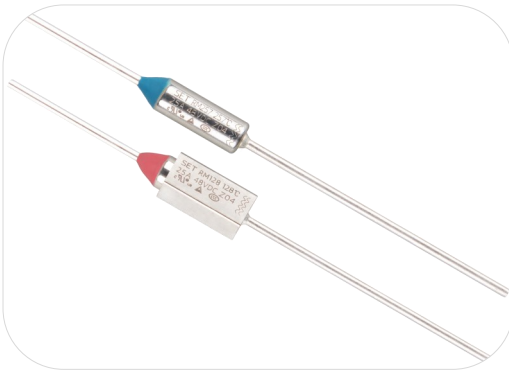


Thermal-Link (OTCO)-Organic Type

RM Series I_r : 25A



Description

Organic Thermal-Link (OTCO) RM series is defined as a non-resettable protective device, functioning one time only. It mainly consists of metal case, spring, conductive nail, sliding contact and thermal pellet. When the Thermal-Link senses abnormal heat and temp. reaches the predetermined fusing temp., thermal pellet melts and the conductive nail separates from the isolated lead with the assistance of the trip spring, thereby the circuit is disconnected.

SETsafe | SETfuse Organic Thermal-Link (OTCO) RM series Rated Functioning Temp. from 72 °C to 310 °C, Rated Current: 25 A, Rated Voltage: 48VDC, , safety certification Includes UL, cUL, TUV, complies with RoHS and REACH.

Features

- High Accuracy of Functioning Temp.
- Non-Resettable
- Organic Thermal Pellet
- Metal Case
- Low Resistance
- RoHS & REACH Compliant

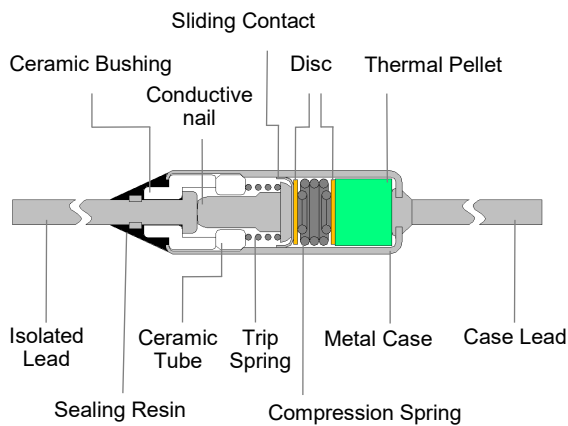
Applications

- Personal Care Appliance
- Kitchen and Toilet Appliance
- Environment Appliances
- Automotive Electronics
- Cleaning Appliances
- Electric Tool

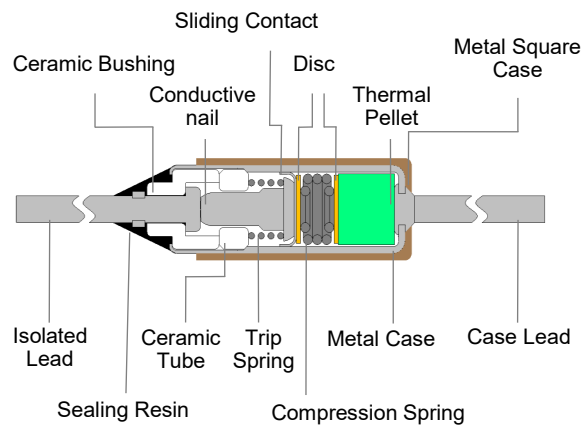
Customization

- Other Temp.
- The Length of Lead Wires
- Taping Packing Available
- Leads Forming Types

