



## Product info sheet no. C 4.2

### Humidity / temperature sensors

Compact sensors in a high-grade steel housing

MELA®-humidity/-temperature sensors in the VC and VR series are rod-shaped, compact sensors. They can be used in a wide range of applications and have been specially developed for use in extreme conditions. They are available with a 1.5 m connecting cable (VC series), without cable (VK series) or with a robust aluminium connecting head and terminal screws (VR series) for measuring relative humidity and temperature in air and other non-aggressive gases.

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.

Their design also makes them ideally suited for performing equilibrium humidity measurements in bulk materials and in brickwork (only series .../5).

#### Technical Data

##### Output 1: relative humidity

measuring range ..... 0...100% rh  
 accuracy (MR 5...95% rh at 10...40°C) ..... ±2% rh  
 influence of temp. <10°C, >40°C ..... 0.1%/K additional

##### Output 2: temperature

measuring element (ref. DIN EN 60751) .... Pt 100 class B  
 measuring range ..... -30...+70°C  
 accuracy

output: 0...1V (-27...70°C) ..... ±0.2 K  
 0...10V (-29...70°C) ..... ±0.2 K  
 4...20mA ..... -0.2 ... +0.6 K  
 (depending on the air speed)

influence of temp. <10°C, >40°C ..... ±0.007 K/K additional

##### Other data

ambient temperature ..... -40...+80°C  
 degree of protection electronics ..... IP 65  
 degree of protection of sensor head depends on used filter

ZE13 ..... IP 65  
 ZE04 ..... IP20

operating voltage:

current output ..... 12...30V DC  
 voltage output (0...10V) ..... 15...30V DC  
 voltage output (0...1V) ..... 6...30V DC

load resistance (0...10V, 0...1V) ..... ≥10kΩ/≥2 kΩ

load (current output) ..... acc.diagram  
 power consumption

0...10V, 2 x 0...1V ..... <5 mA  
 0...1V ..... <1 mA

minimum air speed (across the sensor)

output: 2 x 4...20mA ..... ≥1.5 m/s  
 4...20 mA, 2 x 0...10 V ..... ≥1 m/s  
 0...10V, 2 x 0...1V ..... ≥0.5 m/s

self-heating coefficient Pt100 (v=2 m/s in the 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

Measured variable	Analogue output	VK series without cable	VC series with 1,5m cable	VR series connecting head
<b>F</b> rel. humidity	4...20 mA	FVK3/x	FVC3/x	FVR3/x
	0...10 V	FVK2/x	FVC2/x	FVR2/x
	0...1 V	FVK1/x	FVC1/x	FVR1/x
<b>C</b> rel. humidity and temperature passive	4...20 mA, Pt100	CVK3/x	CVC3/x	CVR3/x
	0...10 V, Pt100	CVK2/x	CVC2/x	CVR2/x
	0...1 V, Pt100	CVK1/x	CVC1/x	CVR1/x
<b>K</b> rel. humidity and temperature active	2 x 4...20 mA	KVK3/x	KVC 3/x	KVR3/x
	2 x 0...10 V	KVK2/x	KVC 2/x	KVR2/x
	2 x 0...1 V	KVK1/x	KVC 1/x	KVR1/x
approx. weight		90 g	150 g	130 g

Special versions available on request

- x=5: sintered high-grade steel filter ZE13
- x=9: integrated element filter of PTFE and high-grade steel filter ZE04
- x=9-ME: glass Pt100 1/3-DIN cl.B and 5 m connecting cable for VC series

## User instructions

Install the Mela®-humidity/temperature sensors at a place in the room, plant or equipment where characteristic levels of humidity occur. Avoid installing them close to heaters or windows or against outside walls.

**Concerning the „VC“ and „VR“ series the specified minimum air speeds and the operating voltage-adapted current at current-output (diagram) should be complied with. Deviations may lead to additional corrupted measurement readings because the sensor self-heats clocked operation will help to avoid this).**

The sensor can be installed in any position. However, do avoid positions where water can enter. Dew formation and splashes do not damage the sensor, although corrupted measurement readings are recorded until all the moisture on and directly around the sintered inox filter has dried up. In order to maintain interference immunity in accordance with EN 61326 when it is in use, we recommend that you use a screened cable (type recommended: **8x AWG 26 C UL, order no. 5339**) for connecting sensors of the VR series, and have this fitted into the sensor's EMC conduit thread by a qualified electrician.

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

If there is an excessive build-up of dust, carefully unscrew the protective basket and rinse it out. It is important not to touch.

touch the highly sensitive sensing element in the process. The sintered protective basket should be in an absolutely dry condition when it is screwed on again in order to avoid measurement errors.

