



**Product info sheet no. C 2.6 - „Light Version“**  
**Humidity/temperature sensors**  
 for use in air-conditioning systems, commercial building control and ventilation technology

**Technical Data**

**Humidity**

measuring range ..... 0...100%rh  
 sensing element ..... capacitive FE09/4  
 accuracy at 23°C (73,4°F) ..... ±3%RH (40...60%rh)  
 at 23°C (73,4°F) ..... ±5%RH (otherwise)  
 working range ..... 15...90%rh  
 influence of temperature ..... typ. ± 0.2%RH per °C/°F  
 minimum air speed (only for PL, KL) ..... 1m/sec, 3ft/sec  
 Calibration ..... 1 point  
 measuring medium ..... air, pressureless, non-aggressive  
 output ..... 0...10V or 4...20mA

**Temperature with active output**

measuring range ..... 0...50°C (32...122°F)<sup>2)</sup>  
 sensing element ..... LM35  
 accuracy (10...40°C ; 50...104°F) ..... ±1 °C; ±1.8 °F  
 calibration ..... 1 point at 23°C  
 output ..... 0...10V or 4...20mA

**Electrical Data**

power supply:

current output (KL) (PL) ..... 12...24V  
 load ....  $R_L(\Omega) = \frac{\text{supply} - 10V \text{ DC}}{0,02 A} \pm 50 \Omega$

current output (WL) ..... 15...30V  
 max. load .....  $R_L(\Omega) = \frac{\text{supply} - 14V \text{ DC}}{0,02 A}$

voltage output (KL, WL) ..... 15...30V DC/24V AC ±10%  
 voltage output (PL) ..... 24V AC/DC ±10%  
 load (voltage output only) ..... >10kOhm  
 ambient temperature KL, PL ..... -20...+80°C (-4...176°F)  
 WL ..... -20...+60°C (-4...140°F)

Directive about electromagnetic compatibility **2014/30/EU**  
 DIN EN 61326-1 ..... issue 07/13  
 DIN EN 61326-2-3 ..... issue 07/13  
 sensor tube ..... Ø20mm (Ø 0,79") aluminium  
 housing ..... ABS light grey  
 Schutzart  
 WL ..... IP20  
 PL, KL sensor/electronics .....  
 ..... depends on filter type used/IP54

**Type versions**

| Measured variable            | Output       | WL series wall | KL series duct | PL series rod-shaped |
|------------------------------|--------------|----------------|----------------|----------------------|
| F<br>rel. humidity           | 0..10 V      | FWL2/5         | FKL2/5         | FPL2/5               |
|                              | 4...20 mA    | FWL3/5         | FKL3/5         | FPL3/5               |
| K<br>r.h. + temp.            | 2 x 0..10 V  | KWL2/5         | KKL2/5         | KPL2/5               |
|                              | 2 x 4..20 mA | KWL3/5         | KKL3/5         | KPL3/5               |
| T<br>temperature             | 0..10 V      | TWL2/5         | TKL2/5         | TPL2/5               |
|                              | 4..20 mA     | TWL3/5         | TKL3/5         | TPL3/5               |
| C<br>r.h. + temp.<br>passive | 0..10 V + T  | CWL2/5-X       | CKL2/5-X       | CPL2/5-X             |
|                              | 4..20 mA + T | --             | CKL3/5-X       | CPL3/5-X             |
| Weight approx.               |              | 80g            | 330            | 120g                 |

**Description**

These sensors have been specially adapted to the needs of the ventilation and air-conditioning sector. They come in three series (the WL series for wall mounting, the KL series for duct installation and the PL series with a cable for suspension from any location). The KL and PL series are equipped with gauze filters as standard. Other filters are available on request. Use of capacitive humidity sensor elements is a guarantee of high long-term stability, resistance to dew formation, small hysteresis and good dynamic performance.

**User instructions**


Install these sensors at a place where characteristic climatic conditions occur. The wall-mounting sensors can be installed on flush-mounted sockets on installation systems and directly onto the wall. Avoid installing them close to heaters or windows or against outside walls. The sensors with the connection cable can be suspended directly from the cable. In principle, the sensors do not require any maintenance. However, the dynamic behaviour of the sensor may be affected if it is exposed to too much dust. In this case, clean the sensor element by blowing the dust off. In the case of the KL and PL series, clean the sensors by rinsing them carefully in distilled water. Never touch the highly sensitive 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.

