

# 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\*

<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 / PBT, PA6.6 GF30	
Seals:	FKM fluoroelastomer (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 / 8-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) Approx. 80 mA (Output Code 6)	
<b>Analog output:</b>	4-20 mA	
Current output:	4-20 mA	
Scanning rate:	2 ms	
Adjustment range:	25% to 100% f. s.	
<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
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

Mating connector not included; see accessories for options

### Electrical Connection Chart

Pin	Signal Output Code 1	Signal Output Code 2 & 3	Signal Output Code 4 & 5	Signal Output Code 6
1	+Ub	+Ub	+Ub	+Ub
2	SP2	Signal	Signal	SP1a
3	0V	0V	0V	SP1b
4	SP1	SP1	SP1	0V
5	-	-	SP2	SP2a
6	-	-	-	SP2b
7	-	-	-	-
8	-	-	-	Housing

### Connection diagram

Output order codes

### Length

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]

\*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 point plus 0-10V
6	Dual switch points (1 x NO SPST / 1 x NC SPST), non uL

Process Connections:

N	1/4" NPT male thread
3 <sup>1</sup>	1/2" NPT male thread (Consult factory)
E	7/16-20 UNF (SAE 4)
G	G1/4" male thread
G1/2	G1/2" male thread (Consult factory)

Electrical Connection:

M<sup>3</sup> M12

Sealing:

V <sup>2</sup>	FKM fluoroelastomer (standard)
E <sup>2</sup>	EPDM (EPR) (optional)
X	No seal (Required for units with NPT thread)
F	FFKM (optional) (Consult factory)

Temperature Ranges:

1	0 to 100°C
2	-30 to 140°C
3	32 to 210°F
4	-22 to 280°F

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

## 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
208779 <sup>1</sup>	2" Probe - Brass Thermowell
208779-SS <sup>1</sup>	2" Probe - 316 Stainless Steel Thermowell
208780 <sup>1</sup>	4" Probe - Brass Thermowell
208780-SS <sup>1</sup>	4" Probe - 316 Stainless Steel Thermowell
208781 <sup>1</sup>	6" Probe - Brass Thermowell
208781-SS <sup>1</sup>	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.