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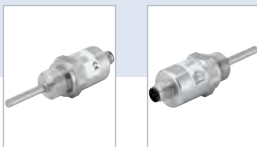
**Единый адрес:** [btk@nt-rt.ru](mailto:btk@nt-rt.ru) **Веб-сайт:** [www.burkert.nt-rt.ru](http://www.burkert.nt-rt.ru)

## **ДАТЧИКИ И РЕЛЕ ДАВЛЕНИЯ**



## RTD temperature sensor with CANopen interface

- Single RTD temperature probe, type Pt1000
- Process connection: G 1/2" or NPT 1/2"
- Temperature measurement range: -50...+150 °C
- Limit value monitoring function
- Access to measurement value, device status and settings via CANopen interface



Product variants described in the data sheet may differ from the product presentation and description.

### Can be combined with



**Type ME43**  
Fieldbus gateway



**PLC**  
With CANopen interface

Integration into CANopen and bÜS networks

### Type description

RTD temperature probes are the preferred choice for temperature measurement in liquids and gases. The design offers reliable tightness under negative and positive pressure.

The measuring insert is equipped with a Pt1000 temperature sensor according to DIN EN 60751, class A. The measured temperature value is digitized, linearized, and made available through the CANopen digital communication interface (CAN slave) for further processing.

Instead of an analogue output this device offers the digital interface CANopen. This allows bidirectional data transfer with e.g. a gateway CAN/Ethernet or directly to a PLC having a CAN interface itself. CAN devices can also be connected to the Burkert bÜS digital communication interface. A driver, which is used for data exchange and settings of the 8412, is integrated in the Burkert PC tool Communicator and is available on our website.

Several useful extra functions have been implemented through the DS 404 device profile.

## 1. General Technical Data

| Product properties                      |  |
|---|--|
| <b>Material</b>                         |  |
| <b>Non wetted parts</b>                 |  |
| Housing                                 | Stainless steel 1.4571 (316Ti)   |
| <b>Wetted parts</b>                     |  |
| Process connection                      | Stainless steel 1.4571 (316Ti)   |
| Protection tube                         | Stainless steel 1.4571 (316Ti)   |
| Dimensions                              | Detailed information can be found in chapter <b>"3. Dimensions"</b> on page 5.   |
| Measurement element                     | Pt1000 temperature sensor, two-wire circuit  |
| Probe length                            | 50 or 100 mm   |
| Measuring range                         | -50...+150 °C (-58...+302 °F)  |
| Monitoring                              | <ul style="list-style-type: none"> <li>• Measuring circuit               <ul style="list-style-type: none"> <li>– Underrange (freely selectable lower limit)</li> <li>– Overrange (freely selectable upper limit)</li> </ul> </li> <li>• Probe short circuit</li> <li>• Probe break</li> </ul> |
| Additional functions                    | <ul style="list-style-type: none"> <li>• Min./max. measured value memory</li> <li>• Fine adjustment</li> <li>• Toggling between °C, °F, °K</li> <li>• Decimal places selectable 0, 1, 2</li> </ul>   |
| Weight                                  | Approx. 80 g for the version with thread connection and 100 mm probe length. The weight of the temperature sensor depends on the process connection and the insertion length.  |
| Performance data                        |  |
| Sampling rate                           | 250 ms   |
| Transmission behaviour                  | Temperature linear   |
| Response time                           | <ul style="list-style-type: none"> <li>• <math>t_{0.5}</math> = 5 s; <math>t_{0.9}</math> = 12 s, in water with a flow velocity of 0.4 m/s</li> <li>• <math>t_{0.5}</math> = 40 s; <math>t_{0.9}</math> = 110 s, in air with a flow velocity of 3.0 m/s</li> </ul>                             |
| Measuring resolution                    | 12 Bit   |
| Measurement deviation                   | <ul style="list-style-type: none"> <li>• Tolerance class A according to EN 60751:2009 / IEC 60751:2008</li> <li>• Max. <math>\pm 0.2\%</math> of the measuring range span</li> </ul>   |
| Electrical data                         |  |
| Operating voltage                       | 10...30 V DC, filtered and regulated   |
| Power source (not supplied)             | The auxiliary energy of the pressure sensor must meet SELV requirements; optionally, an energy-limited current circuit according to section 9.3 of DIN EN 31010-1 and UL 61010-1 can be used.  |
| Current consumption                     | Approx. max. 45 mA   |
| DC reverse polarity protection          | Yes  |
| Overvoltage protection                  | Yes  |
| Short circuit protection                | Yes  |
| Cable                                   | 5-wire shielded cable, length depends on the transmission speed. The physical CAN transmission is standardized according to ISO 11898-2 (high-speed) and ISO 11898-3 (low-speed)   |
| Medium data                             |  |
| Fluid                                   | Liquid and gaseous medium  |
| Fluid pressure                          | Max. 40 bar  |
| Process/Port connection & communication |  |
| Process connection                      | G ½" or NPT ½" screw-in thread   |
| Electrical connection                   | M12 × 1 male connector, 5 pin according to DIN IEC 60947-5-2   |
| <b>Digital communication: CANopen</b>   |  |
| Protocol                                | CiA DS 301, V4.02, CANopen slave   |
| Profile                                 | CiA DS 404, V1.2; measuring devices and closed-loop controllers  |
| Baud rate                               | 20 kbaud to 1 Mbaud, setting via LSS or SDO  |
| Node ID                                 | 1 to 127 setting via LSS or SDO  |
| PDO                                     | 0 Rx, 1 Tx   |

