



## D Series Sensors for Humidity and Temperature Measurement With calibrated dModul

### Type DI Room version Optional display

- dynamic MELA® humidity sensing element
- calibrated dModul for humidity and temperature measurement
- with integrated measuring chamber
- easy to install
- operating temperatures up to 60°C

The core part of the D Series is the digital calibrated dModul, which processes the measurement values of relative humidity and temperature individually. The values are compared to the calibration values stored in the dModul and communicated digitally to the transmitter electronics, where they are processed to standardised current and voltage signals.

The integrated measuring chamber of the room version is separated from the electronics. Thus, a good air circulation around the sensing elements is provided.

The housing of the room version has a simple and robust closing mechanism. After mounting the base part, the top which contains the transmitter electronics, can be easily clipped into place and pressed shut without any tool.

## Technical data

### Humidity

|                                      |                 |
|--------------------------------------|-----------------|
| measuring range                      | 0...100 %RH     |
| measuring element                    | capacitive FE09 |
| measuring accuracy                   |                 |
| 40...60 %RH                          |                 |
| (at 23°C / U <sub>B</sub> =24 V DC ) | ±2,5 %RH        |
| 10...40 %rF or 60...90 %RH           |                 |
| (at 23°C / U <sub>B</sub> =24 V DC ) | ±3 %RH          |
| influence of temperature             | ±0,05 %RH/K     |

### Temperature

|   |  |
|---|--|
| measuring element                       | Pt1000   |
| measuring ranges (outputs)              | 0...+50°C<br>-30...+70°C<br>0...+100°C<br>further ranges<br>on request |
| measuring accuracy                      |  |
| (at 23°C / U <sub>B</sub> =24 V DC )    |  |
| sensors with active temperature signal  |  |
| voltage output 10°C...40°C              | ±0,25 K  |
| current output 10°C...40°C              | ±0,4 K   |
| influence of temperature <10°C or >40°C | ±0,01 K/K  |

## Electrical data

|  |   |
|--|---|
| outputs  | 0...1 V DC<br>0...10 V DC<br>4...20 mA<br>passive temperature<br>outputs on request |
| voltage supply                                 | see type survey   |
| consumption of electronics<br>(voltage output) | typ. 7 mA   |

Load R<sub>L</sub>  
(current output)

$$R_L(\Omega) = \frac{\text{voltage supply} - 10 \text{ V}}{0,02 \text{ A}} \pm 50 \Omega$$

|  |                                     |
|--|-------------------------------------|
| min. load resistance<br>(voltage output) | ≥10 kΩ                              |
| electromagnetic<br>compatibility         | ref. EN 61326-1<br>and EN 61326-2-3 |

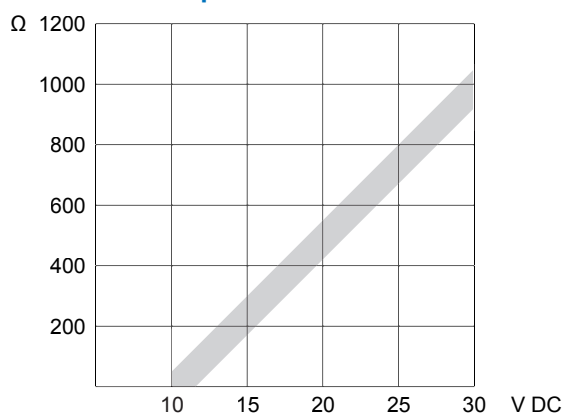
## Options

|         |   |
|---------|---|
| display | 2 lines<br>3 digits + 1 decimal place<br>display approx. 21 x 40 mm²<br>digit height approx. 8 mm |
|---------|---|

