
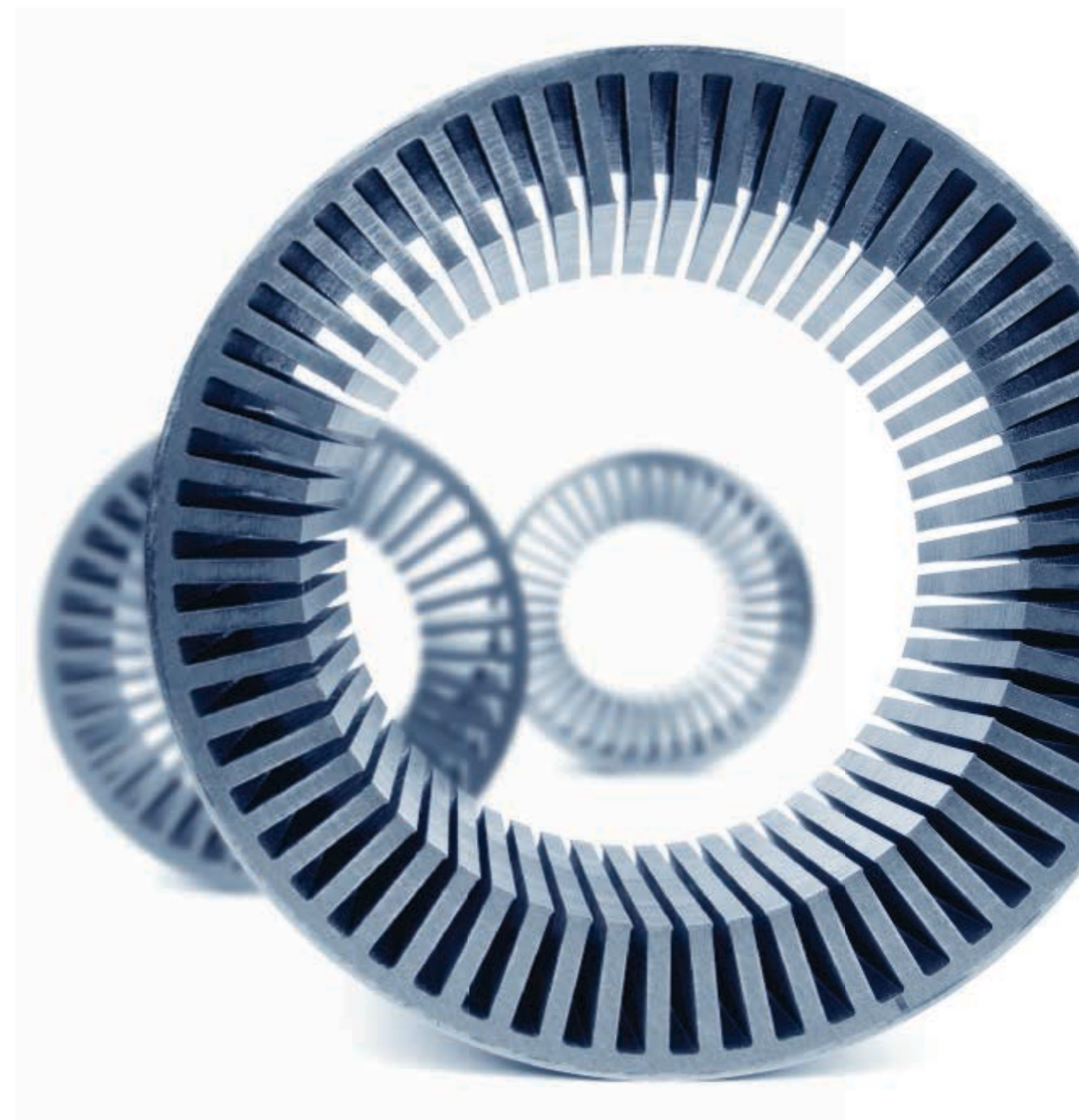




Slot Resistance Thermometers



A complete solution
for temperature sensing
of electrical rotary
machines



Simplex (Single element) Slot Resistance Thermometers



Product Overview

The Stator winding temperature detector (RTD) are used to measure winding temperature of large Motors, Generators etc. These sensor are sandwiched between the windings of Motors/Generators.

Unlike on/off devices, It allows continuous measurement of winding temperature. The NEMA recognizes this kind of sensor as a standard protection for motor and generator insulation.

Normally, these RTDs are of wire wound and sensing element extends through out the length of the detector. These feature will provide average temperature reading. Normally six sensors are recommended for each motor, Two per Phase. This RTD are generally flat type in construction and are available in various sizes.

