



EMBELINK Technologies

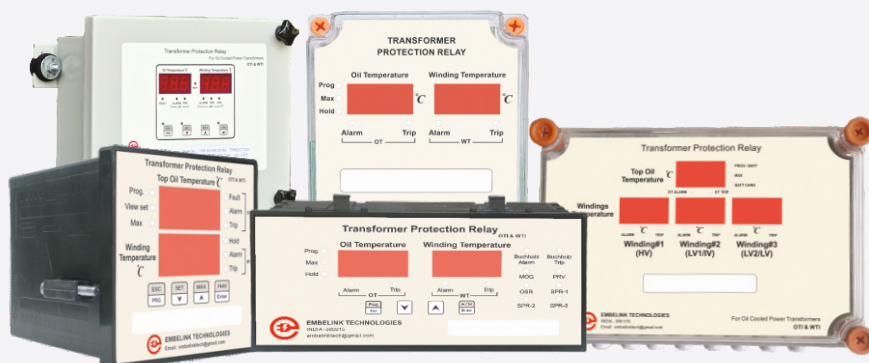
Link to Embedded World



LEADERS IN

DIGITAL

TRANSFORMER PROTECTION RELAY



www.embelink.com

WHY CHOOSE US ?



OUR PRESENCE

GOVT / SEMI GOVT / PSU

	 GUJARAT STATE ELECTRICITY LTD.	 एन एम डी सी N M D C	 इंडियन ऑयल IndianOil	 VIZAG STEEL Pride of Steel
 (A Government of Karnataka Enterprise)	 TP WESTERN ODISHA DISTRIBUTION LIMITED (A Joint Venture of Tata Power and Government of Odisha)	 TP SOUTHERN ODISHA DISTRIBUTION LIMITED (A Joint Venture of Tata Power and Government of Odisha)	 TP CENTRAL ODISHA DISTRIBUTION LIMITED (A Joint Venture of Tata Power and Government of Odisha)	 TP NORTHERN ODISHA DISTRIBUTION LIMITED (A Joint Venture of Tata Power and Government of Odisha)

PRESTIGE TRANSFORMER MANUFACTURERS / END CUSTOMER

				
 Electrical Controls & Systems (MV Instrument Transformer Division)			 powering the nation	
 Crafting Excellence with Innovation & Integrity A Transformer Manufacturing Company		 Remanufacturing Transformers & Electricals Pvt. Ltd.		 Manufacturers of Distribution & Power Transformer

ABOUT US

- **EMBELINK TECHNOLOGIES** known as **EMBELINK** – a name stands for excellence in embedded manufacturing and service industry. **EMBELINK** was established by 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.

INFRASTRUCTURE



AREA

Industry spread of 1000 sq.mtr



MANUFACTURING

Manufacturing of facility of 25000 units/annum



TESTING FACILITY

In house testing lab facility tracable to NABL / NPL

ADVANCED TECHNOLOGIES



TEMP RISE

Alarm/Trip threshold setting in terms of temp rise from ambient temp.



IoT

IoT based transformer monitoring system



TOMLA

Transformer operation, monitoring and life analysis.



FIBER OPTIC (FO)

Fiber optic based transformer temperature monitoring system

PRODUCTS



OTI & WTI

Digital OTI & WTI for oil cooled transformers



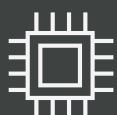
WTI

WTI / WTS for dry transformers



MARSHALLING BOX

Marshalling box for OTI & WTI



INTERNET OF THINGS

IoT based transformer monitoring system TOMLA



FIBER OPTIC

Fiber optic based transformer monitoring system.

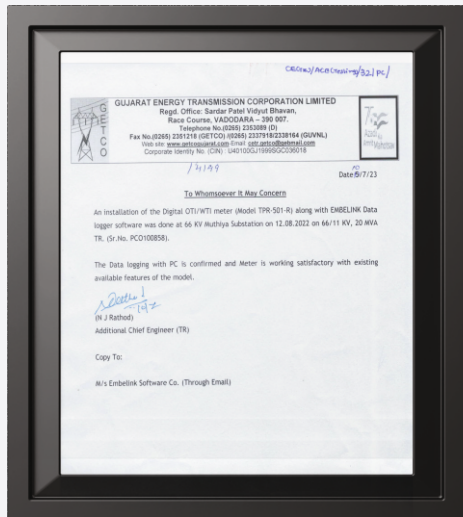


OTHER PRODUCTS

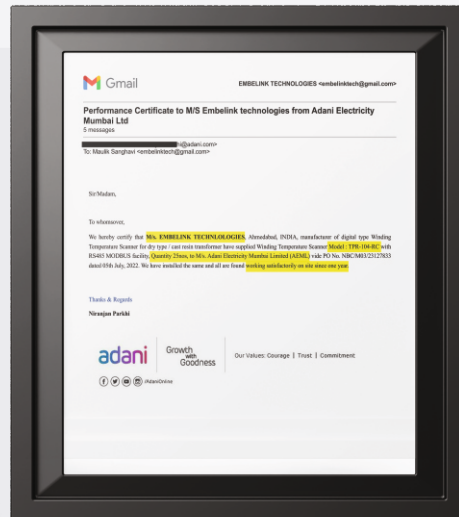
RWTI
AVR
TPI
TRANSFORMER FAN

PERFORMANCE CERTIFICATE

GETCO



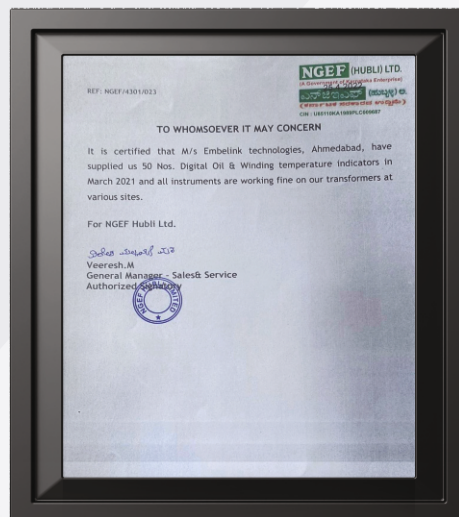
ADANI ELECTRICITY



TATA POWER



NGEF



ACCREDITATION



OTI & WTI - DIGITAL Vs ANALOG COMPARISION

EMBELINK DIGITAL OTI & WTI



ANALOG OTI & WTI



Vs

CT RATIO & DELTA T (dT) GRADIENT	- Site selectable - It will protect all the transformers irrespective of its rating. - Do not need to keep one to one spares for Preventive maintenance. - Simplifies Inventory - Ease in replacement / retro-fitting	CT Ratio & Gradient are factory set . Hence user can not alter CT Ratio / Gradient on site.
CT OVERLOAD	OTI & WTI will work up to 150% of rated current.	WTI heater coil might get damaged beyond 100% load.
TEMPERATURE RISE	It has facility to protect the transformer with the specified temperature rise, irrespective of ambient temperature.	It does not have the facility to protect transformer as per specified temperature rise.
TEMPERATURE READING AFTER TRANSFORMER TRIP	- In case of rechargeable battery backup OR battery backup supply from customer end, when transformer trips, the OTI & WTI will show current transformer temperature. - With Battery backup, It has facility to record / display the temperature & relay status at the time of transformer trip	When transformer trip, OTI / WTI will display current temperature. but it will not record / display the temperature at the time of transformer trip.
REMOTE OUTPUT 4 - 20 MA	It is inbuilt inside OTI & WTI, Hence it has very small form factor. No external CCU / PSU is required.	- It is generated using CCU & PSU. - As CCU / PSU are installed externally along with OTI & WTI, it will considerably occupy more space in Marshalling Box
AUXILIARY SUPPLY	85 to 440VAC/DC	For CCU / PSU auxiliary supply is 90 to 270VAC/DC
INGRESS PROTECTION	IP-66	Generally IP-55
RS-485 FOR SCADA	Optionally available	Generally 4-20 mA output is fed to Analog to RS-485 converter (addition hardware) and data (only 1 parameter) will be available to SCADA
TEMPERATURE SIMULATION	Available with TEST function so that all the wiring up to C & R / RTCC / Breaker panel, can be tested on site	No such function is available

OTI & WTI FORM FACTOR

ANALOG VS DIGITAL

CONVENTIONAL ANALOG OTI & WTI



Analog OTI & WTI marshalling box panel 4-20mA only (No RS-485)

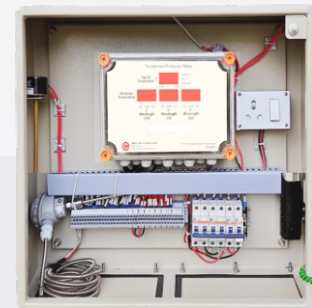
EMBELINK DIGITAL OTI & WTI



Embelink digital OTI & WTI marshalling box panel 4-20mA output (RS-485 optionally)



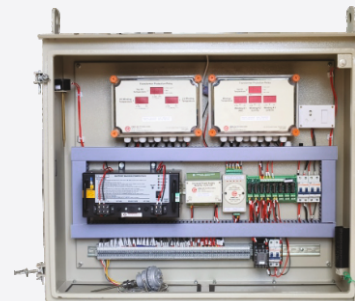
Analog 10TI & 3WTI power transformer marshalling box panel 4-20mA only (No RS-485)



Embelink digital 10TI & 3WTI power transformer marshalling box panel 4-20mA output (RS-485 optionally)



Analog 10TI & 5WTI solar inverter duty transformer marshalling box panel

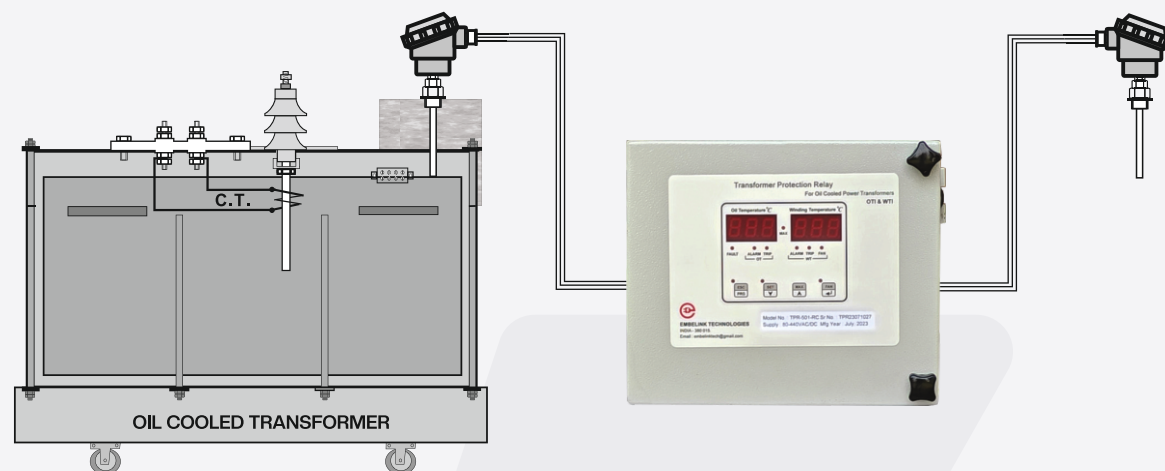


Embelink digital 10TI & 5WTI solar inverter duty transformer marshalling box panel

TRANSFORMER PROTECTION WITH CORRECT CALCULATION OF TEMPERATURE RISE

TOP OIL RTD SENSOR (PT100)

AMBIENT RTD SENSOR (PT 100)



Transformer trip setting : 90 °C

Transformer ambient temperature : 10 °C

Transformer effectively trip at **Temperature Rise of : 80 °C**

**IS IT CORRECT? IF NO,
THEN WHAT TO DO?**

EMBELINK OTI & WTI (TPR-521-R) has been developed to counter this situation. It will measure ambient temperature along with oil / winding temperature and has facility to set trip setting in terms of temperature rise.

