

KLIXON

1NT SERIES

Fixed Temperature Thermostats



Key Features

- ISO9000 Certification
- Recognized by 9 worldwide agencies
- 100% factory inspected for continuity, function and contact resistance
- Global sales and technical support
- Ambient temperature rating from -40°C to 240°C (-40°F to 464°F)
- PPS* base provides
 - low cost
 - High temperature capability
 - Clean processing
 - High impact strength
 - Low static generation
- Factory pre-set bi-metal disc ensures:
 - Safe and reliable operation
 - Tamperproof settings
- Life-expanding innovations include:
 - Solid metal-to-metal terminal construction
 - Current free spring
 - One piece transfer mechanism
- Switch actions:
 - Automatic reset: Available with both normally open and normally closed switch logic
 - Manual reset: Mechanically resettable device
 - Trip free manual reset: UL M2 class rating that resists consumer tampering
 - One shot: meets agency requirements for single operation device

Applications

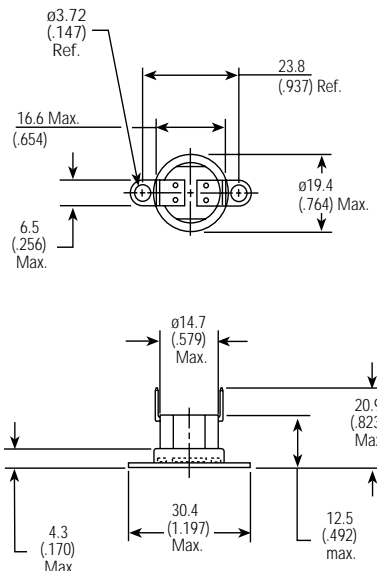
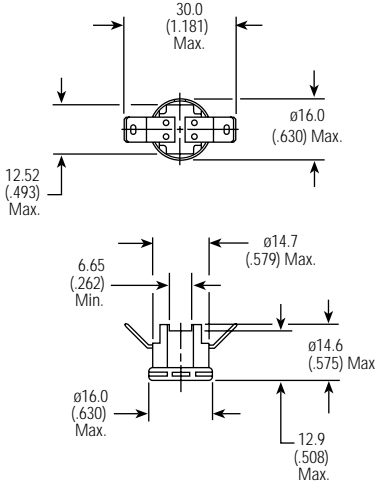
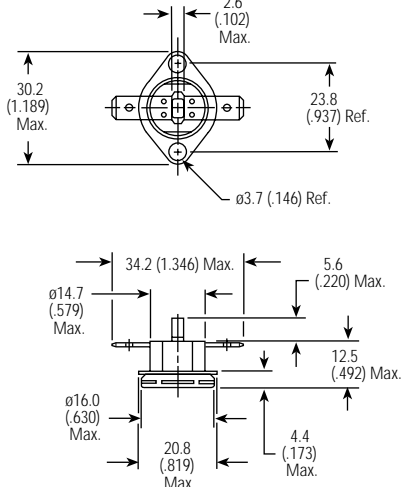
The 1NT thermostat is used in a variety of applications throughout the world. They help ensure the correct and safe function of many appliances and HVAC products that we, as consumers, use every day to make our lives better. Texas Instruments reputation is based on the proven quality and reliability of its products. Our cost-effective solutions protect the consumer as well as the manufacturers of these

products. TI thermostats operate in numerous coffee and tea makers, microwave ovens, sandwich makers, rice cookers, hair setters, fan heaters, vacuum cleaners and gas furnaces - just to name a few. Decades of experience and the commitment to continuous improvement have resulted in the best thermal protection devices available.



