



KPC.RS Humidity Temperature Sensor with RS232 signal level converter

Compact sensors with plug-in connection
standard and meteorological design

Description

MELA® Humidity / temperature sensors in the KPC.RS and KPC.RS-ME series are rod-shaped, compact sensors with a plug-in connection and are used to measure the relative humidity and temperature with great accuracy in both air and other non-aggressive gases. They can be used in a wide range of applications.

The sensors in this series have got a digital RS232 output and are particularly suitable for data transfer via a network and the internet.

All the sensors in this series are supplied with a **ZE17-type** gauze filter (or respectively ZE20 membrane filter for ...-ME) as standard.

We recommend that you use the version with the **ZE 21/22** type sintered high-grade steel filter at high wind speeds or if the sensor is polluted with salt mist, sand or dust (near the sea, industrial estates etc.).

(for filter programme refer to product info sheet no. F 5.1).

Technical Data

Humidity

measuring range 0...100% rh
measuring accuracy 10...90 % rh at 23° C ±1.5% rh
at <10%rh and >90%rh ±2% rh
influence of temperature <0.04% rh/K

Temperature

measuring element (ref. DIN IEC 751) Pt1000 1/3-DIN cl.B
measuring range -40 ... 85° C
accuracy @ 23°C ±0.15 K
temperature coefficient <0.005 K/K

General

power supply 5 ... 30V DC
max. transfer distance for RS23215 m
max. ambient temperature -40 ... 80° C
degree of protection / tip of measuring head KPC.RS..... IP20
degree of protection / tip of measuring head KPC.RS-ME..... IP30
degree of protection / connector IP67
consumption of electronics < 7 mA
electromagnetic compatibility EN 61326-2-3

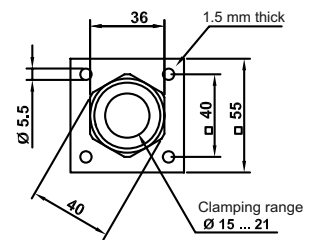
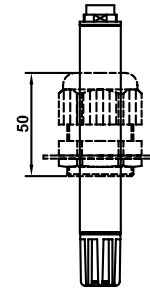
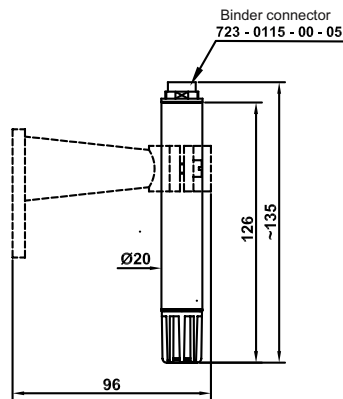
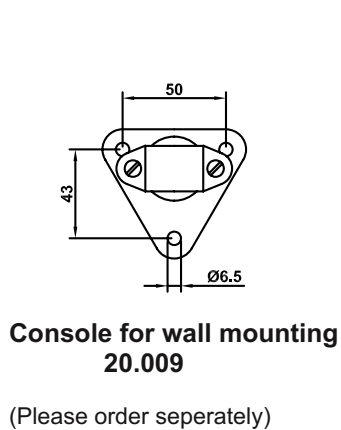
„subject to technical modifications“

Type versions

Type / Order reference	Measuring range		Output	
	Humidity	Temperature	Humidity	Temperature
KPC.RS with gauze filter ZE17	0 ... 100 % rh	-40 ... +85°C	RS232	RS232
KPC.RS-ME with membrane filter ZE20	0 ... 100 % rh	-40 ... +85°C	RS232	RS232