CASE : 1

Transformer trip setting (in terms of temperature rise) : 55 °C

Transformer ambient temperature : 10 °C

Effective trip setpoint (temp rise + ambient) : 65 °C

Transformer effectively trip at temperature rise of : 65 °C

CASE : 2

Transformer trip setting (in terms of temperature rise) : 55 °C

Transformer ambient temperature : 45 °C

Effective trip setpoint (temp rise + ambient) : 100 °C

Transformer effectively trip at temperature rise of : 100 °C



OIL & WINDING (OTI & WTI) TEMPERATURE INDICATORS

SELECTION GUIDE

Features ↓ Models	IP Rating	OTI (1-Alarm & 1-Trip)	WTI (1-Alarm & 1-Trip)	WTI - 2 (1-Alarm & 1-Trip)	WTI - 3 (1-Alarm & 1-Trip)	4 - 20 mA	RS - 485	Fan / Cooling Control	Pump Control	Dual Relay O/P (Alarm & Trip)	TPR Auxiliary Supply Fail Indication	Auxiliary Supply 85 - 440V AC/DC	Common Alarm for OTI, WTI, Buchholz, MOG etc.	Common Trip for OTI, WTI, Buchholz, main tank PVR, OLTC tank PRV, OSR.	Page no.
TPR - 501 - R	66	✓	✓	✗	✗	✓	✗	✗	✗	✗	✗	✓	✗	✗	14
TPR - 501 - RC	66	✓	✓	✗	✗	✓	✓	✗	✗	✗	✗	✓	✗	✗	14
TPR - 501 - RF2	66	✓	✓	✗	✗	✓	✗	✓	✗	✗	✗	✓	✗	✗	14
TPR - 501 - RCF	66	✓	✓	✗	✗	✓	✓	✓	✗	✗	✗	✓	✗	✗	14
TPR - 501 - RFE	66	✓	✓	✗	✗	✓	✗	✓	✗	✗	✓	✓	✗	✗	14
TPR - 501 - RFEC	66	✓	✓	✗	✗	✓	✓	✓	✗	✗	✓	✓	✗	✗	14
TPR - 701 - E	66	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	15
TPR - 701 - RC	66	✓	✓	✗	✗	✓	✓	✗	✗	✗	✗	✓	✗	✗	16
TPR - 701 - RFEC	66	✓	✓	✗	✗	✓	✓	✓	✗	✗	✓	✓	✗	✗	16
TPR - 701 - RDFC	66	✓	✓	✗	✗	✓	✓	✓	✗	✓	✗	✓	✗	✗	16
TPR - 701 - RDEC	66	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✓	✗	✗	16
TPR - 701 - FPEC	66	✓	✓	✗	✗	✓	✓	✓	✓	✗	✓	✓	✗	✗	16
TPR - 702 - R	66	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗	✓	✗	✗	17
TPR - 702 - RC	66	✓	✓	✓	✗	✓	✓	✗	✗	✗	✗	✓	✗	✗	17
TPR - 702 - RFC	66	✓	✓	✓	✗	✓	✓	✓	✗	✗	✗	✓	✗	✗	17
TPR - 702 - RFEC	66	✓	✓	✓	✗	✓	✓	✓	✗	✗	✓	✓	✗	✗	17
TPR - 702 - FPEC	66	✓	✓	✓	✗	✓	✓	✓	✓	✗	✓	✓	✗	✗	17

OIL & WINDING (OTI & WTI) TEMPERATURE INDICATORS

SELECTION GUIDE

Features ↓ Models	IP Rating	OTI (1-Alarm & 1-Trip)	WTI (1-Alarm & 1-Trip)	WTI - 2 (1-Alarm & 1-Trip)	WTI - 3 (1-Alarm & 1-Trip)	4 - 20 mA	RS - 485	Fan / Cooling Control	Pump Control	Dual Relay O/P (Alarm & Trip)	TPR Auxiliary Supply Fail Indication	Auxiliary Supply 85 - 440V AC/DC	Common Alarm for OTI, WTI, Buchholz, MOG etc.	Common Trip for OTI, WTI, Buchholz, main tank PVR, OLTC tank PRV, OSR.	Page no.
TPR - 703 - R	66	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗	✓	✗	✗	18
TPR - 703 - RC	66	✓	✓	✓	✓	✓	✓	✗	✗	✗	✓	✓	✗	✗	18
TPR - 703 - RFC	66	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✓	✗	✗	18
TPR - 703 - REC	66	✓	✓	✓	✓	✓	✓	✗	✗	✗	✓	✓	✗	✗	18
TPR - 601 - C	54	✓	✓	✗	✗	✗	1nos	✗	✗	✗	✓	✓	✗	✗	20
TPR - 601 - C2	54	✓	✓	✗	✗	✗	2nos	✗	✗	✗	✓	✓	✗	✗	20
TPR - 651 - C	54	✗	✗	✗	✗	✗	1nos	✗	✗	✗	✓	✓	✓	2c/o	20
TPR - 651 - 2C	54	✗	✗	✗	✗	✗	2nos	✗	✗	✗	✓	✓	✓	2c/o	20

SUFFIX USED IN TPR MODULE NAME :

- M = Marshalling Box (ABS/PC)
- R = Remote Communication 4-20 mA
- C = Communication RS-485
- F = Fan Control
- P = Pump Control
- E = Auxiliary Supply Fail
- D = Dual Really Output

SALIENT FEATURES : (APPLICABLE ALL OTI & WTI)

- **CT Ratio & Delta T Gradient** : Site Selectable
- **CT Overload** : 150% of rating current
- **Supply Voltage** : 85 to 440 VAC / DC
(optionally 20 to 50 VAC / DC)
- **Ingress Protection** : IP-66
- **Battery Backup (Optionally)** : Rechargeable
- **Warranty** : 5 years*

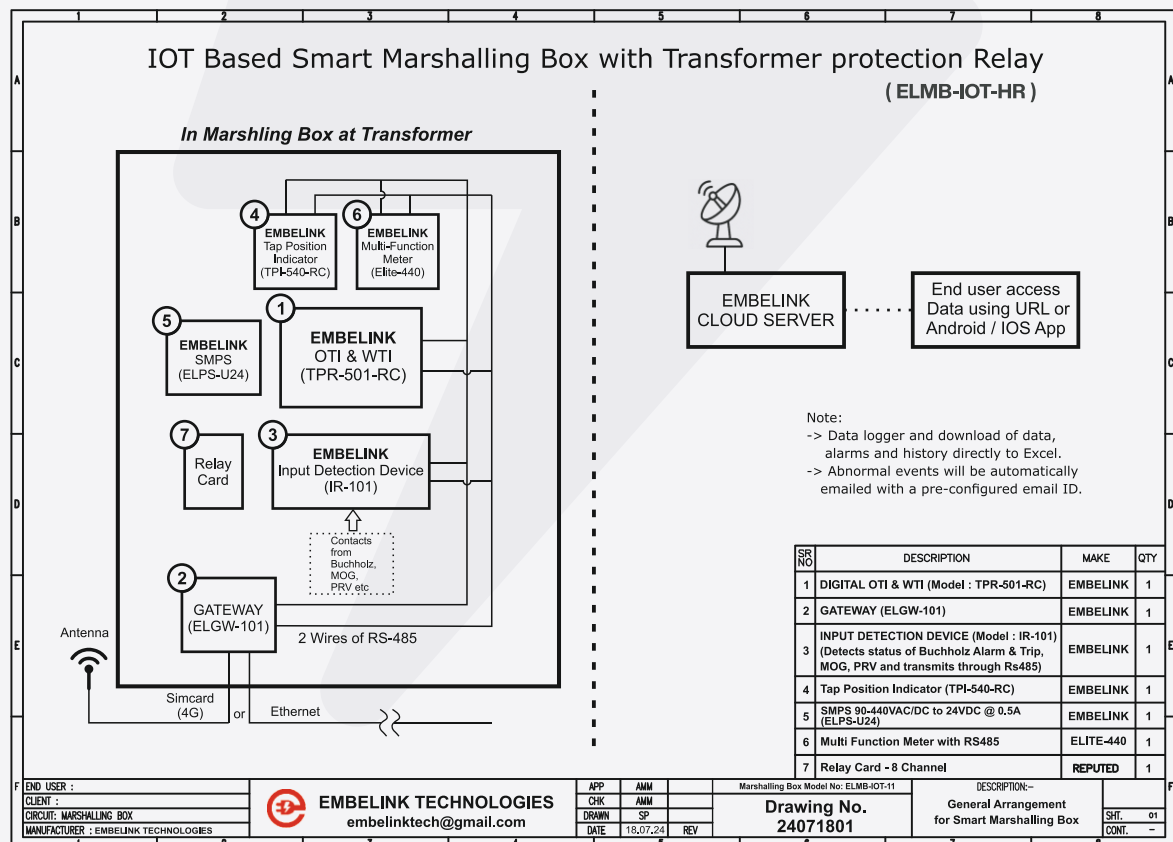
IoT BASED TRANSFORMER MONITORING SYSTEM (ELMB-IOT-HR)

SMART MARSHALLING BOX



- OTI : Top oil temperature
- WTI - 1 : Winding temperature
- Tape Position Indicator (TPI-540-RC) : Displays current position of tape (up to 40 count) upper limit reached
- Multi Function Meter : Displays voltage and current rating (R,Y,B,N)
- GATEWAY : Collect all devices data upload to SCADA clouds
- RS - 485 : We can connect MODBUS output of other then smart panel devices to upload data to SCADA Cloud.
- 4 - 20 mA : 2 Nos 4-20mA O/P (OTI, WTI-1)

- HEATER & THERMOSTAT: Maintains temperature inside marshaling box
- IR - 101 : Buchholz alarm, trip. MOG, OLTC/PRV tank, OLTC OSR Signal status on cloud
- SWITCH SOCKET : 230V AC voltage supply (15A)
- IP Rating : IP 55 Weather Protection



IoT BASED TRANSFORMER MONITORING SYSTEM

TOMLA

TRANSFORMER OPERATIONS,
MONITORING & LIFE-ANALYSIS

OTI & WTI

MARSHALLING BOX

RTCC PANEL

DRY TRANSFORMER



TRANSFORMER PARAMETERS AVAILABLE FOR USER

- Oil, winding temperature
- Oil, winding alarm & trip relay status
- Winding CT current, winding CT load
- Transformer tap position
- Transformer LT 3 Ph. Line voltage, Line current, Ph-Ph voltage, 3 Ph. Power factor, Avg. Power factor, 3 Ph. Actual, Reactive & apparent power, Energy and demand
- Buchholz alarm, Buchholz trip, MOG, PRV, OSR status

FOR DEMO SCAN QR



USER NAME

demo@embelink.com

PASSWORD

demo@embelink.com

TRANSFORMER PROTECTION SYSTEM (WITH FIBER OPTIC SENSOR)

FOR HT & EHT TRANSFORMER WINDINGS

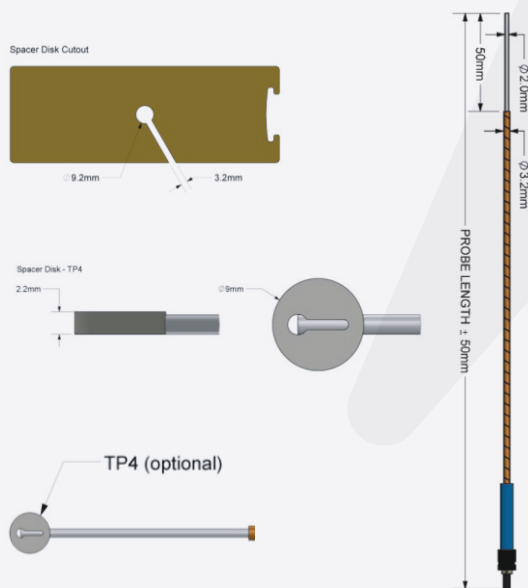


TRANSFORMER PROTECTION RELAY (TPR-501-RCFO)

- Fiber optic sensor simplify the sensor installation in the windings of the transformer where very high voltage insulation is required.
- Temperature indication range (Resolution 1 °C) :
Oil : -50 to 150°C | Winding : -50 to 200 °C
- Four relay outputs for fault, Fan, Alarm & trip.
- Isolated 4-20mA and isolated RS-485 MODBUS for SCADA application.
- Aux. supply : 85-440 VAC/DC (Optionally 20-50 VAC/DC)

TEMPERATURE TRANSMITTERS (SIGNAL CONDITIONERS)

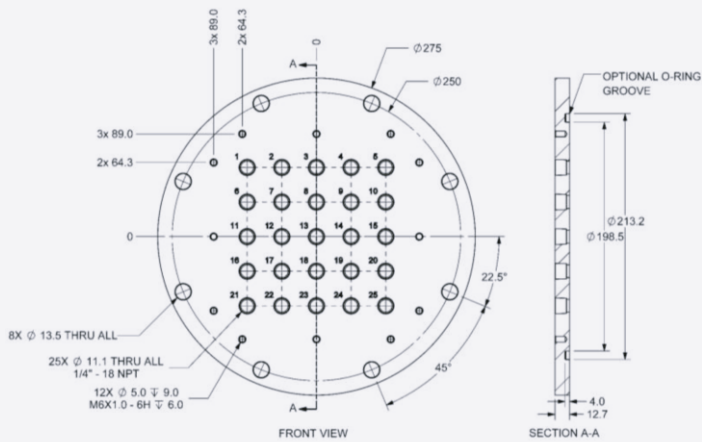
- Inputs : 3/6/12/18 fiber optic sensors (FOS)
- Measurement range : - 50 to 250 °C
- RS-485 protocol : MODBUS RTU.
- Power : 12-24 VDC (2.5 W max.)
- Mounting : 35 mm.DIN rail
- Dimension : 114(H) 22.5(W) 100(L) mm.
- Total system accuracy : +/- 2 °C
- Operating environment : -40 °C to +65°C, 0 to 90%RH (non-condensing)



