

Product info sheet no. C 4.7
Humidity-/temperature sensors
for industrial applications up to 200°C, up to 25 bar

Description

MELA®-humidity-/temperature sensors in this series are supplied with a robust aluminium die cast housing with an inox or aluminium sensor part to measure relative humidity or relative humidity and temperature in air and other non-aggressive gases for a working temperature range of up to 200°C.
The pressure-proof executions „D“ and „HD“ can be used at pressures up to 25 bar, at temperatures up to 125°C or up to 160°C. These sensors are ideally suited for industrial applications, e.g. in drying processes.
The advantages of the series .../9 are its improved dynamics, in particular at low air speeds and also its increased service life, even under more challenging operating conditions (pollutant impact or permanent humidity > 95 %rh).
When air speeds are extremely high combined with a high number of particles, using the series .../9 is not recommended.

Technical data

Humidity

measuring range 0...100%rh
accuracy (10...40°C; 5...95%rh) ±2.0%rh
influence of temperature <10°C, >40°C <0.1%/K

Temperature

measuring element (ref. DIN EN 60751) Pt 100 class B
measuring range
series GC -20...+80°C
series ZC, ZC.D, KC -25...+125°C
series ZCx.H, ZCx.HD 0...+200°C
accuracy
output: 0...10 V ±0.2 K
output: 4...20 mA ±0.3 K
influence of temperature <10°C, >40°C ±0.007 K/K

Other data

ambient temperature
transmitter part -40...+80°C
sensor part series GC -40...+80°C
series ZC, KC, ZC.D -40...+125°C
series ZC.HD -40...+160°C
series ZC.H -60...+200°C

operating voltage
current output 2-wire...12...30V DC
voltage output 3/4-wire... 24V±10% AC
or 15...30 V DC

degree of protection
transmitter part IP 65
sensor head .../6 (xKC, xZC) IP 65
sensor head .../9 (xKC, xZC, xGC) IP 00
sensor head (xGC) IP 20

housing material
sensor part (except series GC) inox
sensor part series GC aluminium
transmitter part pressure die casting of alu

load:
 $\Omega = \frac{\text{operating voltage} - 10 \text{ V DC}}{0.02 \text{ A}} \pm 50\Omega$
(current output) ≥10kΩ
load resistance (voltage output) <5mA
power consumption (voltage output) <5mA
self-heating coefficient Pt100 (v=2 m/s in air) 0.2 K/mW

Directive about electromagnetic compatibility **2014/30/EU**
DIN EN 61326-1 issue 07/13
DIN EN 61326-2-3 issue 07/13

Type versions (Order designation)

Measured variable	Analogue output	GC series wall version	KC series duct version	ZC series two-piece
F rel. humidity	0...20 mA	FGC 4/x	FKC 4/x	FZC 4/x
	4...20 mA	FGC 3/x	FKC 3/x	FZC 3/x
	0...10 V	FGC 2/x	FKC 2/x	FZC 2/x
C r.h. + temp.	0...20 mA, Pt100	CGC 4/x	CKC 4/x	CZC 4/x
	4...20 mA, Pt100	CGC 3/x	CKC 3/x	CZC 3/x
	0...10 V, Pt100	CGC 2/x	CKC 2/x	CZC 2/x
K r.h. + temp.	2 x 4...20 mA	KGC 3/x	KKC 3/x	KZC 3/x
	2 x 0...10 V	KGC 2/x	KKC 2/x	KZC 2/x
T temperature	Pt 100	TGC 5/5	TKC 5/5	TZC 5/5
	4...20 mA	TGC 3/5	TKC 3/5	TZC 3/5
	0...10 V	TGC 2/5	TKC 2/5	TZC 2/5
weight approx.		380 g	470 g	500 g

/x please select the appropriate filter (refer also to datasheet F5.1)

series GC: open protective basket ZE16 → **x=5**
integr. element filter made of PTFE and ZE16 → **x=9**
series KC,ZC: sintered inox filter ZE13 → **x=5**
integr. element filter made PTFE and ZE04 → **x=9**

