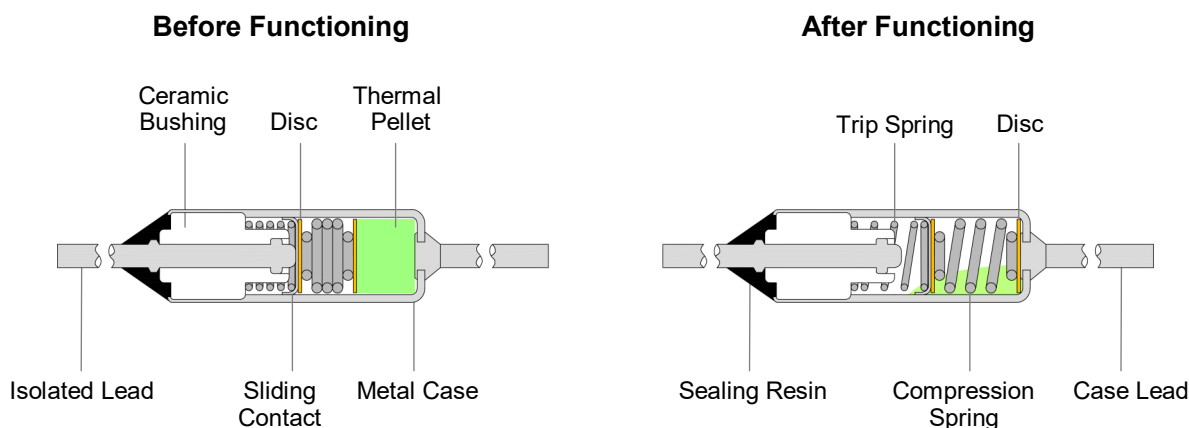




Description

SETsafe | SETfuse Organic Thermal-Link (OTCO) RT series are non-resettable protective device, functioning one time only. It mainly consists of metal case, spring, sliding contact and thermal pellet. The organic thermal pellet responds to abnormal temp. situation and triggers the cutoff function. OTCO RT series are designed for higher current applications, widely used in electrical equipment to provide over temp. protection, comply with RoHS and REACH.

Construction



Functioning Principle:

Under normal operating temp., the solid thermal pellet keeps the isolated lead connected to the sliding contact. When the Thermal-Link senses abnormal heat and temp. reaches the predetermined fusing temp., thermal pellet melts and the sliding contact separates from the isolated lead with the assistance of the trip spring, thereby the circuit is disconnected.

Features

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

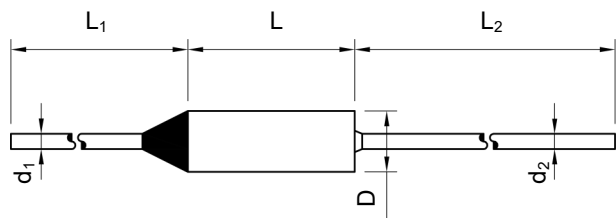
Customization

- Other Temp.
- The Length of Lead
- Lead Cutting
- Lead Forming

Applications

- Small Home Appliances (Such as Electric Cooker, Bread Maker, Coffee Machine, Soymilk Machine, etc.)
- Comfort Home Appliances (Such as Washing Machine, Refrigerator, Air Conditioner, etc.)
- Personal Care Appliances (Such as Hair Dryer, Hair Straightener, Electric Iron, etc.)
- Commercial Appliances (Such as Printer, Scanner, Fax Machine etc.)
- Automobile Field (Such as Air Conditioner, Heated Seat, etc.)

Dimensions (mm)



Lead Length	L	L_1	L_2	D	d_1, d_2
Standard	11 ± 1	19 ± 1	36 ± 1	4 ± 0.2	1 ± 0.1
Long	11 ± 1	36 ± 1	36 ± 1	4 ± 0.2	1 ± 0.1
Option	11 ± 1	Customization		4 ± 0.2	1 ± 0.1