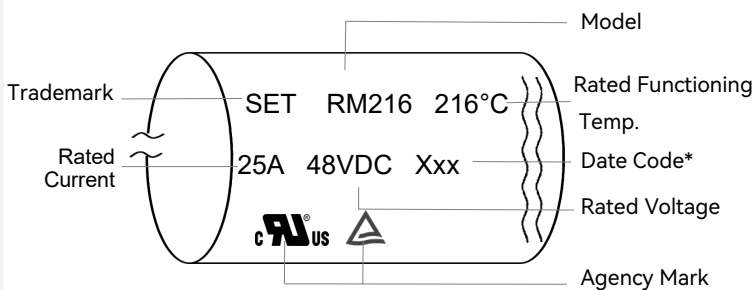
Cylindrical Structure Diagrams



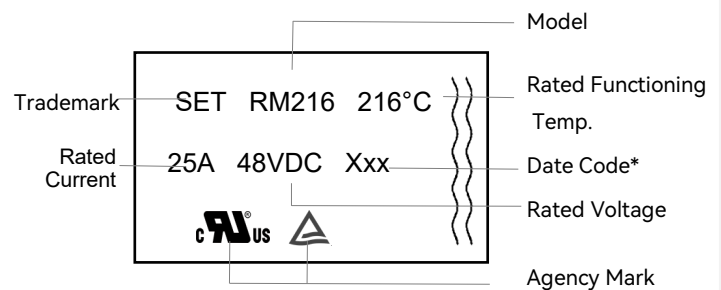
Square Structure Diagrams



Cylindrical Structure Marking



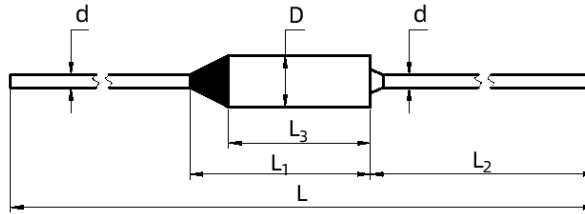
Square Structure Marking



Remark:

1: The Date Code means Year and quarter: A stands for 2000, B stands for 2001 and 01 stands for the first quarter, 02 stands for the second quarter, and so on.

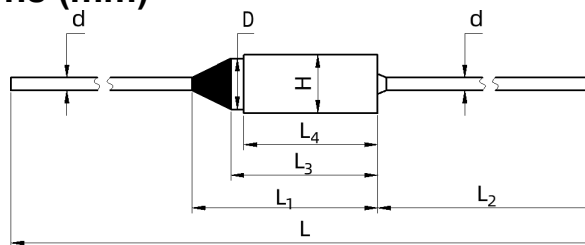
Cylindrical Structure Dimensions (mm)



| Lead Length | L | L ₁ | L ₂ | L ₃ | D | d |
|-------------|---------------|----------------|----------------|----------------|-----------|-------------|
| Standard | 65 ± 3 | (14) | 35 ± 2 | (11.5) | Φ 4 ± 0.2 | Φ 1.2 ± 0.1 |
| Long | 81 ± 3 | (14) | 35 ± 2 | (11.5) | Φ 4 ± 0.2 | Φ 1.2 ± 0.1 |
| Option | Customization | (14) | Customization | (11.5) | Φ 4 ± 0.2 | Φ 1.2 ± 0.1 |

Remark: The dimensions in parentheses are for reference only.





Square Structure Dimensions (mm)



| Lead Length | L | L ₁ | L ₂ | L ₃ | L ₄ | D | H | d |
|-------------|---------------|----------------|----------------|----------------|----------------|-----------|-----------|-------------|
| Standard | 65 ± 3 | (14) | 35 ± 2 | (11.5) | 10.3 ± 0.5 | Φ 4 ± 0.2 | 4.6 ± 0.3 | Φ 1.2 ± 0.1 |
| Long | 81 ± 3 | (14) | 35 ± 2 | (11.5) | 10.3 ± 0.5 | Φ 4 ± 0.2 | 4.6 ± 0.3 | Φ 1.2 ± 0.1 |
| Option | Customization | (14) | Customization | (11.5) | 10.3 ± 0.5 | Φ 4 ± 0.2 | 4.6 ± 0.3 | Φ 1.2 ± 0.1 |

Remark: The dimensions in parentheses are for reference only.

Agency Information

| Agency Symbol | Standards | The File No. and certification No. obtained by SETsafe SETfuse |
|---|----------------|--|
|  | UL60691 | E214712 |
|  | CAN-CSA-E60691 | E214712 |
|  | EN 60691 | R507153440001 |
|  | GB 9816.1 | Certification in progress |

