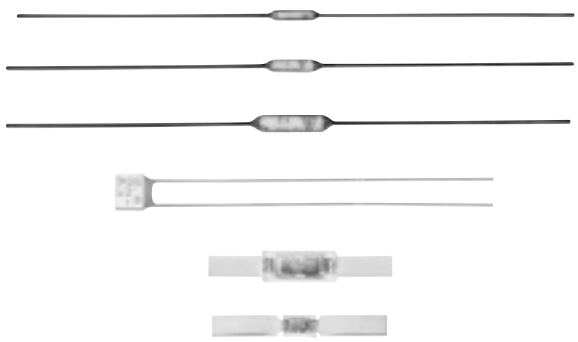
Thermal Cutoffs (TCO)/ Thermal-Links

EYP Series: **N**
Series: **F**
Series: **E**
Series: **H**
Series: **ML**
Series: **MU**



■ Features

- **Small and Insulation Type**
  TCO is compact and insulated, featuring quick temperature response, and mountable in a small space without insulation or protection.
- **High Reliability**
  TCO opens reliably when the equipment becomes abnormal, and is not resettable.
- **Solid Structure**
  Unique formed lead provides reliable TCO connection and provides easy assembly handling. (Axial lead type only)
- **Non-Cadomium Alloy**
- **Thin Type**
  Thickness is less than 1 mm. Available for spot welding.(ML and MU series)

■ Approved Safety Standards

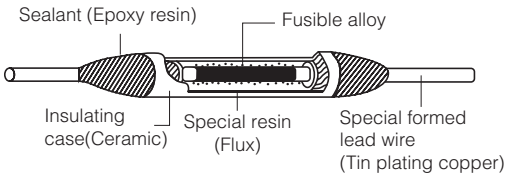
- (PS E) (Japan) : Approved by JET
- UL (U.S.A.) : E60271
- CSA (Canada) : LR67163
- VDE (Germany) : 4811. 6-1171-□□□□
- BEAB (U.K.) : C□□□□
- CCC (China) : □□□□□□□□□□□□□□□□□□
  See Ratings in details.

■ Recommended Applications

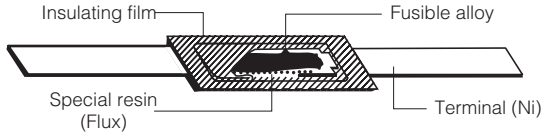
- Transformers, Solenoids, Ventilation fans, Electric fans, Small electric motors, Driers, Gas home appliances, Fluorescent lights, Electric shavers, Adaptors, Heating devices, ICs, Batteries, etc. The TCO can also be used for overheating protection.

■ Construction

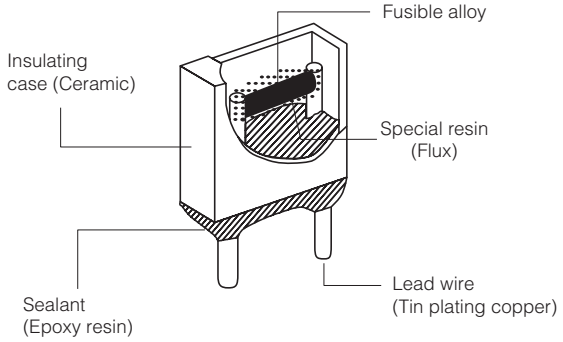
● Axial lead type (N, F and E series)



● Thin type (MTand MS series)



● Radial lead type (H series)



Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
Should a safety concern arise regarding this product, please be sure to contact us immediately.