|                                |  |
|--------------------------------|--|
| SDO                            | 1 Rx, 1 Tx   |
| Emergency                      | Yes  |
| Heartbeat                      | Yes (if active, then Node Guarding deactivated)  |
| Node Guarding                  | Yes (if active, then Heartbeat deactivated)  |
| LSS                            | Yes  |
| SYNC                           | Yes  |
| Operation and project planning | All parameters are accessible via the CANopen object directory (EDS) and can be set via standard CANopen software tools or Bürkert Communicator.   |
| EDS (electronic data sheet)    | <ul style="list-style-type: none"> <li>• Device driver in Bürkert Communicator tool Type 8920, see “Bürkert Communicator” on the website in the Software chapter <b>Type 8920</b> ▶</li> <li>• See “Device Description Files” on the website in the Software chapter <b>Type 8412</b> ▶</li> </ul> |
| Factory setting                | See “Operating Instructions Type 8412” on the website in the User Manuals chapter <b>Type 8412</b> ▶   |

### Approvals and certificates

#### Standards

|                      |  |
|----------------------|--|
| Degree of protection | IP67, according to IEC/EN 60529 with female connector screwed on |
| Accuracy class       | Class A according to IEC 60751                                   |
| Protection class     | Class III according to EN 61140                                  |

#### Directives

|                                     |   |
|-------------------------------------|---|
| CE directives                       | The applied standards, which verify conformity with the EU Directives, can be found on the EU Type Examination Certificate and/or the EU Declaration of conformity (if applicable)  |
| Electromagnetic compatibility (EMC) | CE conformity according to EN 61326-2-3 <ul style="list-style-type: none"> <li>• Interference emission: class B</li> <li>• Immunity to interference: to industrial requirements</li> </ul>  |
| Pressure equipment directives       | <ul style="list-style-type: none"> <li>• The device does not meet the requirements for “safety accessories” within the meaning of the Pressure Equipment Directive 2014/68/EU.</li> <li>• Complying with Article 4, Paragraph 1 of 2014/68/EU directive<br/>Detailed information on the pressure equipment directive can be found in chapter <b>“2.1. Pressure Equipment Directive” on page 5.</b></li> </ul> |

### Environment and installation

#### Ambient temperature

|                       |  |
|-----------------------|--|
| Operation             | -20...+85 °C (-4...+185 °F)  |
| Storage               | -40...+85 °C (-40...+185 °F)   |
| Temperature influence | ≤ ±0.0025 % of the measuring span per K deviation from 22 °C   |
| Relative air humidity | <ul style="list-style-type: none"> <li>• During operation: ≤ 100 %, without condensation on the outer housing surface of the device</li> <li>• During storage: ≤ 90 %, without condensation</li> </ul> |
| Climate class         | 3K7 according to EN 60721-3-3  |
| Area of use           | Indoors and outdoors (protect this device against electromagnetic interference, ultraviolet rays and the effects of climatic conditions)   |
| Vibration resistance  | According to EN 60068-2-6: <ul style="list-style-type: none"> <li>• for 50 mm probe length: 10 g max. with 10...2000 Hz</li> <li>• for 100 mm probe length: 5 g max. with 10...300 Hz</li> </ul>       |
| Shock resistance      | According to EN 60068-2-27: <ul style="list-style-type: none"> <li>• for 50 mm probe length: 50 g, 3 ms</li> <li>• for 100 mm probe length: 30 g, 3 ms</li> </ul>                                      |
| Mounting position     | Installation: unrestricted   |

