



सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

TI/STR/015
Rev. 1

Schedule of Technical Requirements for
Approval of vendors for supply of
AC Switchgear for Traction Application of
Indian Railway as per RDSO Specification No.

1. TI/SPC/PSI/LVCBIN/0120 Rev.0 (Dec,2013) with A&C Slip
No. 1 & 2 or latest
2. TI/SPC/PSI/HVCB/0120 Rev. 0 (June, 2014) with A&C Slip
No. 1 & 2 or latest

ISSUED BY

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1.0 **SCOPE**

This STR covers the technical requirement to assess the manufacturing capability of vendor for supply of 220kV, 132kV, 2X25kV and 25kV Outdoor Circuit Breaker/Interrupter for Traction Sub Station used in AC Traction system on Indian Railways.

2.0 **GENERAL INFRASTRUCTURE AND MANUFACTURING FACILITIES**

- 2.1 The firm should have adequate covered accommodation for the purpose of effective storage of inward raw material, to manufacturing/assembling and the finished product awaiting dispatch and prototype/routine inspection and testing. The firm should have system to ensure that product conforms to the requirement of RDSO Specification No. TI/SPC/PSI/LVCBIN/0120 Rev.0 (Dec, 2013) with A&C Slip No. 1& 2 or latest and TI/SPC/PSI/HVCB/0120 Rev. 0 (June, 2014) with A&C Slip No. 1 & 2 or latest.
- 2.2 The firm should have an effective quality control system to monitor quality control of the
 - Inward raw material
 - Stage inspection at various assembly stages.
 - Inspection of the final assembled product to conform adherence to the requirements of the specification.
- 2.3 The firm 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 up-gradation of the knowledge and skills of the employees.
- 2.5 The firm should have a proper drawing office with facility of CAD or other software to support the designs/development of product.

3.0 **Plant & Machinery**

The firm should have the following plants/machines/equipments of suitable capacity/rating required for manufacturing of the switchgears in different stages as per RDSO specification in its works:

A. **Essential facilities:**

S.N	Description of items	Application
1.	Fabrication and assembly i. Fixture & tools for assembly operating mechanism. ii. Hydraulic press* iii. Material handling equipment like trolley. iv. Cleaning equipment for pole & operating mechanism (force air and vacuum cleaner).	For assembly of Pole and Operating mechanism. -do- -do- -do-
2.	Machinery and other basic equipment's. i. Drying oven	For interrupting Chamber and operating mechanism.
3.	Material handling facilities. i. Overhead crane of 5/10 t. ii. Jib crane. iii. Lifting fork	
4.	SF6 gas handling & evacuation Plant (for SF6 only)	

* The activity at para 3.0(A)(1) (ii) above i.e. Hydraulic Press may be outsourced subject to stringent quality control by manufacturer. The manufacturer has to provide detail information regarding this in the Quality Assurance Plan (to be approved by RDSO) and also ensure that the Hydraulic press shall be essentially available at the premises of the firm from where this facility is outsourced.

B. Desirable facilities:

S.N	Description of items	Application
1.	CNC machines	For manufacturing interrupting chamber and operating mechanism.
2.	Machinery and other basic equipments. i. Lathe ii. Drill of Various sizes iii. Boring Machine iv. Press Machine v. Hackshaw vi. Shearing Machine vii. Sheet bending Machine viii. Punching Machine ix. Grinder x. Short blasting Machine xi. Welding Machine xii. Coil Winding Machine	For interrupting Chamber and operating mechanism.
3.	Corrosion Protection facility i. Galvanization Plant ii. Electroplating Plant iii. Painting Facility	

4.0 Testing facilities

The firm should have the following testing equipments of suitable capacity/rating required for carrying out the test on sub-components/components and the complete Switchgears in different stages to ensure the quality as per RDSO specification in their works.

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.

A. Essential facilities:

S No.	Description of Items	Application
1	i. Floor bed comprising a. Floor area for mounting the switchgear b. Desk for proper keeping of measuring instruments. ii. Circuit Breaker Parameters Analyzer. iii. DC current injection set up to 200 A. iv. Millivolt meter 0-200 m V v. Micro-Ohmmeter 0-100 micro Ohm. vi. HV test set 0-2 kV For L T Circuit vii. Megger-500 V / 1000 V. viii. AC & DC voltmeter and ammeters	Speed, time etc. Contact Resistance -do- -do- For LT Circuit -do- General

	of various ranges. ix. High Voltage testing Transformer	For dry P.f. test
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B. Desirable Facilities:

S No.	Description of Items	Application
1.	i. Wet power frequency test facilities.	-
	ii. Impulse voltage test facilities	-
	iii. Ac current injection set-2000A	Temperature rise
	iv. Thermo couple	-do-
	v. Thermometer.	-do-
	vi. Tongue tester 0-2000A	-do-

5.0 QUALITY CONTROL REQUIREMENTS

- 5.1 The firm should have acquired ISO-9001-2015 of certification for the product for which approval is sought and it should be broadly covered in the scope of the certification for manufacture and supply.
- 5.2 Quality Manual of the firm for ISO-9001-2015 should clearly indicate at any stage the control over manufacturing and testing of the said railway product.
- 5.3 The system of easy traceability of the product from the raw material stage to the finished product stage should be available.
- 5.4 The firm should have a system of monitoring the supplied product complaints in the format similar to the format given in RDSO's Guideline for preparing Quality Assurance Plan.
- 5.5 Quality assurance plan for the product in accordance with RDSO's guideline should be available. Quality assurance plan (QAP) shall be approved by RDSO.
- 5.6 Quality manual of the firm indicating the extent of control over production and testing should be available.
- 5.7 At least a diploma holder must be the head of the inspection / testing / final control section with 5 years experience in the relevant field.
- 5.8 System of documentation in respect of rejection at the customer end and its warranty replacement should be available.
- 5.9 System should exist for documentation of the following.
 - 5.9.1 Incoming raw material with the reference of suppliers as well as internal test.
 - 5.9.2 Details regarding stage inspection and test results.
 - 5.9.3 Details regarding the final testing and dispatch to the customer in proper packed condition.
 - 5.9.4 System for calibration of testing and measuring instruments.
