OPERATION MANUAL

Humidity temperature probe with analogue voltage output 0…10 V

Description

Characteristic features

- Voltage output 0...10 V for 0...100 % RH
- Linearised and temperature compensated humidity measurement
- High long term stability, innovative technology
- High quality stainless steel housing grade 1.4571
- Integrated sinter protection filter or protection cap
- Optional passive temperature sensor
- Optional with temperature measuring unit (type TE1), 0...10 V for -20...80 °C

Areas of application

- Industrial instrumentation and control systems
- High precision meteorological recording
- Building instrumentation
- Drying systems

Technical data

Humidity measurement	
Measuring range	0...100 % RH, no condensation
Accuracy	±2 % RH (from 25...90 % RH)
Output scaling	0...100 % RH to 0...10 V
Response time t_{90}	approx. 10 sec. ohne Schutzfilter
Application temperature	-20...+80 °C
Temperature measurement (only Type TE1)	
Temperature measuring range	-20...+80 °C
Accuracy	±0,3 °K (from 0...+50 °C)
Calibrated output	0…10 V for –20...+80 °C
General	
CE-conformance	2014/30/EU
EMV-noise emission	EN 61000-6-3:2011
EMV-noise immunity	EN 61000-6-1:2007
Protection type	As per filter, connector IP67
Sensor dimensions	Ø12 mm, L= 150 mm
Sensor housing	Stainless steel grade 1.4571
Connection	plug M12, 4 poles
Sensor head pressure resistance	500 mbar
Operating voltage	12...24 V DC
Over voltage protection	Varistor and RC-Filter
Protection filter	Steel sinter filter 45 µm

Range of applications

In industrial applications, there are especially high requirements of precision and long term stability of measuring system under extreme working conditions. The B+B humidity sensor fulfils these requirements through most modern sensor technology and innovative construction for special purpose measurements.

The measuring probe body is of high quality stainless steel with the sensor head fitted air tight inside a Teflon holder and is provided with a waterproof M12 connection plug. The entire signal processing is in the probe housing resulting in a compact measuring system with simple mounting.

The measurement of relative humidity takes place by a capacitive polymer sensor element, which guarantees high accuracy and long term stability with outstanding chemical resistance.

To ensure high measuring accuracy over the complete temperature range, the humidity measurement is linearised and temperature compensated. The output of humidity values are generated as normalized, analog voltage signal. The measuring range of 0 to 100 % relative humidity corresponds to output voltage of 0...10 V.

For measurement of temperature, a passive sensor can be fitted in the sensor head whose terminals are also brought out through the M12 plug connector. The power supply is given from 12…24 V DC source. The measuring sensor element is safeguarded against over voltage by an integrated protection circuit.

B+B Thermo-Technik GmbH | Heinrich-Hertz-Straße 4 | D-78166 Donaueschingen
Fon +49 771 83160 | Fax +49 771 831650 | info@bb-sensors.com | bb-sensors.com

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Calibration

The measuring sensors are checked and calibrated before despatch with reproducibility of PTB National standard. Calibration certificate as per ISO 9000 standard is also available with some extra charges.
The sensors have long-term stability and are maintenance free under clean ambient air conditions. Hence, a re-calibration is generally not required. 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.

Output scaling

The range of output voltage is 0..10 V corresponding to 0...100 % RH.

Protection filter

The humidity sensor is supplied with a 80µm stainless steel sinter filter as per standard. Other types of filters, including hydrophobic special filters, are also available as special accessories. Dirt deposits on filter or sensor element can deteriorate the sensing behaviour. Dirty filters should be replaced.

Accessories

For outdoor application, a PE-filter in combination with weather protection housing is recommended.

Guarantee

A 24-month guarantee is provided on our high quality measurement sensors. Mechanically damaged sensors or tampering into electronics makes the sensors devoid of guarantee claims. Calibration services are excluded from guarantee.

Connection

The connection for processing of superimposed measurement data is done through the M12 plug connector. The negative terminal of power supply is connected to the signal ground of humidity voltage signal and optional passive temperature sensor. The load resistance of voltage output should not be less than 10 kΩ. The output source impedance is approx. 50 Ω. Shielded cable leads should be used for connection. The shielding should be grounded.