Part Numbering System

OTCO - RT72 - P S A B - 001

Other Options

Packaging

B: Bulk
T: Taping
R: Reeling

Leads Forming

A: Straight Lead
B: Single Lead Bending
C: Leads Bending

Lead Length

S: Standard
L: Long
O: Option

Process of Mark

P: Printing
L: Laser

Rated Functioning Temp.
refer to specifications

Series

RT

Product Category

Agency Approvals

Agency	Standards	File No.
	UL60691	E214712
	CAN-CSA-E60691	E214712
	EN60691	On-going
	J60691	JET2121-32001-2011 JET2121-32001-2012 JET2121-32001-2013 JET2121-32001-2014 JET2121-32001-2015 JET2121-32001-2016 JET2121-32001-2017 JET2121-32001-2018 JET2121-32001-2019 JET2121-32001-2020
	K60691	SU05023-19006A SU05023-19007A SU05023-19008A SU05023-19009B SU05023-19010A
	GB9816	2019010205214198

Marking








Trademark	SET RT72	Model
Rated Functioning Temp.	72°C XXX	Date Code
Rated Current	15/16A 250V~	Rated Voltage
Agency Mark		

Note:

The first letter of date code represents the year, letter A represents 2000, letter B represents 2001, and so on. The last two digits represent the quarter, the quarter code is represented by 01, 02, 03 and 04, representing the four quarters of the year.

Specifications

Model	T_f	Fusing Temp.	T_h	T_h^c (UL/cUL)	T_m	I_r	U_r							RoHS & REACH
	(°C)	(°C)	(°C)	(°C)	(°C)	(A)	(VAC)	UL	cUL	VDE	PSE	KTL	CCC	
RT72	72	69±2	42	57	180	15 /16	250	●	●	⦿	●	NA	●	●
RT77 ^d	77	74±2	50	62	300	15 /16	250	●	●	⦿	●	NA	●	●
RT84	84	81±2	54	69	200	15 /16	250	●	●	⦿	●	●	●	●
RT94	94	89±2	64	79	300	15 /16	250	●	●	⦿	●	●	●	●
RT99	99	94±2	69	84	200	15 /16	250	●	●	⦿	●	●	●	●
RT104	104	102±2	74	89	250	15 /16	250	●	●	⦿	●	●	●	●
RT110	110	107±2	82	95	240	15 /16	250	●	●	⦿	●	●	●	●
RT117	117	114±2	88	102	200	15 /16	250	●	●	⦿	●	●	●	●
RT121	121	117±2	93	106	300	15 /16	250	●	●	⦿	●	●	●	●
RT128	128	124±2	98	113	200	15 /16	250	●	●	⦿	●	●	●	●
RT134	134	131±2	104	119	250	15 /16	250	●	●	⦿	●	●	●	●
RT144	144	141±2	114	129	300	15 /16	250	●	●	⦿	●	●	●	●
RT152	152	149±2	122	137	205	15 /16	250	●	●	⦿	●	●	●	●
RT167	167	163±2	137	152	220	15 /16	250	●	●	⦿	●	●	●	●
RT172	172	169±2	143	157	260	15 /16	250	●	●	⦿	●	●	●	●
RT184	184	181±2	154	169	250	15 /16	250	●	●	⦿	●	●	●	●
RT192	192	189±2	162	177	300	15 /16	250	●	●	⦿	●	●	●	●
RT216	216	213±2	186	200	450	15 /16	250	●	●	⦿	●	●	●	●
RT229	229	226±2	200	200	450	15 /16	250	●	●	⦿	●	●	●	●
RT240	240	235±2	200	205	450	15 /16	250	●	●	⦿	●	●	●	●
RT257	257	254±2	200	220	480	15 /16	250	●	●	⦿	●	●	●	●

NOTES:

