

## Data sheet

# Temperature Sensors

## Types MBT 5250, MBT 5260 and MBT 5252



Heavy-duty temperature sensors for controlling cooling water, lubrication oil, hydraulic oil and refrigeration plants within general industry and marine applications. These temperature sensors are based on a standardized Pt 100 or Pt 1000 element, which gives a reliable and accurate measurement. All three sensor types can be delivered with NTC / PTC elements on request.

In the low temperature version (-50 – 200 °C) the measuring insert is based on a silicone cable, which makes the sensor very resistant towards vibrations. The MBT 5250 with changeable measuring insert and MBT 5260 with fixed measuring insert are equipped with EN 175301-803-A, Pg 9 as standard. The MBT 5252 is equipped with a B-head as standard, but can also be delivered with B-mini Head on request. If needed, a transmitter (MBT 9110) can be ordered as an integrated part of the MBT 5252 sensor.

### Features

- Gaseous or liquid media, e.g. air, gas, vapour, water or oil.
- Up to 200 °C media temperature (MBT 5250 and MBT 5260)
- Up to 200 °C or 400 °C media temperature (MBT 5252)
- Pt 100 or Pt 1000 sensing element
- Can be used with 2- or 3-wire connections
- Gold plated male and female connector (MBT 5250 and MBT 5260)
- MBT 5250 and MBT 5252 with interchangeable measuring insert
- MBT 5260 with fixed measuring insert
- Available with built-in transmitter (MBT 5252)

### Approvals

Lloyds Register of Shipping, LR  
Germanischer Lloyd, GL  
Det Norske Veritas, DNV  
Registro Italiano Navale, RINA

Nippon Kaiji Kyokai, NKK  
American Bureau of Shipping, ABS  
Korean Register of Shipping, KR  
Bureau Veritas, BV  
China Classification Society, CCS

## Data sheet | Temperature Sensor, Types MBT 5250, MBT 5260 and MBT 5252

### Technical data MBT 5250, MBT 5260

#### General data MBT 5250, MBT 5260

|                 |                 |
|-----------------|-----------------|
| Measuring range | -50 – 200 °C    |
| Sensing element | Pt 100, Pt 1000 |
| Protection tube | ø8 × 1 mm       |

#### Response times

| Type                                           | Protection tube | Indicative response times |                  |                  |                  |
|------------------------------------------------|-----------------|---------------------------|------------------|------------------|------------------|
|                                                |                 | Water 0.2 m/s             |                  | Air 1 m/s        |                  |
|                                                |                 | t <sub>0.5</sub>          | t <sub>0.9</sub> | t <sub>0.5</sub> | t <sub>0.9</sub> |
| MBT 5250 with interchangeable measuring insert | ø8 × 1 mm       | 9 s.                      | 33 s.            | 95 s.            | 310 s.           |
| MBT 5260 with fixed meas. ins.                 | ø8 × 1 mm       | 6 s.                      | 20 s.            | 35 s.            | 140 s.           |

#### Materials

|                                       |                            |
|---------------------------------------|----------------------------|
| Protection tube in contact with media | W.no. 1.4571 (AISI 316 Ti) |
| Process connection                    | W.no. 1.4404 (AISI 316 L)  |
| Extension length                      | W.no. 1.4571 (AISI 316 Ti) |
| Union                                 | Nickel plated brass        |
| Gasket                                | Silicone                   |
| Plug EN 175301-803                    | PA 6.6 (max 125 °C)        |

#### Mechanical and environmental specifications

|                           |                                                |                                                              |
|---------------------------|------------------------------------------------|--------------------------------------------------------------|
| Sensor tolerance          | EN 60751 Class B: $\pm (0.3 + 0.005 \times t)$ | t = temperature of medium, numerical value                   |
| Vibration stability       | Shock:                                         | 100 g / 6 ms                                                 |
|                           | Vibrations:                                    | 4 g sine function 5 – 200 Hz, measured acc. to IEC 60068-2-6 |
| Enclosure                 | IP65 according to IEC 60529                    |                                                              |
| Cable entry EN 175301-803 | Pg 9, Pg 11 or Pg 13.5                         |                                                              |