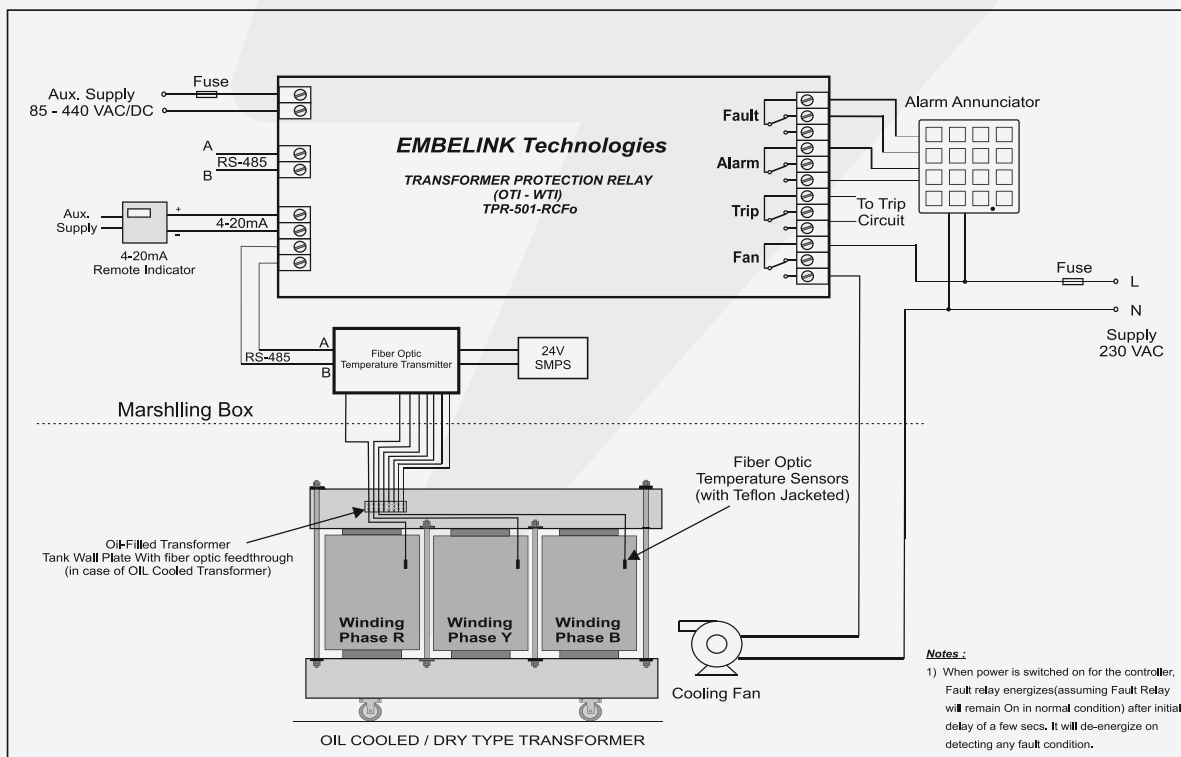
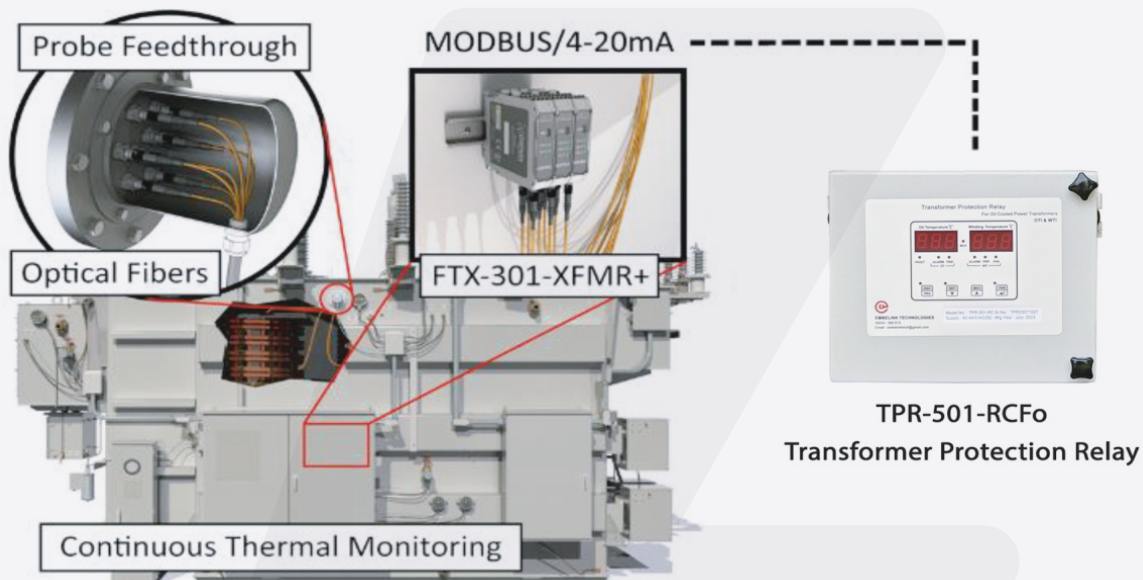
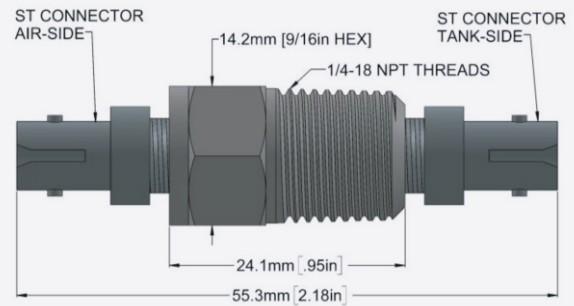
NON-CONDUCTING, FIBER OPTIC SENSOR WITH EXCEPTIONALLY LONG LIFE (ELFS- 3M)

- Measurement Range : -40°C to 230°C
- Accuracy : $\pm 1.0^{\circ}\text{C}$
- Immersion response time constant : 2.0s
- Tip diameter : 2.0mm
- Minimum bend radius : 50mm
- Probe materials : PFTE & polyimide
- Dielectric strength ASTM-D149 : 10 kV/mm
- Partial discharge IEC 60270 : Less than 10pC
- Lengths : 0.5metre to 10metre

OIL-FILLED TRANSFORMER TANK WALL PLATE



ACC-FEEDTHRU-NPT FIBER OPTIC FEEDTHROUGH



OTI & WTI 'TPR-501' SERIES

Specially Designed For Solar IDT / Wind Transformer



OTI & WTI

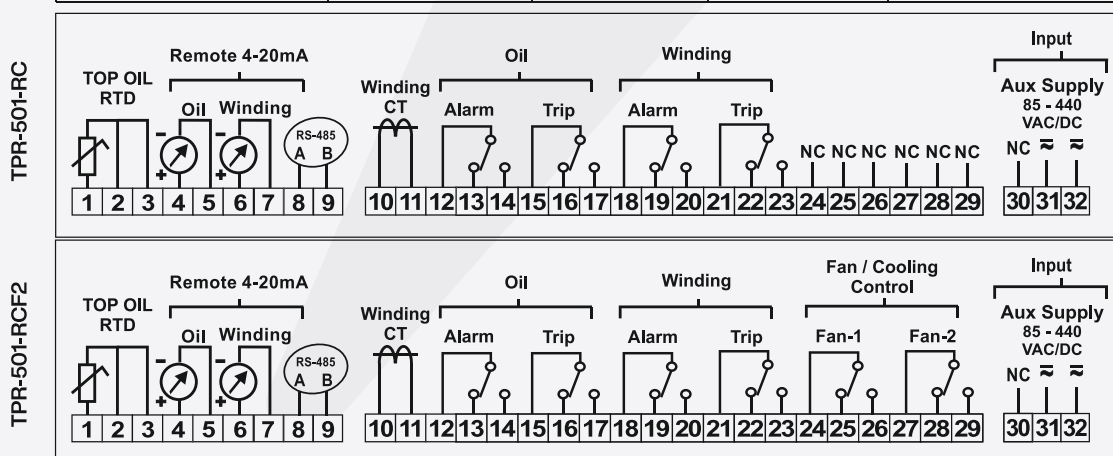


ELMB-16H



Features ↓ TPR Model No. OTI & WTI →	IP Rating OTI & WTI	No. of OTI	No. of WTI	Relay Contacts	No. of 4 - 20 mA	RS - 485	Electrical Fail Fault	Pump Control	Fan Control
TPR-501-R	66	1	1	4c/o	2	✗	✗	✗	✗
TPR-501-RC	66	1	1	4c/o	2	✓	✗	✗	✗
TPR-501-RF	66	1	1	4c/o	2	✗	✗	✗	✓
TPR-501-RE	66	1	1	4c/o	2	✗	✓	✗	✗

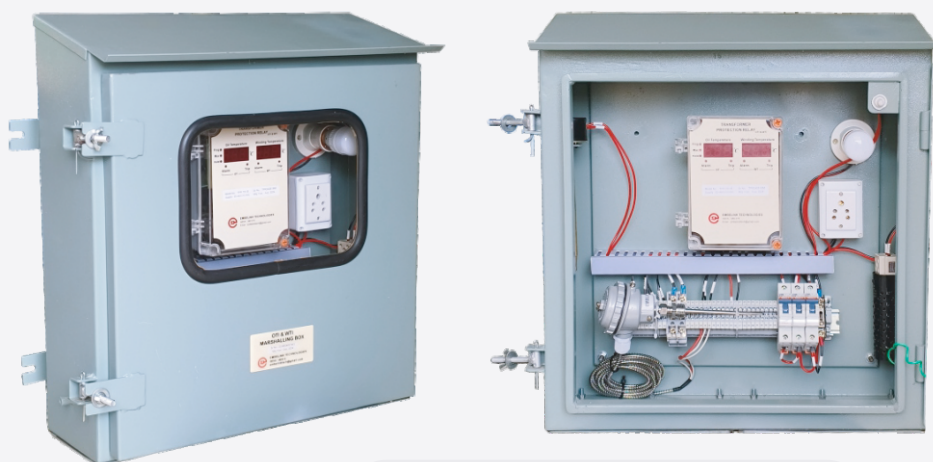
Features ↓ Marshalling Box Model No. →	IP Rating Marshalling Box	Heater & Thermostate	Switch & Socket	Marshalling Box Overall Dimensions
ELMB-16	55	✗	✗	Height = 550MM Width = 570MM Depth= 250MM
ELMB-16H	55	✓	✓	



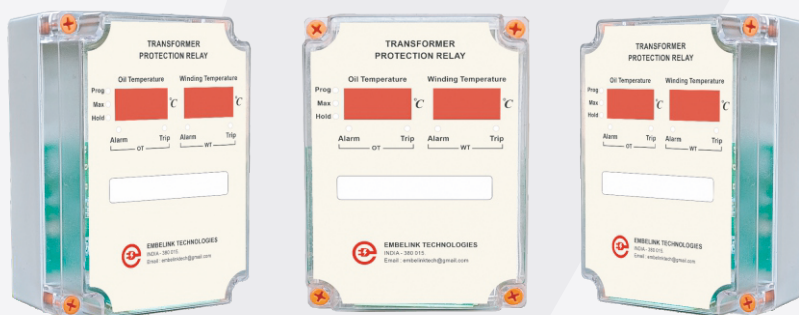
NOTE

- Auxiliary supply 20-50VAC/DC is available optionally
- Rechargeable battery backup (in case of power failure) is available optionally

OTI & WTI (TPR-701-E)



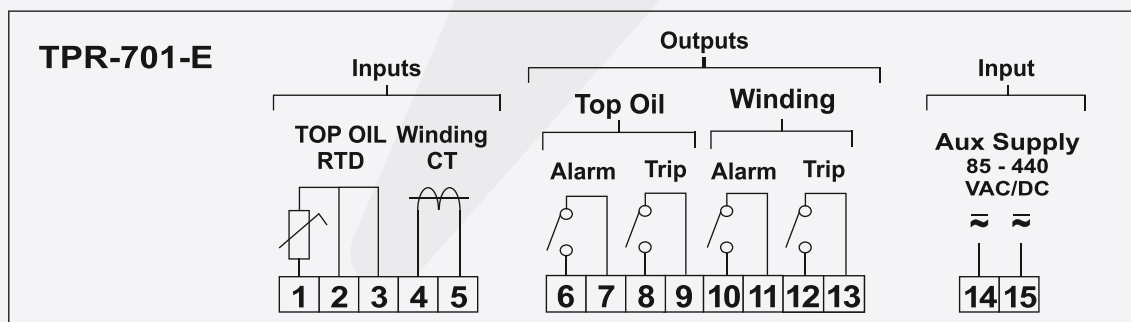
ELMB-16H



OTI & WTI

Features ↓ TPR Model No. OTI & WTI →	IP Rating OTI & WTI	No. of OTI	No. of WTI	Relay Contacts
TPR-701-E	66	1	1	4No

Features ↓ Marshalling Box Model No. →	IP Rating Marshalling Box	Heater & Thermostate	Switch & Socket	Marshalling Box Overall Dimensions
ELMB-16	55	✗	✗	Height = 550MM Width = 570MM Depth= 250MM
ELMB-16H	55	✓	✓	

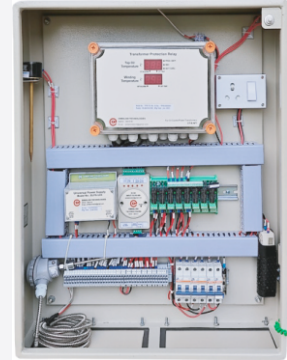


NOTE

- Rechargeable battery backup (in case of power failure) is available optionally

OTI & WTI 'TPR-701' SERIES

Specially Designed For Solar IDT / Wind Transformer



| OTI & WTI

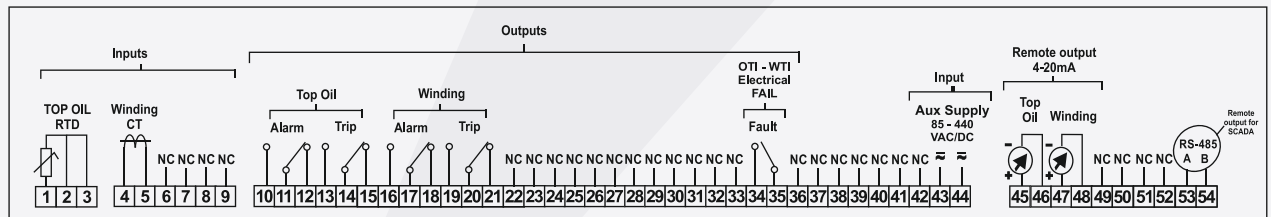
| ELMB-16-H

| ELMB-71-HR

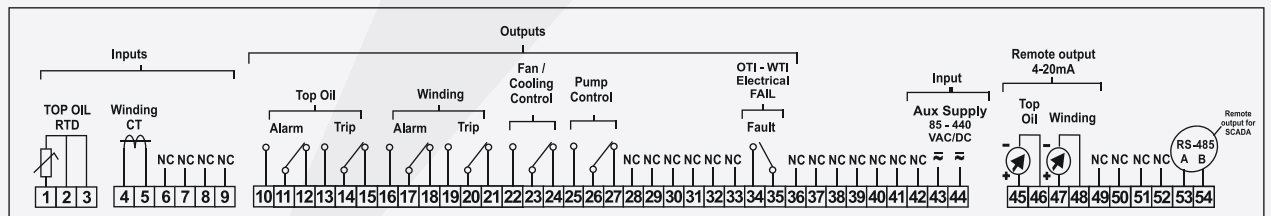
Features ↓ TPR Model No. OTI & WTI →	IP Rating OTI & WTI	No. of OTI	No. of WTI	Relay Contacts	No. of 4 - 20 mA	RS - 485	Electrical Fail Fault	Pump Control	Fan Control
TPR - 701 - RC	66	1	1	4c/o	2	✓	✓	✗	✗
TPR - 701 - RCF	66	1	1	5c/o	2	✓	✓	✗	✓
TPR - 701 - RCFP	66	1	1	6c/o	2	✓	✓	✓	✓

