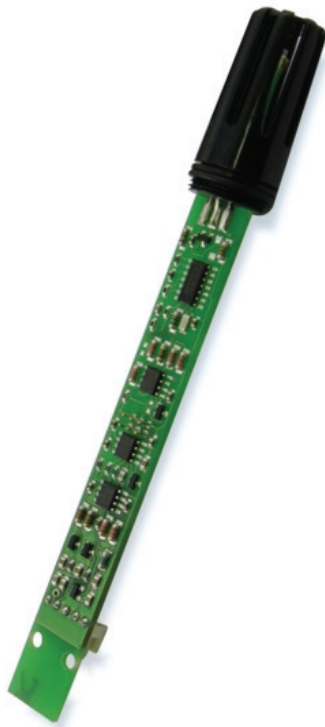


DATA SHEET



Humidity probe module with voltage output 0 ... 10 V

Description



Characteristic features

- Humidity probe module with voltage output
- Output 0 ... 10 V for 0 ... 100 % RH
- Operating voltage 12.0 ... 15 V DC
- High grade, capacitive polymer sensor
- Universal and reasonably priced model
- Supplied in ready-to-connect and calibrated condition
- Stainless steel housing as accessories (optional)
- Optional with Temperature measuring part (Type -HYTE)

Areas of application

- Room climate measurement
- Building automation
- Humidity probe for air conditioning equipment
- Customised regulation device
- Humidity regulation for sanitary rooms

Technical data

Humidity measurement	
Humidity application range	10 ... 90 % RH, without condensation
Accuracy at 23°C	3 % RH (from 20 % RH to 90 % RH)
Output scaling	0 ... 10 V ~ 0 ... 100 % RH
Temperature application range	0 ... 50 °C
General	
Operating voltage	12 ... 15 V DC
Operating current	< 5 mA
Dimensions	PCB approx. 110 x 13 mm Overall approx. Ø17 x 170 mm
Protection cage	ca. Ø 17 x 30 mm
Connection	5-pin connection strip RM 2,54 mm
Scope of supply	Humidity module, calibrated, with documentation

Range of application

The universal humidity module delivers output voltage of 0 ... 10 V proportional to relative air humidity of 0 ... 100 % RH so that it can be further processed as standard signal in regulation and measuring systems.

The humidity values are captured with the help of high grade, capacitive humidity sensors (Type KFS140). The signal processing in the module takes place with the help of a special ASIC, which corrects the linearity error and also the temperature dependence of sensor element, because of which a good measuring accuracy and stability is achieved. The power supply is through a stabilised voltage of 12.0 to 15.0 V DC. All signals are through a 5-pin plug connector with RM 2.54. The module is supplied with sensor head and plastic protection cage and is calibrated at two points.

Note

This model is used for measurement of air humidity. For simultaneous measurement of temperature at the measuring location, another product variant (type -HYTE) is available, which converts the temperature measurement range of 0 ... 50 °C into a standard signal of 0 ... 10 V.

DATA SHEET



Humidity probe module with voltage output 0 ... 10 V

Mounting

The sensor holder is provided with M16x1 threads and can be screwed onto customised housings. In case there is a danger of direct water effect, the sensor head should be mounted upside down and covered with water repellent protection filters. The measuring location must show representative climate conditions. Air currents or heat radiation should be avoided

The measuring probes are digitally adjusted at works. A re-calibration by the user is not required due to long term stability of the sensor elements.

Connection layout

Pin	Color	Function
1 TEMP	brown	Unoccupied
2 HYGRO	red	Humidity voltage output
3 GND	orange	Power supply and analog ground
4 VCC12V	yellow	Operating voltage 12 ... 15 V
5 TESEN	green	Unoccupied
----	tinned	Shielding of cables

Ordering number format

Art.-No.	Article
HY-ANA-10V	Measuring probe with analog output 0..10 V Only humidity measurement
HYTE-ANA-10V	Measuring probe with analog output 0..10 V Humidity and temperature measurement

Accessories (optional)

For applications, where temperature measurement is additionally required at the measuring location, a model is available with additional amplifier of 0 ... 10V for temperature signal (type HYTE).

