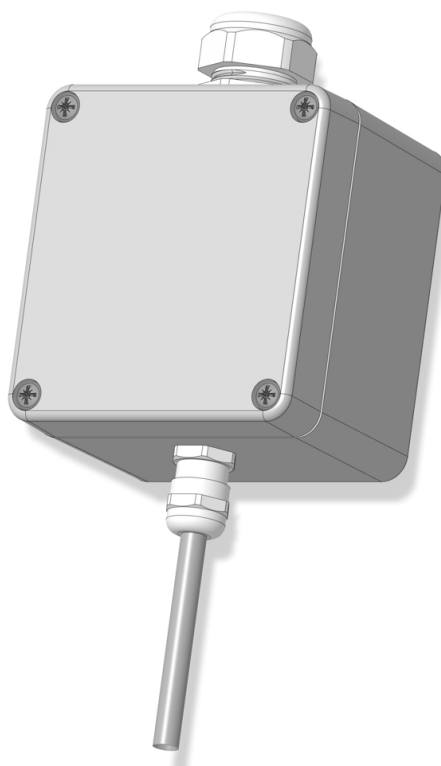




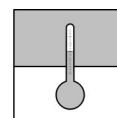
## Prospectus

### TW7#

Indoor/contact resistance thermometers  
with Pt100 temperature sensor

Model series TW70, TW71, TW72, TW73

09015528 • PR\_EN\_TW7# • Rev. ST4-A • 03/26



# 1 General

## 1.1 Performance characteristics

### Main features

- Easy to install
- Cost-effective measurement principle (Pt100)

### Typical fields of application

- Boiler and furnace construction
- Heating technology
- Ventilation and air conditioning technology

## 1.2 Intended use

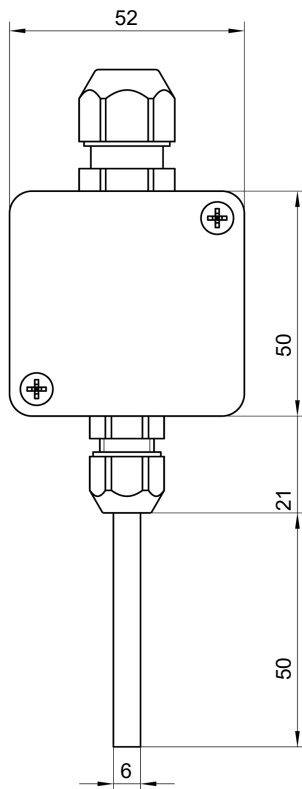
TW7# series resistance thermometers are used for direct temperature measurement. Please refer to the data sheets for the model below for more detailed specifications on the operating conditions.

In addition to the standard range described in this brochure, designs for special applications are also available on request.

## 1.3 Measuring accuracy

The measuring elements include a measuring resistor in accordance with DIN EN 60751 Class B as standard. The reference values and tolerance limits can be found in the appendix to this data sheet.

## 2 TW70 Outdoor resistance thermometer



Measuring element: Stainless steel insertion tube 1.4571  
Measuring resistor 1x or 2x Pt100 DIN EN 60751

Casing: Material: Polycarbonate  
Protection class: IP65 in accordance with  
DIN EN 60529

Cable gland: M16 x 1.5  
Material: Polyamide PA6  
Clamping range: 5 - 10 mm  
Spanner size: 19

Operating temp.: -25°C ... +80°C

### Order codes



#### Base type

Sensor with 1xPt100/2-wire ...> **A**  
Sensor with 1xPt100/3-wire ...> **B**  
Sensor with 1xPt100/4-wire ...> **C**  
Sensor with 2xPt100/2-wire ...> **D**

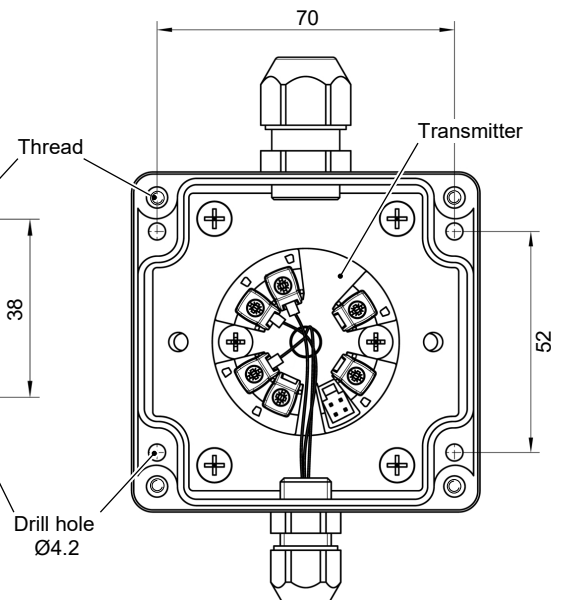
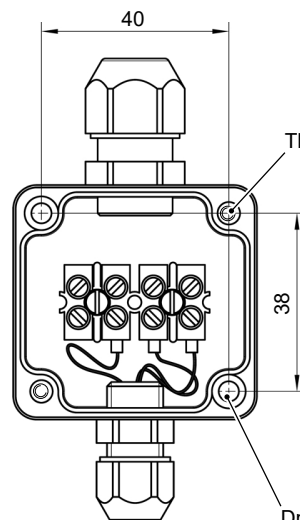
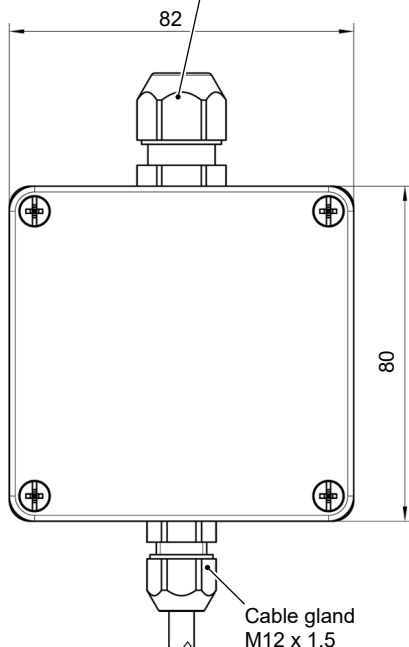
#### Output

