



Operating Instructions

Transmitter **ALMEMO® 8646-1**

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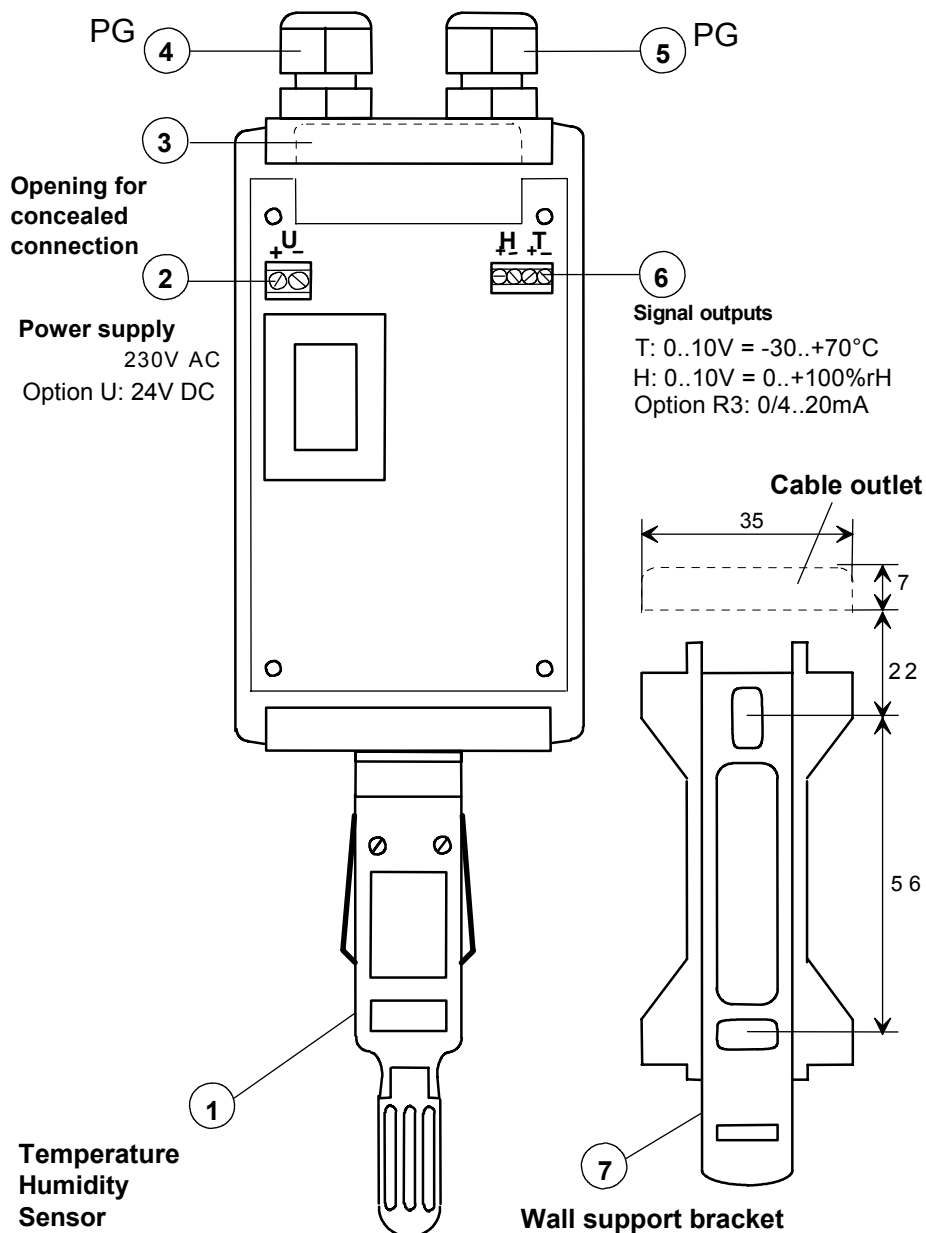
Temperature Humidity Transmitter

ALMEMO® 8646-1

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1. OPERATING CONTROLS



2. SAFETY INSTRUCTIONS

These operating instructions are intended to allow optimum use of the transmitter. To prevent the user from hazards and to guarantee the perfect function of the device the instructions must be read thoroughly before taking the device into initial operation.

Safety Symbols



This symbol marks general safety instructions. If they are not observed the manufacturer will not be liable for damages.



Warning: There is a hazard of an electric shock in case of touching live connectors. If voltages of more than 60V must be handled, the personnel must be instructed with regard to the hazards.



General Safety Instructions

With regard to power supply and analog output options it is absolutely necessary that the type plate is checked before taking the device into initial operation.

