PRODUCT INFORMATION

TBS

Temperature sensors

SICK
Sensor Intelligence.

Temperature monitoring made easy

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 flexible due to its two rotation locations. It is 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)
- Various insertion lengths and connection threads
- Wetted parts made from corrosion-resistant stainless steel 1.4571
- Enclosure rating IP 65 and IP 67

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
- Quick response time
- Versatile configuration allows for optimal solutions for specific requirements

Additional information

8014742/2011-11-07
Subject to change without notice

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 PNP 1 x PNP + 4...20 mA 1 x PNP + 0...10 V 2 x PNP + 4...20 mA 2 x PNP + 0...10 V 2 x NPN 1 x NPN + 4...20 mA 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
Scaling of temperature range	Zero: max. +25 % of span Full scale: max. -25 % of span
Display	14-segment LED, blue, 4-digits, height 9 mm Display electronically turnable by 180° Update: 200 ms
Rotatable housing	Display against housing with electrical connection: 330° Housing against process connection: 320°

Performance

Accuracy of sensor element	≤ ± (0.15 °C + 0,002 |t|) [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] |t| is the absolute value of the temperature in °C

[2] Depending on sensor configuration, according to IEC 60751.

Mechanics/electronics

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)
Maximum process pressure [1]	150 bar
Housing material	Lower body: stainless steel 1.4301 (AISI 304) Plastic head: PC + ABS Buttons: TPE-E Display window: PC
Enclosure rating [2]	IP 65 and IP 67
Maximum ohmic load R_A	< 0.5 kΩ for output signal 4 mA ... 20 mA > 10 kΩ for output signal 0 V ... 10 V ≤ 100 kΩ (switching outputs)
Electrical connection	Round connector M12 x 1, 4-pin Round connector M12 x 1, 5-pin (only for variants with two switching outputs and one analog output)
Supply voltage	15 V DC ... 35 V DC
Maximum current consumption	45 mA (for configurations without analog signal output) 70 mA (for configurations with analog signal output)
Total current consumption	max. 320 mA / 570 mA (incl. switching current)
Electrical safety	Protection class: III Isolation voltage: 500 V DC Overvoltage protection: 40 V DC Short-circuit protection: Q_A, Q_1, Q_2 towards M Reverse polarity protection: L+ towards M
CE-conformity	2004/108/EC, EN 61326-1 emission (group 1, class B) and interference immunity (industrial application)
ROHS	✔

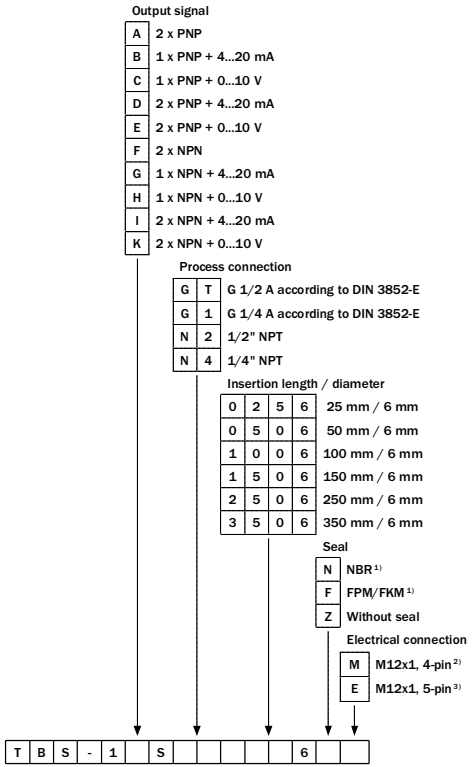
[1] At room temperature and when connected through thread.

[2] Enclosure rating IP per IEC 60529. The enclosure rating classes specified only apply while the thermometer is connected with female connectors that provide the corresponding enclosure rating.

Ambient data

Ambient temperature	–20 °C ... + 80 °C
Storage temperature	–20 °C ... + 80 °C
Relative humidity	45 % ... 75 %

Type code



1) Only for connections G 1/2 A according to DIN 3852-E and G 1/4 A according to DIN 3852-E.
2) For configurations with 2 switching outputs or with one switching output + one analog output.
3) For configurations with 2 switching outputs + one analog output.

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 on page 5 indicates all possible configurations that can be ordered.

- **Electrical connection:** M12x1, 4-pin
- **Seal:** NBR

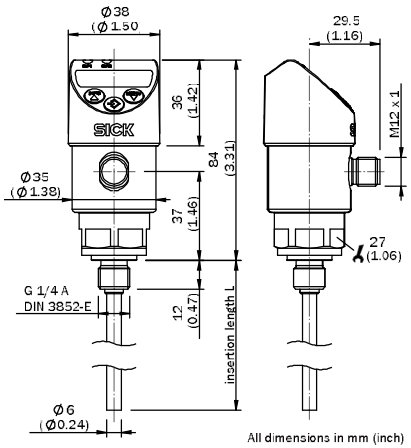
Output signal	Process connection	Insertion length/ diameter of probe	Model name	Part no.
2 x PNP	G 1/4 A acc. to DIN 3852-E	50 mm / 6 mm	TBS-1ASG10506NM	6048661
		100 mm / 6 mm	TBS-1ASG11006NM	6048662
		150 mm / 6 mm	TBS-1ASG11506NM	6048663
		250 mm / 6 mm	TBS-1ASG12506NM	6048664
	G 1/2 A acc. to DIN 3852-E	50 mm / 6 mm	TBS-1ASGT0506NM	6048665
		100 mm / 6 mm	TBS-1ASGT1006NM	6048666
		150 mm / 6 mm	TBS-1ASGT1506NM	6048667
		250 mm / 6 mm	TBS-1ASGT2506NM	6048668
1 x PNP + 4 mA ... 20 mA	G 1/4 A acc. to DIN 3852-E	50 mm / 6 mm	TBS-1BSG10506NM	6048669
		100 mm / 6 mm	TBS-1BSG11006NM	6048670
		150 mm / 6 mm	TBS-1BSG11506NM	6048671
		250 mm / 6 mm	TBS-1BSG12506NM	6048672
	G 1/2 A acc. to DIN 3852-E	50 mm / 6 mm	TBS-1BSGT0506NM	6048673
		100 mm / 6 mm	TBS-1BSGT1006NM	6048674
		150 mm / 6 mm	TBS-1BSGT1506NM	6048675
		250 mm / 6 mm	TBS-1BSGT2506NM	6048676

