precipitations on the filter or sensor element can deteriorate the response behaviour. Contaminated filters should be replaced.

Connection

Preferably shielded connection cable should be used for the connection. First of all, it is to be noted that in EMI disturbed environment, the shielding should be grounded. Check before connection, whether the supply voltage is as per operating voltage specification mentioned in the data sheet.

OPERATION MANUAL



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Mounting of measuring probes

Mounting should be done with the probe tube in downside direction to avoid measuring error caused by self heating of the electronic circuit. Moderate flow in region of the probe is an advantage concerning response time and accuracy.

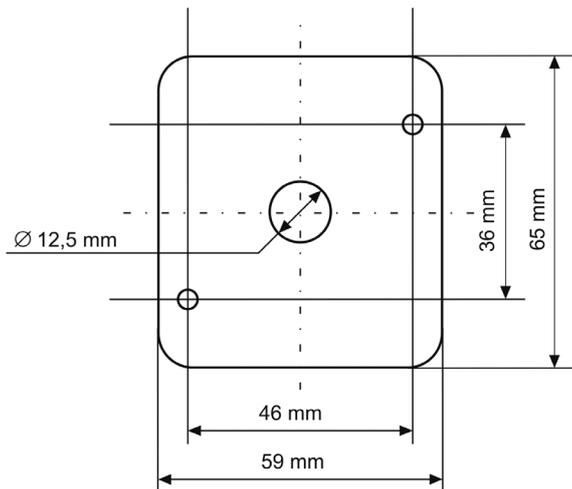
For mounting of external measuring probes, commercially available bayonet connectors or mounting flanges can be used. Please ask for our accessories overview.

The probe is pressure tight up to 100 mbar. The probes are not suitable for compressed air with higher pressure.

For outdoor applications, a special weather protection housing with mast/wall holder as well as a hydrophobic PE sinter filter is recommended.

The projected measuring probe type -INT can be directly mounted on the ventilation ducts. Drill the holes with the help of enclosed drilling template, for the probe and two mounting screws. Directly mount the probe on the ventilation duct with a gasket in between. Alternatively, a mounting flange is available with clamping ring/clamping screws.

Drilling template for measuring amplifier



Product variants

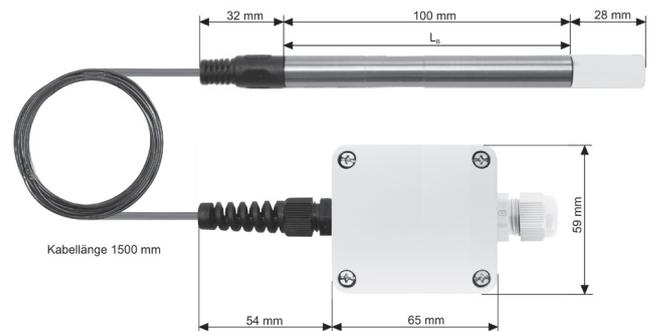
Type -INT

The measuring probe is firmly flanged on to the evaluation electronics. Other probe tube lengths (max. 500 mm) are available on inquiry.



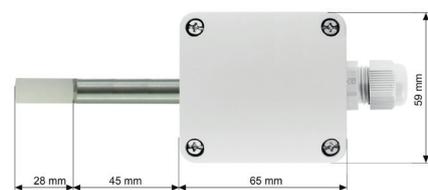
Type -EXT

The measuring probe is connected to the evaluation electronics through a solidly mounted cable (approx. 1.5 m in stretched condition). The length L_p of standard model is around 100 mm. Probe tube length 150 mm and 200 mm are available at short notice. Other lengths or special models e.g. pressure resistant humidity probe with 1/2" mounting threads are available on enquiry.



Type -AF

Model for wall mounting, for example, as external probe, the measuring probe is horizontally flanged (at the front side) to the evaluation electronics. Probe tube length is around 70 mm.



