



FK120J for humidity  
 TFK120J for humidity and temperature

**Technical Data**

measuring range **humidity** ..... 0...100%rh  
 working range ..... 10...95%rh  
 measuring accuracy ..... ±3.5 %rh  
 measuring medium..... air, pressureless, non-corrosive/condence  
 temperature coefficient ..... 0.05%/K at 20°C and 50%rh  
 adjustment ..... at average air pressure 430m NN  
 half-life period (v=2m/sec) ..... approx. 10 sec  
 output **humidity** .... 0...20mA or 0...10V 4-wire system  
 ..... or 4...20mA2-wire system  
 measuring range **temperature**  
 ..... 0...+50°C, -10...90°C<sup>1)</sup>, -30...60°C, 0...100°C<sup>1)</sup>  
 measuring accuracy ..... ±0.8 K  
 working range ..... -10...+60°C  
 output **temperature** .... 0...20mA or 0...10V 4-wire-system  
 ..... or 4...20mA2-wire-system  
 linearity tolerance ..... <0.5%  
 operating voltage ..... 15..24V DC / 24V AC  
 max. load for current output ..... 500 ohms  
 min. ballast resistance for voltage-output ..... 10 k ohms  
 internal consumption per measuring range (4-wire) ..... 15 mA  
 permissible ambient temperature ..... -10...60°C  
 permissible air speed ..... 15 m/sec.  
 fixing ..... slots in housing base for wall mounting  
 mounting position ..... preferably ventilation slots at right-  
 angles to wind direction  
 contact ..... connecting terminals in the housing  
 connecting terminals .....  
 ..... for conductor cross-sections 1.5mm<sup>2</sup>  
 cable connection ..... simple shielding  
 electromagnetic compatibility EMC  
 according to ..... DIN EN 61326-1 and 61326-2-3  
 housing ..... impact resistant plastic, light grey  
 dimensions ..... 115x70x43mm  
 protective system ..... IP20  
 weight ..... ca 0.2 kg

1) please heed working range

**Humidity Sensor FK120J**

with capacitive measuring element  
 with current or voltage output, to determine air humidity

**Humidity-temperature Sensor TFK120J**

with capacitive measuring element  
 with current or voltage output, to determine air humidity  
 and temperature

**Description of the sensor**

The FK120J (humidity only) / TFK120J (humidity and temperature) sensor measures the air humidity by means of a humidity-dependant condenser. The capacitive humidity measuring element, produced using thin-film technology, consists of a base plate, on which the electrodes are housed, and a hygroscopic polymer layer above it. The hygroscopic polymer layer absorbs water molecules from the medium to be measured (air) or releases them, thereby altering the capacity of the condenser. In a tandem-arranged electronic device, the change in capacity is processed via integrated signal preprocessing into standardised signals **0...20mA** or **0...10VDC** or **4...20mA**.

The measuring element is protected in the housing. The sensors are designed for pressureless systems - the measuring medium is non-corrosive air.

The TFK120J sensors also contain a Pt100 resistance for simultaneous temperature measurement. Its measured values are likewise converted into standardised signals **0...20mA** or **0...10VDC** or **4...20mA**.

**Maintenance**

The measuring element is maintenance free when the surrounding air is clean. Depending on type and concentration, agents that are corrosive and contain solvents can result in faulty measurements and can cause the sensor to break down. Substances deposited on the sensor (e.g. resin aerosols, lacquer aerosols, smoke deposits etc.) are damaging. Please consult the **application notes for humidity 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.

**ATTENTION:** Contact with the inner parts nullifies the guarantee.

## Overview of capacitive sensors operating voltage = 15...24V DC and/or 24V AC

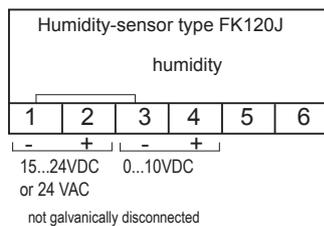
<b>FK120J</b>	0...100%rh	0...10V DC			15...24V DC 24V AC	3/4 wire	59014700
	0...100%rh	4...20 mA			15...24V DC	2 wire	59014800
<b>TFK120J</b>	0...100%rh	0...20 mA	0...+50°C	0...20 mA	15...24V DC	3/4 wire	59523030
	0...100%rh	0...10V DC	0...+50°C	0...10V DC	15...24V DC 24V AC	3/4 wire	59524747
	0...100%rh	4...20 mA	0...+50°C	4...20 mA	15...24V DC	2 wire	59524848
	0...100%rh	4...20 mA	-30...+60°C	4...20 mA	15...24V DC	2 wire	59574848
	0...100%rh	0...20 mA	0...+50°C	0...20 mA	24V AC	4 wire	59524242
	0...100%rh	0...20 mA	-30...+60°C	0...20 mA	24V AC	4 wire	59574242
	0...100%rh	0...20 mA	-10...+90°C	0...20 mA	24V AC	4 wire	59624242
	0...100%rh	0...20 mA	0...100°C	0...20 mA	24V AC	4 wire	59544242

\* observe max. temperature range

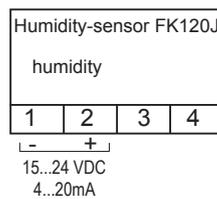
## Connection diagram

EMC-information: use shielded signalling lines and earth the shielding!