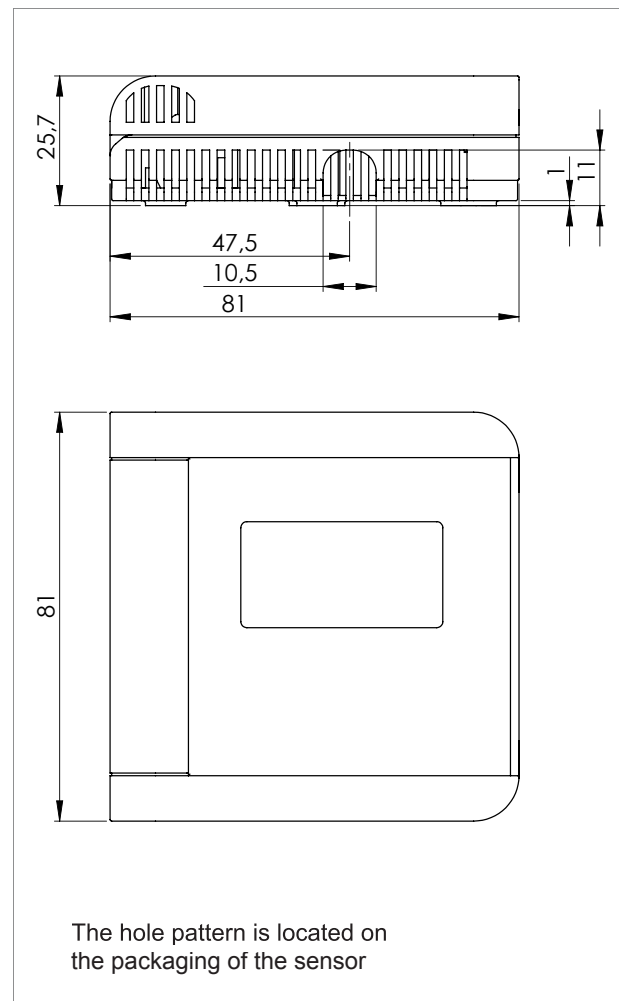
## General data

|                                    |                                      |
|------------------------------------|--------------------------------------|
| measuring medium                   | air, pressureless,<br>non-aggressive |
| operating temperatures             | -30...+60°C                          |
| storage temperatures               | -40...+85°C                          |
| connection                         | connecting terminals                 |
| wire diameter per connector        | max. 1,5 mm²                         |
| cable diameter total               |                                      |
| → cable on-wall                    | max. 7 mm                            |
| → cable in-wall                    | (5 mm recommended)                   |
| see: mounting instructions, page 4 |                                      |
| degree of protection               | IP 30D                               |
| material of housing                | ABS                                  |
| color of housing                   | RAL 9003<br>signal white             |

## Load at current output



## Dimensions



## Type survey DIF Humidity sensor

| Type | Housing                          | Physical values   | Measuring range | Output      | Voltage-supply $U_B$         |
|------|----------------------------------|-------------------|-----------------|-------------|------------------------------|
| DIF  | Room version<br>optional display | relative humidity | 0...100 %RH     | 0...1 V DC  | 6...30 V DC<br>6...26 V AC   |
|      |                                  |                   |                 | 0...10 V DC | 15...30 V DC<br>13...26 V AC |
|      |                                  |                   |                 | 4...20 mA   | 10...30 V DC                 |

## Type survey DIK Humidity and temperature sensor

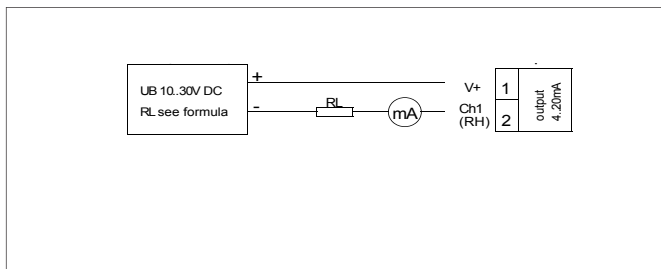
| Type | Housing                          | Physical values   | Measuring range                        | Outputs     | Voltage-supply $U_B$         |
|------|----------------------------------|-------------------|--|-------------|------------------------------|
| DIK  | Room version<br>optional display | relative humidity | 0...100 %RH                            | 0...1 V DC  | 6...30 V DC<br>6...26 V AC   |
|      |                                  | temperature       | -30...+70°C<br>0...+100°C<br>0...+50°C | 0...10 V DC | 15...30 V DC<br>13...26 V AC |
|      |                                  |                   |  | 4...20 mA   | 10...30 V DC                 |

## Type survey DIC Humidity and temperature sensor, passive temp. output

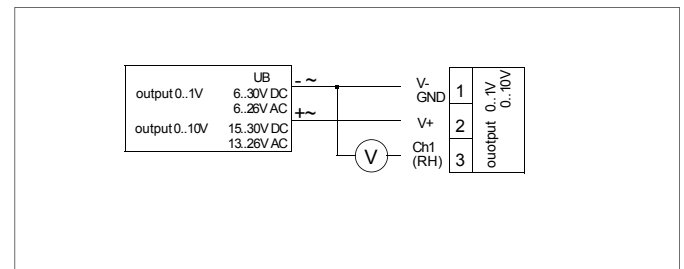
| Type | Housing                          | Physical values   | Measuring range | Outputs                            | Voltage-supply $U_B$         |
|------|----------------------------------|-------------------|-----------------|------------------------------------|------------------------------|
| DIC  | Room version<br>optional display | relative humidity | 0...100 %RH     | 0...1 V DC<br>temperature passive  | 6...30 V DC<br>6...26 V AC   |
|      |                                  | temperature       | passive         | 0...10 V DC<br>temperature passive | 15...30 V DC<br>13...26 V AC |
|      |                                  |                   |                 | 4...20 mA<br>temperature passive   | 10...30 V DC                 |

