



Sensata
Technologies



KLIXON
®

PRECISION PRODUCTS
Thermal, Position, Pressure & Airflow



pg 4

KLIXON® Tiny Stat™ 3BT & 4BT Series Thermostats

General Description

- Tiny Stat™ precision thermostat
- Single pole, single throw (SPST)
- Hermetically sealed and back-filled with nitrogen
- Gold-plated contacts available upon request

Operating Switch Range

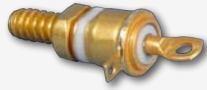
- 0°F to 350°F (-18°C to 177°C)

Max Current and Voltage Rating

- 1 amp at 115VAC & 30VDC for 10,000 life cycles
- 0.01 amp at 30mVAC & 30mVDC (gold contacts, min amps) for 10,000 life cycles

Approvals

- 3BT: MIL-PRF-24236/19
- 4BT: MIL-PRF-24236/13



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KLIXON® 5BT Series Hermetic Thermostats

General Description

- ½" bimetal disc thermostat, hermetically sealed
- Single pole, double throw (SPDT)
- High resistance to shock and vibration

Operating Switch Range

- -65°F to 400°F (-54°C to 204°C)

Max Current and Voltage Rating

- 2 amp at 125VAC & 30VDC for 100,000 cycles
- 3 amp at 125VAC & 30VDC for 50,000 cycles

Approvals

- MIL-PRF-24236 /24



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KLIXON® M1, 11041 Series Hermetic Thermostats

General Description

- ½" bimetal disc thermostat, hermetically sealed
- Single pole, single throw (SPST)
- High resistance to shock and vibration

Operating Switch Range

- -65°F to 550°F (-54°C to 288°C)

Max Current and Voltage Rating

- 5 amp at 30VAC & 30VDC at 100,000 cycles
- 6 amp at 125VAC at 5,000 cycles
- Other amperages, voltage, cycles are available

Approvals

- MIL-PRF-24236/1



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KLIXON® M2 Series Hermetic Thermostats

General Description

- ½" bimetal disc thermostat, hermetically sealed
- Single pole, single throw (SPST)
- Low profile, tight tolerance, narrow differentials

Operating Switch Range

- 0°F to 300°F (-18°C to 149°C)

Max Current and Voltage Rating

- 2 amp at 120VAC & 30VDC at 250,000 cycles

Approvals

- MIL-PRF-24236/20
- S-311-641



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KLIXON® 2288 Series Hermetic Thermostats

General Description

- Environmentally sealed, high capacity, ½" bimetal disc
- SPST, normally open or closed

Operating Switch Range

- 30°F to 400°F (-1°C to 204°C)

Max Current and Voltage Rating

- 10 amps, 120VAC / 240VAC up to 100,000 cycles
- 7 amps, 277VAC up to 100,000 cycles

Approvals

- UL & CUL recognized (#34618)



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KLIXON® 4344 Series Hermetic Thermostats

General Description

- ½" bimetal disc thermostat, hermetically sealed
- Single pole, single throw (SPST)
- Many option available, including switch packaged into probe and pipe strap mount options

Operating Switch Range

- -65°F to 550°F (-54°C to 288°C)

Max Current and Voltage Rating

- 7 amps, 30VAC/VDC at 5,000 cycles
- 3 amps, 125VAC at 50,000 cycles
- Other amperages, voltage, cycles are available

Approvals

- CUL recognized (#34618)



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KLIXON® 4391 Series Hermetic Thermostats

General Description

- ½" bimetal disc thermostat, hermetically sealed
- Single pole, single or double throw (SPST/SPDT)
- Many option available, including optional overmold

Operating Switch Range

- 0°F to 450°F (-18°C to 232°C)

Max Current and Voltage Rating

- 14 amps, 30VAC/VDC at 5,000 cycles
- 6 amps, 125VAC at 50,000 cycles
- Other amperages, voltage, cycles are available



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KLIXON® 7BT2 Series Thermostats

General Description

- Environmentally sealed, high capacity, ½" bimetal disc
- SPST, normally open or closed

Operating Switch Range

- 30°F to 400°F (-1°C to 204°C)

Max Current and Voltage Rating

- 10 amps, 120VAC / 240VAC up to 100,000 cycles
- 7 amps, 277VAC up to 100,000 cycles

Approvals

- UL & CUL recognized (#34618)



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KLIXON® 6786 Series Thermostats

General Description

- Environmentally sealed, low-profile, ½" bimetal disc
- SPST, normally open or closed

Operating Switch Range

- -20°F to 350°F (-29°C to 177°C)

Max Current and Voltage Rating

- 7 amps, 30VAC/VDC at 5,000 cycles
- 3 amps, 125VAC at 50,000 cycles

Approvals

- UL & CUL recognized (#34618)



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KLIXON® Thermostat Probe Packages

General Description

- Extreme temperature probes (up to 550°F), fast response probes and narrow differential probes (2°F to 8°F reset differential) are available

Operating Switch Range

- Extreme temperature: -65°F to 550°F (-54°C to 288°C)
- Fast response: 0°F to 350°F (-18°C to 177°C)
- Narrow differential: 0°F to 275°F (-18°C to 135°C)

Max Current and Voltage Rating

- Extreme temperature: Up to 7 amps, various voltages
- Fast response: Up to 1 amp at 115VAC & 30VDC
- Narrow differential: Up to 2 amp at 125VAC & 30VDC

Approvals

- Extreme temperature, 28303 series only: UL / CUL recognized (#E34618)



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KLIXON® AT/KX Series Limit Switches

General Description

- Compact, hermetically sealed limit switches
- Available options include various actuators, mounting brackets, terminations and body styles

Operating Switch Range

- -65°F to 275°F (-54°C to 135°C)

Max Current and Voltage Rating

- AT Series: Up to 4 amps (resistive)
- KX Series: Up to 10 amps (resistive)



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KLIXON® 7PS Series Pressure Switches

General Description

- Hermetically sealed pressure switches
- 300 stainless steel construction

Actuation Range

- 45 to 700 PSIA

Max Current and Voltage Rating

- 5 amp @ 28VDC resistive, 2 amp @ 28VDC inductive, life cycle rating of 50,000 cycles

Burst Pressure

- 8,000 PSI minimum



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KLIXON® 2SE Series Airflow Sensors

General Description

- Solid-state airflow sensors designed to recognize loss or reduction of airflow in power supplies, data processing units, electronic equipment
- SPST or SPDT, normally open or closed

Operating Temperature Range

- 10°C to 50°C (50°F to 122°F)

Max Current and Voltage Rating

- 0.40 amp at 30VDC

Approvals

- Military
- Aerospace
- Commercial



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KLIXON® ACMP Series Aircraft Motor Protectors

General Description

- Single & three-phase protection
- Locked rotor protection
- Neutral tap

Max Current and Voltage Rating

- 28VDC / 120VAC, from 16 amps up to 120 amps



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KLIXON® 2EP Series Circuit Breakers

General Description

- Explosion-Proof
- Ambient compensated

Interrupt Current Capacity

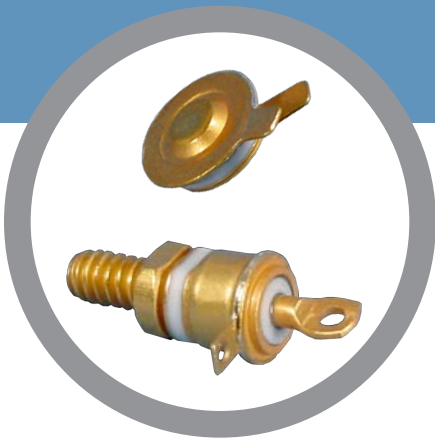
- 3,500 amps @ 75 VDC
- 1,000 amps @ 250 VAC, 60 Hz

Max Current and Voltage Rating

- 1 to 35 amps, 75 VDC / 250 VAC

Approvals

- UL Listed



KLIXON® | 3BT / 4BT Series

Tiny Stat™ Hermetic Thermostats, 0°F to 350°F, SPST

FEATURES

- Smallest snap-acting thermal switches on the market today
- Single Pole / Single Throw (SPST)
- Preset temperature set points, non-adjustable calibration
- Hermetically sealed and back-filled with nitrogen
- Various mounting configurations available
- Qualified to MIL-PRF-24236/13 (4BT) and MIL-PRF-24236/19 (3BT)

INTRODUCTION

The Klixon® Tiny Stat™ 3BT and 4BT series combine an impressive list of superlatives in a reliable, hermetically sealed, snap-acting design. The 3BT and 4BT series are the smallest envelope size ever developed, ideal for remote sensing applications in locations with severe space limitations. The 3BT and 4BT are the lightest construction available on the market today, and are perfect for applications where weight is an important consideration. All Klixon Tiny Stats have an extremely fast response in order to permit early warning of overheat conditions. Their low mass internal components allow Tiny Stat precision thermostats to meet the most demanding shock and vibration standards of MIL-PRF-24236. Gold plated contacts can be furnished when low wattage conditions exist that requires reliable circuit switching.

Applications include electronics overheat protection, transformer windings and medical equipment.

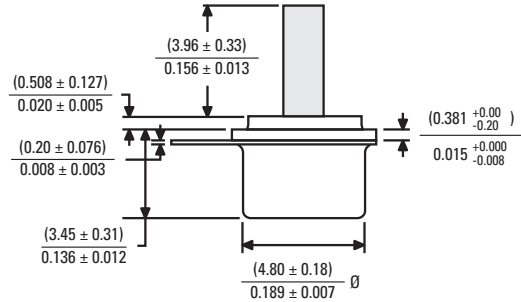
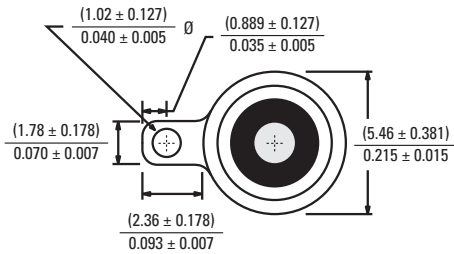
SPECIFICATIONS			
Contact Ratings	<i>Cycles</i>	<i>Voltage</i>	<i>Amps (resistive)</i>
	10,000	115VAC / 30 VDC	1.00 (silver contacts)
	10,000	30 VAC / VDC	0.10 (silver contacts)
	10,000	30VAC / VDC	500 mA and below (gold contacts)
	10,000	115VAC	200 mA and below (gold contacts)
Contact Operations	Either close on rise or open on rise , SPST (Single Pole, Single Throw)		
Operating Temperature	+0°F to 350°F (-17.8°C to 176.7°C)		
Dielectric Strength	500 VAC, rms, 60 cycles for 1 minute, across open contacts, per MIL-STD-202, Method 301		
Contact Resistance	0.050 ohms maximum (0.100 ohms maximum for close on rise devices with set points greater than 175°F), per MIL-STD-202, Method 307		
Vibration	5–2000 Hz, 30 G, per MIL-STD-202, Method 204 <i>Devices which open on rise should not be subjected to vibration while at temperature of 75°F or more below the opening temperature. Devices that close on rise should not be subjected to vibration while at temperatures of 75°F or more above the closing temperature.</i>		
Shock	100 G, 6 milliseconds, per MIL-STD-202, Method 213		
Hermeticity	1 x 10 ⁻⁸ atm cc/sec. maximum, per MIL-STD-202, Method 112, Condition C		
Salt Spray	Per MIL-STD-202, Method 101, Condition B, 5% solution		
Weight	Basic Unit: 0.2 to 0.9 grams		
Ambient Temperature Range	-80°F to 350°F (-62.2°C to 176.7°C)		

STANDARD TEMPERATURE SETTINGS – STD. TOLERANCE OF $\pm 8^{\circ}\text{F}$ (4.4°C)

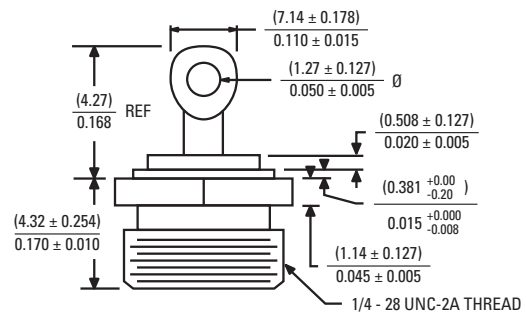
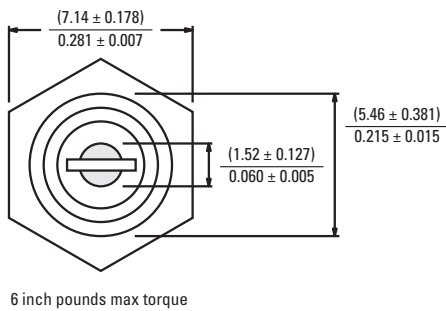
CODE	OPERATING TEMPERATURE		DIFFERENTIAL		CODE	OPERATING TEMPERATURE		DIFFERENTIAL		CODE	OPERATING TEMPERATURE		DIFFERENTIAL	
	$^{\circ}\text{F}$	$^{\circ}\text{C}$	$^{\circ}\text{F}$	$^{\circ}\text{C}$		$^{\circ}\text{F}$	$^{\circ}\text{C}$	$^{\circ}\text{F}$	$^{\circ}\text{C}$		$^{\circ}\text{F}$	$^{\circ}\text{C}$	$^{\circ}\text{F}$	$^{\circ}\text{C}$
1	0	-17.8	30	16.7	25	120	48.9	30	16.7	49	240	115.6	30	16.7
2	5	-15.0	30	16.7	26	125	51.7	30	16.7	50	245	118.3	30	16.7
3	10	-12.2	30	16.7	27	130	54.4	30	16.7	51	250	121.1	30	16.7
4	15	-9.4	30	16.7	28	135	57.2	30	16.7	52	255	123.9	30	16.7
5	20	-6.7	30	16.7	29	140	60.0	30	16.7	53	260	126.7	30	16.7
6	25	-3.9	30	16.7	30	145	62.8	30	16.7	54	265	129.4	30	16.7
7	30	-1.1	30	16.7	31	150	65.6	30	16.7	55	270	132.2	30	16.7
8	35	1.7	30	16.7	32	155	68.3	30	16.7	56	275	135.0	30	16.7
9	40	4.4	30	16.7	33	160	71.1	30	16.7	57	280	137.8	30	16.7
10	45	7.2	30	16.7	34	165	73.9	30	16.7	58	285	140.6	30	16.7
11	50	10.0	30	16.7	35	170	76.7	30	16.7	59	290	143.3	30	16.7
12	55	12.8	30	16.7	36	175	79.4	30	16.7	60	295	146.1	30	16.7
13	60	15.6	30	16.7	37	180	82.2	30	16.7	61	300	148.9	30	16.7
14	65	18.3	30	16.7	38	185	85.0	30	16.7	62	305	151.7	30	16.7
15	70	21.1	30	16.7	39	190	87.8	30	16.7	63	310	154.4	30	16.7
16	75	23.9	30	16.7	40	195	90.6	30	16.7	64	315	157.2	30	16.7
17	80	26.7	30	16.7	41	200	93.3	30	16.7	65	320	160.0	30	16.7
18	85	29.4	30	16.7	42	205	96.1	30	16.7	66	325	162.8	30	16.7
19	90	32.2	30	16.7	43	210	98.9	30	16.7	67	330	165.6	30	16.7
20	95	35.0	30	16.7	44	215	101.7	30	16.7	68	335	168.3	30	16.7
21	100	37.8	30	16.7	45	220	104.4	30	16.7	69	340	171.1	30	16.7
22	105	40.6	30	16.7	46	225	107.2	30	16.7	70	345	173.9	30	16.7
23	110	43.3	30	16.7	47	230	110.0	30	16.7	71	350	176.7	30	16.7
24	115	46.1	30	16.7	48	235	112.8	30	16.7	<i>Consult factory for additional temperatures</i>				