Article	Arrticle no.
Humidity industrial sensor with 0...10 V voltage output and no temperature measuring	FF-IND-10V-TE0
Humidity industrial sensor with 0...10 V voltage output and temperature measuring	FF-IND-10V-TE1
Humidity industrial sensor with 0...10 V voltage output and Pt1000	FF-IND-10V-TEPT
Accessories	**Arrticle no.**
Connection cable, 2 m	0409 1051
Connection cable, 5 m	KAB-M12-5M
Humidity reference cell, 32,9 % RH	REFZ-12Z-33RH
Humidity reference cell, 75,4 % RH	REFZ-12Z-75RH
Sintered filter PE	H555 0019
Sensor Pt1000	0634 0102-10
Professional weather protecting housing	STRAHUT-MAST
Professional weather protecting housing with mounting bracket	STRAHUT-MOWI

Product variants

Typ TE0: This is without additional temperature measurement.

Typ TE1: With a second measuring amplifier for temperature measurement and also conversion to 0…10 V signal.

Typ TEPT: Temperature measurement with passive Pt1000 resistance, sensor respected to GND at terminal 2 of M12 plug connector.

Attention

Please avoid extreme mechanical and inappropriate exposure.

The device/product is not suitable for potential explosive areas and medical-technical applications.

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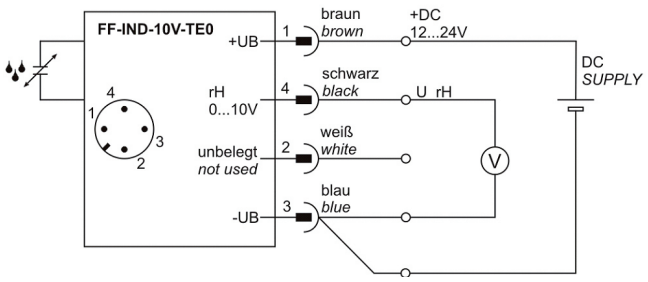
Connector configuration

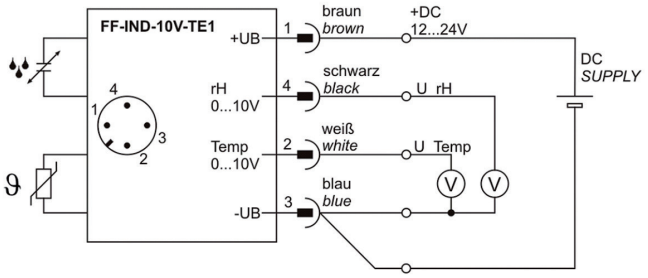
Humidity measurement with 0…10 V output, without temperature measurement, Type –TE0



Pin	Function	Description
1 br	+UB	Supply potential positive
2 wh	Not used	-----
3 bl	GND	Ground
4 bk	RH 0...10 V	Voltage output 0...10 V

The voltage output is ground related. Signal ground also is reference potential of the supply.

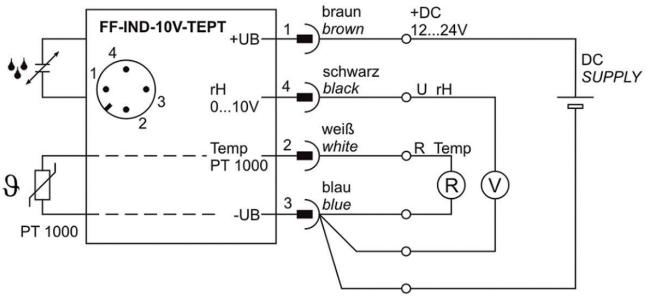
Humidity measurement with 0…10 V output and temperature measurement with 0…10 V output, Type –TE1



Pin	Function	Description
1 br	+UB	Supply potential positive
2 wh	Temp 0...10 V	Voltage output 0...10 V
3 bl	GND	Ground
4 bk	RH 0...10 V	Voltage output 0...10 V

Both voltage outputs are ground related. Signal ground also is reference potential of the supply.

Humidity measurement with 0…10 V output and passive PT1000 for temperature measurement, Type –TEPT



Pin	Function	Description
1 br	+UB	Supply potential positive
2 wh	Temp PT1000	Temperature Sensor, reference to gnd
3 bl	GND	Ground
4 bk	RH 0...10 V	Voltage output 0...10 V

The Pt1000 is looped through passivly. The voltage output and the Pt1000 are ground related. Signal ground also is reference potential of the supply.

Important note for the temperature measurement with a PT1000 sensor: To avoid measuring failures in the temperature measurement with the passive sensor element please connect the temperature sensor with a separate connection wire directly on the M12 plug! The wire- and contact-resistance is included into the measurement of resistance characteristic curve and have to be corrected arithmetically / electronically.

The connector in the sketch is shown in sight to the contacts of the probe.

For further information, please visit our website:
www.bb-sensors.com