Transformer Protection Relay

Winding Temperature Indicators
For
Dry / Cast Resin type Transformers

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About EMBELINK

- EMBELINK TECHNOLOGIES – a name stands for excellence in embedded manufacturing and service industry. EMBELINK was established by two technically qualified engineers in 2014.
- EMBELINK is recognized for standing in market place with great customer satisfaction and as one of the trusted name offering quality products and solution in Embedded and IoT field with strong services.
- EMBELINK is a small close-knit company with well-qualified and trained manpower.

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Nature of Business

- Manufacturers and sales of industrial electronics and process control instruments and micro-controller based control system for Transformer, Power-Energy, Electrical utility center, Medical, Banking, Security, Text-tile, Boom-barrier and toll gate automation etc.
- Also, providing customized application development services in field of embedded, IoT and IT or combinations of any for the above said industries.

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Technical Expertise

- EMBELINK is having expertise in developing customized application or product using following advanced technologies :
- Advanced interfaces like : UART, I2C, SPI, RS-232, RS-485, Ethernet, USB, CANBUS etc.
- Advanced interfacing of module like : GSM / GPRS, GPS, Wi-Fi, RFID, Blue-tooth, Zigbee, InfraRed, RF etc.
- Advanced universal protocols like : TCP/IP, MODBUS, Profibus, DLMS etc.
- Development of product to comply IEC 61000 series EMI/EMC standards
- Advanced Linux OS based boards like : Raspberry Pi, Beagle bone etc.
- Advanced PCB Designing : Single-side, Double-side and Four layer board.

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Products

- Transformer Protection Relay for Dry and Oil cooled transformer.
- Energy Meter Gateway for single and three phase energy meter.
- Blood warming system, Rectal and skin temperature monitoring device for Medical Application.
- Ethernet TCP/IP based banking security product.
- Industrial SMPS.
- Energy efficient system for Solar based street light.
- USB, Wi-Fi and RF based Gate controlled device for automatic toll collection booth.
- Xbee based data logging system for temperature and humidity.
- Customized embedded and IoT application development.

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Basic Requirements for Winding Temperature Indicators

For the safety, reliability and long operational life of the transformer, a good temperature surveillance system is necessary.

A good temperature surveillance system should provide the following features:

- Accurate temperature measurement for at least three windings and core.
- Capability of warning the user of excessive transformer temperature
- Capable of switching off and isolating the transformer from line in case the transformer reaches a limiting temperature level.
- Cooling fan control.
- Alarm, trip and fan controls fully settable over operating range.
- Sensor Fault monitoring and indication.
- Maximum temperature registering.
- Signal for remote indication
- Should be suitable for switchyard environmental conditions.

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EMBELINK WTS Features

EMBELINK winding temperature scanners (Transformer protection relays) are designed to meet these basic requirements. Most of them will have many more added features incorporated.

Salient Features :

- **WTI is designed to give better noise immunity for Transient Spike, Surge, Electrostatic Discharge and Radiated Magnetic field.**
- **Wide operating power supply range from 85 – 440 VAC / DC.** This makes our unit to work without any problem considering neutral open or other phase imbalance conditions.
- **WTI Enclosure is designed for Ingress Protection IP-55.** This makes our unit to work for long life without any dust, moisture or water related problems and it allows to mount the WTI in open sky condition. However, we recommend to mount it in marshalling box with Fuse / MCB protection.
- **Isolated 4-20mA output with maximum burden resistance of 500 ohms.**
- **Isolated SCADA / DAS compatibility (RS-485 based MOBUS RTU Slave protocol)**
  - In very near future, IEC 61850 gateway connectivity.

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EMBELINK WTS Variants for Dry / Case Resin Type Transformers

Models →	TPR-104-R	TPR-104-C	TPR-104-RC	TPR-104-R2	TPR-104-R2C
4-20 mA Analog Outputs	One	No	One	Two	Two
RS-485 MODBUS Protocol	No	Yes	Yes	No	Yes
No. of Relay Outputs	4 (1 C/O)	4 (1 C/O)	4 (1 C/O)	4 (1 C/O)	4 (1 C/O)