STANDARD CONFIGURATIONS

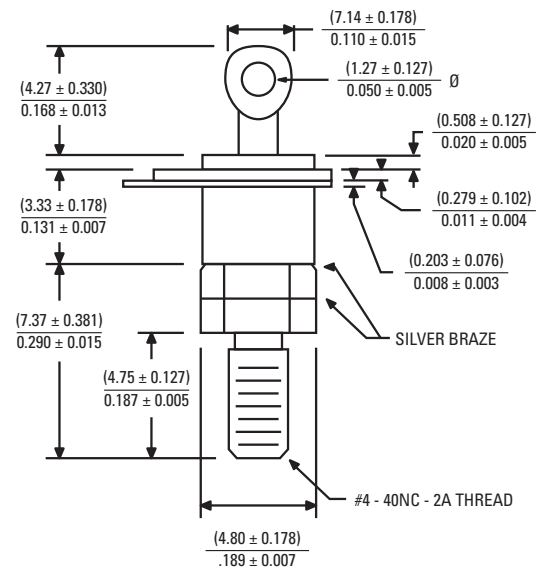
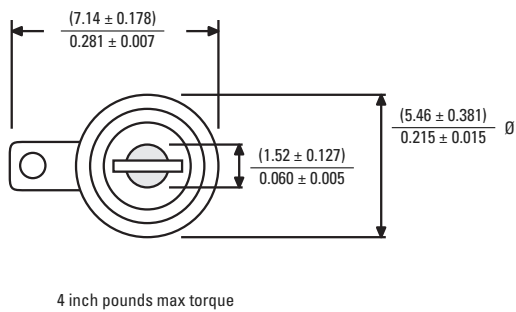
3BT-2 | Grounded Case Construction | Approx. wt. 0.4 grams | Conforms to MIL-PRF-24236/19 | Config 1



3BT-3 | Grounded Case Construction | Approx. wt. 0.9 grams | Conforms to MIL-PRF-24236/19 | Config 3

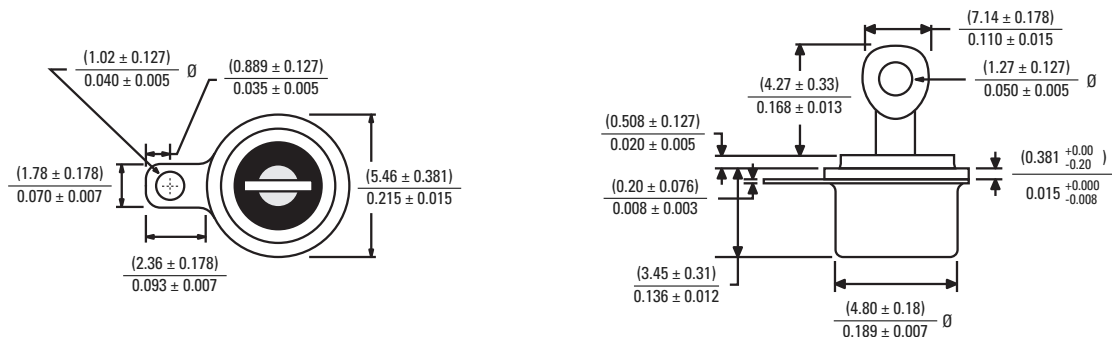


3BT-6 | Insulated Case Construction | Approx. wt. 0.9 grams | Conforms to MIL-PRF-24236/19 | Config 3

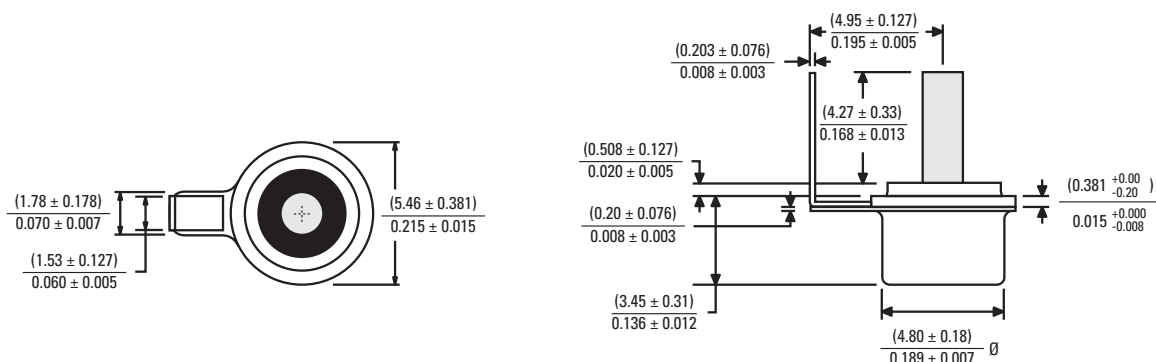


STANDARD CONFIGURATIONS

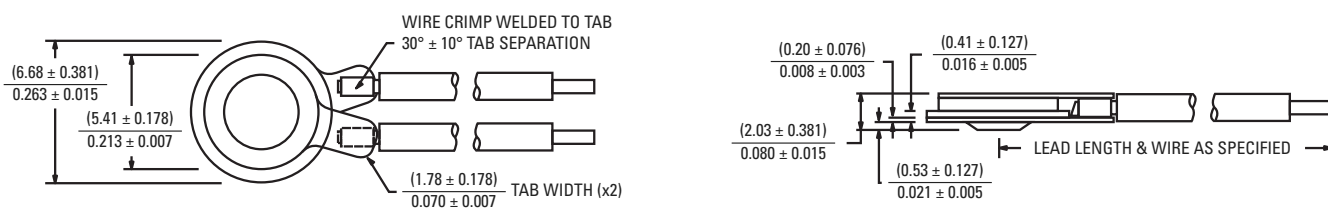
3BT-8 Grounded Case Construction | Approx. wt. 0.4 grams | Conforms to MIL-PRF-24236/19 | Config 4



3BT-15 PC Board Mount | Approx. wt. 0.4 grams | Conforms to MIL-PRF-24236/19 | Config 5

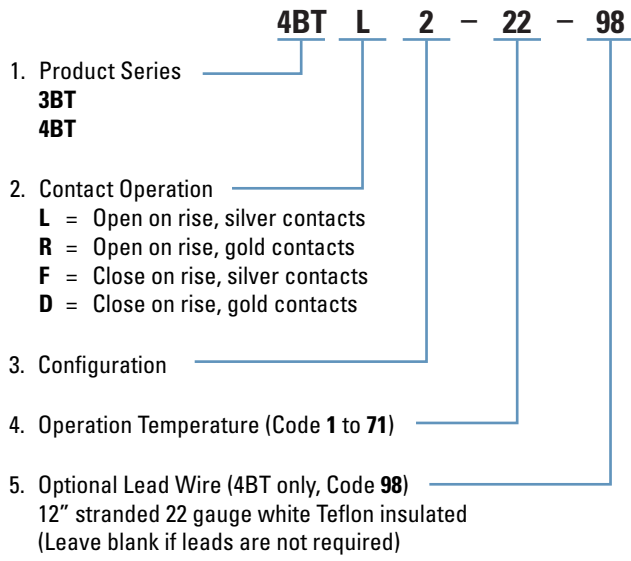


4BT-2 Grounded Case Construction | Approx. wt. 0.9 grams | Conforms to MIL-PRF-24236/19 | Config 1



Additional configurations available, contact Sensata Technologies for more information. All dimensions are nominal, (millimeters) / inches.

STANDARD PART NUMBER BUILDER



The example to the left is a 4BT-2 configuration, open on rise, silver contacts, open on rise at $105^{\circ}\text{F} \pm 8^{\circ}\text{F}$, close at $85^{\circ}\text{F} \pm 8^{\circ}\text{F}$ with 12" wire leads



KLIXON® | 5BT Series

SPDT Hermetic Thermostats, -65°F to 400°F

FEATURES

- Single Pole / Double Throw (SPDT)
- Preset temperature set points, non-adjustable calibration
- High resistance to shock and vibration
- Hermetically sealed, vacuum baked and back-filled with nitrogen
- Various mounting configurations available
- Qualified to MIL-PRF-24236/24

INTRODUCTION

The Klixon® 5BT series thermostat is a high reliability, hermetically sealed thermal switch. The single pole, double throw design allows versatility and economy in providing two functions within the same device. Typically these Klixon switches are used to control and indicate at a preset temperature. One pole can control a cooling fan and the other pole can indicate impending danger. The 5BT thermostat is the ideal choice where quality and reliability in a double throw device are critical. Applications include data processing equipment, computers, electronic equipment, communication equipment, cooling and heating systems.

SPECIFICATIONS

Contact Ratings	Cycles	Voltage	Amps (resistive)
	100,000	125VAC, 30VAC, 30 VDC	2.0
	50,000	125VAC, 30VAC, 30 VDC	3.0
Contact Operations	SPDT (Single Pole, Double Throw)		
Operating Temperature	-65°F to 400°F (-53.9°C to 204.4°C)		
Dielectric Strength	1250 VAC, rms, 60 cycles for 1 minute, terminal to case per MIL-STD-202, Method 301		
Contact Resistance	0.050 ohms maximum per MIL-STD-202, Method 307		
Insulation Resistance	100 megaohms min. at 500 VDC		
Vibration	10-2000 Hz, 10G, per MIL-STD-202, Method 204, Condition D		
Shock	60G, 11 milliseconds, per MIL-STD-202, Method 213		
Hermeticity	1 x 10 ⁻⁸ atm cc/sec. maximum, per MIL-STD-202, Method 112, Condition C		
Salt Spray	Per MIL-STD-202, Method 101, Condition B, 5% solution		
Humidity	MIL-STD-202, Method 103, Condition A		
Sand & Dust	MIL-STD-202, Method 110, Condition A		
Weight	6 grams (without bracket) to 7 grams (with bracket)		
Ambient Temperature Range	-65°F to 450°F (-53.9°C to 232.2°C) <i>Maximum ambient exposure while in the closed position is 200°F above contact closing temperature.</i>		

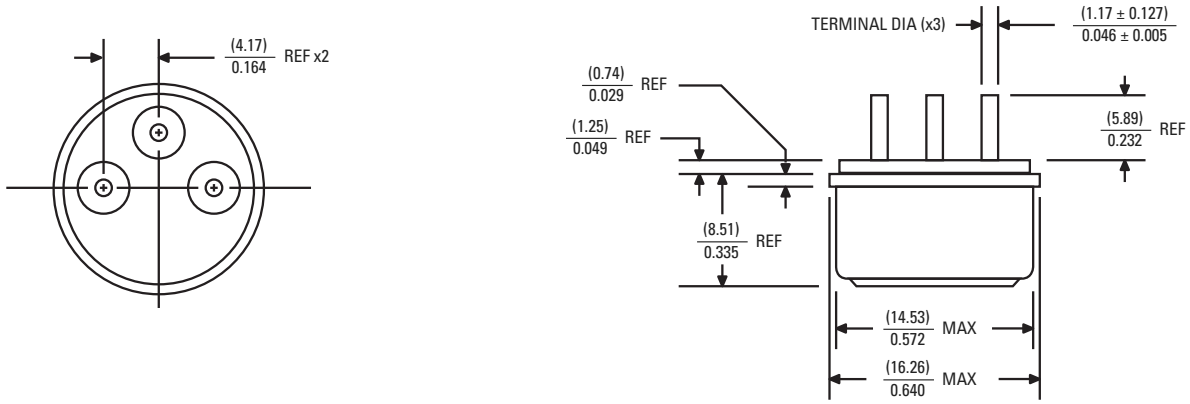
STANDARD TEMPERATURE SETTINGS

OPERATING TEMPERATURE		DIFFERENTIAL		TOLERANCE	
°F	°C	°F	°C	± °F	± °C
- 65	- 53.9	30	16.7	10	5.6
- 40	- 40	30	16.7	10	5.6
- 15	-26.1	30	16.7	10	5.6
0	- 17.8	20	11.1	8	4.4
10	- 12.2	20	11.1	8	4.4
20	- 6.7	20	11.1	8	4.4
30	- 1.1	20	11.1	8	4.4
40	4.4	20	11.1	8	4.4
50	10.0	20	11.1	8	4.4
60	15.6	20	11.1	8	4.4
70	21.1	20	11.1	8	4.4
80	26.7	20	11.1	8	4.4
90	32.2	20	11.1	8	4.4
100	37.8	20	11.1	8	4.4
110	43.3	20	11.1	8	4.4
120	48.9	20	11.1	8	4.4
130	54.4	20	11.1	8	4.4
140	60.0	20	11.1	8	4.4
150	65.6	20	11.1	8	4.4
160	71.1	20	11.1	8	4.4
170	76.7	20	11.1	8	4.4

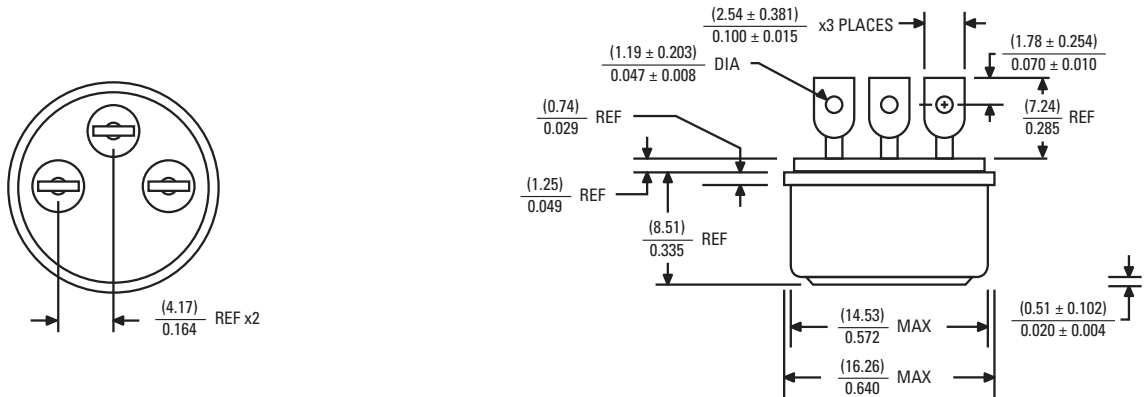
OPERATING TEMPERATURE		DIFFERENTIAL		TOLERANCE	
°F	°C	°F	°C	± °F	± °C
180	82.2	20	11.1	8	4.4
190	87.8	20	11.1	8	4.4
200	93.3	20	11.1	8	4.4
210	98.9	20	11.1	8	4.4
220	104.4	20	11.1	8	4.4
230	110.0	20	11.1	8	4.4
240	115.6	20	11.1	8	4.4
250	121.1	20	11.1	8	4.4
260	126.7	20	11.1	8	4.4
270	132.2	20	11.1	8	4.4
280	137.8	20	11.1	8	4.4
290	143.3	20	11.1	8	4.4
300	148.9	20	11.1	8	4.4
310	154.4	25	13.9	10	5.6
320	160.0	25	13.9	10	5.6
330	165.6	25	13.9	10	5.6
340	171.1	25	13.9	10	5.6
350	176.7	25	13.9	10	5.6
375	190.6	35	19.4	12	6.7
400	204.4	35	19.4	12	6.7
<i>Consult factory for additional temperatures</i>					

