PMA Prozeß- und Maschinen-Automation GmbH

Operating Manual *Relative Humidity And Temperature *) Transducer digital*

9499 040 79011

*Specification *)*

Measuring range: relative humidity: 0.0...100.0 % rel. humidity (temperature compensated)
temperature: -40.0...120.0 °C or -40.0...248 °F
Rec. range of application: standard: 20,0...80,0 % RH
option high humidity: 5,0...95,0 % RH
Sensors: relative humidity: cap. polymer sensor
temperature: Pt1000
Further tecnical details see datasheet: **Transmitter for Humidity 9498-737-51613**
Internet: http://**www.pma-online.de/en/products/humid.html**

ORDERING-DATA 2)

Description	**Order-no.**	
Standard-Sensor	**9407-292-000 .**	**1**
Humidity wall	**0**	
Humid./Temp.-wall 5)	**1**	
Humidity duct	**2**	
Humid./Temp-duct 5)	**3**	
High Humidity/Temp. Sensor 2)		
Humidity wall special	**4**	
Humid./Temp-wall special 5)	**5**	
Humidity duct special	**6**	
Humid./Temp-duct special 5)	**7**	
length to specification 1)	**.**	**2**
Optional accessories		
Adaptor 3)	**9407-291-00081**	
Radiation protector 4)	**9407-291-00091**	

1) Other length 300, 400 or 500 mm to specification
2) Specify operating range, e.g. 0...40 % rH or 70...100 % rH, if not standard.
Also indication of operating level (e.g. 68% rH) should be given.
3) Mounting adapter (flange) is included in delivery.
4) Configured only in factory, dimensions on request.
5) Combi= combination of humid.& temp. Separate supply neccessary!

EMC: The device corresponds to the essential protection ratings established in the Regulations of the Council for the Approximation of Legislation for the member countries regarding electromagnetic compatibility (89/336/EWG).
In accordance with EN61326 +A1 +A2 (appendix A, class B), additional errors: < 1% FS.
When connecting long leads adequate measures against voltage surges have to be taken.

Safety instructions

This device has been designed and tested in accordance with the safety regulations for electronic devices. However, its trouble-free operation and reliability cannot be guaranteed unless the standard safety measures and special safety advises given in this manual will be adhered to when using the device.

1 Trouble-free operation and reliability of the device can only be guaranteed if the device is not subjected to any other climatic conditions than those stated under "Specification". If the device is transported from a cold to a warm environment condensation may cause in a failure of the function. In such a case make sure the device temperature has adjusted to the ambient temperature before trying a new start-up.
2 General instructions and safety regulations for electric, light and heavy current plants, including domestic safety regulations (e.g. VDE), have to be observed.
3 If device is to be connected to other devices (e.g. via PC) the circuitry has to be designed most carefully. Internal connection in third party devices (e.g. connection GND and earth) may result in not-permissible voltages impairing or destroying the device or another device connected.

*) depending on version

4 If there is a risk whatsoever involved in running it, the device has to be switched off immediately and to be marked accordingly to avoid re-starting.
Operator safety may be a risk if:
- there is visible damage to the device
- the device is not working as specified
- the device has been stored under unsuitable conditions for a longer time.

In case of doubt, please return device to manufacturer for repair or maintenance.

5 **Warning**:
Do not use these product as safety or emergency stop devices, or in any other application where failure of the product could result in personal injury or material damage.

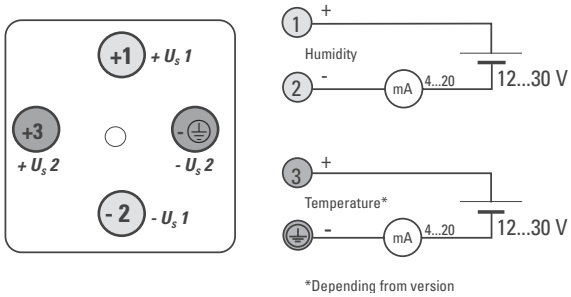
Failure to comply with these instructions could result in death or serious injury and material damage.