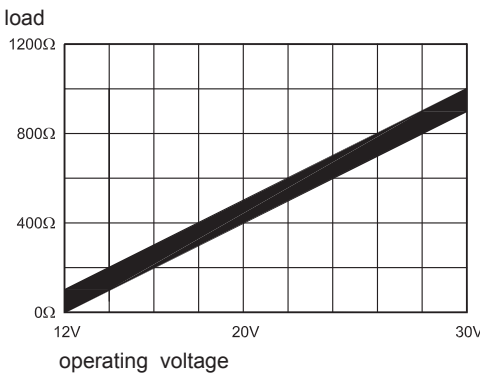
As a mounting support we recommend the mounting plate **type ZA 24** (stainless steel base plate with brass screw connections) or **ZA25** (stainless steel base plate with stainless steel screw connections) (see product info sheet no. F 5.1).

In order to check functioning in the place of installation, we recommend that you use the **ZE 31/1-type Mela® humidity standard** with **ZE 33-type testing adapter** (product info sheet no. F 5.2).

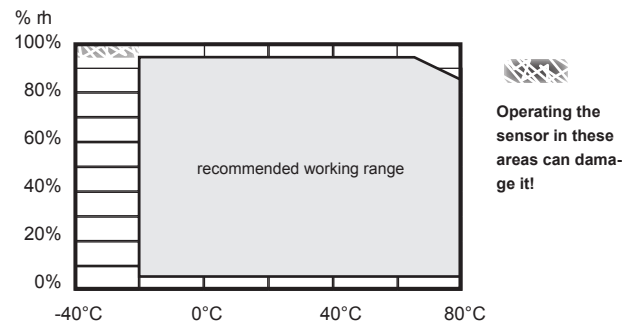
The humidity sensor can also be used for measuring the humidity of the material via the measurement of the equilibrium humidity. Therefore insert the sensor head far enough into the material to be measured (e.g. bulk material or brickwork) and seal it in order to eliminate any connection with the ambient humidity in the room. The relative humidity is measured, which is a measure of the moisture of the material, as equilibrium humidity via the sorption isotherms of the material.

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.

