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MEASURING TRANSDUCER OF HUMIDITY  
AND TEMPERATURE  
with Modbus RTU output

MB-AHT-1

**WARRANTY.** The F&F products are covered by a warranty of the 24 months from the date of purchase. Effective only with proof of purchase. Contact your dealer or directly with us. More information how to make a complaint can be found on the website: [www.fif.com.pl/reklamacje](http://www.fif.com.pl/reklamacje)



Do not dispose of this device in the trash along with other waste! According to the Law on Waste, electro coming from households free of charge and can give any amount to up to that end point of collection, as well as to store the occasion of the purchase of new equipment (in accordance with the principle of old-for-new, regardless of brand). Electro thrown in the trash or abandoned in nature, pose a threat to the environment and human health.

**Purpose**

The MB-AHT-1 transducer is used for continuous measurement of temperature in the range -40÷70°C and humidity in the range 0÷100% RH. Data exchange is carried out via the RS-485 port in accordance with the Modbus RTU protocol.

**Features**

- \* humidity measurement
- \* temperature measurement
- \* readout of the current temperature
- \* sensor operating status

**Functioning**

The module continuously measures via the built-in sensor. Readout of recorded values, setting of all measurement, communication and data exchange parameters are all carried out via the RS-485 port using the Modbus RTU communication protocol.

The module has a heater designed to dry the surface of the measuring sensor. This prevents the condensation of moisture that may interfere with the measurement result. This feature is optional and can be switched on via register 512. In switch-on mode, the heater is started automatically when the humidity rises above 97%. The operation of the heater can affect the correctness of the measurement, therefore during its operation the measurements are blocked (the transducer displays values from before the heater was switched on).

Approximate heating cycle: operation - 1s / stop - 5s.

**Parameters of MODBUS RTU protocol**

Communication parameters	
Protocole	MODBUS RTU
Operation mode	SLAVE
Port settings (factory settings)	Number of bits per sec: 1200 / 2400 / 4800 / <del>9600</del> / 19200 / 38400 / 57600 / 115200 Data bits: <b>8</b> Parity: <b>NONE</b> / EVEN / ODD Starts bits: <b>1</b> Stop bits: 1 / 1.5 / <u>2</u>
Range of network addresses (factory setting)	1÷245 ( <u>1</u> )
Command codes	3: Readout of registers group (0x03 - Read Holding Register) 6: Single output value setting (0x06) - Write Single Register
Maks. częstotliwość zapytań	15 Hz

**Measurement parameters - factory settings**

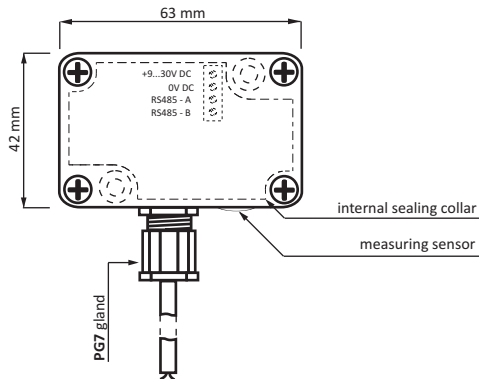
Heater (heating mode)	active (value of registry 512=1)
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Communication registers				
address	description	function	type	attrib.
256	Reading of a current base address and recording of a new base address: 1÷245	03 06	int	read write
257	Reading of a current transmission rate and recording of a new transmission rate: 0:1200 / 1:2400 / 2:4800 / <del>3:9600</del> / 4:19200 / 5:38400 / 6:57600 / 7:115200	03 06	int	read write
258	Reading of a current parity value and recording of a new parity value: 0: <b>NONE</b> / 1:EVEN / 2:ODD	03 06	int	read write
259	Readout of a current stop bits number and recording of a new stop bits number: 0:1bit / 1:1,5bit / <u>2:2bits</u>	03 06	int	read write
260	Restore factory settings: Enter 1.	06	int	write
<b>Warning!</b> Any change in communication parameters (transmission rate, number of stop bits, parity) will be applied only after power restart.				
1026-1027	Serial number: R1026×256 <sup>2</sup> +R1027	03	int	read
1028	Production date: 5 bits/day; 4 bits/month; 7 bits/year (without 2000)	03	int	read
1029	Software version	03	int	read
1031-1035	Identifier: F&   F   MB   -A   HT	03	int	read
The transducer does not support broadcast commands (address 0).				

Measurement and configuration registers				
address	description	com-mand	type	attrib.
0	Temperature [°C] - number with a sign (signed)	03	int	read
1	Humidity [%]	03	int	read
2	Heater status: 0 - heater turned off, measurement active; 1 - heater turned on, measurement inactive; 2 - delay in measurement after turning off the heater.	03	int	read
4	Operating status of the measuring sensor: 0 - error; 1 - correct.	03	int	read
512	Heater: 0 - inactive; 1 - active	03	int	read

### Transducer design

Transducer in a special, small-sized plastic box, connected through a PG7 gland using a round wire (max.  $\varnothing 7$ ) of any length. Box with a special sealing collar, fastened to the ground with two screws, covered with a lid with a silicone gasket for four screws.



### Separation

No galvanic isolation between the power supply, RS-485 line and sensor inputs.

### Mounting

General guidelines:

- \* Use of surge protectors and interference filters is recommended (e.g. OP-230).
- \* Use of shielded twisted wires is recommended for connecting the unit to another device.
- \* If using shielded cables, ground the shield on one side only and as close to the device as possible.
- \* Do not run signal cables parallel and in direct proximity to high- and medium-voltage line.
- \* Do not install the unit in direct proximity to high power receivers, electromagnetic measuring devices, devices with phase power adjustment and any other devices that can create interferences.

Installation:

1. Set the selected MODBUS communication parameters and measurement options before installation.
  2. Disconnect the power.
  3. Unscrew the cover fixing screws.
  4. Fix the module to the ground in the place of the measurement with the measuring sensor facing down.
  5. Pull the cable through the gland and tighten it firmly so that the internal gasket fit close to the wire.
  6. Connect the power cables to the +/- terminals.
  7. Connect the A-B (RS-485 port) signal output to the output of the MASTER-type device.
  8. Connect signal output 1-3 to the power supply and analog input (AI) of the current receiving device (any polarity).
- WARNING!**  
The maximum length of the cable (UTP) is 300 m.
9. Screw the lid to the housing.

### Technical data

supply voltage	9±30 V DC
maximum current	40 mA
measurement range	0÷100% RH/-40÷70°C
maximum temperature measurement error	±1°C
maximum humidity measurement error	±4.5% (0÷80 RH)
	±6.0% (80÷100 RH)
sampling rate	10 Hz
port	RS-485
communication protocol	Modbus RTU
operation mode	SLAVE
communication parameters	
transmission rate—set	1200÷115200 bit/sec
data bits	8
stop bits	1/1.5/2
parity bits	EVEN/ODD/NONE
address	1÷247
power consumption	0,3 W
working temperature	-40÷70°C
terminal	2.5 mm <sup>2</sup> screw terminals
tightening torque	0.4 Nm
gland	PG7
maximum wire diameter	∅7
dimensions	42×63×30 mm
mounting	2 screws to the flat surface
protection level	IP65

