

## Overview

The TRS™ Series Thermal Reed Switch is a highly reliable, precise temperature-sensitive switch ideal for energy conservation. The TRS Series is composed of a magnet and a temperature-sensing soft ferromagnetic substance called Thermorite®. The material's magnetic flux density decreases as the temperature increases, turning it into a paramagnetic substance at its Curie temperature. The TRS Series has also been attested by the International Relay Association.

## Applications

Typical applications include temperature detection and overheat monitoring of electric appliances, heat-retention heater control for rice cookers, defrost for air conditioners and vending machines, roll heater temperature control for copying machines, radiator water temperature detection for automotive electric fan control.

## Benefits

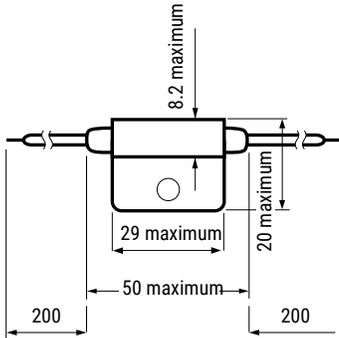
- High reliability
- Long operational life
- Excellent temperature accuracy of  $\pm 2.5^{\circ}\text{C}$
- Wide range of operating temperatures available from  $+50^{\circ}\text{C}$  to  $+130^{\circ}\text{C}$
- Excellent environmental durability



## Ordering Information

TRS	5-	50	B	LR	V	U
Series	Reed Switch Type	Operating Temperature ( $^{\circ}\text{C}$ )	Contact Type	Shape Classification	Rated Voltage (VDC)	Approvals
TRS	5	50 60 70 80 90 100 110 120 130	B = Break	LR = L type with Tin	Blank = 100 V = 200	U = UL and CSA approved

## Dimensions in mm



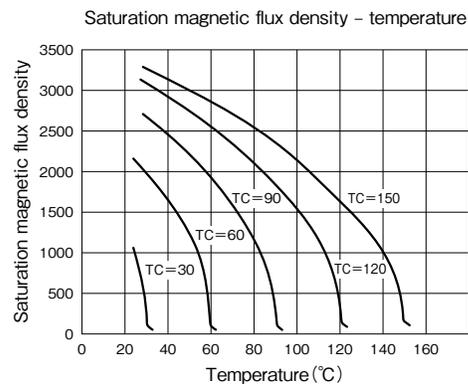
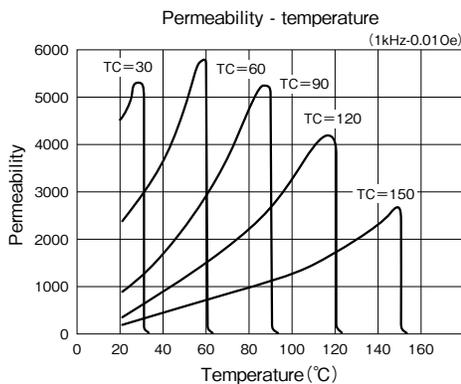
## Structures and Principles of Operation

Thermal Reed Switches (TRS) are temperature-sensing switches composed of a magnet and a temperature-sensing soft ferromagnetic substance called Thermorite. This material's saturation magnetic flux density decreases as the temperature increases, and it turns into a paramagnetic substance at its Curie temperature.

### Thermorite Properties

- Thermorite changes its magnetic property rapidly at its Curie temperature, providing quick response times.
- The Curie temperature of Thermorite does not vary with time, as it is based on a compounding ratio.
- Thermorite is stable against moisture and hazardous gas.