STANDARD CONFIGURATIONS

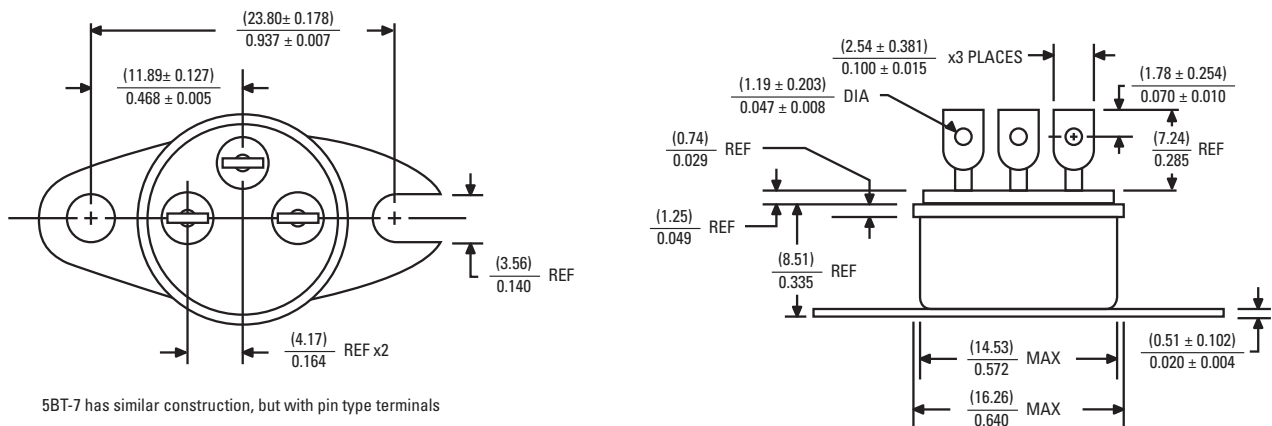
5BT-2 Pin Type Terminals | SPDT (Single Pole, Double Throw) | Conforms to MIL-S-24236/24



5BT-4 Flattened Pierced Terminals | SPDT (Single Pole, Double Throw) | Conforms to MIL-S-24236/24



5BT-5 Surface Mount Bracket | SPDT (Single Pole, Double Throw) | Conforms to MIL-S-24236/24



5BT-7 has similar construction, but with pin type terminals

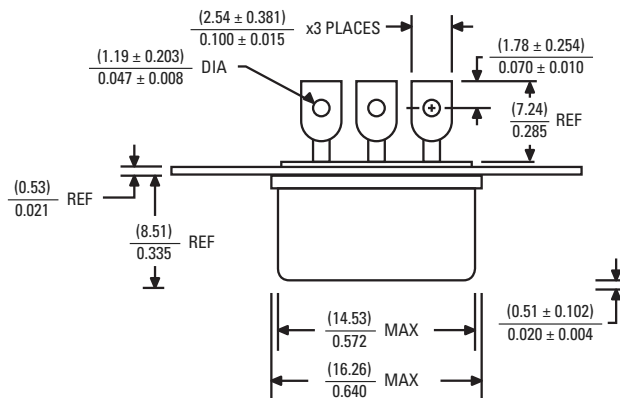
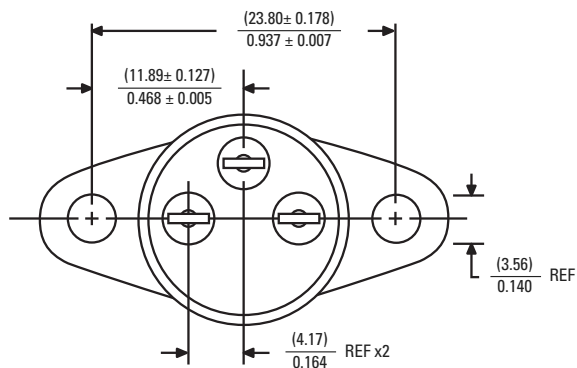
STANDARD CONFIGURATIONS

5BT-6

Top Mounting Bracket

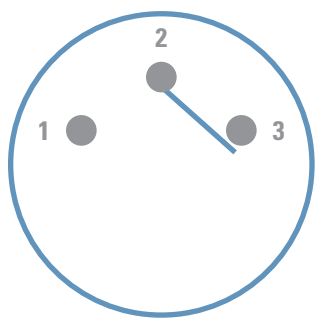
SPDT (Single Pole, Double Throw)

Conforms to MIL-S-24236/24



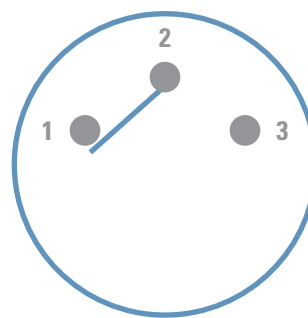
Additional configurations available, contact Sensata Technologies for more information.

LOW TEMPERATURE CONTACT POSITION

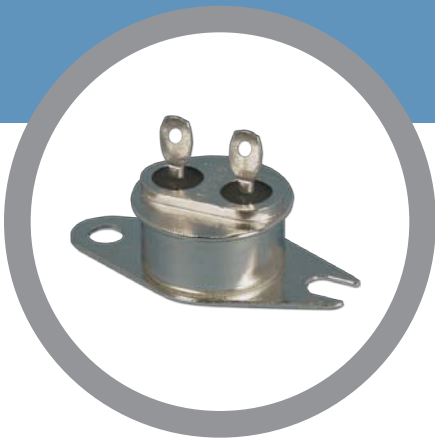


Terminals 1 & 2 are opened and terminals 2 & 3 are closed at the low temperature settings

HIGH TEMPERATURE CONTACT POSITION



Terminals 1 & 2 are closed and terminals 2 & 3 are open at the high temperature settings



KLIXON® | M1 and 11041 Series

½" Disc Hermetic Thermostats, -65°F to 550°F, SPST

FEATURES

- Single Pole / Single Throw (SPST)
- Preset temperature set points, non-adjustable calibration
- High resistance to shock and vibration
- Hermetically sealed, vacuum baked and back-filled with nitrogen
- Various mounting configurations available
- Qualified to MIL-PRF-24236/1

INTRODUCTION

The Klixon® M1/11041 series of thermostats are engineered for exceptional vibration and shock resistance to provide reliable switching in the most demanding applications. Prior to the final weld, finished assemblies are vacuum baked and back-filled with dry nitrogen. The inert, dry atmosphere eliminates moisture and other volatilizs to prevent condensation at low temperatures or possible contact contamination at high temperatures. This back-fill also improves the dielectric characteristics of the device and prevents oxidation of the contacts. The M1 thermostat is the ideal choice where quality and reliability are paramount.

SPECIFICATIONS

Contact Ratings (Resistive)	Cycles	30VDC / 30VAC	125VAC	250VAC
	100,000	5.0 amps	2.0 amps	1.0 amps
50,000	5.5 amps	3.0 amps	1.5 amps	
25,000	6.0 amps	4.0 amps	2.0 amps	
10,000	6.5 amps	5.0 amps	2.5 amps	
5,000	7.0 amps	6.0 amps	3.0 amps	
Operating Temperature	-65°F to 550°F (-53.9°C to 287.8°C)			
Dielectric Strength	1250 VAC, rms, 60 cycles for 1 minute, terminal to case per MIL-STD-202, Method 301			
Contact Resistance	0.050 ohms maximum per MIL-STD-202, Method 307			
Insulation Resistance	100 megohms min. at 500 VDC			
Vibration	5-2000 Hz, 20G, per MIL-STD-202, Method 204, Condition D (monitored) 5-1000 Hz, 100G, per MIL-STD-202, Method 204, Condition D (unmonitored) 1000-2000 Hz, 50G, per MIL-STD-202, Method 204, Condition D (unmonitored)			
Shock	100G, 6 milliseconds, per MIL-STD-202, Method 213			
Hermeticity	1 x 10 ⁻⁸ atm cc/sec. maximum, per MIL-STD-202, Method 112, Condition C			
Salt Spray	Per MIL-STD-202, Method 101, Condition B, 5% solution			
Average Weight	4.8 grams (without bracket) to 5.9 grams (with bracket)			
Ambient Temperature Range	-80°F to +550°F (-62.2°C to 287.8°C) <i>Maximum ambient exposure while in the closed position is 200°F above contact closing temperature.</i>			

STANDARD TEMPERATURE SETTINGS

OPERATING TEMPERATURE		DIFFERENTIAL		TOLERANCE	
°F	°C	°F	°C	± °F	± °C
- 65	- 53.9	30	16.7	10	5.6
- 40	- 40	30	16.7	10	5.6
- 15	-26.1	30	16.7	10	5.6
0	- 17.8	20	11.1	5	2.8
10	- 12.2	20	11.1	5	2.8
20	- 6.7	20	11.1	5	2.8
30	- 1.1	20	11.1	5	2.8
40	4.4	20	11.1	5	2.8
50	10.0	20	11.1	5	2.8
60	15.6	20	11.1	5	2.8
70	21.1	20	11.1	5	2.8
80	26.7	20	11.1	5	2.8
90	32.2	20	11.1	5	2.8
100	37.8	20	11.1	5	2.8
110	43.3	20	11.1	5	2.8
120	48.9	20	11.1	5	2.8
130	54.4	20	11.1	5	2.8
140	60.0	20	11.1	5	2.8
150	65.6	20	11.1	5	2.8
160	71.1	20	11.1	5	2.8
170	76.7	20	11.1	5	2.8
180	82.2	20	11.1	5	2.8
190	87.8	20	11.1	5	2.8
200	93.3	20	11.1	5	2.8

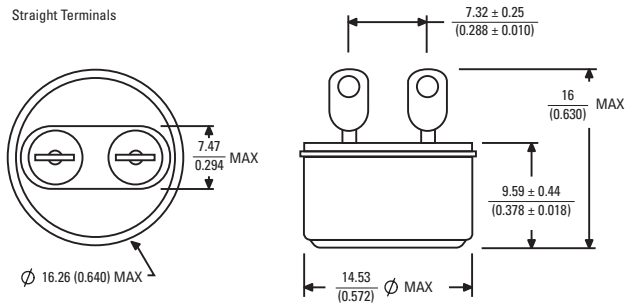
OPERATING TEMPERATURE		DIFFERENTIAL		TOLERANCE	
°F	°C	°F	°C	± °F	± °C
210	98.9	30	16.7	8	4.4
220	104.4	30	16.7	8	4.4
230	110.0	30	16.7	8	4.4
240	115.6	30	16.7	8	4.4
250	121.1	30	16.7	8	4.4
260	126.7	30	16.7	8	4.4
270	132.2	30	16.7	8	4.4
280	137.8	30	16.7	8	4.4
290	143.3	30	16.7	8	4.4
300	148.9	30	16.7	8	4.4
310	154.4	40	22.2	12	6.7
320	160.0	40	22.2	12	6.7
330	165.6	40	22.2	12	6.7
340	171.1	40	22.2	12	6.7
350	176.7	40	22.2	12	6.7
375	190.6	40	22.2	12	6.7
400	204.4	40	22.2	12	6.7
425	218.3	40	22.2	12	6.7
450	232.2	40	22.2	12	6.7
475	246.1	70	38.9	25	13.9
500	260	70	38.9	25	13.9
525	273.9	70	38.9	25	13.9
550	287.8	70	38.9	25	13.9
<i>Consult factory for additional temperatures</i>					

STANDARD CONFIGURATIONS

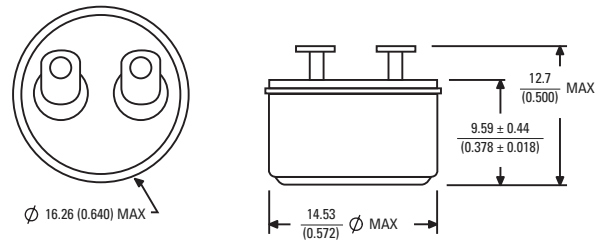
MM / (INCHES)

No Bracket | SPST (Single Pole, Single Throw)

Straight Terminals

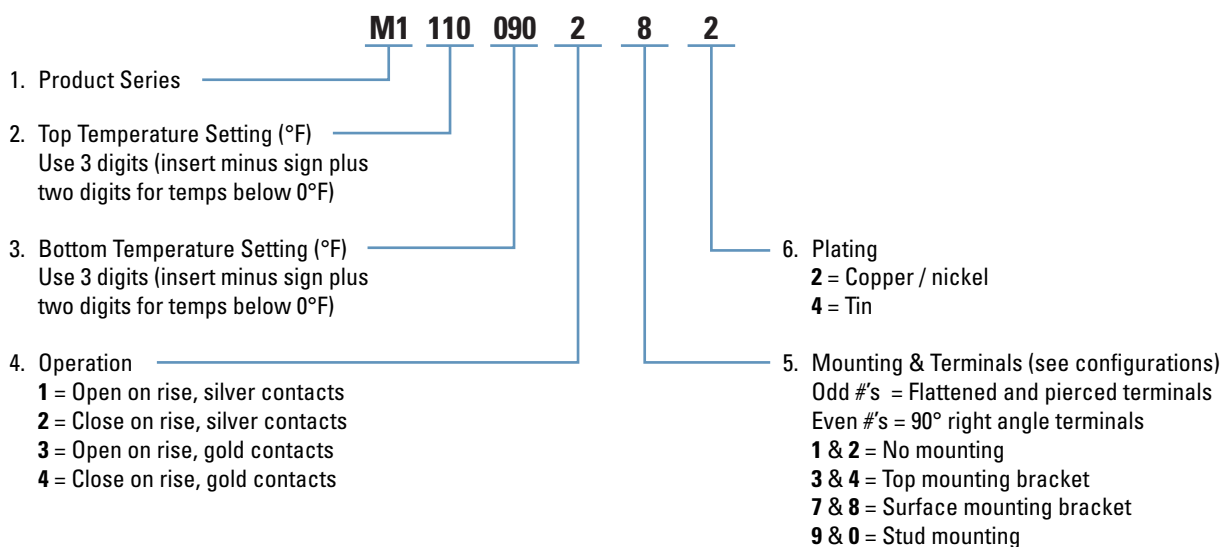


Bent Terminals



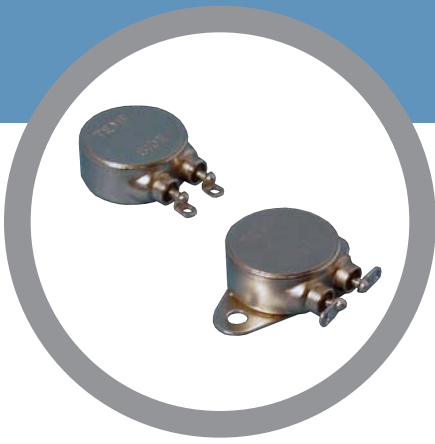
NOTE: Stud mount, surface and top mounting brackets are available. Dimensions listed are for reference only. Please contact Sensata for more detailed envelope drawings.