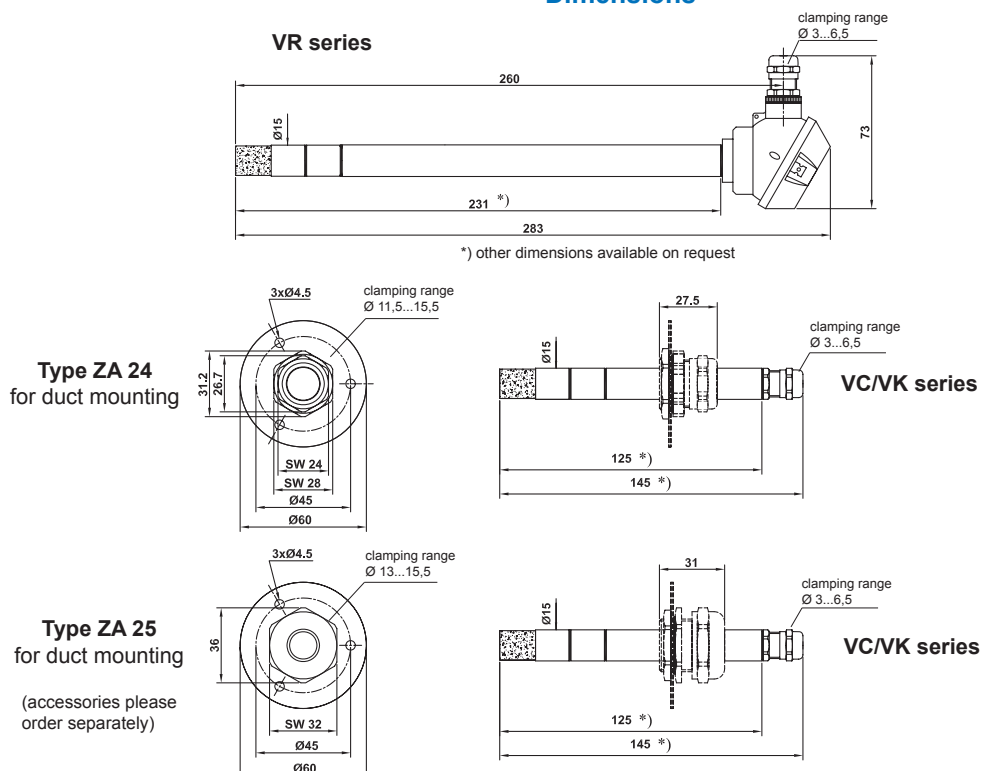
## Load at current output



## Working range of humidity and temperature



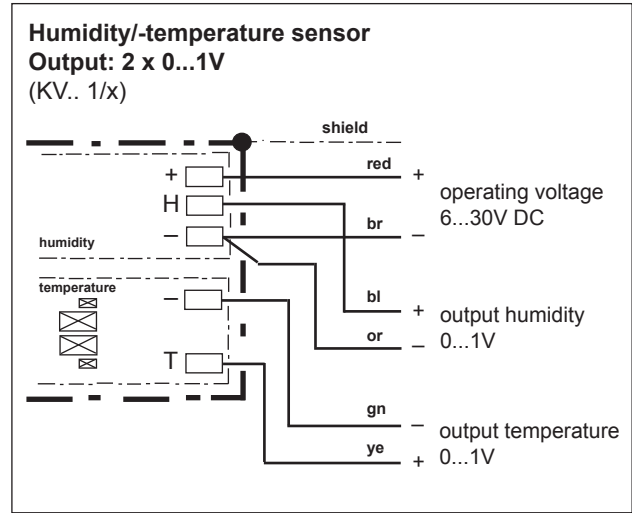
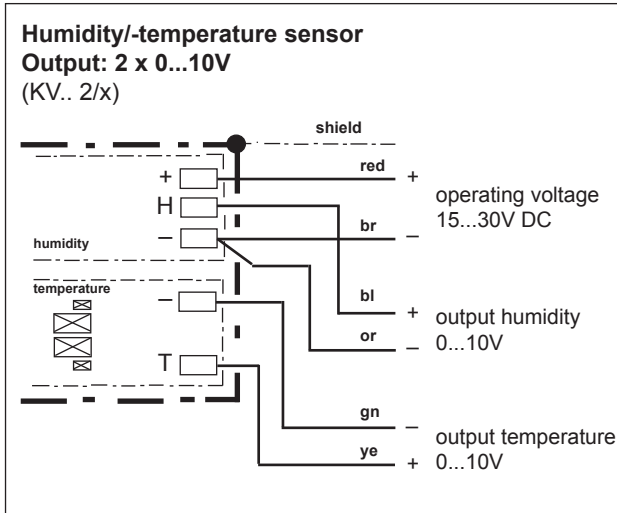
## Dimensions



