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Operating manual

Relative humidity- and temperature sensor HITY 4000

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Operating manual for HITY 4000

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Subject to technical modifications

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1 Classification of the safety instructions

This manual contains instructions that you have to observe for your personal safety as well as to avoid material damage. These instructions are highlighted using a triangular warning sign and shown as follows, depending on the degree of risk.



HAZARD

means that death or severe physical injury will occur if the appropriate precautionary measures are not taken.



WARNING

means that death or severe physical injury may occur if the appropriate precautionary measures are not taken.



CAUTION

with a triangular warning sign means that minor physical injury may occur if the appropriate precautionary measures are not taken.

CAUTION

without a triangular warning sign means that material damage may occur if the appropriate precautionary measures are not taken.



ATTENTION

means that an undesired result or state may ensue if the corresponding instruction is not followed.



NOTE

denotes important information about the product, handling of the product or the respective part of the documentation, is aimed at drawing special attention to the latter and should be complied with.

In addition to the instructions in this manual, the generally applicable safety and accident prevention regulations must be observed.

If the information contained in this document should not be sufficient in any specific case, you can obtain more detailed information from our telephone service.

Please read this manual carefully prior to installation and commissioning.

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2 General Instructions

This device left the plant in flawless condition in terms of its safety features. To preserve this condition and ensure safe operation of the device, the user has to observe the instructions and warning notes indicated in this operating manual.

NOTE



For the sake of clarity the manual does not contain complete detailed information on all product types and can therefore not take into account every conceivable case with respect to installation, operation and maintenance.

Should you wish further information or should special problems arise that are not treated in sufficient detail in the manual, you can obtain the necessary information by telephone. Moreover, we point out that the content of the manual shall not constitute part of or amend a previous or existing contract, agreement or legal relationship. All obligations of Mütec Instruments GmbH shall result from the respective contract of purchase, which also contains the complete and solely valid warranty terms. These contractual warranty terms shall neither be extended nor limited by the information contained in the manual. The content reflects the technical state of the art regarding printing. It is subject to technical modifications in the course of further development.

DISCLAIMER

All modifications to the device fall within the responsibility of the user unless expressly specified otherwise in the operating manual.

QUALIFIED PERSONNEL

are persons who are familiar with installation, assembly, repair and operation of the product and have the qualifications necessary for their work, such as:

- training, instruction and/or authorization to operate and maintain equipment/systems in accordance with the standards of safety technology for electrical circuits, high pressures and corrosive as well as hazardous media.
- in the case of equipment with explosion protection: training, instruction and/or authorization to perform work on electrical circuits for potentially explosive equipment.
- training or instruction in accordance with the standards of safety technology regarding care and use of appropriate safety equipment.

CAUTION

Potentially electrostatic components may be destroyed by voltage that is far below the limits of human perception. Such voltage occurs even when you touch a component or electrical connections of a component and are not electrostatically discharged. The damage that occurs to a component because of overvoltage usually cannot be detected immediately and does not become noticeable until after a longer operating period.

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3 Introduction

The HITY 4000 is a relative humidity- and temperature sensor, intended to measure the relative humidity in gases. The measured value is transmitted via a 4–20mA current-loop interface.

Optionally, the HITY 4000 offers the possibility to transmit the measured temperature via a second current-loop interface.

Features

- output signal for rel. humidity
- option: output signal for temperature
- factory calibrated
- effectively maintenance-free
- IP code: IP65
- compact design
- simple installation
- persistence against dewing
- persistence against acetone, petrol, toluene

4 General information on construction and operation

Safety instructions

If the device can no longer be operated safely, it must be put out of operation and secured to prevent unintentional operation. The reasons for this may include:

- visible damage to the device
- failure or malfunction
- storage or operation outside the approved temperature range
- moisture inside the device
- severe transport stress

Before the device is put into operation again, a professional routine test must be performed in accordance with DIN EN 61010, Part 1. This test should be performed by the manufacturer.

Intended use

The HITY 4000 is intended to be used as a humidity sensor in air conditioning systems, cooling towers, drying plants, production- and storage rooms in food- and tobacco industries, chemical sterilization, and other similar applications.

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5 Mounting Instructions

5.1 HITY 4000

The HITY 4000 is intended to be mounted in machines, air ducts, or similar places. The device can simply be screwed in (cylindrical British Standard Whitworth G1").