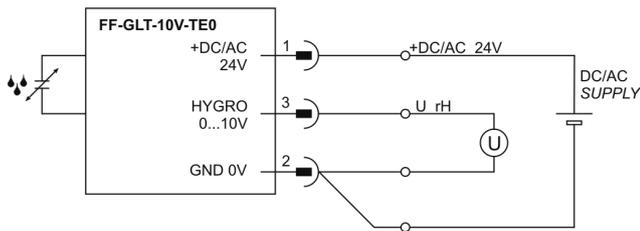
OPERATION MANUAL



Humidity-Temperature probe with standard Signal FF-GLT-Series

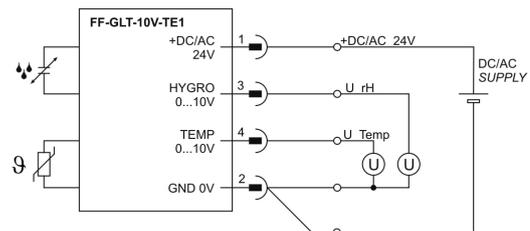
Plug configuration

Humidity measurement 0 ... 10 V, without Temperature measurement, Type -TE0



| Pin | Function | Description |
|-----|------------------|----------------------------|
| 1 | +DC/AC 24 V | Operating voltage |
| 2 | GND 0 V | Reference potential |
| 3 | HYGRO 0 ... 10 V | Humidity Signal 0 ... 10 V |

Humidity measurement 0 ... 10 V and Temperature measurement 0 ... 10 V, Type -TE1



| Pin | Function | Description |
|-----|------------------|-------------------------------|
| 1 | +DC/AC 24 V | Operating voltage |
| 2 | GND 0 V | Reference potential |
| 3 | HYGRO 0 ... 10 V | Humidity-Signal 0 ... 10 V |
| 4 | TEMP 0 ... 10 V | Temperature-Signal 0 ... 10 V |



The measurement of the output signal should be done with separate signal ground, in order to avoid measuring error due to voltage drop at the supply ground.



Temperature and humidity is always with reference to GND, operating voltage +DC/AC 24 V is common for both transmitters.

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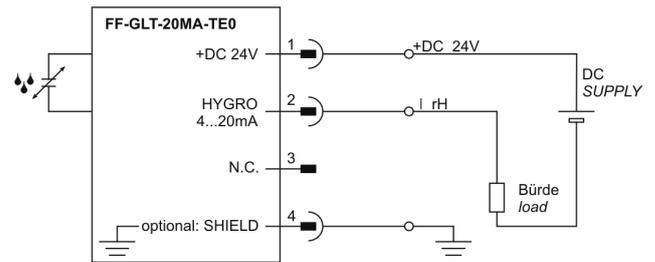
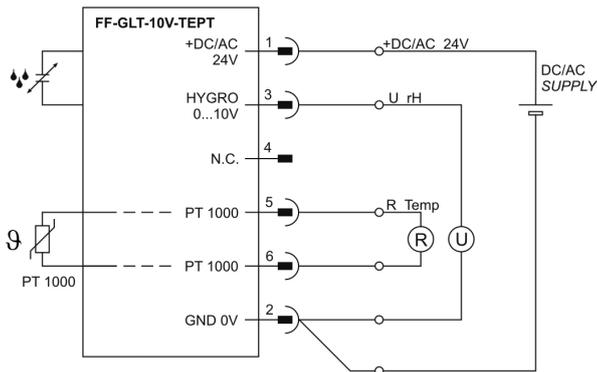
OPERATION MANUAL



Humidity-Temperature probe with standard Signal FF-GLT-Series

Humidity measurement 0 ... 10 V and passive Pt1000 for Temperature measurement, Type –TEPT

Humidity measurement 4 ... 20 mA, without Temperature measurement Type –TE0



| Pin | Function | Description |
|-----|------------------|------------------------------|
| 1 | +DC/AC 24 V | Operating voltage |
| 2 | GND 0 V | Reference potential |
| 3 | HYGRO 0 ... 10 V | Humidity-Signal 0 ... 10 V |
| 4 | --- | Unoccupied |
| 5 | Pt1000 | Temperature sensor (passive) |
| 6 | Pt1000 | Temperature sensor (passive) |

| Pin | Function | Description |
|-----|-------------------|-----------------------------|
| 1 | +DC 24 V | Operating voltage |
| 2 | HYGRO 4 ... 20 mA | Humidity-Signal 4 ... 20 mA |
| 3 | --- | Unoccupied |
| 4 | SHIELD | Shielding |



The Pt1000 is with brought out potential free with 3 wire connection. The line resistance is to be compensated. Other types of measuring resistances, for example, NTC resistance, are also possible, if required!

The measurement of the output signal should be done with separate signal ground, in order to avoid measuring error due to voltage drop at the supply ground.



The shielding (S through shielded lines is recommended.