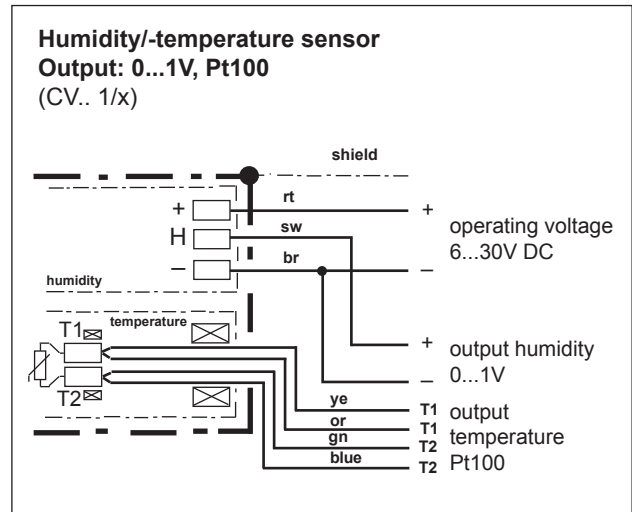
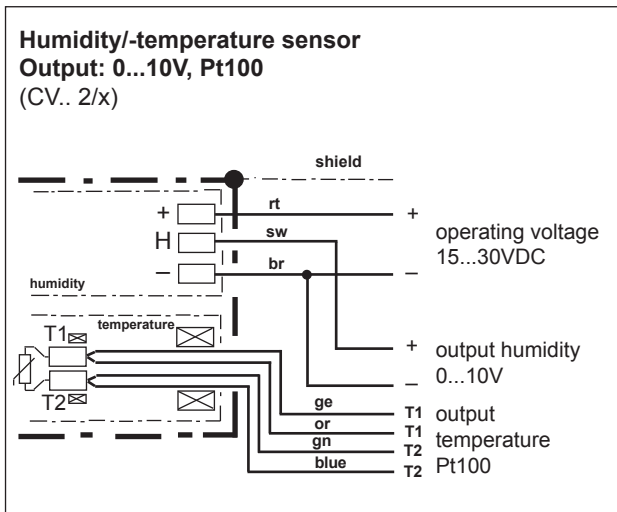
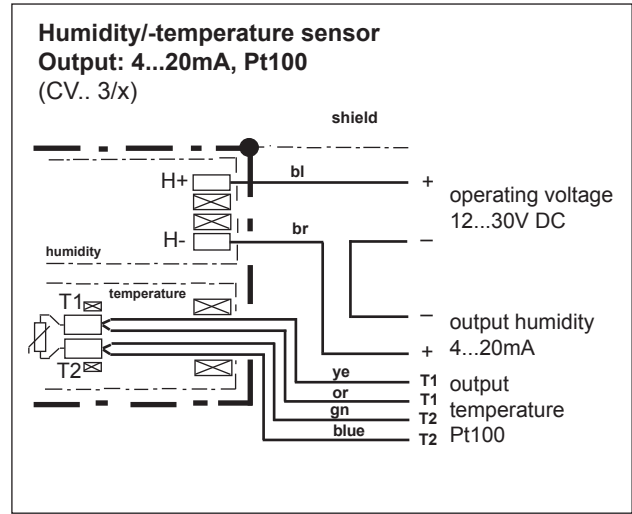
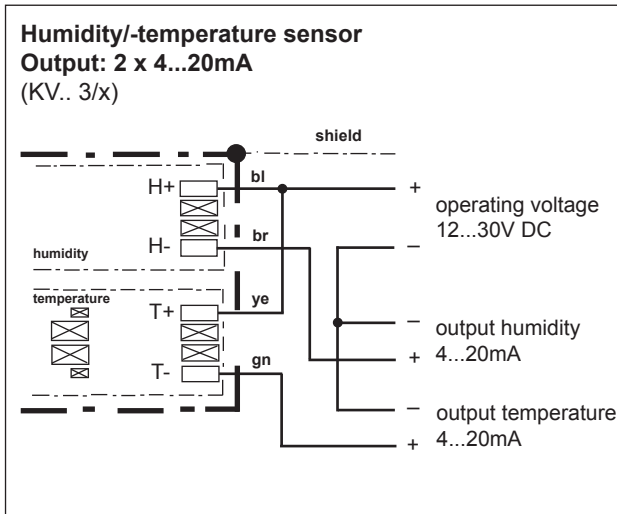
Connection diagram

Humidity/-temperature sensors

Compact sensors in a high-grade steel housing  
VC series



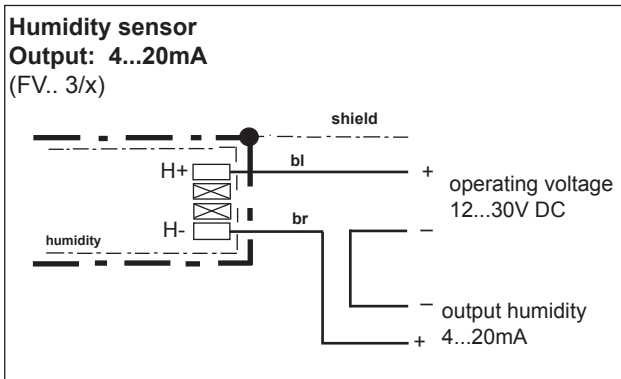
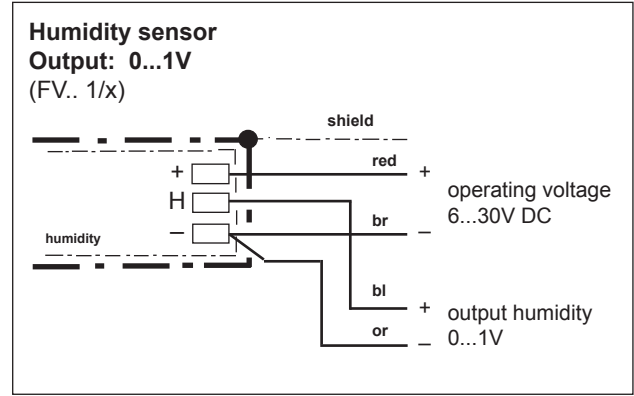
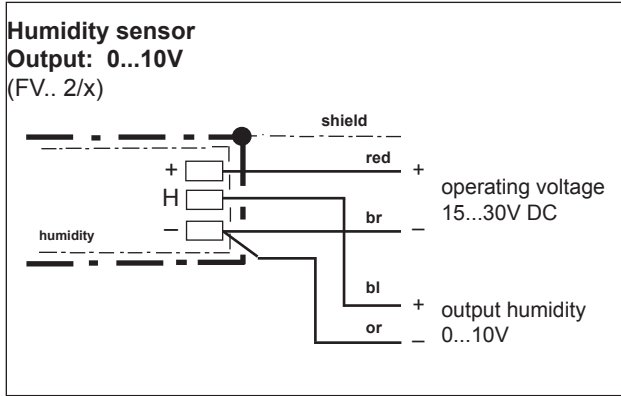
⚠ The electrical connection must only be carried out by properly qualified personnel.