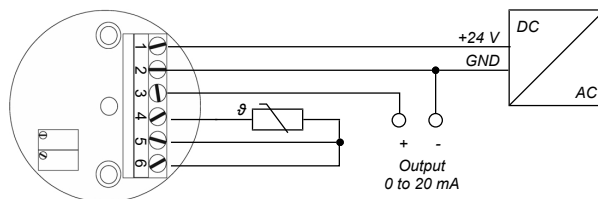
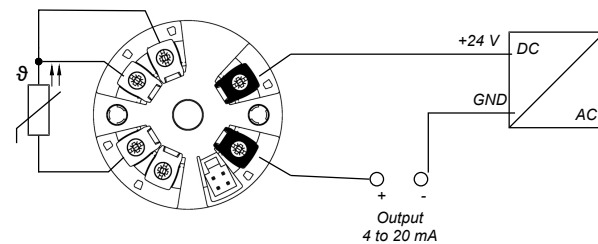
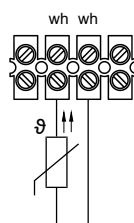
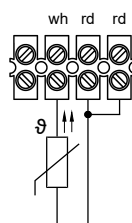
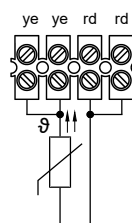
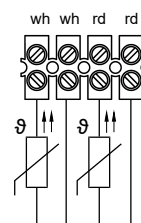
Resistor output .....> **Y**  
2-wire transmitter 4-20 mA/24 Vdc\* .....> **L**  
3-wire transmitter 0-20 mA/24 Vdc\* .....> **M**  
(\*only possible with basic type 1xPt100/3-wire)

#### Measuring range of the 2-L transmitter

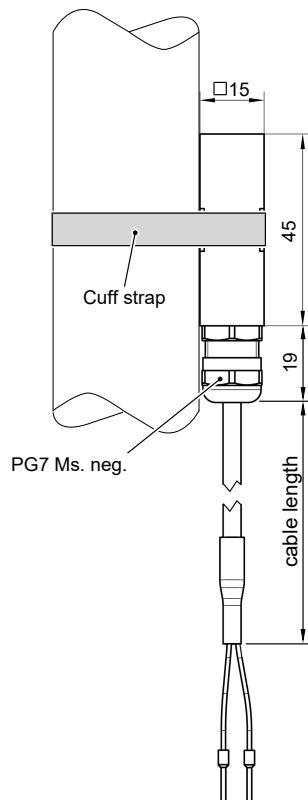
|                           |          |          |
|---------------------------|----------|----------|
| Without transmitter.....> | <b>0</b> | <b>0</b> |
| -50 ... 0 °C .....>       | <b>1</b> | <b>0</b> |
| -50 ... 50 °C .....>      | <b>2</b> | <b>0</b> |
| 0 ... 50 °C .....>        | <b>3</b> | <b>0</b> |

### Installation (Wall mounting)



**Electrical connection****3-wire transmitter (Code M)****2-wire transmitter (Code L)****Resistor output (Code Y)****2-wire  
Code A****3-wire  
Code B****4-wire  
Code C****2 x 2-wire  
Code D**

### 3 TW71 Contact resistance thermometer



Measuring element: Measuring resistor 1x or 2x Pt100 DIN EN 60751

Casing: Material: Aluminium  
Protection class: IP65 in accordance with DIN EN 60529

Connection cable: Sheath: Silicone  
Conductor insulation: PTFE  
Fixed wiring, various cable lengths

Operating temp. -50°C ... +180°C

#### Order codes

**T W 7 1**      **8**      **0 Y 0 0 0**

#### Base type

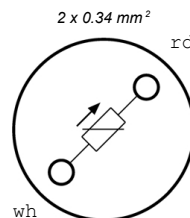
Sensor with 1xPt100/2-wire ...> **A**  
Sensor with 1xPt100/3-wire ...> **B**  
Sensor with 1xPt100/4-wire ...> **C**  
Sensor with 2xPt100/2-wire ...> **D**  
Sensor with 2xPt100/3-wire ...> **E**

#### Cable length

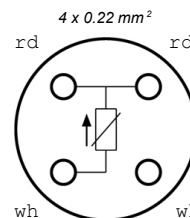
1 m .....> **1**  
2 m .....> **2**  
3 m .....> **3**  
4 m .....> **4**  
7 m .....> **5**  
10 m .....> **6**  
different cable length.....> **9**

#### Electrical connection

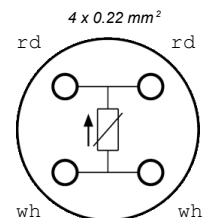
(Connection cable to the measuring element)