STANDARD PART NUMBER BUILDER



The example above describes a M1 series thermostat which closes on temperature rise at 110°F, opens at 90°F, has silver contacts, a surface mounting bracket, 90° bent terminals, and is plated with copper/nickel

Standard configurations are available as the M1 series and are described above. Many other configurations are available as the 11041 series. The M1/11041 can also be custom packaged to meet your specific design requirements.



KLIXON® | M2 Series

Narrow Differential Thermostats, 0°F to 300°F, SPST

FEATURES

- Low profile, narrow differential
- Hermetically sealed, vacuum baked and back-filled with nitrogen
- Single Pole / Single Throw (SPST)
- High resistance to shock and vibration
- Preset temperature set points, non-adjustable calibration
- Qualified to MIL-PRF-24236/20, S-311-641
- On NASA S-311-664 QPL

INTRODUCTION

The Klixon® M2 series of thermostats are engineered for exceptional vibration and shock resistance to provide reliable switching in a low-profile, narrow differential package for the most demanding applications. Prior to the final weld, finished assemblies are vacuum baked and back-filled with dry nitrogen. The inert, dry atmosphere eliminates moisture and other volatiles to prevent condensation at low temperatures or possible contact contamination at high temperatures. This back-fill also improves the dielectric characteristics of the device and prevents oxidation of the contacts. The M2 thermostat is the ideal choice where quality and reliability are paramount. Applications include: airplane wing de-icing systems, satellite heaters, aircraft controls, warning devices, and electronic device overheat protection.

SPECIFICATIONS

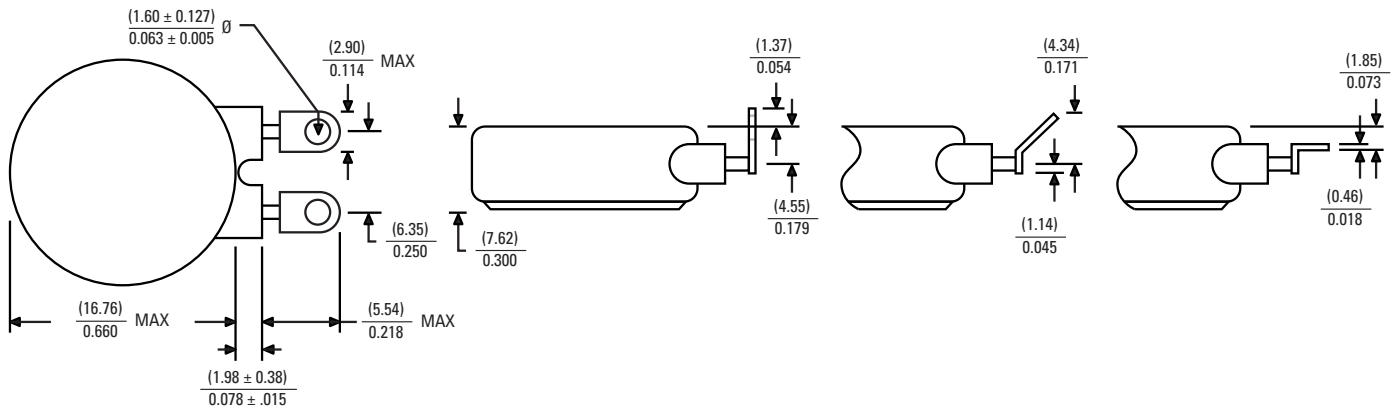
Contact Ratings (Resistive)	<i>Cycles</i> 250,000	<i>30VDC / 30VAC</i> 2.0 amps	<i>120VAC</i> 2.0 amps
Operating Temperature	0°F to 300°F (-17.8°C to 148.9°C)		
Dielectric Strength	1250 VAC, rms, 60 cycles for 1 minute, terminal to case per MIL-STD-202, Method 301		
Contact Resistance	0.050 ohms maximum per MIL-STD-202, Method 307		
Vibration	10-2000 Hz, 10G, per MIL-STD-202, Method 204, Condition D (monitored)		
Shock	100G, 6 milliseconds, per MIL-STD-202, Method 213		
Hermeticity	1 x 10 ⁻⁸ atm cc/sec. maximum, per MIL-STD-202, Method 112, Condition C		
Salt Spray	Per MIL-STD-202, Method 101, Condition B, 5% solution		
Average Weight	5.4 grams (average)		
Ambient Temperature Range	-65°F to +400°F (-53.9°C to 204.4°C) <i>Maximum ambient exposure for close on rise devices is 100°F above contact operating temperature, for open on rise devices it is 100°F below contact operating temperature.</i>		

STANDARD TEMPERATURE SETTINGS

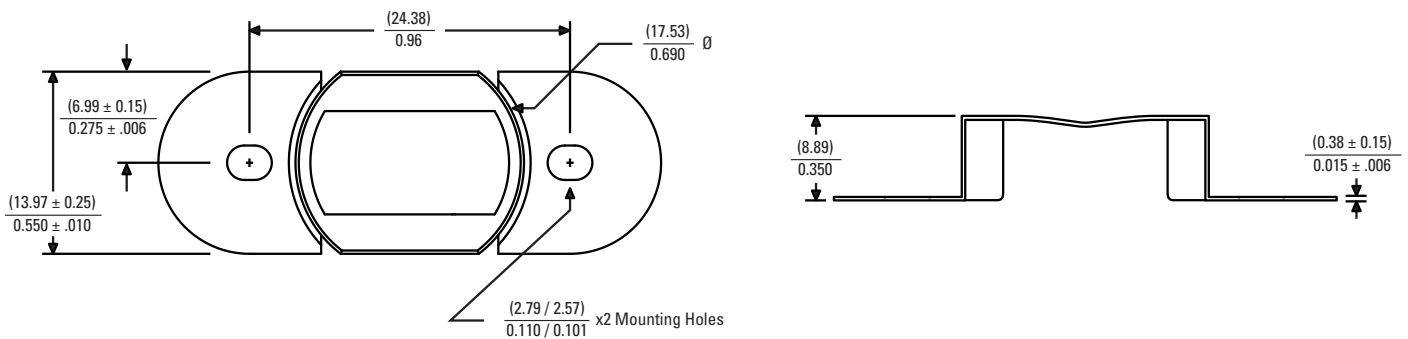
CLOSING TEMPERATURE RANGE	OPENING TEMPERATURE DIFFERENTIAL	TOLERANCE	
		Standard	Special
0°F to 250°F (-17°C to 121°C)	2°F to 5°F (1.1°C to 2.8°C)	± 4°F (± 2.2°C)	± 3°F (± 1.7°C)
251°F to 300°F (122°C to 149°C)	3°F to 7°F (1.7°C to 3.9°C)	± 5°F (± 2.8°C)	± 4°F (± 2.2°C)

The standard operating temperatures, differential and tolerances are shown in this table, but can be customized to meet your specific requirements.

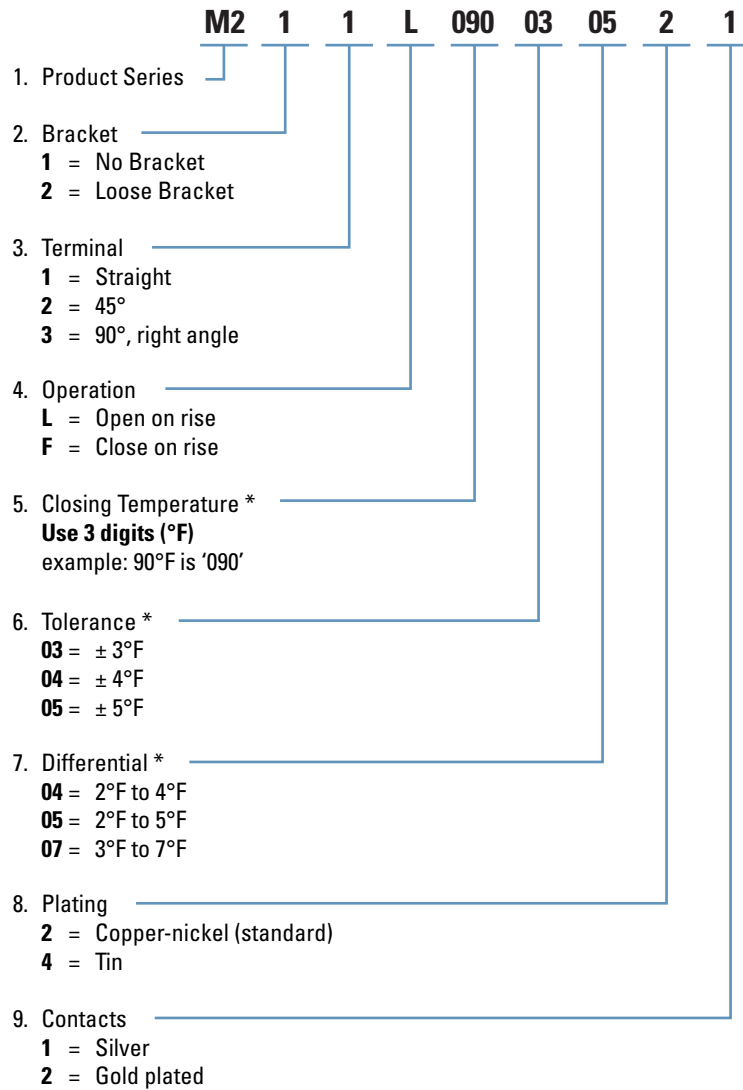
STANDARD CONFIGURATIONS



Mounting Bracket



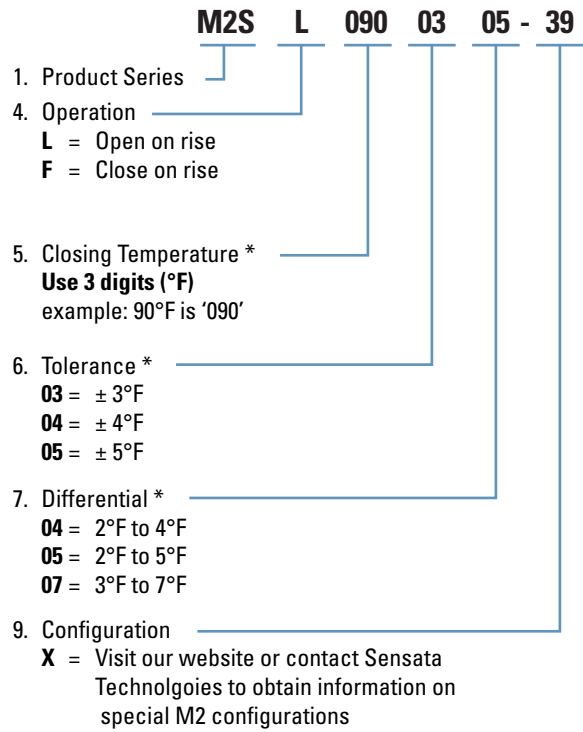
STANDARD M2 PART NUMBER BUILDER

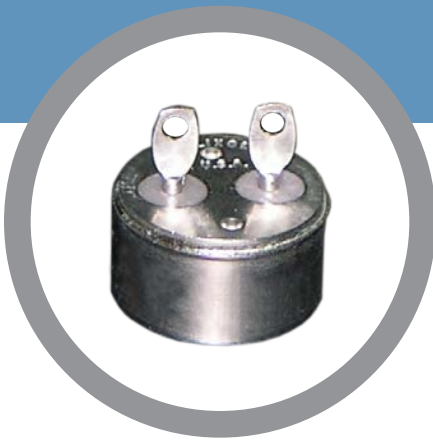


* See temperature table for standard tolerances / differentials

Example is a M2 series, no bracket, straight terminals, open on rise at 90°F ± 3°F with 2°F to 5°F differential, copper-nickel plating, silver contacts

SPECIAL M2 PART NUMBER BUILDER





KLIXON® | 2288 Series

Hermetic Stainless Steel Bimetal Thermostats, SPST

FEATURES

- Hermetic stainless steel construction
- Single Pole / Single Throw (SPST) design
- Preset temperature set points, non-adjustable calibration
- High resistance to shock and vibration, 100% quality tested
- Snap-acting switching, tight temperature tolerances
- Various mounting and terminal configurations available
- Custom built to customer specifications
- UL, Canadian-UL, CE

INTRODUCTION

The Klixon® 2288 precision thermostat is constructed with a snap-acting bimetal disc, which serves as the actuating element. As the temperature reaches a pre-determined set point, the disc snaps to its reverse curvature producing a crisp, positive switching action inherent to Klixon® thermostats. This feature assures reliable, consistent operating temperature over a long cycle life.

Applications include process control, medical/dental equipment, heater control, pumps, motors, liquid temperature control, environmental and critical control systems.

SPECIFICATIONS				
Silver Contact Ratings, Resistive (Standard Temperature Settings)	<i>Cycles</i>	<i>30VDC / 30VAC</i>	<i>125VAC</i>	<i>250VAC</i>
	100,000	5.0 amps	2.0 amps	1.0 amps
	50,000	5.5 amps	3.0 amps	1.5 amps
	25,000	6.0 amps	4.0 amps	2.0 amps
	10,000	6.5 amps	5.0 amps	2.5 amps
	5,000	7.0 amps	6.0 amps	3.0 amps
Gold Contact Ratings, Resistive	<i>30VDC / 30VAC</i>	<i>115VAC</i>	<i>220VAC</i>	
	500 mA and below	200 mA and below	100 mA and below	
Ambient Temperature Range	-53.9°C to 287.8°C (-65°F to 550°F)			
Dielectric Strength	1250 VAC, rms, 60 Hz for 1 minute, terminal to case			
Contact Resistance	0.025 ohms maximum			
Vibration	5-2000 Hz, 20G			
Shock	100G, 6 milliseconds			
Hermeticity	1 x 10 ⁻⁵ atm cc/sec. maximum			
Average Weight	7.0 grams (without bracket) to 8.0 grams (with bracket)			
Electrical Ratings	720 VA, 110-600 VAC, break but not make, ungrounded cup* 360 VA, 600 VAC, make and break, ungrounded cup 125 VA Pilot Duty, 24 to 240 VAC, make and break, grounded or ungrounded cup *At this rating, suitable as a control circuit, temperature limiting device for hazardous location motors and generators.			

