

Operating instruction



High-temperature moisture transmitter type MT 8636 HR6

V1.0
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1. General

The manual is a part of the scope of supply and serves to ensure proper handling and optimum functioning of the instrument. For this reason, the manual must be read before start-up.

In addition, the manual is for all personnel who require knowledge concerning transport, setup, operation, maintenance and repair.

The manual must not be used for the purpose of competition without a written consent from Ahlborn Mess- und Regelungstechnik GmbH and must also not be forwarded to third parties.

Copies for personal use are permitted.

All information, technical data and illustrations contained in these instructions are based on information available at the time of publication.

1.1 Symbol assertion



This symbol indicates a safety instruction.

These safety instructions should always be followed carefully.

By not following these instructions injuries of persons or material damage could happen. Therefore Ahlborn Mess- und Regelungstechnik GmbH does not accept liability.



This symbol indicates a note.

These notes should be observed to achieve optimum functioning of the equipment.

1.2 Safety instructions

General Safety Instructions

- Excessive mechanical loads and incorrect usage should always be avoided.
- Take care when unscrewing the filter cap as the sensor element could be damaged.
- The sensor is an Electro Static Discharge sensitive component (ESD). When touching the sensor element, ESD protective measures should be followed.
- Grip sensors only at the lead wires.
- Installation, electrical connection, maintenance and commissioning should be performed by qualified personnel only.

Safety instructions for use of the alarm module with voltages >50V

- To insulate the optional alarm module from the low-voltage side of the transmitter, the partition provided for this purpose must be fitted in the lower section.
- During operation of the instrument the modular housing must be completely closed.
- The protection class of an opened housing corresponds to IP00 and direct contact with components carrying dangerous voltages is therefore possible. In general, work on live components should be avoided and when absolutely necessary, should be performed by qualified personnel only..

1.3 Environmental aspects

Equipment from Ahlborn Mess- und Regelungstechnik GmbH is developed with due consideration to all resultant environmental issues. When you dispose the equipment you should avoid environmental pollution.

For disposal of the transmitter the individual components must be sorted with care. The housing consists of recyclable polycarbonate. The electronics must be collected as electronic scrap and disposed of according to the regulations in force.

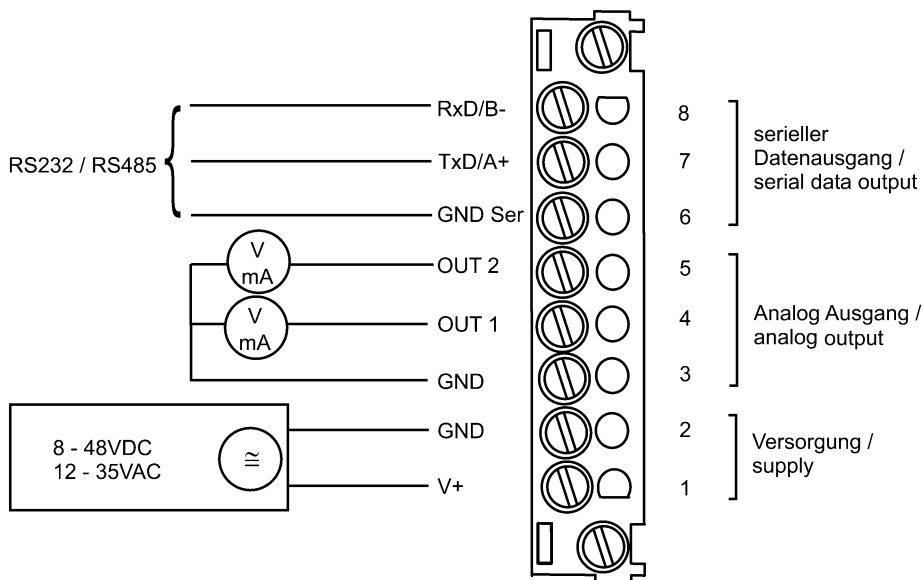
2. Product description

Humidity/temperature transmitters of the MT8636HR6 series provide multi-functionality, highest accuracy and simple installation and maintenance. The modular housing enables a user-friendly operation and a fast replacement of the sensor unit for service purposes.