*Applications shown:
wafflemaker,
fan heater,
gas furnace*

Available Constructions

<p>High Profile Construction Options shown: 90°- 1/4" Q.C. terminals with Surface mount flange</p>  <p>Part Types by Construction</p> <ul style="list-style-type: none"> 1NT01 Auto Reset / Silver Contacts 1NT11 Auto Reset / Gold Contacts 1NT09 One Shot: -35°C (-31°F) Reset 1NT10 One Shot: 0°C (32°F) Reset 	<p>Low Profile Construction 4 or 5 Post Options shown: 45°- 1/4" Q.C. terminals with 4 post & flat Al cup Note: 5 post design includes a .093" Dia. centerpost (Not shown)</p>  <ul style="list-style-type: none"> 1NT02 Auto Reset / Silver Contacts 1NT20 Auto Reset / Gold Contacts 	<p>Manual Reset Construction Options shown: Flat 1/4" Q.C. terminals with Airstream mount cup</p>  <ul style="list-style-type: none"> 1NT08 Manual Reset / Silver Contacts 1NT12 Manual Reset / Gold Contacts 1NT15 Trip Free MR / Silver Contacts 1NT19 Trip Free MR / Gold Contacts
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All dimensions mm (in.)

Numbering System

Part Number

<p>1NTXX</p> <div style="border: 1px solid black; padding: 5px; width: 80%; margin: 5px auto;"> <p>Part Type</p> <p>Consult Table Above</p> </div>	<p>E</p> <div style="border: 1px solid black; padding: 5px; width: 80%; margin: 5px auto;"> <p>Special Processing</p> <p>A Wire Lead Assy E Exposed Disc</p> </div>	<p>L</p> <div style="border: 1px solid black; padding: 5px; width: 80%; margin: 5px auto;"> <p>Switch Type</p> <p>L Limit* F Fan**</p> </div>	<p>-</p> <div style="border: 1px solid black; padding: 5px; width: 80%; margin: 5px auto;"> <p>ID Number</p> <p>Unique, Customer Specific</p> </div>
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Temperature Code

<p>L</p> <div style="border: 1px solid black; padding: 5px; width: 80%; margin: 5px auto;"> <p>Switch Type</p> <p>L Limit* F Fan**</p> </div>	<p>150</p> <div style="border: 1px solid black; padding: 5px; width: 80%; margin: 5px auto;"> <p>Operating Temp.</p> <p>Nominal Open Temperature</p> </div>	<p>F</p> <div style="border: 1px solid black; padding: 5px; width: 80%; margin: 5px auto;"> <p>Temp. Scale</p> <p>C Celcius F Farenheit</p> </div>	<p>-</p> <div style="border: 1px solid black; padding: 5px; width: 80%; margin: 5px auto;"> <p>Differential</p> <p># Nom. Open to Nom. Close MR Manual Reset</p> </div>
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* Limit switch opens on temperature rise
** fan switch closes on temperature rise

1NT Series Electrical Ratings¹

UL and CSA

Type	Max. Temp.		Cycles (X 1000)	Electrical Rating	
	°C	°F			
NT01,02	204	400	100	120 Vac 240 Vac 277 Vac	15 amps 10 amps 7.2 amps
1NT08, 15, 08E	204	400	1 + 5	240 Vac	25 amps
1NT09, 10 ³	204	400	1-Shot	240 Vac 277 Vac	25 amps 7.2 amps
1NT11,20	204	400	100	125 VA 30 Vdc	1 amp
1NT12, 19	204	400	1 + 5	125 VA	
1NT01E, 02E	204	400	100	120 Vac	10 amps

VDE and BEAB²

Type	Max. Temp. ⁴		Cycles (X 1000)	Electrical Rating	
	°C	°F			
1NT01, 02	175	347	30 ⁵ 100 30 ⁵	250 Vac 250 Vac 380 Vac	16 amps 10 amps 4 amps
1NT08, 15 ⁷	175	347	6 6 ⁶	250 Vac 380 Vac	16 amps ⁸ 4 amps

Notes:

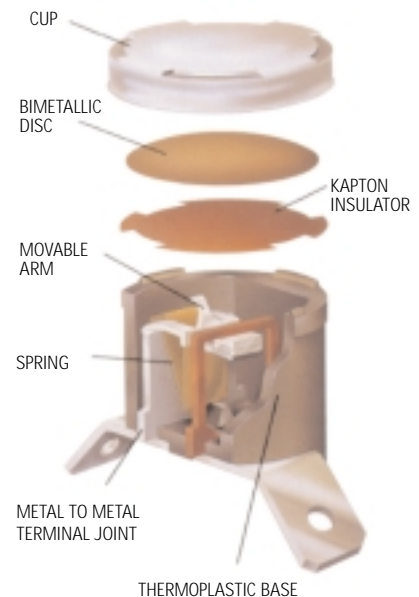
1. All the above ratings are for base material Phillips Ryton R-7 and R-10 7006A.
2. All European ratings are being updated to comply with the EN60730 Standard.
3. Specifications for 1NT09 and 1NT10 apply to UL only.
4. Maximum ambient temperature for VDE and BEAB is 200°C or 392°F.
5. BEAB rating is limited to 10k cycles
6. Specifications apply to VDE only.
7. VDE rating does not apply to 1NT15 Type.
8. BEAB rating is limited to 13 amps.