■ Ratings

● N series

Part No.	Type No. of Approved Standards	Rated Functioning Temp.*1 (°C)	Functioning Temp.*2 (°C)	Maximum Operating Temp.*3 (°C)	Holding Temp.*4 (°C)	Maximum Temp. Limit (°C)*5		Electrical Rating			Approved Safety Standards						RoHS
						UL,VDE, BEAB CCC	CSA	AC/ DC	Amp. (A)	Volt. (V)	PSE	UL	CSA	VDE	BEAB	CCC	
EYP2BN082	N082	86	82±2	52	56	200	150	AC	3	125		○	○	○	○	○	○
				60	60			AC	2	250	○	○	○	○	○	○	
				45	50			DC	4	50		○	○	○	○	○	
EYP2BN088	N088	92	88±2	56	60	200	—	AC	3	125		○	—	—	—	—	(Under examination)
				62	65			AC	2	250	○	○	—	—	—	—	
				47	52			DC	4	50		○	—	—	—	—	
EYP2BN098	N098	102	98±2	65	70	200	150	AC	3	125		○	○	○	○	○	(Under examination)
				75	76			AC	2	250	○	○	○	○	○	○	
				55	60			DC	4	50		○	○	○	○	○	
EYP2BN109	N109	114	110±3	76	86	200	150	AC	3	125		○	○	○	○	○	○
				80	90			AC	2	250	○	○	○	○	○	○	
				65	74			DC	5	50		○	○	○	○	○	
EYP2BN110	N110	115	110^{+3}_{-2}	76	86	200	150	AC	3	125		○	○	○	○	○	○
				80	90			AC	2	250	○	○	○	○	○	○	
				65	74			DC	5	50		○	○	○	○	○	
EYP2BN124	N124	130	126±2	90	105	200	180	AC	3	125		○	○	○	○	○	(Under examination)
				94	105			AC	2	250	○	○	○	○	○	○	
				80	94			DC	5	50		○	○	○	○	○	
EYP2BN126	N126	133	128±2	92	108	200	180	AC	3	125		○	○	○	○	○	(Under examination)
				96	108			AC	2	250	○	○	○	○	○	○	
				82	96			DC	5	50		○	○	○	○	○	
EYP2BN135	N135	140	136±3	99	115	200	180	AC	3	125		○	○	○	○	○	(Under examination)
				103	115			AC	2	250	○	○	○	○	○	○	
				80	90			DC	6	50		○	○	○	○	○	
EYP2BN143	N143	145	141±2	105	115	200	180	AC	3	125		○	○	○	○	○	○
				110	120			AC	2	250	○	○	○	○	○	○	
				80	90			DC	6	50		○	○	○	○	○	
EYP2BN163	N163	168	163^{+4}_{-2}	120	130	200		AC	3	125		○	○	○	○	○	(Under examination)
				120	135			AC	2	250	○	○	○	○	○	○	
				90	100			DC	6	50		○	○	○	○	○	

Note: For long lead types add the letter "L" at the end of the part number.
(Approved Safety Standards File No. UL:E60271, CSA:LR60271, VDE: 4811.6-1171-001, BEAB:C1068, CCC:2002010205004249)

● F series

Part No.	Type No. of Approved Standards	Rated Functioning Temp.*1 (°C)	Functioning Temp.*2 (°C)	Maximum Operating Temp.*3 (°C)	Holding Temp.*4 (°C)	Maximum Temp. Limit (°C)*5		Electrical Rating			Approved Safety Standards						RoHS
						UL,VDE, BEAB CCC	CSA	AC/ DC	Amp. (A)	Volt. (V)	PSE	UL	CSA	VDE	BEAB	CCC	
EYP1BF102	F102	102	98±2	70	74	200	150	AC	2	125		○	○	○	○	○	(Under examination)
				75	76			AC	1	250	○	○	○	○	○	○	
				55	60			DC	3.5	50		○	○	○	○	○	
EYP1BF115	F115	115	110^{+3}_{-2}	76	90	200	150	AC	2	125		○	○	○	○	○	○
				80	90			AC	1	250	○	○	○	○	○	○	
				70	80			DC	4	50		○	○	○	○	○	
EYP1BF130	F130	130	126±2	90	105	200	180	AC	2	125		○	○	○	○	○	(Under examination)
				94	105			AC	1	250	○	○	○	○	○	○	
				74	90			DC	4.5	50		○	○	○	○	○	
EYP1BF133	F133	133	128±2	92	108	200	180	AC	2	125		○	○	○	○	○	(Under examination)
				96	108			AC	1	250	○	○	○	○	○	○	
				76	92			DC	4.5	50		○	○	○	○	○	
EYP1BF139	F139	139	135±3	99	115	200	180	AC	2	125		○	○	○	○	○	(Under examination)
				103	115			AC	1	250	○	○	○	○	○	○	
				80	95			DC	5	50		○	○	○	○	○	
EYP1BF168	F168	168	163^{+4}_{-2}	120	135	200		AC	2	125		○	○	○	○	○	(Under examination)
				120	142			AC	1	250	○	○	○	○	○	○	
				95	110			DC	5	50		○	○	○	○	○	