Main Features

- Slim dimensions to get inserted in between windings
- Bifilar design that prevents induction voltage resulting in measurement errors
- Resistance to shock, vibration and pressure
- Withstand of VPI(Vacuum Pressure Impregnation) Process
- High Dielectric Strength
- ATEX, IECEx, CSA approved Model available for equipment used in hazardous area

Specification

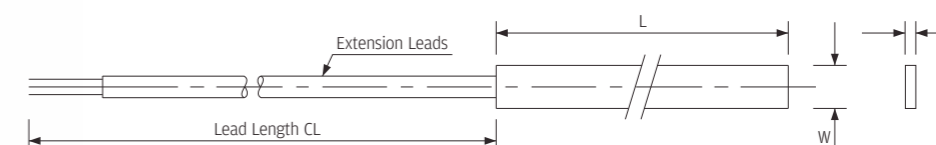
- Type: PT 100(100 ohm at 0°C)*
- Model: TSRE and TSRF
- Element: Single for TSRE series
Double for TSRF series
- Body Material: Fibre Glass epoxy
- Temperature Class: Class F(Temperature limit:155°C) or Class H(Temperature limit:180°C)
- Calibration Standard: IEC 60751
Temperature coefficient(TCR):0.003850
- Accuracy: Class A/B/2B
- Sensing current: 10mA maximum
- Dielectric strength: 3 KV 50/60 Hz for 1 minute between leads and surface of Glass epoxy body (5 KV design are available on request)
- Number of wire: Two or three or four
- Lead Wire: Single or multiple stranded with Tin/silver/Nickel plated copper wire with teflon or Polyamide insulation (special Lead wire and cable upon request). Please note that the selection of suitable wire gauge is depend up on the width and thickness of the sensor.

For Sizes & all other dimension please refer drawing.

*Note: Other values like PT-50,PT-200 and temperature coefficient of 0.003916 are available upon request. Custom design of sensors are also available upon request.

** Patent apply

Model: TSRE series (Single element)



MODEL: TSRE-ACC-L-T-W-NW-CL-WG-CC

ACC	Accuracy of RTD element (A/B/2B)
L	Length in mm
T	Thickness in mm
W	Width in mm
NW	Nos. of wires (option 2/3/4)
CL	Lead length in mm
WG	Wire Gauge of lead wires in AWG (option 22 to 28 AWG)
CC	Lead wire Construction (See table I)

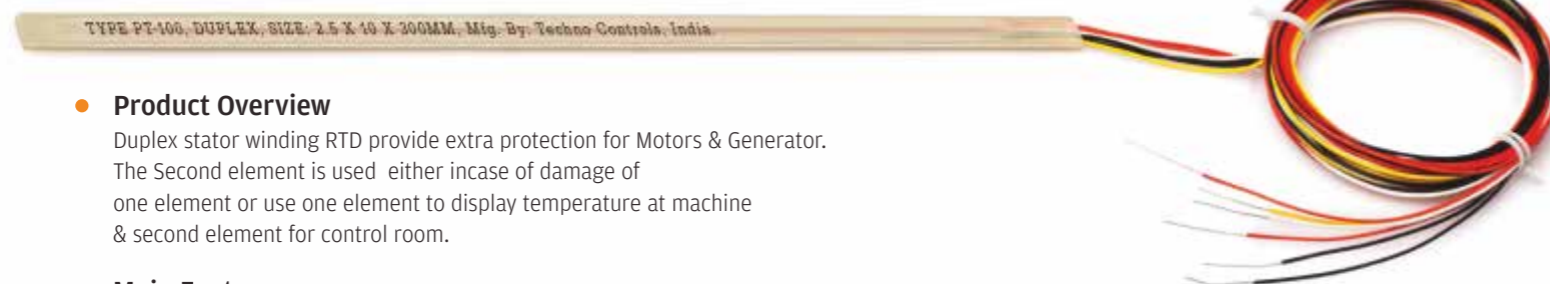
EXAMPLE (Part Number): TSRE-B-150-2-8-3-1000-24-X

DIMENSIONAL RANGE (IN MM)			
PARAMETER	MAX	MIN*	TOLERANCE
LENGTH (L)	600.0	45.0	+/- 5.0
THICKNESS (T)	4.5	2.0	+/-0.25
WIDTH (W)	30.0	6.0	+/-0.20
LEAD LENGTH (CL)	50000.0	1000.0	+50.0/-0.0

Cable Construction

TABLE 1	
DESCRIPTION	CODE
TWISTED TEFLON INSULATED / TEFLON JACKETED	X
FLAT TEFLON INSULATED LEADS (Without Jacket)	Y
FLAT POLYAMIDE INSULATED LEADS (Without Jacket)	Z
FLAT TEFLON INSULATED AND JACKETED	W
TWISTED TEFLON INSULATED /SHIELDED/ TEFLON JACKETED	R

Duplex (Double element) Slot Resistance Thermometers



Product Overview

Duplex stator winding RTD provide extra protection for Motors & Generator. The Second element is used either incase of damage of one element or use one element to display temperature at machine & second element for control room.

