

Temperature

Electronic Temperature Switch

BTS3000

Features

- ▶ Measuring range: -22° to +284°F (-30° to +140°C)
- ▶ One or two switch points
- ▶ Analog output 4 - 20 mA or 0 - 10 V
- ▶ Display & electronic connection: rotatable by 320°
- ▶ Simple navigation menu
- ▶ Superior EMI protection
- ▶ 0.50% accuracy
- ▶ Enclosure Rating: Type 4X (IP65) / Type 6 (IP67)

Applications

- ▶ Machine tool industry
- ▶ Hydraulic & pneumatic systems
- ▶ Injection molding machines
- ▶ Cooling monitoring / circuits
- ▶ Lubrication systems
- ▶ Construction machinery
- ▶ Automobile industry



General Specifications*

| | | |
|--|--|----------------------|
| Sensor element: | PT100 Class A DIN/IEC 60751 | |
| Materials: | 304 Stainless steel | |
| Wetted parts: | 304 Stainless steel | |
| Enclosure: | 304 Stainless steel/polycarbonate/elastomer | |
| Seals: | FKM fluorelastomer (standard) EPDM (optional) | |
| Operating elements: | 3 easy-response push-buttons | |
| Enclosure rating: | Type 4X (IP65) / Type 6 (IP67) | |
| Protection class: | III | |
| Electrical connection: | Plug M12 x 1, 4-pin / 5-pin | |
| Process connection: | 1/4" NPT Male, 1/2" NPT Male, 7/16-20 UNF (SAE-4) Male, G1/4" Male | |
| Dimensions Enclosure: | 1.6 Ø x 4.4 inches (without plug connector and sensor) | |
| Weight: | Approx. 0.4 lb (200 g) | |
| Measuring ranges: | -22°F to +284°F (-30°C to +140°C) | |
| Max. pressure: | 2,900 psi (200 bar) | |
| A/D-Converter: | 12 bit (4,096 steps per measure span) | |
| Resolution: | 12 bit (4,096 steps per measure span) | |
| Scanning rate: | 1000/s | |
| Time Constant: | Approx. 40 s | |
| Accuracy: | < ±0.5 % f. s. at +25 °C | |
| Repeatability: | ±0.1% f. s. | |
| Temperature range: | 14°F to 140°F (-10°C to +60°C) | |
| Electronics: | -22°F to 176°F (-30°C to +80°C) | |
| Storage: | | |
| Power supply: | 15 to 28 V DC, reversed polarity protected (SELV, PELV) Class 2 | |
| Digital display: | 4-digit 14-segment LED red display, digit height .35 inches (9 mm) | |
| Display rate: | 20/s | |
| Error display: | LED RED and alphanumeric display | |
| Power consumption: | Approx. 50 mA (without load) | |
| Analog output: | 4-20 mA | |
| Current output: | 2 ms | |
| Scanning rate: | 0 to 10 V DC | |
| Voltage output: | max. 10 mA | |
| Rating: | 25% to 100% f. s. | |
| Adjustment range: | | |
| Transistor switching outputs: | | |
| Switching function | Normally open / normally closed, standard /window mode and diagnosis function adjustable | |
| Switching output: | PNP | |
| Adjustment range for switching point and hysteresis: | 0% to 125% f. s. | |
| Switching frequency: | Max. 100 Hz | |
| Load: | Max. 500 mA, short-circuit-proof | |
| Delay: | 0.0 s to 50 s adjustable | |
| Status display(s): | LED(s) red | |
| Approvals: | cULus | |
| EMI | EN 61000-4-2 ESD | 4 kV CD / 8 kV AD |
| | EN 61000-4-3 HF radiated | 10 V/m |
| | EN 61000-4-4 Burst | 2 kV |
| | EN 61000-4-5-Surge | 1/2 kV |
| | EN 61000-4-6 HF conducted | 10 V |
| Shock resistance** | DIN EN 60028-2-27 | 50 g (11 ms) |
| Vibration resistance** | DIN EN 60028-2-26 | 20 g (10 to 2000 Hz) |

* See product configurator for additional options.