DEFINITIONS

Limit Type Device: A thermostat which opens its contacts on temperature rise

Fan Type Device: A thermostat which closes its contacts on temperature rise

Operating Temperature: The temperature at which normally closed contacts open, or normally open contacts close

Differential: The difference between the nominal top set point temperature and the nominal bottom set point temperature

Tolerance: The allowable range above and below the set point temperatures

Example: A model 2288 thermostat that opens on temperature rise at 60°C (140°F) with a standard tolerance and closes at the standard differential would be described as: 'Model 2288, Limit Type, with an Operating Temperature of 60°C (140°F), Differential of 11.1°C (20°F), Tolerance of ±2.8°C (5°F)'

STANDARD TEMPERATURE SETTINGS

OPERATING TEMPERATURE		DIFFERENTIAL		TOLERANCE	
°C	°F	°C	°F	± °C	± °F
- 17.8	0	11.1	20	2.8	5
- 12.2	10	11.1	20	2.8	5
- 6.7	20	11.1	20	2.8	5
- 1.1	30	11.1	20	2.8	5
4.4	40	11.1	20	2.8	5
10.0	50	11.1	20	2.8	5
15.6	60	11.1	20	2.8	5
21.1	70	11.1	20	2.8	5
26.7	80	11.1	20	2.8	5
32.2	90	11.1	20	2.8	5
37.8	100	11.1	20	2.8	5
43.3	110	11.1	20	2.8	5
48.9	120	11.1	20	2.8	5
54.4	130	11.1	20	2.8	5
60.0	140	11.1	20	2.8	5
65.6	150	11.1	20	2.8	5
71.1	160	11.1	20	2.8	5
76.7	170	11.1	20	2.8	5
82.2	180	11.1	20	2.8	5

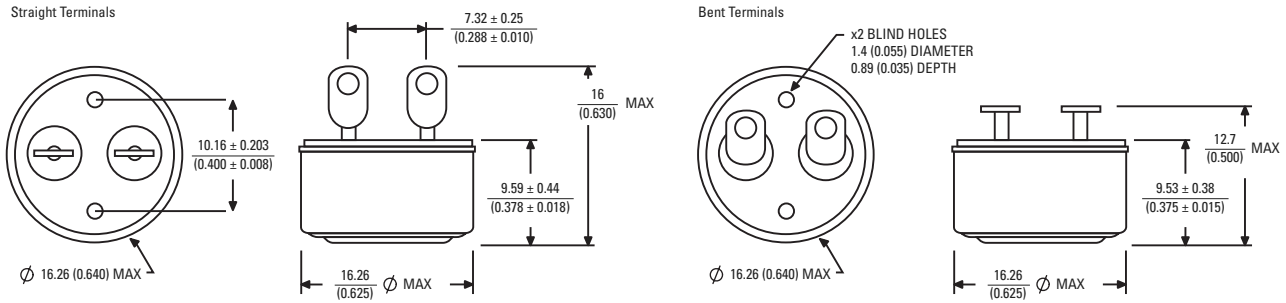
OPERATING TEMPERATURE		DIFFERENTIAL		TOLERANCE	
°C	°F	°C	°F	± °C	± °F
87.8	190	11.1	20	2.8	5
93.3	200	11.1	20	2.8	5
98.9	210	16.7	30	4.4	8
104.4	220	16.7	30	4.4	8
110.0	230	16.7	30	4.4	8
115.6	240	16.7	30	4.4	8
121.1	250	16.7	30	4.4	8
126.7	260	16.7	30	4.4	8
132.2	270	16.7	30	4.4	8
137.8	280	16.7	30	4.4	8
143.3	290	16.7	30	4.4	8
148.9	300	16.7	30	4.4	8
154.4	310	22.2	40	6.7	12
160.0	320	22.2	40	6.7	12
165.6	330	22.2	40	6.7	12
171.1	340	22.2	40	6.7	12
176.7	350	22.2	40	6.7	12
<i>Consult factory for additional temperatures</i>					

NOTE: Close on rise devices should not be subject to temperatures 93.3°C (200°F) above their closing temperature set point.

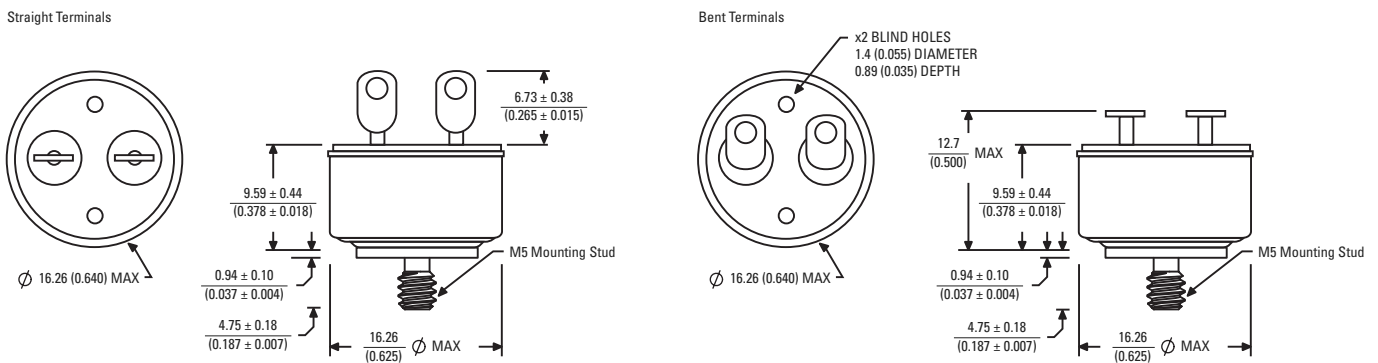
STANDARD CONFIGURATIONS

MM / (INCHES)

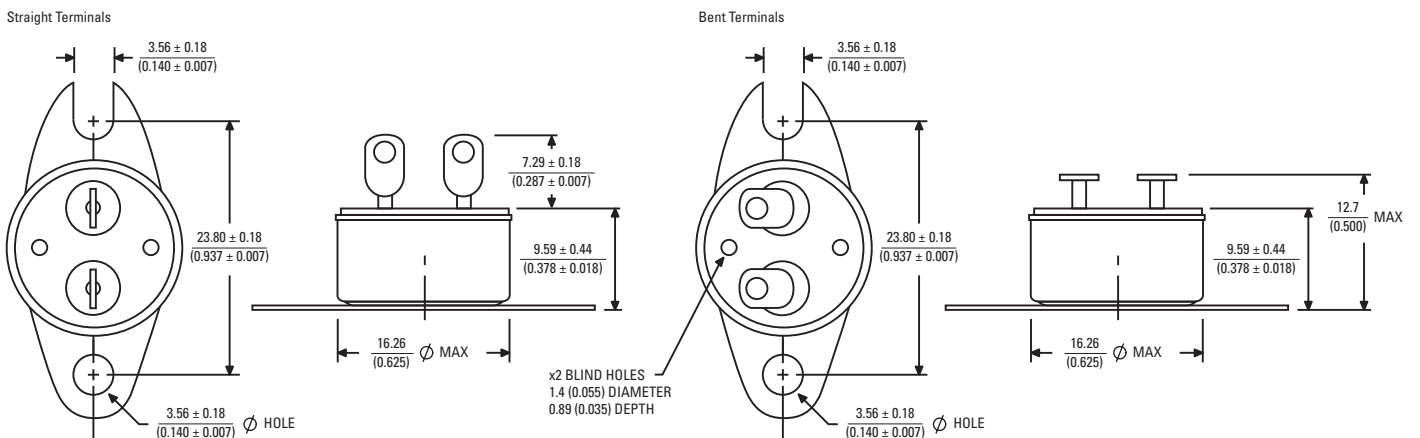
No Bracket | SPST (Single Pole, Single Throw) | 304 Stainless Steel



Stud Mount | SPST (Single Pole, Single Throw) | 304 Stainless Steel



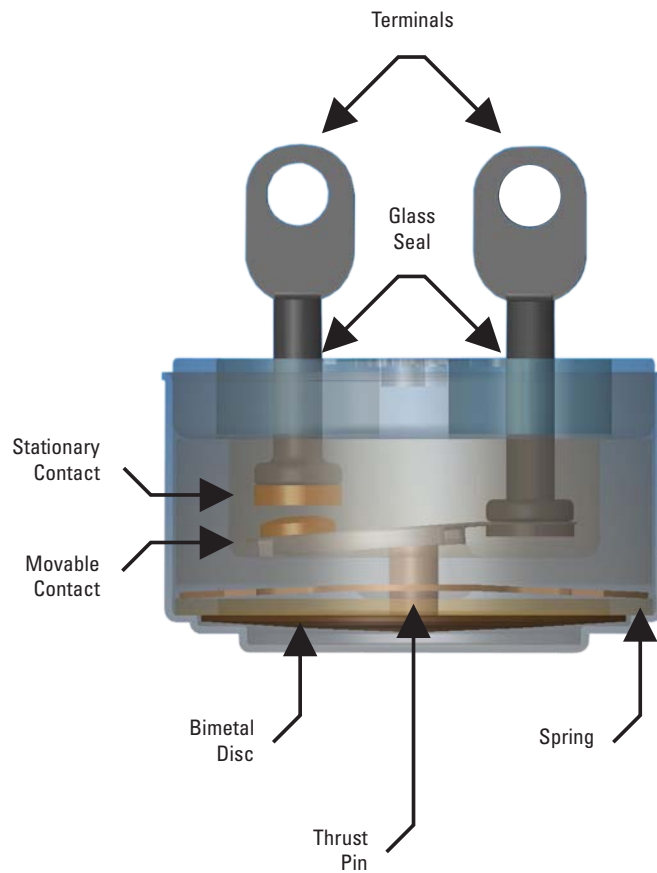
Bottom Mount Bracket | SPST (Single Pole, Single Throw) | 304 Stainless Steel



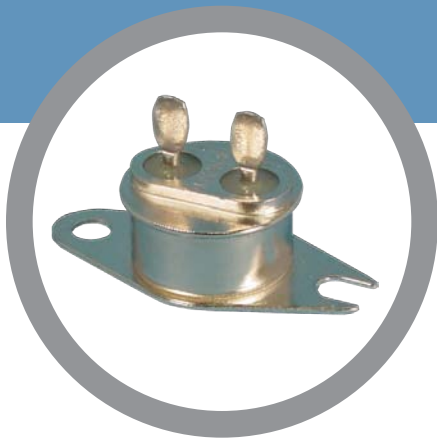
NOTE: Dimensions listed are for reference only. Please contact Sensata for more detailed envelope drawings.

OPERATION

When heated, the internal stresses of the bimetal cause the disc to reverse its curvature with a snap-action at a fixed, preset temperature, operating the electrical contacts. A decrease in the ambient temperature below the reset temperature of the disc relieves the internal stresses on the disc. The disc returns to its normal curvature and the contacts assume their normal operating position.



Model 2288 Cross Sectional View



KLIXON® | 4344 Series

1/2" Disc Hermetic Thermostats

-65°F to 550°F, SPST

FEATURES

- Single Pole / Single Throw (SPST)
- Preset temperature set points, non-adjustable calibration
- High resistance to shock and vibration
- Max resistive load: 7 amps
- Hermetically sealed, welded steel construction
- Various mounting configurations available, including probe, strap-mount or immersion thermostat
- Canadian-UL (UL File #34618), CSA (File #LR24458)

INTRODUCTION

The Klixon® 4344 series of thermostats are engineered with a snap-acting bimetal disc, producing a crisp, positive switching action. The standard 4344 comes copper-nickel plated with silver contacts. Other plating finishes are available upon request.

SPECIFICATIONS				
Contact Ratings (Resistive)	<i>Cycles</i>	<i>30VDC / 30VAC</i>	<i>125VAC</i>	<i>250VAC</i>
	100,000	5.0 amps	2.5 amps	1.0 amps
	50,000	5.5 amps	3.0 amps	1.5 amps
	25,000	6.0 amps	4.0 amps	2.0 amps
	10,000	6.5 amps	5.0 amps	2.5 amps
	5,000	7.0 amps	6.0 amps	3.0 amps
Gold Contact Ratings (Resistive)	<i>30VDC / 30VAC</i>	<i>115VAC</i>	<i>220VAC</i>	
	500 mA and below	200 mA and below	100 mA and below	
Operating Temperature	-65°F to 550°F (-53.9°C to 287.8°C)			
Dielectric Strength	1250 VAC, rms, 60 cycles for 1 minute, terminal to case per MIL-STD-202, Method 301			
Contact Resistance	0.050 ohms maximum per MIL-STD-202, Method 307			
Vibration	5-2000 Hz, 20G, per MIL-STD-202, Method 204, Condition D (unmonitored)			
Shock	100G, 6 milliseconds, per MIL-STD-202, Method 213			
Hermeticity	1 x 10 ⁻⁵ atm cc/sec. maximum, per MIL-STD-202, Method 112, Condition C			
Salt Spray	Per MIL-STD-202, Method 101, Condition B, 5% solution			
Average Weight	4.8 grams (without bracket) to 5.9 grams (with bracket)			
Ambient Temperature Range	-80°F to +550°F (-62.2°C to 287.8°C)			
	<i>Maximum ambient exposure while in the closed position is 200°F above contact closing temperature.</i>			
Electrical Ratings	720 VA, 110-600 VAC, break but not make, ungrounded cup*			
	360 VA, 600 VAC, make and break, ungrounded cup			
	125 VA Pilot Duty, 24 to 240 VAC, make and break, grounded or ungrounded cup			
	<i>*At this rating, suitable as a control circuit, temperature limiting device for hazardous location motors and generators.</i>			

STANDARD TEMPERATURE SETTINGS

OPERATING TEMPERATURE		DIFFERENTIAL		TOLERANCE	
°F	°C	°F	°C	± °F	± °C
- 65	- 53.9	30	16.7	10	5.6
- 40	- 40	30	16.7	10	5.6
- 15	-26.1	30	16.7	10	5.6
0	- 17.8	20	11.1	5	2.8
10	- 12.2	20	11.1	5	2.8
20	- 6.7	20	11.1	5	2.8
30	- 1.1	20	11.1	5	2.8
40	4.4	20	11.1	5	2.8
50	10.0	20	11.1	5	2.8
60	15.6	20	11.1	5	2.8
70	21.1	20	11.1	5	2.8
80	26.7	20	11.1	5	2.8
90	32.2	20	11.1	5	2.8
100	37.8	20	11.1	5	2.8
110	43.3	20	11.1	5	2.8
120	48.9	20	11.1	5	2.8
130	54.4	20	11.1	5	2.8
140	60.0	20	11.1	5	2.8
150	65.6	20	11.1	5	2.8
160	71.1	20	11.1	5	2.8
170	76.7	20	11.1	5	2.8
180	82.2	20	11.1	5	2.8
190	87.8	20	11.1	5	2.8
200	93.3	20	11.1	5	2.8

OPERATING TEMPERATURE		DIFFERENTIAL		TOLERANCE	
°F	°C	°F	°C	± °F	± °C
210	98.9	30	16.7	8	4.4
220	104.4	30	16.7	8	4.4
230	110.0	30	16.7	8	4.4
240	115.6	30	16.7	8	4.4
250	121.1	30	16.7	8	4.4
260	126.7	30	16.7	8	4.4
270	132.2	30	16.7	8	4.4
280	137.8	30	16.7	8	4.4
290	143.3	30	16.7	8	4.4
300	148.9	30	16.7	8	4.4
310	154.4	40	22.2	12	6.7
320	160.0	40	22.2	12	6.7
330	165.6	40	22.2	12	6.7
340	171.1	40	22.2	12	6.7
350	176.7	40	22.2	12	6.7
375	190.6	40	22.2	12	6.7
400	204.4	40	22.2	12	6.7
425	218.3	40	22.2	12	6.7
450	232.2	40	22.2	12	6.7
475	246.1	70	38.9	25	13.9
500	260	70	38.9	25	13.9
525	273.9	70	38.9	25	13.9
550	287.8	70	38.9	25	13.9
<i>Consult factory for additional temperatures</i>					



KLIXON® | 4391 Series

High Capacity, Hermetically Sealed Thermostats SPST or SPDT, Manual or Auto Reset

FEATURES

- Single Pole / Single Throw (SPST) or Single Pole / Double Throw (SPDT)
- Automatic or manual reset
- Preset temperature set points, non-adjustable calibration
- High current capacity, environmentally sealed
- Normally open or closed
- Various mounting brackets are available
- Capacity optional overmold

INTRODUCTION

The Klixon® 4391 series snap-acting disc type control is designed to provide crisp, positive switching action. The 4391 is the most versatile of the Klixon precision thermostats with its available SPST or SPDT switching, automatic or manual reset, and overmold options.