Note: For long lead types add the letter "L" at the end of the part number.
(Approved Safety Standards File No. UL:E60271, CSA:LR60271, VDE: 4811.6-1171-003, BEAB:C1065, CCC:2002010205004248)

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
Should a safety concern arise regarding this product, please be sure to contact us immediately.

● E series

Part No.	Type No. of Approved Standards	Rated Functioning Temp.*1 (°C)	Functioning Temp.*2 (°C)	Maximum Operating Temp.*3 (°C)	Holding Temp.*4 (°C)	Maximum Temp. Limit (°C)*5		Electrical Rating			Approved Safety Standards						RoHS
						UL,VDE, BEAB CCC	CSA	AC/ DC	Amp. (A)	Volt. (V)	PS E	UL	CSA	VDE	BEAB	CCC	
EYP05BE102	E102	102	98±2	70	78	200	150	AC	1.5	125		○	○	○	○	○	(Under examination)
				75	80			AC	0.5	250	○	○	○	○	○	○	
				65	70			DC	3	50		○	○	○	○	○	
EYP05BE115	E115	115	110±2	76	93	200	150	AC	1.5	125		○	○	○	○	○	○
				80	95			AC	0.5	250	○	○	○	○	○	○	
				70	84			DC	3	50		○	○	○	○	○	
EYP05BE130	E130	130	126±2	90	112	200	180	AC	1.5	125		○	○	○	○	○	(Under examination)
				94	112			AC	0.5	250	○	○	○	○	○	○	
				83	102			DC	3	50		○	○	○	○	○	
				70	81			DC	5	50		○	○	○	○	○	
EYP05BE133	E133	133	128±2	92	115	200	180	AC	1.5	125		○	○	○	○	○	(Under examination)
				96	115			AC	0.5	250	○	○	○	○	○	○	
				85	105			DC	3	50		○	○	○	○	○	
EYP05BE139	E139	139	135±2	99	120	200	180	AC	1.5	125		○	○	○	○	○	(Under examination)
				103	120			AC	0.5	250	○	○	○	○	○	○	
				92	110			DC	3	50		○	○	○	○	○	
				80	90			DC	5	50		○	—	—	—	—	
EYP05BE145	E145	145	141±2	105	125	200	—	AC	1.5	125		○	—	○	○	○	○
				110	125			AC	0.5	250	○	○	—	○	○	○	
				80	95			DC	5	50		○	—	○	○	○	

Note: For long lead types add the letter "L" at the end of the part number.
(Approved Safety Standards File No. UL:E60271, CSA:LR60271, VDE: 4811.6-1171-002, BEAB:C1066, CCC:2002010205004246)

