PTC thermistors

Point level sensors, Glass-encapsulated, oil level sensing

Series/Type:	**E11-P 430**
Ordering code:	**B59011E0160A040**
Date:	2025-11-06
Version:	b

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Applications

Liquid level detection, e.g. for overflow protection in oil tanks

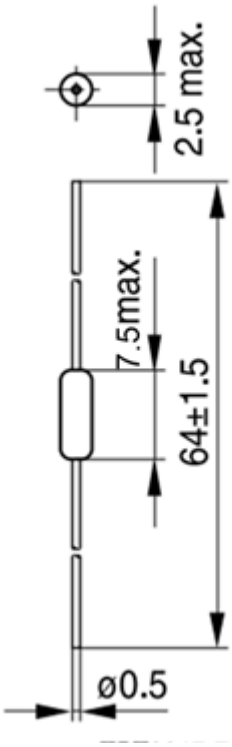
Features

- Hermetically sealed glass case
- Marked with manufacturer's logo, type designation and date code
  Example: E 11 W 9 E 11 = Type, W = 2008, 9 = September (IEC 60062)
- Solderability complies with IEC 60068-2-20
- RoHS compatible

Delivery mode

Bulk (packed in static shielding bag)

Dimensional drawing



General technical data

Max. operating voltage		V_{max}	25	V DC
Rated resistance		R_{25}	140 ±60	Ω
Pressure test		P	4	bar
Operating temperature range	(V=0 V)	T_{op}	-55/+100	°C
Operating temperature range	(V=25 V)	T_{op}	-25/+60	°C
Number of cycles	(R_S = 100 Ω)	N	≥ 5000	
Residual current in oil	(V = 12 V, TA = 50 °C)	Ir,oil	≥ 45	mA
Residual current in oil	(V = 14 V, TA = -25 °C)	Ir,air	≤ 33.5	mA
Switching time		t_s	2	s
Settling time		t_E	40	s
Surface temperature	(V=25 V)	T_{surf}	< 200	°C

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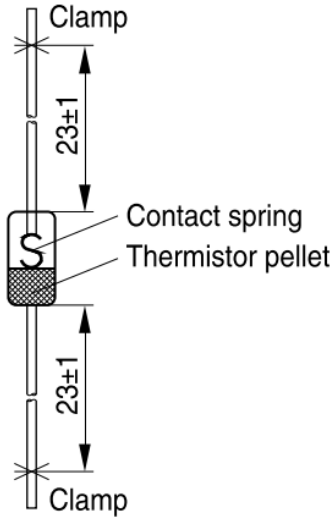
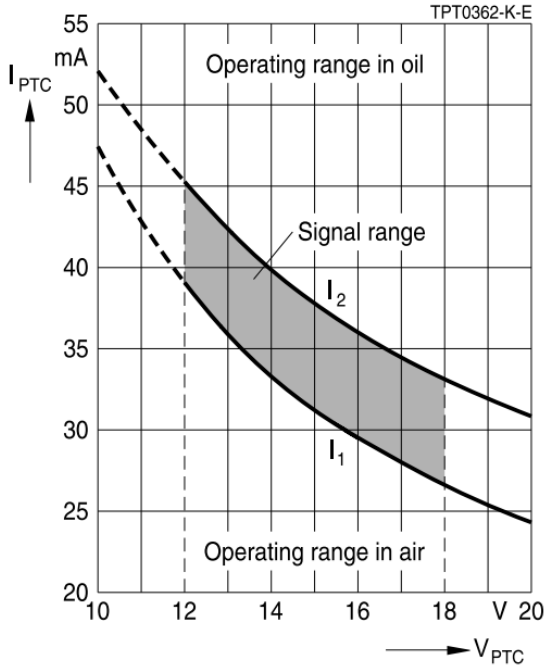
Test setup

- Unclipped leads, held at the ends by clamps
- Sensor in vertical position
- Distance of clamping point to body: min. 22 mm
- Pellet points downwards
- Settling time after application of voltage: min. 40 s