SPECIFICATIONS

Contact Ratings (Resistive)	Cycles	30VDC / 30VAC	125VAC	250VAC
	100,000	10.0 amps	4.0 amps	2.0 amps
	50,000	11.0 amps	6.0 amps	3.0 amps
	25,000	12.0 amps	8.0 amps	4.0 amps
	10,000	13.0 amps	10.0 amps	5.0 amps
	5,000	14.0 amps	12.0 amps	6.0 amps
Operating Temperature	Non-Overmold: 0°F to 450°F (-17.8°C to 232.2°C) Silicone Overmold: 0°F to 400°F (-17.8°C to 204.4°C)			
Dielectric Strength	1250 VAC, rms, 60 cycles for 1 minute (1500VAC available upon request)			
Vibration	5-500 Hz, 3G (std), 5-500, 5G (high vibration construction option)			
Hermeticity	1 x 10 ⁻⁵ atm cc/sec. maximum			
Ambient Temperature Range	Non-Overmold: -65°F to 450°F (-53.9°C to 232.2°C) Silicone Overmold: -60°F to 400°F (-51.1°C to 204.4°C)			
Weight	Non-Overmold: 21 grams w/ Silicone Overmold: 56 grams			

STANDARD TEMPERATURE SETTINGS

OPERATING TEMPERATURE	SPST (Single Pole / Single Throw), Standard Vibration				SPDT (Single Pole / Double Throw), High Vibration			
	DIFFERENTIAL		TOLERANCE		DIFFERENTIAL		TOLERANCE	
	°F	°C	± °F	± °C	°F	°C	± °F	± °C
0 to 200°F (-17.8 to 93.3°C)	15	8.3	5	2.8	25	13.9	8	4.4
210 to 300°F (-98.9 to 148.9°C)	25	13.9	7	3.9	30	16.7	10	5.6
325 to 350°F (-160 to 176.7°C)	45	25.0	12	6.7	45	25.0	12	6.7
375 to 450°F * (-190.6 to 232.2°C) auto reset only	60	33.3	15	8.3	60	13.9	15	8.3

Standard temperature set points are at every 5°F degrees (for example, 320°F, 325°F, 330°F).
Consult Sensata Technologies if a custom operating temperature range is required.

* Available in automatic reset only



KLIXON® | 7BT2 Series

High Capacity, Environmentally Sealed Thermostats 30°F to 400°F, SPST

FEATURES

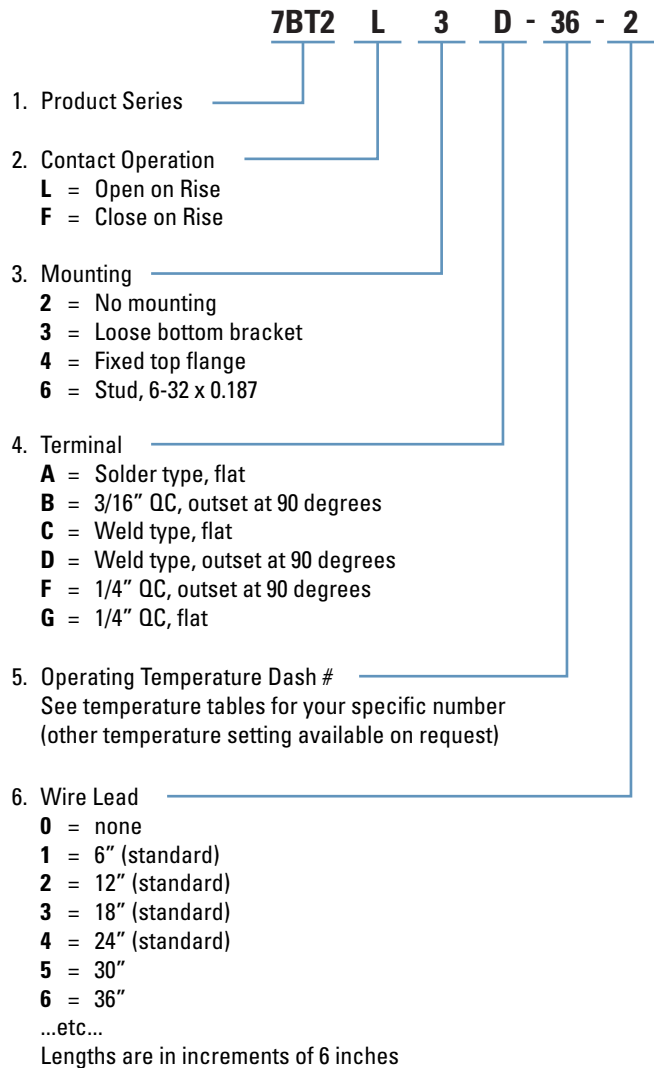
- Single Pole / Single Throw (SPST)
- Preset temperature set points, non-adjustable calibration
- High current capacity, environmentally sealed
- Max resistive load: 15 amps
- UL, Canadian-UL (UL File #34618), KEMA (ENEC, file #2018218.03)

INTRODUCTION

The Klixon® 7BT2 thermostat is a snap-acting disc type control designed to provide crisp, positive switching action. The bimetal disc and electrical contacts are enclosed in a stainless steel cup to provide protection from dust and other foreign particles. The 7BT2 is available in a variety of configurations, making it a versatile candidate for your thermal protection needs.

SPECIFICATIONS	
Contact Ratings (Resistive, Max Temp 400°F)	<i>Cycles</i> 120 VAC 240VAC 30VDC 100,000 15.0A 7.5A 10A
Operating Temperature	30°F to 400°F (-1.1°C to 204.4°C)
Dielectric Strength	2000 VAC, rms, 60 cycles for 1 minute, terminal to case
Ambient Temperature Range	-20°F to +400°F (-28.9°C to 204.4°C)

STANDARD PART NUMBER BUILDER



STANDARD TEMPERATURE SETTINGS

DASH #	OPERATING TEMPERATURE		DIFFERENTIAL		TOLERANCE	
	°F	°C	°F	°C	± °F	± °C
1	120	48.9	20	11.1	5	2.8
2	125	51.7	20	11.1	5	2.8
3	130	54.4	20	11.1	5	2.8
4	135	57.2	20	11.1	5	2.8
5	140	60.0	20	11.1	5	2.8
6	145	62.8	20	11.1	5	2.8
7	150	65.6	20	11.1	5	2.8
8	155	68.3	20	11.1	5	2.8
9	160	71.1	20	11.1	5	2.8
10	165	73.9	20	11.1	5	2.8
11	170	76.7	20	11.1	5	2.8
12	175	79.4	20	11.1	5	2.8
13	180	82.2	20	11.1	5	2.8
14	185	85.0	20	11.1	5	2.8
15	190	87.8	20	11.1	5	2.8
16	195	90.6	20	11.1	5	2.8
17	200	93.3	20	11.1	5	2.8
18	205	96.1	30	16.7	8	4.4
19	210	98.9	30	16.7	8	4.4
20	215	101.7	30	16.7	8	4.4
21	220	104.4	30	16.7	8	4.4
22	225	107.2	30	16.7	8	4.4
23	230	110.0	30	16.7	8	4.4
24	235	112.8	30	16.7	8	4.4
25	240	115.6	30	16.7	8	4.4
26	245	118.3	30	16.7	8	4.4

DASH #	OPERATING TEMPERATURE		DIFFERENTIAL		TOLERANCE	
	°F	°C	°F	°C	± °F	± °C
27	250	121.1	30	16.7	8	4.4
28	255	123.9	30	16.7	8	4.4
29	260	126.7	30	16.7	8	4.4
30	265	129.4	30	16.7	8	4.4
31	270	132.2	30	16.7	8	4.4
32	275	135.0	30	16.7	8	4.4
33	280	137.8	30	16.7	8	4.4
34	285	140.6	30	16.7	8	4.4
35	290	143.3	30	16.7	8	4.4
36	295	146.1	30	16.7	8	4.4
37	300	148.9	30	16.7	8	4.4
38	305	151.7	40	22.2	12	6.7
39	310	154.4	40	22.2	12	6.7
40	315	157.2	40	22.2	12	6.7
41	320	160.0	40	22.2	12	6.7
42	325	162.8	40	22.2	12	6.7
43	330	165.6	40	22.2	12	6.7
44	335	168.3	40	22.2	12	6.7
45	340	171.1	40	22.2	12	6.7
46	345	173.9	40	22.2	12	6.7
47	350	176.7	40	22.2	12	6.7
<i>For 30°F to 110°F and 360°F to 400°F, consult factory for a customer specific dash #</i>						



KLIXON® | 6786 Series

½" Disc, Low Profile Thermostats
-20°F to 350°F, SPST

FEATURES

- Single Pole / Single Throw (SPST)
- Preset temperature set points, non-adjustable calibration
- Normally open or normally closed
- Max resistive load: 7 amps
- Environmentally sealed, low profile
- Various mounting configurations available including brackets, studs, and with or without surface mounting brackets
- UL recognized, Canadian-UL (UL File #34618)

INTRODUCTION

The Klixon® 6786 thermostat is a snap-acting disc type control designed to provide crisp, positive switching action for applications where maximum shock and vibration resistance is required. The Klixon snap-acting disc and fine silver electrical contacts are sealed in a stainless steel cup to provide protection from dust and other foreign particles. This construction also assures rapid thermal response plus dependable circuit operation at all times. The small size of the 6786 makes it particularly suitable where space and weight accommodations are limited.

SPECIFICATIONS

Contact Ratings (Resistive)	<i>Cycles</i>	<i>30VDC / 30VAC</i>	<i>125VAC</i>	<i>250VAC</i>
	100,000	5.0 amps	2.0 amps	1.0 amps
50,000	5.5 amps	3.0 amps	1.5 amps	
25,000	6.0 amps	4.0 amps	2.0 amps	
10,000	6.5 amps	5.0 amps	2.5 amps	
5,000	7.0 amps	6.0 amps	3.0 amps	
Operating Temperature	-20°F to 350°F			
Dielectric Strength	1250 VAC, rms, 60 cycles for 1 minute, terminal to case per MIL-STD-202, Method 301			
Vibration	10-500 Hz, 10G, per MIL-STD-202, Method 204, Condition A (unmonitored)			
Shock	30G, 11 milliseconds			
Ambient Temperature Range	-65°F to +400°F (-53.9°C to 204.4°C)			
Average Weight	2.5 grams			

STANDARD TEMPERATURE SETTINGS

OPERATING TEMPERATURE		DIFFERENTIAL		TOLERANCE	
°F	°C	°F	°C	± °F	± °C
-20	-28.9	30	16.7	10	5.6
0	-17.8	20	11.1	10	5.6
10	-12.2	20	11.1	10	5.6
20	-6.7	20	11.1	8	4.4
30	-1.1	20	11.1	8	4.4
40	4.4	20	11.1	8	4.4
50	10.0	20	11.1	8	4.4
60	15.6	20	11.1	8	4.4
70	21.1	20	11.1	8	4.4
80	26.7	20	11.1	8	4.4
90	32.2	20	11.1	8	4.4
100	37.8	20	11.1	8	4.4
110	43.3	20	11.1	8	4.4
120	48.9	20	11.1	8	4.4
130	54.4	20	11.1	8	4.4
140	60.0	20	11.1	8	4.4
150	65.6	20	11.1	8	4.4
160	71.1	20	11.1	8	4.4
170	76.7	20	11.1	8	4.4

OPERATING TEMPERATURE		DIFFERENTIAL		TOLERANCE	
°F	°C	°F	°C	± °F	± °C
180	82.2	20	11.1	8	4.4
190	87.8	20	11.1	8	4.4
200	93.3	20	11.1	10	5.6
210	98.9	30	16.7	10	5.6
220	104.4	30	16.7	10	5.6
230	110.0	30	16.7	10	5.6
240	115.6	30	16.7	10	5.6
250	121.1	30	16.7	10	5.6
260	126.7	30	16.7	10	5.6
270	132.2	30	16.7	10	5.6
280	137.8	30	16.7	10	5.6
290	143.3	30	16.7	10	5.6
300	148.9	30	16.7	10	5.6
310	154.4	40	22.2	12	6.7
320	160.0	40	22.2	12	6.7
330	165.6	40	22.2	12	6.7
340	171.1	40	22.2	12	6.7
350	176.7	40	22.2	12	6.7
<i>Consult factory for additional temperatures</i>					



KLIXON® | Probe Assemblies

Custom Immersion-Type Thermostat Probes

FEATURES

- Various Klixon® thermostats in custom probe assemblies
- Preset temperature set points, non-adjustable calibration
- Normally open or normally closed
- Hermetically sealed (probe only)
- Extreme temperature, fast response, narrow differential or custom probe assembly configurations
- Qualified to MIL-S-24236, MIL-S-24236/2, MIL-S-24236/11, and MIL-S-24236/25 (order by MS number)

INTRODUCTION

To meet a wide range of application requirements, Klixon® probe-type thermostat packages are available in a variety of sizes, configurations, and thermal characteristics. Select from one of our existing designs, or specify custom requirements to suit your needs.

- **Extreme Temperature Probes:**
Constant speed drives, aircraft refrigeration systems, food processing equipment, and missile hydraulic systems often require protection from or indication of extreme high or low temperatures. These Klixon® snap-acting thermostat probes are designed to provide reliable, consistent performance over a long cycle life in the harshest of environments. These probes provide excellent shock and vibration resistance and operate as low as -65°F and as high as 550°F and incorporate the reliable Klixon M1/11041 thermostat.
- **Fast Response Probes:**
Quick response to rapidly changing temperature is a virtue of the low thermal mass series of probe. The Klixon® 3BT Tiny Stat™ is located at the end of the probe for ultimate sensitivity. Quick response to rapidly changing temperatures is a virtue of the low thermal mass series probes.
- **Narrow Differential Control Probes:**
These thermostat probes accurately open and close with a narrow 2° to 8°F differential, providing close temperature control in applications ranging from environmental to power tube coolant systems. Probe assembly incorporates the reliable Klixon® M2 thermostat.



STANDARD PART NUMBER BUILDER

21542 - 03 - xxx - 01

1. Package Type

Extreme Temperature (M1 thermostat)

21542 = 3/4" - 16 thread w/ connector

21543 = 1/2" pipe thread w/ leads

21548 = 3/4" - 16 thread w/ leads

21549 = 1/2" pipe thread w/ connector

Narrow Differential (M2 thermostat)

21545 = 1/2" pipe thread w/ leads

21546 = 3/4" - 16 thread w/ connector

21547 = 3/4" - 16 thread w/ leads

21550 = 1/2" pipe thread w/ connector

Fast Response (3BT thermostat)

21544 = 1/8" pipe thread with leads

21557 = 1/8" pipe thread with connector

21561 = 7/16" - 20 thread with leads

21562 = 7/16" - 20 thread with connector

2. Probe Length

XX = value of 2 times the length of probe needed
 Probes lengths available in 1/2" increments from 1" to 6",
 length measured from bottom of hex to tip of probe
*For example, for a 1.5" probe, part number would
 require a 03*

3. Operating Characteristics

XXX = 3-digit code to be assigned by Sensata Technologies
 based on the customers specific requirements for the
 thermostat within the assembly

4. Wire Lead

01 = 6"

02 = 12"

03 = 18"

...etc...