**Connection diagram**

**Humidity/-temperature sensors**

Compact sensors in a high-grade steel housing  
**VC series**

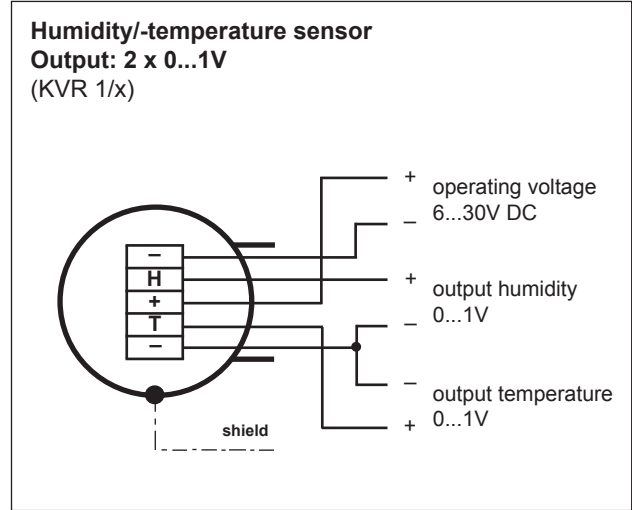
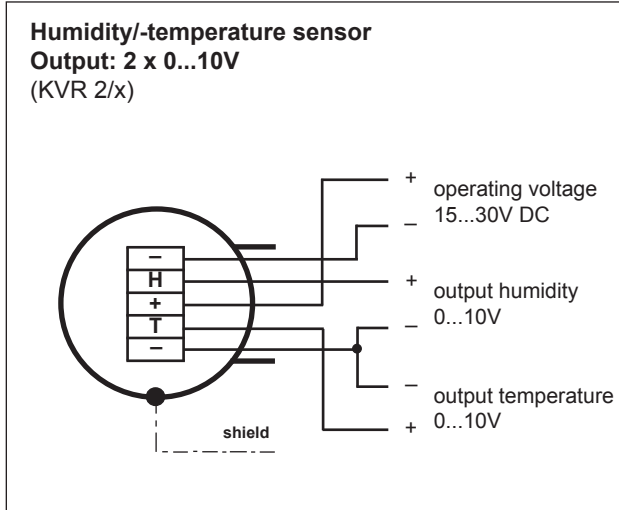