TPT0024-P-E

Limits of operating range



Reliability data

Test	Standard	Test conditions	$I\Delta R_{25}/R_{25}I$
Electrical endurance, cycling		V = 19 V, RS = 100 Ω T_{air} = 25 °C, T_{oil} = 50 °C Number of cycles: 5000	< 25%
Electrical endurance, constant	IEC 60738-1	Storage at V_{max} and $T_{op,max}$ (@V_{max}) Test duration: 1000 h	< 25%
Damp heat	IEC 60738-1	Temperature of air: 40 °C Relative humidity of air: 93% Duration: 56 days Test according to IEC 60068-2-78	< 10%
Rapid change of temperature	IEC 60738-1	$T_1 = T_{op,min}$ (0 V), $T_2 = T_{op,max}$ (0 V) Number of cycles: 5 Test duration: 30 min Test according to IEC 60068-2-14, Test Na	< 25%
Vibration	IEC 60738-1	Frequency range: 10 to 55 Hz Displacement amplitude: 0.75 mm Test duration: 3 x 2 h Test according to IEC 60068-2-6, Test Fc	< 5%

Cautions and warnings

General

- TDK Electronics thermistors are designed for specific applications and should not be used for purposes not identified in our specifications, application notes and data books unless otherwise agreed with TDK Electronics during the design-in-phase.
- Ensure suitability of thermistor through reliability testing during the design-in phase. The thermistors should be evaluated taking into consideration worst-case conditions.

Storage

- Store thermistors only in original packaging. Do not open the package prior to processing.
- Storage conditions in original packaging: storage temperature -25 °C ... +45 °C, relative humidity ≤ 75% annual mean, maximum 95%, dew precipitation is inadmissible.
- Avoid contamination of thermistors surface during storage, handling and processing.
- Avoid storage of thermistor in harmful environment with effect on function on long-term operation (examples given under operation precautions).
- Use thermistor within the following period after delivery:
  - Through-hole devices (housed and leaded PTCs): 24 months
  - Motor protection sensors, glass-encapsulated sensors and probe assemblies: 24 months
  - Telecom pair and quattro protectors (TPP, TQP): 24 months
  - Leadless PTC thermistors for pressure contacting: 12 months
  - Leadless PTC thermistors for soldering: 6 months
  - SMDs in EIA sizes 3225 and 4032, and for PTCs with metal tags: 24 months
  - SMDs in EIA sizes 1210 and smaller: 12 months

Handling

- PTCs must not be dropped. Chip-offs must not be caused during handling of PTCs.
- The ceramic and metallization of the components must not be touched with bare hands. Gloves are recommended.
- Avoid contamination of thermistor surface during handling.

Soldering (where applicable)

- Use rosin-type flux or non-activated flux.
- Insufficient preheating may cause ceramic cracks.
- Rapid cooling by dipping in solvent is not recommended.
- Complete removal of flux is recommended.
- Standard PTC heaters are not suitable for soldering.

Mounting

- Electrode must not be scratched before/during/after the mounting process.
- Contacts and housing used for assembly with thermistor have to be clean before mounting. Especially grease or oil must be removed.
- When PTC thermistors are encapsulated with sealing material, the precautions given in chapter "Mounting instructions", "Sealing and potting" must be observed.
- When the thermistor is mounted, there must not be any foreign body between the electrode of the thermistor and the clamping contact.
- The minimum force and pressure of the clamping contacts pressing against the PTC must be 10 N and 50 kPa, respectively. In case the assembly is exposed to mechanical shock and/ or vibration this force should be higher in order to avoid movement of the PTC during operation.
- During operation, the thermistor's surface temperature can be very high. Ensure that adjacent components are placed at a sufficient distance from the thermistor to allow for proper cooling at the thermistors.
- Ensure that adjacent materials are designed for operation at temperatures comparable to the surface temperature of thermistor. Be sure that surrounding parts and materials can withstand this temperature.
- Avoid contamination of thermistor surface during processing.

Operation

- Use thermistors only within the specified temperature operating range.
- Use thermistors only within the specified voltage and current ranges.
- Environmental conditions must not harm the thermistors. Use thermistors only in normal atmospheric conditions. Avoid use in deoxidizing gases (chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas etc.), corrosive agents, humid or salty conditions. Contact with any liquids and solvents should be prevented.
- Be sure to provide an appropriate fail-safe function to prevent secondary product damage caused by abnormal function (e.g. use VDR for limitation of overvoltage condition).

This listing does not claim to be complete but merely reflects the experience of TDK Electronics AG.

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Important notes

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