



A Division of Transnet SOC Limited

INFRASTRUCTURE ENGINEERING

ELECTRICAL DEPARTMENT

SPECIFICATION

MEDIUM VOLTAGE CABLE FAULT LOCATOR

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A handwritten signature in black ink, appearing to be 'CS', written over a dotted line.

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1. GENERAL REQUIREMENTS

- 1.1. The cable fault locator shall be suitable for medium voltage (MV) power cables up to 33kV AC and it shall be the EZ-THUMP type or similar.
- 1.2. It shall be compatible with a variety of cable types, including XLPE, PILC, and others.
- 1.3. It must comply with international safety standards (e.g., IEC, IEEE).

2. OPERATING CONDITIONS

- 2.1. The cable fault locator shall 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 vary from heavily saline to dry and dusty conditions.

Ambient air temperatures: -10° C to 50° C. (daily average +30° C)

3. FUNCTIONAL REQUIREMENTS

- 3.1. The cable fault locator shall be capable of detecting and locating all types of faults including open circuits, short circuits, low-resistance faults, high-resistance faults, intermittent faults, and sheath faults.
- 3.2. It shall be capable of supporting multiple fault detection methods such as:
 - 3.2.1. Time-Domain Reflectometry (TDR)
 - 3.2.2. Arc Reflection Method (ARM)
 - 3.2.3. Impulse Current Method
 - 3.2.4. DC Testing (Hipot)
- 3.3. In addition, it shall be capable of insulation resistance measurements and cable sheath locating.
- 3.4. It must have high accuracy capabilities on fault location, typically within ± 1 meter or better.
- 3.5. The covered distance range should be up to 10km or more.
- 3.6. It shall be suitable for all medium voltage cables (e.g., 6.6 kV, 11 kV, 22 kV, 33 kV AC).

4. TECHNICAL REQUIREMENTS

- 4.1. The cable fault locator shall comply with the following technical requirements:
 - 4.1.1. It must have adjustable high-voltage output suitable for locating faults in MV cables.

4.1.2. It must have sufficient energy to burn high-resistance faults for easier location.

4.1.3. It must have adjustable pulse width to cater to various cable lengths and types.

4.1.4. It must be fitted with an LCD screen with high-resolution colour display for clear visualization of fault data.

4.1.5. It must be equipped with intuitive graphical user interface (GUI) for easy operation.

5. SOFTWARE FEATURES

5.1. The cable fault locator shall have the following software features:

5.1.1. A built-in software tools for analysing fault traces and patterns.

5.1.2. An option for remote control and operation through a PC or mobile device.

5.1.3. A feature for automatic report generation with options to customize reports.

5.1.4. A continuous data logging capability for monitoring long-term cable conditions.

5.1.5. It must have a built-in memory for storing test results and data, with options for exporting data via USB, ethernet or other interfaces. USB option is necessary.

6. PHYSICAL AND MECHANICAL REQUIREMENTS

6.1. The cable fault locator must be compact and lightweight design for ease of transport and use in the field. Its weight shall not exceed 30kgs excluding accessories.

6.2. It must be rugged and durable in construction to withstand harsh field conditions.

6.3. It must be equipped with long life rechargeable battery to support extended testing sessions, with quick charging capability.

6.4. It must have an effective cooling system to prevent overheating during prolonged use.

7. ACCESSORIES

7.1. The cable fault locator must be supplied with all necessary cables, connectors, and adapters for various cable tests. Insulation for the main cables must be rated for high voltage application and must not be less than 3m in length.

7.2. Its carry case must be durable, weather resistant (IP53) carrying case for protection during operation and transportation.

7.3. It must be supplied with a complete grounding kit to ensure safe operation during testing.

7.4. It must have an option of external power supply (230V AC @ 50Hz) for continuous operation in the field and to also charge the battery.

8. COMPLIANCE AND CERTIFICATION

- 8.1. The cable fault locator must compliance with relevant international standards.
- 8.2. It must be supplied with calibration certificates traceable to national standards.
- 8.3. It must come with a minimum of 2 years warranty where the supplier shall take full responsibility in repairing or replacing the faulty unit and component unless it has been proven to be negligence on the side of the end user.

9. SUPPORT AND TRAINING

- 9.1. The OEM or contractor shall provide on-site training for not less than 10 operators and maintenance personnel.
- 9.2. The OEM shall be willing to provide technical support with quick response times.
- 9.3. The instrument shall be supplied with comprehensive user manual, service manual, and technical documentation.

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.