● H series

Part No.	Type No. of Approved Standards	Rated Functioning Temp.*1 (°C)	Functioning Temp.*2 (°C)	Maximum Operating Temp.*3 (°C)	Holding Temp.*4 (°C)	Maximum Temp. Limit (°C)*5		Electrical Rating			Approved Safety Standards						RoHS
						UL,VDE, BEAB CCC	CSA	AC/ DC	Amp. (A)	Volt. (V)	PS E	UL	CSA	VDE	BEAB	CCC	
EYP2BH102	H102	102	98±2	70	74	200	200	AC	3	125		○	○	○	○	○	(Under examination)
				75	76			AC	2	250	○	○	○	○	○	○	
				65	70			DC	3.5	50		○	○	○	○	○	
EYP2BH115	H115	115	110±2	76	86	200	200	AC	3	125		○	○	○	○	○	○
				80	90			AC	2	250	○	○	○	○	○	○	
				74	84			DC	3.5	50		○	○	○	○	○	
EYP2BH130	H130	130	126±2	90	105	200	200	AC	3	125		○	○	○	○	○	(Under examination)
				94	105			AC	2	250	○	○	○	○	○	○	
				86	100			DC	3.5	50		○	○	○	○	○	
EYP2BH133	H133	133	128±2	92	108	200	200	AC	3	125		○	○	○	○	○	(Under examination)
				96	108			AC	2	250	○	○	○	○	○	○	
				88	102			DC	3.5	50		○	○	○	○	○	
EYP2BH139	H139	139	135±2	99	115	200	200	AC	3	125		○	○	○	○	○	(Under examination)
				103	115			AC	2	250	○	○	○	○	○	○	
				95	107			DC	3.5	50		○	○	○	○	○	
EYP2BH168	H168	168	163^{+3}_{-2}	120	135	200	200	AC	3	125		○	○	○	○	○	(Under examination)
				120	142			AC	2	250	○	—	○	○	○	○	
				120	135			DC	3.5	50		○	○	○	○	○	

(Approved Safety Standards File No. UL:E60271, CSA:LR60271, VDE: 4811.6-1171-004, BEAB:C1067, CCC:2002010205004245)

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
Should a safety concern arise regarding this product, please be sure to contact us immediately.

● ML series

Part No.	Type No. of Approved Standards	Rated Functioning Temp.*1 (°C)	Functioning Temp.*2 (°C)	Maximum Operating Temp.*3 (°C)	Holding Temp.*4 (°C)	Maximum Temp. Limit (°C)*5	Electrical Rating			Approved Safety Standards			RoHS
							AC/DC	Amp. (A)	Volt. (V)	UL	VDE	CCC	
EYP2ML092	ML092	92	89±2	55	60	135	DC	2	50	○	○	○	—
EYP2ML092U	—	92	89^{+3}_{-4}	55	60	135	DC	2	50	Under Application	Under Application	Under Application	○
EYP2ML098	ML098	98	94±2	60	65	135	DC	2	50	○	○	○	—
EYP2ML098U	—	98	$94^{+3}_{-2.5}$	60	65	135	DC	2	50	Under Application	Under Application	Under Application	○
EYP2ML102	ML102	102	98±2	65	70	135	DC	2	50	○	○	○	—
EYP2ML102U	—	102	$98^{+3}_{-2.5}$	65	70	135	DC	2	50	Under Application	Under Application	Under Application	○

(Approved Safety Standards File No. UL:E60271, VDE: 4811.6-1171-004, CCC:2003010205034615), Last letter "U" of part number means Pb-free product.

● MU series

Part No.	Type No. of Approved Standards	Rated Functioning Temp.*1 (°C)	Functioning Temp.*2 (°C)	Maximum Operating Temp.*3 (°C)	Holding Temp.*4 (°C)	Maximum Temp. Limit (°C)*5	Electrical Rating			Approved Safety Standards			RoHS
							AC/DC	Amp. (A)	Volt. (V)	UL	VDE	CCC	
EYP4MU092X	MU092X	92	89±2	55	55	150	DC	4	50	○	○	○	(Under examination)

(Approved Safety Standards File No. UL:E60271, VDE: 4811.6-1171-009, CCC:2003010205034614)

*1 Rated Functioning Temperature (UL: TF, CSA,VDE, BEAB, CCC: Tf)
The temperature at which a TCO changes its state of conductivity to open circuit with loading detection current only.
Tolerance; Pb ; ±7 °C
UL,CSA,VDE, BEAB, CCC; $^{0}_{-10}$ °C

*2 Functioning Temperature (Fusing-off temperature)
The functioning temperature at which a TCO changes its state of conductivity to open circuit in the ambient air oven which increases temperature by 1 °C per minute and with loading the detective current 0.1 A or less.