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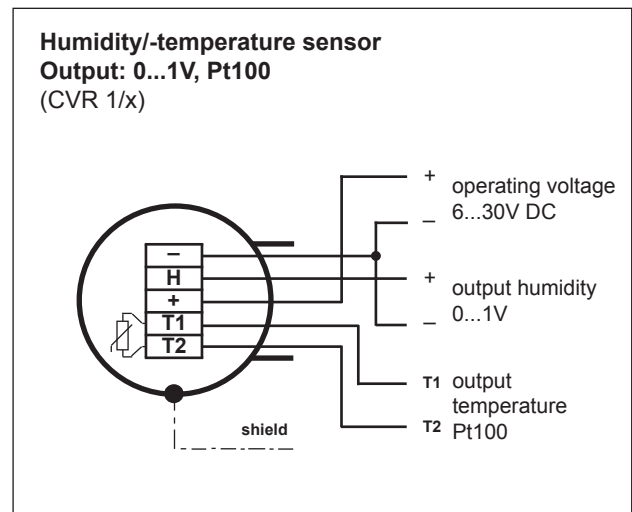
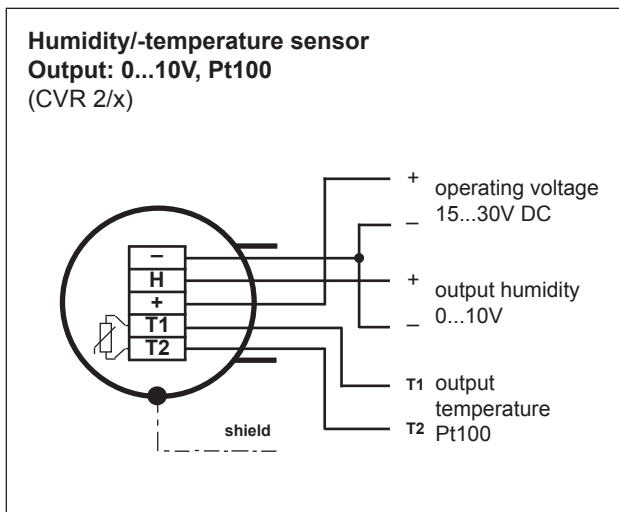
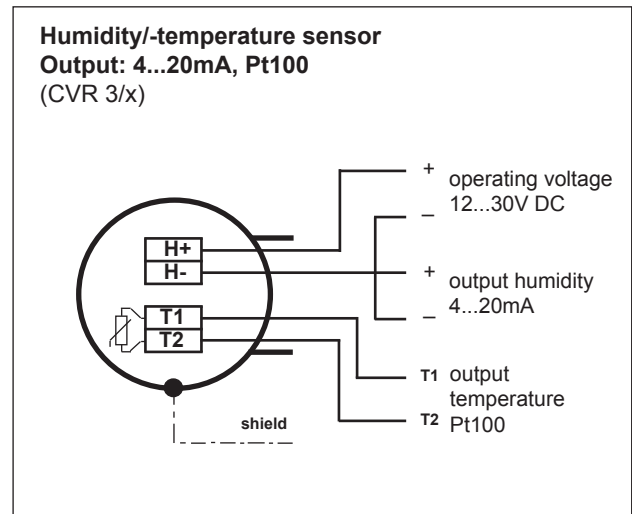
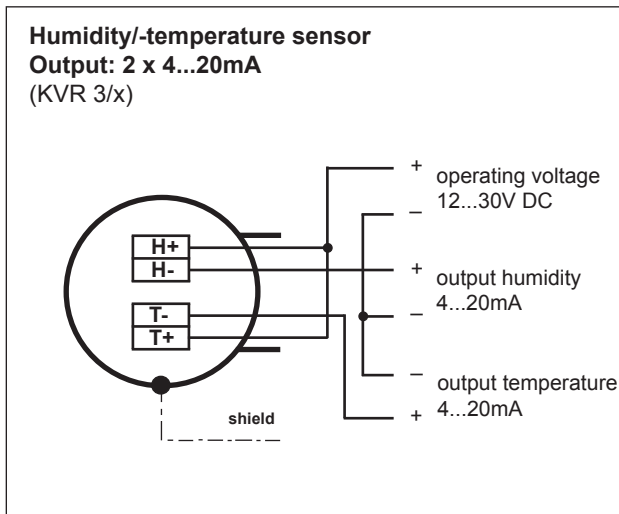
Connection diagram

Humidity/-temperature sensors

Compact sensors in a high-grade steel housing  
VR series



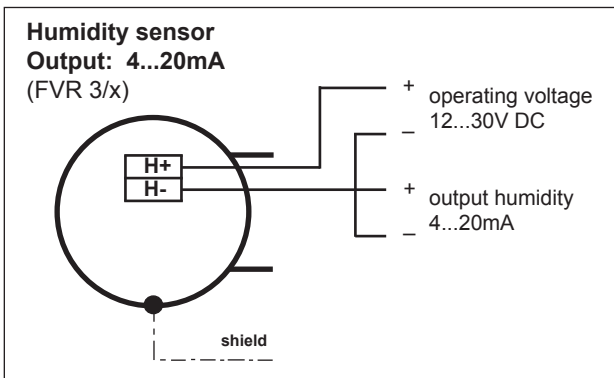
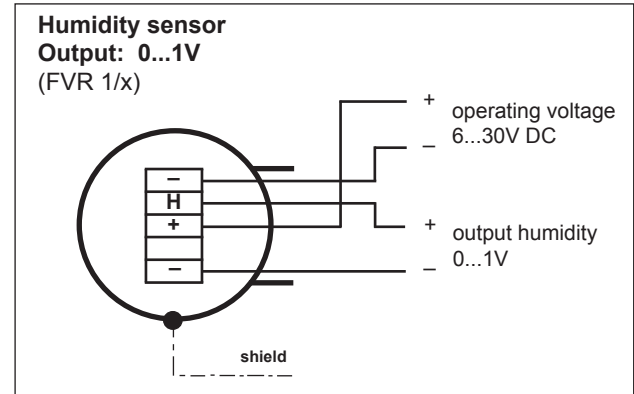
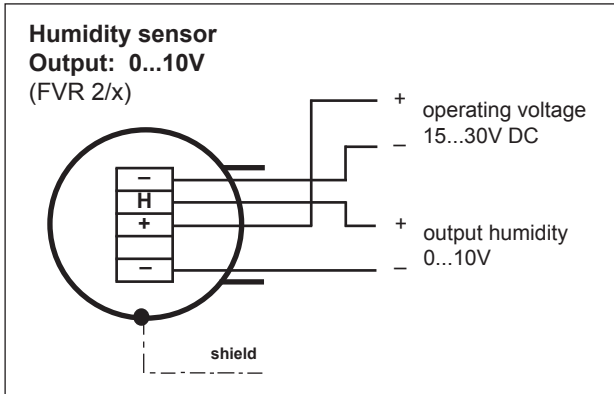
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## Connection diagram