Dimensions

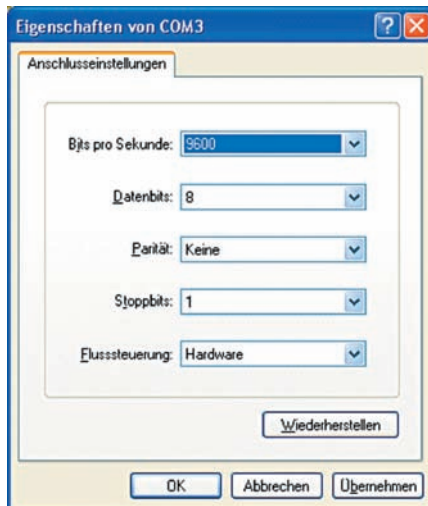
PCs.S (-ME) series



Accessories

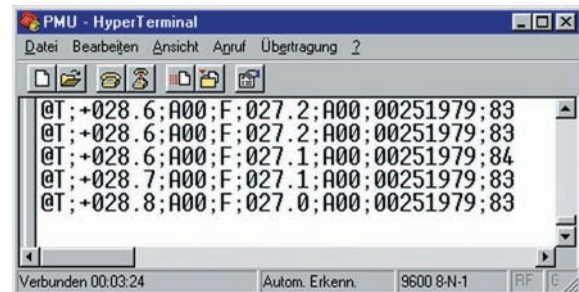
Designation	Order reference	Description
cable	KPC.RS.02-xx.x *)	cable with coupling IP40
cable (ME)	KPC.RS.02-ME-xx.x *)	cable with coupling IP67
*) xx.x = length of cable in meters. Please indicate desired length in your order (max 15 m).		
Sub-D adapter cable	KPC.RS.02	connecting cable, 2.5 m with 5 pin binder plug and 9 pin SUB-D jack for direct connection to serial PC interface max. permissible ambient temperatures binder plug and cable IP40 -40 ... +85 °C SUB-D jack (PC connection) IP30 -10 ... +50 °C
Sub-D adapter cable	KPC.RS.02.xx.x	connecting cable, xx.x m with 5 pin binder plug and 9 pin SUB-D jack for direct connection to serial interface on PC max. permissible ambient temperatures binder plug and cable IP40 -40 ... +85 °C SUB-D jack (PC connection) IP30 -10 ... +50 °C
Sub-D adapter cable	KPC.RS.02-ME.xx.x	connecting cable, xx.x m with 5 pin binder plug and 9 pin SUB-D jack for direct connection to serial interface on PC max. permissible ambient temperatures binder plug and cable IP67 -40 ... +85 °C SUB-D jack (PC connection) IP30 -10 ... +50 °C
USB adapter serial -> USB	USB adapter	USB adapter for Sub-D-data line <i>To connect up the Sub-D-data line to a USB interface on the PC or Laptop</i>
weather guard ZA 161/1	ZA 161/1	weather guard for rod-shaped sensors Ø 20 mm <i>recommended for outside use to protect from rainfall and sunlight</i>
wall console	20.009	wall console, plastic, for mounting sensors Ø 20 mm with mounting sleeve 00.502 also suitable for rod sensors Ø 15 mm
humidity standards	ZE 31/1-12 ZE 31/1-33 ZE 31/1-75 ZE 31/1-84	standard humidity to check the accuracy of the sensors 12 %rh and 25°C standard humidity to check the accuracy of the sensors 33 %rh and 25°C standard humidity to check the accuracy of the sensors 75 %rh and 25°C standard humidity to check the accuracy of the sensors 84 %rh and 25°C
adapter ZE33	ZE33	adapter for humidity standard ZE 31/1

Connection settings



HyperTerminal (Windows)

The sensor can be read via the Hyper Terminal programme from Windows. The picture below shows the character string of the data issued.



Notes on ASCII protocol

start of protocol	end of protocol	separation sign
@	"CR" and "LF"	“, “

The measurement data is sent in the measurement phase as ASCII-protocol on the RxD-pin:

@T	<sign>	<temperature>	<alarm-code>	F	<humidity>	<alarm-code>	<serial number>	<check-sum>	<CR>	<LF>
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Example:

@T; + 021.37; A00; F; 038.92; A00; 0000121; 38 control character Carriage Return control character Line Feed

The check sum is calculated as follows:

$$\text{check sum} = 255 - (\sum_{\text{dez}} \% 256) = \text{check sum}_{\text{dez}} = \text{check sum}_{\text{hex}}$$

Example:

$$\text{check sum} = 255 - (1991 \text{ Modulo } 256) = 255 - 199 = 56 = 38_{\text{hex}}$$

The check sum is not transmitted as a hexadecimal character with 1 byte, but is translated into readable digits with 2 bytes. Through the comparison of the transmitted check sum with a check sum calculated at the read-out point, the user has the opportunity to check whether the transmission of the data is error-free.

Alarm codes:

Temperature channel:

A00 = no alarm, the temperature value is within the limits
 A01 = temperature measurement range exceeded
 A02 = below temperature measurement range
 A03 = no sensor signal
 A04 = short circuit at PT1000 (resistance < 500 Ω)

Humidity channel:

A00 = no alarm, the humidity value is within the limits
 A01 = humidity measurement range exceeded (=100% rh)
 A02 = below humidity measurement range (= 0% rh)
 A03 = no sensor signal
 A04 = humidity sensor defective

Software „Visual PMU“ (Freeware)

This simple and very clear visualisation software supports the data output of a sensor via a serial interface on the PC without an additional power supply.

For USB connections, a *USB adapter* can be supplied.

The relative humidity, the dew point and the temperature (°C or °F) can be displayed and can be depicted as a graph.

Apart from that, the programme has a simple data logger function.

Recorded data can be exported to other programmes. This freeware version can be found on our Homepage www.galltec-mela.de as a free download.

User information

Installation

The sensors are to be attached in a position representative for the climate measurement.

The position the sensor is mounted in (horizontal, vertical) does not matter. However, it should be mounted in such a way that no water can get into it.

Please note the maximum permissible ambient temperature when installing the sensor. The sensors always have to be installed in such a way that the plugs are not exposed to an increased ambient temperature either (>85°C).

In a clean environment, the sensor is maintenance-free.

Dust and other solid particles do not damage the humidity sensor element, however, if there is an accumulation of dust on it, the dynamic behaviour could be impaired.

If it should become necessary to clean it, the filter can carefully be unscrewed and rinsed. Loose dirt can also be removed from the measuring element by blowing it off or rinsing it carefully with distilled water.

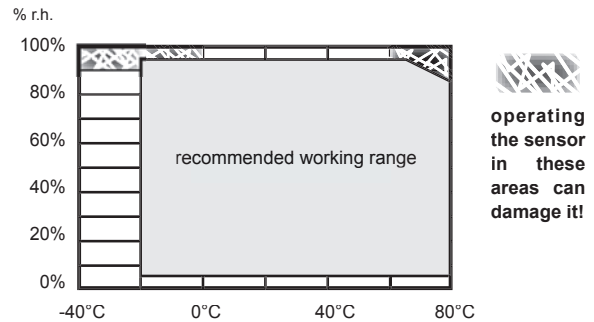
Dew formation and splashes do not damage the sensor, although corrupted measurement readings are recorded until all the moisture on and directly around the sensor element has dried up.

Damaging Influences

Agents that are corrosive and contain solvents, depending upon the type and concentration of the agent, can result in faulty measurements and cause the measuring element to break down. Substances deposited on the sensor are damaging as they form a water-repellent film (this applies to all humidity sensors with hygroscopic measuring elements); e.g. resin aerosols, lacquer aerosols, smoke deposits etc.

In order to check functioning in the place of installation, we recommend that you use our ZE31/1-x type *humidity standards (accessories)*.

Tolerance validity range rh



For further information, please consult **product info A.1** available at www.galltec-mela.de

Connection diagram