**Ordering standard  
(MBT 5250, MBT 5260)**

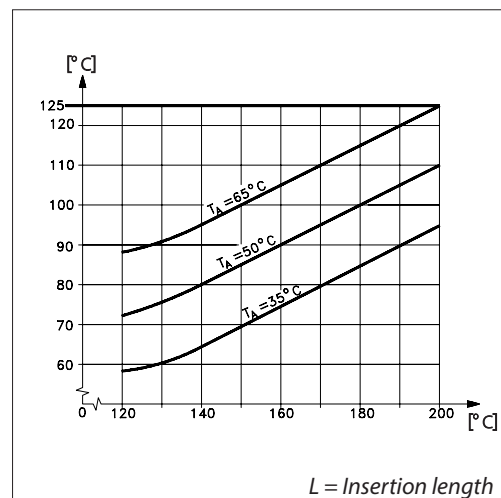
| Type MBT 52X0                                                                                                           |  | Sensor                                                                                                                                                                                                                                                                                                                                                    |  |
|-------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>Measuring range, sensor element</b><br>-50 – 200 °C                                                                  |  | <b>Tolerance</b><br>EN 60751 Class B<br>Other                                                                                                                                                                                                                                                                                                             |  |
| <b>Sensing element</b><br>1 × Pt 100<br>1 × Pt 1000 (Class B only)<br>2 × Pt 100<br>2 × Pt 1000 (Class B only)<br>Other |  | <b>Process connection</b><br>None<br>G 1/4 A<br>G 1/2 A<br>1/2 – 14 NPT<br>G 3/4 A<br>M18 × 1.5<br>Other                                                                                                                                                                                                                                                  |  |
| <b>Protection Tube, W.nr. 1.4571 (AISI 316 Ti)</b><br>Acid-proof steel, ø8 × 1mm<br>Other                               |  | <b>Electrical Connections</b><br>EN175301/803 excl. female plug<br>EN175301/803 plug Pg 9 (IP65)<br>EN175301/803 plug Pg 11 (IP65)<br>EN175301/803 plug Pg 13,5 (IP65)<br>ITT Canon 4 pins Au<br>EN175301/803 GL. plug Pg 13,5 (IP65) Sn pins<br>EN175301/803 Pg 9–4 pins without earth (IP65)<br>EN175301/803 Pg 11–4 pins without earth (IP65)<br>Other |  |
| <b>Extension length</b><br>None<br>50 mm                                                                                |  |                                                                                                                                                                                                                                                                                                                                                           |  |
| <b>Insertion length</b><br>50 mm<br>80 mm<br>100 mm<br>150 mm<br>200 mm<br>250 mm<br>xx0 mm                             |  |                                                                                                                                                                                                                                                                                                                                                           |  |
| <input checked="" type="checkbox"/> Preferred versions                                                                  |  |                                                                                                                                                                                                                                                                                                                                                           |  |

# Data sheet | Temperature Sensor, Types MBT 5250, MBT 5260 and MBT 5252

## Technical data MBT 5250, MBT 5260

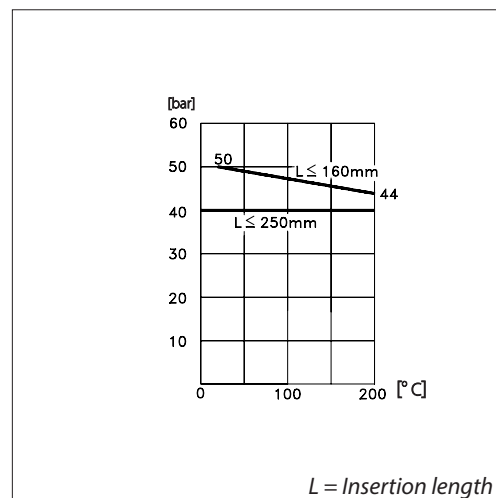
Max. temperature (Ext. length "None")  
Plug EN 175301-803

Max. load on protection tube  
( $\varnothing 8 \times 1$ ,  $\varnothing 10 \times 2$ ) acc. to EN 175301-803



$T_m$  = Media temperature  
 $T_p$  = Temperature for electric plug  
 $T_A$  = Ambient temperature