## 2. Approvals

### 2.1. Pressure Equipment Directive

The device conforms to Article 4, Paragraph 1 of the Pressure Equipment Directive 2014/68/EU under the following conditions:

#### Device used on a pipe

**Note:**

- The data in the table is independent of the chemical compatibility of the material and the fluid.
- PS = maximum admissible pressure, DN = nominal diameter of the pipe

| Type of fluid                              | Conditions                          |
|--|-------------------------------------|
| Fluid group 1, Article 4, Paragraph 1.c.i  | DN ≤ 25                             |
| Fluid group 2, Article 4, Paragraph 1.c.i  | DN ≤ 32 or PS*DN ≤ 1000             |
| Fluid group 1, Article 4, Paragraph 1.c.ii | DN ≤ 25 or PS*DN ≤ 2000             |
| Fluid group 2, Article 4, Paragraph 1.c.ii | DN ≤ 200 or PS ≤ 10 or PS*DN ≤ 5000 |

#### Device used on a vessel

**Note:**

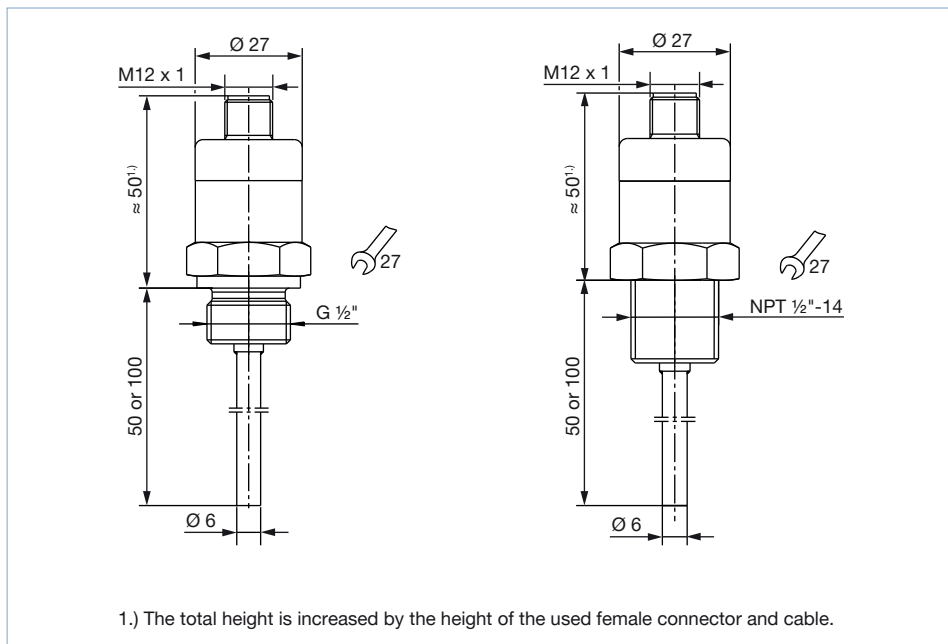
- The data in the table is independent of the chemical compatibility of the material and the fluid.
- PS = maximum admissible pressure, V = vessel volume

| Type of fluid                              | Conditions  |
|--|---|
| Fluid group 1, Article 4, Paragraph 1.a.i  | V > 1 L and PS*V ≤ 25 bar.L or PS ≤ 200 bar         |
| Fluid group 2, Article 4, Paragraph 1.a.i  | V > 1 L and PS*V ≤ 50 bar.L or PS ≤ 1000 bar        |
| Fluid group 1, Article 4, Paragraph 1.a.ii | V > 1 L and PS*V ≤ 200 bar.L or PS ≤ 500 bar        |
| Fluid group 2, Article 4, Paragraph 1.a.ii | PS > 10 bar and PS*V ≤ 10000 bar.L or PS ≤ 1000 bar |