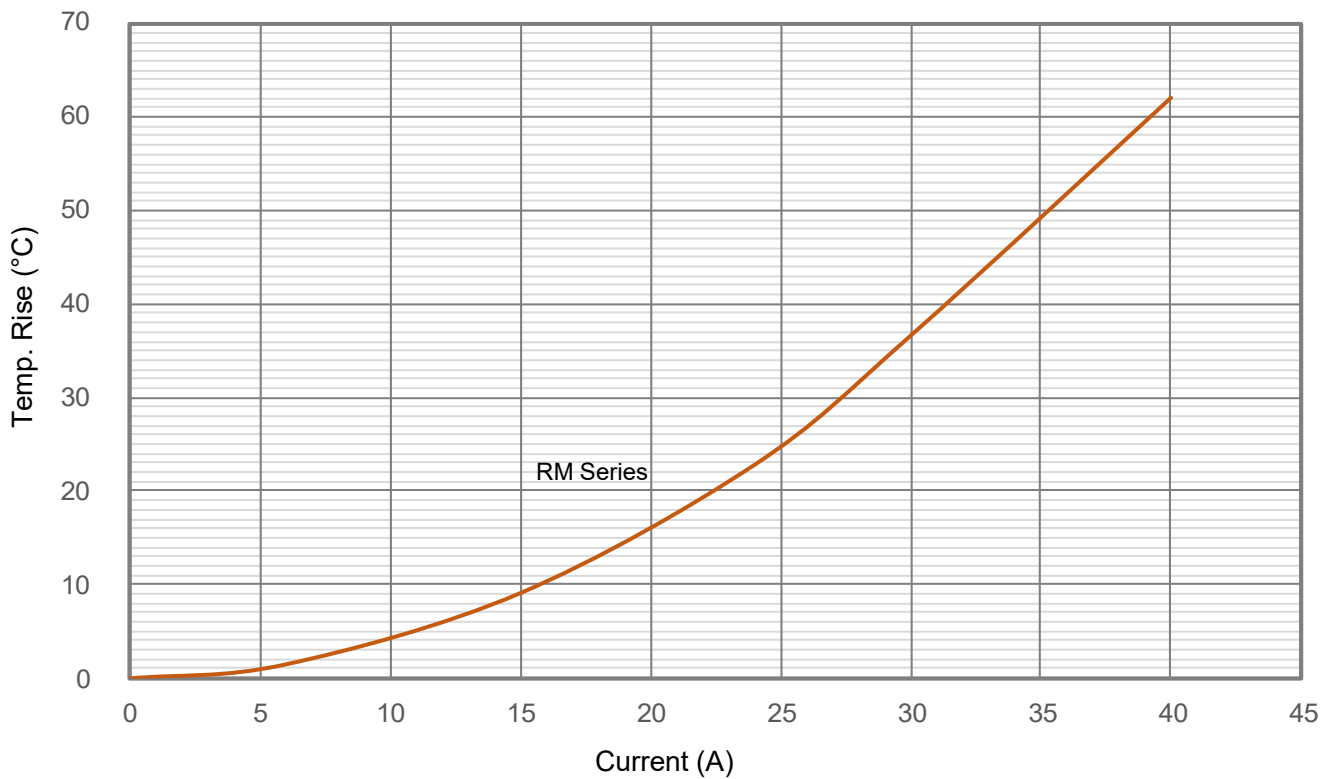
Specifications

| | Model | Fusing Temp. | T_h | $T_{UL/cUL}$ | T_m | I_r | U_r | UL® | cUL® | TUV | CCC | RoHS REACH |
|-----|-------|--------------|-------|--------------|-------|-------|-------|-----|------|-----|-----|-------------------|
| | | (°C) | (°C) | (°C) | (°C) | (A) | (VDC) | UL | cUL | TUV | CCC | |
| 310 | RM310 | 304 ± 3 | 215 | 280 | 500 | 25 | 48 | ○ | ○ | ○ | ○ | ● |
| 275 | RM275 | 271 ± 4 | 215 | 260 | 500 | 25 | 48 | ● | ● | ● | ○ | ● |
| 263 | RM263 | 261 ± 2 | 185 | 225 | 500 | 25 | 48 | ○ | ○ | ○ | ○ | RoHS ● REACH * |
| 257 | RM257 | 254 ± 2 | 197 | 237 | 500 | 25 | 48 | ● | ● | ● | ○ | ● |
| 240 | RM240 | 238 ± 2 | 180 | 220 | 500 | 25 | 48 | ● | ● | ● | ○ | ● |
| 229 | RM229 | 227 ± 2 | 176 | 210 | 500 | 25 | 48 | ○ | ○ | ○ | ○ | ● |
| 216 | RM216 | 213 ± 2 | 163 | 203 | 500 | 25 | 48 | ● | ● | ● | ○ | ● |
| 205 | RM205 | 203 ± 2 | 152 | 192 | 500 | 25 | 48 | ○ | ○ | ○ | ○ | ● |
| 192 | RM192 | 190 ± 2 | 139 | 179 | 500 | 25 | 48 | ● | ● | ● | ○ | ● |
| 184 | RM184 | 181 ± 2 | 131 | 171 | 500 | 25 | 48 | ● | ● | ● | ○ | ● |
| 172 | RM172 | 168 ± 2 | 119 | 159 | 500 | 25 | 48 | ○ | ○ | ○ | ○ | ● |
| 167 | RM167 | 164 ± 2 | 114 | 154 | 500 | 25 | 48 | ● | ● | ● | ○ | ● |
| 157 | RM157 | 155 ± 2 | 104 | 144 | 500 | 25 | 48 | ● | ● | ● | ○ | ● |
| 152 | RM152 | 149 ± 2 | 99 | 139 | 500 | 25 | 48 | ● | ● | ● | ○ | ● |
| 144 | RM144 | 141 ± 2 | 91 | 131 | 500 | 25 | 48 | ● | ● | ● | ○ | ● |
| 134 | RM134 | 131 ± 2 | 81 | 121 | 500 | 25 | 48 | ● | ● | ● | ○ | ● |
| 128 | RM128 | 124 ± 2 | 75 | 115 | 500 | 25 | 48 | ● | ● | ● | ○ | ● |
| 121 | RM121 | 118 ± 2 | 68 | 108 | 500 | 25 | 48 | ● | ● | ● | ○ | ● |
| 117 | RM117 | 114 ± 2 | 64 | 104 | 500 | 25 | 48 | ○ | ○ | ○ | ○ | ● |
| 110 | RM110 | 108 ± 2 | 57 | 97 | 500 | 25 | 48 | ● | ● | ● | ○ | ● |
| 104 | RM104 | 102 ± 2 | 51 | 91 | 500 | 25 | 48 | ○ | ○ | ○ | ○ | ● |
| 98 | RM98 | 95 ± 2 | 45 | 85 | 500 | 25 | 48 | ● | ● | ● | ○ | ● |
| 94 | RM94 | 91 ± 2 | 41 | 81 | 500 | 25 | 48 | ○ | ○ | ○ | ○ | ● |
| 84 | RM84 | 82 ± 2 | N/A | 71 | 500 | 25 | 48 | ○ | ○ | ○ | ○ | ● |
| 77 | RM77 | 74 ± 2 | N/A | 64 | 500 | 25 | 48 | ○ | ○ | ○ | ○ | ● |
| 72 | RM72 | 69 ± 2 | N/A | 59 | 500 | 25 | 48 | ○ | ○ | ○ | ○ | ● |