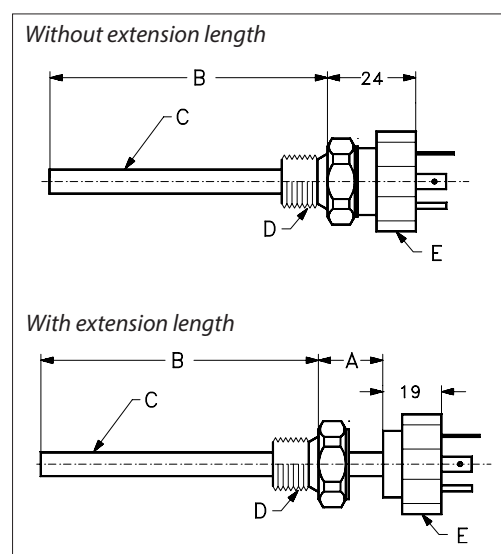
**Note:** for extension length = 50 mm  
no limitations up to 200 °C media temperature  
and 90 °C ambient temperature



| Permissible media velocity | Air    | Water |
|----------------------------|--------|-------|
|                            | 25 m/s | 3 m/s |

| Process connection     | G 1/4 A | G 1/2 A<br>G 3/8 A - M18 | G 3/4 A<br>M24 |
|------------------------|---------|--------------------------|----------------|
| Max. tightening torque | 25 Nm   | 50 Nm                    | 100 Nm         |

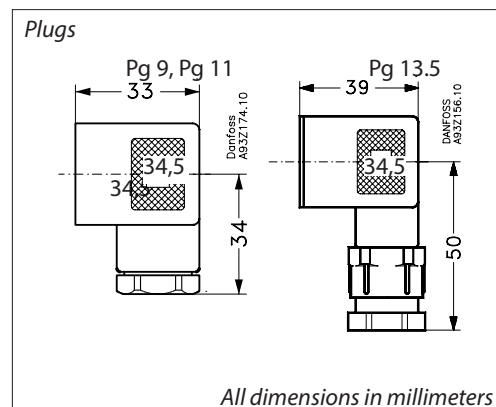
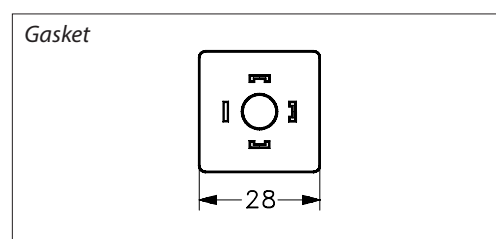
## Dimensions MBT 5250, MBT 5260



A = Extension length  
B = Insertion length  
C = Protection tube  
D = Process connection  
E = Union

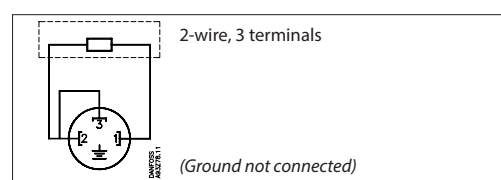
Please note:

- Tightening torque for the mounting screw at the rear end of the electrical connection plug: 25 Ncm
- Tightening torque for the union (position "E"): 17 Nm



| Process connection | G 1/4  | G 1/4 A - G 1/2 A<br>G 3/8 A - M18 | G 3/4 A<br>M24 |
|--------------------|--------|------------------------------------|----------------|
| Width across flats | HEX 22 | HEX 27                             | HEX 32         |

## Electrical connections



## Data sheet | Temperature Sensor, Types MBT 5250, MBT 5260 and MBT 5252

### Technical data MBT 5252

#### General data MBT 5252

|                 |                                                |
|-----------------|------------------------------------------------|
| Measuring range | -50 – 200 °C or -50 – 400 °C                   |
| Sensing element | Pt 100, Pt 1000                                |
| Protection tube | Low temperature: $\varnothing 10 \times 2$ mm  |
|                 | High temperature: $\varnothing 11 \times 1$ mm |

|                            |       |         |
|----------------------------|-------|---------|
| Permissible media velocity | Air   | 25 m/s. |
|                            | Steam | 25 m/s. |
|                            | Water | 3 m/s.  |

| Process connection     | G ¼   | G ¼ A – G ½ A G ¾ A – M18 | G ¾ A M24 |
|------------------------|-------|---------------------------|-----------|
| Max. tightening torque | 25 Nm | 50 Nm                     | 100 Nm    |

