

A Division of Transnet SOC Limited

RAIL NETWORK

ELECTRICAL DEPARTMENT SPECIFICATION

SINGLE PHASE RELAY TEST INSTRUMENT

Author: Siyabonga Khoza: Engineer, RN-Technical Office

Approved: Charles Shihlomule: Senior Technologist, RN-Technical Office

Authorised: Selby Mathebula: Principal Engineer, RN-Technical Office - KHA-



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Transnet Freight Rail - Infrastructure

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1. GENERAL REQUIREMENTS

- 1.1. This specification outlines Transnet Freight Rail's requirements for the supply and delivery of a Single Phase Relay Test Instrument (SMRT1) or similar.
- 1.2. The instrument shall be ergonomically designed for maximum operator productivity and safety.
- 1.3. These instruments shall be of robust nature and designed to withstand the rough conditions of the railway environment. Proper casing or carry bag shall be supplied with each instrument.
- 1.4. Unless it can be proven that the instruments were damaged due to negligence, the successful supplier shall give warranty for one year where all faults will be addressed by the supplier.

2. OPERATING CONDITIONS

2.1. The Single Phase Relay Test Instrument will be operated in all weather conditions as well as salt laden and industrial atmosphere.

Altitudes:	From sea level to 2000m above sea level.
Relative humidity:	10% to 95%
Atmospheric conditions: May v	ary from heavily saline to dry and dusty conditions.
Ambient air temperatures:	-10º C to +50º C. (daily average +30°C)

3. QUALIFICATIONS

- 3.1. The design of the Single Phase Relay Test Instrument is to be that of the manufacturer but must be of robust construction in order to meet sustained heavy duty demands, yet it must be light and easy handled by one operator.
- 3.2. The Single Phase Relay Test Instrument will be acceptable in standard factory production finish and colour.

4. PERFORMANCE

- 4.1. The actual design and service life of the Single Phase Relay Test Instrument is to be stated.
- 4.2. The Single Phase Relay Test Instrument are to be easily and economically maintained with standard workshop/calibration tools and equipment.

5. TECHNICAL REQUIREMENTS

5.1. General Description

- 5.1.1. A heavy duty and portable Single Phase Relay Test Instrument shall be capable of testing electromechanical, solid state, microprocessor-based overcurrent relays, differential protection relays and distance protection relays.
- 5.1.2. The equipment must come in a lockable case capable of storing all accessories furnished with the device.

5.2. Operational requirements

- 5.2.1. The device shall be designed to cater for 100 to 240 V AC (± 10%), and 50Hz frequency.
- 5.2.2. The device shall be able to test and evaluate voltage controlled, voltage restraint and directional overcurrent, under/over voltage, single-phase impedance, single-phase power, directional, synchronising, auto-synchronising, negative sequence under/overvoltage, current balance, frequency, volts/hertz, reclosing, thermal, and various other relays.
- 5.2.3. The devices outputs shall be independent from sudden changes in line voltage and frequency.
- 5.2.4. The device shall have switch selectable current and voltage ranges both on AC and DC.
- 5.2.5. The device shall be capable of providing up 32 A at 200 VA per phase continuous for timing tests and 60 A at 319 VA or higher for testing instantaneous overcurrent relays.
- 5.2.6. The device shall provide a 150 VA power output on the voltage channel at the lower critical test voltages (from 30 to 150 V).
- 5.2.7. The device shall have programmable binary input and output for timing and logic operations in real-time with the output voltages and currents. The binary must be programmable with Boolean logic, for more complex power system simulations.
- 5.2.8. The device shall have Ethernet ports for PC connection and for interconnecting multiple Single Phase Relay Test Systems.
- 5.2.9. The devise shall be supplied with all power cables.
- 5.2.10. The device shall have robust enclosure and all components shall be housed within one unit.

5.3. Preferred mass and housing

- 5.3.1. The device mass shall be of the unit shall not exceed 15 kg.
- 5.3.2. The housing for the units making up this device shall be of robust construction to sustain heavy duty demands under the service conditions.

5.4. Support and Training

- 5.4.1. An operator's handbook, and calibration results must be supplied with each device in order to ensure that the device is operated in accordance with the manufacturer's instructions.
- 5.4.2. The OEM or contractor shall provide on-site training for not less than 10 operators and maintenance personnel.
- 5.4.3. The instrument shall be supplied with comprehensive user manual, service manual, and technical documentation.
- 5.4.4. The OEM shall be willing to provide technical support with quick response times.

6. MARKING AND INSTRUCTIONS

- 6.1. The Single Phase Relay Test Instrument shall clearly be legibly and indelibly with the following information:
- 6.1.1. The name and Trademark of the manufacturer
- 6.1.2. Type, Model and Serial Number
- 6.1.3. Dimensions and weight
- 6.1.4. Fuse Ratings
- 6.1.5. All markings to be written in English.

7. SOFTWARE

- 7.1. The Single Phase Relay shall be accompanied by all necessary software to program for remove operation.
- 7.2. The software must have a feature for automatic report generation with options to customize reports.
- 7.3. The software should be compatible with 32-bit and 64-bit operating system.

8. ACCESSORIES

- 8.1. The cable fault locator must be supplied with all necessary cables, connectors, and adapters for various cable types.
- 8.2. Its carry case must be durable, weather-resistant carrying case for protection during transport.
- 8.3. It must be supplied with a complete grounding kit to ensure safe operation during testing.

9. LEGAL AND OPERATIONAL

- 9.1. The equipment must comply with the relevant international standards.
- 9.2. The information as requested by the various clauses in this specification is to be supplied in form of technical data, pamphlets and/or drawings. If this is not complied to, offers may be overlooked.
- 9.3. Single Phase Relay Test Instrument which is not already in service with Transnet Freight Rail must be made available for testing/evaluation during the adjudication of the tender. Technical improvements on existing testers/equipment are to be substantiated by physical examples.
- 9.4. A Single Phase Relay Test Instrument is to be guaranteed for a minimum period of 24 months against faulty material and workmanship fair wear and tear excluded. Full details of guarantee are to be submitted.

10. TECHNICAL EVALUATION

- 10.1. All bidders shall submit data sheets with clear pictures of the instrument and its accessories.
- 10.2. Data sheets shall detail relevant technical, operational, functional, and other relevant requirements as indicated in the specification. Failure to provide detailed datasheets shall result in the disqualification of the bidder.