Lengths are in increments of 6 inches.

For connectors, please contact Sensata Technologies
 for the code



KLIXON® | AT / KX Series

Precision Switches

-20°F to 350°F, SPST

AT FEATURES

- Meet the demands of low-level current switching applications
- Various mechanical and electrical configurations available as standard or custom configurations
- Actuation plungers of various shapes and materials available
- Multi-pole switch package options
- Wiring can be supplied as flying leads or via a variety of standard connectors
- Mounting via threaded bushings or side-plate design

KX FEATURES

- Hermetic seal provides exceptional operational freedom from environmental conditions
- Compactly designed to fit small, narrow spaces
- Available with either screw or solder lug type terminals
- Snap-acting sine switch provides exceptional resistance to shock and vibration
- Embedded leads are available
- Lead lengths can be supplied to customer requirements

INTRODUCTION

Due to its broad performance envelope, small size, and ability to be easily incorporated into a wide variety of packages, this is our most popular family of precision hermetic switches. Klixon® AT series switches are available as basic switches, basic switches with mounting brackets and actuators, or as switch packages. Packages are formed by configuring various electrical terminations, actuator means and physical construction around one or more basic switches. Since these sources are still far from exhaustive, please call if you need something you don't see. (There are too many designs to include here.) We would also be pleased to consider new designs for custom packaging.

Within this family there are four basic switches: the AT, the 3AT, the 4AT, and the 10AT. Each has been optimized for particular performance characteristics and is capable of meeting the demands of low-level current switching applications.

The Klixon® KX Series hermetically sealed sine switch is a precision snap-acting device. It is designed for use in the aerospace industry and for other applications where operational freedom from environmental conditions is a requirement. (Performance chart.)

KX series switches are sealed within a one-piece steel case engineered to withstand extremely low or high ambient pressures. True hermetic sealing is achieved with a metal "wave type" diaphragm at the actuating lever. The actuating arm is keyed to hold the arm in alignment and to prevent damage to the diaphragm.

The switching element is the versatile Klixon® sine switch. This simple, one-piece element eliminates knife edges and high friction joints. Rigidly supported at both ends and accurately prestressed in tension, the sine switch features outstanding resistance to shock and vibration.

Klixon® switches have been used in a variety of aircraft, weapons systems, aircraft engine and aerospace applications for well over 30 years. A brief listing of typical applications include:

- Door interlock systems
- Aircraft engine ignitions
- Aircraft missile launcher position indication
- External stores emergency jettison switches
- Stowed / deployed indication for thrust reversers
- Safety ignition indication for military jet engines
- Radar pod door switches
- Tank/armored personnel carrier missile launcher switches
- Tank gun turret position indication

SPECIFICATIONS

		AT		3AT	4AT	10AT	KX
Current Ratings (28VDC)	Res.	3 amp	1 amp	1 amp	3 amp	4 amp	10 amp
	Ind.	1 amp	0.5 amp	0.5 amp	1 amp	1 amp	5 amp
	Lamp	1 amp	0.5 amp	0.5 amp	1 amp	2 amp	3 amp
Min Life at Rated Load Cycles		25K	50K	25K	25K	25K	25K
Min Mechanical Life Cycles		100K		100K	50K	50K	25K
Ambient Temperature Range		-65°F to 275°F (-53.8°C to 135°C)		-65°F to 450°F (-53.8°C to 232.2°C)	-275°F to 275°F (-170.5°C to 135°C)	-85°F to 275°F (-65°C to 135°C)	-65°F to 275°F (-53.8°C to 135°C)
Dielectric Strength Terminal to Case VRMS Terminal to Terminal VRMS		1000 800		500 500	1000 800	1000 800	1250 1250
Max Leakage Std. cc He/Dec		1 x 10 ⁻⁸					1 x 10 ⁻⁶
Shock		200G, 6 ms sawtooth					100G
Vibration		65G, 10 - 2000Hz, .5 DA or 65 G RMS					20G
Insulation Resistance @ 500VDC		100 megaohms	100 megaohms	100 megaohms	100 megaohms	100 megaohms	—



KLIXON® | 7PS Series

Hermetic Stainless Steel Pressure Switch

FEATURES

- Hermetically sealed per MIL-E-5400 paragraph 6.3.10
- Covers actuation range of 45 to 700 PSIA
- Maximum corrosion resistance under hostile conditions
 - 300 series stainless steel construction for all environment exposed parts
 - Stainless steel and brass construction for media exposed parts
- High vibration resistance
- 8000 psi minimum burst pressure
- SPDT switch configuration
- Available in a wide range of standard and custom configurations

INTRODUCTION

The Klixon® 7PS Series precision pressure switches are snap-acting, all-welded devices with hermetically sealed switch contacts. The 7PS was developed for applications in aerospace and electronics where high reliability and/or resistance to severe environments is required. To ensure maximum corrosion resistance under hostile conditions, all parts exposed to the pressure media and the environment are made of brass or 300 series stainless steel — no rubber parts are used.

Small and lightweight, 7PS Series switches can be mounted by their pressure ports alone, allowing maximum flexibility of design. Full contact force is maintained even during high shock and vibration—regardless of applied pressure—because the positive, snap-action disc works in tandem with snap-action switch contacts.

Now you can completely specify a Klixon custom built pressure switch designed to satisfy your unique requirements. Our building block approach utilizes standard components and provides a wide variety of options... while retaining the cost advantage of off-the-shelf devices.

SPECIFICATIONS	
Temperature Rating	-65°F to 275°F (-53.8°C to +135°C)
Vibration Resistance	25 G, 20–2000 cps (no contact chatter in excess of 10 microseconds)
Burst Pressure	8,000 PSI minimum
Proof Pressure	8 times actuating pressure
Life @ Rated Current	50,000 cycles
Current Capacity	Resistive : 5amp @ 28 VDC Inductive : 2amp @ 28 VDC Lamp : 1amp @ 28 VDC
Dielectric Strength	Terminal to terminal : 1000 vrms Terminal to case : 1000 vrms
Weight	Without Leads : 30 grams maximum With Connector : 60 grams maximum
Metal Parts Exposed to Pressure & Environment	300 series stainless steel CA-360-2 (1/2 hard leaded brass)
Potting Material	Epoxy resin

PRESSURE SPECIFICATIONS

Range of Actuation Pressure Settings	at STP from 45 PSIA to 700 PSIA
Range of Deactuation Pressure Settings	Standard : 60% to 85% of actuation pressure Special : 85% to 90% of actuation pressure
Range of Tolerances on Actuation & Deactuation Pressure	Standard : up to $\pm 6\%$ of actuation pressure (± 10 PSI minimum) Special : up to $\pm 4\%$ of actuation pressure (± 5 PSI minimum) <i>Choice of deactuation pressure setting and tolerances affects price</i>

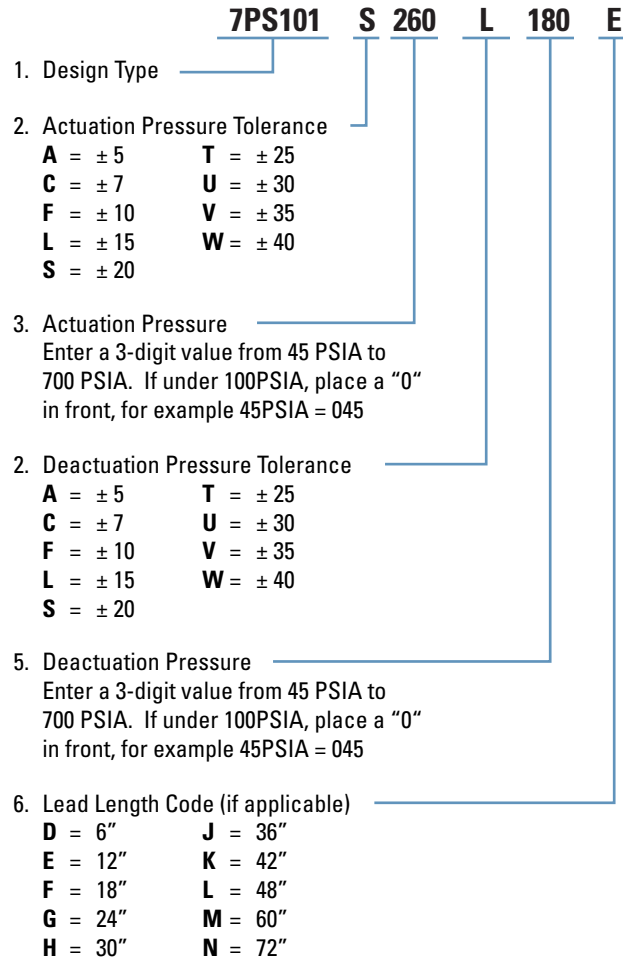
Actuation Pressure (PSIA)			Deactuation Pressure (PSIA)			
Pressure	Standard Tolerance	Special Tolerance	Standard 60% to 85%	Special 85% to 90%	Standard Tolerance	Special Tolerance
45 to 134	± 10	± 5	28 to 112	40 to 117	± 10	± 5
135 to 164	± 10	± 7	83 to 137	117 to 144	± 10	± 7
165 to 249	± 15	± 10	101 to 208	142 to 216	± 15	± 10
250 to 369	± 20	± 15	153 to 310	217 to 324	± 20	± 15
370 to 429	± 25	± 20	225 to 361	319 to 378	± 25	± 20
430 to 489	± 30	± 20	261 to 412	370 to 432	± 30	± 20
490 to 549	± 35	± 25	297 to 463	421 to 486	± 35	± 25
550 to 599	± 40	± 25	333 to 510	472 to 540	± 40	± 25
600 to 700	————— Consult Factory —————					

DESIGN TYPE

<p>Terminals</p> <p>Pressure Port</p>		<p>FLATTENED & PIERCED TERMINALS</p>	<p>POTTED LEADS</p>	<p>PT1H-8-3P CONNECTOR</p>
		<p>7PS100</p>	<p>7PS101</p>	<p>7PS102</p>
<p>1/8" OD Tubing MS 33656 -E2 (1" HEX)</p>	<p>1.00 (25.4)</p>	<p>7PS100</p>	<p>7PS101</p>	<p>7PS102</p>
<p>3/16" OD Tubing MS 33656 -E3 (1" HEX)</p>	<p>1.00 (25.4)</p>	<p>7PS200</p>	<p>7PS201</p>	<p>7PS202</p>
<p>1/4" OD Tubing MS 33656 -E4 (1" HEX)</p>	<p>1.00 (25.4)</p>	<p>7PS300</p>	<p>7PS301</p>	<p>7PS302</p>
<p>5/16" OD Tubing MS 33656 -E5 (1" HEX)</p>	<p>1.00 (25.4)</p>	<p>7PS400</p>	<p>7PS401</p>	<p>7PS402</p>
<p>3/8" OD Tubing MS 33656 -E6 (1" HEX)</p>	<p>1.00 (25.4)</p>	<p>7PS500</p>	<p>7PS501</p>	<p>7PS502</p>
<p>1/8" Pipe Fitting MS 33677 (1" HEX)</p>	<p>1.00 (25.4)</p>	<p>7PS600</p>	<p>7PS601</p>	<p>7PS602</p>
<p>1/4" Pipe Fitting MS 33677 (1" HEX)</p>	<p>1.00 (25.4)</p>	<p>7PS700</p>	<p>7PS701</p>	<p>7PS702</p>
<p>1" O.D. x 0.040" Flange Mount</p>		<p>7PS800</p>	<p>7PS801</p>	<p>7PS802</p>

STANDARD PART NUMBER BUILDER

See pressure table for standard tolerances for the actuation and deactuation pressures. Note, after building the part number, consult the factory for pricing and to confirm pressure specifications are valid.





KLIXON® | 2SE Series

Solid-State Air Flow Sensors

FEATURES

- Solid-state design for improved reliability
- SPST or SPDT configuration
- Normally open or normally closed
- Commercial or military grades available
- Low power dissipation (approximately 3 watts)
- Excellent shock and vibration resistance

INTRODUCTION

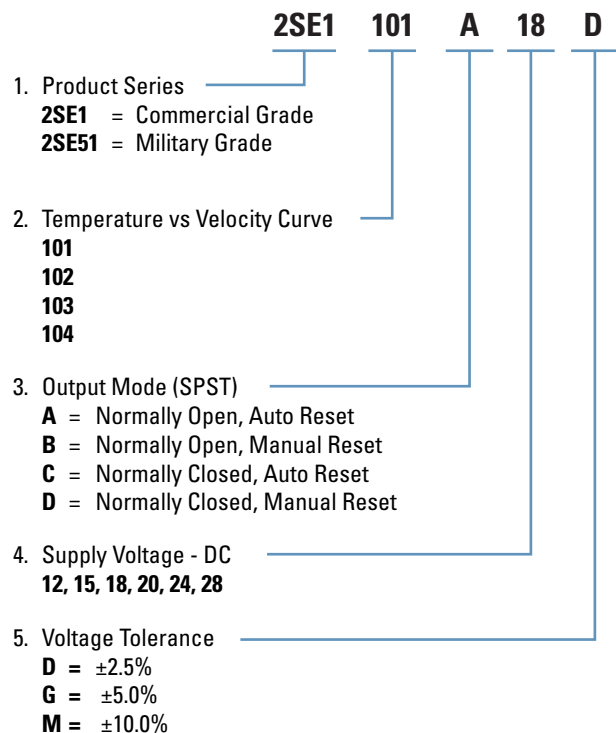
Sensata is a world leader in the design and manufacture of air flow sensors. We build devices that are high-quality, dependable, and reasonably priced. We can customize Klixon® air flow sensors to meet your engineering needs. Our solid-state vane switch is ideal for recognizing loss or reduction of airflow in electronic equipment. Typically used in power supplies, data processing equipment, and large electronic cabinets.

Unlike its electromechanical vane switch predecessor, our solid-state switch continues to provide reliable switching even in the dirtiest of environments. Klixon® air flow sensors are designed to recognize loss or reduction of airflow in:

- Power supplies
- Data processing units
- Commercial electronic equipment
- Military electronic equipment

SPECIFICATIONS	
Supply Voltage	30 VDC max
Switching Capacity	up to 400 milliamps
Operating Temperature	+10°C to +50°C
Ambient Temperature Range	up to 150°C
Life Cycles	100,000
Average Weight	20 grams

STANDARD PART NUMBER BUILDER





KLIXON® | ACMP Series

Single & Three-Phase Aircraft Motor Protectors

FEATURES

- Single and three-phase protection
- Locked rotor protection
- Neutral trap
- Thermal protection
- Meets thermal protection requirements of MIL-M-7969, direct acting type, Method III

INTRODUCTION

Sensata motor protection for aircraft prevents hazards beyond the control of the manufacturer — hazards such as sustained overload and excessive temperatures. Since the protecting devices are sensitive to both temperature and current they inherently protect against a variety of abnormal conditions while allowing maximum motor output before shutdown. Motor life is extended by limiting the damaging temperatures to a designed level.