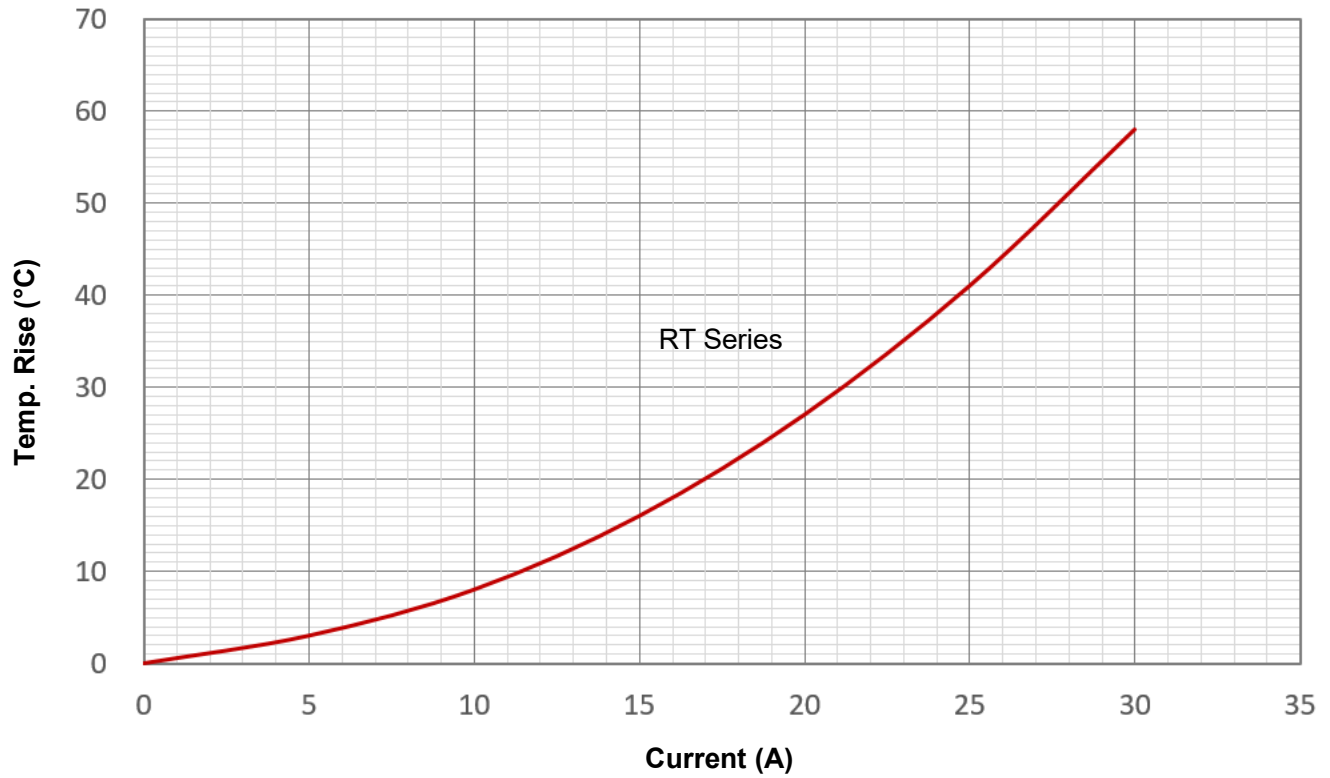
a. ●: Approved, ○: On-going.

b. OTCO RT series with a T_f rating 175°C and above comply with UL conductive heat aging (CHAT) requirements.

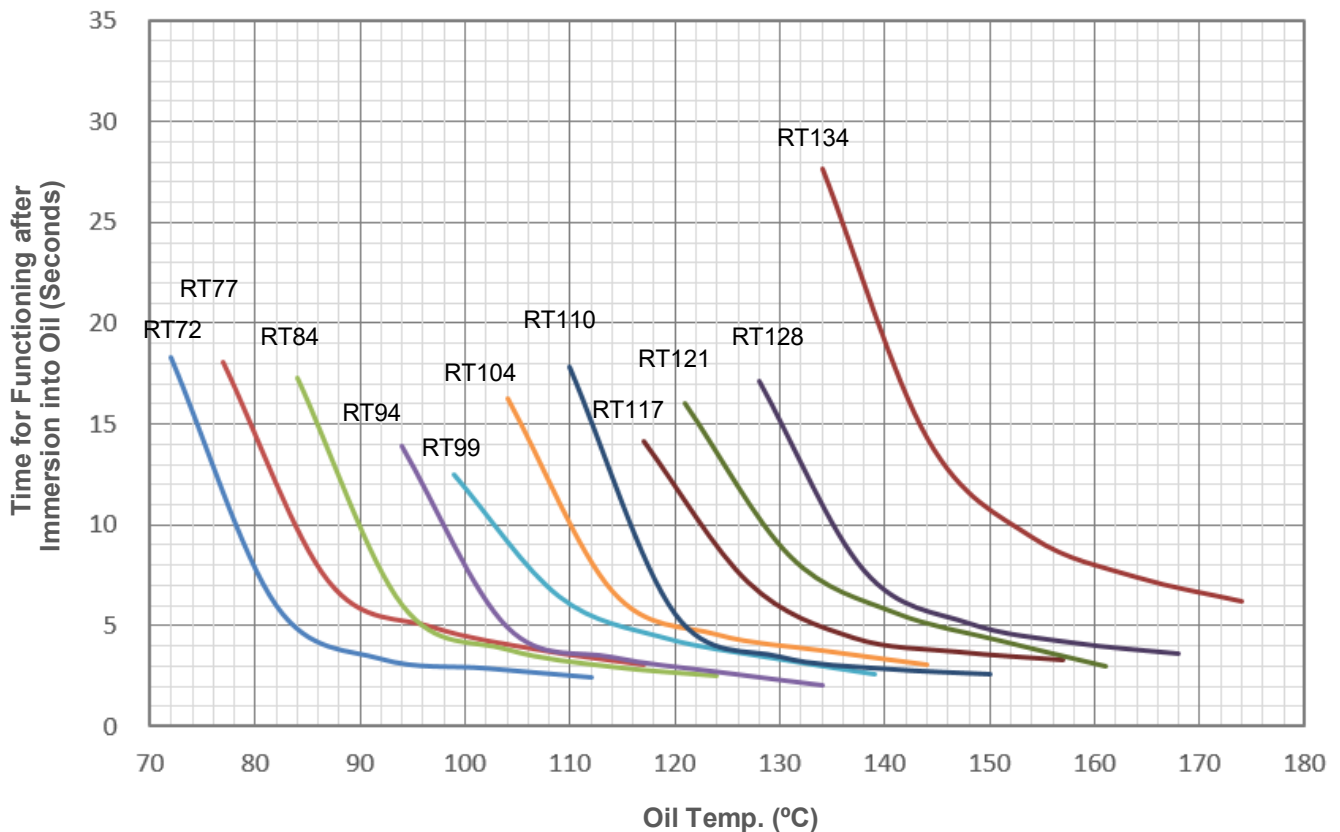
c. For T_h test, UL / cUL standard requests the thermocouples are placed on the surface of OTCO body (refer to Fig. RT-1) , while other standards request the thermocouples are placed on the sample isothermal point.