Standard Temperatures, Tolerances and Differential

Automatic Reset Thermostats

Nominal Top Temperature		Min. Bottom Temperature		Differential		Standard Tolerances			
						Open		Close	
°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
18 to 27	65 to 80	-33	-26	11 to 16 17 to 21 22 to 33	20 to 29 30 to 38 39 to 59	±3.0 ±3.0 ±3.0	±5.5 ±5.5 ±5.5	±4.0 ±4.5 ±5.5	±7.5 ±8.5 ±10.0
28 to 80 and *81 to 93	81 to 176 and *177 to 199	-33 50	-26 122	11 to 13 14 to 16 17 to 33	20 to 23 24 to 29 30 to 59	±3.0 ±3.0 ±3.0	±5.5 ±5.5 ±5.5	±4.0 ±4.5 ±5.0	±7.5 ±8.5 ±9.0
*94 to 121	*200 to 249	50	122	11 to 16 17 to 21 22 to 33 34 to 55	20 to 29 30 to 38 39 to 59 60 to 99	±3.5 ±3.5 ±3.5 ±5.5	±6.5 ±6.5 ±6.5 ±10.0	±4.5 ±5.5 ±6.5 ±11.0	±8.5 ±10.0 ±12.0 ±20.0
122 to 149	250 to 300	50	122	14 to 21 22 to 33 34 to 55	24 to 38 39 to 59 60 to 99	±4.0 ±4.0 ±5.5	±7.5 ±7.5 ±10.0	±5.5 ±8.0 ±11.0	±10.0 ±14.5 ±20.0
150 to 204	301 to 399	50	122	14 to 21 22 to 33 34 to 44 45 to 55	24 to 38 39 to 59 60 to 79 80 to 99	±5.0 ±5.0 ±5.5 ±5.5	±9.0 ±9.0 ±10.0 ±10.0	±7.0 ±9.0 ±11.0 ±11.0	±13.0 ±16.5 ±20.0 ±20.0

* minimum bottom temperature of 50°C (122°F)



Manual Reset and One-Shot Thermostats

Nominal Top Temperature		Open Tolerances	
°C	°F	°C	°F
<60	<140	±4.0	±7.5
61 TO 160	141 to 320	±5.0	±9.0
161 TO 204	321 to 399	±6.0	±11.0

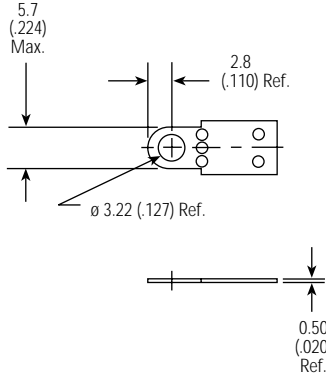
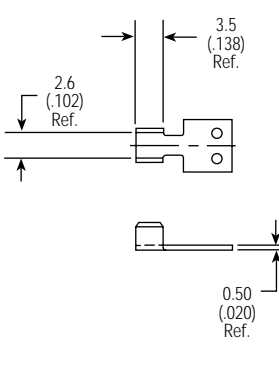
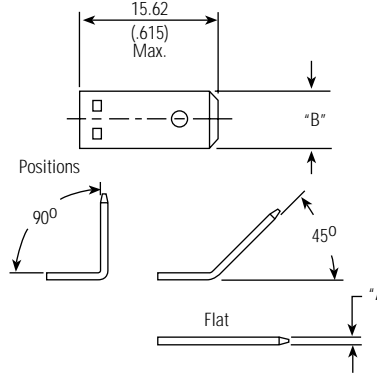
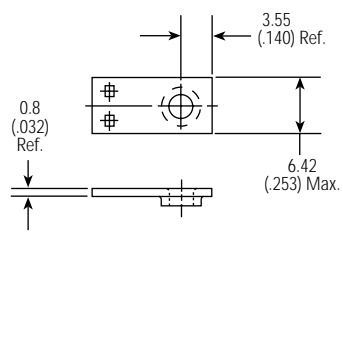
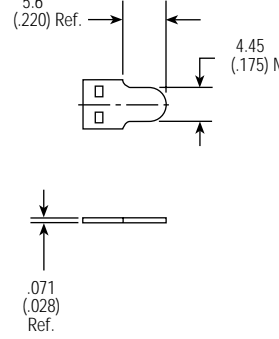
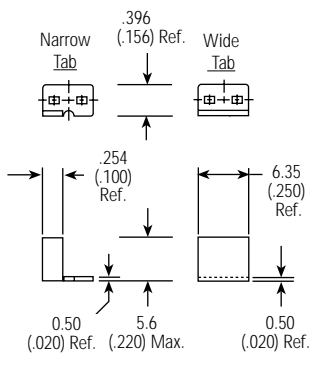
Accessories and Options