Features ↓ Marshalling Box Model No. →	IP Rating Marshalling Box	Heater & Thermostate	Switch & Socket	Buchholz, MOG, PRV Tank Status on SCADA	Marshalling Box Overall Dimensions
ELMB-16H	55	✓	✓	✗	Height = 550MM Width = 570MM Depth = 250MM
ELMB-71HR	55	✓	✓	✓	Height = 850MM Width = 700MM Depth = 250MM

TPR-701-RC



TPR-701-RCFP

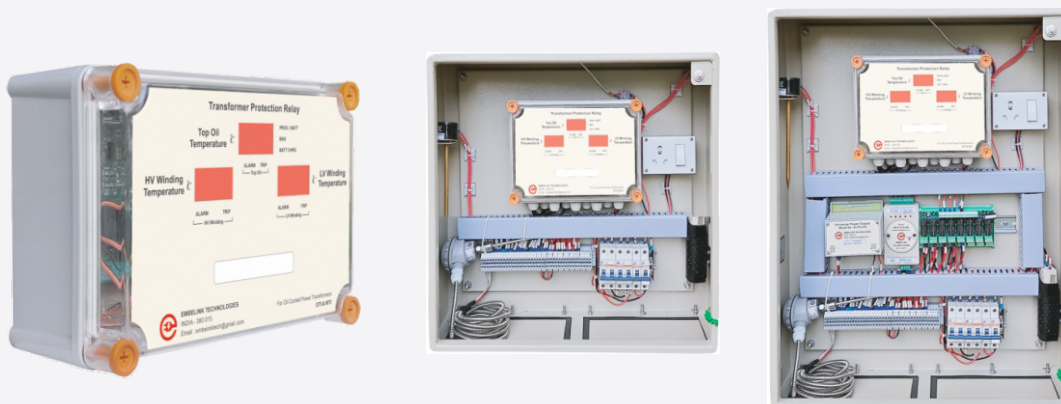


INOTE

- Auxiliary supply 20-50VAC/DC is available optionally
- Rechargeable battery backup (in case of power failure) is available optionally

OTI & 2 WTI 'TPR-702' SERIES

Specially Designed For Solar IDT Transformer



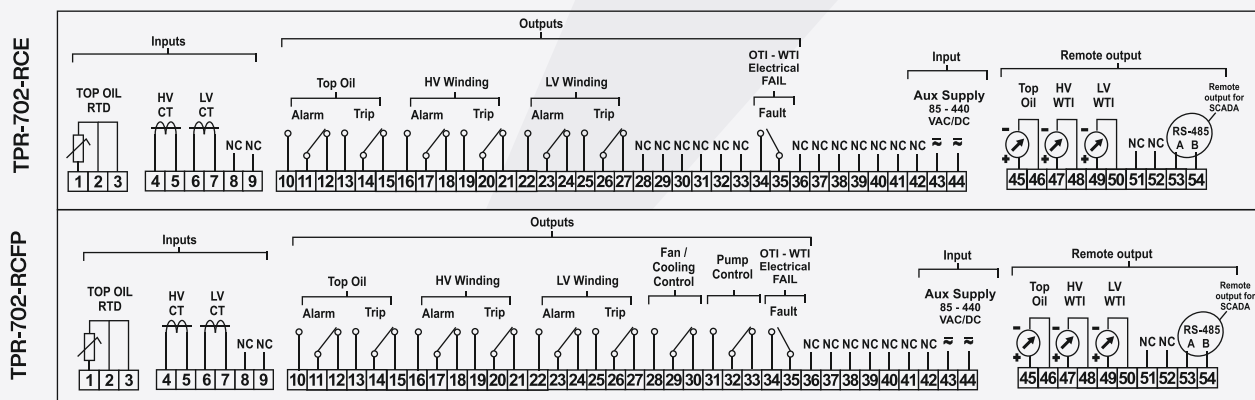
OTI & 2 WTI

ELMB-16H

ELMB-72HR

Features ↓ TPR Model No. OTI & WTI →	IP Rating OTI & WTI	No. of OTI	No. of WTI	Relay Contacts	No. of 4 - 20 mA	RS - 485	Electrical Fail Fault	Pump Control	Fan Control
TPR - 702 - R	66	1	2	6c/o	3	✗	✓	✗	✗
TPR - 702 - RC	66	1	2	7c/o	3	✓	✓	✗	✗
TPR - 702 - RCF	66	1	2	8c/o	3	✓	✓	✗	✓
TPR - 702 - RCFP	66	1	2	8c/o	3	✓	✓	✓	✓

Features ↓ Marshalling Box Model No. →	IP Rating Marshalling Box	Heater & Thermostat	Switch & Socket	Buchholz, MOG, PRV Tank Status on SCADA	Marshalling Box Overall Dimensions
ELMB-16H	55	✓	✓	✗	Height = 550MM Width = 570MM Depth = 250MM
ELMB-72HR	55	✓	✓	✓	Height = 850MM Width = 700MM Depth = 250MM

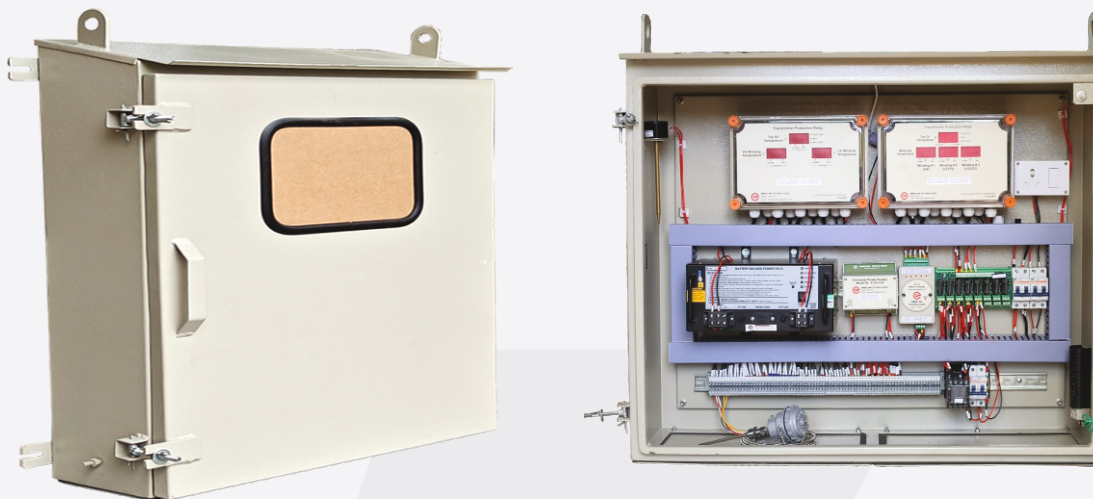


NOTE

- Auxiliary supply 20-50VAC/DC is available optionally
- Rechargeable battery backup (in case of power failure) is available optionally

OTI & 5 WTI MARSHALLING BOX

Specially Designed For Solar IDT Transformer

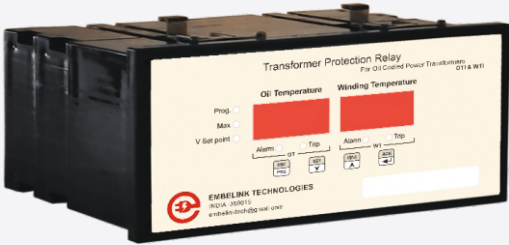


ELMB-75HR

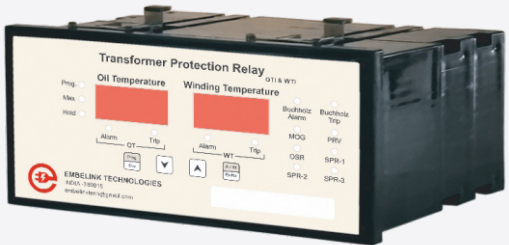
Features ↓ TPR Models No. OTI & WTI	IP Rating OTI & WTI	No. of OTI	No. of WTI	Relay Contacts	No. of 4 - 20 mA	RS - 485	Electrical Fail Fault	Pump Control	Fan Control
TPR - 702 - R TPR - 703 - R	66	1	5	14 _{c/o}	6	✗	✓	✗	✗
TPR - 702 - RC TPR - 703 - RC	66	1	5	14 _{c/o}	6	✓	✓	✗	✗
TPR - 702 - RCF TPR - 703 - RC	66	1	5	14 _{c/o}	6	✓	✓	✗	✓
TPR - 702 - RCFP TPR - 703 - RC	66	1	5	14 _{c/o}	6	✓	✓	✓	✓

Features ↓ Marshalling Box Model No.	IP Rating Marshalling Box	Heater & Thermostate	Switch & Socket	Fan Control	Buchholz, MOG, PRV Tank Status on MODBBUS	Marshalling Box Overall Dimensions
ELMB-75H	55	✓	✓	✗	✗	Height = 800MM Width = 950MM Depth = 250MM
ELMB-75HR	55	✓	✓	✗	✓	
ELMB - 75HF12	55	✓	✓	12	✗	
ELMB - 75HRF12	55	✓	✓	12	✓	

OTI & WTI 'TPR-601' & 'TPR-651' SERIES



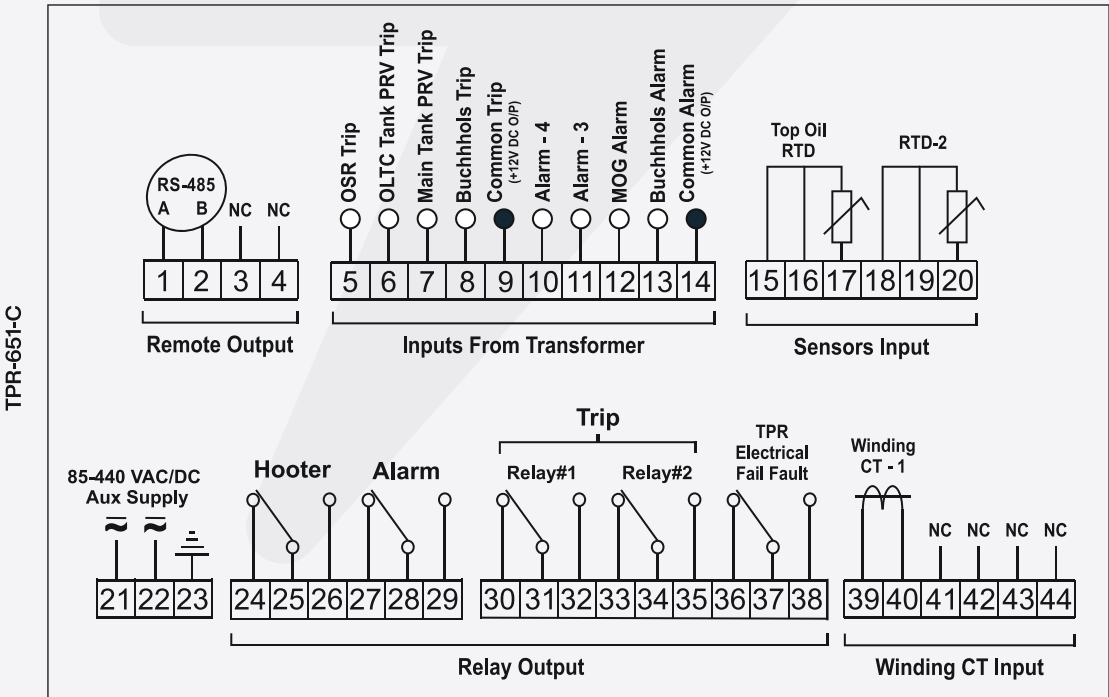
TPR-601
(OTI & WTI)



TPR-651
(OTI & WTI WITH ANNUNCIATION)

Overall Dimensions	Flush Panel Mounting	Meterial
Height = 96MM Length = 190MM Depth = 125MM	Cutout = 92(H) X 188(w) mm	ABS

Features ↓ TPR Model No. OTI & WTI →	IP Rating Face	No. of OTI	No. of WTI	Relay Contacts	No. of 4 - 20 mA	RS - 485	Electrical Fail Fault	Buchholz, MOG, PRV, OSR Trip Indication	Annunciation
TPR - 601 - C	54	1	1	4c/o	✗	1	✓	✗	✗
TPR - 601 - C2	54	1	1	4c/o	✗	2	✓	✗	✗
TPR - 651 - C	54	1	1	4c/o	✗	1	✓	✓	✓
TPR - 651 - C2	54	1	1	4c/o	✗	2	✓	✓	✓