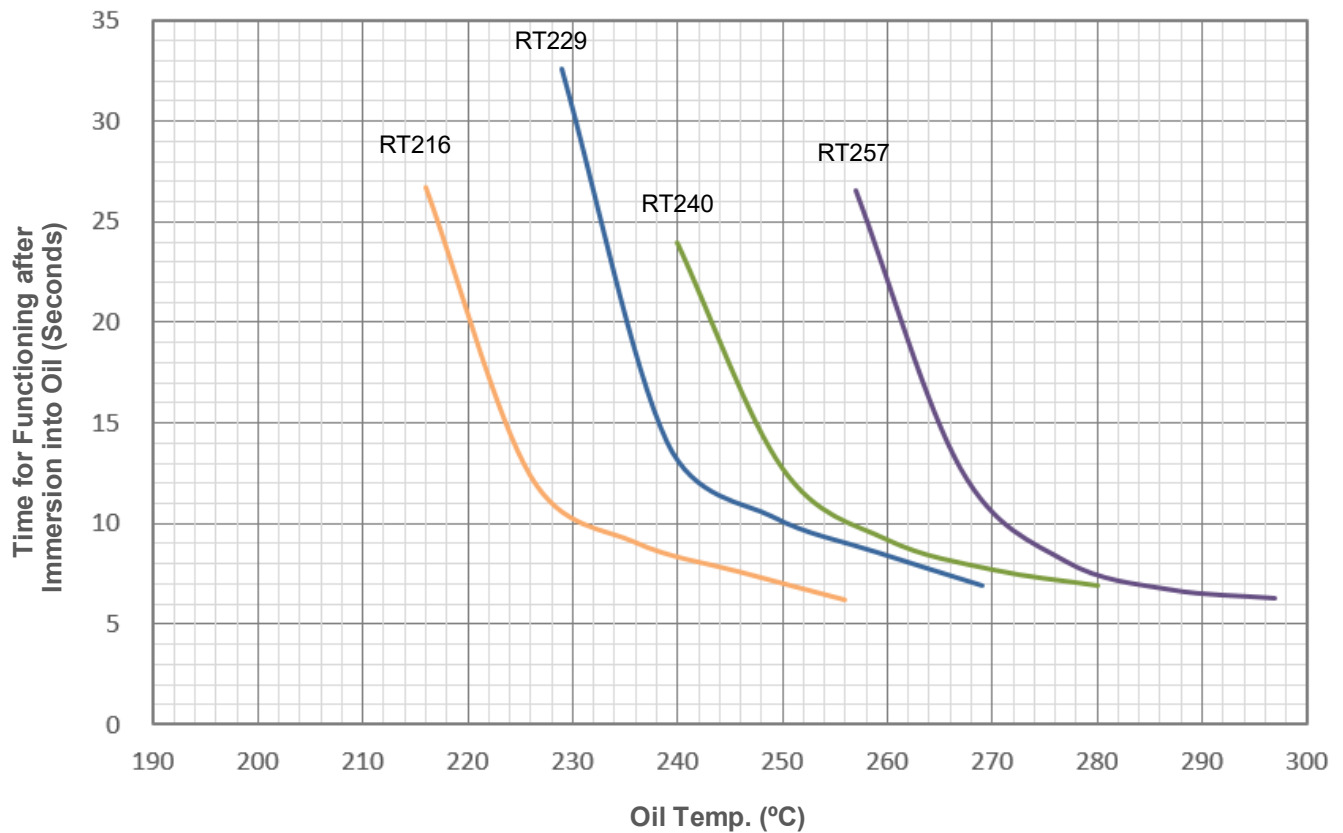
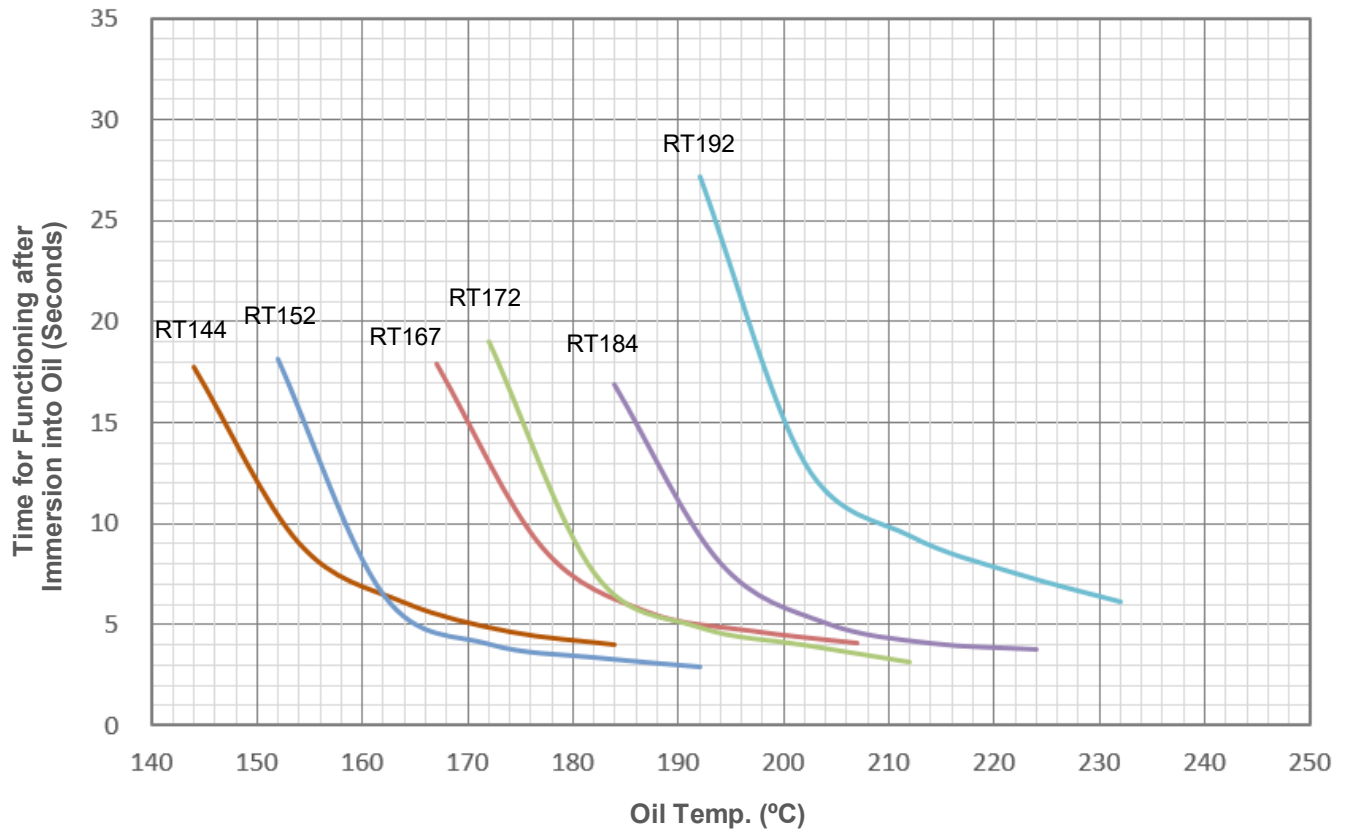
d. For RT77 T_m parameter, UL / cUL approved is 200°C, while other agency approved is 300°C.

