Product description
The TBS temperature switch is easy to use and has a rugged design. It is designed for temperature measurement and monitoring of operating liquids, such as hydraulic oils, coolant lubricants and cleaning liquids in machine building and manufacturing. With up to two binary outputs and one analog output, it can be used in many applications. A large, well-legible display and three pushbuttons facilitate setup. The intuitive menu navigation and display use familiar and standardized features and programming. The switching state of the binary outputs is displayed by highly visible LEDs.

During installation, the TBS is uniquely possible to rotate the display and the process connection independently of the sensor body, ensuring both clean cable layout and that the display is facing the user. Temperature measurement is done using a Pt1000 element that is located in the tip of the stainless steel probe.

At a glance
- Large display
- Individually programmable transistor outputs PNP or NPN, optional analog output 4 mA ... 20 mA or 0 V ... 10 V
- Round connector M12 x 1
- Measuring range -20 °C ... +80 °C
- Pt1000 element, accuracy class A (IEC 60751)

Your benefits
- Quick and safe set-up through superior ease of use
- Compact dimensions and rotatable housing facilitate integration
- Very reliable: splash-proof housing, high-grade materials, rugged design, and field proven technology
- Very good long-term stability, accuracy and linearity
- Very good response time
- Versatile configuration allows for optimal solutions for specific requirements
- Various insertion lengths and connections threads
- Wetted parts made from corrosion-resistant stainless steel 1.4571
- Enclosure rating IP 65 and IP 67
Temperature sensors

**Detailed technical data**

**Features**

- **Measuring range**: -20 °C ... +80 °C
- **Sensor element**: Pt1000, 2-wire, class A according to IEC 60751

**Output signals**

- 2 x NPN
- 1 x PNP + 4...20 mA
- 1 x PNP + 0...10 V
- 2 x PNP + 0...10 V
- 2 x NPN
- 1 x NPN + 4...20mA
- 1 x NPN + 0...10 V
- 2 x NPN + 4...20 mA
- 2 x NPN + 0...10 V

**Switching points**

- Type: transistor switching output PNP or NPN
- Quantity: 1 or 2
- Function: normally open / normally closed; windows- and hysteresis function freely adjustable
- Contact rating: supply voltage L+ - 1 V [V DC]
- Max. switching current: 250 mA
- Switching delay: 0...50 s (adjustable)
- Individually adjustable via control buttons
- Setting accuracy: 0.1 °C
- Temperature offset: ± 3 °C
- Full scale: ± 25 % of span

**Display**

- 14-segment LED, blue, 4-digits, height 9 mm
- Display electronically turnable by 180°
- Update: 200 ms
- Display against housing with electrical connection: 330°
- Housing against process connection: 320°

**Performance**

- Accuracy of sensor element: ± 0.15 °C + 0.002 °C (1)
- Accuracy of switching output: ± 0.8 % of span
- Display accuracy: ± 0.8 % of span ± 1 digit
- Accuracy of optional analog output: ± 0.5 % of span
- Response time t50: ≤ 5 s
- Response time t90: ≤ 10 s

*(1) is the absolute value of the temperature in °C
*Depending on sensor configuration, according to IEC 60751

**Process connection**

- G 1/4 A according to DIN 3852 E
- G 1/2 A according to DIN 3852 E
- 1/4” NPT
- 1/2” NPT

**Insertion lengths/diameter of probe**

- 25 mm / 6 mm
- 50 mm / 6 mm
- 100 mm / 6 mm
- 150 mm / 6 mm
- 250 mm / 6 mm
- 350 mm / 6 mm

**Wetted parts**

- Stainless steel 1.4571 (AISI 316Ti)

**Mechanics/electronics**

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**Ambient data**

- Ambient temperature: -20 °C ... +80 °C
- Storage temperature: -20 °C ... +80 °C
- Relative humidity: 45 % ... 75 %
Temperature sensors

Type code

Output signal
- A 2 x PNP + 4...20 mA
- B 1 x PNP + 0...10 V
- C 1 x PNP + 4...20 mA
- D 2 x PNP + 4...20 mA
- E 2 x PNP + 0...10 V
- F 1 x PNP + 4...20 mA
- G 2 x PNP + 0...10 V
- H 2 x PNP + 0...10 V
- I 2 x PNP + 0...10 V
- K 2 x PNP + 0...10 V

Process connection
- G 1/2 A according to DIN 3852-E
- G 1/4 A according to DIN 3852-E
- N 2 1/2'' NPT
- N 4 1/4'' NPT

Insertion length / diameter
- 0 25 mm / 6 mm
- 1 50 mm / 6 mm
- 2 100 mm / 6 mm
- 3 150 mm / 6 mm
- 4 250 mm / 6 mm
- 5 350 mm / 6 mm
- 6 500 mm / 6 mm

Seal
- N NBR
- F FPM/FKM
- Z Without seal

Electrical connection
- M M12x1, 4-pin

Ordering information

The part numbers below show a selection of our common configurations and represent only a portion of the product portfolio. The type code in page 5 indicates all possible configurations that can be ordered.

- Electrical connection: (M12x1, 4-pin)
- Seal NBR

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<tr>
<th>Output signal</th>
<th>Process connection</th>
<th>Insertion length/diameter of probe</th>
<th>Model name</th>
<th>Part no.</th>
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Temperature sensors

**TBS**

**Dimensional drawings**

- **TBS with connection G 1/4 A according to DIN 3852 E**
- **TBS with connection G 1/2 A according to DIN 3852 E**

- **TBS with connection 1/4'' NPT**
- **TBS with connection 1/2'' NPT**

**Recommended accessories**

**Plug connectors and cables**

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<thead>
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<th>Flying leads</th>
<th>Electrical connection</th>
<th>Enclosure rating</th>
<th>Sheath material</th>
<th>Cable length</th>
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Temperature sensors

SICK at a glance

Leading technologies
With a staff of more than 5,000 and over 50 subsidiaries and representa- tions worldwide, SICK is one of the leading and most successful manufac- turers of sensor technology. The power of innovation and solution competency have made SICK the global market leader. No matter what the project and industry may be, talking with an expert from SICK will provide you with an ideal basis for your plans – there is no need to settle for anything less than the best.

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- Accident and operator protection with sensors, safety software and services
- Automatic identification with barcode and RFID readers
- Laser measurement technology for detecting the volume, position and contour of people and objects
- Complete system solutions for analysis and flow measurement of gases and liquids

Comprehensive services
- SICK LifeTime Services – for safety and productivity
- Application centers in Europe, Asia and North America for the develop- ment of system solutions under real-world conditions
- E-Business Partner Portal www.mysick.com – price and availability of products, requests for quotation and online orders

Worldwide presence with subsidiaries in the following countries:

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Brasil
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China
Danmark
Deutschland
España
France
Großbritannien
India
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Slovenija
South Africa
South Korea
Suomi
Sverige
Taiwan
Türkiye
United Arab Emirates
USA

Please find detailed addresses and additional representatives and agencies in all major industrial nations at www.sick.com

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