The Klixon® ACMP is basically a bimetallic thermostat with a built-in heating element which is installed in series with the motor winding. The actuating element is a Klixon® snap-acting thermal disc. The built-in heaters simulate winding temperatures caused by increases in current. This protector provides crisp, positive switching when the specified trip current is sustained for a specific duration at room temperature. The device will also actuate when an excessive ambient temperature condition occurs, providing protection against overheat conditions other than overload. Separately, the disc protects against excessive ambient temperature and the heaters protect against excessive current increases (as experienced during locked motor conditions). Together, the heaters and disc protect against any combination of overload and ambient conditions.

Inherent protection means that a protector is built into a motor and becomes an integral part of the system. For this reason, Klixon® protectors should only be applied by the motor manufacturer after detailed application tests to determine the heating characteristics of the motor under a full range of load and ambient conditions to verify the selected rating will meet the specific application requirements. Consult a sales correspondent at left for test samples.

SPECIFICATIONS		
Part Number	28VDC	120VAC
SKA	16 amps	16 amps
MKA	50 amps	50 amps
KA	100 amps	100 amps
SJE	30 amps	30 amps
MJE	60 amps	60 amps
BJE	120 amps	120 amps



KLIXON® | 2EP Series

1 to 35 Amps, UL Listed Commercial Circuit Breakers

FEATURES

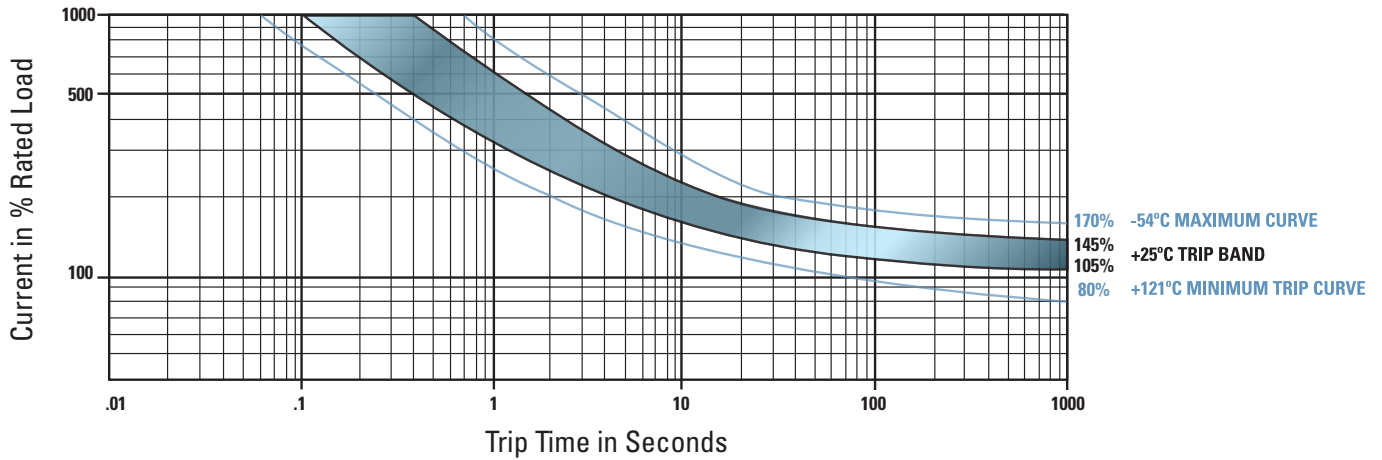
- Explosion-proof device
- UL Listed
- 1 to 35 amps ratings, high interrupt capacity
- Miniature size, lightweight
- Ambient compensated
- Rated to 75VDC and 250VAC, 60Hz

INTRODUCTION

The Klixon® single pole 2EP series of commercial circuit breakers offers a unique combination of miniature size and weight (less than 22 g) with high shock and vibration resistance. This thermal circuit breaker design can minimize nuisance tripping while offering a high short circuit capacity, and low voltage drop levels. The design offers trip-free operation so that it can not be held closed against an overload. The push-pull actuation minimizes accidental tripping while a white band offers visual trip indication. These features combine to make this solution especially well suited for industrial equipment, radars, medical and dental equipment, electronic control systems, telecom equipment, power supplies and test equipment.

SPECIFICATIONS	
Interrupt Current Capacity	1 to 35 amps : 3,500 amps @ 75 VDC 1 to 35 amps : 1,000 amps @ 250 VAC, 60 Hz
Vibration Resistance	10G minimum, 50 - 500 Hz
Mechanical Shock	Exceeds 50G's
Explosion Proof	While interrupting rupture currents
Endurance	250 VAC / 75 VDC 6,000 cycles resistive load 120VAC 400Hz 2,500 cycles inductive and 6,000 resistive load 30VDC 2,500 cycles inductive load and 6,000 resistive load 10,000 cycles mechanical no load
Potting Material	Minimum 100 cycles @ 200% rated current
Potting Material	Exceeds 10G's
Potting Material	22.0 gm max (including mounting hardware)

TRIP CURVE - Approximate Time, Current Characteristics at 77°F (25°C)

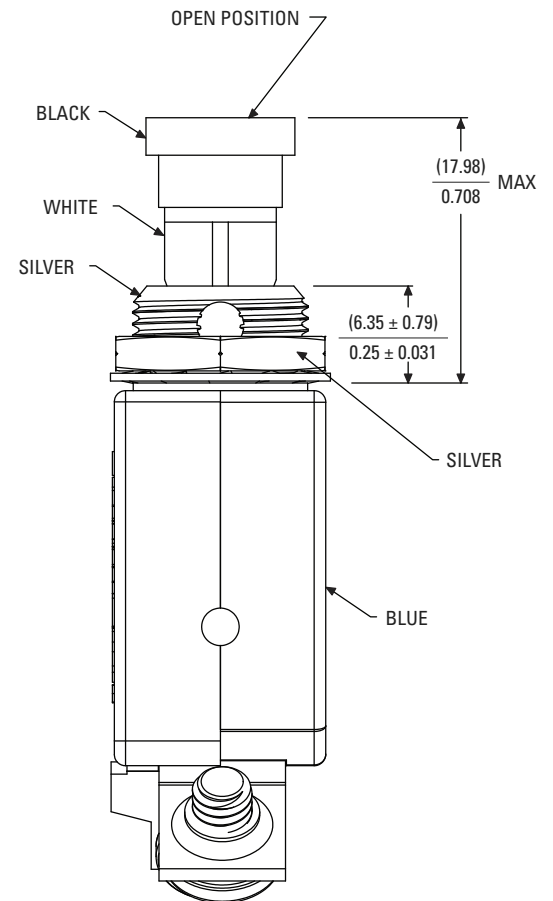
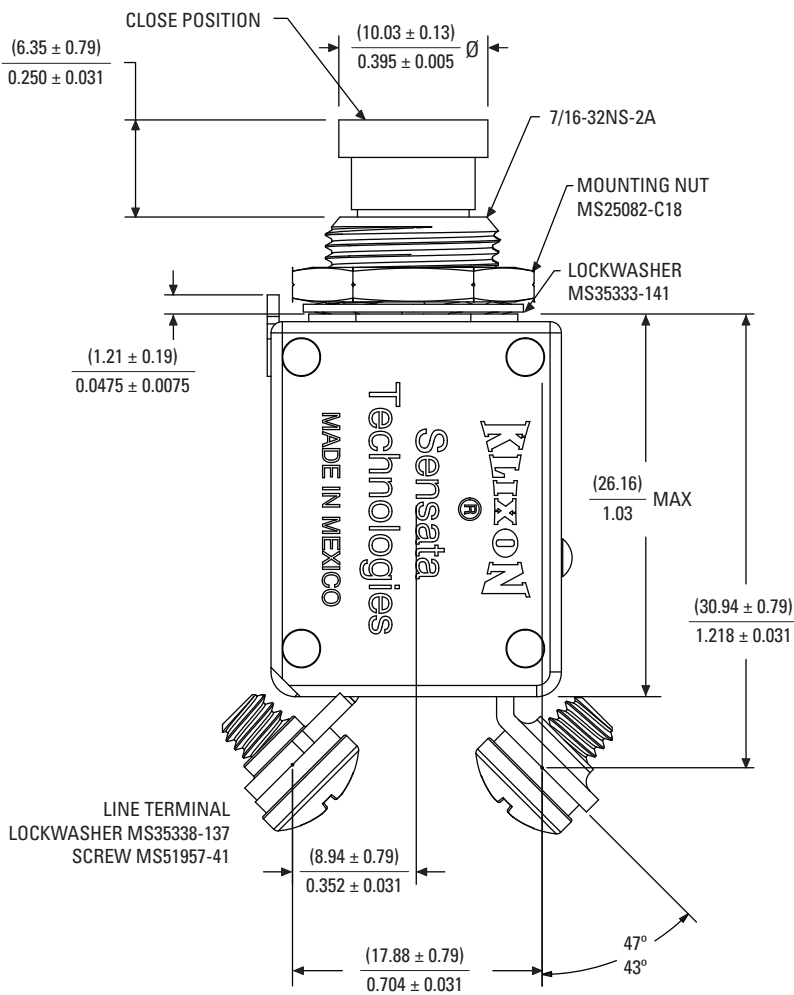
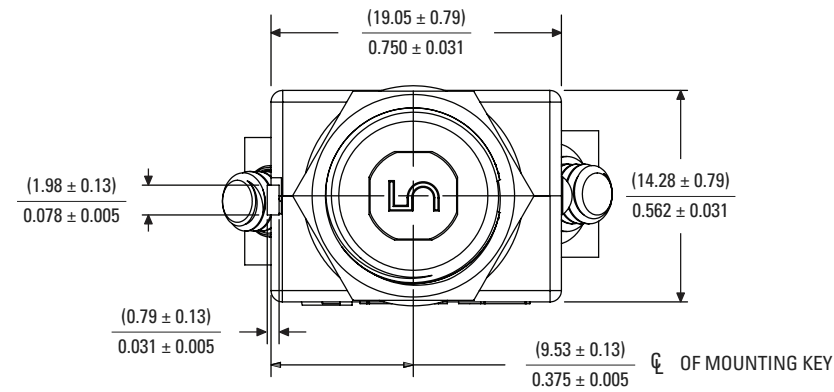


MAX VOLTAGE DROP @ NOMINAL RATED CURRENT	
Amp Rating	Max Drop
1 amps	1.10 volts max
2 amps	0.70 volts max
2.5 amps	0.50 volts max
3 amps	0.40 volts max
4 amps	0.45 volts max
5 amps	0.35 volts max
7.5 amps	0.30 volts max
10 amps	0.28 volts max
15 amps	0.25 volts max
20 amps	0.25 volts max
25 amps	0.20 volts max
30 amps	0.15 volts max
35 amps	0.15 volts max

CALIBRATION					
TEMP °C / °F	MIN ULT TRIP	MAX ULT TRIP	Trip Time in Seconds		
			200%	500%	1000%
+25 / +77	105%	145%	4 to 16	.4 to 1.6	.10 to .40
-54 / -65	105%	170%	7 to 35	.6 to 3.0	.15 to .70
+121 / 250	80%	150%	2 to 13	.25 to 1.0	.06 to .25

RUPTURE		
Amp Rating	Voltage Rating	Rupture Rating
1 to 15 amps	120 VAC, 400 Hz	2,500 amps
1 to 20 amps	28 VDC	6,000 amps
20 amps	120 VAC, 400 Hz	2,000 amps
25 to 35 amps	28 VDC	1,625 amps
25 to 35 amps	120 VAC, 400Hz	1,800 amps

DIMENSIONAL DRAWINGS: 2EP20



STANDARD PART NUMBER BUILDER

2EP X - X

Style

- 20** = 7/16" bushing, 8-32 screw terminals
- 30** = 15/32" bushing, 8-32 screw terminals
- 40** = M12x1 bushing, M4 screw terminals

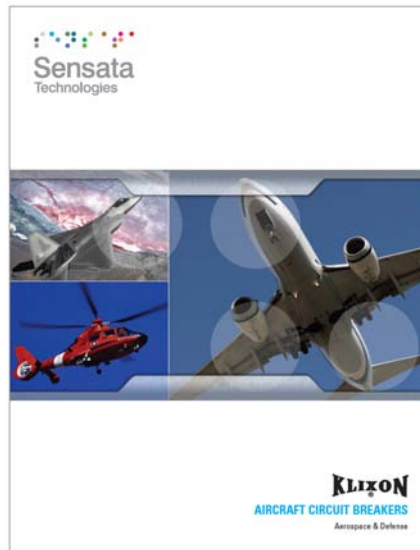
Amp Rating

(1, 2, 2 ½, 3, 4, 5, 7 ½, 10, 15, 20, 25, 30, 35)

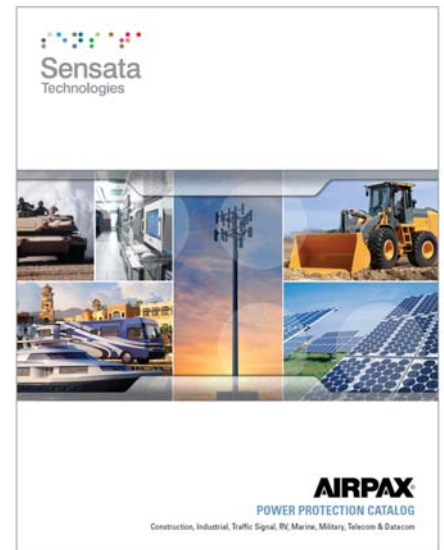
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Klixon™ Aircraft Circuit Breakers
Literature PN 2455009002



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BUSINESS CENTERS

Sensata Technologies Inc.
529 Pleasant Street
Attleboro, MA 02703, USA
Phone: +1 508-236-3287
Brands: Klixon™, Sensata Technologies™

Sensata Technologies
807 Woods Road
Cambridge, MD 21613, USA
Phone: +1 410-228-1500
Brands: Airpax™

Sensata Technologies
4467 White Bear Lake Parkway
St. Paul, MN 55110, USA
Phone: +1 800-553-6418
Brands: Dimensions™

Sensata Technologies Holland B.V.
Kolphofsingel 8
7602 EM Almelo, The Netherlands
Phone: +31 546 87 95 55
Brands: Klixon™, Sensata Technologies™

Sensata Technologies China Co., Ltd.
Novel Plaza, 8th Floor
128 Nanjing Road West
Shanghai, 20003
People's Republic of China
Phone: +86 21 23061500
Brands: Klixon™, Sensata Technologies™

Sensata Technologies Korea Ltd.
29F, Trade Tower
159-1 SamSung-Dong, KangNam-Ku, Seoul
135-729, Korea
Phone: +81-2-551-2918
Brands: Klixon™, Sensata Technologies™

Sensata Technologies Japan Ltd.
305, Tanagashira
Oyama-cho, Sunto-gun, Shizuoka-ken
Japan, 410-1396
Phone: +81 550 78 1211
Brands: Klixon™, Sensata Technologies™



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