Temp. Rise



Response Time





Glossary

Item	Description
TCO	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 temp. in excess of that for which it has been designed.
OTCO	Organic Thermal-Link Organic type Thermal-Link, organic is the THERMAL ELEMENT.
T_f	Rated Functioning Temp. The temp. of the Thermal-Link which causes it to change the state of conductivity with a detection current up to 10 mA as the only load. Tolerance: $T_f + 0 / - 10$ K (GB9816, EN60691, UL60691, K60691). Tolerance: $T_f \pm 7$ K (J60691).
Fusing Temp.	The temp. of the Thermal-Link which causes it to change its state of conductivity is measured with silicone oil bath in which the temp. is increased at the rate of 0.5 K/min to 1 K/min, with a detection current up to 10 mA as the only load.
T_h	Holding Temp. The max. temp. at which a Thermal-Link will not change its state of conductivity when conducting rated current for 168 hours.
T_m	Max. Temp. Limit The temp. of the Thermal-Link stated by the manufacturer, up to which the mechanical and electrical properties of the Thermal-Link having changed its state of conductivity, will not be impaired for a given time.
I_r	Rated Current The current used to classify a Thermal-Link, which is the max. current that Thermal-Link allows to carry and is able to cut off the circuit safely.
U_r	Rated Voltage The voltage used to classify a Thermal-Link, which is the max. voltage that Thermal-Link allows to carry and is able to cut off the circuit safely.

Attention

Usage

1. Use OTCO within rated current and voltage.
2. Do not use the OTCO in environments outside the standard specifications, such as those containing sulfur dioxide gas, nitrogen oxide gas, ammonia gas or formic acid. It is also not suitable for use in high humidity environment or immersed in liquid.

Replace

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

Transportation

During the transportation of OTCO, semi-finished products and finished products, please pay attention to avoid that the body temp. of OTCO exceeds $T_f - 25^\circ\text{C}$. For OTCO with $T_f \leq 90^\circ\text{C}$, pay special attention during the transportation in summer.

Storage

1. OTCO must be kept in a place with no sunshine and no corrosive gas, with temp. $-10^\circ\text{C} \sim 40^\circ\text{C}$ and humidity within 30% ~ 75%. The validity period of OTCO is 12 months after purchase.
2. The case and isolated lead of OTCO are silver-plated. Therefore, to avoid sulfuration, the OTCO should not be kept around materials such as cardboard or rubber etc. which generate sulfurous acid gas.
3. When storage in cardboard boxes is required, OTCO should be double packed and sealed in polybags such as polyethylene.

Lead Process

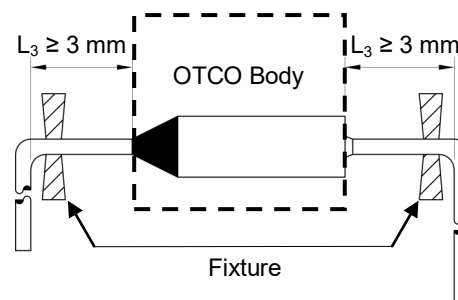


FIGURE RT-1

1. If lead wires have 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 should not exceed 15.7N, the thrust force applied to the lead wires should not exceed 3.9N.
2. The lead wires should be bent at a distance 3 mm or above from the body of OTCO (see L_3 in Fig. RT-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. The infrared thermography or multiple thermocouples should be considered to detect the ambient temp. under normal and abnormal situation. The point that provides the biggest temp. rise between these two situations is the best installation location.

Make Sure the Temp. of Installation Location

1. The body temp. of OTCO will increase as current flows through it, so it is recommended that a dummy OTCO with a thermocouple attached to the case should be used to determine the proper temp., the dummy OTCO should match the electrical characteristics of the OTCO but not have thermal pellet.
2. Continuous exposure close to the T_h temp. could shortening the lifespan of the OTCO, it is suggested that the body temp. of OTCO during working should not continuous exceed $T_f - 25^\circ\text{C}$, For OTCO with $T_f \geq 184^\circ\text{C}$, the max. body temp. should not continuous exceed 150°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

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 greater than 5 mm away from the OTCO body (see L_4 in Fig. RT-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 be connected closer to the heat source.