Rated Functioning Temp. (T_f) °C

- Note:
1. "●"Means certificated, "○"Means non-certificated, "○"Means Certification in progress, RoHS & REACH Compliant ." * " indicates that RM263 complies with REACH Directive 1907/2006/EC, SVHC Candidate List, Batch 29, Item 235 for most of the content (please consult SET for details).
 2. For the T_h test, UL/cUL monitors the temperature of the product itself, while other standards monitor the ambient temperature inside the oven.
 3. RM series with a T_r rating 175°C and above comply with UL conductive heat aging (CHAT) requirements.

Cylindrical Structure Temp. Rise (Reference)

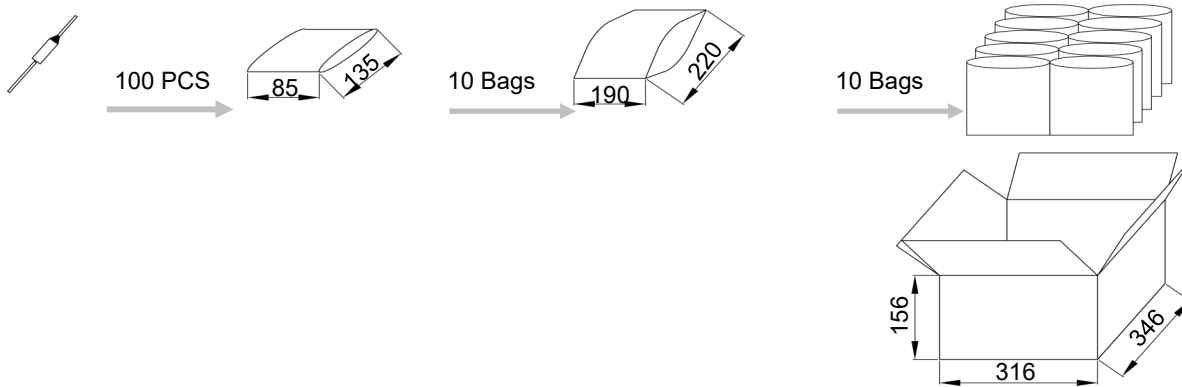


Note: The temperature rise test for square products is continuously updated. If you need data, please consult SET.