Assignment of angled connector

4-20mA (2-wire connection)

1 = supply voltage + Uv (humidity)
2 = GND / signal (humidity)
3 = supply voltage + Uv (temperature) *)
(4)= GND / signal (temperature)*)

*) *Version depending*



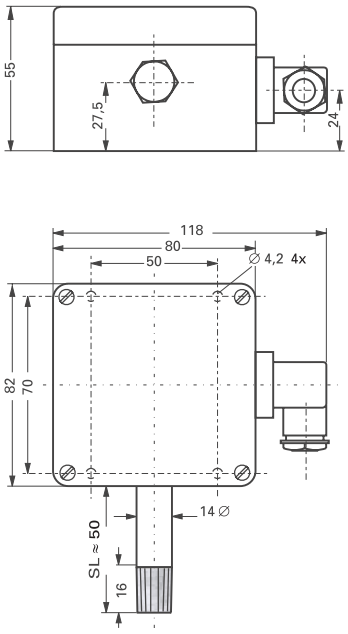
*Depending from version

Electrical installation instructions

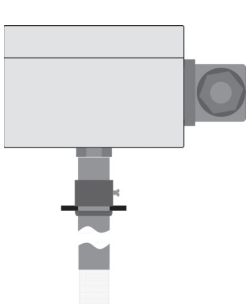
Prior to mounting the cable, the fastening screw in the angled connector has to be removed and the connector insert must be levered out by means of a screw driver (see arrow mark at insert). Feed cable through gland of the connector housing and mount the leads to the contacts of the connector insert according to the diagramm shown above. Push insert onto the terminal lugs of the transmitter, considering the different fits . Replace connector housing in the postion required onto the insert until it clicks. Ensure that the seal is positioned correctly between bottom and top part. Put screw back into place and tighten with max 1 Nm torque (hand tight). Tighten cable gland.

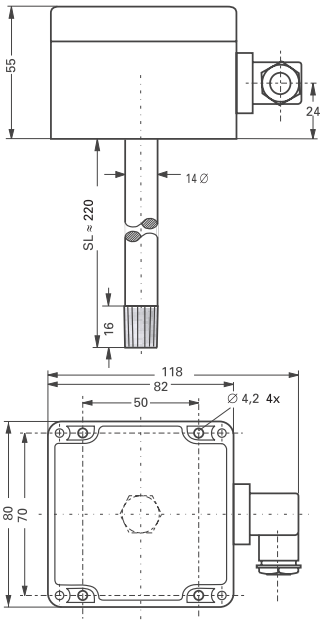
Versions, dimensions

short sensor tube aside



long sensor tube bottom



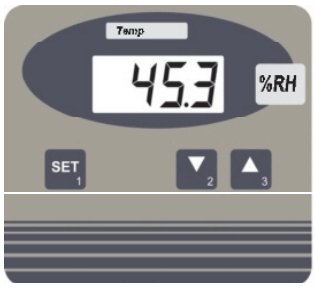


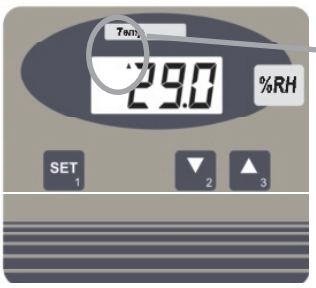
*) depending on version, see ordering-data

Display functions

Currently measured values

During normal operation the **relative humidity** in **[%RH]** is displayed alternating *) to the **temperature** in **[° C]** or **[° F]**.





Arrow to Temp indicates temperature display

*)Only humidity : During normal operation the **relative humidity** displayed in the unit **[%]**. By pressing key 1 (SET) the **temperature** in **[° C]** or **[° F]** can be displayed.
After 5 seconds the display switches automatically back to humidity display.

display relative humidity **display temperature**

Min/Max Value Memory

read Min values (Lo):	press 'down'(2) shortly once	display changes between 'Lo' and Min values
Read Max values (Hi):	press 'up'(3) shortly once	display changes between 'Hi' and Max values
restore current values:	press 'down'(2) or 'up'(3) once again:	current values are displayed
clear Min-values:	press 'down'(2) for 2 seconds	Min values are cleared. The display shows shortly 'CLr'.
clear Max-values:	press 'up'(3) for 2 seconds	Max values are cleared. The display shows shortly 'CLr'.

After 10 seconds the currently measured values will be displayed again.

Error and system messages

Display	Description	Possible fault cause	Remedy
Err.1	measuring range exceeded	Wrong signal	Temperature above 120°C not allowed.
Err.2	Measuring value below measuring range	Wrong signal	Temperature below -40°C not allowed.
Err.7	System fault	Error in device	Disconnect from supply and reconnect. If error remains: return to manufacturer
Err.9	Sensor error	Sensor or cable defective	Check sensor, cable and connections
Er.11	Calculation not possible	Calculation variable missing or invalid	Check temperature
8.8.8.8	Segment test	The transducer performs a display test for 2 seconds after power up. After that it will change to the display of the measuring.	