Measured variable	Analogue output	ZC.D series 25 bar	ZC.H series 200°C	ZC.HD series 25 bar, 160°C
F rel. humidity	0...20 mA	FZC 4.D/x	FZC 4.H/x	FZC 4.HD/x
	4...20 mA	FZC 3.D/x	FZC 3.H/x	FZC 3.HD/x
	0...10 V	FZC 2.D/x	FZC 2.H/x	FZC 2.HD/x
C r.h. + temp.	0...20 mA, Pt100	CZC 4.D/x	CZC 4.H/x	CZC 4.HD/x
	4...20 mA, Pt100	CZC 3.D/x	CZC 3.H/x	CZC 3.HD/x
	0...10 V, Pt100	CZC 2.D/x	CZC 2.H/x	CZC 2.HD/x
K r.h. + temp.	2 x 4...20 mA	KZC 3.D/x	KZC 3.H/x	KZC 3.HD/x
	2 x 0...10 V	KZC 2.D/x	KZC 2.H/x	KZC 2.HD/x
weight approx.		520 g	520 g	520 g

/x please select the appropriate filter (refer also to datasheet F5.1)

series ZC.H, ZC.D, ZC.HD
sintered inox filter ZE13 → **x=6**
integr. element filter made PTFE and ZE04 → **x=9**

Special versions available on request

This information is based on current knowledge and is intended to provide details of our products and their possible applications. It does not, therefore, act as a guarantee of specific properties of the products described or of their suitability for a particular application. It is our experience that the equipment may be used across a broad spectrum of applications under the most varied conditions and loads. We cannot appraise every individual case. Purchasers and/or users are responsible for checking the equipment for suitability for any particular application. Any existing industrial rights of protection must be observed. The perfect quality of our products is guaranteed under our General Conditions of Sale. Issue : June 2020 C47_E. Subject to modifications.

User instructions

Install the MELA®- humidity/temperature sensors in a place where characteristic climatic conditions can be measured. For attaching them into ducts or wall bushings, we recommend to use the MELA®-ZA 24-type mounting plate (product info sheet no. F 5.1).

The specified minimum air speed and - with current output - the load according to the operating voltage (diagram) should be complied with. Deviations may lead to additional measuring faults resulting of the self-heating of the sensor.

The sensor can be installed in any position. However, do not position it in a position where water ingress can occur. 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.

In order to maintain interference immunity in accordance with EN 61326-2-3 when it is in use, we recommend to use a screened cable (type recommended: 8x AWG26 C UL order no. 5339) for connecting the sensors, and have this fitted into the sensor's EMC heavy-gauge conduit thread by a qualified electrician.

In order to check functioning in the place of installation, we recommend that you use the MELA®-ZE31/1-type humidity standard with a ZE 33-type auxiliary adapter (product info sheet no. F 5.2).

Dust does not cause any harm to the humidity sensor, however, it does affect dynamic performance.

The protective filter should only be screwed off carefully to check functioning with a humidity standard.

It is important not to touch the highly sensitive sensor element in the process. If necessary, soiled filters can be screwed off and rinsed. When you screw them back on, bear in mind that sensors will not measure accurately again

until they are completely dry. Sensors of the series .../9 can be completely and carefully cleaned in distilled water. It is not possible to exchange the PTFE filter on the humidity sensor element.

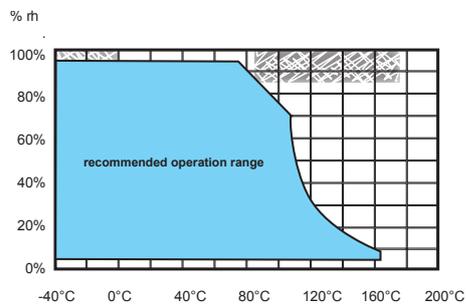
Please consult the **application instructions for the sensing elements** (product info sheet no. A 1) or check with the manufacturer for further information which you need to bear in mind when using humidity sensors with capacitive sensing elements.

Caution! When you install the pressure-proof sensors (series ZC.D and ZC.HD), do not apply a torque in excess of 25 Nm.

Sensors with voltage output have no galvanic separation between output and operating voltage at the negative pole.