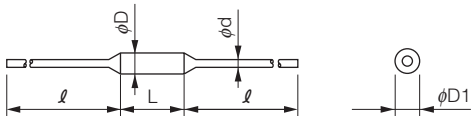
*3 Maximum Operating Temperature.
The maximum temperature at which a TCO can be maintained while conducting rated current for 3000 h (N, F, E, H series) or 1000 h (ML, MU series) For details please refer to specification.

*4 Holding Temperature (UL: TH, CSA: Th, VDE, BEAB, CCC: Tc)
The maximum temperature at which a TCO can be maintained while conducting rated current for 168 h which will not cause a change in state of conductivity to open circuit.

*5 Maximum Temperature Limit (UL: TM, CSA,VDE, BEAB, CCC: Tm)
The maximum temperature at which a TCO can maintains its mechanical and electrical properties without closing again for 10 minutes after a TCO has changed its state of conductivity.

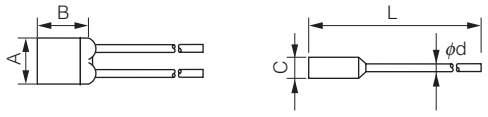
■ Dimensions in mm (not to scale)

● Axial lead type



	Dimensions (mm)				
	L	φD	φD1	ℓ	φd
N Series	9.0±1.0	2.5±0.2	3 max.	38±3 (*78±3)	0.60±0.05
F Series	6.0±1.0	$1.85^{+0.20}_{-0.15}$	2.2 max.	38±3 (*68±3)	0.53±0.02
E Series	5.0±0.5	1.5±0.1	1.8 max.	38±3 (*68±3)	0.53±0.02

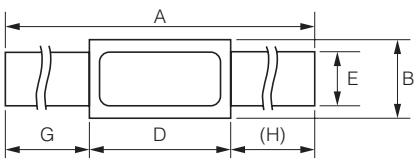
● Radial lead type

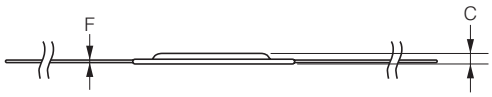


	Dimensions (mm)				
	A	B	C	L	φd
H Series	5.0±0.5	4.0±0.5	2.2±0.3	55±3	0.53±0.02

(*) Long lead type

● Thin type





	Dimensions (mm)							
	A	B	C	D	E	F	G	(H)
ML Series	25.0±0.5	3.2±0.3	0.65±0.15	4.5±0.5	3.0±0.2	0.10±0.02	10.25±0.50	(10.25)
MU Series	26.5±0.5	4.5±0.4	1.00±0.15	$11.0^{+0.6}_{-0.4}$	3.0±0.2	0.15±0.02	7.7±0.5	(7.7)

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
Should a safety concern arise regarding this product, please be sure to contact us immediately.

■ Marking

The following items are indicated on TCO.