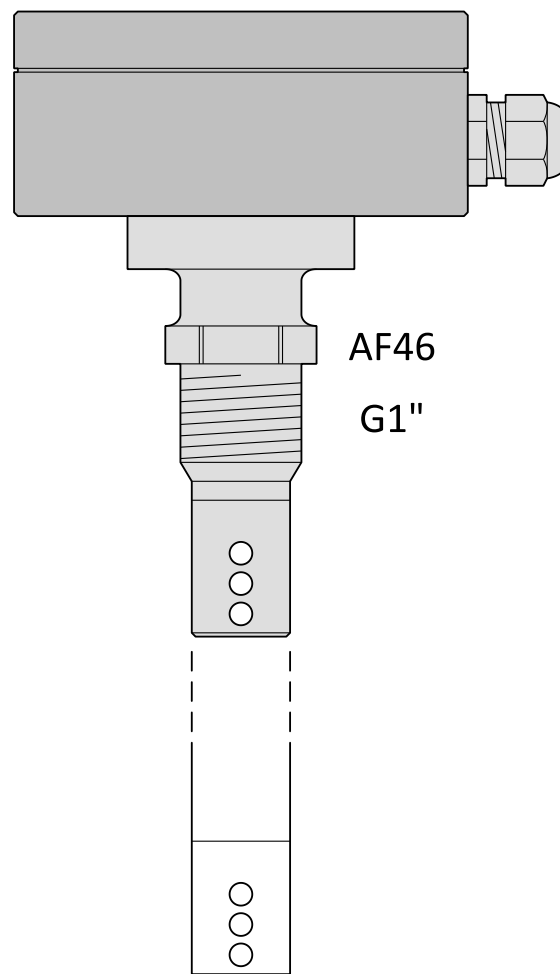


Figure 1 – HITY 4000

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5.2 HITY 4000w

The HITY 4000w is intended to be wall-mounted. The 120 mm x 80 mm enclosure is attached using four mounting holes. These are accessible only when the enclosure is opened. The holes are arranged as a rectangle (108 mm x 50 mm), having a diameter of 4,4 mm.

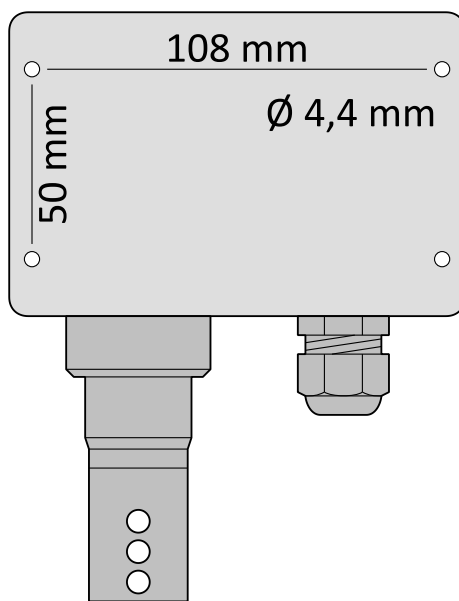


Figure 2 – HITY 4000w

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6 Electrical connection

Depending on the variant of the used HITY 4000, the electrical connection is accomplished via a housing plug (electrovalve connector, DIN 43650) or via a screw terminal on the mainboard, inside the device (the connecting cable is installed in a cable gland). To avoid interference, a shielded cable must be used to connect the device.

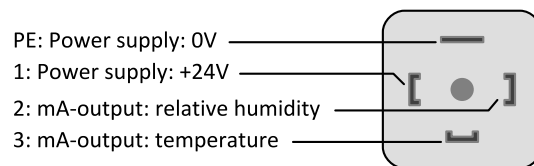


Figure 3 – Housing plug connector (at HTIY4000)

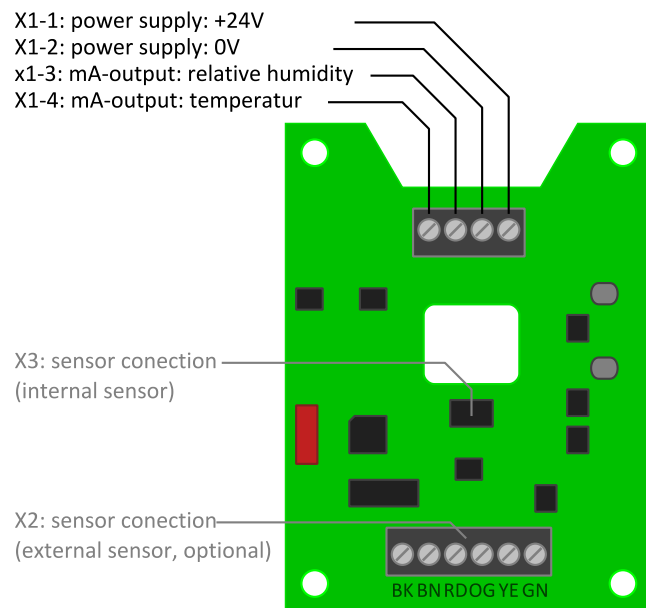


Figure 4 – Mainboard with screw terminals

6.1 External sensor (optional)

If the optional external sensor is used, the connection to the mainboard is accomplished via the screw terminal X2 (see fig. 4), the, cable screen is connected to contact 2 of terminal X1. The assignment of the cable colors to the terminal contacts is shown in fig. 5 and table 1. If the external sensor is used, the internal sensor must not be connected simultaneously.