#### Response time

| Type          | Protection tube              | Indicative response times |                  |                  |                  |
|---------------|------------------------------|---------------------------|------------------|------------------|------------------|
|               |                              | Water 0.2 m/s             |                  | Air 1 m/s        |                  |
|               |                              | t <sub>0.5</sub>          | t <sub>0.9</sub> | t <sub>0.5</sub> | t <sub>0.9</sub> |
| MBT 5252      | $\varnothing 10 \times 2$ mm | 14 s.                     | 42 s.            | 110 s.           | 390 s.           |
| MBT 5252 (HT) | $\varnothing 11 \times 1$ mm | 25 s.                     | 80 s.            | 150 s.           | 450 s.           |

#### Mechanical and environmental specifications

|                                        |                                                |                                                              |
|----------------------------------------|------------------------------------------------|--------------------------------------------------------------|
| Max. ambient temperature <sup>1)</sup> | Sensors without transmitter                    | 90 °C                                                        |
|                                        | Sensors with transmitter                       | 85 °C                                                        |
| Sensor tolerance                       | EN 60751 Class B: $\pm (0.3 + 0.005 \times t)$ | t = temperature of medium, numerical value                   |
| Vibration stability                    | Shock:                                         | 100 g / 6 ms                                                 |
|                                        | Vibrations:                                    | 4 g sine function 5 – 200 Hz, measured acc. to IEC 60068-2-6 |
| Enclosure                              | IP65 according to IEC 60529                    |                                                              |
| Cable entry B-head                     | Pg16                                           |                                                              |
| Cable entry BM                         | Pg 9                                           |                                                              |
| Temperature transmitter MBT 9110       | Supply voltage:                                | 8 – 35 V d.c.                                                |
|                                        | Output:                                        | 4 – 20 mA                                                    |

<sup>1)</sup> The temperature of the transmitter is influenced by media temperature, ambient temperature and ventilation in the engine room. If the temperature of the transmitter exceeds the max. allowed temperature the transmitter must be placed in a separated enclosure, as described in the separate sheet for MBT 9110.

#### Materials

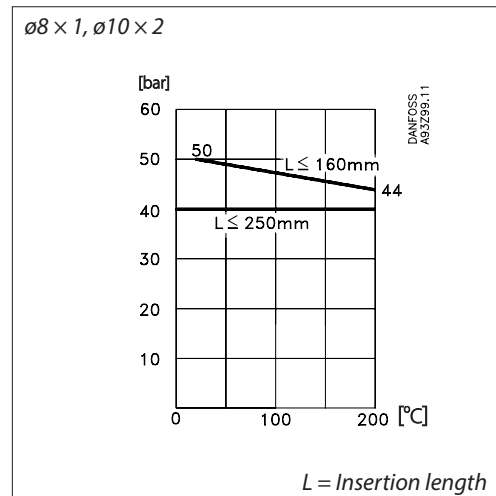
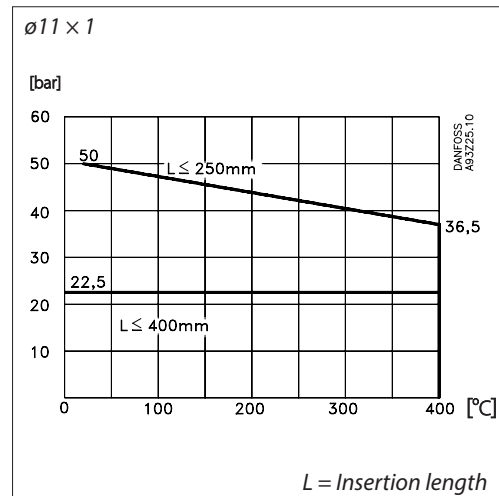
|                                       |                            |
|---------------------------------------|----------------------------|
| Protection tube in contact with media | W.no. 1.4571 (AISI 316 Ti) |
| Process connection                    | W.no. 1.4404 (AISI 316 L)  |
| Extension length                      | W.no. 1.4571 (AISI 316 Ti) |
| Union nut                             | Nickel plated brass        |
| Connection head                       | Die cast aluminium         |