Packaging Information

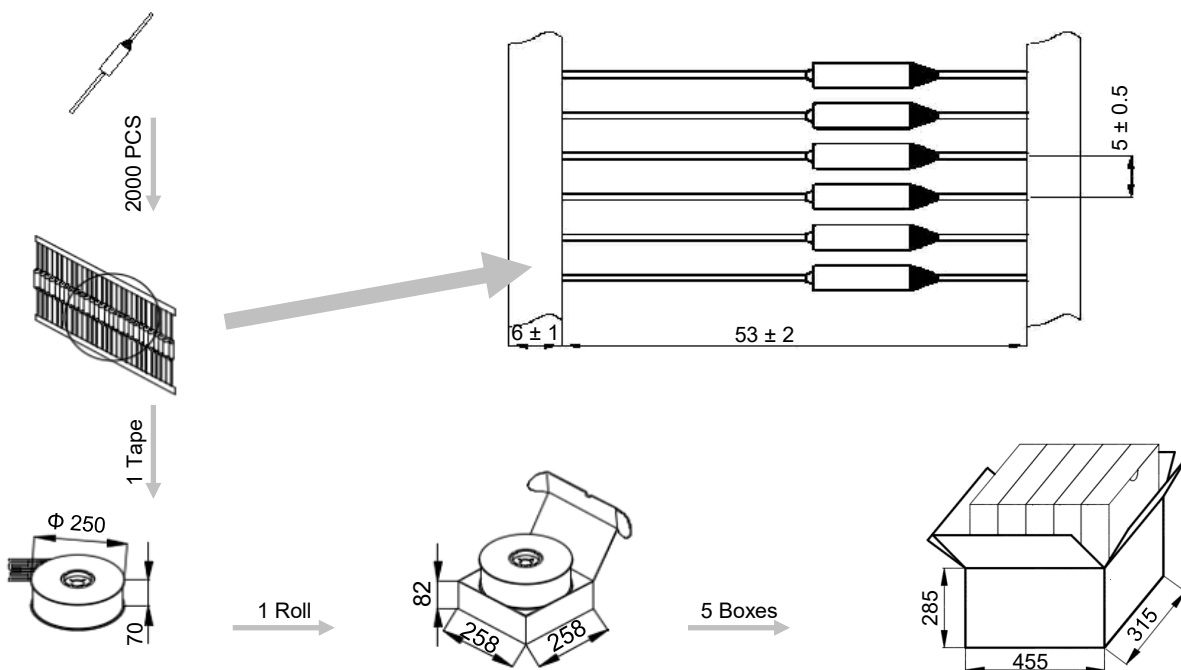
1. Bulk

| Item | PE Bag | PE Bag | Carton |
|-------------------|----------|-----------|---|
| Dimensions (mm) | 135 x 85 | 220 x 190 | 346 x 316 x 156 |
| Quantity (PCS) | 100 | 1000 | 10000 |
| Gross Weight (kg) | | | Cylindrical: 13.3 ± 10% Square: 20.3 ± 10% |