## Humidity/-temperature sensors

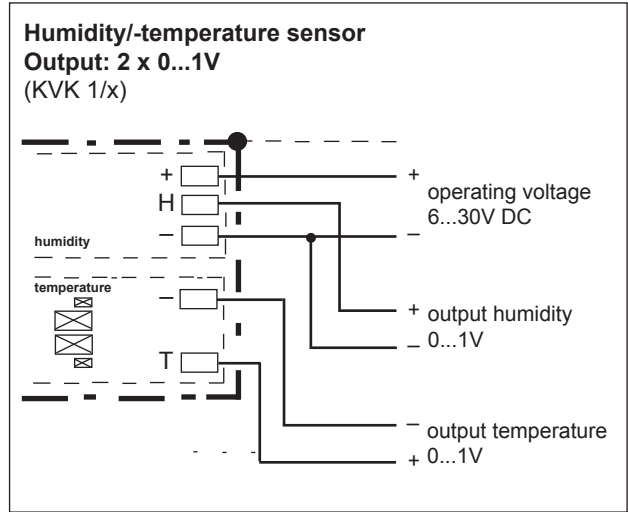
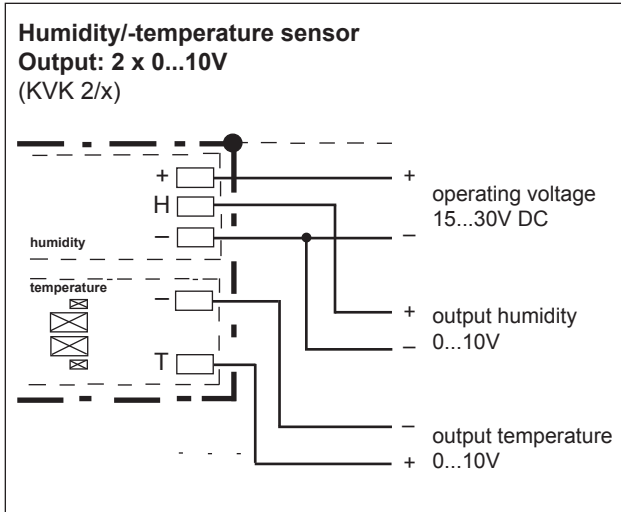
Compact sensors in a high-grade steel housing  
**VR series**