- N, F, E, H Series : Type No., Date Code, M Mark(Ⓜ), <PS>E Mark, Rated Functioning Temperature, Rated Current
- ML, MU Series : Type No., Date Code, M Mark(Ⓜ)

■ Packaging Methods

Part No.	Standard Quantity	Style	Mass (Weight) [mg/pc.]
EYP2BN□□□	2000 pcs./Box	Bulk	340
EYP2BN□□□L	2000 pcs./Box		510
EYP1BF□□□	3000 pcs./Box		220
EYP1BF□□□L	4000 pcs./Box		330
EYP05BE□□□	4000 pcs./Box		210
EYP05BE□□□L	5000 pcs./Box		320
EYP2BH□□□	1500 pcs./Box		350
EYP2ML□□□□	2000 pcs./Box		68
EYP4MU□□□□	1000 pcs./Box		150

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
Should a safety concern arise regarding this product, please be sure to contact us immediately.

⚠Safety Precautions (Handling Precautions)

The following are precautions for individual products. Please also refer to the precautions common to CR Combinations, Fuses, and Sensors shown on page EX3 of this catalog.

● Design Applications

1. Use the TCO within their specified temperature and electrical ratings.
   1) Use the TCO under the maximum operating temperature specified in the individual specification.
      Using the TCO under a higher temperature than the maximum operating temperature may cause premature opening or opening delay.
      • When the TCO is continuously used at the temperature close to the functioning temperature, the TCO may operate while being used.
      • When the TCO is continuously used at the temperature higher than the maximum operation temperature, the TCO may be degraded and may not operate normally at the specified temperature.
   2) The holding temperature is defined as the highest temperature at which the TCO is activated continuously at the rated current for 168 hours. The TCO can not be used over 168 hours exceeding the holding temperature.
   3) Equipment should be designed so that its over shoot does not exceed the maximum temperature limit after the TCO operates.
   4) If the TCO is activated by voltage higher than the rated voltage or current higher than the rated current, the TCO produces excessive heat, resulting in premature opening. The arc generated at this condition of operation will result in an abnormality of appearance (crack on body) and insufficient insulation.
      • When TCO is operated in an abnormal mode while the rated voltage and/or the rated current being exceeded, it may not cut off the circuit .
   5) Where transient overload is expected to be applied, repeat the tests under the worst conditions.
   6) The TCO cannot be used as a current sensitive fuse.
2. To fully use the function of the TCO, a suitable TCO for each equipment application must be selected.
   1) Tests should be repeated for the finished equipment to confirm that the TCO does operate as expected.
   2) To improve thermal response of the TCO, put the main body of the TCO and the lead wires(terminals) as close to the heat source as possible and the place where the TCO is evenly heated.
      If the temperatures transferred to the main body and to the lead wires(terminals) are largely different from each other, improper operation can be expected, causing arcing and deterioration of insulation.
3. Avoid application of excessive vibration and mechanical stress to the TCO. Otherwise, failure of the fusible alloy or lead wires, or damage to the main body may result.
4. When sealing the TCO with resin, select a resin that does not corrode the seals or the lead wires(terminals). When sealing the overall TCO with resin, determine the fixing conditions by repeating the test using your final product to check whether or not the resin properties (e.g. expansion, contraction, and curing temperature) affect the TCO and whether or not the TCO can operate normally.
5. When immersing equipment with a TCO in varnish or solvent and then drying it, repeat the test to check whether or not the varnish or solvent used dissolved the coating of the TCO or caused damage, such as cracks, before performing the treatment again.
6. Do not use under the following environments.
   1) In liquids such as water, oil, chemical and organic solvents
   2) In direct sunlight, outdoors or in dusty atmospheres
   3) In places where water condensation occurs
   ✻ Use in the following environments may affect the performance of the TCO; Verify performance and reliability before production use.
   (1) In places full of corrosive gases such as sea breeze, Cl_2, H_2S, NH_3, SO_2 and NO_2
   (2) In environments with high static electricity and/or strong electromagnetic waves.
7. Do not use the TCO in aerospace equipment, atomic energy equipment, military weapons, life saving equipment, etc.