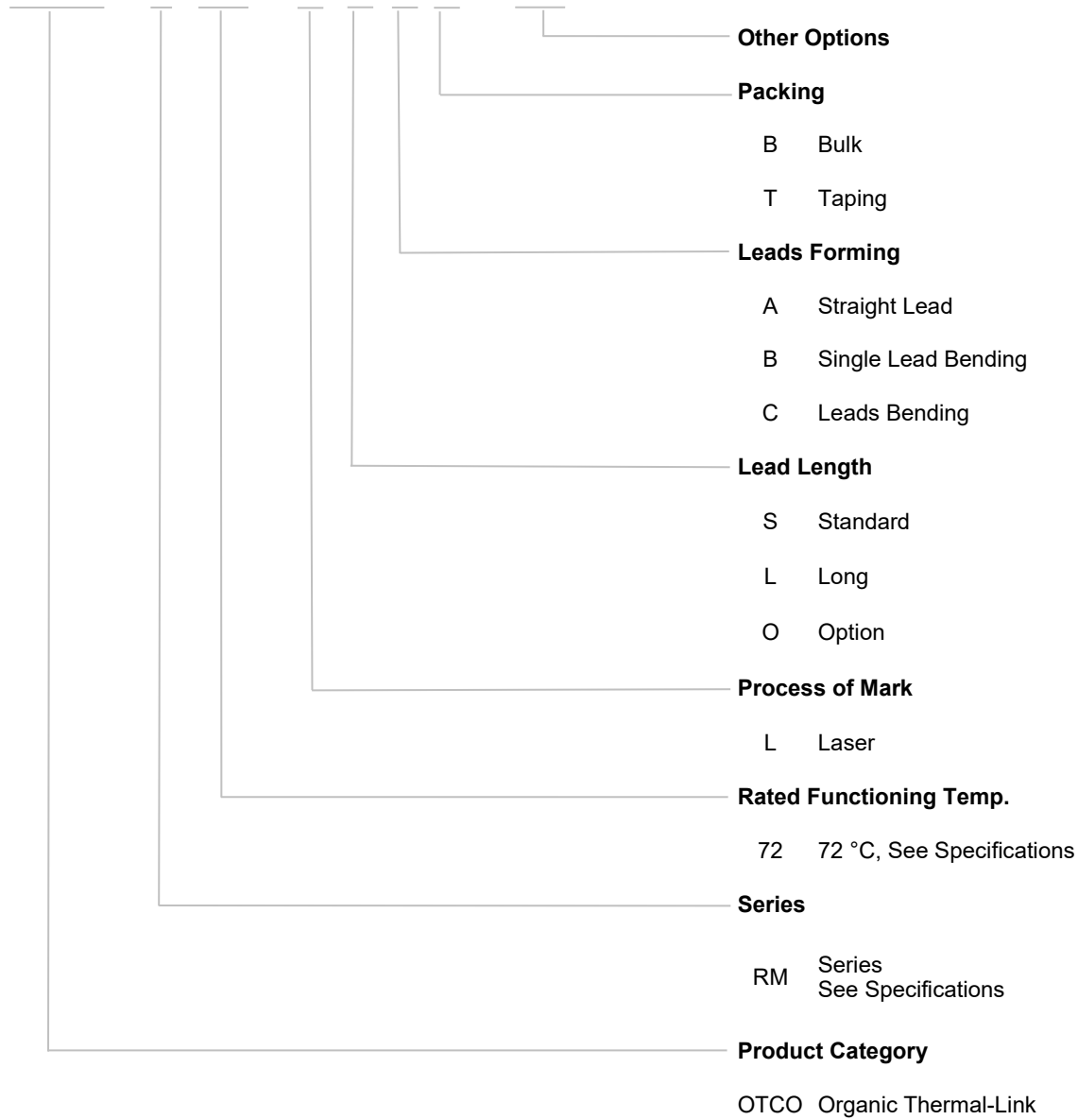
2. Taping

| Item | Scroll | Box | Carton |
|-------------------|-------------------|----------------|---|
| Dimensions (mm) | Φ 250 x Φ 85 x 70 | 258 x 258 x 82 | 455 x 315 x 285 |
| Quantity (PCS) | 2000 | 2000 | 10000 |
| Gross Weight (kg) | | | Cylindrical: 15.0 ± 10% Square: 22.0 ± 10% |



Part Numbering System

OTCO - RM 72 - L S A B - 001



Glossary

| Item | Description |
|--------------|--|
| TCO | <p>Thermal-Link A non-resettable device incorporating a THERMAL ELEMENT which will open a circuit once only when exposed for a sufficient length of time to a temperature in excess of that for which it has been designed.</p> <p style="text-align: right;">— (GB 9816.1)</p> |
| OTCO | <p>Organic Thermal-Link Organic type Thermal-Link, organic is the THERMAL ELEMENT.</p> |
| T_f | <p>Rated Functioning Temp. The temperature of the Alloy Thermal-Link which causes it to change the state of conductivity with a detection current up to 10 mA as the only load.</p> <p style="text-align: right;">— (GB 9816.1)</p> <p>Tolerance: T_f °C (GB 9816.1, EN 60691, K60691). Tolerance: $T_f \pm 7$ °C (J60691).</p> |
| Fusing Temp. | <p>Fusing Temp. The temperature of the Alloy Thermal-Link which causes it to change its state of conductivity is measured with silicone oil bath in which the temperature is increased at the rate of 0.5 °C to 1 °C / minute, with a detection current up to 10 mA as the only load.</p> <p style="text-align: right;">— (GB 9816.1)</p> |
| T_h | <p>Holding Temp. The Maximum temperature at which a Alloy Thermal-Link will not change its state of conductivity when conducting rated current for 168 hours.</p> <p style="text-align: right;">— (GB 9816.1)</p> |
| T_m | <p>Maximum Temp. Limit The temperature of the Alloy Thermal-Link stated by the manufacturer, up to which the mechanical and electrical properties of the Alloy Thermal-Link having changed its state of conductivity, will not be impaired for a given time.</p> <p style="text-align: right;">— (GB 9816.1)</p> |
| I_r | <p>Rated Current Current used to classify a Thermal-Link.</p> <p style="text-align: right;">— (IEC60691)</p> |
| U_r | <p>Rated Voltage Voltage used to classify a Thermal-Link.</p> <p style="text-align: right;">— (IEC60691)</p> |



ATTENTION

Usage

1. Please use OTCO without exceeding the rated current and voltage.
2. Do not use the OTCO in environments out of the standard specifications, such as those containing sulfur dioxide gas, nitrogen oxide gas, ammonia gas or formic acid. It is also not suitable for using in high humidity environment or immersed in liquid.

Replace

OTCO is a non-repairable product. For safety aspect, it shall be replaced by an equivalent OTCO from the same manufacturer, and mounted in the same way.

Storage

1. OTCO must be kept in a place with no sunshine or corrosive gas, the temperature shall be within 10 °C ~ 30 °C and humidity within 30 % ~ 70 %. The validity storage period of OTCO is 12 months after purchase.
2. The case and isolated lead of OTCO are silver-plated. Therefore, to avoid vulcanization, the OTCO shall not be kept around materials such as cardboard or rubber etc. which generate sulfurous acid gas.

Lead Process

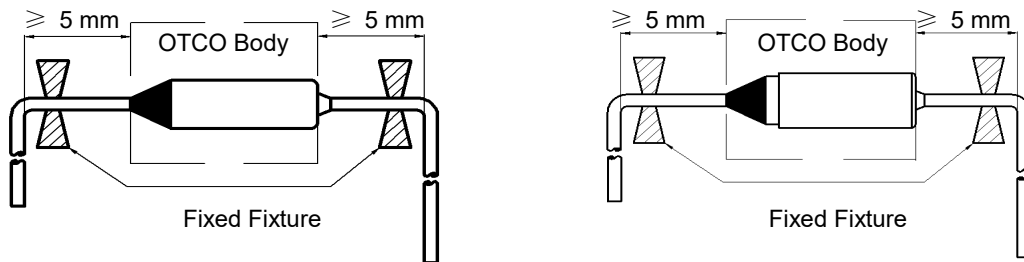


FIGURE 1

1. If lead wires has to be bent, it is important not to apply excessive pressure to the root of the lead wires. The tensile forces applied to the lead wires shall not exceed 22.7 N, and the thrust force applied to the lead wires shall not exceed 5.65 N.
2. The lead wires should be bent at a distance 5 mm or above from the body of OTCO (see Fig.1).
3. To avoid damaging the OTCO, when bending lead wires, please use pincher or similar tools to fix the OTCO.