## 3. Dimensions

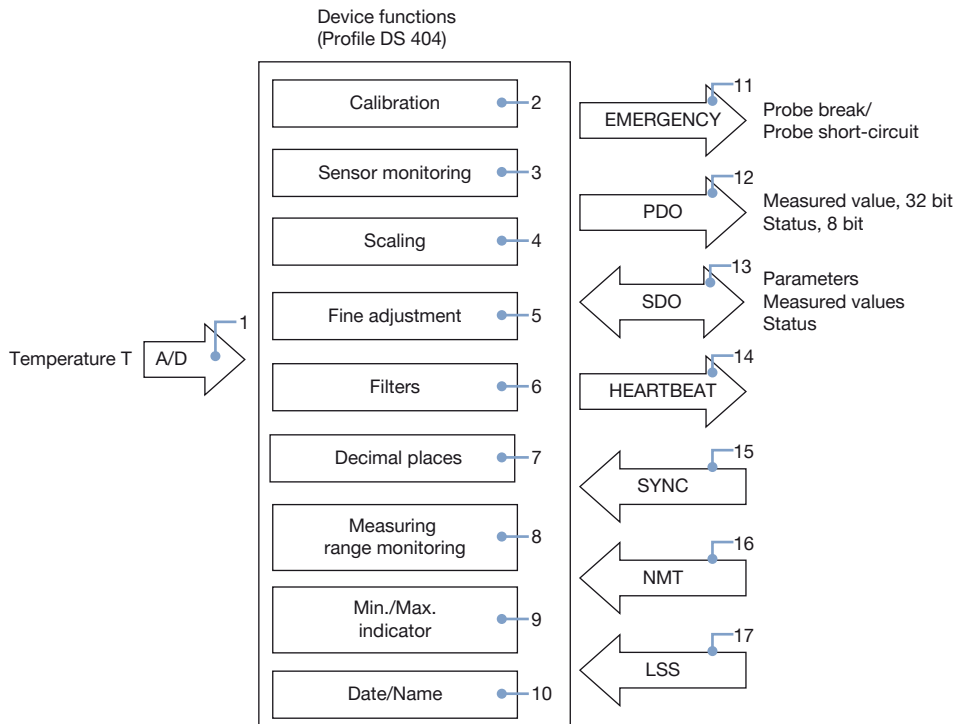
**Note:**

Dimensions in mm



## 4. Product operation

### 4.1. Functional overview




| No. | Description   |
|-----|---|
| 1   | The measured temperature value is digitized.  |
| 2   | The temperature signal is adjusted digitally per default.   |
| 3   | The sensor monitoring continuously checks the correct function of the sensor signal and triggers high-priority emergency frames in the event of an error. |
| 4   | The measured temperature value can be scaled to any measuring units (or in % of the measuring range).   |
| 5   | The fine adjustment features a freely adjustable characteristic line offset.  |
| 6   | Undesired signal fluctuations can be suppressed using the adjustable filter constant.   |
| 7   | The measurement output has a freely selectable decimal place.   |
| 8   | Free choice of upper and lower limits for range monitoring. The result is given as a status byte in addition to the measurement in the PDO frame.         |
| 9   | The drag pointer ("min./max. index") function records the minimum and maximum temperature values.   |
| 10  | The date and name of the last maintenance operation can be saved.   |
| 11  | The emergency frame is triggered in the event of a sensor fault.  |
| 12  | The PDO frame contains a 32-bit measurement and a 8-bit status. The measurement output can be controlled by means of different trigger conditions.        |
| 13  | SDO frames can be used to set parameters and to request measured values and statuses.   |
| 14  | The heartbeat signal can be used to additionally monitor the function of the transmitter.   |
| 15  | The sync command can also be used to control the transfer of the measured values.   |
| 16  | The NMT frames are for the purpose of controlling the operating status of the transmitter.  |
| 17  | The CAN Node ID and the CAN baud rate are set either with LSS or SDO.   |

## 5. Product accessories

### Note:

To set up a device, please use the USB-büS interface in combination with the Bürkert software tool Communicator Type 8920.