OTI & WTI 'TPR-601' & 'TPR-651' SERIES

OTI & WTI

MARSHALLING BOX

RTCC PANEL

DRY TRANSFORMER

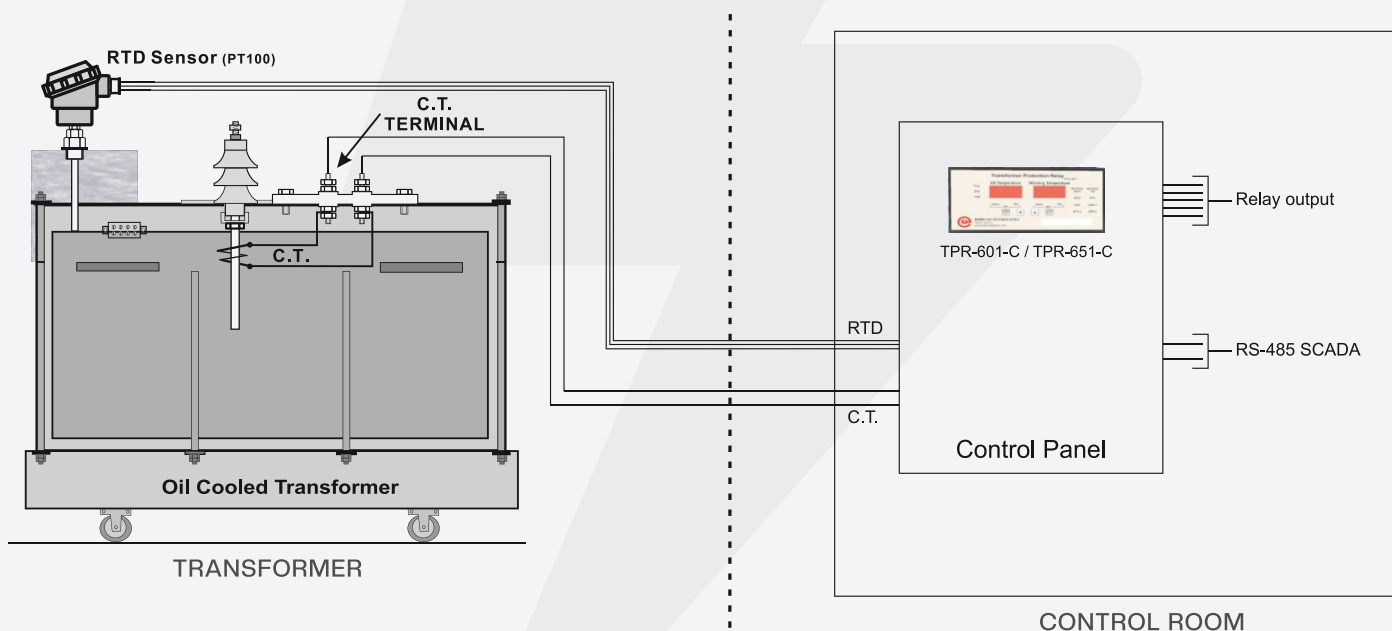


TPR-651 DETAILS

TRANSFORMER PROTECTION RELAY (TPR-651)

- Buchholz alarm/trip, MOG alarm main tank PRV, OSR trip indication are available on display.
- No master trip relay required.
- Alarm relay will be energized with OT alarm / WT alarm / Buchholz alarm MOG alarm.
- Trip relay will be energized with OT trip / WT trip / Buchholz trip.
- Hooter relay is available for annunciation, also Ack / Hooter silence key is provided.

No Marshalling Box is required as OTI & WTI is directly mounted on C & R / RTCC Panel

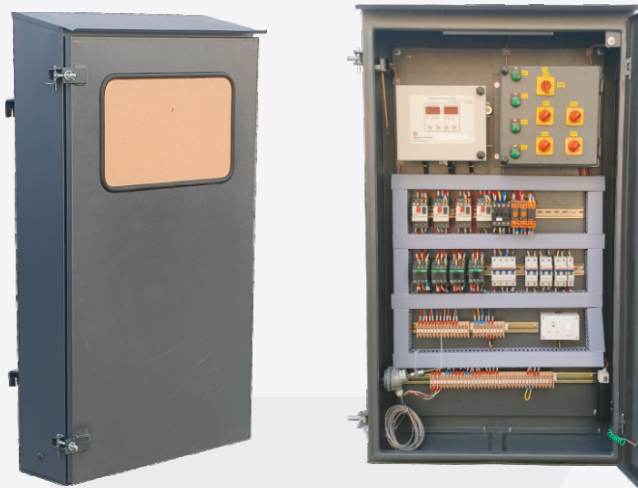


NOTE

- No **MASTER TRIP** relay is required
- No remote output needed
- No marshalling box needed
- Cable length is reduced

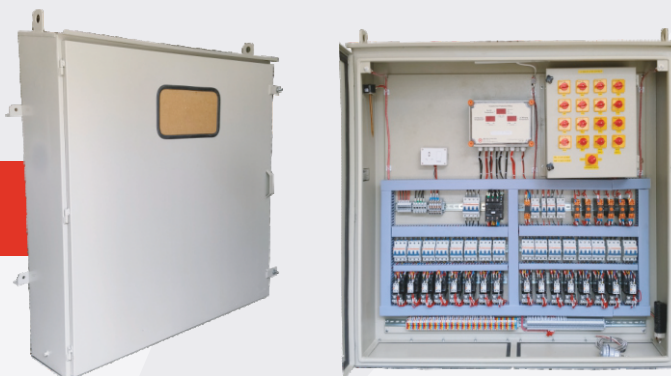
OTI & WTI WITH FAN CONTROL MARSHALLING BOX

| ELMB-4FH



4 FANS

Features ↓ Model No	IP Rating Marshalling Box	Heater & Thermostate	Switch & Socket	Buchholz, MOG, PRV Tank Status on MODBUS	No. of Fan Group	No of Fan	No. of Pump Group	No of Pump	Marshalling Box Overall Dimensions
ELMB-4FH	55	✓	✓	✗	2	4	1	2	Height = 1250MM Width = 850MM Depth = 200MM
ELMB-4FHR	55	✓	✓	✓	2	4	1	2	

14 FANS
2 PUMPS

| ELMB-14FH

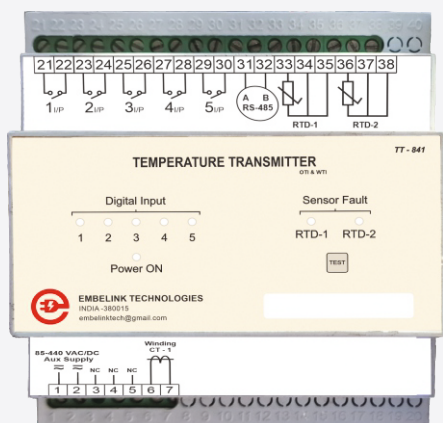
Features ↓ Model No	IP Rating Marshalling Box	Heater & Thermostate	Switch & Socket	Buchholz, MOG, PRV Tank Status on MODBUS	No. of Fan Group	No of Fan	No. of Pump Group	No of Pump	Marshalling Box Overall Dimensions
ELMB-14FH	55	✓	✓	✗	2	14	1	2	Height = 1250MM Width = 1350MM Depth = 200MM
ELMB-14FHR	55	✓	✓	✓	2	14	1	2	

NOTE

- Marshalling box can be customized with 6 fans, 8 fans and any other nos. of fans.

OTI & WTI TEMPERATURE TRANSMITTER

TT-841



- Measures oil and winding temperature and transmit through RS-485.
- Five input status sensing like Buchholz alarm & trip, MOG, OLTC/PRV tank, OLTC OSR. connection (Maximum Voltage +24VDC)
- Enclosure is designed for Din-rail mounting.
- Overall Dimensions:
112mm (L) x 112mm (W) x 88mm (D)
- 85 - 440 VAC/DC universal power supply. due to this wide range supply TT-841 performs well in phase imbalance condition. (20-50 VAC/DC supply available optionally)

- CT and dT(Gradient) are site selectable simplifies inventory and preventive maintenance.
- Fully user programmable
- Maximum temperature storage capacity and max. reading can be recalled after power fails.
- Facility is provided to reset maximum temperature for fresh recordings.
- Fault indication is provided for sensor open, short, over or under temperature conditions.
- TT-841 provided with data communication / interaction facility on MODBUS RTU slave protocol.

OIL LOW LEVEL DETECTION AND SEND SMS

ELOD-01

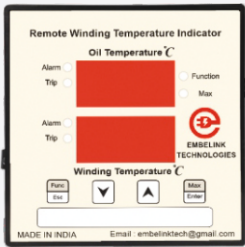


- It will detect oil low level and send SMS to pre-configure mobile no.
- Enclosure is designed for Din-rail Mounting.
- Overall Dimensions:
143mm (L) x 95mm (W) x 100mm (D)
- Power Supply : 24VDC (10-30VDC) with in-built rechargeable battery
- Sim card (nano) is in client scope

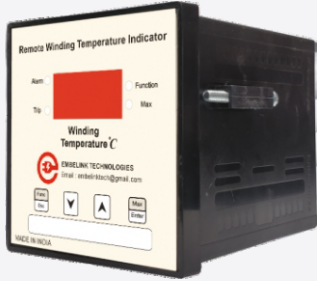
REMOTE TEMPERATURE INDICATOR



| ROTI-501



| ROWTI-501



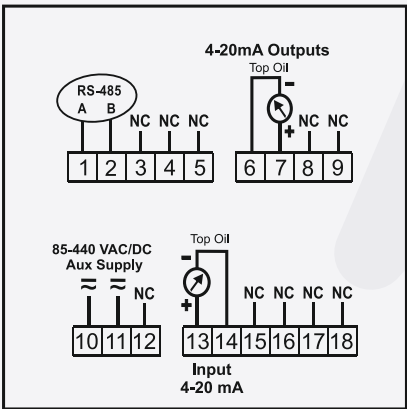
| RWTI-501

Overall Dimensions	Flush Panel Mounting	Material
Height = 96MM Length = 96MM Depth = 125MM	Cutout = 92(H) X 92(w) mm	ABS

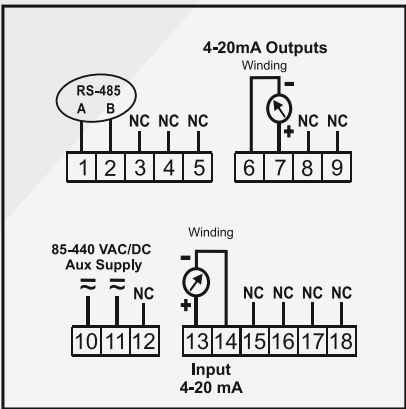
Features	ROTI / RWTI / ROWTI
Indication	TWO (Alarm, Trip)
IP Rating	IP - 54 (Face)

Feature Models	INPUT		OUTPUT		Display
	4 - 20 mA	RS-485	4 - 20 mA	RS-485	
ROTI-501	✓	✗	✗	✗	Oil Temp.
ROTI-501 -R	✓	✗	✓	✗	Oil Temp.
ROTI-501-RC	✓	✓	✓	✓	Oil Temp.
RWTI-501	✓	✗	✗	✗	Winging Temp.
RWTI-501-R	✓	✗	✓	✗	Winging Temp.
RWTI-501-RC	✓	✓	✓	✓	Winging Temp.
ROWTI-501	✓	✗	✗	✗	Oil & Winging Temp.
ROWTI-501-R	✓	✗	✓	✗	Oil & Winging Temp.
ROWTI-501-RC	✓	✓	✓	✓	Oil & Winging Temp.