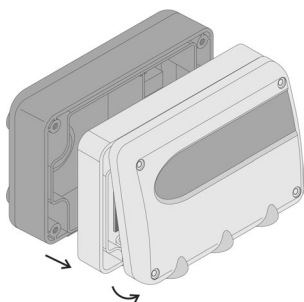
By selecting a suitable housing version the MT8636HR6 series can be used for the entire range of humidity measurement applications:
for wall mounting with remote sensing probe for measurements from -40 to 180degC and with remote sensing probe for pressure-tight applications up to 15 bar

3. Installation

3.1 Electrical connections



3.2 Mounting of the housing



1. Drill the mounting holes according to the drilling template. For installation on mounting rails use a special installation set (see "Accessories," page 21)
2. The bottom part of the housing is mounted with 4 screws (not supplied), e.g.: 4.5x30mm
3. Connection of the transmitter (see "Electrical connections,")
4. Mounting of the middle part and cover with 4 screws (included in the scope of supply)

3.3 Mounting of model with Remote sensing probe

Transmitters of the MT8636HR6 series are transmitters with remote sensing probes for measurements in the extended temperature range.

Working range of sensor probe: $-40 \dots 180 \text{ degC}$

Working range of electronics: $-40 \dots 60 \text{ degC}$

Mounting of the remote sensing probe

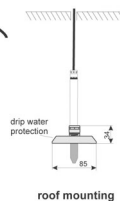
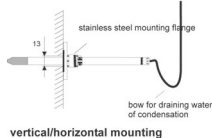
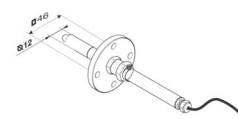
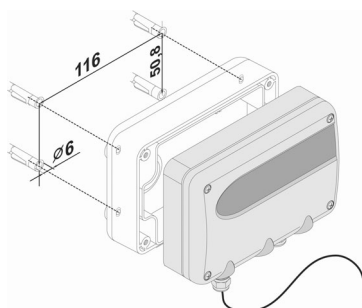
Using the stainless steel mounting flange (refer to accessories) it is possible to mount the probe on the outer wall of the measuring chamber.

The depth of immersion is adjustable.

For roof installations use the drip water protection (refer to accessories) to protect the sensor head and elements against condensed water.



The sensor probe must be mounted horizontally or vertically, pointing downwards. When possible, a drip sheet should be fitted for each mounting.



3.4 Mounting of model with pressure-tight sensor

Transmitters of the MT8636HR6 series are transmitters with remote, pressure-tight sensor probes that are suitable for applications at

pressures between $0.01 \dots 15 \text{ bar}$.

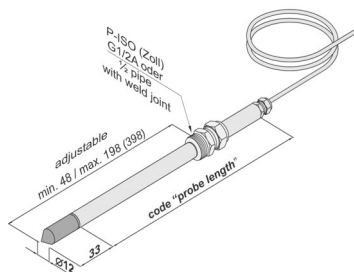
Working range temperature: $-40 \dots 180 \text{ degC}$

pressure: $0.01 \dots 15 \text{ bar}$

Working range of electronics: $-40 \dots 60 \text{ degC}$



The sensor probe must be mounted horizontally or vertically pointing downwards. Where possible, a drip sheet should be fitted for each mounting.



4. Maintenance

4.1 Self diagnosis and error messages

Self diagnosis via LEDs on the circuit board:

- **Green LED**
flashing ⇒ Supply voltage applied / Microprocessor is active
- **Red LED**
constantly lit ⇒ Humidity sensor element damaged
flashing ⇒ Humidity sensor element accruing moist (condensation!)

Definitions:

- **Error**
possible cause
⇒ *Measures / Help*

Filter soiled
⇒ *Replace filter*

Sensor defective
⇒ *Replace sensor*

Output configured incorrectly
⇒ *PC - Software*
- **Long response time**
Filter soiled
⇒ *Replace filter*

Incorrect filter type
⇒ *Filter type should match the application*
- **Transmitter failure**
no supply voltage
⇒ *Check wiring and supply voltage*
⇒ *only green LED is illuminated continuously*
⇒ *Electronics defect ⇒ contact the manufacturer*
- **High humidity values - red LED blinks**
Dew (condensation) in sensor probe head
⇒ *Dry probe head and check the sensor probe mounting type*

Incorrect filter type (e.g. storage of humidity after stainless steel sintered filter condensation)
⇒ *Filter type should match the application*