The high grade metal housing with cable crack protection is provided with a M16x1 thread for sensor holder and augments the module to a full fledged measuring probe.

A ready-made connection cable of 2 m length is available as accessories. Special lengths are available on request.

The fine pored, hydrophobic PE sinter filter can be inserted into the protection cage and protects the sensor from dust, deposits and direct water effects.

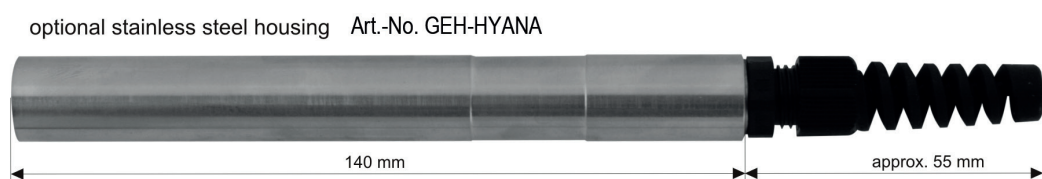
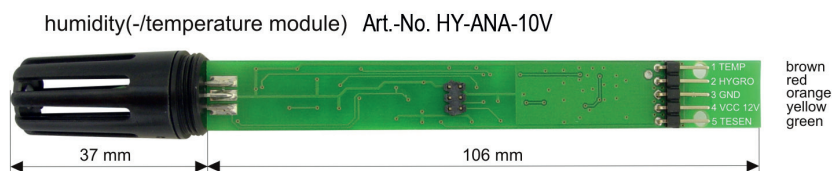
The measuring accuracy can be cross-checked with the help of reference cells. Detailed application notes are covered in the scope of supply of reference cells. The stainless steel housing (Ø x L) 17 mm x 195 mm augments the module into a full fledged measuring probe.

The PE sinter cap, to be inserted in the protection cover, is water proof and protects the sensor against dust and water splash. The 5-pin connection cable of 2 m is pluggable on the module side and the other side is with tinned strands.

Accessories	Art.-No.
Metal housing	GEH-HYANA
PE sinter filter	H555 0008
Spare-protection cap	H192 0003
Connection cable 2 m	KAB-HYTEMOD-ANA
Reference cells 33 % und 75 % RH	REFZ-M20-SET1

Scope of supply

The item is delivered as a ready-to-connect, calibrated module with protection cap and documentation, but without housing, connection cable and sinter filter.



DATA SHEET



Humidity/Temperature module 5V, axial PCB - HYTEMOD-5V-OG-ST1

Description



Areas of application

- Industrial electronics
- building instrumentation
- canal probe
- outdoor probe
- transducer

Technical data

HYTEMOD-5V-OG-ST1	
Humidity application range	25 ... 95% rH
Humidity measuring accuracy	±3% rH
Humidity output scaling	0 ... 5 V corresponding to 0 ... 100% rH
Humidity sensor	Capacitive polymer humidity sensor KFS 140
Temperature application range	-30 ... +70 °C
Temperature measuring accuracy	±0.4 K at 23 °C
Temperature output scaling	0 ... 5 V corresponding to -30 ... +70 °C
Temperature sensor	Pt1000
Operating voltage	6 ... 8 V DC
Current consumption	< 2 mA
Model	PCB without housing, with PTFE-sensor head and O-Ring
Plug connector	6-pin, 2 x 3 pins, RM 2.0 mm
Dimensions	approx. 230 x 9.8 mm

Universal humidity module as narrow, axial plug-board with a voltage output of 0 ... 5 V for humidity and temperature, the application range is 25 ... 95% RH, -30 ... 70 °C. The sensor consists of a capacitive sensor element comprising a temperature sensor 140 KFS Pt1000. The humidity measurement is linearized and temperature compensated.

The sensor head is detached from the electronics.

The electronics can be directly inserted in a tube of internal diameter 10 mm and hence is ideally suitable for manufacture of measuring probes. The PCB with length 200 mm can be cut to a dimension of 150 mm or 100 mm.