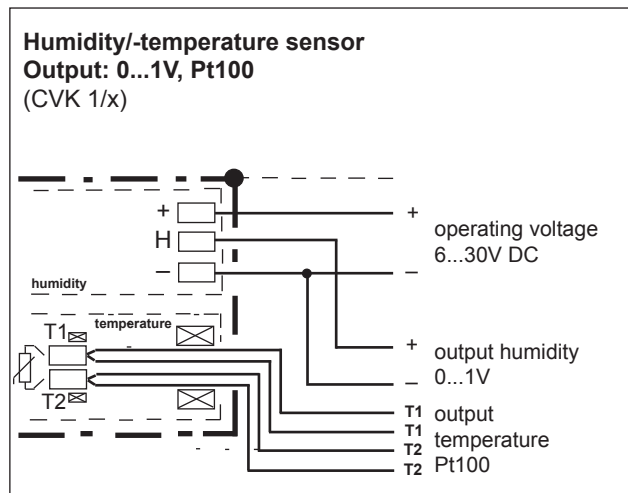
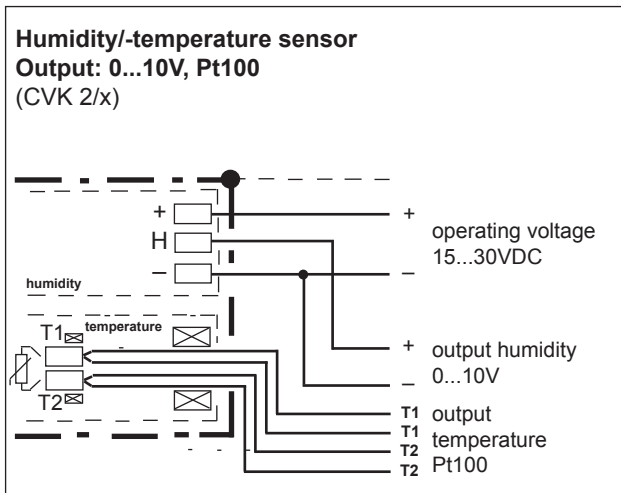
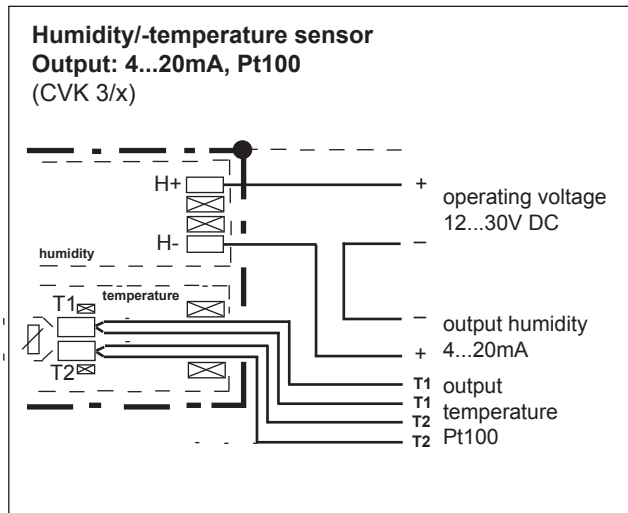
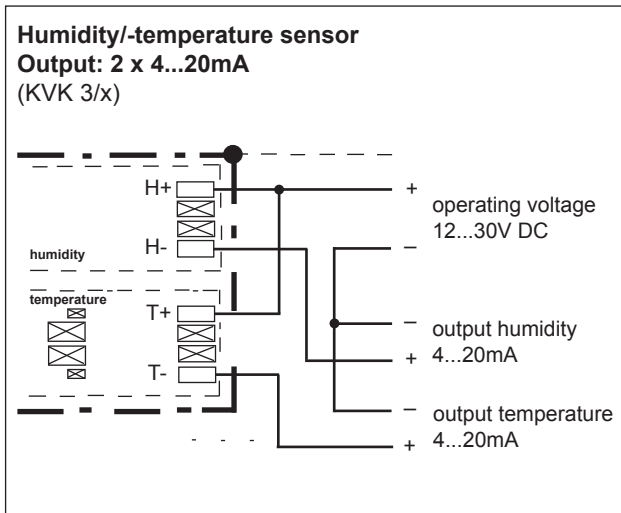
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Connection diagram

Humidity/-temperature sensors  
Rod-shaped compact sensors VK series

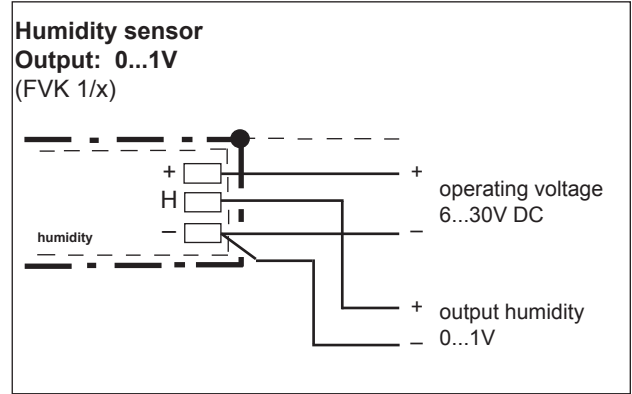
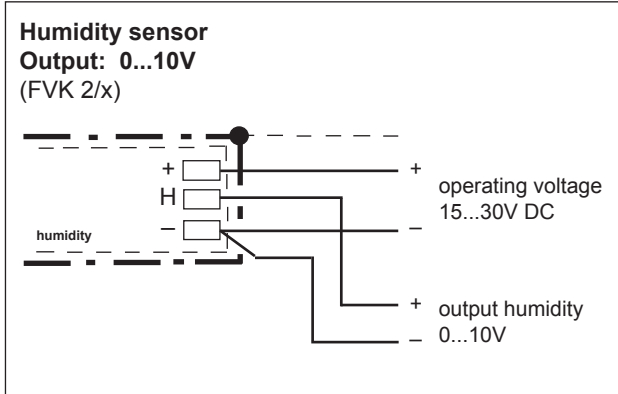



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**Connection diagram**

**Humidity/-temperature sensors**  
Rod-shaped compact sensors **VK series**



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