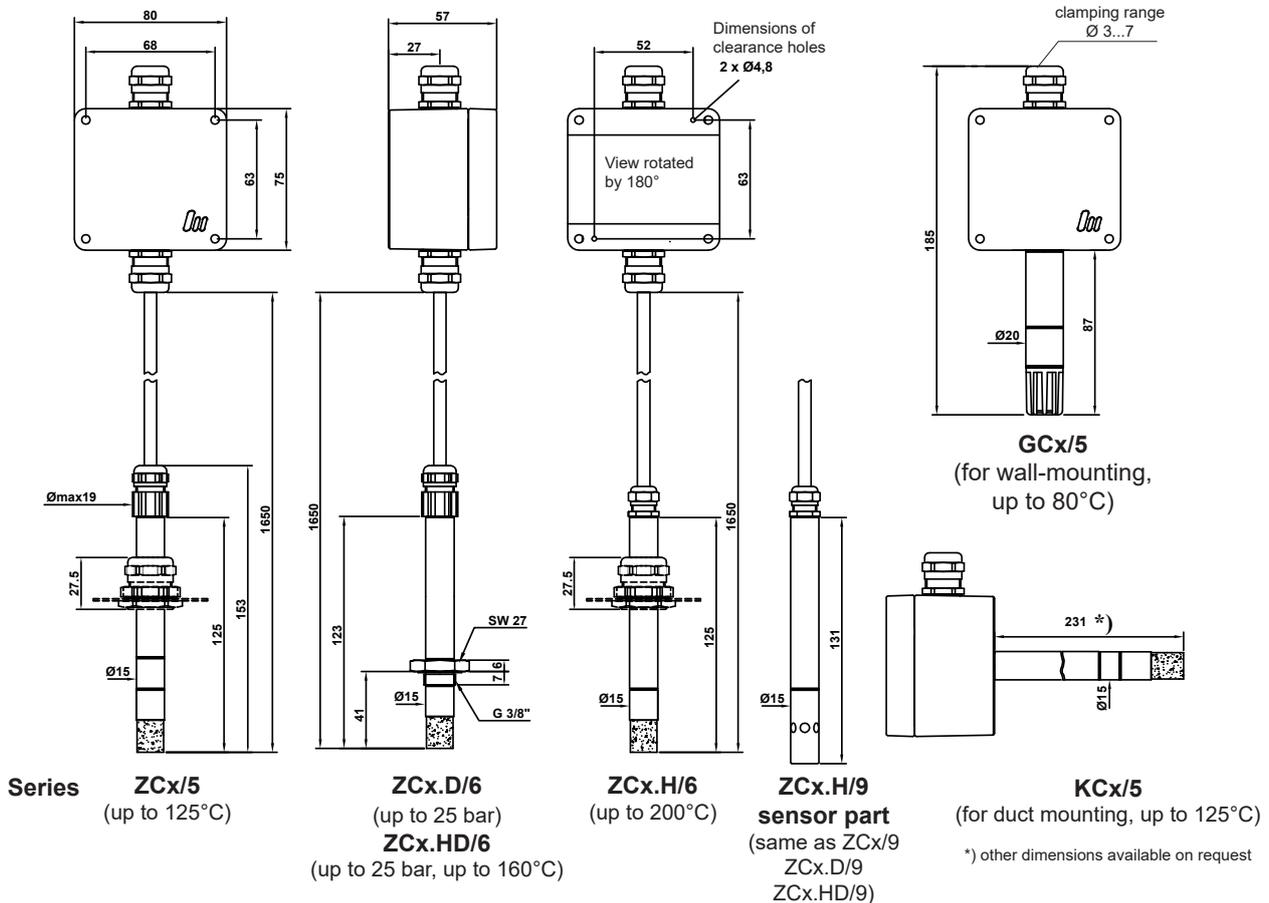
The humidity output and temperature output of sensors with current output are always galvanically separated from each other!

Working range for humidity and temperature



Operating the sensor in these areas can damage it!

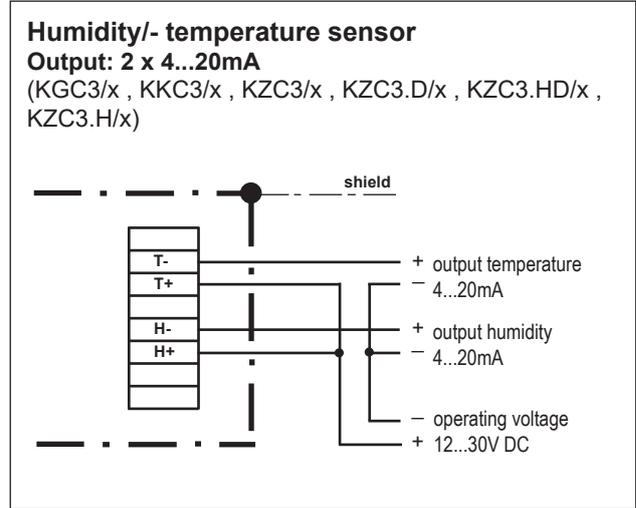
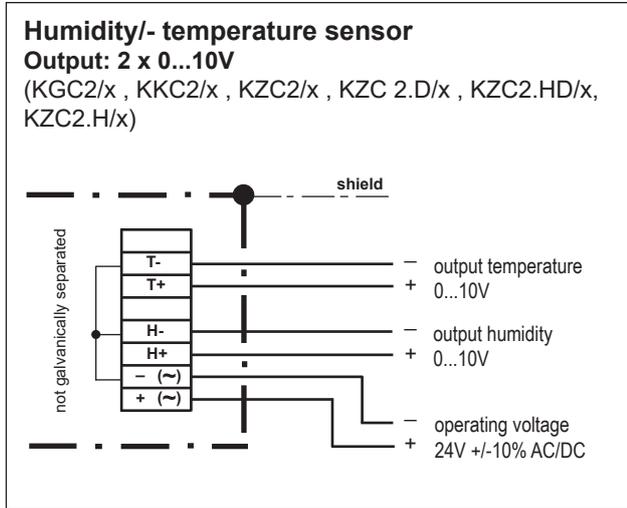
Dimensions



