



PRECAUTIONS FOR USING ELMWOOD THERMAL CUT OFFS

The performance of the Elmwood Thermal Cut Offs can be affected by proper storage, handling, mounting location and usage environment. Please refer to the following guidelines to achieve an optimal performance of thermal device.

STORAGE

Since the case body and the wire contact of the Thermal Cut Offs (TCO) are silver plated. Thus, these parts may discolor due to the effects of sulfurization.

Therefore, please avoid storing in places where sulfur gas is generated, such as cardboard and rubber bands. If you use a cardboard box to store the TCO, please put it in a polyethylene bag and double pack it.

We recommend to store the TCO in packing case or in polyethylene bags with the temperature range from $20^{\circ}\text{C}\pm 10^{\circ}\text{C}$ and RH up to 55%.

The location of storage shall be no direct sun light and no rapid change of temperature or humidity. The location must also be free from shock and vibration.

Avoiding storage in places containing corrosive gases such as sea breeze, ammonia gas, sulfuric acid gas, nitrogen oxide gas and formic acid.

For long-term storage from purchase to use, please perform appearance, contact resistance, and X-ray inspection before use.

MOUNTING

Please note the following when installing the TCO during appliance connection to achieve an optimal performance.

1) Mechanical Forces

- a) Please do not bend, twist, pull, or push the leads unnecessarily.
- b) Be aware not to damage the sealing epoxy such as chips and cracks.
- c) The case body must remain cylindrical for the TCO to work properly.

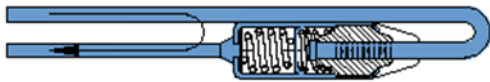
Do not pinch the case body with pliers during the installation work.

If the sealing of the TCO is impaired, the airtightness inside the TCO will be lost and leading to malfunction.

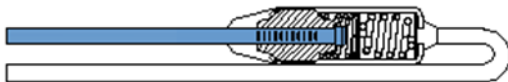
2) Electrical consideration

- a) The case body of the TCO is electrically connected, so if the other side is metal, be sure to insulate it.
- b) The direction of mounting and the polarity of + and - are not related at all, but it is recommended to connect the lead on the sealing resin side to the input side of the power supply in case the circuit does not open due to damage to the insulation.

- ① The circuit does not open even if the TCO operates



- ② The circuit opens even if the TCO is short-circuited



TEMPERATURE CONSIDERATION

1) How to choose the rated temperature

The closer to the actual usage condition, the more accurate the measurement of the TCO temperature. It is necessary to confirm how much temperature TCO is received in the actual environment. ELMWOOD provide a thermocouple thermal fuse is able to figure out the proper calibration temperature and location of the TCO.

Connecting the thermocouple leads to a digital temperature measuring device to the record temperature.

This measurement clarifies the effect of the loading current on the TCO temperature from various viewpoints such as the temperature rise of the TCO case body, self-heating of the connection terminal, and heat tracking characteristics.

Under the normal conditions, the temperature received by the TCO determines the average life of the TCO. If the TCO temperature rating is too close to the temperature received during the normal operation, the TCO could be opened unexpectedly.

It is caused by pellet shrinkage because the constant load of temperature during operation and the self-heating of the connections on both sides of lead have an effect.

Since the TCO have a limited life, it is important for designers to understand the responsiveness in the abnormal condition and the lifespan in normal condition use in order to determine the correct calibration temperature in actual application.

2) Please find a proper location to install the TCO to be able to receive abnormal heat generation as quickly as possible.

We recommend to use thermocouples to identify the high temperature area during both normal operation and abnormal operation such as assuming the worst-scenarios.

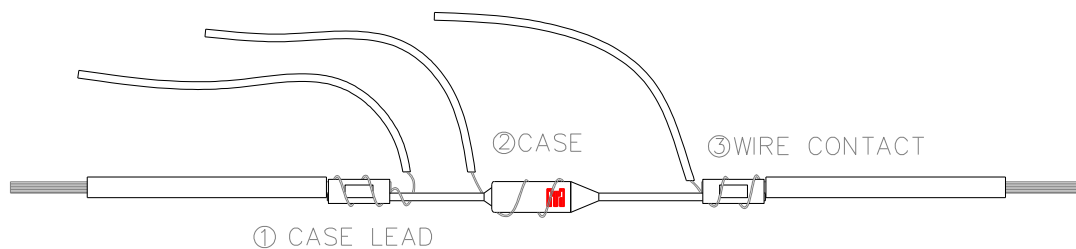
3) Please make sure that the temperature gradient is equal when installing the TCO.

When measuring, please attach thermocouples to

- ① Case lead, ② Case body ③ Wire contact
by the attachment method shown in the figure.

Please check each temperature and find whether there is no abnormal heat generation.

If the temperature on the case lead is higher than wire contact, the temperature of the TCO pellets could be received higher temperature. As time passes, it would lead to shortens the life of the TCO. If the temperatures on both sides are different, please install wire contact side closer to the heat source to minimize the temperature increase of the TCO pellet and the effect of thermal gradients from the heat flow in actual application.



Regarding the temperature calibration of the TCO, the mounting position, and the mounting method should be made by the customer own decision while referring to the above confirmation method.

SAFETY PRECAUTIONS

When using a thermal cut offs, use it lower the rated voltage and rated current listed in catalog.

If a thermal cut offs is used higher level of the rated voltage and rated current, the contacts may be welded, leading to malfunction or even non-operation.

Please do not use under the following environments without any protection.

- a) In liquid such as water, oil, organic solvents and chemicals.
- b) In places full of corrosive gases such as sea breeze, ammonia gas, sulfurous acid gas, nitrogen oxide gas and formic acid.
- c) In places high humidity environment

Under use in the above environment, thermal cut offs could operate at lower temperatures or it may not operate even though the rated temperature is exceeded.

Please do not repair the TCO and replace it with new equivalent TCO with the same catalogue number.