Main Features

- Slim dimensions to get inserted in between windings
- Bifilar design that prevents induction voltage resulting in measurement errors
- Resistance to shock, vibration and pressure
- Withstand of VPI(Vacuum Pressure Impregnation) Process
- High Dielectric Strength
- ATEX, IECEx, CSA approved Model available for equipment used in hazardous area

Specification

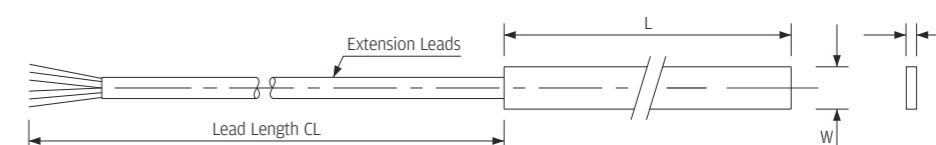
- Type: PT 100(100 ohm at 0°C)*
- Model: TSRF series
- Body Material: Fibre Glass epoxy
- Temperature Class: Class F (Temperature limit:155°C) or Class H (Temperature limit:180°C)
- Calibration Standard: IEC 60751
- Temperature coefficient (TCR): 0.003850
- Accuracy: Class A/B/2B
- Sensing current: 10mA maximum
- Dielectric strength: 3 KV/50Hz for 1 minute between leads and surface of Glass epoxy body (Increased dielectric strength up to 5 KV/50Hz for 1 minute upon request.)
- Lead Wire: 2/3/4 single or multiple stranded silver plated copper wire with PTFE or Polyamide insulation(special Lead wire and cable upon request).Please note that the selection of suitable wire gauge is depend up on the width and thickness of the sensor.

For Sizes & all other dimension please refer drawing.

*Note: Other values like PT-50,PT-200 and RTD with TCR value 0.003920 etc. are available upon request. Custom design of sensors are also available upon request.

** Patent apply

Model : TSRF series (Double Element)



MODEL: TSRF-ACC-L-T-W-NW-CL-WG-CC

ACC	Accuracy of RTD element (A/B/2B)
L	Length in mm
T	Thickness in mm
W	Width in mm
NW	Nos. of wires (option 2/3/4)
CL	Lead length in mm
WG	Wire Gauge of lead wires in AWG (option 22 to 28 AWG)
CC	Lead wire Construction (See table I)

EXAMPLE (Part Number): TSRF-B-150-2-8-2-1000-24-X

DIMENSIONAL RANGE (IN MM)			
PARAMETER	MAX	MIN*	TOLERANCE
LENGTH (L)	600.0	45.0	+/- 5.0
THICKNESS (T)	4.5	2.0	+/-0.3
WIDTH (W)	30.0	10.0	+/-0.3
LEAD LENGTH (CL)	50000.0	1000.0	+50.0/-0.0

Cable Construction

TABLE 1	
DESCRIPTION	CODE
TWISTED TEFLON INSULATED /TEFLON JACKETED	X
FLAT TEFLON INSULATED LEADS	Y
FLAT POLYAMIDE INSULATED LEADS	Z
FLAT TEFLON INSULATED AND JACKETED	W
TWISTED TEFLON INSULATED /SHIELDED/ TEFLON JACKETED	R



ATEX, IECEx & CSA approved Sensors

Slot Resistance Thermometer

Explosive Gas atmospheres

(Increased safety “e”, Intrinsically safe “ia”)