### Ordering standard

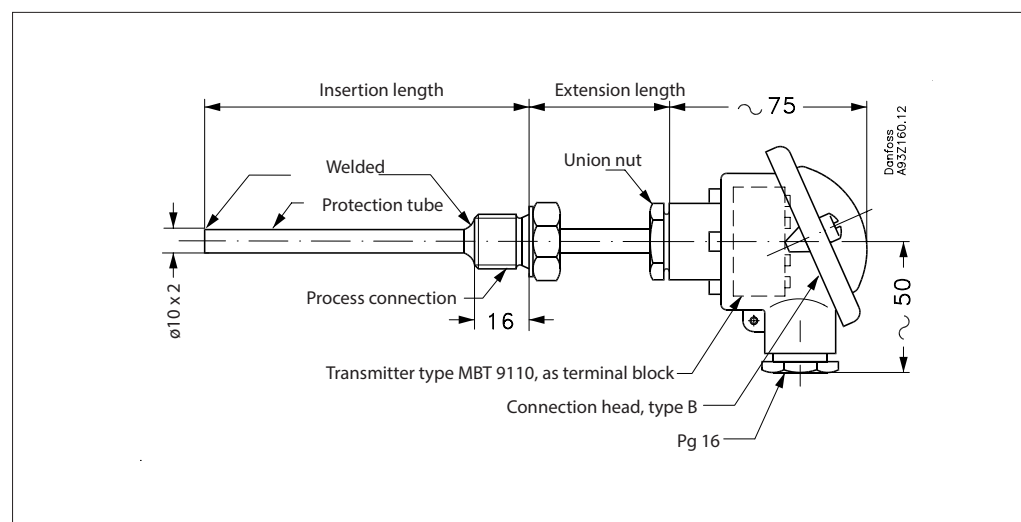
| Sensor                                                                                                                                                                                                                                                                          |  |  |  |  |  |  |  |  |  | Transmitter |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|-------------|--|--|--|
|                                                                                                                                                                                                                                                                                 |  |  |  |  |  |  |  |  |  |             |  |  |  |
| <div> <div> <b>Type MBT 5252</b> </div> </div>                                                                                                                                                                                                                                  |  |  |  |  |  |  |  |  |  |             |  |  |  |
| <div> <div> <b>Measuring range, sensor element</b> </div> <div> <div>-50 – 200 °C</div> <div>-50 – 400 °C</div> </div> </div>                                                                                                                                                   |  |  |  |  |  |  |  |  |  |             |  |  |  |
| <div> <div> <b>Sensing element</b> </div> <div> <div>1 × Pt 100</div> <div>2 × Pt 100 (-50 – 200 °C)</div> <div>1 × Pt 1000</div> <div>2 × Pt 1000 (-50 – 200 °C)</div> <div>Other</div> </div> </div>                                                                          |  |  |  |  |  |  |  |  |  |             |  |  |  |
| <div> <div> <b>Protection Tube, W.nr. 1.4571 (AISI 316 Ti)</b> </div> <div> <div>Acid-proof steel, ø8 mm (-50 – 200 °C)</div> <div>Acid-proof steel, ø10 mm (-50 – 200 °C)</div> <div>Acid-proof steel, ø11mm (-50 – 400 °C)</div> <div>Other</div> </div> </div>               |  |  |  |  |  |  |  |  |  |             |  |  |  |
| <div> <div> <b>Extension length</b> </div> <div> <div>None</div> <div>50 mm</div> <div>100 mm</div> <div>Other</div> </div> </div>                                                                                                                                              |  |  |  |  |  |  |  |  |  |             |  |  |  |
| <div> <div> <b>Insertion length</b> </div> <div> <div>50 mm</div> <div>100 mm</div> <div>150 mm</div> <div>200 mm</div> <div>250 mm</div> <div>300 mm</div> <div>400 mm</div> <div>500 mm</div> <div>xx0 mm</div> </div> </div>                                                 |  |  |  |  |  |  |  |  |  |             |  |  |  |
| <div> <div> <b>Connection head</b> </div> <div> <div>B (IP65)</div> <div>B-mini (IP65) (only up to 4 terminals) (transmitter not possible)</div> <div>Other</div> </div> </div>                                                                                                 |  |  |  |  |  |  |  |  |  |             |  |  |  |
| <div> <div> <b>Process connection</b> </div> <div> <div>G ¼ A (only ø8 mm protection tube)</div> <div>G ⅜ A</div> <div>G ½ A</div> <div>G ¾ A</div> <div>½ –14 NPT</div> <div>Other</div> </div> </div>                                                                         |  |  |  |  |  |  |  |  |  |             |  |  |  |
| <div> <div> <b>Transmitter setting, end of range</b> </div> <div> <div>0 °C (or none)</div> <div>Temperature range 220 °C = 22</div> <div>Temperature range 150 °C = 15</div> <div>1. digit defines 100's</div> <div>2. digit defines 10's</div> <div>Other</div> </div> </div> |  |  |  |  |  |  |  |  |  |             |  |  |  |
| <div> <div> <b>Transmitter setting, start of range</b> </div> <div> <div>None</div> <div>0 °C</div> <div>-50 °C</div> <div>Other</div> </div> </div>                                                                                                                            |  |  |  |  |  |  |  |  |  |             |  |  |  |
| <div> <div> <b>Transmitter type</b> </div> <div> <div>As terminal block</div> <div>In heightened lid</div> </div> </div>                                                                                                                                                        |  |  |  |  |  |  |  |  |  |             |  |  |  |
| <div> <div> <b>Connection</b> </div> <div> <div>2-wire, 3 terminals</div> <div>4-wire, also to be used for 3 wire</div> <div>2 wire, 2 terminals</div> </div> </div>                                                                                                            |  |  |  |  |  |  |  |  |  |             |  |  |  |
| <div> <div> <b>Tolerance</b> </div> <div> <div>EN 60751 Class B</div> <div>EN 60751 Class A</div> <div>Other</div> </div> </div>                                                                                                                                                |  |  |  |  |  |  |  |  |  |             |  |  |  |
| <div> <div> <b>Preferred versions</b> </div> </div>                                                                                                                                                                                                                             |  |  |  |  |  |  |  |  |  |             |  |  |  |