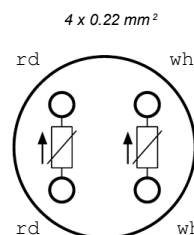
Code A



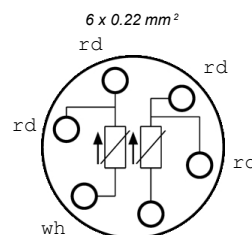
Code B



Code C

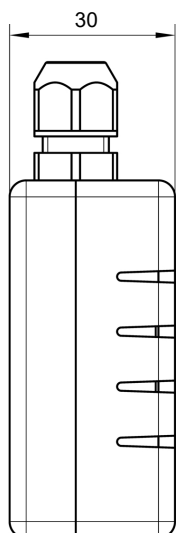
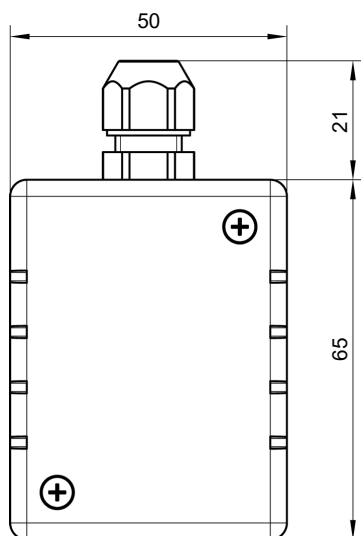


Code D



Code E

## 4 TW72 Indoor resistance thermometer



- Measuring element: Pt100 measuring resistor to DIN EN 60751  
4-wire connection
- Casing: Material: Polystyrene  
Protection class: IP30 in accordance with  
DIN EN 60529
- Connection terminal: Screw terminal with pull-on sleeve  
Conductor cross-section: 0.25 mm<sup>2</sup> ... 2.5 mm<sup>2</sup>  
Tightening torque: 0.5 Nm ... 0.6 Nm
- Cable gland: M12 x 1.5  
Material: Polyamide PA6  
Clamping range: 2.5 – 6.5 mm  
Spanner size: 15
- Operating temp.: -10°C ... +65°C

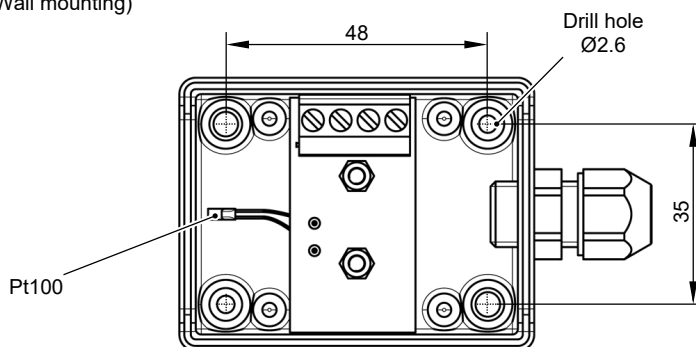
### Order codes

|   |   |   |   |
|---|---|---|---|
| T | W | 7 | 2 |
|---|---|---|---|

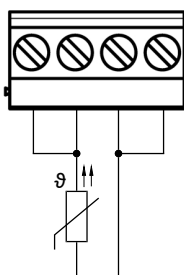
|   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|
| C | 9 | 9 | 0 | Y | 0 | 0 | 0 |
|---|---|---|---|---|---|---|---|

### Installation

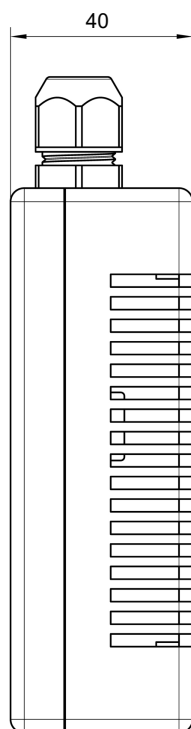
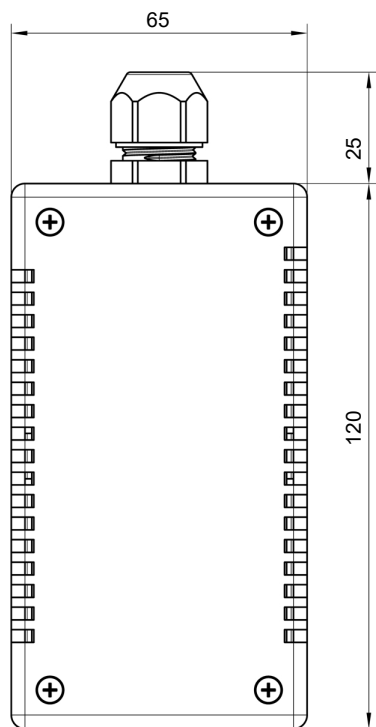
(Wall mounting)



### Electrical connection



## 5 TW73 Indoor resistance thermometer



Measuring element: Measuring resistor 1x or 2x Pt100 DIN EN 60751

Casing: Material: Polystyrene  
Protection class: IP20 in accordance with DIN EN 60529

Terminal block: Material: Cresol resin (KrG)  
Conductor cross-section: 0.33 mm<sup>2</sup> ... 4 mm<sup>2</sup>  
Tightening torque: 0.4 Nm

Cable gland: M16 x 1.5  
Material: Polyamide PA6  
Clamping range: 5 - 10 mm  
Spanner size: 19

Operating temp.: -20°C ... +60°C

### Order codes



#### Base type

Sensor with 1xPt100/2-wire ... > A  
Sensor with 1xPt100/3-wire ... > B  
Sensor with 1xPt100/4-wire ... > C  
Sensor with 2xPt100/2-wire ... > D