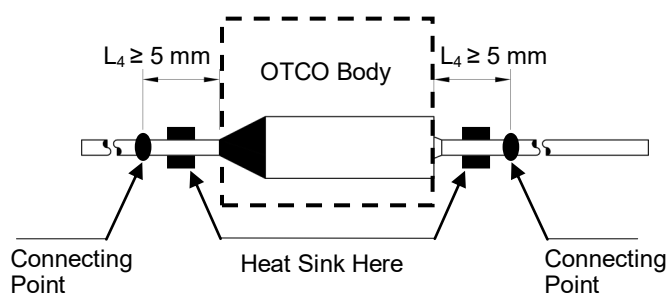


FIGURE RT-2

Soldering

1. Soldering should be carried out according to Table RT-1, if secondary soldering is required, wait until the OTCO cools to room temp..
2. Soldering is not recommended for $T_f \leq 110^\circ\text{C}$.
3. In the process of soldering, heat sink fixture should be used between soldering point and OTCO body.
4. It is recommended to take X-ray after soldering, the size of the pellet should be measured to verify that no shrinkage has occurred during the soldering.

TABLE RT-1 Max. Allowable Soldering Time for Different Length (L_4) of soldering point from OTCO body

Rated Functioning Temp. (T_f)	L_4 Length	Time	L_4 Length	Time	L_4 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 to 150	5	N / A	15	1	25	2	
151 to 190	5	1	15	2	25	3	
≥ 191	5	1	15	3	25	5	

Welding

1. For the process of welding, follow the above soldering attentions.
2. It is necessary to avoid welding current flowing into the inside of the OTCO. The welding current will weld the internal components together, so that the OTCO cannot be disconnected.
3. During the welding process, the lead wires of the OTCO must be supported to avoid the damage of the OTCO.
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 should not be reversed, sealing resin should not be destroyed.
5. When the working temp. exceeds 150°C , it is necessary to use soldering reinforcement after riveting and crimping.

Riveting or Crimping

1. Select materials with low resistivity (such as copper) for riveting and crimping.
2. Contact resistance should be minimal, large contact resistance will cause higher temp. to make OTCO functioning in advance.

The isolated lead is forbidden to touch OTCO body to avoid short circuit.

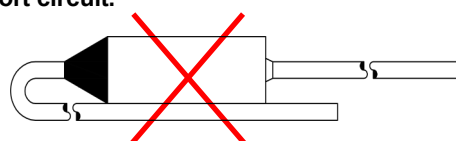
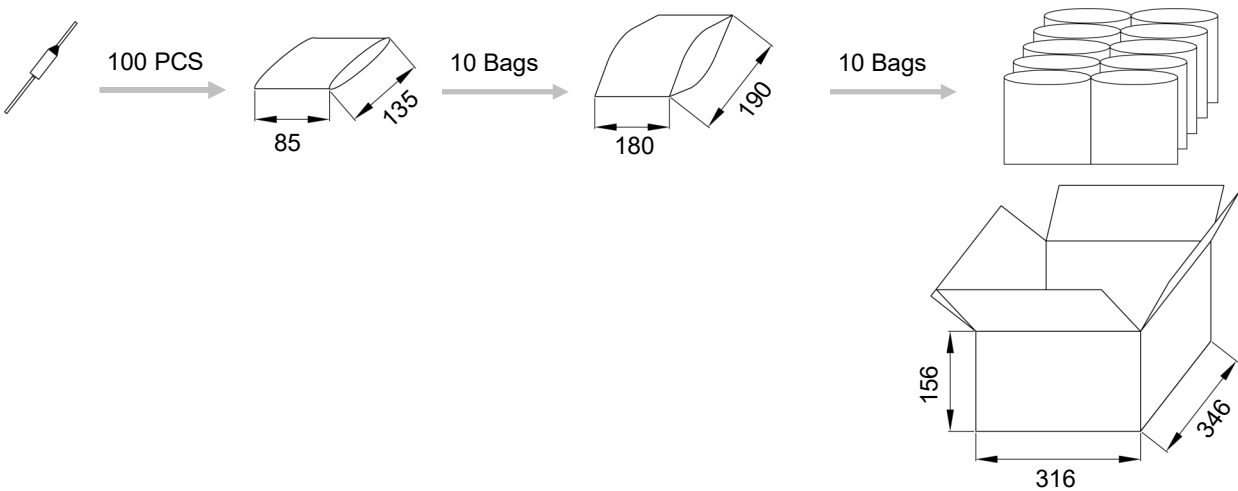