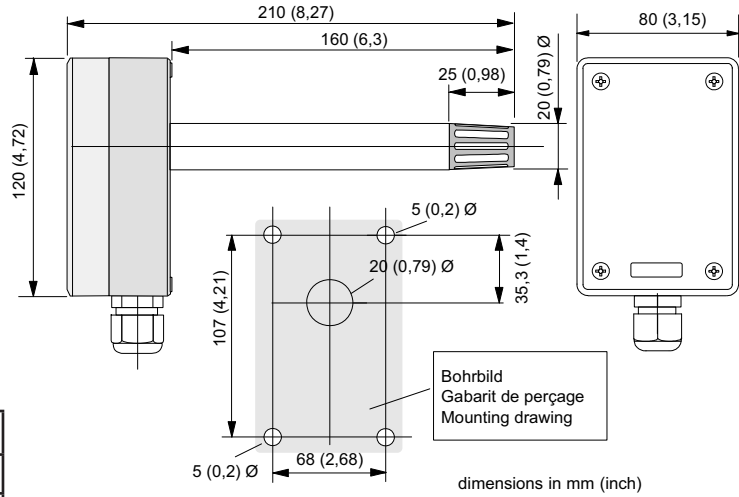
**Temperature with passive output**

Measuring elements to be chosen: ..... NTC; PTC; KTY; LMx35; Pt100; Pt1000; Ni1000; AD592; LM34; BALKO 1kΩ; SILICON 2kΩ; SEMICONDUCTOR 559 mVDC @23°C (73,4°F) Thermistors @ 25°C (77°F) 1,8kΩ; 2,25kΩ; 3kΩ; 5kΩ; 10kΩ; 1,8kΩ (Type II; III, CSI); 20kΩ; 100kΩ

2) 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 : March 2018 C26\_E. Subject to modifications.

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



**Connection diagram series KL**

version **0...10V DC**

|  | terminals | ranges                                  |
|--|-----------|---|
| supply   | (1-) (2+) | 15...30V DC                             |
|  | (1~) (2~) | 24V AC ±10%                             |
| „humidity“   | (3) (4+)  | 0...10V DC                              |
| „temperature“  | (5) (6+)  | 0...10V DC                              |
| not galvanic disconnected<br>negative pole (1-) (3) (5) = common |           |   |
| „temperature“  | (5) (6)   | passive sensor<br>galvanic disconnected |
| shield   | (7)       |   |

version **4...20mA, 12...24V DC** (heed load)

|               | terminals | ranges         | outputs<br>galvanic<br>disconnected |
|---------------|-----------|----------------|-------------------------------------|
| „humidity“    | (1-) (2+) | 4...20mA       |                                     |
| „temperature“ | (3-) (4)  | 4...20mA       |                                     |
| „temperature“ | (3) (4)   | passive sensor |                                     |
| shield        | (5)       |                |                                     |

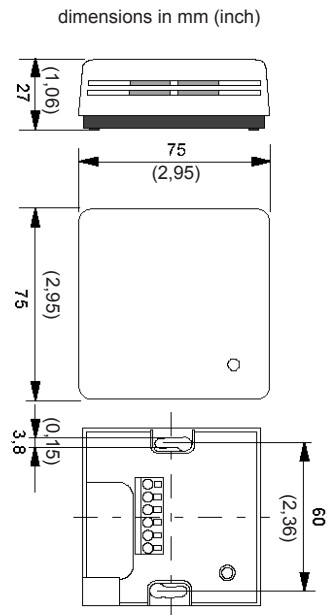
**Connection diagram series WL**

version **0...10V DC**

|  | terminals | ranges                                  |
|--|-----------|---|
| supply   | (1-) (2+) | 24V DC ±10%                             |
|  | (1~) (2~) | 24V AC ±10%                             |
| „humidity“   | (3) (4+)  | 0...10V DC                              |
| „temperature“  | (5) (6+)  | 0...10V DC                              |
| not galvanic disconnected<br>negative pole (1-) (3) (5) = common |           |   |
| „temperature“  | (5) (6)   | passive sensor<br>galvanic disconnected |

version **4...20mA, 15...30V DC** (heed max. load )

|               | terminals | ranges   | outputs<br>galvanic<br>disconnected |
|---------------|-----------|----------|-------------------------------------|
| „humidity“    | (1-) (2+) | 4...20mA |                                     |
| „temperature“ | (3-) (4)  | 4...20mA |                                     |

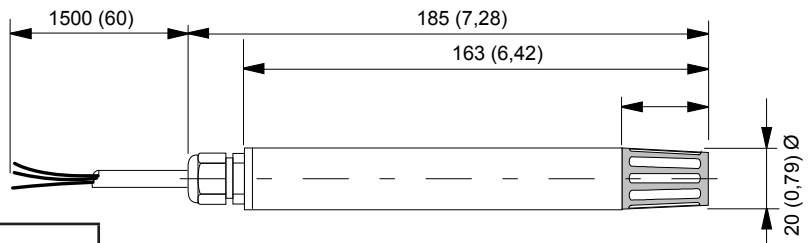


**Connection diagram series PL**

version **0...10V DC**

not galvanic disconnected  
negative pole (-brown) = common

|               | wire colour         | ranges                                  |
|---------------|---------------------|---|
| supply        | *(-brown) (+green)  | 24V DC ±10%                             |
|               | (~brown) (~green)   | 24V AC ±10%                             |
| „humidity“    | *(-brown) (+white)  | 0...10V DC                              |
| „temperature“ | *(-brown) (+yellow) | 0...10V DC                              |
| „temperature“ | (blue) (yellow)     | passive sensor<br>galvanic disconnected |



version **4...20mA, 12...24V DC** (heed load)

|               | wire colour        | ranges         | outputs<br>galvanic<br>disconnected |
|---------------|--------------------|----------------|-------------------------------------|
| „humidity“    | (-green) (+brown)  | 4...20mA       |                                     |
| „temperature“ | (-white) (+yellow) | 4...20mA       |                                     |
| „temperature“ | (white) (yellow)   | passive sensor |                                     |