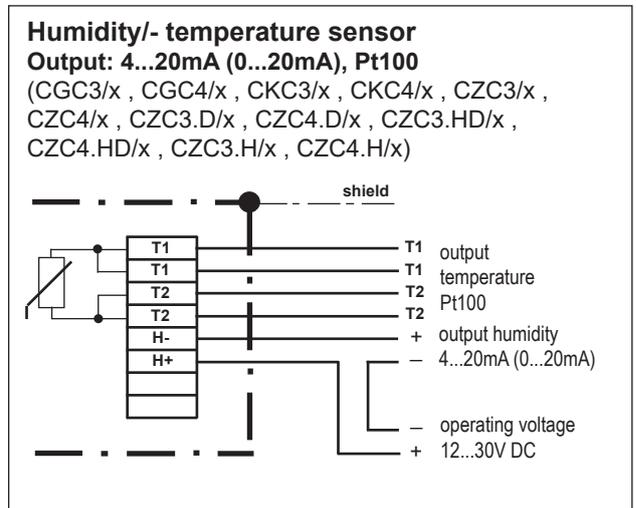
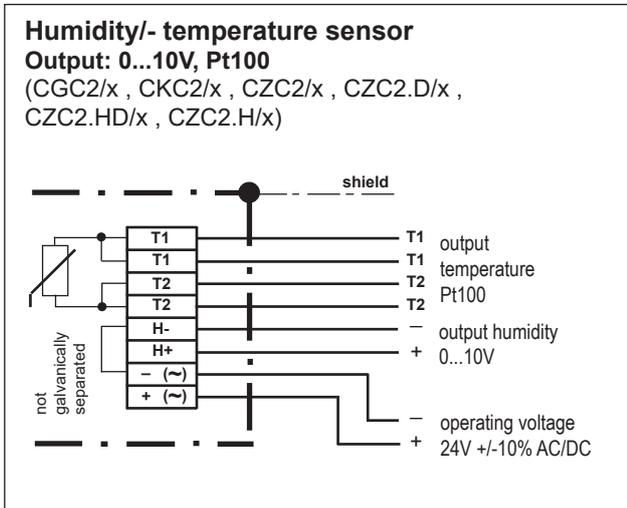
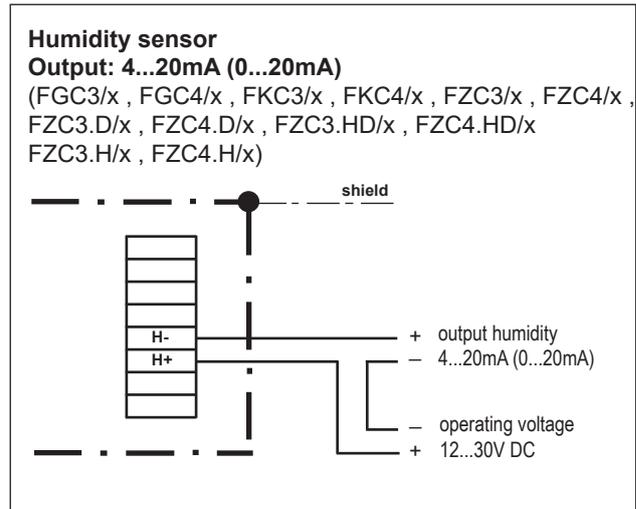
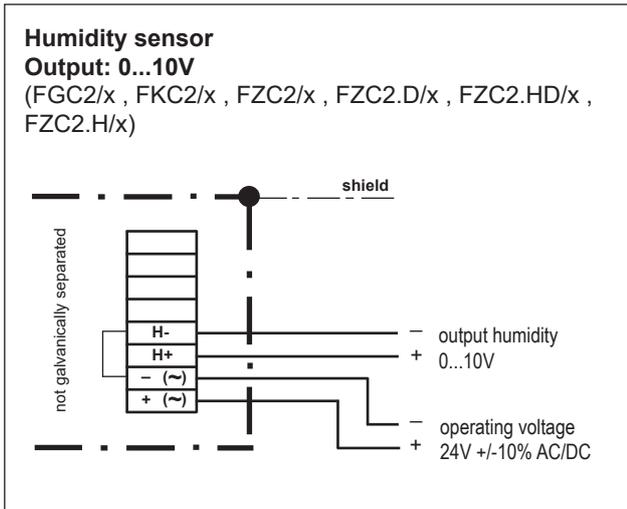
Connection diagram