See **Software manual Type 8920** ▶ for more information.

| Accessories   | No. | Description  |
|---|-----|--|
|  | 1   | Quick-Start  |
|   | 2   | Power supply: 100...240 V AC/24 V DC 1 A and adaptors for power supply worldwide use   |
|   | 3   | büS terminating resistor on büS Y-splitter   |
|   | 4   | 5 pin M12 male connector wired on free end cable   |
|   | 5   | büS connection cable with 5 pin M12 plug, micro USB B plug   |
|   | 6   | büS adapter with 5 pin M12 plug, A-coded to 5 pin M12 plug, A-coded  |
|   | 7   | büS stick (USB to büS/CANopen adaptor)   |
|   | 8   | büS service cable with 5 pin M12 plug, mini USB and circular plug-in connectors for power supply   |
|   | 9   | Magnetic key   |
|   | 10  | CD - Communicator (30-day license without registration, update and licensing over Bürkert home page). It is recommended to download and install the Communicator software from the homepage to use the latest version. |

## 6. Ordering information

### 6.1. Bürkert eShop – Easy ordering and quick delivery



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### 6.2. Bürkert product filter



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### 6.3. Ordering chart

**Note:**

All following versions have a 10...30 V DC operating voltage and a CANopen digital interface.

| Process connection | Temperature range | Probe length | Article no. |
|--------------------|-------------------|--------------|-------------|
|                    | [°C]              | [mm]         |             |
| G ½"               | -50...+150        | 50           | 574638      |
|                    |                   | 100          | 574639      |
| NPT ½"             |                   | 50           | 574640      |
|                    |                   | 100          | 574641      |

| Further versions on request  |                                     |
|--|-------------------------------------|
| <b>Process connection</b><br>Screw-in thread G ¼", G ⅜", M14x1.5, M18x1.5 and M20x1.5  | <b>Temperature</b><br>-50...+450 °C |
| <b>Additional</b> <ul style="list-style-type: none"> <li>Pt1000 temperature sensor, two-wire circuit, class B according to EN 60751:2009 / IEC 60751:2008</li> <li>Insertion length: 150, 200 or 250 mm</li> </ul> |                                     |

### 6.4. Ordering chart accessories

**Note:**

- büS communication specifications are based on CANopen.
- All following accessories can be used for CANopen as well.

| Description  | Article no.           |
|--|-----------------------|
| <b>System connection</b>   |                       |
| <b>Type ME43 Gateway / Interface</b>   |                       |
| büS/Ethernet (Profinet, Ethernet/IP, Modbus TCP, EtherCAT)   | 307390                |
| büS/Profibus DP  | 307393                |
| <b>Interface accessories</b>   |                       |
| <b>büS Stick Set</b>   |                       |
| USB-büS-Interface Set 1, Type 8920. Detailed information can be found in chapter "5. Product accessories" on page 7. | 772426                |
| USB-büS Interface Set 2, Type 8920 (only büS Stick, cable and büS service cable)                                     | 772551                |
| <b>Connectors and sockets</b>  |                       |
| büS Y-connector, 5 pin M12 female to 5 pin M12 male and 5 pin M12 female   | 772420                |
| büS Y-connector, 5 pin M12 female to 5 pin M12 male and 5 pin M12 female (power interrupt)                           | 772421                |
| büS adaptor M12 male A-coded - M12 male A-coded  | 772867                |
| büS termination, 5 pin M12 male cable plug   | 772424                |
| büS termination, 5 pin M12 female cable plug   | 772425                |
| <b>Extensions</b>  |                       |
| 5 pin M12 female and male straight cable plug moulded on cable (0.5 m, shielded)                                     | 772403                |
| 5 pin M12 female and male straight cable plug moulded on cable (1 m, shielded)                                       | 772404                |
| 5 pin M12 female and male straight cable plug moulded on cable (3 m, shielded)                                       | 772405                |
| 5 pin M12 female and male straight cable plug moulded on cable (5 m, shielded)                                       | 772406                |
| 5 pin M12 female and male straight cable plug moulded on cable (10 m, shielded)                                      | 772407                |
| 5 pin M12 female and male straight cable plug moulded on cable (20 m, shielded)                                      | 772408                |
| <b>Software</b>  |                       |
| Software Bürkert Communicator  | Download<br>Type 8920 |