#### Output

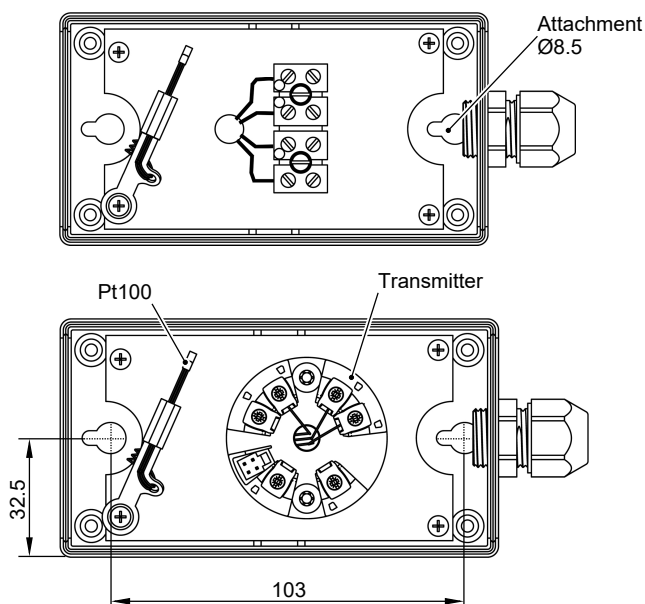
Resistor output ..... > Y  
2-wire transmitter 4-20 mA/24 Vdc\* ..... > L  
(\*only possible with basic type 1xPt100/3-wire)

#### Measuring range of the 2-L transmitter

|                          |   |   |   |
|--------------------------|---|---|---|
| Without transmitter..... | > | 0 | 0 |
| -50 ... 0 °C .....       | > | 1 | 0 |
| -50 ... 50 °C .....      | > | 2 | 0 |
| 0 ... 50 °C .....        | > | 3 | 0 |

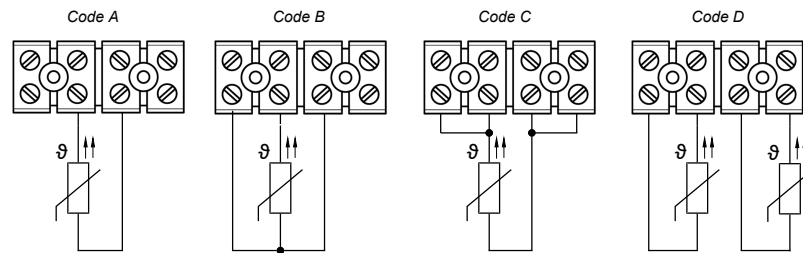
### Installation

(Wall mounting)

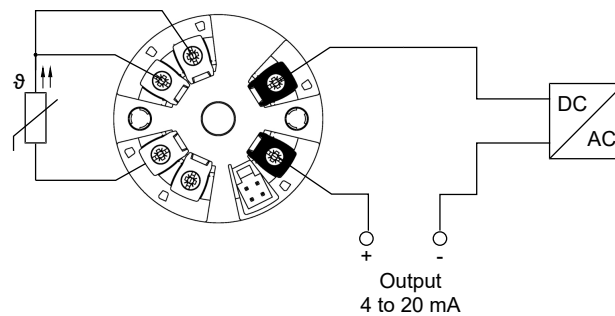


## Electrical connection

### Resistor output



### Transmitter output





## 6 Annex

### 6.1 Basic specifications for Pt100 resistance thermometers

The DIN EN 60751 standard uses the following functional relationships between temperature and resistance.

1. For the temperature range -200°C to 0°C:

$$R_t = R_0 [1 + At + Bt^2 + C(t-100^\circ\text{C})t^3]$$

2. For the temperature range 0°C to 850°C

$$R_t = R_0 (1 + At + Bt^2)$$

The following applies:

$R_0$  := the resistance in ohms at  $t = 0^\circ\text{C}$

$R_t$  := the resistance at the measured temperature  $t$  in  $^\circ\text{C}$

The following values apply for the coefficients:

$$A := 3.9083 \times 10^{-3} \text{ } ^\circ\text{C}^{-1}$$

$$B := -5.775 \times 10^{-7} \text{ } ^\circ\text{C}^{-2}$$

$$C := -4.183 \times 10^{-12} \text{ } ^\circ\text{C}^{-4}$$

These equations and coefficients are used to calculate the table of resistance values for a platinum resistor with  $R_0 = 100 \Omega$ .