- **Electrical connection:** M12x1, 5-pin
- **Seal:** NBR

Output signal	Process connection	Insertion length/ diameter of probe	Model name	Part no.
2 x PNP + 4 mA ... 20 mA	G 1/4 A acc. to DIN 3852-E	50 mm / 6 mm	TBS-1DSG10506NE	6048677
		100 mm / 6 mm	TBS-1DSG11006NE	6048678
		150 mm / 6 mm	TBS-1DSG11506NE	6048679
		250 mm / 6 mm	TBS-1DSG12506NE	6048680
	G 1/2 A acc. to DIN 3852-E	50 mm / 6 mm	TBS-1DSGT0506NE	6048681
		100 mm / 6 mm	TBS-1DSGT1006NE	6048682
		150 mm / 6 mm	TBS-1DSGT1506NE	6048683
		250 mm / 6 mm	TBS-1DSGT2506NE	6048684

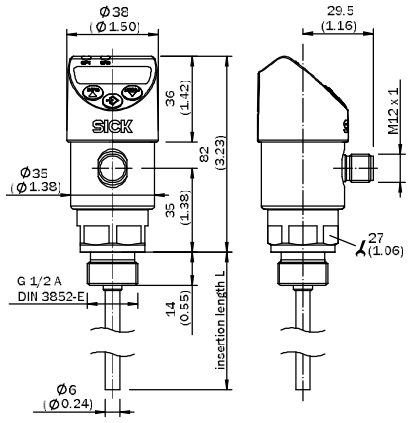
Dimensional drawings

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



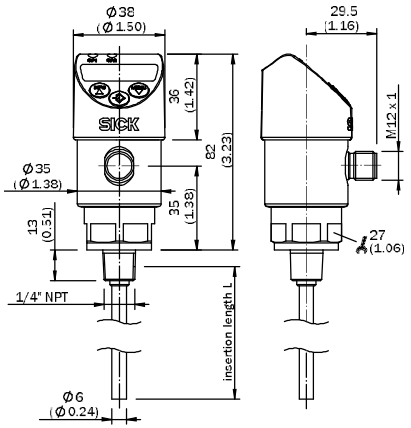
All dimensions in mm (inch)

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



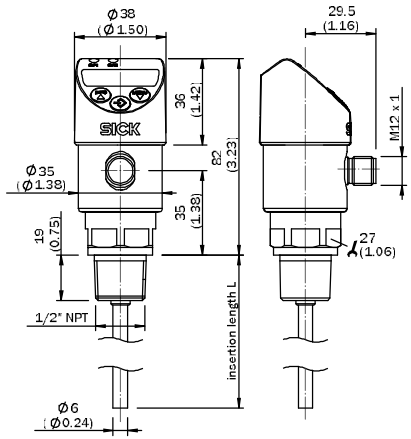
All dimensions in mm (inch)

TBS with connection 1/4" NPT



All dimensions in mm (inch)

TBS with connection 1/2" NPT



All dimensions in mm (inch)

Recommended accessories

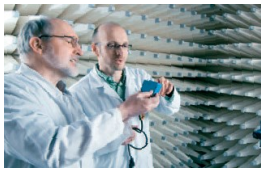
Plug connectors and cables

	Flying leads	Electrical connection	Enclosure rating	Sheath material	Cable length	Type	Part no.
	Straight	4-pin	IP 67	PVC	2 m	DOL-1204-G02M	6009382
					5 m	DOL-1204-G05Mw	6009866
			IP 68	PUR halogen free	2 m	DOL-1204-G02MC	6025900
					5 m	DOL-1204-G05MC	6025901
		5-pin	IP 67	PVC	2 m	DOL-1205-G02M	6008899
					5 m	DOL-1205-G05M	6009868
			IP 68	PUR halogen free	2 m	DOL-1205-G02MC	6025906
					5 m	DOL-1205-G05MC	6025907

Notes

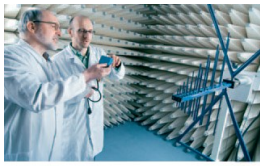
8014742/2011-11-07 IL (2011-11) WEB USmod int37

SICK at a glance



Leading technologies

With a staff of more than 5,000 and over 50 subsidiaries and representations worldwide, SICK is one of the leading and most successful manufacturers 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.



Unique product range

- Non-contact detecting, counting, classifying, positioning and measuring of any type of object or media
- Accident and operator protection with sensors, safety software and services
- Automatic identification with bar code 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 development 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

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