DATA SHEET



HUMIDITY MODULE WITH VOLTAGE OUTPUT AND I²C-BUS - HYTEMOD-I²C

Description



Characteristic features

- Temperature and humidity measurement
- Digital I²C-interface
- Voltage output 0 ... 5 V for humidity
- Calibrated and operational
- Broad spectrum of applications
- Capacitive sensor element
- Weather resistant and long term stable
- Miniaturised dimensions
- Optimum price performance ratio
- Custom made product variants possible

Typical areas of application

- Industrial instrumentation
- Building automation
- Ventilation and air conditioning systems
- White goods
- OEM-Products

Technical data

Humidity sensor module HYTEMOD-I2C	
Humidity sensor	Capacitive Polymer humidity sensor KFS 140
Humidity application range	20 ... 90% rH (max. Dew point = 50 °C)
Measuring accuracy	±3% rH
Temperature application range	-20 ... +60 °C
Temperature sensor	PT1000 class B
Interfaces	I ² C-Bus and voltage output
Protection filter (optional)	PP Membrane filter Wire mesh filter
Response time	< 20 sec. without filter
Dimensions	Approx. ø12 x 70 mm, refer drawing
Operating voltage	6 ... 12 V
Input current	< 3 mA
Housing	plastic housing, optional stainless steel housing
Connection	connection cable 6-pole with RJ11-plug

Features

Off late, humidity measurement has found entry into many mass-produced items like ventilation devices, household devices or automotive applications. Normally for such products, a fully integrated and calibrated sub-system is required which can result into a attractive system price with a standard calibrated interface.

The B+B humidity module combines the most modern thin film sensor technology with flexible signal processing of an ASIC and presents an optimum price performance ratio.

The high quality, capacitive humidity sensor guarantees highest measuring accuracy, drift stability, weather resistance as well as an outstanding long-term stability.

The calibrated humidity and temperature values are transmitted over the corresponding analog or digital interface with high resolution, which enables simple integration into customised products. The calibrated and standardized output signal facilitates a very simple integration of the sub-system during development phase, which results in shortest time-to-market product developments.

Besides product variants in plastic housing, a wide variety of customer specific models are available. For example, in stainless steel housing, with protection filter and ready-made connection leads.

DATA SHEET



HUMIDITY MODULE WITH VOLTAGE OUTPUT AND I²C-BUS - HYTEMOD-I²C

Standard model

The module is with 6-pole connector. The models available from stock are configured as follows:

- Operating voltage range 6 ... 12 V / 3 mA
- Calibrated at 8.0 V
- I²C Interface for temperature and humidity
- Ratiometric voltage output at PIN 6
0 ... 5 V corresponds to 0 ... 100% rH
- Temperature measurement by integrated PT1000
- Module in plastic housing with connection cable and RJ11 plug connector.

Voltage output

At PIN6, the measured relative humidity values are passed on as voltage signal. The presented measuring range of 0 ... 5 V corresponds to 0 ... 100% rH.

The minimum connection impedance should not be below 10 kOhm. The output impedance is 50 Ohm. The output is protected against short time transients. External voltage at the output can cause a damage of the ASIC and is absolutely to be avoided.

Operating voltage

Standard system is with 6 to 12 V operating voltage which is stabilized in the module on 5 V. The 5 V operating voltage serves also as reference level for the digital I²C-communication.

For the minimization of the self-heating over 8 V operating voltage, we recommend the stainless steel housing.

I²C-Interface

The communication is as per I²C protocol. All technical specifications of the protocol and commands can be obtained from the documentation "Serial Interface of HYGROSENS ASIC". The documentation is available on request.

The default address of the component is 0x78 and the component can always be communicated at this address. In addition, a second address can also be programmed during configuration at works, under which the humidity probe can be addressed.

Up to 4 bytes can be read at the address 0x78. If temperature values are not required, it is enough to read only the first two bytes. The following allocation is adopted:

Data		
0x78	Byte_0	MSB Humidity
	Byte_1	LSB Humidity
	Byte_2	MSB Temperature
	Byte_3	LSB Temperature

Scaling the measured values

Both humidity and temperature values are converted as 15 Bit values (Bit 0 - 14). From the 15 bit measured values, 11 bit resolution is to be used so that lower side bit (0 - 3) can be ignored.

The high value bit (15) is always 0 under normal operation and in case of an error it is turned to 1. Further instructions on error codes are available in the write-up "Serial Interface of HYGROSENS ASIC".