Thermal property of Thermorite

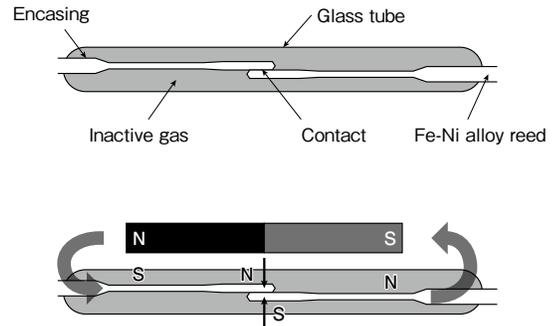


TC=Curie temperature

## Structures and Principles of Operation cont'd

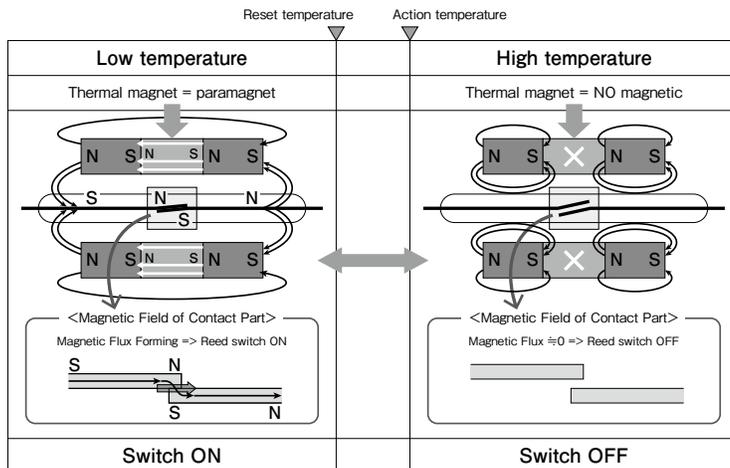
### Reed Switch Structure

- The reed switch is a contact switch comprised of a pair of Fe-Ni alloy reeds encased in a glass tube with inactive gas. The reeds are switched on or off by the magnetic field of a permanent magnet or magnet coil.
- The reeds in the glass tube become magnetized from the magnetic field, allowing the two reeds to make contact and connect (switch on). When the magnetic field disappears, the reeds separate and disconnect (switch off).
- The glass encasement of the reeds ensures high environmental resistance and a long operational life.



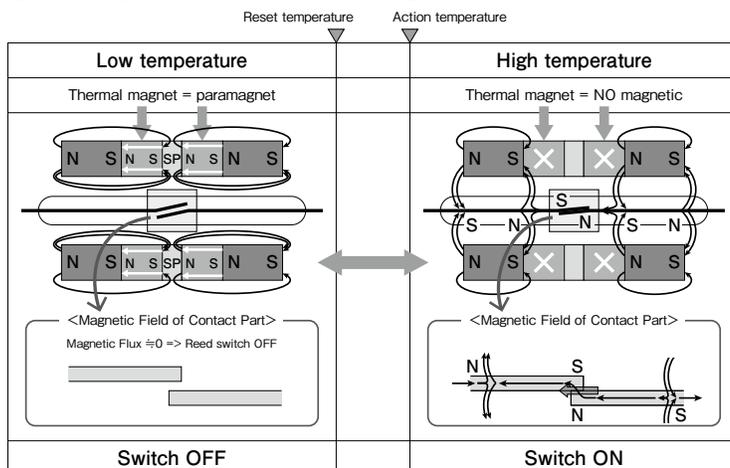
### TRS principle: Break (B) type

(■: Permanent magnet ■: Thermorite® ■: Reed switch contact area)



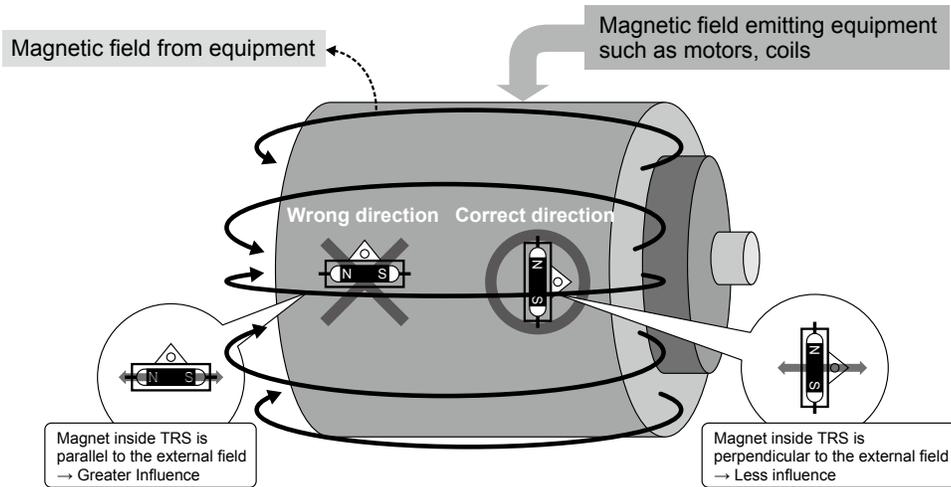
### TRS principle: Make (M) type

(■: Permanent magnet ■: Thermorite® ■: Gapspace (SP) ■: Reed switch contact area)