Humidity/- temperature sensors

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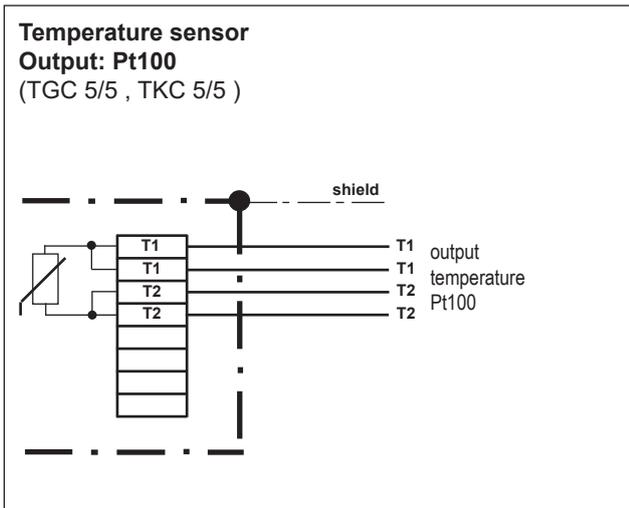
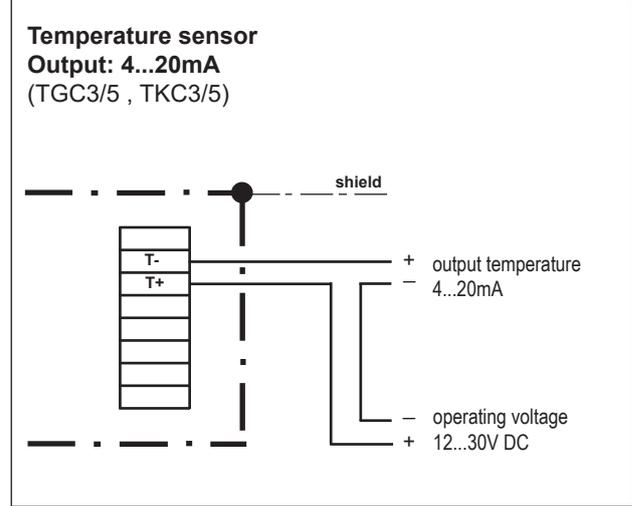
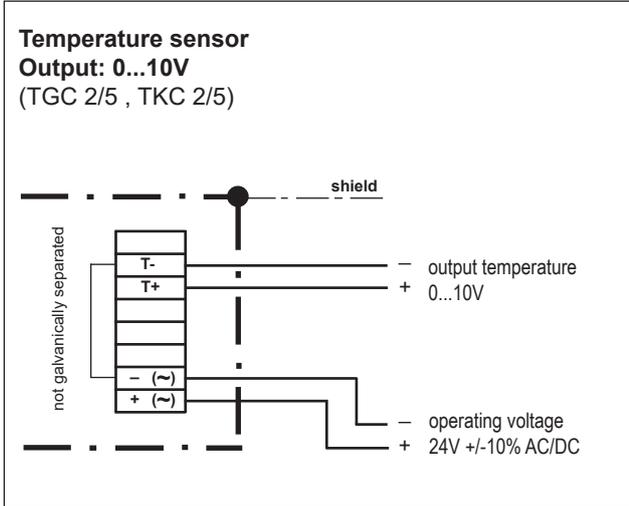
The electrical connection must only be carried out by properly qualified personnel.



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 The electrical connection must only be carried out by properly qualified personnel.