| Resistance at a temperature of $t_{\text{ITS90}} / ^\circ\text{C} [\Omega]$ |        |       |       |       |       |       |       |       |       |       |       |
|-----------------------------------------------------------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| ITS90                                                                       | 0      | -1    | -2    | -3    | -4    | -5    | -6    | -7    | -8    | -9    | ITS90 |
| -200                                                                        | 18.52  |       |       |       |       |       |       |       |       |       |       |
| -190                                                                        | 22.83  | 22.40 | 21.97 | 21.54 | 21.11 | 20.68 | 20.25 | 19.82 | 19.38 | 18.95 | -190  |
| -180                                                                        | 27.10  | 26.67 | 26.24 | 25.82 | 25.39 | 24.97 | 24.54 | 24.11 | 23.68 | 23.25 | -180  |
| -170                                                                        | 31.34  | 30.91 | 30.49 | 30.07 | 29.64 | 29.22 | 28.80 | 28.37 | 27.95 | 27.52 | -170  |
| -160                                                                        | 35.54  | 35.12 | 34.70 | 34.28 | 33.86 | 33.44 | 33.02 | 32.60 | 32.18 | 31.76 | -160  |
| -150                                                                        | 39.72  | 39.31 | 38.89 | 38.47 | 38.05 | 37.64 | 37.22 | 36.80 | 36.38 | 35.96 | -150  |
| -140                                                                        | 43.88  | 43.46 | 43.05 | 42.63 | 42.22 | 41.80 | 41.39 | 40.97 | 40.56 | 40.14 | -140  |
| -130                                                                        | 48.00  | 47.59 | 47.18 | 46.77 | 46.36 | 45.94 | 45.53 | 45.12 | 44.70 | 44.29 | -130  |
| -120                                                                        | 52.11  | 51.70 | 51.29 | 50.88 | 50.47 | 50.06 | 49.65 | 49.24 | 48.83 | 48.42 | -120  |
| -110                                                                        | 56.19  | 55.79 | 55.38 | 54.97 | 54.56 | 54.15 | 53.75 | 53.34 | 52.93 | 52.52 | -110  |
| -100                                                                        | 60.26  | 59.85 | 59.44 | 59.04 | 58.63 | 58.23 | 57.82 | 57.41 | 57.01 | 56.60 | -100  |
| -90                                                                         | 64.30  | 63.90 | 63.49 | 63.09 | 62.68 | 62.28 | 61.88 | 61.47 | 61.07 | 60.66 | -90   |
| -80                                                                         | 68.33  | 67.92 | 67.52 | 67.12 | 66.72 | 66.31 | 65.91 | 65.51 | 65.11 | 64.70 | -80   |
| -70                                                                         | 72.33  | 71.93 | 71.53 | 71.13 | 70.73 | 70.33 | 69.93 | 69.53 | 69.13 | 68.73 | -70   |
| -60                                                                         | 76.33  | 75.93 | 75.53 | 75.13 | 74.73 | 74.33 | 73.93 | 73.53 | 73.13 | 72.73 | -60   |
| -50                                                                         | 80.31  | 79.91 | 79.51 | 79.11 | 78.72 | 78.32 | 77.92 | 77.52 | 77.12 | 76.73 | -50   |
| -40                                                                         | 84.27  | 83.87 | 83.48 | 83.08 | 82.69 | 82.29 | 81.89 | 81.50 | 81.10 | 80.70 | -40   |
| -30                                                                         | 88.22  | 87.83 | 87.43 | 87.04 | 86.64 | 86.25 | 85.85 | 85.46 | 85.06 | 84.67 | -30   |
| -20                                                                         | 92.16  | 91.77 | 91.37 | 90.98 | 90.59 | 90.19 | 89.80 | 89.40 | 89.01 | 88.62 | -20   |
| -10                                                                         | 96.09  | 95.69 | 95.30 | 94.91 | 94.52 | 94.12 | 93.73 | 93.34 | 92.95 | 92.55 | -10   |
| 0                                                                           | 100.00 | 99.61 | 99.22 | 98.83 | 98.44 | 98.04 | 97.65 | 97.26 | 96.87 | 96.48 | 0     |

