Adjustable PT100 Bearing Temperature Sensor with $\frac{1}{2}$ NPT Conduit Entry

Hot bearing WARNING device, for use in hazardous areas

**Brochure**

Adjustable Bearing Temperature Sensor, type **PT100V3C** With Grease nipple

The PT100V3C bearing temperature sensor with grease nipple is specially designed for accurate measuring of universal bearing housings. The PT100V3C sensor is very easy to mount in the bearing housing without need for modifications. Use this installation method to avoid losing the guarantee on the bearing.

The advantage of measuring with a PT100 is that it sends a continuous output signal to the operating system.
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1. Application

The PT100V3C bearing temperature sensor with grease nipple is specially designed for accurate measuring of universal bearing housings.

The bearing temperature sensor emits a standard analogue output signal. The signal can be implemented very simply in an operating system. If the analogue signal is interrupted, the reason for this must be investigated (failsafe). Early detection of high temperature can prevent the bearing from becoming overheated, thereby reducing the risk of possible dust explosions.

The PT100V3C sensor is very easy to install in the bearing housing without need for modifications. Use this installation method to avoid losing the guarantee on the bearing.

The advantage of measuring with a PT100 is that it sends a continuous analogue output signal to the operating system. The measuring principle is: 1°C temperature difference results in a difference in resistance of 0.348 Ohms.

1.1 PT100V3C use in hazardous areas

The Rub-Block RB200DN has the following CSA approval: Class II, Division 1

2.1 Information PT100

The resistance value is in conformance with the European standard: \( R_{PT100} = 100 + 0.385\,055 \times T \). The positive temperature coefficient of a PT100 is 0.385 055 Ohms per Kelvin.

2. Dimensions of the PT100V3C

![Diagram of PT100V3C sensor dimensions]
3. Mounting location

1. Rub-Block RB100DN or RB200DN belt misalignment monitoring location (both sides)
2. Bearing temperature sensor monitoring PT100 location (both sides)
3. Speed monitoring
4. Junction box small or large
First of all, the electrical signal for the PT100 sensors has to be operational. If this is not the case, you must put back the existing grease nipple till the electrical signal is operational.

**Built in Reed Switch “Fail-Safe”**

When a service engineer forgets to return the PT100 sensor correctly into the fitting adapter during a maintenance job, the Pt100 sensor will measuring the ambient temperature instead of measuring the bearing ring.

For this we provided the PT100 probe with a single reed switch and the fitting adapter with a magnet. When the PT100 sensor is not properly installed into a fitting adapter there will be no signal active in the PLC.

This signal is only activated when the PT100 sensor is placed correctly into the fitting adapter. If a service engineer now forgets to return the PT100 sensor correctly into the fitting adapter during a maintenance job, the elevator or conveyor will not start, because there’s an high alarm visible into the PLC (no temperature located).

The alarm can be reset in order to correctly installed the PT100 sensor in the fitting adapter “fail-safe”.

**The adjustable bearing temperature sensor with reed switch are available in two versions:**
- With a reed switch built in, type RS-PT100V3C (100 mm probe length)
- With a reed switch built in, type RS-PT100V3C/70 (70 mm probe length)
4. Technical data

4.1 technical data PT100V3C

**PT100 sensor**
- Sensor type: R8-81227320-0115/050.S01 with 1 x 4L connection wires
- Protection type: IP 67
- Tolerance class: Class A DIN IEC751
- Cable type: PFA-PFA-V2A Cn 4 x 0.22 mm²
- Ambient temperature limit for cable: -40°C to +185°C
- Cable Length: 5 meter, (several cable lengths available)
- Measuring temperature limit: -40°C to +280°C
- Measuring current: 1mA
- Output signal: Analogue

**Probe length**
- PT100V3C/5: 100 mm
- PT100V3C/70: 70 mm
- Standard probe Diameter: Stainless Steel 5 mm, (several probe lengths available)

**Electrical Data PT100**
- Measuring voltage: Ui 30 V
- Maximum current input: li 101 mA
- Maximum total output: P 750 mW