● Instruction

1. Forming and Cutting
   1) Lead wires(terminals) are to be bent or cut at least 3 mm away from the TCO seals to avoid damaging the TCO . (axial / radial type) or body (thin type). The TCO seals (axial / radial type) shall not be grasped with any tools or holders. Terminals of thin type TCO are to be grasped before they are bent . (See Fig.1)
   2) The lead wires and terminals shall not be nicked, fractured or burned.
      The body and/or seals must not be damaged, burned or overheated.
   3) It is recommended that experimental assembly trials, should be done so that it can be verified that manufacturing procedures will not exceed the maximum tested "pull" and "push" forces of 20 N (ML series:5 N, MU series:10 N) and 5 N respectively on the lead wires (terminals), or induce excessive twisting or the like.

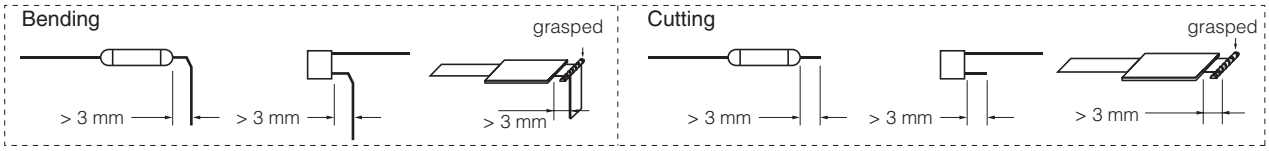


Fig-1

2. Soldering, Welding, Calking
   1) Lead wires are to be soldered with the standard conditions shown in Table 1.
      Excessive soldering heat and soldering time may cause damage to a TCO.
      If higher temperature, longer time or shorter lead length exist rather than the conditions of Table 1 ,it is recommended to run tests for finding the soldering conditions that do not damage the TCO. Also, use of tools such as pliers are recommended to dissipate the soldering heat by grasping lead wires between the TCO body and soldering point.
   2) Avoid preheating and gradual cooling as much as possible. However if preheating and gradual cooling is done, set the process conditions after confirming that the TCO is not affected by these procedures.
   3) Do not use reflow soldering.
   4) Thin type (ML, MU series) is not to be soldered.
   5) If water or solvent is used for cleaning flux after soldering, check and confirm the reliability of the agent.
   6) Lead wires are to be clamped at least 3 mm away from the seals.
      Improper connections may cause damage to the seals or other parts and may result in nuisance tripping of the devices due to the generation of excessive heat at a faulty high resistance junction.
   7) Set the conditions for welding and calking only after checking contact resistance and connection strength.
   8) When resoldering or rewelding, cool the TCO under room conditions.
   9) When the TCO is heated by soldering or welding, be careful not to pull, push or twist the TCO lead wires.

Table-1 Soldering Conditions

Temperature of Soldering: 300 °C Time: 3 s					● Soldering point ℓ ℓ
Lead Length (ℓ)	Type No.				
25 mm	N082, N088	F102	E102, E115	H102, H115	
20 mm	N098, N109 N110	F115, F130 F133, F139	E130, E133 E139, E145	H130, H133 H139	
15 mm	N124, N126 N135, N143	F168		H168	
10 mm	N163				

3. The use of sufficiently flexible, appropriate free length and proper size wire should be used for splice connection. Connection including connectors used for splicing shall be of the low resistance type, and they shall be made mechanically secure.
4. Where the lead wires of the TCO is tied with string, put them at least 10 mm apart from the seals of the main body of the TCO.
5. Quality control notes.
   1) Measurement of resistance between lead wires (terminals) and checking of the internal status with X-rays are effective means to confirm the status of the TCO on delivery and after mounting in the equipment.
6. Storage method
   1) Store the TCO in packing cases or in polyethylene bags within the temperature range -10 °C to +40 °C and RH of 30 % to 75 %. Store them at a location where no rapid changes of temperature or humidity or no direct sunlight is applied. The location must also be free from vibration and shock .
   2) Avoid storage in places containing corrosive gases such as sea breeze, Cl_2, H_2S, NH_3, SO_2 and NO_2.
   3) The period of guarantee for performance such as solderability is for one year after our delivery; and this condition applies only in the case where the storage method specified in above has been followed.
7. Do not repair a TCO. Replace it with a new part.