5. Technical data

Measurement values

Relative humidity

Relative humidity

Mesuring range¹⁾

0...100% RH

Accuracy including hysteresis and non-linearity

± 2% RH (0...90% RH) ± 3% RH (90...100% RH)

Temperature dependence of electronics

typ. ± 0,01% RH/degC

Temperature dependence of sensing probe

typ. ± (0,002 + 0,0002 x RH[%]) x ΔT [degC]

Response time with metal grid filter at 20°C / t90

< 15s

Temperature

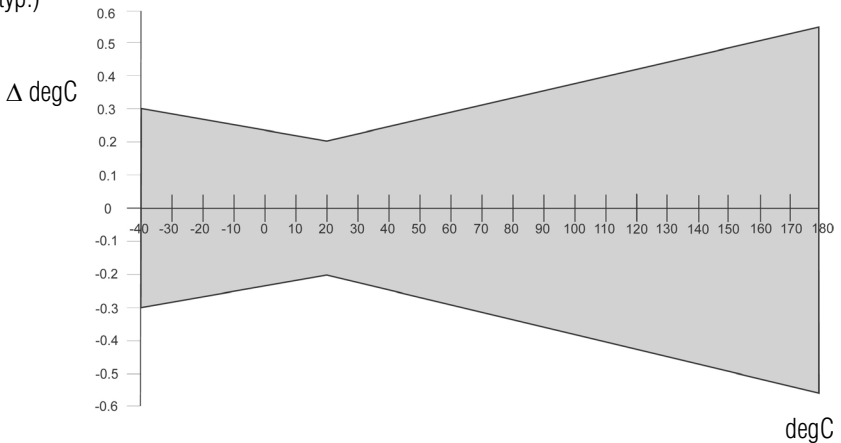
Temperature sensor element

Pt1000 (Tolerance class A, DIN EN 60751)

Working range sensing head

-40...180degC

Accuracy (typ.)



Temperature dependence of electronics

typ. ± 0.005 degC/degC

Outputs

Two freely selectable and scaleable analogue outputs
0...100% RH / xx...yy degC respectively

0 - 5V

-1 mA < I_L < 1mA

0 - 10V

-1 mA < I_L < 1mA

4 - 20mA

R_L < 500 Ohm

0 - 20mA

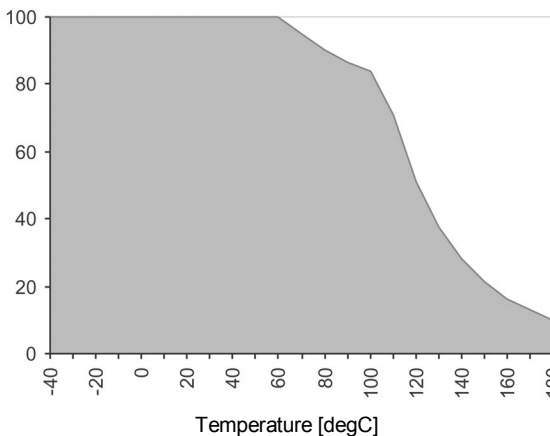
R_L < 500 Ohm

General

Power supply	8 ... 48V DC or from ALMEMO device
Current consumption	- 2x voltage output - 2x current output for 24V DC/AC: typ. 40mA typ. 80mA
Pressure range for pressure tight probe	0,01...15bar
Housing / protection class	Plastic PC / IP65
Cable gland	M16 x 1,5
Electrical connection	screw terminals up to max. 1,5mm ²
Sensor protection	stainless steel sintered filter, PTFE filter or metal grid filter
Working temperature range of electronics	-40...+60 degC
Working and storage temperature range	-40...+60 degC
Storage temperature range	-40...+60 degC
Electromagnetic compatibility according to	EN61000-6-2; EN61010-1; EN50081-1

1) See Working range of the humidity sensor!

5.1 Working range humidity sensor



The gray area shows the allowed measurement range for the humidity sensor.

Working points outside of this range do not lead to destruction of the element, but the specified measurement accuracy cannot be guaranteed.

6. Humidity / temperature calibration

The MT8636HR6 transmitter series can be calibrated in two ways.

- 1-point humidity/temperature calibration: quick and simple calibration on a defined humidity/temperature point (working point).
- 2-point humidity/temperature calibration: simple calibration for accurate measuring results over the whole humidity/temperature working range.