**Connection body PT100V3C**
- Housing sensorbody: Stainless Steel
- Diameter screw connection head: 1/8 NPT

**Hazardous area classification**
- ATEX Class (Ex-i): Ex II 1D Ex iaD T85°C / Ex II 1G IIC T6
- Certificate number: IBEExU13ATEX1079X
- IECEx Class (Ex-i): Ex II 1D Ex iaD T85°C Da, Ex II 1/2 G Ex ia IIC T6+ Ga/GB TAMB -40°C to 185°C
- Certificate number: IECEx IBE 15.0014X
- Gost R (Ex-i): Ex II 1D Ex iaD T85°C / Ex II 1G IIC T6

**CSA**
- Measuring voltage: Ui 5 V
- Maximum current input: li 40 mA
- Maximum total output: P 250 mW
### 6. Explosion protection worldwide

<table>
<thead>
<tr>
<th>Groups</th>
<th>IEC/ATEX/NEC 505</th>
<th>NEC 500/CEC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gas groups</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Group I</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Methane</td>
<td>-*</td>
</tr>
<tr>
<td><strong>Group II</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IIA</td>
<td>Propane</td>
<td>Propane</td>
</tr>
<tr>
<td>IIB</td>
<td>Ethylene</td>
<td>Ethylene</td>
</tr>
<tr>
<td>IIB + H2</td>
<td>Ethylene + hydrogen</td>
<td>Acetylene</td>
</tr>
<tr>
<td>IIC</td>
<td>Acetylene</td>
<td>Hydrogen</td>
</tr>
<tr>
<td><strong>Dust groups</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Group III</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IIA</td>
<td>Combustible flyings</td>
<td>Fibres, flyings</td>
</tr>
<tr>
<td>IIB</td>
<td>Non-conducting dust</td>
<td>Non-carbon-containing dust</td>
</tr>
<tr>
<td>IIC</td>
<td>Conducting dust</td>
<td>Carbon-containing dust</td>
</tr>
</tbody>
</table>

* Are not within the scope of NEC or CEC  
** per IEC 2007 and CENELEC 2009
## 6.1 ATEX Groups

### Conditions hazardous areas

<table>
<thead>
<tr>
<th>Material Groups</th>
<th>Temporary behaviour of the flammable material in the hazardous area</th>
<th>Classification of hazardous area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gases, vapours</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are present continuously, for long periods or frequently</td>
<td>Zone 0</td>
<td>Ga</td>
</tr>
<tr>
<td>Occur occasionally</td>
<td>Zone 1</td>
<td>Gb</td>
</tr>
<tr>
<td>Probably do not occur at all, but if they do, only rarely or for short periods</td>
<td>Zone 2</td>
<td>Gc</td>
</tr>
<tr>
<td><strong>Dust</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are present continuously, for long periods or frequently</td>
<td>Zone 20</td>
<td>Da</td>
</tr>
<tr>
<td>Occur occasionally</td>
<td>Zone 21</td>
<td>Db</td>
</tr>
<tr>
<td>Probably do not occur at all, due to suspended dust, but if they do, only rarely or for short periods</td>
<td>Zone 22</td>
<td>Dc</td>
</tr>
<tr>
<td><strong>Methane, dust</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazardous areas</td>
<td>-</td>
<td>Ma</td>
</tr>
<tr>
<td>Potentially hazardous areas</td>
<td>-</td>
<td>Mb</td>
</tr>
<tr>
<td>Fibres, flyings</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*) Equipment Protection Level per IEC 2007 and CENELEC 2009

### Ignition protection types (examples)

<table>
<thead>
<tr>
<th>Ignition protection type</th>
<th>Marking</th>
<th>Definition</th>
<th>IEC</th>
<th>ATEX approval</th>
<th>FM / UL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flameproof enclosure</td>
<td>Ex d</td>
<td>Propagation of an explosion to the outside is prevented</td>
<td>IEC 60079-1</td>
<td>EN 60079-1</td>
<td>FM 3615 UL 1203</td>
</tr>
<tr>
<td>Intrinsic safety</td>
<td>Ex i</td>
<td>Limitation of the energy of sparks and temperatures</td>
<td>IEC 60079-11</td>
<td>EN 60079-11</td>
<td>FM 3610 UL 913</td>
</tr>
<tr>
<td>n</td>
<td>Ex n</td>
<td>Different protection principles only for Zone II/Div. 2</td>
<td>IEC 60079-15</td>
<td>EN 60079-15</td>
<td>FM 3611 ANSI/ISA 12.12.01</td>
</tr>
</tbody>
</table>