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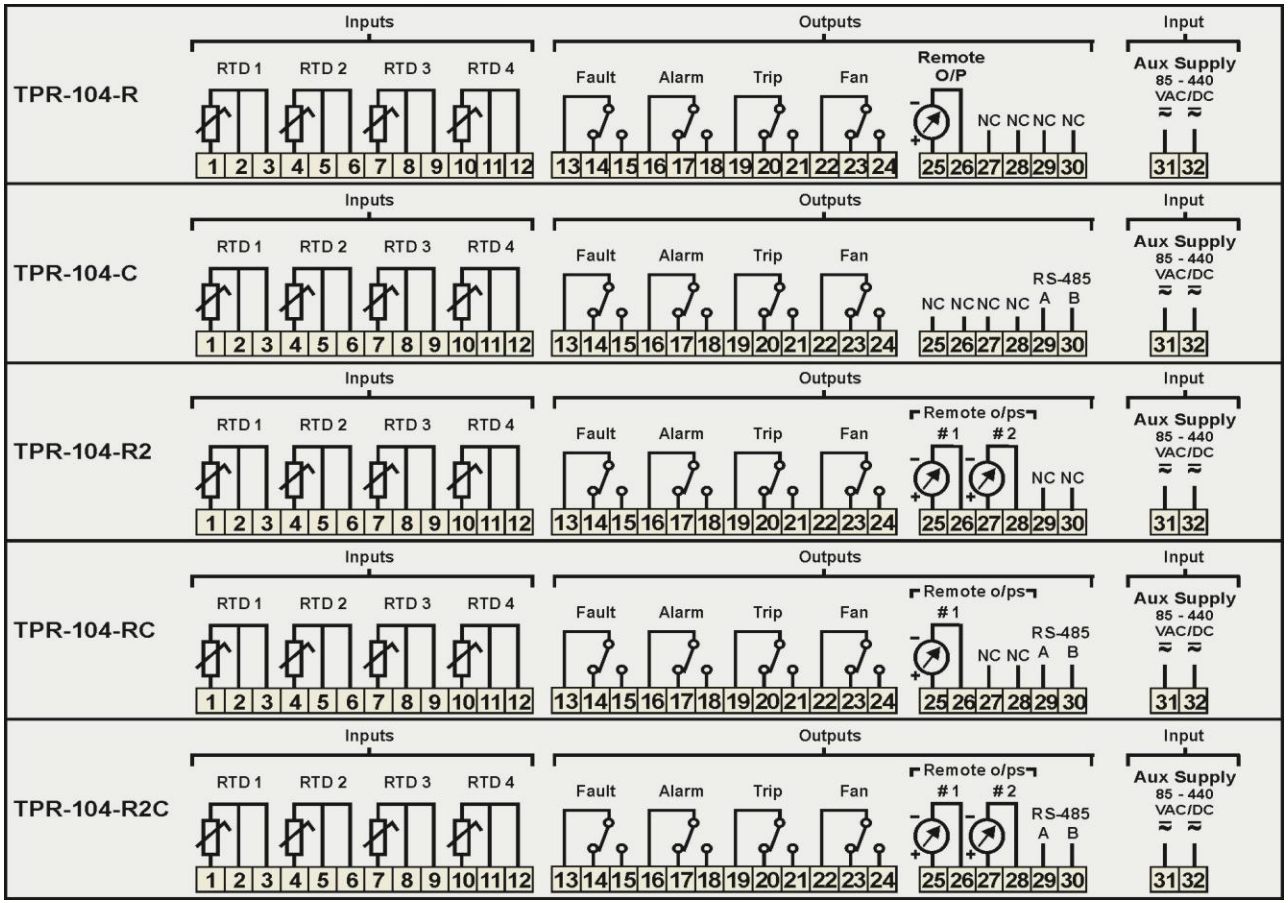
EMBELINK WTS Wiring Details



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Difference between Normal Temperature Scanner and Winding Temperature Scanner (WTS)

- *WTS are built specially for transformer application.*
- *The features provided in line with the requirements of transformer industry.*
- *WTS are designed specially keeping in mind, the switchyard application and the environment they would be subjected to. Normal temperature scanners are built keeping in mind that they will be installed in a control room.*
- *The operating conditions are more severe for equipment meant for transformer / switchyard application. The design for these scanners is more focused towards reliability, vibration handling, noise immunity, mounting ease, higher ambient temperatures etc. Designs of normal scanners are more focused on control room requirements for environmental conditions, which are much less severe than that are expected for transformer winding temperature scanners.*
- *That is the reason we call these winding temperature scanners as Transformer Protection Relays.*
- At **EMBELINK**, we manufacture products for both transformer as well as for control room application. We therefore insist and suggest our customers to use appropriate equipment for specific need and application.

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Advantages of RS-485 and 4-20mA Remote Outputs

- **EMBELINK** “WTI” can be provided with Isolated RS-485 port with MODBUS RTU slave protocol.
- Benefits of using RS-485 are
  - Just 2 wires can be used to connect 32 units to a SCADA / DAS/ remote winding temperature indicators.
  - The data does not get corrupt because of ambient noise.
  - Data can be taken to long distances (upto 1 km). Further it can taken using repeaters.
  - External RS-485 connected devices can be used to transmit data over internet, on wireless networks, on GPRS systems etc very easily.
  - Can be used with our remote indicators to pass on all the information to a remote location, if SCADA / DAS is not available.

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Advantages of RS-485 and 4-20mA Remote Outputs

- Using RS-485 capabilities, using just 2 wires, this remote indicator can show
  - Winding temperatures of all channels
  - Recorded Maximum temperatures
  - Alarm & Trip status
  - Fan relay status
  - Fault indication
  - Set points.
- 4-20 mA signal corresponding to either any one channel or current maximum is available as in-built feature.
- This signal can be used to connect to SCADA / DAS or easily available remote indicators.
- **These are the majors advantages of Electronics Type WTIs compare to conventional Dial Type WTIs.**

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Thank You

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