- To reach a temperature balance it is recommended to keep the transmitter and the reference chamber (e.g. HUMOR 20,...) for minimum 4 hours in the same room.
- During stabilisation period and calibration procedure it is important to keep the temperature constant in the reference climate chamber.
- For calibration the humidity sensor probe must be stabilised at least 20 minutes into the reference chamber.
- Replace a used dirty filter cap before calibration!

6.1 2-point humidity calibration

For accurate adjustment over the whole working range or in case of sensor exchanges a two point calibration is recommended.



- Start calibration at the low humidity calibration point!
- The humidity difference between the two points should be > 30%RH
- Low humidity point < high humidity point
- Two point calibration may be performed directly on the circuit board

2-point humidity calibration procedure on the circuit board!

low calibration point :

1. Insert the sensor probe into the reference humidity 1 (low calibration point) and stabilise for at least 20 minutes.



2. **BUTTON S2:** Pressing the button for 5 seconds starts the procedure for the calibration mode RH. The calibration mode is indicated by the lit LED "D2" on the circuit board.



3. **BUTTON S2:** Pressing the button for 5 seconds starts the procedure for the low calibration point. The calibration mode is indicated by the lit LED "D2" and the symbol "CALIB LOW" will appear on the optional LCD display.



4. **BUTTON S1 (up) and S2 (down):** Pressing one of the two buttons will adjust the measuring value in steps of 0.1% up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output. As soon as the measured value is changed, "D1" is flashing.



5. **BUTTON S1 (store):** Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" will disappear from the optional LCD display.



BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" will disappear from the optional LCD display.

high calibration point :

6. Insert the sensor probe into the reference humidity 2 (high calibration point) and stabilise for at least 20 minutes.



7. BUTTON S2: Pressing the button for 5 seconds starts the procedure for the calibration mode RH. The calibration mode is indicated by the lit LED "D2" on the circuit board.



8. BUTTON S1: Pressing the button for 5 seconds starts the procedure for the high calibration point. The calibration mode is indicated by the lit LED "D2" and the symbol "CALIB HIGH" will appear on the optional LCD display.



9. BUTTON S1 (up) and S2 (down): Pressing one of the two buttons will adjust the measuring value in steps of 0.1% up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output. As soon as the measured value is changed, "D1" is flashing.



10. BUTTON S1 (store): Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB HIGH" will disappear from the optional LCD display.



BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB HIGH" will disappear from the optional LCD display.

6.2 2-point temperature calibration



- Start calibration at the low calibration point!
- The temperature difference between the two points should be at least 30 degC!
- Low temperature point < high temperature point

low calibration point :

1. Insert the sensor probe into the reference temperature 1 (low calibration point) and stabilise for at least 10 minutes.



2. BUTTON S1: Pressing the button for 5 seconds starts the procedure for the calibration mode temperature. The calibration mode is indicated by the lit LED "D1" on the circuit board.



" CALIB LOW"

3. BUTTON S2: Pressing the button for 5 seconds starts the procedure for the low calibration point. The calibration mode is indicated by the symbol "CALIB LOW" on the optional LCD display.



4. BUTTON S1 (up) and S2 (down): Pressing one of the two buttons will adjust the measuring value in steps of 0.1 degC up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output. As soon as the measured value is changed, "D1" is flashing.



5. BUTTON S1 (store): Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" will disappear from the optional LCD display.



BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" will disappear from the optional LCD display.

high calibration point :

D1  red

S1 

S1 

" CALIB HIGH"

D1  red

S1 

S2 

S1 

D2  flashing green

D2  flashing green

S2 

6. Insert the sensor probe into the reference temperature 2 (high calibration point) and stabilise for at least 10 minutes.

7. BUTTON S1: Pressing the button for 5 seconds starts the procedure for the calibration mode temperature. The calibration mode is indicated by the lit LED "D1" on the circuit board.

8. BUTTON S1: Pressing the button for 5 seconds starts the procedure for the high calibration point. The calibration mode is indicated by the symbol "CALIB HIGH" on the optional LCD.

9. BUTTON S1 (up) and S2 (down): Pressing one of the two buttons will adjust the measuring value in steps of 0.1 degC up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output. As soon as the measured value is changed, "D1" is flashing.

10. BUTTON S1 (store): Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB HIGH" will disappear from the optional LCD display.

BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB HIGH" will disappear from the optional LCD display.