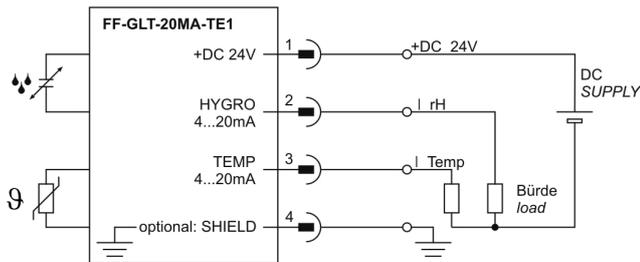
connection

OPERATION MANUAL



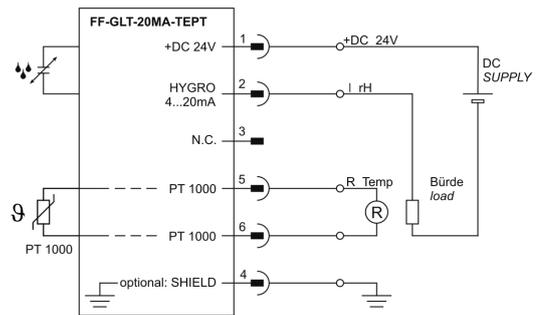
Humidity-Temperature probe with standard Signal FF-GLT-Series

Humidity measurement 4 ... 20 mA and Temperature measurement 4 ... 20 mA, Type –TE1



| Pin | Function | Description |
|-----|-------------------|--------------------------------|
| 1 | +DC 24 V | Operating voltage |
| 2 | HYGRO 4 ... 20 mA | Humidity-Signal 4 ... 20 mA |
| 3 | TEMP 4 ... 20 mA | Temperature-Signal 4 ... 20 mA |
| 4 | SHIELD | Shielding |

Humidity measurement 4 ... 20 mA and passive Pt1000 for Temperature measurement, Type –TEPT



| Pin | Function | Description |
|-----|-------------------|------------------------------|
| 1 | +DC 24 V | Operating voltage |
| 2 | HYGRO 4 ... 20 mA | Humidity-Signal 4 ... 20 mA |
| 3 | --- | Unoccupied |
| 4 | SHIELD | Shielding |
| 5 | Pt1000 | Temperature sensor (passive) |
| 6 | Pt1000 | Temperature sensor (passive) |



The shielding (SHIELD) is to be optionally covered. Connection through shielded lines is recommended. Operating voltage +DC 24 V is common for both the instrument transformers.



The shielding (SHIELD) is to be optionally covered. Connection through shielded lines is recommended. The Pt1000 is with brought out potential free with 2 wire connection. The line resistance is to be compensated. Other type of measuring resistances, for example, NTC resistance are also possible, if required!

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Temperature measuring part

| Type | Description |
|------|--|
| TE0 | Without additional temperature measurement |
| TE1 | With second measuring amplifier for temperature measurement, also conversion to 0 ... 10 V or 4 ... 20 mA standard signal. |
| TEPT | Temperature measurement with passive Pt1000 measuring resistance, potential free at terminals of the connector. |

Guarantee

On our high quality measuring probes, you get a guarantee of 24 months. Mechanically damaged sensors or tampering into electronics makes the sensors devoid of guarantee claims. Calibration services are not covered in the guarantee.

Ordering numbers

| Humidity-Temperature probe | Ordering No. |
|--|----------------------|
| Type INT - 0 ... 10V | FF-GLT-10V-INT-TE0 |
| | FF-GLT-10V-INT-TE1 |
| | FF-GLT-10V-INT-TEPT |
| 4 ... 20mA | FF-GLT-20MA-INT-TE0 |
| | FF-GLT-20MA-INT-TE1 |
| | FF-GLT-20MA-INT-TEPT |
| Type EXT - 0 ... 10V | FF-GLT-10V-EXT-TE0 |
| | FF-GLT-10V-EXT-TE1 |
| | FF-GLT-10V-EXT-TEPT |
| 4 ... 20mA | FF-GLT-20MA-EXT-TE0 |
| | FF-GLT-20MA-EXT-TE1 |
| | FF-GLT-20MA-EXT-TEPT |
| Type AF - 0 ... 10V | FF-GLT-10V-AF-TE0 |
| | FF-GLT-10V-AF-TE1 |
| | FF-GLT-10V-AF-TEPT |
| 4 ... 20mA | FF-GLT-20MA-AF-TE0 |
| | FF-GLT-20MA-AF-TE1 |
| | FF-GLT-20MA-AF-TEPT |
| Accessoires | |
| Reference cells, Set 33 % und 75 % | REFZ-M20-SET1 |
| Optionen | |
| Length of probe tube | |
| Length of measuring probe cable (only - EXT) | |
| Output scaling of temperature and humidity | |