**Technical data**  
**MBT 5252**

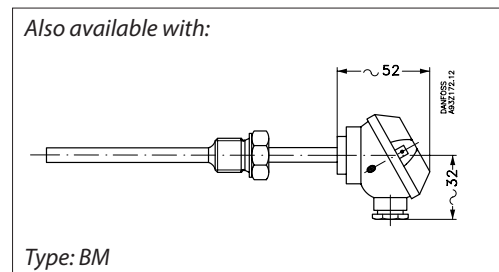
Max. load on protection tube according  
to DIN 43763



**Dimensions [mm]**  
**MBT 5252**

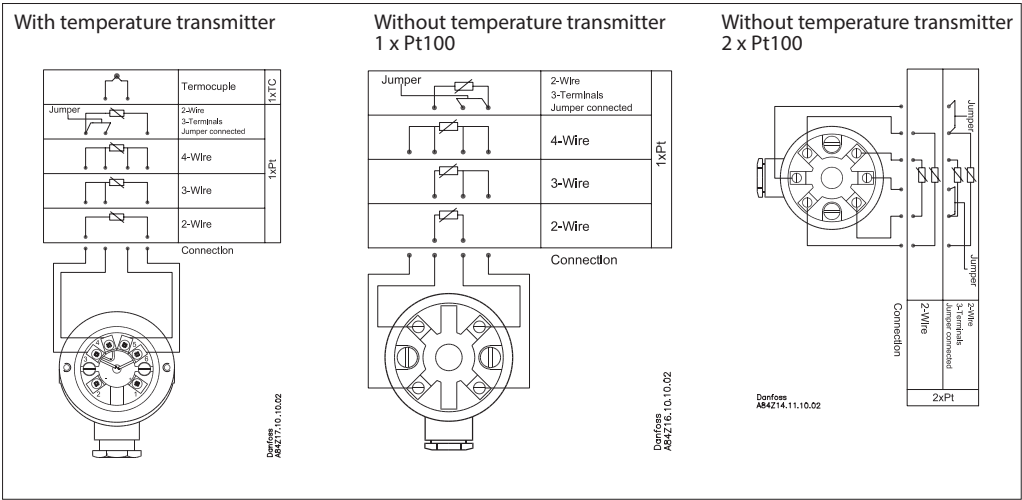


Also available with:



| Process connection | G ½ A,<br>½-14 NPT | G ¾ A  |
|--------------------|--------------------|--------|
| Width across flats | HEX 27             | HEX 32 |

Electrical connections



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