

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(भारत सरकार, रेल मंत्रालय)



TI/STR/004

(Revision-1)

**“Schedule of Technical Requirement for Manufacturing
& testing facilities and quality control requirement for
approval of firms for supply of Series Reactors
for Shunt Capacitor banks for
Traction Sub – Station of Indian Railways”**

SPECIFICATION NO.

1. TI/SPC/PSI/FC&SR/0100 OR LATEST
2. TI/SPC/PSI/FC&SR/1210 OR LATEST

ISSUED BY

TRACTION INSTALLATION DIRECTORATE,
RESEARCH DESIGNS & STANDARDS ORGANISATION,
MANAKNAGAR, LUCKNOW – 226 011.

	Prepared By	Checked By	Approved by
Signature			

Designation	SSE/PQ	Dir/TI-3	PED/TI
-------------	--------	----------	--------

1. SCOPE

This schedule covers the technical requirement to assess the manufacturing capability of firm for Series Reactor for Shunt Capacitor Banks for use in 25 kV single phase AC traction system and 2x25 kV AC traction system (New System) on Indian railways.

2. GENERAL INFRASTRUCTURE AND MANUFACTURING FACILITIES

2.1 The Firm should have adequate covered accommodation for the purpose of effective storage of inward raw material, and the finished product awaiting dispatch and prototype / routine inspection and testing. The Firm should have an effective quality control system to monitor quality of the

- Inward raw material
- Stage inspection at various assembly/manufacturing stages.
- Inspection of the final assembled product to conform adherence to the requirements of the specification.

2.2 The relations with the workers should be harmonious and regular employee training programs should be scheduled by the management for regular up gradation of the knowledge and skills of the employees.

2.3 The Firm should have a proper drawing office with AutoCAD to support the designs/ 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.

3. MACHINERY AND PLANT

The following machinery and plant of suitable capacity should be available at the firm's premises for the manufacturing of the Air-Cooled Series Reactor:

- 3.1 EOT crane for moving the reactors
- 3.2 Vacuum chamber with set up for vacuum impregnation
- 3.3 Electric drying oven with closed air circulation
- 3.4 Hydraulic trolley
- 3.5 Heavy/medium light duty winding machines
- 3.6 Heavy duty assembly trolleys
- 3.7 Drilling machines, cutting machines etc.
- 3.8 Tig welding equipment
- 3.9 Air compressor
- 3.10 Hand tools.

Note: The items at para 3.7 & 3.8 above i.e., drilling machines, cutting machines etc. and Tig welding equipment respectively may be outsourced subject to stringent quality control by Firm. The Firm has to provide detail information regarding this in the Quality Assurance Plan (to be approved by RDSO) and also ensure drilling machines, cutting machines, Tig welding equipment etc. shall be essentially available at the premises of the firm from where this facility is outsourced.

4. QUALITY CONTROL REQUIREMENTS

- 4.1 The Firm should possess valid ISO 9001 certificate for manufacture of same/similar item at his works address for which approval is being sought and it should be broadly covered in the scope of the certification for manufacture and supply.
- 4.2 Quality manual of the firm for ISO-9001 certificate should clearly indicate at any stage the control over manufacturing and testing of the product.
- 4.3 There should exist a system of easy tractability of the product from the raw-material stage to the finished product stage.
- 4.4 The Firm should have a system of monitoring the supplied product complaints. The complaints made by the customer should be identifiable to the various manufacturing stages of the product and linking the complaint for corrective and preventive action of the product.
- 4.5 Quality assurance plan for the product in accordance with RDSO's guideline should be available with the firm. Quality assurance plan (QAP) shall be approved by RDSO.
- 4.6 There should exist a quality manual of the firm indicating the extent of control over production and testing.
- 4.7 At least Diploma holder must be the head of the inspection / testing / final control section with 5 years' experience in the relevant field.
- 4.8 There should exist a System of documentation in respect of rejection at the customer and its warranty replacement.
- 4.9 System should exist for documentation of the following.
 - Incoming raw material with Test Certificate (TC) reference of suppliers as well as internal test/ audit checking from outside agency.
 - Details regarding stage inspection and test results.
 - Details regarding the final testing and dispatch to the customer in proper packed condition.
 - System for timely calibration of testing and measuring instruments.

5. INSPECTION AND TESTING FACILITIES

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

- 5.1 Impulse Generator or induced voltage test set up
- 5.2 High voltage testing equipment

533843/2021/O/o PED/TI/RDSO

5.3 Digital Resistance meter

5.4 High/Low voltage 1phase load balancing capacitor

5.5 1/2.5/5 kV megger

5.6 LPF watt meter

5.7 HV CTs & PTs

5.8 Electronic test bench

5.9 Digital LCR meter

5.10 Digital voltmeter, Ammeter & watt meter

5.11 Multi-meter