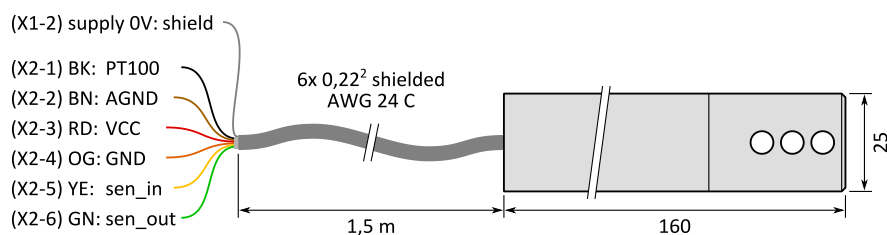


Figure 5 – External sensor with pinout

Contact	Designation	Color	Function
X1-2	-	black/gray	shield
X2-1	BK	black	PT100
X2-2	BN	brown	AGND
X2-3	RD	red	VCC
X2-4	OG	orange	GND
X2-5	YE	yellow	sensor in
X2-6	GN	green	sensor out

Table 1 – External sensor: pinout

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7 Commissioning and Operation

7.1 Commissioning

Once the system is connected to the 24V supply, the device commences operation. The measured humidity (and if applicable temperature) is present at the current loop-output(s). In the case of swift changes in humidity or temperature (e.g. by inserting the sensor into a duct), the device needs a brief time for the values to settle. This is due to the time, the investigated medium needs to reach the sensing element.

7.2 Operation

During operation, the current humidity (and temperature) is signaled in form of a current-loop signal. A current of 4 mA represents the lower end of the measurement range, whereas 20 mA represents to upper end. The measurement range of the optional temperature measurement depend on the device variant.

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8 Technical Data

Housing material:	HITY 4000: Vestamide (PA)
	HITY 4000w: Polycarbonate (PC)
Material sensor rod:	Polyvinylidene fluoride (PVDF)
IP class:	IP65
Weight:	HITY 4000: 400 g
	HITY 4000w: 300 g
Tightening torque - mounting:	HITY 4000: 30 Nm
Storage temperature:	-20°C to +70°C (not condensing)
Operating temperature:	+0°C to +60°C
Process temperature:	5°C to +60°C (temporarily +100°C)
Process pressure:	0 to 1 bar (up to 5 bar on demand)
Flow velocity:	max. 20 m/s
Supply voltage:	24 VDC (18 VDC ... 26 VDC)
Current consumption:	max. 70 mA
Power:	< 2 W
Cable gland:	PG11
Housing plug (option):	DIN 43650

Operating manual HITY 4000**Relative humidity**

Measurement range:	20...95% rel. humidity
Uncertainty:	±2% rel. humidity
Calibration:	fixed
Output signal:	4...20 mA
Load max.:	600 Ω

Temperature

Measurement range:	T1 = 0...+50°C T2 = -30...+50°C T3 = -30...+70°C T4 = 0...+100°C T5 = -20...+100°C T6 = 0...+40°C
Accuracy:	±1%
Calibration:	fixed
Output signal:	4...20 mA
Burden max.:	600 Ω



If the maximum permissible parameters are exceeded, the warranty expires.

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9 Service and maintenance

The HITY 4000 is effectively maintenance-free. When using the measuring device at abrasive materials, the product stream exposed areas must be regularly checked.

The transmission of the devices remains reliable and stable over a long period, neither regular adjustments nor maintenances are required. Nevertheless, the condition of the sensing element has great influence on the measurement, resulting in a negative effect of a damaged sensing element due to unsuitable environment conditions.

Eventual dirt can be removed from the dry sensing element by purging with clean compressed air. To do so, the protection cover can be removed by carefully pulling it off. Persistent dirt can be removed by submerging the sensing element in isopropyl alcohol and subsequent drying using clean compressed air.



The sensing element itself must not be touched, because fat and other deposits strongly effect the measurement, leading to faulty results.

10 Fault Elimination



Remove the device as soon as a disturbance of the device is detected. Send the device to the manufacturer for maintenance.

11 Disposal

The disposal of packaging and used parts must be done in accordance with the provisions of the country in which the equipment is installed. In particular, electronic components that are to be disposed of, are classified as hazardous!