Caution must be taken when unscrewing and replacing the filter cap as the humidity sensor can be easily damaged.

Any contact with the sensor element must be avoided.

3. INTRODUCTION

The temperature humidity transmitter ALMEMO® 8646-1 utilizes a removable, internally digitally calibrated ALMEMO® sensor with Ntc temperature sensor and capacitive humidity sensor as sensor components. It can be interchanged without a loss of accuracy. The sensor FH A646-6C is used to perform a digital temperature compensation over the entire temperature range resulting in a high accuracy that can be also guaranteed at high temperatures. The compatibility with the ALMEMO® system allows the programming of the data processing, particularly the configuration of the analog output range within the ALMEMO® sensor. The signal outputs with 2x 0...10 V cover the temperature range from -30 to +70°C and the humidity range from 0 to 100 %rH. A 0/4...20 mA output is available as an option. The selection of 0...20 or 4...20 mA can be programmed. As standard, the transmitter has a mains supply. Optionally a 24V DC voltage supply with electrical isolation can be used. The device can be wall mounted by means of a support bracket and can also be removed without tools.

4. INITIAL OPERATION

1. Fasten wall support bracket (7) to the wall (see 5), hang up the transmitter.
2. **Power supply** to the terminals (2) by mains supply or 24V DC voltage (option U, see 6).
3. Connect the **recording devices** to the analog outputs (6), see 7.

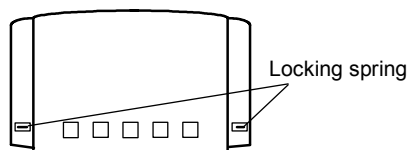


5. INSTALLATION

Mount the transmitter with the sensor facing downwards or sideways to avoid an influence on the measuring data caused by the heating of the mains supply unit. A wall support bracket (7) is supplied for **wall mounting**. By means of the two wall plugs and two screws it must be fastened to the wall so the cable outlets are positioned below the corresponding opening in the enclosure (3), (see dimensioned sketch in section 1). First attach the transmitter on the upper supports, then place underneath, move upwards until it locks.

Opening the Enclosure:

To open the enclosure, the locking springs located on both face sides, must be pressed in by means of a screw driver and, simultaneously, the lid must be pulled off.



Make sure that the mains supply is switched off before opening the enclosure!

Alternatively, the connecting cables can also be guided through two PGs, (4) and (5), at the face side of the enclosure. For this purpose both covers must be unscrewed and the supplied PGs must be screwed in.

6. POWER SUPPLY



Before connecting the supply voltage the type of power supply must be checked on the type plate located on the back of the device! A power supply unit, 230V +10%-15% / 50-60Hz, is integrated as a standard power supply for the transmitter. A power supply with 24 V DC voltage is available as option U.

6.1 Mains Supply



Connections to the 230 V network must only be carried out by a qualified electrician. Before carrying out the connection, make sure that the corresponding fuse has been removed or switched off and that the cables do not carry any voltage! The mains cable must be connected to the screw terminal (2). On the terminal side, the cables must be wired short enough that, even in case of an error, a connection to the signal outputs will not be possible.

6.2 DC Voltage Supply (Option U)

If the power supply is to be performed using 24V DC voltage the transmitter must be equipped with the option U (OA 8646-U) (see type plate). The voltage must then also be connected to the screw terminal (2). The use of a DC/DC converter guarantees an electrical isolation between the power supply and the signal outputs.

7. SIGNAL OUTPUTS

The transmitter has 2 analog voltage outputs 0...10 V (6) fitted as standard. The temperature range covers -30...+70 °C and the humidity range covers 0...100 %rH. The terminals **T** (-+) and **H** (-+) (6) are used to connect the signals. Take notice of the polarity!

Current outputs, 0...20 mA and 4...20mA, are available as option R3. The option is entered on the type plate.

7.1 Scaling

If required, a partial range of the measuring signal (e.g. 10 to 50°C) can be expanded to the full output range (0-10V, 0/4-20mA). The corresponding programming can be specified when ordering. It will be saved to the EEPROM of the sensor and must be re-programmed when the sensor is being replaced. If you already own an ALMEMO® device, which allows to program the analog start and analog end using the keyboard or interface, you can perform or change the scaling on your own at any time (see device manual or ALMEMO® Manual section 6.10.7). Furthermore, the setting 0 or 4 to 20 mA can be set for each channel through the element flag 8, which can be configured via the interface of the ALMEMO® device (see manual section 6.10.3).