FIGURE RT-3

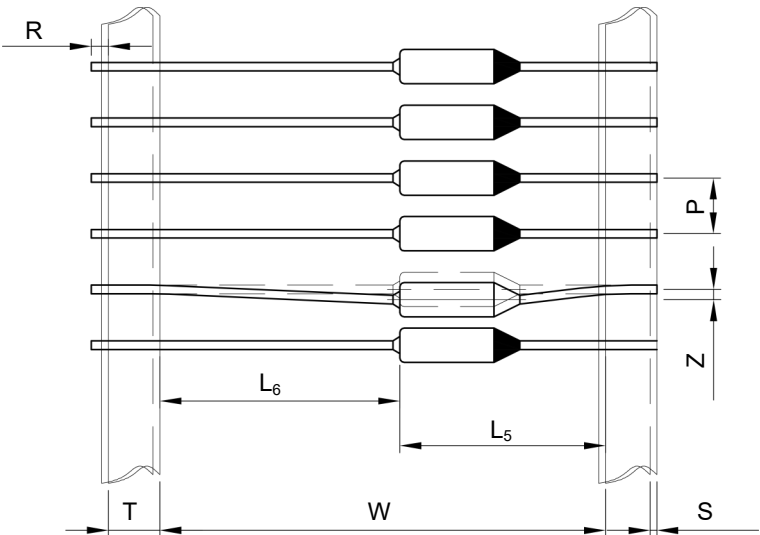
Packaging Information

Bulk Packaging

Item	PE Bag	PE Bag	Carton
Dimensions (mm)	135 x 85	190 x 180	346 x 316 x 156
Quantity (PCS)	100	1,000	10,000
Gross Weight (kg)			11.4 ± 10%

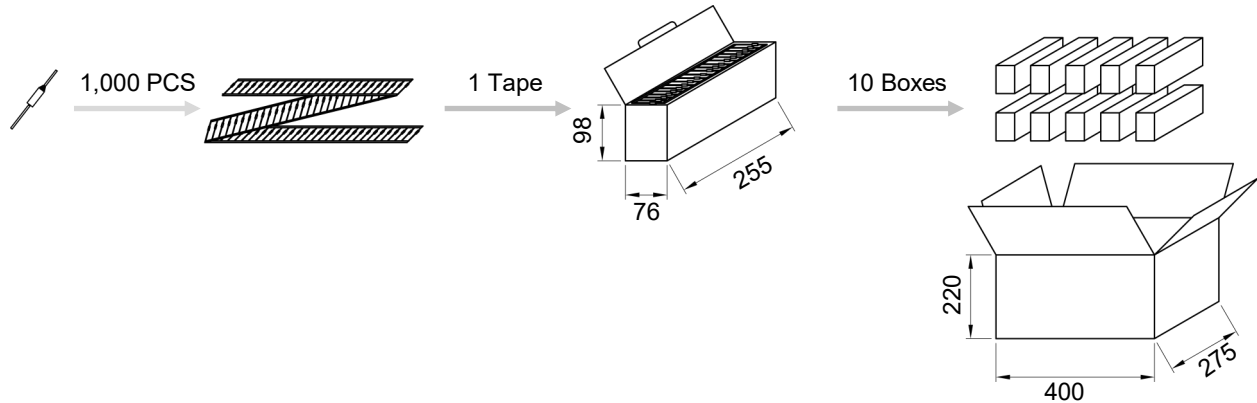


Tape Packaging



Item	Dimensions (mm)
W	52 ± 2
L ₅	24 ± 1
L ₆	28 ± 1
T	6 ± 1
P	5 ± 0.5
R	2 ± 1
Z	≤ 0.8
S	≤ 0.8

Item	Box	Carton
Dimensions (mm)	255 x 76 x 98	400 x 275 x 220
Quantity (PCS)	1,000	10,000
Gross Weight (kg)		11.5 \pm 10%



Reel Packaging

Item	Reel	Box	Carton
Dimensions (mm)	$\Phi 250 \times \Phi 70 \times 76$	258 x 258 x 98	456 x 316 x 276
Quantity (PCS)	2,000	2,000	8,000
Gross Weight (kg)			10 \pm 10%