Configuration of the device

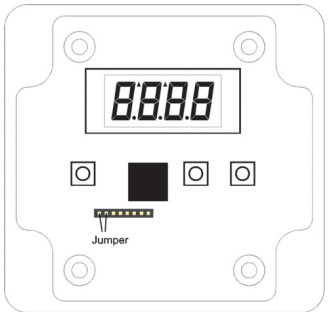
In the configuration following parameters can be changed:
- Display unit of temperature measuring
- Scaling of the humidity output and of the temperature *) output
- Adjusting of humidity and temperature display *) (offset and scale correction)

By means of the scaling the analogue signal outputs can be adopted to Your needs.
The adjusting by means of offset and scale is intended to be used to compensate errors of the measurings. It is recommended to keep the scale correction deactivated ("oFF").
The display value is given by following formula:

Display = measured value - offset

With a scale correction (just for calibration laboratories, etc) the formula changes:

Display = (measured value - offset) * (1 + scale adjustment/100)



If the jumper is removed from the shown contacts, the configuration is inaccessible, values are protected.
Never interconnect to other contacts!

*) depending on version, see ordering-data

To configure the parameters proceed like follows

1. Press the key 1 (SET) for more than 4 sec 's until **'unit' with temperature arrow** appears in the display.

I.) 'unit' with Temp-arrow: Temperature unit

Enter the desired Temperature unit. All referring settings and displays are done in this unit.

2. Choose the desired value by pressing 2 (down) or 3 (up) key. Choice between ° C and ° F (ex works: ° C)
3. Enter by key 1 (SET), select next parameter by pressing key 1 again: **'Out.0' without temperature arrow** appears.

II.) 'Out.0': Display at zero output of humidity measuring (output scaling)

Enter the humidity value at which the output should have 4mA .

4. Choose the desired value by pressing 2 (down) or 3 (up) key. Max. input range: 0.0...100.0 % (ex works: 0.0%)
5. Enter by pressing key 1 (SET), select next parameter: **'Out.1' without temperature arrow** appears in the display.

III.) 'Out.1': Display at maximum output for humidity measuring (output scaling)

Enter the humidity value at which the output should have 20mA .

6. Choose the desired value by pressing 2 (down) or 3 (up) key. Max. input range: 0.0...100.0 % (ex works: 100.0%)
7. Enter by pressing key 1 (SET) , select next parameter: **'Out.0' with temperature arrow** appears in the display.

IV.) 'Out.0' with Temp-arrow: Display at zero output of temperature measuring *) (output scaling)

Enter the temperature value at which the output should have 4mA .

8. Choose the desired value by pressing 2 (down) or 3 (up) key. (ex works: 0.0° C / 32.0° F)
9. Enter by pressing key 1 (SET), select next parameter: **'Out.1' with temperature arrow** appears in the display.

V.) 'Out.1' with Temp-arrow: Display at maximum output for temperature measuring *) (output scaling)

Enter the temperature value at which the output should have 20mA .

10. Choose the desired value by pressing 2 (down) or 3 (up) key. (ex works: 100.0° C / 212.0° F)
11. Enter by pressing key 1 (SET), select next parameter: **'OFFS' without temperature arrow** appears in the display.

VI.) 'OFFS': Offset of humidity measuring (correction of measuring deviations):

The offset of the measuring will be shifted by this value, the input is in % rh. Calculation: see above.

12. Choose the desired value by pressing 2 (down) or 3 (up) key.
    Max. input range: -5.0...5.0 % rh or 'oFF': offset is deactivated (= 0.0%, ex works)
13. Enter by pressing key 1 (SET), select next parameter: **'SCAL' without temperature arrow** appears in the display.

VII.) 'SCAL': Scale of humidity measuring (correction of measuring deviations):

The scale of the measuring is changed by this value. Calculation: see above.

14. Choose the desired value by pressing 2 (down) or 3 (up) key.
    Max. input range: -5.00...5.00 or 'oFF': scale is deactivated (= 0.00, ex works)
15. Enter by pressing key 1 (SET), select next parameter: **'OFFS' with temperature arrow** appears in the display.

VIII.) 'OFFS' with Temp-arrow: Offset of temperature measuring*) (correction of measuring deviations):

The offset of the measuring will be shifted by this value, the input is in ° C. Calculation: see above.

16. Choose the desired value by pressing 2 (down) or 3 (up) key.
    Max. input range: -5.0...5.0 ° C / -9.0...9.0° F or 'oFF': offset is deactivated (= 0.0, ex works)
17. Enter by pressing key 1 (SET), select next parameter: **'SCAL' with temperature arrow** appears in the display.

IX.) 'SCAL' with Temp-arrow: Scale of temperature measuring*) (correction of measuring deviations):

The scale of the measuring is changed by this value. Calculation: see above.

18. Choose the desired value by pressing 2 (down) or 3 (up) key.
    Max. input range: -2.00...2.00 or 'oFF': scale is deactivated (= 0.00, ex works)
19. Enter by pressing key 1 (SET). After pressing key 1 again, the instrument will restart (segment test).

*) depending on version, see ordering-data

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