

# MICROTEMP® Thermal Cutoffs: TYPES & SPECIFICATIONS



MICROTEMP® thermal cutoffs are available in a range of temperatures and electrical ratings to meet application requirements (see Microtemp® Operating Temperature Summary and Electrical Rating Summary on page 4). There are 5 primary types of thermal cutoffs available. Standard dimensions of each TCO series are shown on page 4.

**G Series:** This “Global” series or G designation represents the world standard in thermal cutoffs. MICROTEMP® TCOs were the first chemical-pellet spring-type TCO ever developed and continue to be the thermal cutoff of choice for over 35 years.

**E Series:** This new “Environmentally” friendly series holds Agency recognition equivalent to the G series and has been designed to comply with the Restriction of Hazardous Substances in Electrical and Electronic Equipment (ROHS) Directive (2002/95/EC). None of the substances specified in this Directive have been intentionally incorporated into the E-series products.

## G4 Series

Rated for continuous operating currents up to 10 amps @ 250VAC (15 amps @ 120VAC, 5 amps @ 24VDC), the G4 series MICROTEMP® TCO is the industry standard for over-temperature protection. The G4 series is applied to millions of appliances and personal care products each year, providing reliable back-up protection for temperature controlling thermostats and other over-temperature conditions. The G4 series is also widely applied in office machines, portable heaters and industrial equipment as a thermal safeguard.

## G5 Series

Designed for higher voltage and current applications than the G4, the G5 series MICROTEMP® TCO is rated for operating currents up to 20 amps @ 250VAC and 277 VAC (25 amps @ 120VAC). Similar in appearance to the G4 series, the G5 series has a different internal construction designed for interrupting higher currents and withstanding higher temperatures.

## G6 Series

The G6 series MICROTEMP® TCO can be utilized in applications where a higher maximum-overshoot temperature rating is not required, yet it is rated for operating currents up to 16 amps @ 250VAC. It is the same physical size as the G4, G5 and G8 series TCOs.

## G7 Series

The G7 series MICROTEMP® TCO is designed to satisfy applications requiring miniaturized components that do not need maximum current interrupt capability. The G7 is just 2/3 the size of the G4 and G5, and with a current interrupting capability of 5 amps @ 250VAC (5 amps @ 24VDC), it is capable of meeting the requirements of transformers, motors, battery packs and electronic circuit applications.

## G8 Series

Designed for very high-current applications such as major appliances and high-wattage electric heat packages, the G8 series MICROTEMP® TCO is rated for operating currents up to 25 amps @ 250VAC (20 amps @ 277VAC). More economical than electromechanical bimetal-type one shot devices, it can be utilized in applications where its small size is an advantage in terms of mounting (it’s the same physical size as the G4, G5 and G6 series TCOs) and thermal response.

# MICROTEMP® TCO Operating Temperature Summary

| Open Temp<br>Tf°C | Holding Temperature °C |               | Maximum Overshoot Temperature °C |           |           |           |           |           |           |           |
|-------------------|------------------------|---------------|----------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                   | Th°C                   | Th°C          | Tm°C                             | Tm°C      | Tm°C      | Tm°C      | Tm°C      | Tm°C      | Tm°C      | Tm°C      |
|                   | G4, G5, Z6, G7 Series  | G6, G8 Series | G4 Series                        | G5 Series | G6 Series | Z6 Series | G7 Series | G8 Series | R9 Series | R7 Series |
| 072               | 57                     | 47            | 100                              | 175       | 100       | -         | -         | 175       | 100       | -         |
| 073               | 58                     | 48            | 100                              | 175       | 100       | -         | -         | 175       | 130       | 130       |
| 077               | 62                     | 52            | 125                              | 200       | 125       | -         | 125       | 200       | 125       | 125       |
| 084               | 69                     | 59            | 125                              | 200       | 125       | -         | 125       | 200       | 125       | 125       |
| 093               | 78                     | 68            | 140                              | 215       | -         | -         | 140       | 215       | 140       | 140       |
| 098               | 83                     | 73            | 140                              | 215       | 140       | 280       | 140       | 215       | 140       | 140       |
| 104               | 89                     | 79            | 150                              | 225       | 150       | 260       | -         | 225       | 150       | -         |
| 110               | 95                     | 85            | 150                              | 225       | -         | -         | 140       | 225       | 150       | 140       |
| 117               | 102                    | 92            | 160                              | 235       | 160       | 275       | 150       | 235       | 160       | 150       |
| 121               | 106                    | 96            | 160                              | 235       | 160       | 380       | 150       | 235       | 160       | 150       |
| 128               | 113                    | 103           | 205                              | 235       | 205       | -         | 150       | 235       | 160       | 150       |
| 134               | 119                    | 109           | 205                              | 250       | -         | -         | 175       | -         | 205       | 175       |
| 141               | 126                    | 116           | 205                              | 250       | -         | -         | 175       | -         | 205       | 175       |
| 144               | 129                    | 119           | 205                              | 250       | 205       | 380       | 175       | 250       | 175       | 175       |
| 152               | 137                    | 127           | 205                              | 250       | 205       | 250       | 175       | -         | 175       | 175       |
| 158               | 143                    | 133           | 240                              | 285       | -         | -         | 200       | -         | 240       | 200       |
| 167               | 152                    | 142           | 210                              | 285       | -         | 380       | 200       | 285       | 210       | 200       |
| 172               | 157                    | 147           | 240                              | 350       | -         | -         | 200       | -         | 240       | 200       |
| 184               | 169                    | 159           | 210                              | 350       | 210       | 380       | 200       | 350       | 210       | 200       |
| 190               | 175                    | 165           | 310                              | 350       | -         | -         | 270       | -         | 310       | 270       |
| 192               | 177                    | 167           | 210                              | 350       | 210       | -         | 210       | 350       | 210       | 210       |
| 205               | 190                    | 180           | 310                              | 375       | -         | -         | -         | -         | 310       | -         |
| 216               | 200                    | 191           | 375                              | 375       | -         | -         | -         | -         | 375       | -         |
| 229               | 200                    | 200           | 375                              | 375       | 375       | 380       | -         | 375       | 375       | -         |
| 240               | 200                    | 200           | 450                              | 375       | 450       | 380       | -         | 375       | 375       | -         |
| 257               | 200                    | -             | 470                              | -         | -         | -         | -         | -         | -         | -         |

