

Temperature

Electronic Dual Temperature Switch

BTS3000

Features

- ▶ Measuring range: -22° to +284°F (-30° to +140°C)
- ▶ One or two switch points
- ▶ Analog output 4 - 20 mA
- ▶ 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: | |
| Wetted parts: | 304 Stainless steel |
| Enclosure: | 304 Stainless steel/polycarbonate/elastomer |
| Seals: | FKM fluoroelastomer (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: | |
| 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: | |
| Electronics: | 14°F to 140°F (-10°C to +60°C) |
| Storage: | -22°F to 176°F (-30°C to +80°C) |
| 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: | | |
| Current output: | 4-20 mA | |
| Scanning rate: | 2 ms | |
| Adjustment range: | 25% to 100% f. s. | |
| 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 |
| Vibration resistance** | DIN EN 60028-2-26 | 20 g (10 to 2000 Hz) |

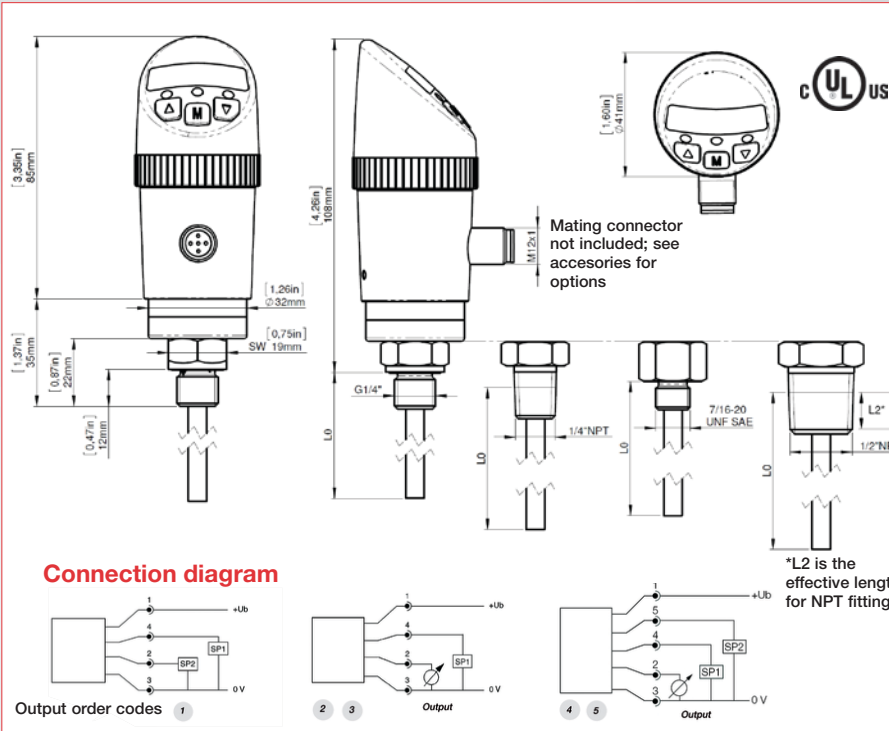
* See product configurator for additional options.

** 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 | 9 to 32 VDC | 9 to 32 VDC | 9 to 32 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] |
| | | 25.59" [650 mm] |

Dimensions inches [mm]

Product Configurator

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

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 point 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 (Consult factory) |
| E | 7/16-20 UNF (SAE 4) |
| G | G1/4" male thread |

Sealing:

| | |
|----------------|--|
| V ² | FKM fluoroelastomer (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 |
| 208779 ¹ | 2" Probe - Brass Thermowell |
| 208779-SS ¹ | 2" Probe - 316 Stainless Steel Thermowell |
| 208780 ¹ | 4" Probe - Brass Thermowell |
| 208780-SS ¹ | 4" Probe - 316 Stainless Steel Thermowell |
| 208781 ¹ | 6" Probe - Brass Thermowell |
| 208781-SS ¹ | 6" Probe - 316 Stainless Steel Thermowell |

Note:

1. Thermowell option available for 1/2" NPTF only with 2", 4" and 6" probes only; consult factory for details.
2. Available only for G and UNF thread.
3. Mating connector not included with unit; mating connectors are available and can be ordered as an accessory.
4. Custom probe length available; minimum quantities may apply.
5. Available only for G thread.
6. At probe length over 11.8" (300 mm), the probe must be kept out of the direct path of the flowing media.
7. Available only for NPT and UNF thread.
8. See Cable Connectors & Accessories for more options.