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
Should a safety concern arise regarding this product, please be sure to contact us immediately.

⚠Safety Precautions (Common precautions for CR Combinations, Fuses, and Sensors)

- When using our products, no matter what sort of equipment they might be used for, be sure to make a written agreement on the specifications with us in advance. The design and specifications in this catalog are subject to change without prior notice.
- Do not use the products beyond the specifications described in this catalog.
- This catalog explains the quality and performance of the products as individual components. Before use, check and evaluate their operations when installed in your products.
- Install the following systems for a failsafe design to ensure safety if these products are to be used in equipment where a defect in these products may cause the loss of human life or other significant damage, such as damage to vehicles (automobile, train, vessel), traffic lights, medical equipment, aerospace equipment, electric heating appliances, combustion/gas equipment, rotating equipment, and disaster/crime prevention equipment.

✻ Systems equipped with a protection circuit and a protection device
✻ Systems equipped with a redundant circuit or other system to prevent an unsafe status in the event of a single fault

(1) Precautions for use

- These products are designed and manufactured for general and standard use in general electronic equipment (e.g. AV equipment, home electric appliances, office equipment, information and communication equipment)
- These products are not intended for use in the following special conditions. Before using the products, carefully check the effects on their quality and performance, and determine whether or not they can be used.
  1. In liquid, such as water, oil, chemicals, or organic solvent
  2. In direct sunlight, outdoors, or in dust
  3. In salty air or air with a high concentration of corrosive gas, such as Cl_2, H_2S, NH_3, SO_2, or NO_2
  4. In an environment where strong static electricity or electromagnetic waves exist
  5. In an environment where these products cause dew condensation
  6. Sealing or coating of these products or a printed circuit board on which these products are mounted, with resin or other materials
- These products generate Joule heat when energized. Carefully position these products so that their heat will not affect the other components.
- Carefully position these products so that their temperatures will not exceed the category temperature range due to the effects of neighboring heat-generating components. Do not mount or place heat-generating components or inflammables, such as vinyl-coated wires, near these products (except Thermal Cutoffs).
- Note that non-cleaning solder, halogen-based highly active flux, or water-soluble flux may deteriorate the performance or reliability of the products.
- Carefully select a flux cleaning agent for use after soldering. An unsuitable agent may deteriorate the performance or reliability. In particular, when using water or a water-soluble cleaning agent, be careful not to leave water residues. Otherwise, the insulation performance may be deteriorated.

(2) Precautions for storage

The performance of these products, including the solderability, is guaranteed for a year from the date of arrival at your company, provided that they remain packed as they were when delivered and stored at a temperature of 5 °C to 35 °C and a relative humidity of 45 % to 85 %.
The performance of Combinations(EMI Filters) is guaranteed for 6 months or a year from the outgoing inspection date indicated on the packages, provided that they are stored at a temperature of -5 °C to +40 °C and a relative humidity of 40 % to 60 %. Check the guarantee period in the specifications. The performance of Thermal Cutoffs is guaranteed for a year from the outgoing inspection date indicated on the packages, provided that they are stored at a temperature of -10 °C to +40 °C and a relative humidity of 30 % to 75 %.

Even within the above guarantee periods, do not store these products in the following conditions. Otherwise, their electrical performance and/or solderability may be deteriorated, and the packaging materials (e.g. taping materials) may be deformed or deteriorated, resulting in mounting failures.

1. In salty air or in air with a high concentration of corrosive gas, such as Cl_2, H_2S, NH_3, SO_2, or NO_2
2. In direct sunlight

<Package markings>
Package markings include the product number, quantity, and country of origin.
In principle, the country of origin should be indicated in English.