## Connection diagrams

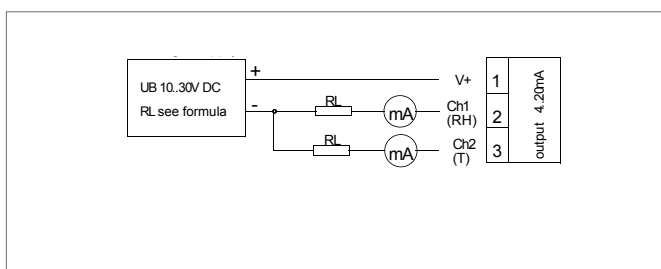
### DIF 4...20 mA



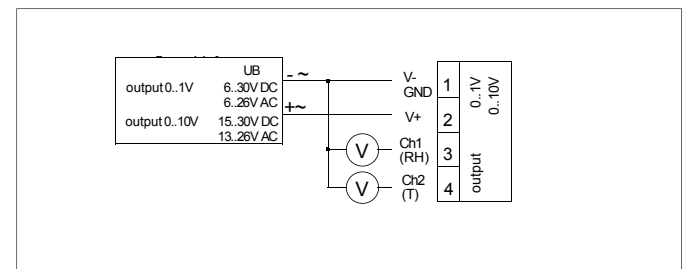
### DIF 0...1 V DC or 0...10 V DC



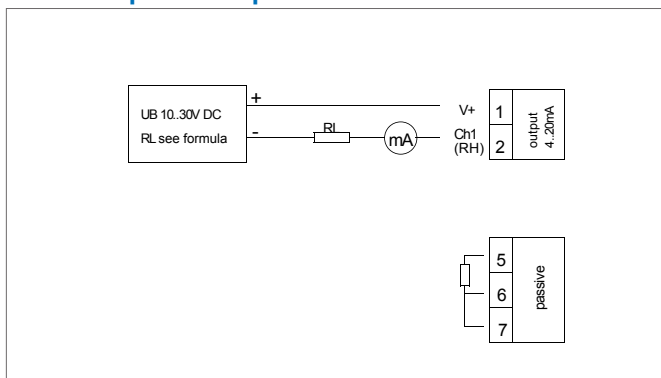
### DIK 2 x 4...20 mA



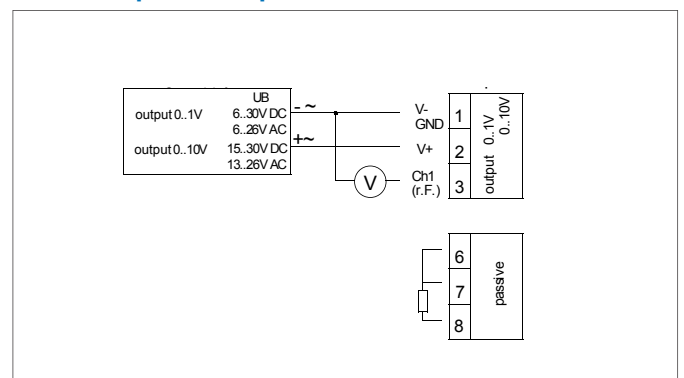
### DIK 2 x 0...1 V DC or 0...10 V DC



### DIC humidity: 4...20mA temperature: passive



### DIC humidity: 0...1 V DC or 0...10 V DC temperature: passive




## ESD protection advice

The sensors of the D Series contain components, which can be damaged by the effects of electrical fields or by charge equalisation when touched.

The following protective measures must be taken when the housing of the sensor is to be opened for connection or in situ alignment:

- Before opening the housing of the sensor, ensure electrical potential equalisation between you and your environment.
- Pay particular attention to ensure that this potential equalisation is maintained while you are working with the opened housing.

## Mounting instructions

|                     |  |
|---------------------|--|
| Position            | <p>Install the sensor at a place where characteristic levels of humidity occur. The measuring chamber should be located in streaming air. Avoid installation next to heaters, doors or on outer walls. Avoid places exposed to the sun.</p> <p>When mounting the sensor on an in-wall junction box, ensure by sealing that external air streams coming from the junction box can not enter the sensor .</p> <p>In order to insert the connection cable, prise the pre-cut part of the housing's base part open.</p> <p>In order to insert a on-wall cable, the bars of the immersed part of the housings side can be removed.</p>                  |
| Opening the housing | <p>Insert a flat-headed screw driver into the locking slots and push until the housing springs open.</p>   |
| Connection          | <p>The electrical connection must be carried out by qualified personnel only.</p> <p>The sensor contains sensitive electrical components. When opening the housing, make sure you comply with the electrostatic discharge precautions (ESD).</p> <p>Please pay attention to the ohmic resistance according to the operating voltage (see diagram on page 2) when using sensors with a current output. Else measurement errors may occur.</p> <p>Lines to and from the sensor must not be installed parallel to strong electromagnetical fields.</p> <p>If there is any chance of an electrical surge, please install surge protection devices.</p> |

## User instructions

|                     |   |
|---------------------|---|
| Dew formation       | <p>Dew formation does not damage the sensor, although measurement readings are corrupted until all moisture on and around the sensing element has dried up completely.</p>  |
| Damaging influences | <p>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.</p> <p>Substances deposited on the sensor (e. g. resin aerosols, lacuer aerosols, smoke deposits etc.) are damaging as they eventually form a water-repellent film.</p> |

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 quality of our products is guaranteed under our General Conditions of Sale. Data sheet DR\_EN. Issue April 2011. Subject to modifications.

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