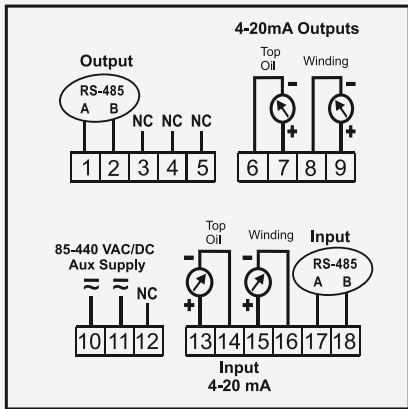
ROTI-501-RC



RWTI-501-RC



ROWTI-501-RC



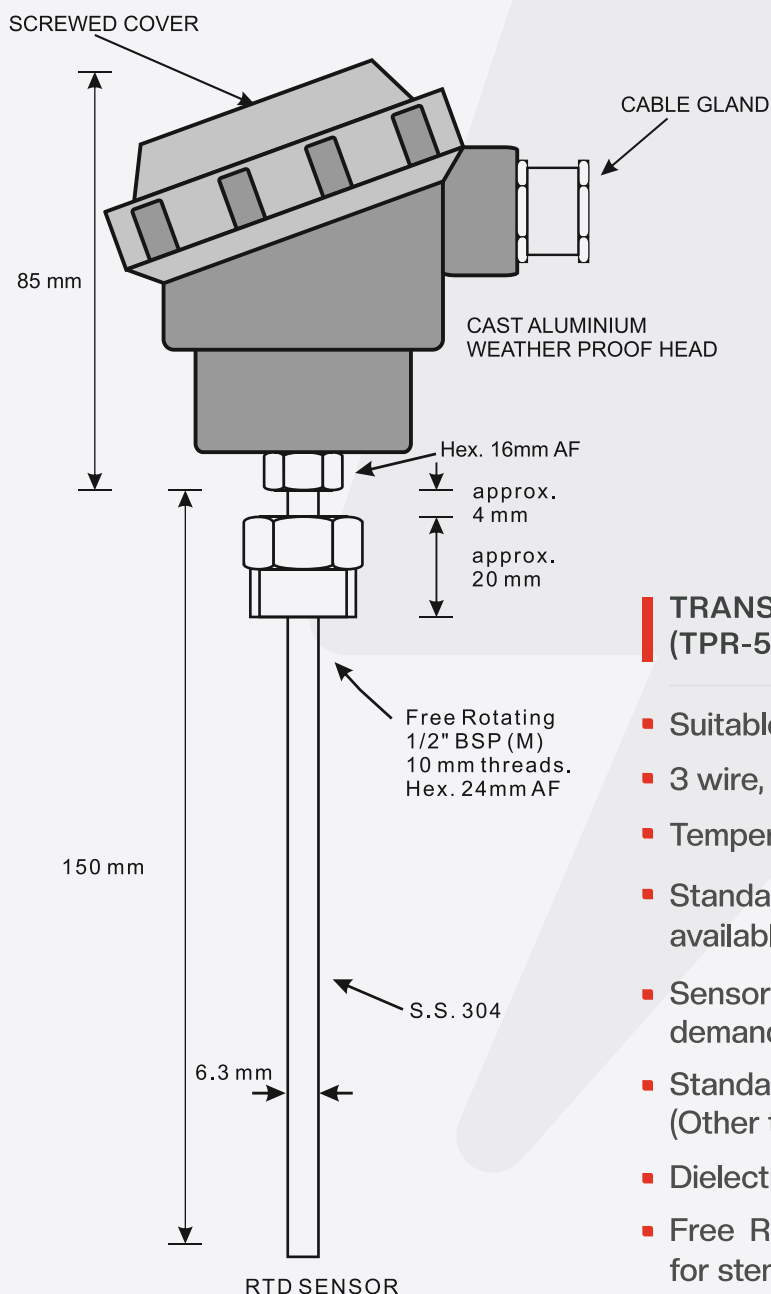
PT-100 SENSOR (FOR OIL-COOLED TRANSFORMER)

ORDERING CODE / INFORMATION

EL05 - TY - AS - TT - CL

TY	AS	TT	CL
TYPE	ADAPTER SIZE	THREAD TYPE	CABLE LENGTH
S = Simplex	12 = 1/2" BSP	M = Male	3M = 3 Meter
D = Duplex	34 = 3/4" BSP	F = Female	5M = 5 Meter
			10M = 10 Meter

Any customized
length available



TRANSFORMER PROTECTION RELAY (TPR-501-RCFO)

- Suitable for all our OTI & WTI
- 3 wire, PT-100 type sensor (IEC-60751, Class B)
- Temperature range : -50 to 200 °C
- Standard lead length : 3 meters (Other lengths available on demand)
- Sensor Type : Simplex (Duplex available on demand)
- Standard thread for RTD pocket : 3/4" BSP Male (Other thread available on demand)
- Dielectric Strength : 2.5KVAC rms for 1 min
- Free Rotating Adjustable Adapter is provided for stem length adjustment

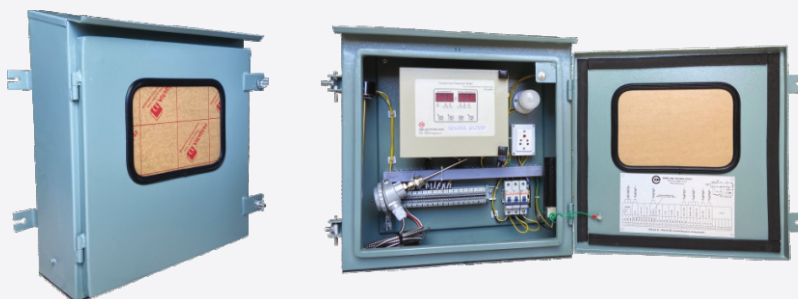
MARSHALLING BOX SELECTION GUIDE

SELECTION GUIDE

↓ Model No. → Features		IP Rating OTI & WTI	IP Rating Marshalling Box	No. of OTI	No. of WTI	Relay Contacts	Electrical Fail Fault	No. of 4 - 20 mA	RS - 485	Buchholz, MOG, PRV Tank Status on SCADA	No. of Fan/Pump Group	No. of Fan/Pump Control	HEATER & THERMOSTAT	Page No.
Marshalling Box Model No.	TPR Model No. OTI & WTI													
ELMB-16H	TPR-501-R	55	55	1	1	4c/o	✗	2	✗	✗	✗	✗	✓	14
ELMB-16H	TPR-501-RC	55	55	1	1	4c/o	✗	2	✓	✗	✗	✗	✓	14
ELMB-16H	TPR-701-E	66	55	1	1	4No	✗	✗	✗	✗	✗	✗	✓	15
ELMB-16H	TPR-701-RC	55	55	1	1	4c/o	1No	2	✓	✗	✗	✗	✓	16
ELMB-71HR	TPR-701-RC	66	55	1	1	4c/o	1No	2	✓	✓	✗	✗	✓	16
ELMB-72H	TPR-702-RC	66	55	1	2	6c/o	1No	3	✓	✗	✗	✗	✓	17
ELMB-72HR	TPR-702-RC	66	55	1	2	6c/o	1No	3	✓	✓	✗	✗	✓	17
ELMB - 72HG2F4	TPR-702-RCF2	66	55	1	2	8c/o	1No	3	✓	✗	2	4	✓	17
ELMB - 72HRG2F4	TPR-702-RCF2	66	55	1	2	8c/o	1No	3	✓	✓	2	4	✓	17
ELMB-73H	TPR-703-RC	66	55	1	3	8c/o	1No	4	✓	✗	✗	✗	✓	18
ELMB-73HR	TPR-703-RC	66	55	1	3	8c/o	1No	4	✓	✓	✗	✗	✓	18
ELMB-75H	TPR-702-RC TPR-703-RC	66	55	1	5	12c/o	1No	6	✓	✗	✗	✗	✓	19
ELMB-75HR	TPR-702-RC TPR-703-RC	66	55	1	5	12c/o	1No	6	✓	✓	✗	✗	✓	19
ELMB - 75HF12	TPR-702-RCF2 TPR-703-RCF2	66	55	1	5	14c/o	1No	6	✓	✗	2	12	✓	22
ELMB - 75HRF12	TPR-702-RCF2 TPR-703-RCF2	66	55	1	5	14c/o	1No	6	✓	✓	2	12	✓	22
ELMB - 4FH	TPR-501-RC	66	55	1	2	14c/o	1No	6	✓	✗	3	6	✓	22
ELMB - 14FH	TPR-702-RCF2P	66	55	1	2	14c/o	1No	6	✓	✗	3	16	✓	22

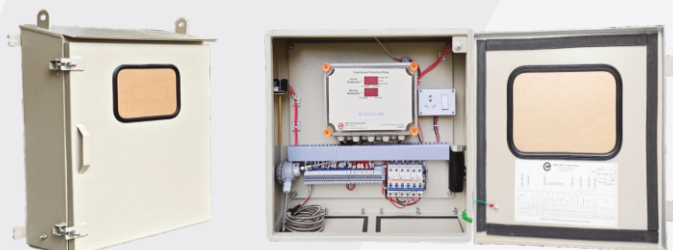
MARSHALLING BOX DETAILS

ELMB-16X MARSHALLING BOX DETAILS



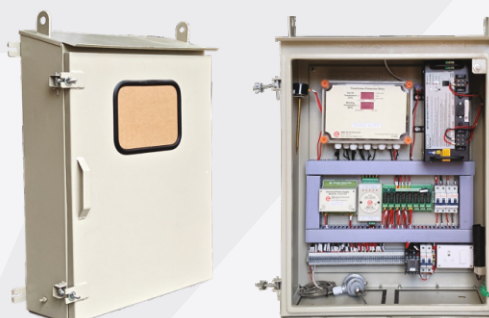
Features Marshalling Box Model No. →	IP Rating Marshalling Box	Heater & Thermostate	Switch & Socket	Marshalling Box		Page No.
				Mounting Dimensions	Overall Dimensions	
ELMB-16	55	✗	✗	Height = 320MM Width = 520MM	Height = 550MM Width = 570MM Depth = 250MM	14
ELMB-16H	55	✓	✓			14

ELMB-7X-H MARSHALLING BOX DETAILS



Features Marshalling Box Model No. →	IP Rating Marshalling Box	Heater & Thermostate	Switch & Socket	Buchholz, MOG, PRV Tank Status on SCADA	Marshalling Box		Page No.
					Mounting Dimensions	Overall Dimensions	
ELMB-73H	55	✓	✓	✗	Height = 520MM Width = 650MM	Height = 700MM Width = 680MM Depth = 250MM	18

ELMB-7X-HR MARSHALLING BOX DETAILS

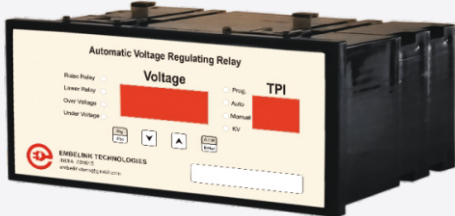


Features Marshalling Box Model No. →	IP Rating Marshalling Box	Heater & Thermostate	Switch & Socket	Buchholz, MOG, PRV Tank Status on SCADA	Marshalling Box		Page No.
					Mounting Dimensions	Overall Dimensions	
ELMB-71HR	55	✓	✓	✗	Height = 700MM Width = 650MM	Height = 800MM Width = 950MM Depth = 250MM	16
ELMB-72HR	55	✓	✓	✗			17
ELMB-73HR	55	✓	✓	✗			18

AUTOMATIC VOLTAGE REGULATING RELAY
(AVR-301 & AVR-302)



AVR-301



AVR-302

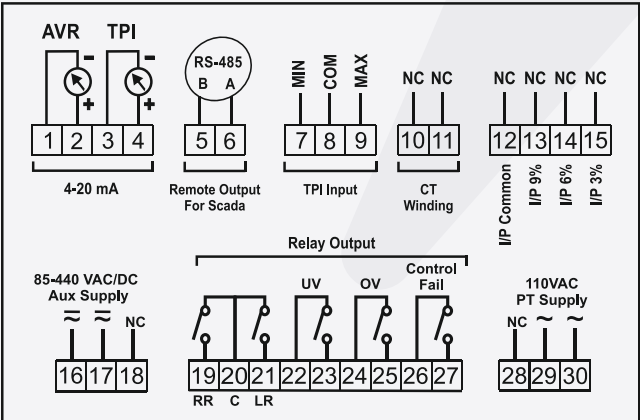
Overall Dimensions	Flush Panel Mounting	Material
Height = 96MM Length = 190MM Depth = 125MM	Cutout = 92(H) X 188(w) mm	ABS

Features	AVR-301 & AVR-302
PT Supply	110V + 10%, 50Hz, 1.5 VA.
Indication	Under and Over Voltage, Rise and Lower Pre-signals, Auto, Manual, KV.
IP Rating	IP - 54 (Face)

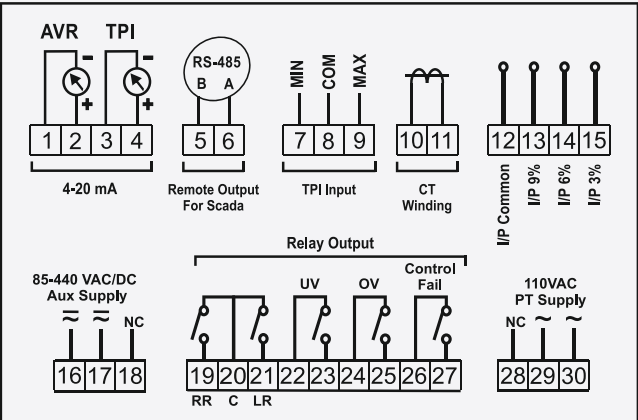
AVR VARIANTS

Feature Models	4 - 20 mA	RS-485	Tap Position	Load Shedding	Line Drop Compensator
AVR-301	✗	✗	✗	✗	✗
AVR-301-R	✓	✗	✗	✗	✗
AVR-301-RC	✓	✓	✗	✗	✗
AVR-302	✗	✗	✓	✗	✗
AVR-302-R	✓	✗	✓	✗	✗
AVR-302-RC	✓	✓	✓	✗	✗
AVR-302-L	✗	✗	✓	✗	✓
AVR-302-S	✗	✗	✓	✓	✗
AVR-302-LS	✗	✗	✓	✓	✓
AVR-302-RCL	✓	✓	✓	✗	✓
AVR-302-RCS	✓	✓	✓	✓	✗
AVR-302-RCLS	✓	✓	✓	✓	✓

AVR-302-RC



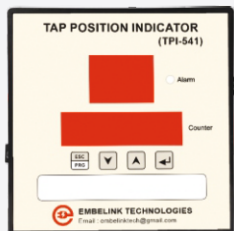
AVR-302-RCLS



TAP POSITION INDICATOR (TPI-54X & TPI-64X SERIES)



| TPI-540



| TPI-541 / TPI-641



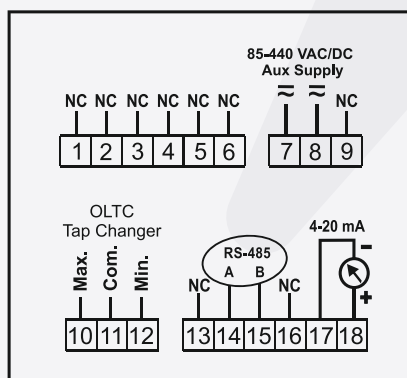
| TPI-640

Overall Dimensions	Flush Panel Mounting	Material
Height = 96MM Length = 96MM Depth = 125MM	Cutout = 92(H) X 92(w) mm	ABS