** At probe length over 100mm shock & vibration resistance can be influenced by the application

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Technical Drawings

Electrical Connection Chart

| M12 Pin Call-Out | Models with 2 switching output | Models with 1 switching output and 1 analog output | Models with 2 switching output and 1 analog output |
|----------------------------|--------------------------------|--|--|
| Color Code of Mating Cable | Plug 4-pin | Plug 4-pin | Plug 5-pin |
| Pin 1 Brown | 15 to 28 VDC | 15 to 28 VDC | 15 to 28 VDC |
| Pin 2 White | SP2 (500 mA/100 Hz) | Analog Output (500 mA/100 Hz) | Analog Output (500 mA/100 Hz) |
| Pin 3 Blue | 0 V | 0 V | 0 V |
| Pin 4 Black | SP1 (500 mA/100 Hz) | SP1 (500 mA/100 Hz) | SP1 (500 mA/100 Hz) |
| Pin 5 Gray | Not Applicable | Not Applicable | SP2 (500 mA/100 Hz) |

| Length | 1/4" NPT / 1/2" NPT / 7/16-20 UNF (SAE-4) | G1/4" |
|--------|---|-----------------|
| L0 | .7" [17.78 mm] | 0.67" [17 mm] |
| | 2" [50.8 mm] | 0.98" [25 mm] |
| | 4" [101.6 mm] | 1.97" [50 mm] |
| | 6" [152.4 mm] | 3.94" [100 mm] |
| | 12" [304.8 mm] | 11.80" [300 mm] |
| | | |

Connection diagram

Output order codes: 1, 2, 3, 4, 5

*L2 is the effective length for NPT fitting.

Dimensions inches [mm]

Product Configurator

Example **BTS3 4 E V M 2.00Z 1**

Series: BTS3 Series BTS3000, electronic dual temperature switch

Output:

| | |
|---|---------------------------------|
| 1 | Dual switch point |
| 2 | Single switch point plus 4-20mA |
| 3 | Single switch point plus 0-10V |
| 4 | Dual switch point plus 4-20mA |
| 5 | Dual switch plus 0-10V |

Temperature Ranges:

| | |
|---|--------------|
| 1 | 0 to 100°C |
| 2 | -30 to 140°C |
| 3 | 32 to 212°F |
| 4 | -22 to 284°F |

Process Connections:

| | |
|----------------|-----------------------|
| N | 1/4" NPT male thread |
| 3 ¹ | 1/2" NPT male thread* |
| E | 7/16-20 UNF (SAE 4) |
| G | G1/4" male thread |

* Consult factory

Sealing:

| | |
|----------------|--|
| V ² | FKM fluorelastomer (standard) |
| E ² | EPDM (EPR) (optional) |
| X | No seal (Required for units with NPT thread) |

Electrical Connection:

M³ M12

Sensor Length⁴:

| | |
|----------------------|--------------|
| 0017M ⁵ | 17 mm probe |
| 0025M ⁵ | 25 mm probe |
| 0050M ⁵ | 50 mm probe |
| 0100M ⁵ | 100 mm probe |
| 0300M ⁵ | 300 mm probe |
| 0650M ^{5,6} | 650 mm probe |
| 0.70Z ^{1,7} | 0.7" probe |
| 2.00Z ^{1,7} | 2" probe |
| 4.00Z ^{1,7} | 4" probe |
| 6.00Z ^{1,7} | 6" probe |
| 12.0Z ^{6,7} | 12" probe |

Accessories

| Order Number | Description |
|----------------------------|---|
| 239535-1M-R-S ⁸ | 4 Pin M12 Female Right Angle Plug Molded Cable, 3.28 Feet (1 Meter), Shielded |
| 239535-1M-S ⁸ | 4 Pin M12 Female Straight Plug Molded Cable, 3.28 Feet (1 Meter), Shielded |
| 239537 | 4 Pin M12 Female Straight Connector |
| 239236 | 4 Pin M12 Female Right Angle Connector |
| 239546-1M-R-S ⁸ | 5 Pin M12 Female Right Angle Molded Cable, 3.28 Feet (1 Meter), Shielded |
| 239546-1M-S ⁸ | 5 Pin M12, Female Straight Plug Molded Cable, 3.28 Feet (1 Meter), Shielded |
| 239548-S | 5 Pin M12 Female Straight Connector |
| 239548-R | 5 Pin M12 Female Right Angle Connector |

- Note:
- Thermowell option available, consult factory for details.
 - Available only for G and UNF thread.
 - Mating connector not included with unit; mating connectors are available and can be ordered as an accessory.
 - Custom probe length available; minimum quantities may apply. Available only for G thread.
 - At probe length over 11.8" (300 mm), the probe must be kept out of the direct path of the flowing media.
 - Available only for NPT and UNF thread.
 - See Cable Connectors & Accessories for more options.