6.3 1-point humidity calibration

When the working range is limited to a certain more narrow range, a calibration on one humidity point is absolutely sufficient.



- In accordance with the working range, either the high or low calibration point should be selected. (CP > or < 50% RH)
- This calibration causes an extra inaccuracy for the rest of the working range.
- The one point humidity calibration may be done directly on the circuit board

1. Insert the sensor probe into the reference humidity (calibration point) and stabilise for at least 20 minutes.

D2  green

S2 

2. BUTTON S2: Pressing the button for 5 seconds starts the procedure for the calibration mode RH. The calibration mode is indicated by the lit LED "D2" on the circuit board.

S1 

D2  green

" CALIB HIGH"

3. BUTTON S1: Pressing the button for 5 seconds starts the procedure. The calibration mode is indicated by the lit LED "D2" and the symbol "CALIB HIGH" will appear on the optional LCD display (CP = 50% RH).

or

D2  green

S2 

" CALIB LOW"

BUTTON S2: Pressing the button for 5 seconds starts the procedure. The calibration mode is indicated by the lit LED "D2" and the symbol "CALIB LOW" will appear on the optional LCD (CP < 50% RH).

D1  red

S1 

D2  green

S2 

4. BUTTON S1 (up) and S2 (down): Pressing one of the two buttons will adjust the measuring value in steps of 0.1% up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output.

S1 

D2  flashing green

5. BUTTON S1 (store): Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" or "CALIB HIGH" will disappear from the optional LCD display.

D2  flashing green

S2 

BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" or "CALIB HIGH" will disappear from the optional LCD display.

6.4 1-point temperature calibration

When the working range is limited to a certain more narrow range, a calibration on at one temperature point is absolutely sufficient.



- In accordance with the working range, either the high or low calibration point should be selected. ($CP \geq 45 \text{ degC}$ or $< 45 \text{ degC}$)
- This calibration causes an extra inaccuracy for the rest of the working range.
- The one point temperature calibration may be performed directly on the circuit board

1. Insert the sensor probe into the reference temperature (calibration point) and stabilise for at least 30 minutes.



2. **BUTTON S1:** Pressing the button for 5 seconds starts the procedure for the calibration mode temperature. The calibration mode is indicated by the lit LED "D1" on the circuit board



3. **BUTTON S1:** Pressing the button for 5 seconds starts the procedure. The calibration mode is indicated by the symbol "CALIB HIGH" on the optional LCD display ($CP \geq 45 \text{ degC}$).

or



"CALIB LOW"

BUTTON S2: Pressing the button for 5 seconds starts the procedure. The calibration mode is indicated by the symbol "CALIB LOW" on the optional LCD display ($CP \geq 45 \text{ degC}$).



4. **BUTTON S1 (up) and S2 (down):** Pressing one of the two buttons will adjust the measuring value in steps of 0.1 degC up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output.



D2  flashing green

5. BUTTON S1 (store): Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" or "CALIB HIGH" will disappear from the optional LCD display.

D2  flashing green



BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" or "CALIB HIGH" will disappear from the optional LCD display.

6.5 Resetting the customer calibration to the factory calibration on the circuit board



D2  flashing green



1. RH + T RESET: BUTTON S1 and S2: In neutral mode pressing both buttons simultaneously for 10 seconds customer calibration settings are reset to factory calibration. A short flash of the LED "D1" indicates the reset.
or



D2  green



2. RH RESET: BUTTON S2: Pressing the button for 5 seconds starts the procedure for the calibration mode RH. Pressing both buttons simultaneously for 10 seconds customer calibration settings are reset to factory calibration. A short flash of the LED "D1" indicates the reset.
or



D1  red

S1 

S1 

D2  short
flash
green

S2 

3. Temp. RESET: BUTTON S1: Pressing the button for 5 seconds starts the procedure for the calibration mode T. Pressing both buttons simultaneously for 10 seconds customer calibration settings are reset to factory calibration.

A short flash of the LED "D2" indicates the reset.

7. Accessories

Designation	Pore-size	Maximum temperature	Order No.
SK7 Metal-mesh filter in PC-housing	100 µm	120°C	ZB9600SK7
SK6 PTFE-Sinterfilter	50 µm	180°C	ZB9600SK6
SK8 Stainless steel sinter filter	10 µm	180°C	ZB9600SK8

8. Your contact

