FRODE PEDERSEN

Thermocouple assembly A
with interchangeable measuring insert

Data sheet 1301

Application
- Measurement of temperature in ducts and furnaces with air and flue gasses
- The operating range is up to 800°C in the low-pressure range
- Fields of application
  - Power plants
  - Incinerators
  - Chemical process engineering

Technical features
- Thermocouple type J, K and N acc. to IEC-584-1
- Built acc. to DIN 43764
- Connected to the process by adjustable flange or compression fittings
- The measuring insert can be exchanged or calibrated without closing down the process
- Protective tube in stainless and acid proof steel
- Modular design and standard length minimize the necessary number of spares
- Optionaly, can be supplied with head mounted transmitter

Ordering
The requested sensor is selected from the table below.
The colour code means:
- Standard: Built of standard modules (short delivery time)
- Variant: Modified standard modules
- Special: Special versions and material. We are specialist in temperature measurement. Please contact us and we will do our best to solve your specific measuring task

Ordering information

<table>
<thead>
<tr>
<th>Specification number</th>
<th>Sensor</th>
<th>Transmitter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1301-1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Protective tube
Stainless, acid proof steel, W.no.1.4571 (AISI 316Ti)
Max. 800°C
15mm OD. 1.5 mm wall

Nominal length (mm)
- 500
- 710
- 1000
- 1400
- 2000
- Interim lengths (Min. 100, max. 3000), ...x...x

Process connection (see page 2)
- None
- Fig. 1 Adjustable flange
- Fig. 1+2 Adjustable flange + counter flange
- Fig. 3 3/4" BSP compression fitting w/ceramic sealing
- Fig. 4 3/4" BSP compression fittings, SS steel
- Fig. 4 3/4" BSP compression fitting, galvanized steel
Andel:

Connection head
- B: Degree of protection IP 65
- BHS: Degree of protection IP 65, high cap for transmitter
- Special:

<table>
<thead>
<tr>
<th>Transmitter, 2-wire, 4-20mA output</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 None</td>
</tr>
<tr>
<td>1 FPTU Standard version. As terminal block</td>
</tr>
<tr>
<td>2 FPTU Standard version. In high cap (B-head)</td>
</tr>
<tr>
<td>3 FPTU galvanic isolated. As terminal block</td>
</tr>
<tr>
<td>4 FPTU galvanic isolated. In high cap (B-head)</td>
</tr>
<tr>
<td>5 FPTU galvanic isolated. EEXialCT4/6. As terminal block</td>
</tr>
<tr>
<td>6 FPTU galvanic isolated. EEXialCT4/6. In high cap (B-head)</td>
</tr>
<tr>
<td>a FPTT galvanic isolated. As terminal block</td>
</tr>
<tr>
<td>b FPTT galvanic isolated. In high cap (B-head)</td>
</tr>
<tr>
<td>c FPTT galvanic isolated. EEXialCT4/6. As terminal block</td>
</tr>
<tr>
<td>d FPTT galvanic isolated. EEXialCT4/6. In high cap (B-head)</td>
</tr>
<tr>
<td>Special</td>
</tr>
</tbody>
</table>

Tolerance acc to IEC 584-2
- Class 2, for J, K and N, i.e. ±2.5°C or 0.0075 x 1 actual (°C) 3
- Class 1, for J, K and N, i.e. ±1.5°C or 0.0040 x 1 actual (°C) 3
- Note 3: The highest value apply

Number of thermocouples
- 1
- 2

Measuring insert

<table>
<thead>
<tr>
<th>Max. temperature 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
</tr>
<tr>
<td>TK80</td>
</tr>
<tr>
<td>TK115</td>
</tr>
<tr>
<td>TK125</td>
</tr>
</tbody>
</table>

Special:
- Note 1: The values apply for the thermocouple.
- Note 2: M+ Mineral insulated.

Accessories
- Process connection: See data sheet 9113
- Transmitter: See data sheet 9168

Customer information
- Name:
- Tel.
**TECHNICAL DATA**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Assembly</th>
<th>Measuring insert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection head</td>
<td>Type B / B+BHX Cap (for transmitter)</td>
<td>Mineral insulated with bushing</td>
</tr>
<tr>
<td></td>
<td>Type BHS / BSH (for transmitter)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Features for protective tube**

- **Application**
  - W.no. 1.4571
  - max. 800°C
- **Liquids**
  - Recommended
- **Acid**
  - Recommended
- **Sulphur atmospheres**
  - Suitable
- **Clorine atmospheres**
  - Suitable
- **Oxidizing atmospheres**
  - Recommended
- **Reducing atmospheres**
  - Not suitable
- **Carburizing atmospheres**
  - Not suitable

**Process connection**

**Fig. 1**

**Adjustable flange DIN 43734**

- Steel W.no. 1.0401
- Max. 1 bar, gas-tight, ceramic sealing

**Protective tube**

- Diameter
  - Dimensions
  - a: 15
  - b: 75
  - c: 50
  - d: 55
  - e: 28
  - f: 18

**Fig. 2**

**Counter flange DIN 43734 f/steel tube**

- Steel W.no. 1.0401
- Max. 1 bar, gas-tight, ceramic sealing

**Protective tube**

- Diameter
  - Dimensions
  - a: 15
  - b: 75
  - c: 50
  - d: 55
  - e: 28
  - f: 18

**Response time**

<table>
<thead>
<tr>
<th>Protective tube Diameter</th>
<th>Response time in seconds (guidelines)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In water @ 0.4m/sec</td>
</tr>
<tr>
<td>15</td>
<td>1.0</td>
</tr>
</tbody>
</table>

**Connection diagram**

<table>
<thead>
<tr>
<th>Thermocouple</th>
<th>Transmitter FPTU/FPTT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single TC</td>
<td></td>
</tr>
<tr>
<td>Duplex TC</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The 0.5/0.9 time is the time that it takes the sensor to reach 50%/90% of the final value of a temperature change of a medium. If media and velocity are different from the ones stated, the time can change significantly.