| Resistance at a temperature of $t_{ITS90}$ /°C [Ω] |        |        |        |        |        |        |        |        |        |        |       |
|----------------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| ITS90                                              | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | ITS90 |
| 0                                                  | 100.00 | 100.39 | 100.78 | 101.17 | 101.56 | 101.95 | 102.34 | 102.73 | 103.12 | 103.51 | 0     |
| 10                                                 | 103.90 | 104.29 | 104.68 | 105.07 | 105.46 | 105.85 | 106.24 | 106.63 | 107.02 | 107.40 | 10    |
| 20                                                 | 107.79 | 108.18 | 108.57 | 108.96 | 109.35 | 109.73 | 110.12 | 110.51 | 110.90 | 111.29 | 20    |
| 30                                                 | 111.67 | 112.06 | 112.45 | 112.83 | 113.22 | 113.61 | 114.00 | 114.38 | 114.77 | 115.15 | 30    |
| 40                                                 | 115.54 | 115.93 | 116.31 | 116.70 | 117.08 | 117.47 | 117.86 | 118.24 | 118.63 | 119.01 | 40    |
| 50                                                 | 119.40 | 119.78 | 120.17 | 120.55 | 120.94 | 121.32 | 121.71 | 122.09 | 122.47 | 122.86 | 50    |
| 60                                                 | 123.24 | 123.63 | 124.01 | 124.39 | 124.78 | 125.16 | 125.54 | 125.93 | 126.31 | 126.69 | 60    |
| 70                                                 | 127.08 | 127.46 | 127.84 | 128.22 | 128.61 | 128.99 | 129.37 | 129.75 | 130.13 | 130.52 | 70    |
| 80                                                 | 130.90 | 131.28 | 131.66 | 132.04 | 132.42 | 132.80 | 133.18 | 133.57 | 133.95 | 134.33 | 80    |
| 90                                                 | 134.71 | 135.09 | 135.47 | 135.85 | 136.23 | 136.61 | 136.99 | 137.37 | 137.75 | 138.13 | 90    |
|                                                    |        |        |        |        |        |        |        |        |        |        |       |
| 100                                                | 138.51 | 138.88 | 139.26 | 139.64 | 140.02 | 140.40 | 140.78 | 141.16 | 141.54 | 141.91 | 100   |
| 110                                                | 142.29 | 142.67 | 143.05 | 143.43 | 143.80 | 144.18 | 144.56 | 144.94 | 145.31 | 145.69 | 110   |
| 120                                                | 146.07 | 146.44 | 146.82 | 147.20 | 147.57 | 147.95 | 148.33 | 148.70 | 149.08 | 149.46 | 120   |
| 130                                                | 149.83 | 150.21 | 150.58 | 150.96 | 151.33 | 151.71 | 152.08 | 152.46 | 152.83 | 153.21 | 130   |
| 140                                                | 153.58 | 153.96 | 154.33 | 154.71 | 155.08 | 155.46 | 155.83 | 156.20 | 156.58 | 156.95 | 140   |
| 150                                                | 157.33 | 157.70 | 158.07 | 158.45 | 158.82 | 159.19 | 159.56 | 159.94 | 160.31 | 160.68 | 150   |
| 160                                                | 161.05 | 161.43 | 161.80 | 162.17 | 162.54 | 162.91 | 163.29 | 163.66 | 164.03 | 164.40 | 160   |
| 170                                                | 164.77 | 165.14 | 165.51 | 165.89 | 166.26 | 166.63 | 167.00 | 167.37 | 167.74 | 168.11 | 170   |
| 180                                                | 168.48 | 168.85 | 169.22 | 169.59 | 169.96 | 170.33 | 170.70 | 171.07 | 171.43 | 171.80 | 180   |
| 190                                                | 172.17 | 172.54 | 172.91 | 173.28 | 173.65 | 174.02 | 174.38 | 174.75 | 175.12 | 175.49 | 190   |
|                                                    |        |        |        |        |        |        |        |        |        |        |       |
| 200                                                | 175.86 | 176.22 | 176.59 | 176.96 | 177.33 | 177.69 | 178.06 | 178.43 | 178.79 | 179.16 | 200   |
| 210                                                | 179.53 | 179.89 | 180.26 | 180.63 | 180.99 | 181.36 | 181.72 | 182.09 | 182.46 | 182.82 | 210   |
| 220                                                | 183.19 | 183.55 | 183.92 | 184.28 | 184.65 | 185.01 | 185.38 | 185.74 | 186.11 | 186.47 | 220   |
| 230                                                | 186.84 | 187.20 | 187.56 | 187.93 | 188.29 | 188.66 | 189.02 | 189.38 | 189.75 | 190.11 | 230   |
| 240                                                | 190.47 | 190.84 | 191.20 | 191.56 | 191.92 | 192.29 | 192.65 | 193.01 | 193.37 | 193.74 | 240   |
| 250                                                | 194.10 | 194.46 | 194.82 | 195.18 | 195.55 | 195.91 | 196.27 | 196.63 | 196.99 | 197.35 | 250   |
| 260                                                | 197.71 | 198.07 | 198.43 | 198.79 | 199.15 | 199.51 | 199.87 | 200.23 | 200.59 | 200.95 | 260   |
| 270                                                | 201.31 | 201.67 | 202.03 | 202.39 | 202.75 | 203.11 | 203.47 | 203.83 | 204.19 | 204.55 | 270   |
| 280                                                | 204.90 | 205.26 | 205.62 | 205.98 | 206.34 | 206.70 | 207.05 | 207.41 | 207.77 | 208.13 | 280   |
| 290                                                | 208.48 | 208.84 | 209.20 | 209.56 | 209.91 | 210.27 | 210.63 | 210.98 | 211.34 | 211.70 | 290   |
|                                                    |        |        |        |        |        |        |        |        |        |        |       |
| 300                                                | 212.05 | 212.41 | 212.76 | 213.12 | 213.48 | 213.83 | 214.19 | 214.54 | 214.90 | 215.25 | 300   |
| 310                                                | 215.61 | 215.96 | 216.32 | 216.67 | 217.03 | 217.38 | 217.74 | 218.09 | 218.44 | 218.80 | 310   |
| 320                                                | 219.15 | 219.51 | 219.86 | 220.21 | 220.57 | 220.92 | 221.27 | 221.63 | 221.98 | 222.33 | 320   |
| 330                                                | 222.68 | 223.04 | 223.39 | 223.74 | 224.09 | 224.45 | 224.80 | 225.15 | 225.50 | 225.85 | 330   |
| 340                                                | 226.21 | 226.56 | 226.91 | 227.26 | 227.61 | 227.96 | 228.31 | 228.66 | 229.02 | 229.37 | 340   |
| 350                                                | 229.72 | 230.07 | 230.42 | 230.77 | 231.12 | 231.47 | 231.82 | 232.17 | 232.52 | 232.87 | 350   |
| 360                                                | 233.21 | 233.56 | 233.91 | 234.26 | 234.61 | 234.96 | 235.31 | 235.66 | 236.00 | 236.35 | 360   |
| 370                                                | 236.70 | 237.05 | 237.40 | 237.74 | 238.09 | 238.44 | 238.79 | 239.13 | 239.48 | 239.83 | 370   |
| 380                                                | 240.18 | 240.52 | 240.87 | 241.22 | 241.56 | 241.91 | 242.26 | 242.60 | 242.95 | 243.29 | 380   |
| 390                                                | 243.64 | 243.99 | 244.33 | 244.68 | 245.02 | 245.37 | 245.71 | 246.06 | 246.40 | 246.75 | 390   |