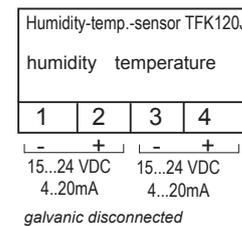
3/4-wire system



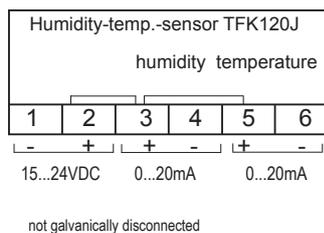
2-wire system



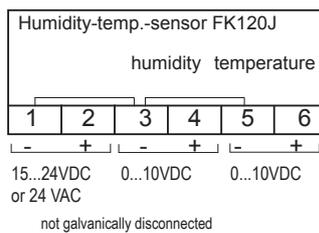
2-wire system



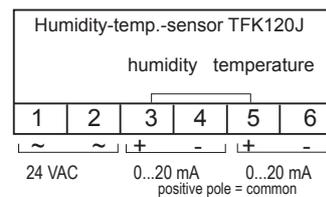
3/4-wire system



3/4-wire system

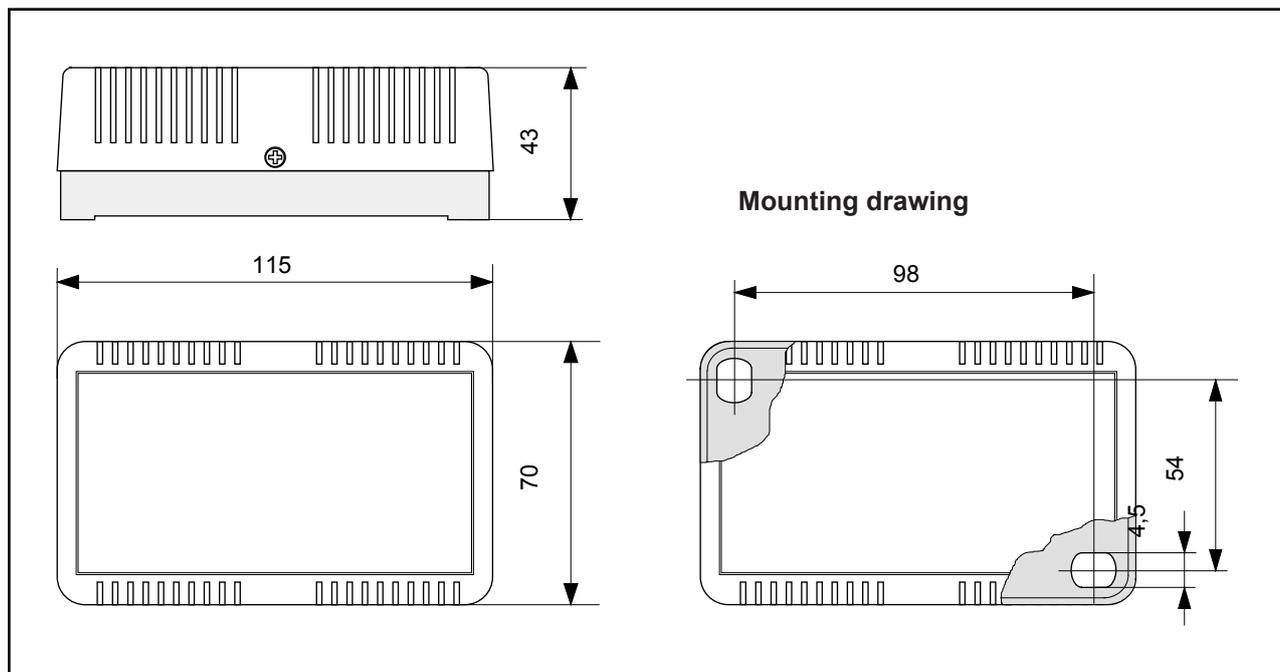


4-wire system (AC-version)



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

## Dimensions diagram



### Mounting instructions

The room sensor should be mounted on a vertical wall about 1.5m above the floor.

Do not fit above radiators, near windows or doors, on areas exposed to intense vibration or direct sunlight, exterior walls or chimneys. Under no circumstances must the sensors be mounted into a wall or niche. The sensors should be protected from dripping water or splashes. Ensure that no air can flow into the interior of the housing via the concealed cable lead. Do not use a silicon sealing compound to seal the cable lead.

The sensors should be mounted such that air in the room can flow upwards unimpeded through the ventilation slots in the housing cover.

The temperature coefficient as well as the self-heating of the electronic may vary according to the location and the application (especially with sensors where electronic and measuring system are integrated in one housing).

### Guide to installation

Interference is often to be encountered during installation. The correct installation procedure can prevent interference to a very large extent. However, some ground rules should be observed.

To avoid interference, suppression should be carried out in accordance with VDE 0875 and VDE 0874

(VDE - this is assumed to be the *Vorschriftenwerk Deutscher Elektrotechniker* - regulations governing German electrical engineers).

Fundamentally, interference must be removed at its source, where suppressor material is most effective. Interference can, however, also result from electromagnetic fields via signalling lines. The EMV law determines the corresponding protective measures. All Galltec equipment is designed in accordance with European standards EN 50081-2 and EN 50082-2 (for industrial locations). In addition, further protective measures must be observed.

Unavoidable sources of interference should be kept at a good distance from the control systems.

Data and signalling lines should not be used in parallel with control, networking and power lines.

For data and signalling lines, shielded cable should be used, and the shielding must be applied to the earth terminal. Ensure that earth circuits and fault currents do not arise as a result of a second earth connection.

For equipment with a network connection, it is recommended that a separate network circuit be used.

During the switch process, electrical power consumers such as switch contactors, magnetic valves etc. produce induction voltages that can cause interference. In the trade there is an abundance of protective and suppressor component parts that are most effective when applied directly to the source of the trouble.

A suitable suppressor has the added advantage that components such as relays, microswitches etc. have a longer service life.

Further difficulties during installation can arise if signalling lines are joined together with common lines. It is essential to check whether this is permissible. Interference is particularly likely when installing using equipment of different makes. Here, too, the trade offers isolating amplifiers that overcome the problem.