Installation

Selection of Installation Location

1. Do not locate the OTCO in a place where severe vibration always occurs.
2. To reduce the deviations between the temperature design and the actual situation, it is recommended that the OTCO be installed in close to the thermostat or temperature sensor.

Make Sure the Temp. of Installation Location

1. The body of OTCO will generate heat as current flows through it, resulting the body temp. higher than ambient temp. The influence of temp. rise shall be considered in the design to determine the appropriate OTCO model.
2. It Considering possible temperature shock situations, it is recommended that the temperature of the body and the ambient temperature of the installation location during the operation of the temperature fuse should not exceed $(T_h-10)^\circ\text{C}$.
3. The end product should be tested to ensure that potential abnormal conditions do not cause ambient temp. to exceed the T_m of the OTCO.

Mounting OTCO

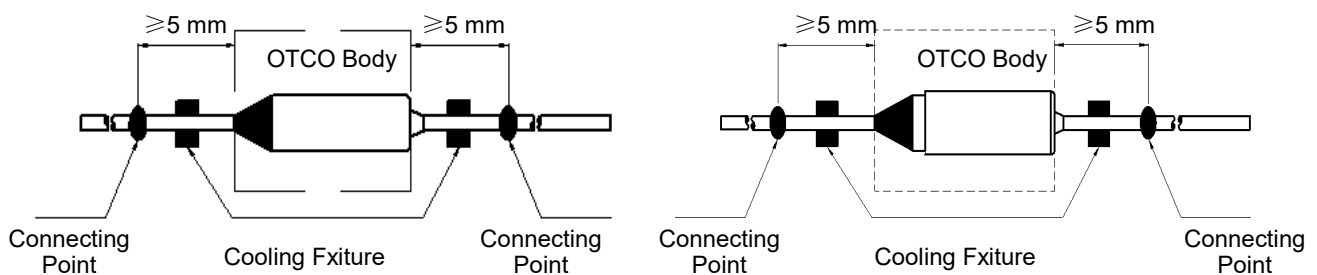


FIGURE 2

1. OTCO can be installed by soldering, welding, riveting or crimping. During and after installation, please do not pull, push or twist OTCO body or lead wires.
2. The connection point of the lead shall be no less than 5 mm away from the OTCO body (see Fig.2).
3. Try to ensure that the body of the OTCO is evenly heated. If the temp. difference is inevitable, make sure that the sealing resin side is connected close to the heat source.
4. **For DC circuits, when mounting the OTCO, the isolated lead should be connected to the negative pole, and the Case Lead should be connected to the positive pole.**

Soldering

1. Soldering should be carried out according to below table. If secondary soldering is required, wait until the OTCO cools to room temp.
2. Soldering is not recommended for Thermal-Link with $T_r \leq 110^\circ\text{C}$, while non heating processes such as crimping and riveting are recommended.
3. In the process of soldering, cooling fixture should be used between soldering point and OTCO body (see Fig.2).
4. It is recommended to take X-ray after soldering, to confirm that the thermal pellet has no shrinkage after soldering.

TABLE 1: Max. Allowable Soldering Time for Different Length of Soldering Point from OTCO Body

| Rated Functioning Temp. (T_r) | Length | Time | Length | Time | Length | Time | Max. Soldering Temp. |
|-----------------------------------|--------|-------|--------|-------|--------|-------|----------------------|
| ($^\circ\text{C}$) | (mm) | (s) | (mm) | (s) | (mm) | (s) | ($^\circ\text{C}$) |
| ≤ 110 | 5 | N / A | 15 | N / A | 25 | N / A | 400 |
| 111 ~ 150 | 5 | N / A | 15 | 1 | 25 | 2 | |
| 151 ~ 190 | 5 | 1 | 15 | 2 | 25 | 3 | |
| ≥ 191 | 5 | 1 | 15 | 3 | 25 | 5 | |

Welding

1. Avoid welding current flowing into the inside of the OTCO. The welding current will cause the internal parts to be welded together, resulting in the failure function of OTCO.
2. During the welding process, the lead wires of the OTCO must be supported to avoid the damage of the OTCO.
3. In the process of welding, cooling fixture should be used between welding point and OTCO body (See Fig.2).
4. It is recommended to take X-ray after welding, to confirm that the thermal pellet has no shrinkage after welding.