| Resistance at a temperature of $t_{ITS90}$ / °C [Ω] |        |        |        |        |        |        |        |        |        |        |       |
|-----------------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| ITS90                                               | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | ITS90 |
| 400                                                 | 247.09 | 247.44 | 247.78 | 248.13 | 248.47 | 248.81 | 249.16 | 249.50 | 249.85 | 250.19 | 400   |
| 410                                                 | 250.53 | 250.88 | 251.22 | 251.56 | 251.91 | 252.25 | 252.59 | 252.93 | 253.28 | 253.62 | 410   |
| 420                                                 | 253.96 | 254.30 | 254.65 | 254.99 | 255.33 | 255.67 | 256.01 | 256.35 | 256.70 | 257.04 | 420   |
| 430                                                 | 257.38 | 257.72 | 258.06 | 258.40 | 258.74 | 259.08 | 259.42 | 259.76 | 260.10 | 260.44 | 430   |
| 440                                                 | 260.78 | 261.12 | 261.46 | 261.80 | 262.14 | 262.48 | 262.82 | 263.16 | 263.50 | 263.84 | 440   |
| 450                                                 | 264.18 | 264.52 | 264.86 | 265.20 | 265.53 | 265.87 | 266.21 | 266.55 | 266.89 | 267.22 | 450   |
| 460                                                 | 267.56 | 267.90 | 268.24 | 268.57 | 268.91 | 269.25 | 269.59 | 269.92 | 270.26 | 270.60 | 460   |
| 470                                                 | 270.93 | 271.27 | 271.61 | 271.94 | 272.28 | 272.61 | 272.95 | 273.29 | 273.62 | 273.96 | 470   |
| 480                                                 | 274.29 | 274.63 | 274.96 | 275.30 | 275.63 | 275.97 | 276.30 | 276.64 | 276.97 | 277.31 | 480   |
| 490                                                 | 277.64 | 277.98 | 278.31 | 278.64 | 278.98 | 279.31 | 279.64 | 279.98 | 280.31 | 280.64 | 490   |
|                                                     |        |        |        |        |        |        |        |        |        |        |       |
| 500                                                 | 280.98 | 281.31 | 281.64 | 281.98 | 282.31 | 282.64 | 282.97 | 283.31 | 283.64 | 283.97 | 500   |
| 510                                                 | 284.30 | 284.63 | 284.97 | 285.30 | 285.63 | 285.96 | 286.29 | 286.62 | 286.95 | 287.29 | 510   |
| 520                                                 | 287.62 | 287.95 | 288.28 | 288.61 | 288.94 | 289.27 | 289.60 | 289.93 | 290.26 | 290.59 | 520   |
| 530                                                 | 290.92 | 291.25 | 291.58 | 291.91 | 292.24 | 292.56 | 292.89 | 293.22 | 293.55 | 293.88 | 530   |
| 540                                                 | 294.21 | 294.54 | 294.86 | 295.19 | 295.52 | 295.85 | 296.18 | 296.50 | 296.83 | 297.16 | 540   |
| 550                                                 | 297.49 | 297.81 | 298.14 | 298.47 | 298.80 | 299.12 | 299.45 | 299.78 | 300.10 | 300.43 | 550   |
| 560                                                 | 300.75 | 301.08 | 301.41 | 301.73 | 302.06 | 302.38 | 302.71 | 303.03 | 303.36 | 303.69 | 560   |
| 570                                                 | 304.01 | 304.34 | 304.66 | 304.98 | 305.31 | 305.63 | 305.96 | 306.28 | 306.61 | 306.93 | 570   |
| 580                                                 | 307.25 | 307.58 | 307.90 | 308.23 | 308.55 | 308.87 | 309.20 | 309.52 | 309.84 | 310.16 | 580   |
| 590                                                 | 310.49 | 310.81 | 311.13 | 311.45 | 311.78 | 312.10 | 312.42 | 312.74 | 313.06 | 313.39 | 590   |
|                                                     |        |        |        |        |        |        |        |        |        |        |       |
| 600                                                 | 313.71 | 314.03 | 314.35 | 314.67 | 314.99 | 315.31 | 315.64 | 315.96 | 316.28 | 316.60 | 600   |
| 610                                                 | 316.92 | 317.24 | 317.56 | 317.88 | 318.20 | 318.52 | 318.84 | 319.16 | 319.48 | 319.80 | 610   |
| 620                                                 | 320.12 | 320.43 | 320.75 | 321.07 | 321.39 | 321.71 | 322.03 | 322.35 | 322.67 | 322.98 | 620   |
| 630                                                 | 323.30 | 323.62 | 323.94 | 324.26 | 324.57 | 324.89 | 325.21 | 325.53 | 325.84 | 326.16 | 630   |
| 640                                                 | 326.48 | 326.79 | 327.11 | 327.43 | 327.74 | 328.06 | 328.38 | 328.69 | 329.01 | 329.32 | 640   |
| 650                                                 | 329.64 | 329.96 | 330.27 | 330.59 | 330.90 | 331.22 | 331.53 | 331.85 | 332.16 | 332.48 | 650   |
| 660                                                 | 332.79 | 333.11 | 333.42 | 333.74 | 334.05 | 334.36 | 334.68 | 334.99 | 335.31 | 335.62 | 660   |
| 670                                                 | 335.93 | 336.25 | 336.56 | 336.87 | 337.18 | 337.50 | 337.81 | 338.12 | 338.44 | 338.75 | 670   |
| 680                                                 | 339.06 | 339.37 | 339.69 | 340.00 | 340.31 | 340.62 | 340.93 | 341.24 | 341.56 | 341.87 | 680   |
| 690                                                 | 342.18 | 342.49 | 342.80 | 343.11 | 343.42 | 343.73 | 344.04 | 344.35 | 344.66 | 344.97 | 690   |
|                                                     |        |        |        |        |        |        |        |        |        |        |       |
| 700                                                 | 345.28 | 345.59 | 345.90 | 346.21 | 346.52 | 346.83 | 347.14 | 347.45 | 347.76 | 348.07 | 700   |
| 710                                                 | 348.38 | 348.69 | 348.99 | 349.30 | 349.61 | 349.92 | 350.23 | 350.54 | 350.84 | 351.15 | 710   |
| 720                                                 | 351.46 | 351.77 | 352.08 | 352.38 | 352.69 | 353.00 | 353.30 | 353.61 | 353.92 | 354.22 | 720   |
| 730                                                 | 354.53 | 354.84 | 355.14 | 355.45 | 355.76 | 356.06 | 356.37 | 356.67 | 356.98 | 357.28 | 730   |
| 740                                                 | 357.59 | 357.90 | 358.20 | 358.51 | 358.81 | 359.12 | 359.42 | 359.72 | 360.03 | 360.33 | 740   |
| 750                                                 | 360.64 | 360.94 | 361.25 | 361.55 | 361.85 | 362.16 | 362.46 | 362.76 | 363.07 | 363.37 | 750   |
| 760                                                 | 363.67 | 363.98 | 364.28 | 364.58 | 364.89 | 365.19 | 365.49 | 365.79 | 366.10 | 366.40 | 760   |
| 770                                                 | 366.70 | 367.00 | 367.30 | 367.60 | 367.91 | 368.21 | 368.51 | 368.81 | 369.11 | 369.41 | 770   |
| 780                                                 | 369.71 | 370.01 | 370.31 | 370.61 | 370.91 | 371.21 | 371.51 | 371.81 | 372.11 | 372.41 | 780   |
| 790                                                 | 372.71 | 373.01 | 373.31 | 373.61 | 373.91 | 374.21 | 374.51 | 374.81 | 375.11 | 375.41 | 790   |