Ex II 2G Ex eb IIC Gb

Ex II 1G Ex ia IIC Ga



Ex ia IIC Ga

Ex eb IIC Gb

TC TSRC 2019-0001 11 2G Ex eb IIC Gb -50°C to 180°C Presafe 18 ATEX 12507U

Product Overview

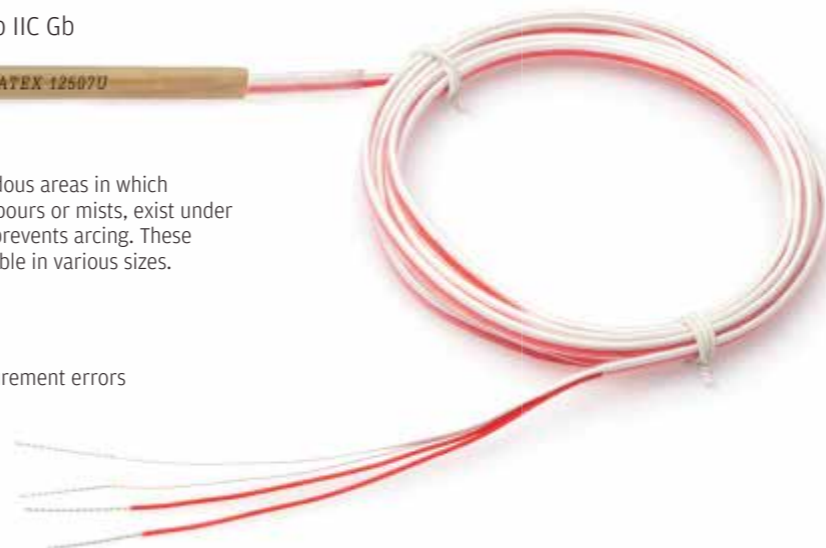
ATEX, IECEx & CSA approved sensors are intended for use in hazardous areas in which explosive gas atmospheres, caused by mixture of air and gases, vapours or mists, exist under normal atmospheric condition. Due to special design guidelines it prevents arcing. These certified RTDs are generally flat type in construction and are available in various sizes.

Main Features

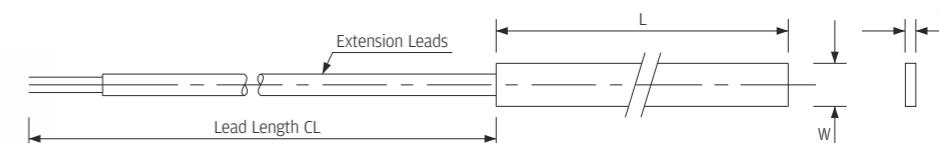
- Slim dimensions to get inserted in between windings
- Bifilar design that prevents induction voltage resulting in measurement errors
- Resistance to shock, vibration and pressure
- Withstand of VPI (Vacuum Pressure Impregnation) Process
- High Dielectric Strength
- RTD certified as Increase safety “e” and Intrinsically safe “ia” approved for zone 1 and 21
- EU-Type examination certificate no: Presafe 18 ATEX 12507U
- IECEx certificate no: IECEx PRE 18.0032U and IECEx SIR 16.0033U
- CSA Certificate no : 70181802
- complies with European standard for electrical apparatus for
 - Explosive gas atmosphere : ATEX EU Directive 2014/34/EU
 - IEC 60079-0:2011 (General requirements)
 - IEC 60079-7:2017 (Increased Safety “e”)
 - IEC 60079-11:2012 (Intrinsically Safe “ia”)

Specification

- Type: PT 100(100 ohm at 0°C)
- Model: TSRB, TSRC, TSRD and TSRK series
- Element: Single for TSRB, TSRC Series
Double for TSRD series
Both single and double for TSRK series
- Body Material: Fibre Glass epoxy (Class H)
- Temperature Range: -50°C to +180°C
- Calibration Standard: IEC 60751
- Temperature coefficient (TCR): 0.003850
- Accuracy: Class A/B/2B
- Sensing current: 10mA maximum
- Dielectric strength: 3 KV/50Hz ,1 minute, For TSRB series
5 KV/50Hz ,1 minute, For TSRC and TSRK series
3 KV/50Hz ,1 minute, For TSRD series
- Lead Wire: 2/3/4 single or multiple stranded silver plated copper wire with PTFE or Polyamide insulation



For TSRB and TSRC Series(Single element RTD)



- **MODEL: TSRB-ACC-L-T-W-NW-CL-WG-CC**
- **MODEL: TSRC-ACC-L-T-W-NW-CL-WG-CC**

ACC	Accuracy of RTD element (A/B/2B)
L	Length in mm
T	Thickness in mm
W	Width in mm
NW	Nos. of wires (option 2/3/4)
CL	Lead length in mm
WG	Wire Gauge of lead wires in AWG (option 22 to 28 AWG)
CC	Cable Construction (See table I)

- **EXAMPLE (Part Number): TSRB-B-150-2-6-3-1000-24-Y**

DIMENSIONAL RANGE (IN MM)			
PARAMETER	MAX	MIN*	TOLERANCE
LENGTH (L)	475.0	45.0	+/- 5.0
THICKNESS (T)	4.5	2.0	+/-0.25
WIDTH (W)	25.0	6.0	+/-0.20
LEAD LENGTH (CL)	50000.0	1000.0	+50.0/-0.0