Riveting or Crimping

1. Select materials with low resistance (such as copper) for riveting and crimping.
2. Contact resistance shall be as small as possible. Large contact resistance will cause high temp. to make OTCO open in advance.
3. It is better to crimp OTCO leads to stranded lead wires rather than solid wires as the stranded wire may be crimped tighter and maintain better electrical contact during temp. cycling.
4. During the riveting and crimping process, ensure that the lead wires shall not be reversed, sealing resin shall not be destroyed.
5. When the working temp. exceeds 150°C , soldering reinforcement is recommended after riveting and crimping.

The isolated lead is forbidden to contact OTCO body directly to avoid short circuit (See Fig.3).

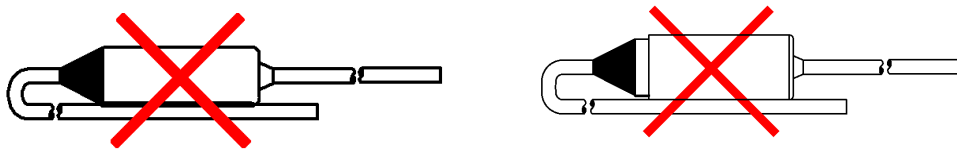


FIGURE 3

Thermal-Link (OTCO) - Organic Type Features & Model List Overview

| Rated Functioning Temp. T_f (°C) | Model | | | | | | | | |
|------------------------------------|---------|---------|-------|-------|-------|-------|--------|-------|--------|
| | RB | RS | RT | RK | RU | RP | RL | RM | |
| 310 | RB310 | RS310 | RT310 | RK310 | RU310 | RP310 | RL310 | RM310 | |
| 275 | RB275 | RS275 | RT275 | RK275 | RU275 | RP275 | RL275 | RM275 | |
| 263 | RB263 | RS263 | RT263 | RK263 | RU263 | RP263 | RL263 | RM263 | |
| 257 | RB257 | RS257 | RT257 | RK257 | RU257 | RP257 | RL257 | RM257 | |
| 240 | RB240 | RS240 | RT240 | RK240 | RU240 | RP240 | RL240 | RM240 | |
| 229 | RB229 | RS229 | RT229 | RK229 | RU229 | RP229 | RL229 | RM229 | |
| 216 | RB216 | RS216 | RT216 | RK216 | RU216 | RP216 | RL216 | RM216 | |
| 205 | RB205 | RS205 | RT205 | RK205 | RU205 | RP205 | RL205 | RM205 | |
| 192 | RB192 | RS192 | RT192 | RK192 | RU192 | RP192 | RL192 | RM192 | |
| 184 | RB184 | RS184 | RT184 | RK184 | RU184 | RP184 | RL184 | RM184 | |
| 172 | RB172 | RS172 | RT172 | RK172 | RU172 | RP172 | RL172 | RM172 | |
| 167 | RB167 | RS167 | RT167 | RK167 | RU167 | RP167 | RL167 | RM167 | |
| 157 | RB157 | RS157 | RT157 | RK157 | RU157 | RP157 | RL157 | RM157 | |
| 152 | RB152 | RS152 | RT152 | RK152 | RU152 | RP152 | RL152 | RM152 | |
| 144 | RB144 | RS144 | RT144 | RK144 | RU144 | RP144 | RL144 | RM144 | |
| 134 | RB134 | RS134 | RT134 | RK134 | RU134 | RP134 | RL134 | RM134 | |
| 128 | RB128 | RS128 | RT128 | RK128 | RU128 | RP128 | RL128 | RM128 | |
| 121 | RB121 | RS121 | RT121 | RK121 | RU121 | RP121 | RL121 | RM121 | |
| 117 | RB117 | RS117 | RT117 | RK117 | RU117 | RP117 | RL117 | RM117 | |
| 110 | RB110 | RS110 | RT110 | RK110 | RU110 | RP110 | RL110 | RM110 | |
| 104 | RB104 | RS104 | RT104 | RK104 | RU104 | RP104 | RL104 | RM104 | |
| 99 | RB99 | RS99 | RT99 | ○ | ○ | ○ | RL99 | ○ | |
| 98 | ○ | ○ | ○ | RK98 | RU98 | RP98 | ○ | RM98 | |
| 94 | RB94 | RS94 | RT94 | RK94 | RU94 | RP94 | RL94 | RM94 | |
| 84 | RB84 | RS84 | RT84 | RK84 | RU84 | RP84 | RL84 | RM84 | |
| 77 | RB77 | RS77 | RT77 | RK77 | RU77 | RP77 | RL77 | RM77 | |
| 72 | RB72 | RS72 | RT72 | RK72 | RU72 | RP72 | RL72 | RM72 | |
| I_r (A) Rated Current | 10 | 10 / 15 | 16 | 20 | 25 | 30 | 16 | 25 | |
| U_r (VAC) Rated Voltage (VDC) | 250 VAC | | | | | | 24 VDC | | 48 VDC |
| Product Structure | | | | | | | | | |