| Resistance at a temperature of $t_{ITS90}$ /°C [ $\Omega$ ] |        |        |        |        |        |        |        |        |        |        |       |
|-------------------------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| ITS90                                                       | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | ITS90 |
| 800                                                         | 375.70 | 376.00 | 376.30 | 376.60 | 376.90 | 377.19 | 377.49 | 377.79 | 378.09 | 378.39 | 800   |
| 810                                                         | 378.68 | 378.98 | 379.28 | 379.57 | 379.87 | 380.17 | 380.46 | 380.76 | 381.06 | 381.35 | 810   |
| 820                                                         | 381.65 | 381.95 | 382.24 | 382.54 | 382.83 | 383.13 | 383.42 | 383.72 | 384.01 | 384.31 | 820   |
| 830                                                         | 384.60 | 384.90 | 385.19 | 385.49 | 385.78 | 386.08 | 386.37 | 386.67 | 386.96 | 387.25 | 830   |
| 840                                                         | 387.55 | 387.84 | 388.14 | 388.43 | 388.72 | 389.02 | 389.31 | 389.60 | 389.90 | 390.19 | 840   |
| 850                                                         | 390.48 |        |        |        |        |        |        |        |        |        | 850   |

## 6.2 Deviations from the limit values for Pt100 resistance thermometers

The tolerance limits for Pt100 temperature sensors are specified in accordance with DIN EN 60751:

| Class    | Valid range [°C]     |                   |                                  |
|----------|----------------------|-------------------|----------------------------------|
|          | Wire-wound resistors | Sheet resistances | Limit deviation [°C]             |
| Class AA | -50 to +250          | 0 to +150         | $\pm (0.10 + 0.0017 \times  t )$ |
| Class A  | -100 to +450         | -30 to +300       | $\pm (0.15 + 0.002 \times  t )$  |
| Class B  | -196 to +600         | -50 to +600       | $\pm (0.30 + 0.005 \times  t )$  |

| ITS90<br>[°C] | Class AA |          | Class A |          | Class B |          |
|---------------|----------|----------|---------|----------|---------|----------|
|               | [°C]     | $\Omega$ | [°C]    | $\Omega$ | [°C]    | $\Omega$ |
| -200          | -        | -        | -       | -        | -       | -        |
| -196          | -        | -        | -       | -        | 1.28    | 0.50     |
| -100          | -        | -        | 0.35    | 0.14     | 0.80    | 0.31     |
| -50           | -        | -        | 0.25    | 0.10     | 0.55    | 0.21     |
| -30           | -        | -        | 0.21    | 0.08     | 0.45    | 0.18     |
| 0             | 0.10     | 0.04     | 0.15    | 0.06     | 0.30    | 0.12     |
| 50            | 0.19     | 0.07     | 0.25    | 0.10     | 0.55    | 0.21     |
| 100           | 0.27     | 0.11     | 0.35    | 0.14     | 0.80    | 0.31     |
| 150           | 0.36     | 0.14     | 0.45    | 0.18     | 1.05    | 0.41     |
| 200           | -        | -        | 0.55    | 0.21     | 1.30    | 0.51     |
| 300           | -        | -        | 0.75    | 0.29     | 1.80    | 0.70     |
| 400           | -        | -        | 0.95    | 0.37     | 2.30    | 0.90     |
| 450           | -        | -        | 1.05    | 0.41     | 2.55    | 1.00     |
| 600           | -        | -        | -       | -        | 3.30    | 1.29     |
| 800           | -        | -        | -       | -        | -       | -        |

## Notes

## Notes



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