

# 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\*

<b>Sensor element:</b>	PT100 Class A DIN/IEC 60751	
<b>Materials:</b>	304 Stainless steel	
Wetted parts:	304 Stainless steel	
Enclosure:	304 Stainless steel/polycarbonate/elastomer	
Seals:	FKM fluorelastomer (standard) EPDM (optional)	
<b>Operating elements:</b>	3 easy-response push-buttons	
<b>Enclosure rating:</b>	Type 4X (IP65) / Type 6 (IP67)	
<b>Protection class:</b>	III	
<b>Electrical connection:</b>	Plug M12 x 1, 4-pin / 5-pin	
<b>Process connection:</b>	1/4" NPT Male, 1/2" NPT Male, 7/16-20 UNF (SAE-4) Male, G1/4" Male	
<b>Dimensions Enclosure:</b>	1.6 Ø x 4.4 inches (without plug connector and sensor)	
<b>Weight:</b>	Approx. 0.4 lb (200 g)	
<b>Measuring ranges:</b>	-22°F to +284°F (-30°C to +140°C)	
<b>Max. pressure:</b>	2,900 psi (200 bar)	
<b>A/D-Converter:</b>	12 bit (4,096 steps per measure span)	
Resolution:	12 bit (4,096 steps per measure span)	
Scanning rate:	1000/s	
<b>Time Constant:</b>	Approx. 40 s	
<b>Accuracy:</b>	< ±0.5 % f. s. at +25 °C	
<b>Repeatability:</b>	±0.1% f. s.	
<b>Temperature range:</b>	14°F to 140°F (-10°C to +60°C)	
Electronics:	-22°F to 176°F (-30°C to +80°C)	
Storage:	-22°F to 176°F (-30°C to +80°C)	
<b>Power supply:</b>	15 to 28 V DC, reversed polarity protected (SELV, PELV) Class 2	
<b>Digital display:</b>	4-digit 14-segment LED red display, digit height .35 inches (9 mm)	
Display rate:	20/s	
<b>Error display:</b>	LED RED and alphanumeric display	
<b>Power consumption:</b>	Approx. 50 mA (without load)	
<b>Analog output:</b>	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:		
<b>Transistor switching outputs:</b>		
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	
<b>Approvals:</b>	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)

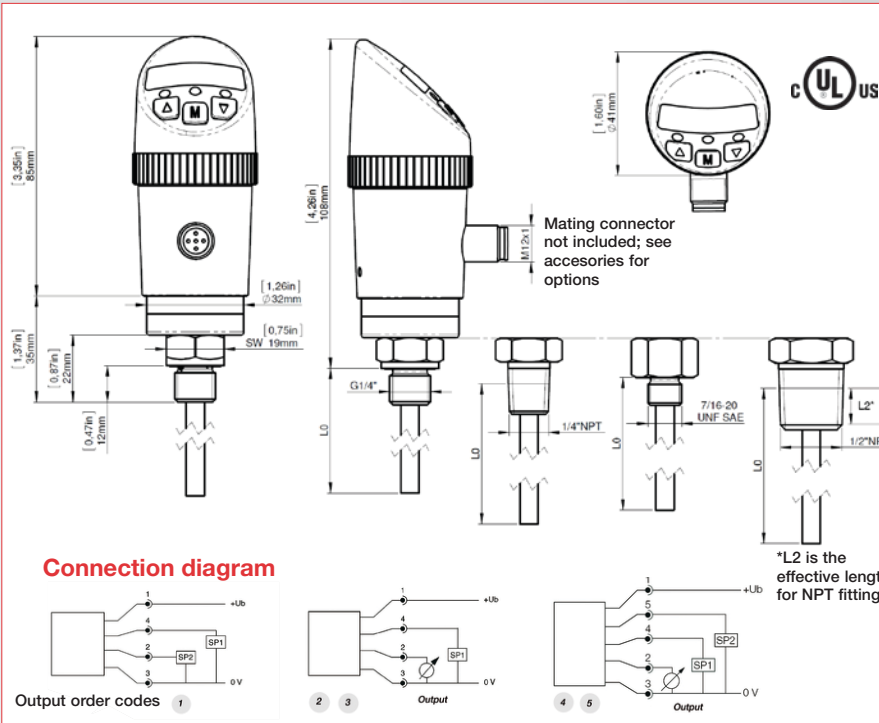
\* See product configurator for additional options.

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

# Electronic Temperature Switch

**BTS3000**

## 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]

\*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 <sup>1</sup>	1/2" NPT male thread*
E	7/16-20 UNF (SAE 4)
G	G1/4" male thread

\* Consult factory

Sensor Length<sup>4</sup>:

0017M <sup>5</sup>	17 mm probe
0025M <sup>5</sup>	25 mm probe
0050M <sup>5</sup>	50 mm probe
0100M <sup>5</sup>	100 mm probe
0300M <sup>5</sup>	300 mm probe
0650M <sup>5,6</sup>	650 mm probe
0.70Z <sup>1,7</sup>	0.7" probe
2.00Z <sup>1,7</sup>	2" probe
4.00Z <sup>1,7</sup>	4" probe
6.00Z <sup>1,7</sup>	6" probe
12.0Z <sup>6,7</sup>	12" probe

Electrical Connection: **M<sup>3</sup> M12**

Sealing:

V <sup>2</sup>	FKM fluorelastomer (standard)
E <sup>2</sup>	EPDM (EPR) (optional)
X	No seal (Required for units with NPT thread)

## Accessories

Order Number	Description
239535-1M-R-S <sup>8</sup>	4 Pin M12 Female Right Angle Plug Molded Cable, 3.28 Feet (1 Meter), Shielded
239535-1M-S <sup>8</sup>	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 <sup>8</sup>	5 Pin M12 Female Right Angle Molded Cable, 3.28 Feet (1 Meter), Shielded
239546-1M-S <sup>8</sup>	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.