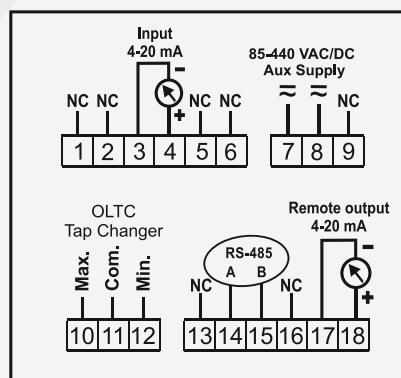
Features	TPI-540-41 & TPI-640-41
STEP	Number of tap position 40
IP Rating	IP - 54 (Face)

Feature Models	INPUT		OUTPUT		Counter
	4 - 20 mA	Resistance (1K)	4 - 20 mA	RS-485	
TPI - 540	✗	✓	✗	✗	✗
TPI - 540 - R	✗	✓	✓	✗	✗
TPI - 540 - RC	✗	✓	✓	✓	✗
TPI - 541	✓	✗	✗	✗	✗
TPI - 541 - R	✓	✗	✓	✗	✗
TPI - 541 - RC	✓	✗	✓	✓	✗
TPI - 640	✗	✓	✗	✗	✓
TPI - 640 - R	✗	✓	✓	✗	✓
TPI - 640 - RC	✗	✓	✓	✓	✓
TPI - 641	✓	✗	✗	✗	✓
TPI - 641 - R	✓	✗	✓	✗	✓
TPI - 641 - RC	✓	✗	✓	✓	✓

| TPI-540-RC



| TPI-640-RC



RTCC PANEL



| ELRT-MAC-12-6L

| ELRT-CTR-CM16-11-2L

| ELRT-CTR-FR20-12-6L

ORDERING CODE / INFORMATION

ELRT - CO - RPD - AM - LI

CO	RPD	AM	LI
COMPATIBLE OLTC	RTCC PANEL DIMENSIONS	AVR/TPI MODEL NO.	LAMP FOR INDICATION

| COMPATIBLE OLTC (CO)

EASUN-MR : EASUN-MR1 OLTC
 MAC : MAC POWER OLTC
 CTR-CM16 : CTR OLTC
 CTR-FR20 : CTR OLTC
 CGL : CGL OLTC

| AVR MODEL NO (AM)

01 : AVR-301 + TPI-540 (separate)
 02 : AVR-302 (TPI Intigratade in AVR)
 03 : AVR-302-S (Load shedding)
 04 : AVR-302-L (Line Drop Compensator)

| RTCC PANEL DIMENSIONS (RPD)

0 : 610mm(H) x 600mm(W) x 410mm(D)
 1 : 610mm(H) x 600mm(W) x 510mm(D)
 2 : 1800mm(H) x 600mm(W) x 500mm(D)

| LAMP INDICATION (LI)

2L : TCPL, SOL
 3L : TCPL, PRV, SOL
 6L : TCPL, ULR, PRV, LLR, SOL, MPR/SF
 11L : TCPL, SOL, MPR, TSL, ASF, ULR, LLR, OVL, UVL, LOCAL, PRT

RTCC PANEL

WITH ADDITIONAL LAMP INDICATION

| ELRT-CTR-01-11L



| LAMP INDICATION DESCRIPTION

TCPL	: Tap change in progress
SOL	: OLTC control supply on
MPR	: OLTC motor protection
TSL	: OLTC TAP changer stuck-up
ASF	: OLTC control supply fail
ULR	: Upper limit reached
LLR	: Lower limit reached
UVL	: Under voltage lamp
OVL	: Over voltage lamp
LOCAL	: OLTC in local mode
PRT	: OLTC PRV operated

| RTCC BUZZERS

TCPBZ	: Tapchange in progress buzzer
TRIPBZ	: TRIP buzzer
ASFBZ	: OLTC supply fail buzzer

WTI FOR DRY-TYPE TRANSFORMER

SELECTION GUIDE

Features ↓ Models	IP Rating	No. of WTS (1-Alarm & 1-Trip)	Fan	4 - 20 mA	RS - 485	Cooling Control	Auxiliary Supply 85 - 440V AC/DC	TPR Power Supply Fail Indication	Page No.
TPR - 104 - R	66	4	✓	✓	✗	✗	✓	✗	33
TPR - 104 - RC	66	4	✓	✓	✓	✗	✓	✗	33
TPR - 106 - R	66	6	✓	✓	✗	✗	✓	✗	34
TPR - 106 - RC	66	6	✓	✓	✓	✗	✓	✗	34
TPR - 108 - R	66	8	✓	✓	✗	✗	✓	✗	35
TPR - 108 - RC	66	8	✓	✓	✓	✗	✓	✗	35
TPR - 204 - R	54	4	✓	✓	✗	✗	✓	✗	36
TPR - 204 - RC	54	4	✓	✓	✓	✗	✓	✗	36
TPR - 206 - R	54	6	✓	✓	✗	✗	✓	✗	36
TPR - 206 - RC	54	6	✓	✓	✓	✗	✓	✗	36

NOTE

- Auxiliary supply 20-50VAC/DC is available optionally
- Rechargeable battery backup (in case of power failure) is available optionally

TPR-104 SERIES WTI FOR DRY TRANSFORMER

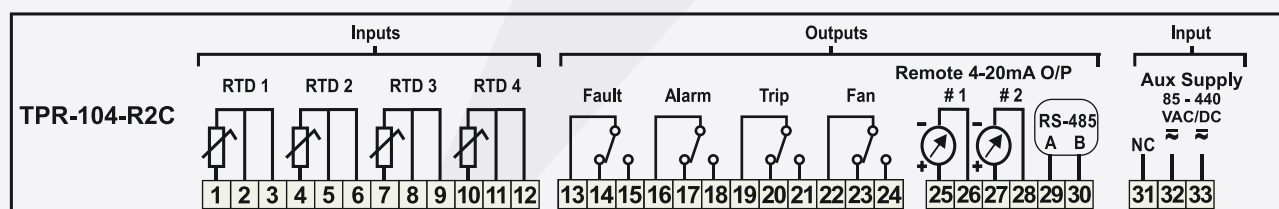
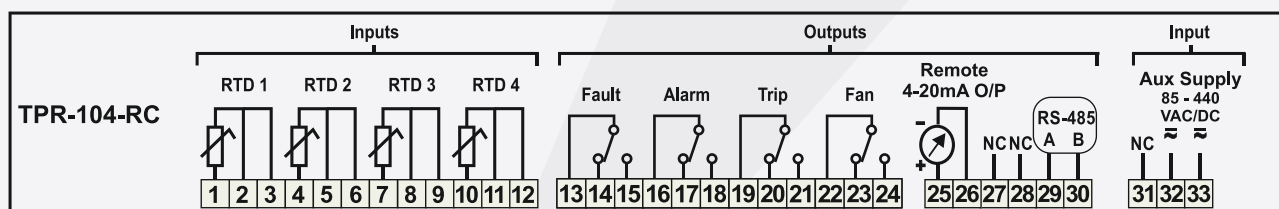
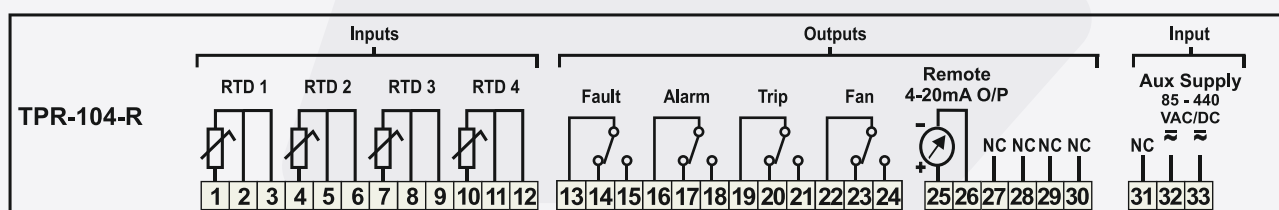
Features	TPR - 104
WTS	4 Channel Winding Temperature Scanners
No. of Relay	Four (Alarm, Trip, Fan, Fault)
IP Rating	IP - 66



I TPR-104

Overall Dimensions	Mounting Dimensions	Material
Height = 210MM Width = 265MM Depth = 120MM		M S Box with Powder Coated

Features Models	No. of Channel	4 - 20 mA	RS - 485	Fan1 / Cooling Control
TPR - 104 - R	4	1NOS	✗	✓
TPR - 104 - C	4	✗	✓	✓
TPR - 104 - R2	4	2NOS	✗	✓
TPR - 104 - RC	4	1NOS	✓	✓
TPR - 104 - R2C	4	2NOS	✓	✓



NOTE

- Auxiliary supply 20-50VAC/DC is available optionally
- Rechargeable battery backup (in case of power failure) is available optionally

TPR-106 SERIES WTI FOR DRY TRANSFORMER

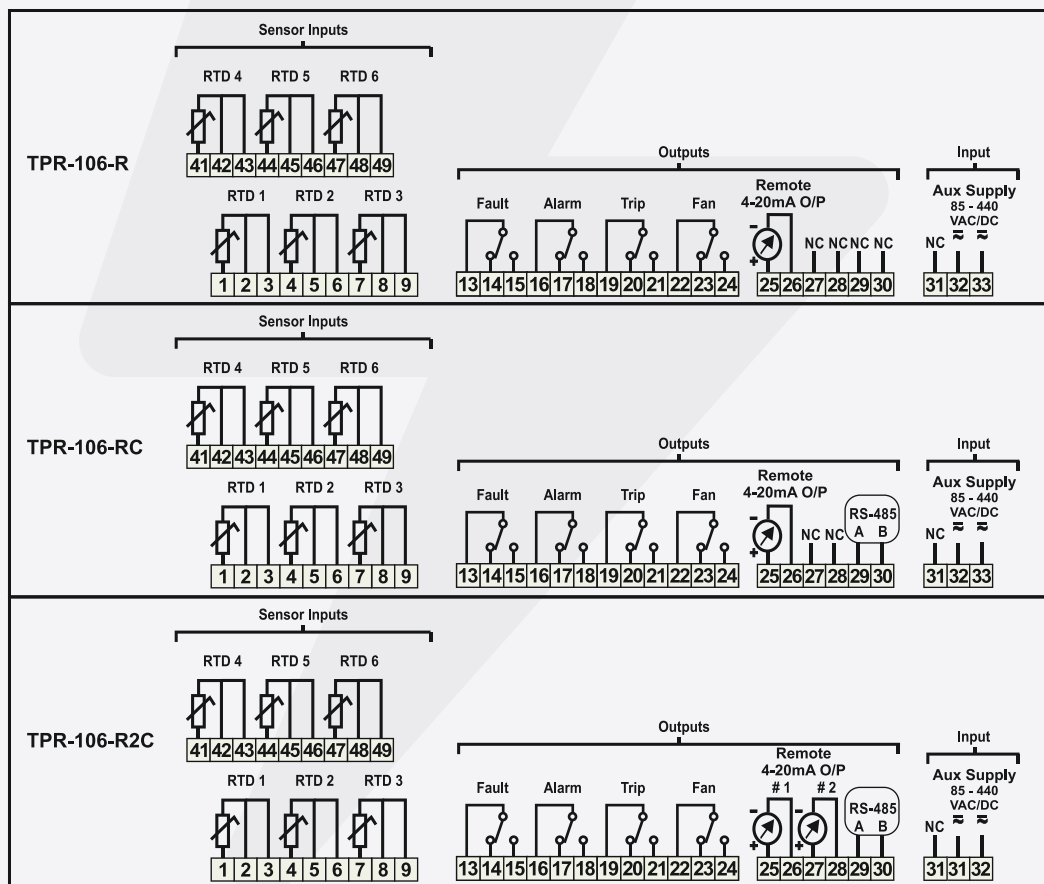


I TPR-106

Features	TPR - 106
WTS	6 Channel Winding Temperature Scanners
No. of Relay	Four (Alarm, Trip, Fan, Fault)
IP Rating	IP - 66

Overall Dimensions	Mounting Dimensions	Material
Height = 210MM Width = 265MM Depth = 120MM		M S Box with Powder Coated

Features Models	No. of Channel	4 - 20 mA	RS - 485	Fan1 / Cooling Control
TPR - 106 - R	6	1NOS	✗	✓
TPR - 106 - C	6	✗	✓	✓
TPR - 106 - R2	6	2NOS	✗	✓
TPR - 106 - RC	6	1NOS	✓	✓
TPR - 106 - R2C	6	2NOS	✓	✓



NOTE

- Auxiliary supply 20-50VAC/DC is available optionally
- Rechargeable battery backup (in case of power failure) is available optionally