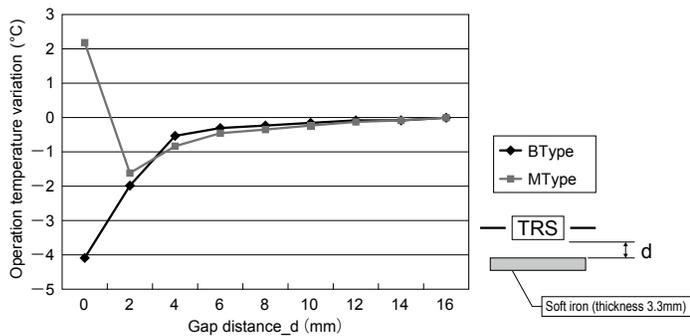


## External Magnetic Field

### TRS installation in external magnetic field



### Ferromagnetic material influence



## Environmental Compliance

All TRS sensors are RoHS compliant.



RoHS Compliant

## Temperature Characteristics

Operating Temperature Range (°C)	Operating Temperature Precision (°C) <sup>1</sup>	Differential Temperature (°C) <sup>2</sup>
50 – 130	+/-2.5	10 maximum

<sup>1</sup> Operating temperature precision does not include measurement error.

<sup>2</sup> The differential temperature is also referred to as the hysteresis temperature on thermal sensors.

### Table 1 – Ratings & Part Number Reference

Part Number	Operating Temp. (°C)	Voltage (VDC)	Maximum Opening/ Closing Voltage (V)	Maximum Opening/ Closing Current (A)	Maximum Opening/ Closing Power (W)	Maximum Make/Break Current (A)	Maximum Make/Break Voltage (VAC)	Maximum Make/Break Power (W)
TRS5-50BLR U	50	100	140 AC/200 DC	0.55 AC/DC	60.5 AC/10 DC	0.5	140	50 AC
TRS5-60BLR U	60	100	140 AC/200 DC	0.55 AC/DC	60.5 AC/10 DC	0.5	140	50 AC
TRS5-70BLR U	70	100	140 AC/200 DC	0.55 AC/DC	60.5 AC/10 DC	0.5	140	50 AC
TRS5-80BLR U	80	100	140 AC/200 DC	0.55 AC/DC	60.5 AC/10 DC	0.5	140	50 AC
TRS5-90BLR U	90	100	140 AC/200 DC	0.55 AC/DC	60.5 AC/10 DC	0.5	140	50 AC
TRS5-100BLR U	100	100	140 AC/200 DC	0.55 AC/DC	60.5 AC/10 DC	0.5	140	50 AC
TRS5-110BLR U	110	100	140 AC/200 DC	0.55 AC/DC	60.5 AC/10 DC	0.5	140	50 AC
TRS5-120BLR U	120	100	140 AC/200 DC	0.55 AC/DC	60.5 AC/10 DC	0.5	140	50 AC
TRS5-130BLR U	130	100	140 AC/200 DC	0.55 AC/DC	60.5 AC/10 DC	0.5	140	50 AC
TRS5-50BLR VU	50	200	264 AC	0.275 AC	60.5 AC	0.275	264	60.5 AC
TRS5-60BLR VU	60	200	264 AC	0.275 AC	60.5 AC	0.275	264	60.5 AC
TRS5-70BLR VU	70	200	264 AC	0.275 AC	60.5 AC	0.275	264	60.5 AC
TRS5-80BLR VU	80	200	264 AC	0.275 AC	60.5 AC	0.275	264	60.5 AC
TRS5-90BLR VU	90	200	264 AC	0.275 AC	60.5 AC	0.275	264	60.5 AC
TRS5-100BLR VU	100	200	264 AC	0.275 AC	60.5 AC	0.275	264	60.5 AC
TRS5-110BLR VU	110	200	264 AC	0.275 AC	60.5 AC	0.275	264	60.5 AC
TRS5-120BLR VU	120	200	264 AC	0.275 AC	60.5 AC	0.275	264	60.5 AC
TRS5-130BLR VU	130	200	264 AC	0.275 AC	60.5 AC	0.275	264	60.5 AC

## Precautions

### Before Using Thermal Reed Switch

- Please read specifications and check the content thoroughly before the actual use.
- Contact KEMET before deciding your specs.
- Do NOT use in close proximity to strong magnetic parts.
- Do NOT use if dropped or severely shocked.
- Do NOT use with a greater load than specified.
- Avoid stress (especially torsion) in case of additional processing.
- Thermal Reed Switches have a specific resonance frequency. Please contact a KEMET representative if an oscillation is added.

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