Cup Styles

<p>Airstream Mount Integral Cup 57611 Material: Aluminum Available mounting rotation relative to terminals - 0° or 90° Closed Bottom Only</p> <p>Top View Dimensions: - Overall width: 30.2 (1.189) Max. - Distance between mounting holes: 23.8 (937) Ref. - Mounting hole diameter: $\phi 3.7$ (.146) Ref. - Mounting hole offset from centerline: 20.8 (.819) Max. - Overall height: 4.5 (.177) Max. - Flange thickness: 0.34 (.013) Ref.</p> <p>Side View Dimensions: - Flange thickness: 0.34 (.013) Ref. - Mounting hole offset: 16.0 (.630) Max. - Overall height: 4.5 (.177) Max.</p>	<p>Flat Cup 73926 Materials: Aluminum, Stainless Steel, or Copper. Closed Bottom only</p> <p>Top View Dimensions: - Overall width: 16.26 (.640) Max. - Mounting hole offset: 3.94 (.155) Max. - Mounting hole diameter: $\phi 0.30$ (.012) Ref.</p> <p>Side View Dimensions: - Flange thickness: 0.30 (.012) Ref. - Mounting hole offset: 16.0 (.630) Max. - Overall height: 3.94 (.155) Max.</p>	<p>3NT Flange Cup 57366 Material: Aluminum or Copper Closed Bottom Only</p> <p>Top View Dimensions: - Mounting hole offset: 19.7 (.776) Max. - Mounting hole diameter: $\phi 5.5$ (.217) Max.</p> <p>Side View Dimensions: - Flange thickness: 0.5 (.020) Ref. - Mounting hole offset: 16.5 (.650) Max. - Overall height: 5.5 (.217) Max.</p>	<p>Airstream Mount Integral Cup 27185 Material: Stainless Steel Available mounting rotation relative to terminals - 0° or 90° with Open Bottom 0°, 45° or 90° with Closed Bottom</p> <p>Top View Dimensions: - Overall width: 30.2 (1.189) Max. - Distance between mounting holes: 23.8 (937) Ref. - Mounting hole diameter: $\phi 20.8$ (.819) Max. - Mounting hole offset: 20.8 (.819) Max. - Overall height: 4.4 (.173) Max. - Flange thickness: 0.25 (.010) Ref.</p> <p>Side View Dimensions: - Flange thickness: 0.25 (.010) Ref. - Mounting hole offset: 16.0 (.630) Max. - Overall height: 4.4 (.173) Max.</p> <p>Note: Available Diameter Mounting Holes with open bottom: 3.7 (.146) with closed bottom: 3.7 (.146) / 4.2 (.165) or none</p>
<p>Airstream Mount Integral Cup (slotted mounting holes) 57367 Material: Aluminum Available mounting rotation relative to terminals - 0° or 90° Closed Bottom Only</p> <p>Top View Dimensions: - Overall width: 32.15 (1.266) Max. - Distance between mounting holes: 24.5 (965) Ref. - Mounting hole offset: 4.5 (.177) Ref. - Mounting hole diameter: $\phi 3.4$ (.134) Ref. - Overall height: 20.15 (.793) Max.</p> <p>Side View Dimensions: - Flange thickness: 0.5 (.020) Ref. - Mounting hole offset: 16.5 (.650) Max. - Overall height: 5.5 (.217) Max.</p>	<p>Wide-Eared Integral Cup 57608 Material: Stainless Steel Available mounting rotation relative to terminals - 0° or 90° Closed Bottom Only</p> <p>Top View Dimensions: - Overall width: 43.28 (1.704) Max. - Distance between mounting holes: 31.75 (1.250) Ref. - Mounting hole diameter: $\phi 4.75$ (.187) Ref. - Mounting hole offset: 22.50 (.886) Max.</p> <p>Side View Dimensions: - Flange thickness: 0.25 (.010) Ref. - Mounting hole offset: 16.0 (.630) Max. - Overall height: 4.6 (.181) Max.