TPR-108 SERIES WTI FOR DRY TRANSFORMER

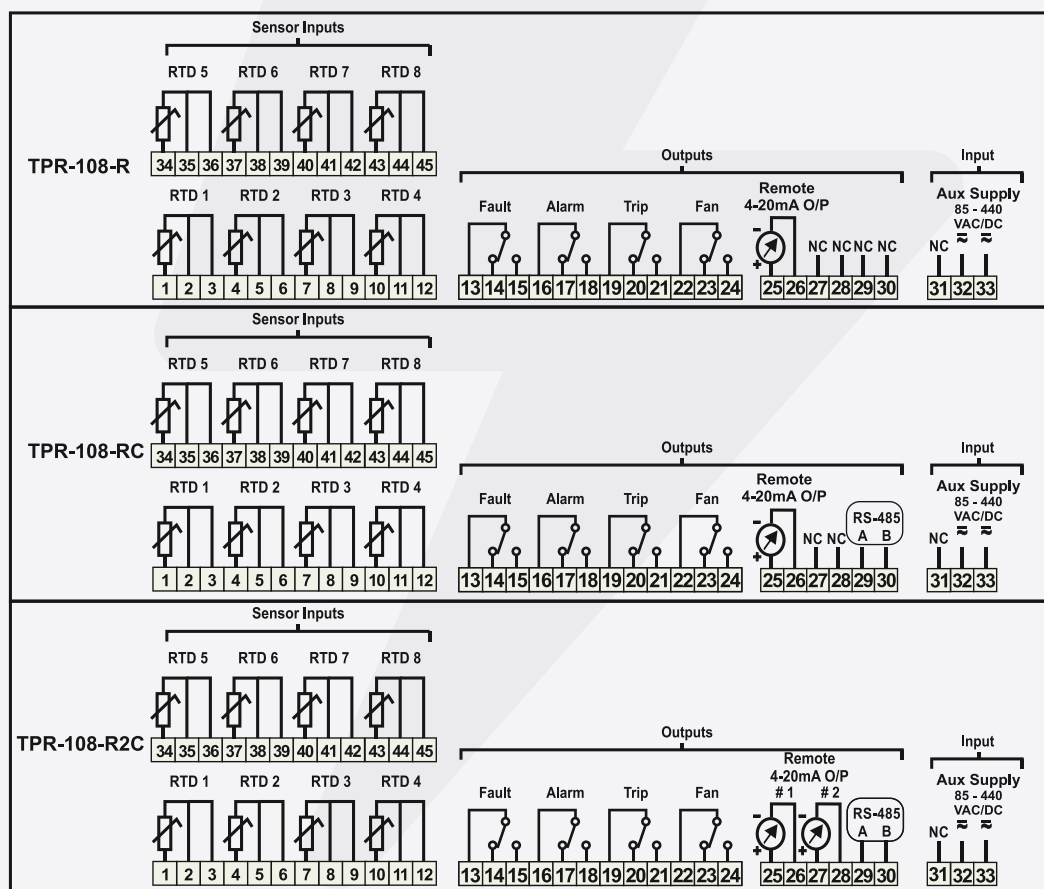
Features	TPR - 108
WTS	8 Channel Winding Temperature Scanners
No. of Relay	Four (Alarm, Trip, Fan, Fault)
IP Rating	IP - 66

Overall Dimensions	Mounting Dimensions	Material
Height = 210MM Width = 265MM Depth = 120MM		M S Box with Powder Coated



TPR-108

Features Models	No. of Channel	4 - 20 mA	RS - 485	Fan1 / Cooling Control
TPR - 108 - R	8	1NOS	✗	✓
TPR - 108 - C	8	✗	✓	✓
TPR - 108 - R2	8	2NOS	✗	✓
TPR - 108 - RC	8	1NOS	✓	✓
TPR - 108 - R2C	8	2NOS	✓	✓



NOTE

- Auxiliary supply 20-50VAC/DC is available optionally
- Rechargeable battery backup (in case of power failure) is available optionally

TPR-204, 206 SERIES WTI FOR DRY TRANSFORMER

OTI & WTI

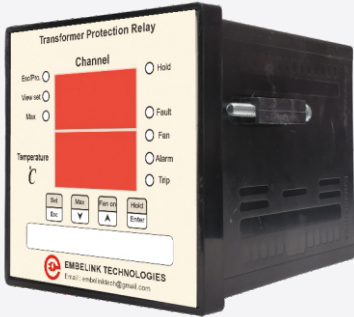
MARSHALLING BOX

RTCC PANEL

DRY TRANSFORMER



TPR-204



TPR-206

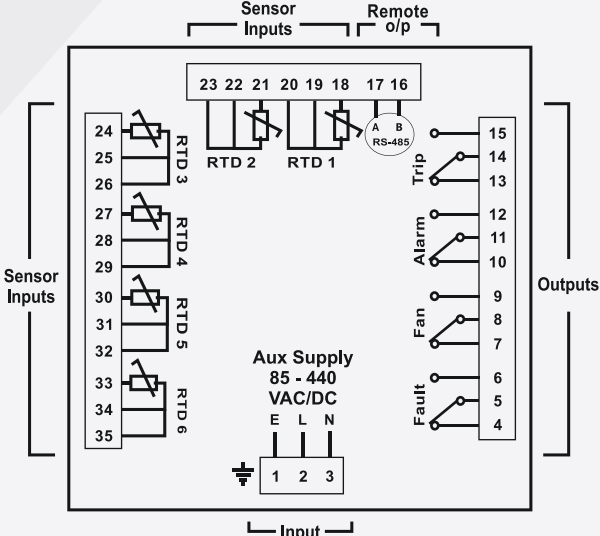
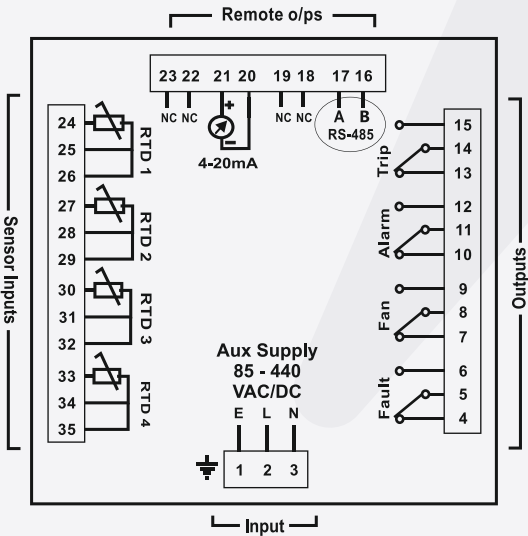
Overall Dimensions	Flush Panel Mounting	Material
Height = 96MM Width = 96MM Depth = 125MM	Cutout = 92(H) X 92(w) mm	ABS

Features	TPR - 204 / TPR - 206
WTS	4,6 Channel Winding Temperature Scanners
No. of Relay	Four (Alarm, Trip, Fan, Fault)
IP Rating	IP - 54

Features Models	No. of Channel	4 - 20 mA	RS - 485	Fan1 / Cooling Control
TPR - 204 - R	4	1NOS	✗	✓
TPR - 204 - C	4	✗	✓	✓
TPR - 204 - R2	4	2NOS	✗	✓
TPR - 204 - RC	4	1NOS	✓	✓
TPR - 204 - R2C	4	2NOS	✓	✓
TPR - 206 - R	6	1NOS	✗	✓
TPR - 206 - C	6	✗	✓	✓

TPR-204-RC

TPR-206-C



RTD PT-100 SENSOR (FOR DRY TRANSFORMER)

| EL02-S-3M



ORDERING CODE / INFORMATION

EL02 - X - XM

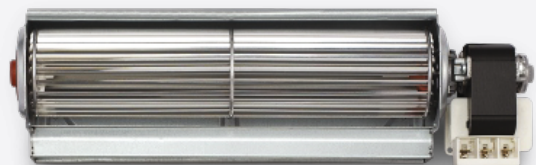
X	XM
TYPE	CABLE LENGTH
S = Simplex	3M = 3 Meter
D = Duplex	5M = 5 Meter
	10M = 10 Meter
	Any customized length available

- Suitable for all our WTI
- 3 wire, PT-100 type sensor (IEC-60751, Class B)
- Temperature range : -50 to 300 °C
- Standard lead length : 3 meters (Other lengths available on demand)
- Sensor Type : Simplex (Duplex available on demand)
- Dielectric Strength : 2.5KVAC rms for 1 min

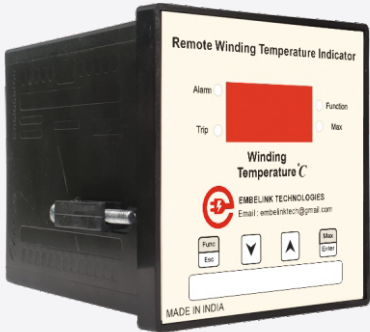
TRANSFORMER COOLING FAN (CROSS FLOW TYPE)

- Impeller dimension : 60 x 240 mm
- Power supply : 180-270 VAC
- Frequency : 50 Hz
- Max air flow : 190 m³ / hour
- Power : 32 W (+/- 5 W)
- Line current : 0.19A@ 230 VAC(+/- 10%)
- Max. pressure : 62 Pa
- Speed : 2000 rpm (+/- 150)

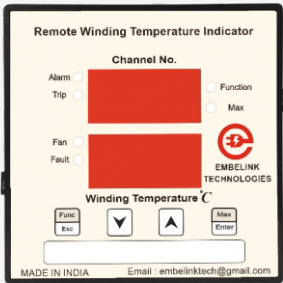
| ELCF-01



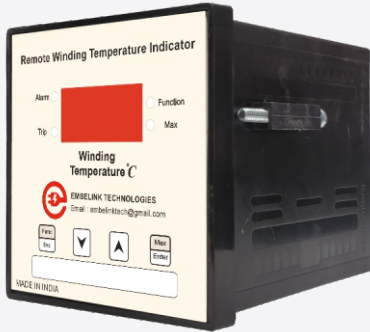
REMOTE WINDING TEMPERATURE INDICATOR
(DRY TYPE TRANSFORMER)



| RWTI-501



| RWTI-501-RC

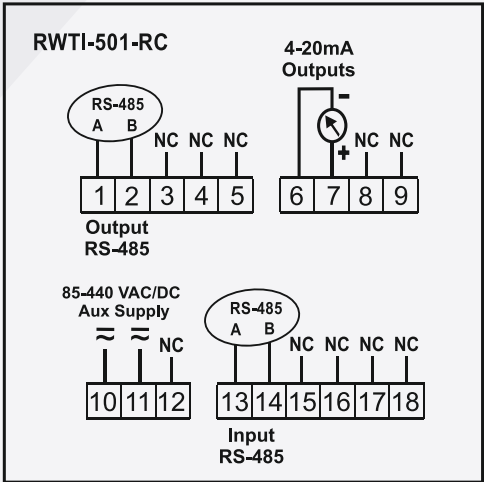
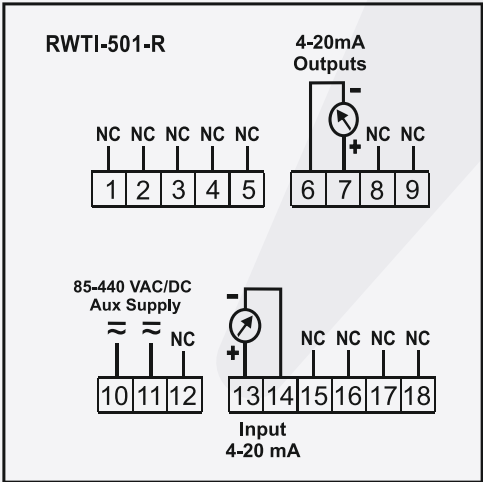


| RWTI-501-R

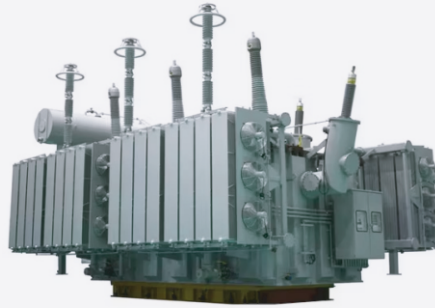
Overall Dimensions	Flush Panel Mounting	Material
Height = 96MM Length = 96MM Depth = 125MM	Cutout = 92(H) X 92(w) mm	ABS

Models Feature	INPUT		OUTPUT		Display
	4 - 20 mA	RS-485	4 - 20 mA	RS-485	
RWTI-501	✓	✗	✗	✗	Winding Temp.
RWTI-501-R	✓	✗	✓	✗	Winding Temp.
RWTI-501-RC	✗	✓	✓	✓	All Winding Temp.

Features	RWTI - 501 / 501-R	RWTI - 501 - RC
Indication	TWO (Alarm, Trip)	TWO (Alarm, Trip, Fan, Fault)
IP Rating	IP - 54 (Face)	IP - 54 (Face)



TRANSFORMER PROTECTION



Oil cooled power transformer



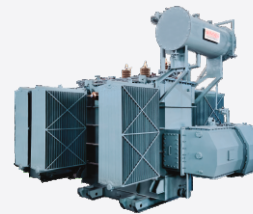
Distribution transformer



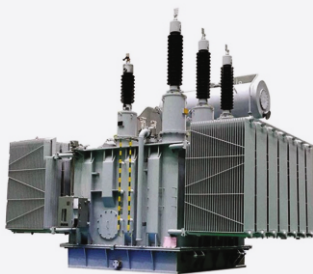
Solar inverter duty transformer



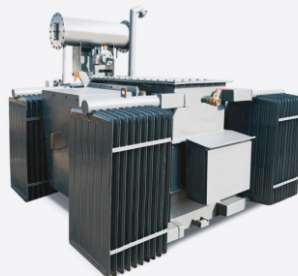
Wind transformer



Induction melting furnace duty transformer



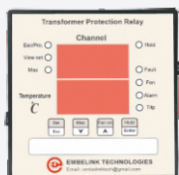
Electric arc furnace transformer



Electrical induction furnace power transformer



Automatic step voltage regulator transformer



Dry-type compact substation



VPI dry-type transformer



Dry-type Transformer

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