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### Description of the sensors

The sensors FK80J (humidity only) / TFK80J (humidity and temperature) measure the air humidity by means of a humidiy-dependant condenser. The capacitive humidity measuring element, produced using thinfilm technology, consists of a base plate, on which the electrodes are housed and a hygroscopic polymer layer avove 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 signals-0..20mA or 0..10VDC or 4..20mA.

The measuring element is protected by a protective guard. The sensors are designed for pressureless systems - the measuring medium is non-corrosive air.

The TFK80J sensors also contain a semi-conductor temperature sensor for simultaneous temperature measurement. Its measured values are likewise converted into standardised signals 0..20mA or 0..10VDC or 4..20mA

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.

# Maintenance - Application instructions - Influence of dirt

The measuring element is maintenance free when the surrounding air is clean. 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 breake down. Direct sunlight should be avoided. Substances deposited on the sensor are damaging as they eventually form a water-repellent film (this applies to all humidity sensors with hygroscopic measuring elements). Such substances are resin aerosols, lacquer aerosols, smoke deposits etc.

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.

## **Humidity Sensor FK80J**

with capacitive measuring element with current or voltage output 0...20mA / 0...10VDC or 4...20mA to determine relative air humidity in air channels

# Humidity-Temperature Sensor TFK80J with capacitive measuring element

with current or voltage output, 0...20mA/0...10VDC or 4...20mA to determine relative air humidity and temperature in air channels

channels
Technical Data           measuring range humidity         0.100%RH           sensing element         capacitive FE09           accuracy         at 23°C (73,4°F)         ±2.0%RH (4060%RH)           at 23°C (73,4°F)         ±2.5%RH (otherwise)           includes linearity and repeatability         typ. less 0,15%RH per °C /°F
operating range
0100°C¹);       32+212°F         sensing element       Pt100 Class B         accuracy       at 010V       ±0.2 K ±0.36 °F         at (0)420mA       ±0.3 K ±0.54 °F         operating range       -30+80°C (-22176°F)         signal output temperature       010V or 020mA or 420mA
Other signal output temperature NTC; PTC; KTY; LMx35; Pt100; Pt1000; Ni1000; AD592; LM34; BALKO 1k $\Omega$ ; SILICON 2k $\Omega$ ; SEMICONDUCTOR 559 mVDC @23°C (75°F) Thermistors @ 25°C (77°F) 1,8k $\Omega$ ; 2,252k $\Omega$ ; 3k $\Omega$ ; 5k $\Omega$ ; 10k $\Omega$ ; 1,8k $\Omega$ (Type II; III, CSI); 20k $\Omega$ ; 100k $\Omega$
power supply
resistance to interference
max. load $R_L(\Omega) = \frac{\text{supply - 10 VDC}}{0.02 \text{ amps}}$
$\begin{array}{llllllllllllllllllllllllllllllllllll$
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probe length

mounting position ......as you like

contacting ...... connecting terminals in the housing

housing.....polystyrol-ABS

protective system ......IP64

weight.....approx. 0.3 kg (0.6 lbs)

connecting terminal conductor cross sections

...... 1.5mm<sup>2</sup> (0,023"<sup>2</sup>)

<sup>1)</sup> please observe working range

<sup>&</sup>quot;subject to technical modifications"