T<sub>m</sub> – Maximum overshoot temperature: temperature up to which TCO will not change status

T<sub>f</sub> – Functioning open temperature tolerance: +0, -5°C

T<sub>h</sub> – Maximum temperature of the MICROTEMP® TCO measured at the case end of the thermal cutoff at which the thermal cutoff can be maintained for a period for 168 hours without opening.

NOTE: it is advised that TCOs are not exposed to continuous operating temperatures in excess of T<sub>f</sub> -25°C.

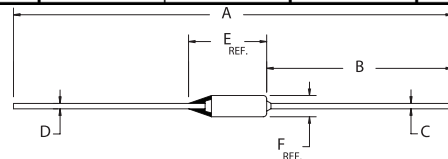
C.T.I. – Comparative tracking index (all primary thermal cutoffs): 250VAC

NOTE: G4, G5, G6, G7 and G8 series TCOs with T<sub>f</sub> ≥ 175°C comply with UL conductive heat aging (CHAT) requirements.

## Electrical Rating Summary

| Agency | Electrical Current & Voltage Rating |                         |  |            |            |                       |                            |            |            |
|--------|-------------------------------------|-------------------------|--|------------|------------|-----------------------|----------------------------|------------|------------|
|        | G4 Series                           |                         | G5 Series  | G6 Series  | Z6 Series  | G7 Series             |                            | G8 Series  | R9 Series  |
|        | Resistive                           | Inductive               | Resistive  | Resistive  | Resistive  | Resistive             | Inductive                  | Resistive  | Resistive  |
| UL/CSA | 10A/250VAC<br>15A/120AC<br>5A/24VDC | 8A/250VAC<br>14A/120VAC | 20A/250VAC<br>25A/120VAC<br>21A/240VAC<br>20A/277VAC | 16A/250VAC | 16A/250VAC | 5A/250VAC<br>5A/24VDC | 4.5A/250VAC<br>4.5A/120VAC | 25A/250VAC |            |
| VDE    | 10A/250VAC<br>15A/120AC<br>5A/24VDC | 8A/250VAC<br>14A/120VAC | 20A/250VAC   | 16A/250VAC | 16A/250VAC | 5A/250VAC<br>5A/24VDC | 4.5A/250VAC<br>4.5A/120VAC | 25A/250VAC |            |
| METI   | 10A/250VAC                          |                         | 15A/250VAC   |            |            | 5A/250VAC<br>5A/24VDC |                            |            | 15A/250VAC |
| CCC    | 10A/250VAC                          |                         | 16A/250VAC   | 16A/250VAC | 16A/250VAC | 5A/250VAC             |                            |            |            |

## MICROTEMP® TCO Standard Dimensions



|                                   | Dimensions - Inches (Millimeters) |                               | G4, G5, G6, Z6 & G8 Series | G7 Series     |
|-----------------------------------|-----------------------------------|-------------------------------|----------------------------|---------------|
|                                   | <b>Standard Leads</b>             | A Overall Length ± .12 (±3.0) |                            | 2.51 (63.8)   |
|                                   | B Case Lead Length ± .06 (±1.5)   |                               | 1.38 (34.9)                | N/A           |
| <b>Long Leads</b>                 | A Overall Length ± .12 (±3.0)     |                               | 3.26 (82.9)                | 3.26 (82.9)   |
|                                   | B Case Lead Length ± .06 (±1.5)   |                               | 1.38 (34.9)                | 1.38 (34.9)   |
| <b>Lead Material and Diameter</b> | C Case Lead Tin Plated Copper     |                               | 0.040 (1.0)                | (0.023 (.57)) |
|                                   | D Epoxy Lead Silver Plated Copper |                               | 0.040 (1.0)                | (0.023 (.57)) |
| <b>Case Dimensions</b>            | E Case Length (Reference)         |                               | 0.58 (14.7)                | 0.38 (9.6)    |
|                                   | F Case Diameter (Reference)       |                               | 0.158 (4.0)                | 0.118 (3.0)   |