</p>	<p>"Tear-Drop" Integral Cup 57609 Material: Stainless Steel Available mounting rotation relative to terminals - 0° or 90° Closed Bottom Only</p> <p>Top View Dimensions: - Overall width: 21.72 (.855) Max. - Distance between mounting holes: 15.87 (.625) Ref. - Mounting hole diameter: $\phi 4.75$ (.187) Ref. - Mounting hole offset: 22.50 (.886) Max.</p> <p>Side View Dimensions: - Flange thickness: 0.25 (.010) Ref. - Mounting hole offset: 16.0 (.630) Max. - Overall height: 4.6 (.181) Max.</p> <p>Note: 90° mounting option is also available with 57612 teardrop shaped stiffening flange upon customer request.</p>	<p>Large Oval Integral Cup 59122 Material: Aluminum Available mounting rotation relative to terminals - 0° or 90° with Open Bottom 0°, 45° or 90° with Closed Bottom</p> <p>Top View Dimensions: - Overall width: 51.1 (2.010) Max. - Distance between mounting holes: 39.67 (1.562) Ref. - Mounting hole diameter: $\phi 38.3$ (1.508) Max. - Mounting hole offset: 1.57 (.062) Ref.</p> <p>Side View Dimensions: - Flange thickness: 0.33 (.013) Ref. - Mounting hole offset: 16.0 (.630) Max. - Overall height: 5.3 (.209) Max.</p>
<p>Flanges</p> <p>Fixed Rotation Surface Mount Flange 57336 Available mounting rotation relative to terminals - 90° with Aluminum -- 0°, 90° / or 57°, 127°, 135° CCW with Nickel Plated Steel</p> <p>Top View Dimensions: - Overall width: 23.8 (937) Ref. - Mounting hole diameter: $\phi 3.72$ (.147) Ref. - Mounting hole offset: 19.4 (.764) Max. - Overall height: 6.5 (.256) Max.</p> <p>Side View Dimensions: - Flange thickness: 0.38 (.015) Ref. - Mounting hole offset: 18.4 (.724) Max. - Overall height: 3.51 (.139) Max.</p>	<p>Loose Ear Surface Mount Flange 27183 Material: Aluminum</p> <p>Top View Dimensions: - Overall width: 23.8 (937) Ref. - Mounting hole diameter: $\phi 14.9$ Hole (.587) Ref. - Mounting hole offset: 19.4 (.764) Max. - Overall height: 6.5 (.256) Max.</p> <p>Side View Dimensions: - Flange thickness: 0.38 (.015) Ref. - Mounting hole offset: 18.4 (.724) Max. - Overall height: 3.81 (.150) Max.</p>	<p>Wide Eared - Fixed Rotation Mounting Flange 57337 Material: Nickel Plated Steel Available mounting rotation relative to terminals - 45° CCW</p> <p>Top View Dimensions: - Overall width: 43.28 (1.704) Max. - Distance between mounting holes: 31.75 (1.250) Ref. - Mounting hole diameter: $\phi 22.5$ (.886) Max. - Mounting hole offset: 2.95 (.116) Ref.</p> <p>Side View Dimensions: - Flange thickness: 0.38 (.015) Ref. - Mounting hole offset: 18.4 (.724) Max. - Overall height: 3.81 (.150) Max.</p>	<p>Bolt On Assembly 73972 Thread Specs: Metric: M4 x 0.7 - 6G M5 x 0.8 - 6G Stud Length: Metric: 6.15, 7.00, 8.00, 9.00 (with M4) 8.00 (with M5) Material: Stud: Zinc Plated Steel Cap: Aluminum</p> <p>Top View Dimensions: - Overall width: 13.74 (.541) Max. - Mounting hole offset: 15.90 (.626) Max.</p> <p>Side View Dimensions: - Stud length: Lgth. Varies</p>

All dimensions mm (in.)