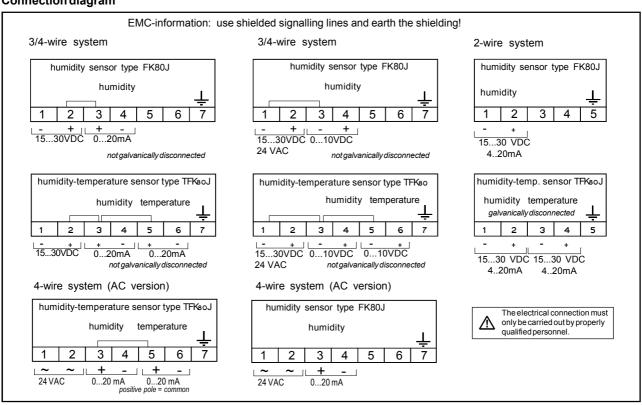
FK80J DC-version	0100%RH 0100%RH 0100%RH	010VDC 420mA 020mA				1530VDC / 24 VAC 1530VDC 1530VDC	3/4wire 2wire 3/4wire	58014700 58014800 58013000
TFK80J	0100%RH 0100%RH 0100%RH 0100%RH	010VDC 010VDC 010VDC 010VDC	-30+60°C 0100°C* 0+50°C -10+90°C	-22+140°F 32+212°F** 32+122°F 14194°F**	010VDC 010VDC 010VDC 010VDC	1530VDC / 24 VAC 3/4w 1530VDC / 24 VAC 3/4w 1530VDC / 24 VAC 3/4w 1530VDC / 24 VAC 3/4w		<b>58574747</b> <b>58544747</b> 58524747 58624747
	0100%RH 0100%RH 0100%RH 0100%RH 0100%RH	420mA 420mA 420mA 420mA 420mA	050°C -30+60°C -20+80°C -10+90°C 0100°C*	-30+60°C		58524848 58574848 58264848 58624848 58544848		
	0100%RH 0100%RH 0100%RH 0100%RH	020mA 020mA 020mA 020mA	0+50°C -10+90°C** -30+60°C 0100°C*	10+90°C** 14194°F** 020mA 1530VDC 3/4wire -30+60°C -22+140°F 020mA 1530VDC 3/4wire				<b>58523030</b> <b>58623030</b> 58573030 58543030
Speciality FK80JPt100	0100%RH 0100%RH 0100%RH	020mA 010VDC 420mA	PT100 PT100 PT100	58703050 58704650 58704850				
TFK80xxx	0100%RH	%RH 010VDC 420mA NTC; PTC; KTY; LMx35; Pt1000; Ni1000; AD592; LM34; BALKO 1kΩ; SILICON 2kΩ; SEMICONDUCTOR 559 mVDC @23°C (75°F) Thermistoren @ 25°C (77°F) 1,8kΩ; 2,252kΩ; 3kΩ; 5kΩ; 10kΩ; 1,8kΩ (Type II; III, CSI); 20kΩ; 100kΩ						

### Overview of capacitive sensors power supply 24V AC ±10 %

FK80J AC-version	0100%RH 0100%RH	010VDC 020mA				1530VDC / 24VAC 24VAC	3/4wire 4wire	<b>58014700</b> 58014200
TFK80J	0100%RH	010VDC	0+50°C	32+122 °F	010VDC	1530VDC / 24 VAC	3/4wire	58524747
	0100%RH	010VDC	-30+60°C	-22+140°F	010VDC	1530VDC / 24 VAC	3/4wire	<b>58574747</b>
	0100%RH	010VDC	-10+90°C	14194°F**	010VDC	1530VDC / 24 VAC	3/4wire	58624747
	0100%RH	010VDC	0100°C*	32+212°F	010VDC	1530VDC / 24 VAC	3/4wire	<b>58544747</b>
	0100%RH	020mA	050°C	32+122 °F	020mA	24VAC	4wire	58524242
	0100%RH	020mA	-30+60°C	-22+140°F	020mA	24VAC	4wire	58574242
	0100%RH	020mA	-10+90°C	14194°F**	020mA	24VAC	4wire	58624242
	0100%RH	020mA	0100°C*	32+212°F	020mA	24VAC	4wire	58544242

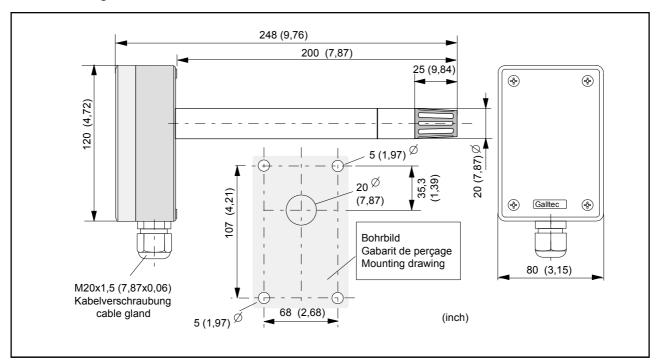
<sup>\*</sup> observe max. temperature range