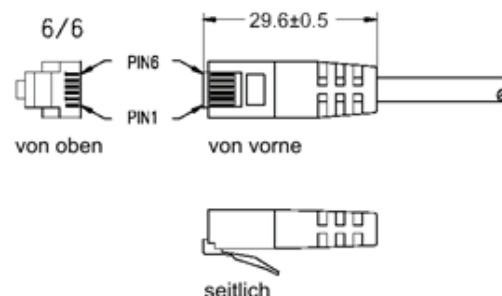
For the readings following scaling is valid:

Humidity channel		
Numerical value over	0x	0000 ... 7FFF
I ² C Interface	dec.	0 ... 32767
Physical value		0 ... 99,9969% rH
Scaling		rH(%)=V / 327,68

Temperature channel		
Numerical value over	0x	0000 ... 7FFF
I ² C Interface	dec.	0 ... 32767
Physical value		-32 ... +95,9961 °C
Scaling		T (°C)=V / 256-32

Connector configuration

RJ 45	Colour	Function	
1	black	VDD	Supply Voltage 6...12 V
2	brown	GND	Ground
3	red	SDA	Serial Data I2C
4	orange	SCL	Serial Clock I2C
5	yellow	VRH	RH Voltage Output
6	green	---	Not used



DATA SHEET



HUMIDITY MODULE WITH VOLTAGE OUTPUT AND I²C-BUS - HYTEMOD-I²C

Application guidelines

First of all, the operating voltage should be selected as low as possible, in case humidity values above 80% rH are to be measured. Because of the compact size, the electronics can get heated slightly, which can result in a loss of measuring accuracy.

The calibration at works is done at 8 V. The specified technical data are valid for this operating voltage. Other configurations and special calibrations as per customer requirements are also possible.

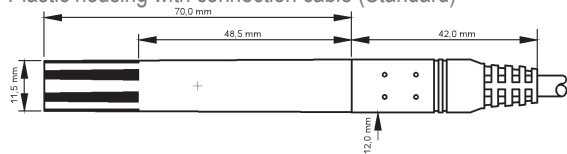
For connection of probes in longer routes, the I²C-Bus, which is used outside the device, should not be used internally, to avoid effect of inter-connection disturbances on internal device communication. The EMV-guidelines are to be followed; use of shielded lines is recommended.

Due to short time interruption of operating voltage, a RESET of humidity probe can be initiated. If the operating voltage is adjustable, then the pull up resistors of I²C Bus must be connected to the triggering voltage.

For simplifying your product development, a communication Board and also an USB-I²C-adapter is available – please contact us !

Outline drawing

Plastic housing with connection cable (Standard)



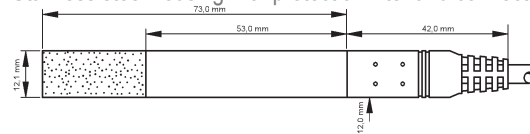
Product variants

The following overview describes the possible options and product variants. You can send us your enquiry for the desired configuration; we shall be pleased to give you an offer!

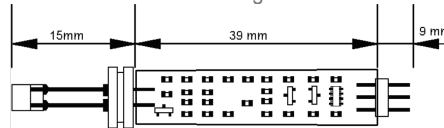
Housing

- Unpackaged module, dimensions 37 x 12mm
- Unpackaged module, with sensor holder and gasket D=12mm, pressure sealed for probe tubes
- In stainless steel housing Ø 12 x 90

Stainless steel housing with protection filter and connection cable



Module without housing with sensor head



TOP:	BOTTOM:
TEMP2/	6 TEMP
5 URH	4 SCL
3 SDA	2 GND
1 VDD	

Connection cable

If required, we can also supply module with connection cable.

The connection cable can be made with loose strands at the end or with any type of plug.

Protection filter

- Plastic protective case
- Wire mesh filter
- Plastic hydrophobic sinter filter
- Stainless steel sinter filter
- Membrane filter

You can get our complete overview on request!

Other options

The ASIC integrated in the module supports a variety of other operating modes:

- PWM-outputs, contact outputs
- SPI-Interface
- One Wire Interface
- ratiometric voltage output
- 3,3V Supply voltage
- LIN-Bus