8. TRANSDUCER

As standard, the transmitter is equipped with the capacitive temperature humidity mini sensor FH A646-1C, which is directly plugged into the ALMEMO® input socket (1) and which guarantees a temperature compensation over the entire temperature range. Alternatively, it is also possible to use the following capacitive ALMEMO® humidity sensors, particularly those versions with an extension cable.

Temperature humidity sensor, plug-in version, digital TC	FH A646-1C
Temperature humidity sensor, plug-in version, analog TC	FH A646-1
Temperature humidity sensor with cable, digital TC	FH A646-6C
Temperature humidity sensor with cable, analog TC	FH A646-6

If required, it is also possible to use any ALMEMO® Ntc temperature sensor. A mechanical coding ensures that the sensors are connected to the correct sockets. Furthermore, the ALMEMO® connector has two locking levers, which engage when being plugged into the socket and which prevent from disconnection as a result of the cable being pulled. To pull off the connector both levers must be pressed on the sides.

9. ELECTROMAGNETIC COMPATIBILITY

The transmitter ALMEMO® 8646-1 meets the fundamental electromagnetic compatibility (EMC) safety requirements specified in the relevant CE directive, issued by the council for the alignment of legal regulations of the member states (89/336/EWG).

The evaluation of the product is based on the following standards:

EN 61326:1997/A1:1998 IEC 61000-3-2:1995, IEC 61000-4-2:1995 8kV
IEC 61000-4-3:1995 3V/m, IEC 61000-4-4:1995 1kV

The following notes must be observed when operating the instrument:

1. If the standard sensor cables are extended it must be considered that the measuring lines are not guided together with high-voltage power cables and that they are appropriately shielded to protect against any coupling of disturbance signals.
2. If the instrument is operated within strong electromagnetic fields an additional measuring error must be expected (<50mV at 3V/m and 1.5m thermocouple transducers). After the irradiation the device operates again within the specified technical data.

Appendix

Product Overview

Temperature Moisture Transmitter, with plug-in sensor,
2 analog outputs 0...10V, mains supply unit 230V 50..60Hz

Order No.

MA8646-1

Options:

Sensor:	including extension cable and connector	OA 8646-L
Outputs:	2 x 0...20mA, burden (load) < 500 ohms	OA 8646-R3
Power supply:	15...28V DC electrically isolated	OA 8646-U

Spare Parts:

Temperature humidity sensor, plug-in version, digital TC	FH A646-1C
Temperature humidity sensor with cable, digital TC	FH A646-6C
Temperature humidity sensor, plug-in version, analog TC	FH A646-1
Temperature humidity sensor with cable, analog TC	FH A646-6
Protective cap with filter	ZB 9600-SK2

Technical Data

Sensor:	length 87mm, diameter 12mm, dust-proof filter
Humidity sensor:	capacitive
Measuring range:	5...98% r.H.
Temp. compensation:	0...70°C
Accuracy:	± 2% r.H. at nominal temperature
Reproducibility:	< 1% r.H. at nominal temperature
Temperature sensor:	Ntc type N
Measuring range:	-30...60 °C
Accuracy:	-20...0°C: 0.4K, 0...60°C: 0.1K
Reproducibility:	0.1°C
Transmitter:	
Measuring Inputs:	ALMEMO® socket for ALMEMO® humidity sensors
Meas. channels:	1 temperature Ntc -50...+125°C (resolution 0.01K), 1 cap. humidity 0...100%rH (resolution 0.1%rH) microprocessor-controlled, digitally calibrated Delta-Sigma A/D converter
Accuracy:	± 0.1% ± 1 dig. ± 0.005%/K
Nominal temperature:	23°C ± 3°C
Outputs:	2 x 0...10 V (load: > 100kΩ)
Resolution, accuracy:	12 bit (4000 digits), ± 2 dig. ± 0.005%/K
Option R3:	2 x 0/4...20mA (burden (load): < 500 Ω)
Output range:	standard 0...100% r.H., -30...+70°C customized programming ex works available, for sensor user-programmable via ALMEMO device
Supply Voltage:	mains 230V +10%-15%, 50..60Hz
Option U:	15...28V DC electrically isolated
Current consumption:	approx. 30 mA (without load)
Connectors:	screw terminals
Cable bushing:	towards the wall or through PGs in the face side
Housing:	wall enclosure plastic 123x68x49 mm system of protection IP 40
Environmental Conditions:	
Operating temperature:	-20 ... +60 °C
Storage temperature:	-30 ... +70 °C
Ambient air humidity:	10 ... 90 % rH non-condensing
Extent of the Delivery:	Transmitter ALMEMO 8646-1 Temperature/Humidity Sensor Wall Support Bracket, 2 PGs Operating Instructions ALMEMO 8646-1