## Connection diagram

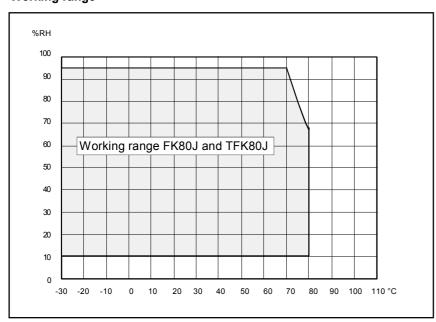


<sup>\*\*</sup> suitable for EDJ controller

## **Dimensions diagram**



## Working range



## Accessories



## Cleaning-instruction

The surface of the measuring element must not be touched.

To clean the measuring element, its surface can be rinsed, however should only be moistened with water drops; immersing into distilled water is possible but pressure should be avoided.

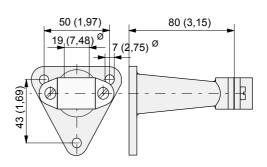
Solvents cannot be used for this purpose.

Correct measuring values will be regained as soon as the measurring element is dry.

The measuring elements can also be blown off carefully; do not use compressed air.

On manipulation of the interior parts warranty will expire

Console for wall mounting item no. 20.009



### **Checking calibration**

It is possible to use sensor checks in order to test the humidity sensors from time to time for accuracy. The physical process is described in detail in **DIN 50 008, IEC Publikation 260, ISO/R 483-1966**. In the air space above an aqueous saturated saline solutaion an ambient climate is formed whose air humidity is dependant on the water vapour pressure of the saline solution.

The Galltec+Mela sensor checks are designed so that a foil permeable to vapour is positioned between the saline solution and the air space (space in which the measuring element is located). This makes carrying out the sensor checks a very straightforward procedure as follows:

Remove the protective cap of the sensor check while opening the PG screw and introduce the sensor duct up to the mark. Tie the sensor in the PG screw. Please make sure that the sensor check is well tight and air-sealed while caring out your measurement. If you are using a sensor with a "Polyga" measuring element, ensure particularly that the lid of the sensor is well tight and that the cable duct is well sealed.

After a certain period of time, a constant humidity builds up between the saline solution and the air space in which the humidity measuring element is located. Depending on the type of saline solution and the sensor check, humidity values range from 33%RH to 98%RH. The standard values of the

Sensor check
33%RH
<b>33/01/11</b>

°F	34	37	40	43	45	48
°C	5	10	15	20	25	30
%RH	34	34	34	33	33	33

Screw the check firmly onto the humidity sensor. Wait for 2 hours. Ensure that the temperature is kept constant. Take humidity reading according to temperature.

Sensor check
55%RH

°F	34	37	40	43	45	48
°C	5	10	15	20	25	30
%RH	58	57	56	55	53	52

Screw the check firmly onto the humidity sensor. Wait for 2 hours. Ensure that the temperature is kept constant. Take humidity reading according to temperature.

Sensor check 76%RH

°F	34	37	40	43	45	48
°C	5	10	15	20	25	30
%RH	76	76	76	76	76	75

Screw the check firmly onto the humidity sensor. Wait for 2 hours. Ensure that the temperature is kept constant. Take humidity reading according to temperature.

Galltec+Mela sensor checks are 33%RH, 55%RH, 76%RH and 98%RH. We recommend a compensation period of about 2 hours. Please ensure that there are no major fluctuations in temperature during this period. Temperature fluctuations severely disturb the equilibrium.

The equilibrium moisture content is dependent on the temperature - according to the type of salt. The corresponding values are given in a correction table located on the sesnsor check.

It is important that you replace the sealing cap of the sensor check after use, otherwise the water of the saline solution will evaporate and the check will become unusable.

#### **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+Mela 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 is 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.