Accessories and Options (cont.)

<p>Terminals</p> <p>Solder Terminal 27182* Material: Tin Plated Brass</p> 	<p>Crimp Terminal 27184* Material: Tin Plated Brass</p> 	<p>Quick Connects</p> <table border="1"> <thead> <tr> <th></th> <th>27132</th> <th>27162*</th> <th>27163</th> </tr> </thead> <tbody> <tr> <td>Thickness (A):</td> <td>0.8(.031)</td> <td>0.5(.020)</td> <td>0.8(.031)</td> </tr> <tr> <td>Width (B):</td> <td>6.3(.250)</td> <td>4.8(.187)</td> <td>4.8(.187)</td> </tr> </tbody> </table> <p>Materials: Brass - Solid, Ni, Ag, or Tin Plated Steel - Nickel Plated</p> 		27132	27162*	27163	Thickness (A):	0.8(.031)	0.5(.020)	0.8(.031)	Width (B):	6.3(.250)	4.8(.187)	4.8(.187)
	27132	27162*	27163											
Thickness (A):	0.8(.031)	0.5(.020)	0.8(.031)											
Width (B):	6.3(.250)	4.8(.187)	4.8(.187)											
<p>Screw Terminal 57200 Material: Nickel Plated Steel M3 x 0.5 Class 6H Thread</p> 	<p>Weld terminal 57201 Material: Nickel Plated Steel</p> 	<p>Weld terminal 57312* Material: Nickel Plated Steel</p> 												

*10A Max. on all terminals 0.51 (.020) thick
All dimensions mm (in.)

1NT Series Agency Listings

Agency: Type / Country:	UL USA	CSA CANADA	VDE Germany	BEAB Great Britain	MITI Japan	SEMKO Sweden	DEMKO Denmark	ETSA Australia	KEMA The Netherlands
1NT01, 02	•	•	•	•	•	•	•		
1NT08	•	•	•	•	•	•			
1NT09, 10	•	•							
1NT11, 12, 19, 20	•	•							
1NT15	•	•		•	•	•			
1NT01E, 02E	•	•	•						
Series								•	•
Reference Numbers	File: E9977 Category: XAPX2	Report: LR53590 Class: 4823-02	File: 4464.9-4510-1105 No. 64679	No. Cat. 0166	J72 (01, 02) J37 (MR 125V) J71 (MR 250V)	43-7118 (01) 9129277 (02) 8140149 (08) 9015121 (15)	69550	NR. 744	LTI 2.9977.2324

** Consult Texas Instruments for additional details regarding specifications and agency listings.

Sample Order Placement

To enable Texas Instruments to serve you in a quicker, more efficient manner, please be prepared to provide the following information when requesting samples:

- Detailed application description
- Estimated yearly usage.
- Opening and closing temperatures
- Max. temperature tolerances allowable
- Switch type
- Mounting style desired
- Terminal orientation and material
- Electrical load

Other conditions which are likely to affect the 1NT operation should also be described. These include:

- Maximum temperature exposure
- Location with respect to heat source
- Temperature transfer medium (air, metal surface, etc)
- Possible contamination sources (lint, chemical fumes, etc.)

When ordering thermocouple samples, specify whether J, K, or T type and the lead length desired. Standard wire size is 30 Ga.

Thermostat Handling Tips

- Exposed disc devices should be kept free of dust and particles. The face of the disc should never be snapped.
- Mounting screws and drivers for use with smaller integral cups and flanges should be sized to provide adequate clearance to the thermostat body.
- The installation force applied to the cup face should not exceed 66.7N (15 lbs.)
- The maximum reset force on the manual reset and trip free button is 22.2N (5 lbs.).

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