

GOVERNMENT OF INDIA  
MINISTRY OF RAILWAYS



**STR No. TI/STR/002(Revision-3)**

Schedule of Technical Requirements  
For Approval of Vendors

For supply of Control & Relay Panels incorporating with protective Relays for 25 kV/ 2x25 kV AC Traction System of Indian Railways.

Revised in:

Effective from:

PREPARED BY	CHECKED BY	REVIEWED BY	APPROVED BY

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## 1. SCOPE

This schedule covers the technical requirement to assess the manufacturing capability of vendor of Control & Relay Panels incorporating with protective Relays for 25 kV/ 2x25 kV AC Traction System of Indian Railways.

- 1.1. This Schedule of technical requirement shall be read in conjunction with RDSO's latest Specifications for control & relay panels incorporated with relays.

## 2. GENERAL REQUIREMENT, INFRASTRUCTURE AND MANUFACTURING FACILITIES

SN	Description	Remarks
2.1	The "Make in India" Policy of Government of India shall be applicable.	
2.2	The firm should have adequate covered accommodation for the purpose of effective storage of inward raw material and the finished panels awaiting dispatch and prototype/routine inspection and testing. The firm should have an effective quality control system to monitor quality control of the-	
2.2.1	Inward raw material	
2.2.2	Stage inspection at various assembly stages.	
2.2.3	Inspection of the final assembled product to conform adherence to the requirements of the specification.	
2.3	The firm should have a proper drawing office to support the design/ development of product. The company should have a clean and pollution free environment, should be taking adequate safety precautions during the production. The company must have items like fire extinguishers, safety warning board, shock treatment charts and medical first aid kit in their premises.	
2.4	The relations with the workers should be harmonious and regular employee training programs should be scheduled by the management for regular upgradation of the knowledge and skills of the employees.	

## 3. MACHINERY AND PLANT REQUIREMENT

The following machinery and plant of suitable capacity should be available at the firm's premises for the manufacturing of Control & Relay Panels incorporating with protective Relays for 25 kV/ 2x25 kV AC Traction System of Indian Railways.

SN	Name of M&P	Required for activity	Remarks
i.	a. CNC Machines required for process like shearing, punching, cutting and bending etc. b. Drilling machine	For fabrication of control panel	

	c. Suitable welding machine d. Grinding machine and portable grinder e. Mobile trolley and hoist		
ii.	a. Seven tank treatment for control panel b. Stove oven / Electric Dryer. c. Powder coating facilities of adequate size.	For dry powder coating on panels	
iii.	a. Portable drilling machines b. Diesel generating set of adequate capacity c. Bench Grinder d. Hand riveting machine e. Crimping tool of various size for lugs etc. f. Hand tools such as nose pliers, cutters, wire strippers, screwdrivers, spanners set and mallets. g. Mobile trolley and hoist	For assembly and panel wiring	
iv.	a. PC installed with latest genuine licensed AutoCAD software b. Colour Printer c. 3D drafting software like Solid Works	Preparation of drawings & printing.	

The activity at para 3.0 (i) & (ii) above may be outsourced, subject to stringent quality control by manufacturer. The manufacturer has to provide information regarding this in the Quality Assurance Plan (to be approved by RDSO) covering full details of activity being outsourced indicating control over quality of inward, in process and finished material as outcome of the said process

#### 4. QUALITY CONTROL REQUIREMENTS

SN	Description	Remarks
4.1.	The firm should have acquired ISO:9001-2015 or latest certification for the product broadly for which approval is being sought.	
4.2.	The system of easy traceability of the product from the raw-material stage to the finished product stage should be available.	
4.3.	QAP for the product in accordance with RDSO's guideline should be available. QAP shall be approved by RDSO.	
4.4.	The firm should have a system of monitoring customer complaints in the format similar to the format given in RDSO's Guideline for preparing	

	QAP.	
4.5.	Head of the inspection / testing / quality control section must possess at least Diploma in Engineering with 5 years' experience in the relevant field.	
4.6.	System should exist for documentation of the following-	
4.6.1	Incoming raw material with the reference of suppliers aswell as internal test.	
4.6.2	Details regarding stage inspection and test results.	
4.6.3	Details regarding the final testing and dispatch to the customer in proper packed condition.	
4.6.4	System for calibration of testing and measuring instruments.	

## 5. INSPECTION AND TESTING FACILITIES

The firm should have the following testing and measuring instruments/ equipment. These instruments should be calibrated with standard master instruments accountable to national physical laboratory or a similar reputed international agency. Each instrument should have a valid calibration certificate.

SN	Description	Remarks
5.1.	Secondary Injection Relay testing kit with following minimum facilities:	
5.1.1	At least 2 numbers fundamental 50 Hz sinusoidal wave current source. The capacity of each current source shall be at least 30 A. the current shall be variable in the steps of 0.001 A.	
5.1.2	At least 2 number ac voltage source, the voltage shall be variable from 0 to 280 V in steps of 0.01 V.	
5.1.3	DC output source, the voltage shall be variable from 0 to 250 in steps of 0.1 V.	
5.1.4	Capable to generate odd and even harmonics up to 13 <sup>th</sup> .	
5.1.5	Facility to mix each fundamental current source with different harmonics.	
5.1.6	The current and voltage source shall be usable alone or simultaneously.	
5.1.7	Facility to measure operating and resetting time of relays	
5.1.8	Error of relay testing kit shall not be more than 0.2%.	
5.1.9	Phase shifting 0 to 360 <sup>0</sup> in steps of 0.1 <sup>0</sup> in leading and lagging phase.	

5.1.10	Manual as well as automatic testing of relays. The automatic test result shall be saved in the memory and printable.	
5.2	High Voltage testing equipment minimum 2 kV.	
5.3	Insulation Resistance tester 500 V and 1000 V.	
5.4	Stabilised DC power supply variable from 0 to 150 V dc.	
5.5	Digital Multi-meter (Adequate number of meters should be available), continuity tester.	
5.6	Magnifying Lenses.	
5.7	High rating variable AC current injection source upto 250A	
5.8	Infrared (IR) Digital thermometer	
5.9	Digital Vernier Callipers, screw gauge and meter scale	
5.10	KVA & KW meter	
5.11	Digital Oscilloscopes with probe (Storage type)	
5.12	Inductor and Rheostat of different rating used for contact making and breaking test.	