### Temperature classes and max. surface temperatures

<table>
<thead>
<tr>
<th>Class</th>
<th>T1</th>
<th>T2</th>
<th>T2A, T2B</th>
<th>T2C, T2D</th>
<th>T3</th>
<th>T3A, T3B</th>
<th>T3C</th>
<th>T4</th>
<th>T4A</th>
<th>T5</th>
<th>T6</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC/ATEX/NEC 505</td>
<td>450ºC</td>
<td>300ºC</td>
<td>-</td>
<td>-</td>
<td>200ºC</td>
<td>-</td>
<td>135ºC</td>
<td>-</td>
<td>100ºC</td>
<td>85ºC</td>
<td></td>
</tr>
<tr>
<td>NEC 500/CEC</td>
<td>450ºC</td>
<td>300ºC</td>
<td>280ºC</td>
<td>260ºC</td>
<td>250ºC</td>
<td>215ºC</td>
<td>180ºC</td>
<td>165ºC</td>
<td>160ºC</td>
<td>135ºC</td>
<td>120ºC</td>
</tr>
</tbody>
</table>
7. Installation diagram

A. 
- Bearing Temperature PT100
- Rub-Block Belt Alignment
- Junctionbox
- PLC: Siemens PLC
- Field-Cable 16 x 0.75 mm² Shielded Armoured Cable

B. 
- Bearing Temperature PT100
- Rub-Block Belt Alignment
- Junctionbox with head transmitters 4-20mA
- PLC: Siemens PLC
- Field-Cable 8 x 0.75 mm² Shielded Armoured Cable

C. 
- Bearing Temperature PT100
- Rub-Block Belt Alignment
- Junctionbox with Converters
- PLC: Siemens PLC
- Field-Cable 24 x 0.75 mm² Shielded Armoured Cable
8. PT100 connection data

8.1 PT100 sensor wiring diagram

8.2 Various indicators and transmitters available

GSI 48 Series – Universal input – Panel mounting

SPECIFICATION

Description
Process indicator for analogue signals. Displaying a process, temperature, load cell or potentiometer signal in engineering units.

Input
- thermocouples: J, K, T, E, R, S, N
- RTD: Pt100
- current: 4÷20 mA
- voltage: 0÷50mV, 0÷10V

Accuracy
- ± 0.25% FS ±1°C: for thermocouples J, K, T, E, N
- ± 0.25% FS ±3°C: for thermocouples S, R
- ± 0.2% FS: for Pt100
- ± 0.2% FS: for input voltage, current

Alarm output
- 2x SPDT relay contact, 260Vca/1A/150VA
- 4x SPST relay contact, 260Vca/0,1A/50VA
- Isolated 4…20mA

Operating Conditions: -10 ÷ +55°C/20 ÷ 85%RH

Power supply: 10-70Vdc and 21-53Vac or 85-260Vac and 100-300Vdc

Dimensions: 48 x 96 x 90 mm
8. Safety notice to our customers

A. In order to maximise efficiency and safety it is vital to select the right equipment for each installation. The correct installation of this equipment as well as regular maintenance and inspection are equally important to proper operation and safety of the product. It is the end user’s responsibility to ensure correct installation and maintenance of all our products.

B. The installation of the wiring should be undertaken by an experienced and qualified professional electrician.

C. Periodic inspection by a qualified person will help extend the lifespan of this product. Muller Beltex recommends that maintenance and inspection be carried out annually, at minimum, depending on the extent the product is used.

8.1 Customer safety responsibilities

1. Please read all operation manuals and safety instructions carefully to ensure that you understand the product operation and are able to safely and effectively use this product

2. Select a qualified and competent installer

   Correct installation of the product is important for safety and proper performance. It is critical for the safety of your operation that those who are authorised be able to work with your equipment properly and that they be qualified to install these products. The product must be installed properly to function correctly and to perform to its designed functions. The installer or the personnel should be qualified, trained, and competent to undertake the installation in accordance with the person responsible.

   **WARNING** The sealing surfaces and any flat seals present must not be damaged!

   Installation and commissioning must be performed by qualified personnel. Read this operation manual carefully before starting up. We are not liable for personal injury or property damage incurred by incorrect use.

   The user is required to check the latest product information on Muller Beltex’ website before installing this product. Failure to do so could result in product failure or damage.