* FOR 4 WIRE RTD MINIMUM WIDTH STARTS FROM 7.5 MM

- **Cable Construction**

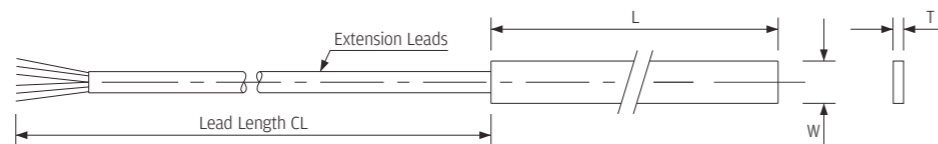
TABLE 1	
DESCRIPTION	CODE
TWISTED PTFE INSULATED /PTFE JACKETED	X
FLAT PTFE INSULATED LEADS	Y
FLAT POLYAMIDE INSULATED LEADS	Z
FLAT PTFE INSULATED AND JACKETED	W
FLAT PTFE INSULATED AND FEP JACKETED	Q
TWISTED PTFE INSULATED /SHIELDED/PTFE JACKETED	R

For Sizes & all other dimension please refer drawing.

*TSRB, TSRC, TSRD, TSRK are listed by CSA Group as Certified

** Notifying Body Number - 2460

TSRD Series (Double element)



● **MODEL: TSRD-ACC-L-T-W-NW-CL-WG-CC**

ACC	Accuracy of RTD element (A/B/2B)
L	Length in mm
T	Thickness in mm
W	Width in mm
NW	Nos. of wires (option 2/3/4)
CL	Lead length in mm
WG	Wire Gauge of lead wires in AWG (option 22 to 28 AWG)
CC	Cable Construction (See table I)

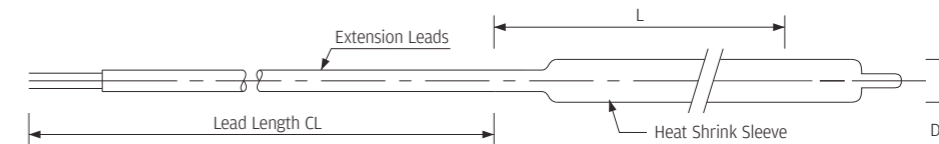
● **EXAMPLE (Part Number): TSRD-B-150-2-14-3-2000-24-Y**

DIMENSIONAL RANGE (IN MM)			
PARAMETER	MAX	MIN*	TOLERANCE
LENGTH (L)	475.0	45.0	+/- 5.0
THICKNESS (T)	4.5	2.0	+/-0.3
WIDTH (W)	25.0	10	+/-0.3
LEAD LENGTH (CL)	50000.0	1000.0	+50.0/-0.0

● **Cable Construction**

TABLE 1	
DESCRIPTION	CODE
TWISTED PTFE INSULATED /PTFE JACKETED	X
FLAT PTFE INSULATED LEADS	Y
FLAT POLYAMIDE INSULATED LEADS	Z
FLAT PTFE INSULATED AND JACKETED	W
FLAT PTFE INSULATED AND FEP JACKETED	Q
TWISTED PTFE INSULATED /SHIELDED/PTFE JACKETED	R

* For TSRK series:



● **MODEL: TSRK-E-T-ACC-L-D-NW-CL-WG-CC**

E	Type of Element(P1=PT-100 & P2=PT-1000)
T	Type of RTD (S=Simplex & D=Duplex)
ACC	Accuracy of RTD element (A/B/2B)
L	Length in mm
D	Diameter in mm
NW	Nos. of wires (option 2/3/4)
CL	Lead length in mm
WG	Wire Gauge of lead wires in AWG (option 20 to 30 AWG)
CC	Cable Construction (See table I)

● **EXAMPLE (Part Number): - TSRK-P1-S-A-25-4-3-10000-24-Y**

DIMENSIONAL RANGE (IN MM)			
PARAMETER	MAX	MIN*	TOLERANCE
LENGTH (L)	500.0	13.0	+/- 3.0
DIAMETER (D)	25.0	3.0	+/-0.5
LEAD LENGTH (CL)	50000.0	1000.0	+50.0/-0.0

● **Cable Construction**

TABLE 1	
DESCRIPTION	CODE
TWISTED PTFE INSULATED /PTFE JACKETED	X
FLAT PTFE INSULATED LEADS	Y
FLAT PTFE INSULATED AND JACKETED	W
TWISTED PTFE INSULATED /SHIELDED/PTFE JACKETED	Q
FLAT FEP INSULATED LEADS	R



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