



METRIX 1.0

Automated Cable Fault locating System

Motwane make Automated Van System for underground cable fault location is a basic requirement of any power distribution network company. It is a very powerful tool to localize the underground cable fault of any nature in a short time. The system is a mobile laboratory having all types of required equipment available to the operator at a site. The Automatic Cable Test Van System is a total solution for fault location in any type of power cable. In the van system operator safety is the highest priority. Generally, the van is divided into two sections, the operator section and the high voltage section. The HV section is equipped with a proper safeguard such as door interlocks, earth monitoring system, auto discharge, and emergency off controls are provided on the operating control panel. These safety controls are very important in any emergency to avoid any major accident. The control unit menu is driven-based and responsible for all control operations of various functions such as Mode selection, Surge Test, Burn and Arc reflection, Range selection, Voltage, and current limit adjustment, surge sequence selection, auto discharge, earth monitoring from a Bluetooth mouse and touchscreen display, and no access to the high voltage side shall be available to the operator as well as operator guidance with on-screen help texts.

Pre-location

After identifying the type of fault, the pre-location of the fault done determined using the latest pre-location methods such as TDR, ICM, SIM/MIM & Decay that are provided in the system.

TDR/ECHO Method

A narrow electromagnetic pulse with a fast rise time is sent in the cable that reflects back from the fault point /far end where the impedance is changed. The VOP for each cable depends on the cable dielectric material is set. The distance to the fault is then computed automatically and displayed on the pre-locator.

SIM/MIM Method

The Time Domain Reflectometer uses a high-speed transient recorder to record no. of measurements showing the fault position during only 1 high-voltage impulse.

ICM Method

It is a current transient analysis method of pre-location of fault. During a breakdown or flashover at the fault, transient waves are generated that oscillate back to the source end which is utilized through a linear current coupler and stored and displayed on a pre-locator.

Decay Method

It is a voltage transient analysis method of pre-location of fault. Using DC voltage,

Features

- ✓ DC Cable Testing up to 40 kV (80kV optional)
- ✓ Burning Vmax - 40kV, Imax - 800 mA
- ✓ Surge energy up to 4000J
- ✓ Surge Voltage 4, 8, 16, 32 kV Selectable
- ✓ User Friendly Interlocks
- ✓ High Safety Level interlocks
- ✓ Auto Discharge
- ✓ High Temperature Auto OFF
- ✓ Operation Through Bluetooth Mouse / Touchscreen
- ✓ GPS mapping (Optional)
- ✓ Remote app monitoring (Optional)
- ✓ Integrated insulation testing facility up to 10kV (optional)
- ✓ Integrated VLF 40 kV module (Optional)
- ✓ Precise Fault Pre-locating using Time-Domain Reflectometer TDR | Arc-Reflection Mode (SIM/MIM) | Impulse Current Mode (ICM/ICE) | Voltage coupling Mode (DECAY) | Automatic Cursor Setting of Fault point.

Applications

Metrix 1.0 is an Automated Van System for underground cable fault location and testing for LV, MV, HV & EHV power cables. The key parameters are flexible to satisfy customer's specific requirements.

at a fault point voltage transients are generated that oscillate back to the source end which is utilized through a voltage divider coupler and stored and displayed on a pre-locator.

DC Test

Used to check the dielectric strength of insulation in the cable and prove the integrity to identify and confirm fault conditions with a test voltage up to 40 kV (80 kV optional) and a current of 50 mA. The over-current trip is provided for the protection of the system under test in the event of the cable under test breaking down.

Pin-point

Accurate pinpointing of cable fault is carried out using a surge wave tester with the help of a surge wave receiver in the acoustic method. The maximum output voltage of 32 kV in three selectable 4,8,16 and 32 kV ranges with 2000 joules of energy. The system can have energy up to 4000 Joules also.

Proof/Burn Test

Using the available DC high voltage of 40 kV/200mA (I max 800mA) outputs, the maximum current is applied for stabilizing the unstable cable faults for a short period. This allows easier and quicker pre-location and pinpointing of the unstable faults.

Functions

The manual operating control unit is an integrated central operator interface for all operational modes and provides the monitoring of the system and the integrated safety facilities. It enables an easy and quick operation of the system, prevents operational errors, and reduces the fault location time considerably. All necessary selection of equipment, switching, and operations such as pre-locations, high voltage tests, and pin-pointing is carried out on the control panel. Data can be logged during testing.

Safety

Motwane gives the highest priority to the safety of operating personnel. The van system is divided into two sections, the operator section and the HV section. The HV section is equipped with proper safeguards such as door interlocks, an earth monitoring system, and auto discharge. Emergency off control is provided on the control panel. An external emergency off switch is provided to switch off in case of any emergency. The earth monitoring system is provided which trips the entire system in case of any dangerous high voltages (more than 40kV DC) accumulated on the van chassis during high voltage testing. Copper shielding is provided for good and proper earth in high voltage section.

Technical Details

METRIX 1.0

Specifications

Input Voltage 230V AC \pm 10%, 50Hz

Power Consumption 2.5 kVA Max

DC Test Mode

Output Voltage 0-40kV DC Variable (80kV Optional)

Output Current 0-5mA, 25mA, 50mA DC (Variable)

Burn Mode

Output Voltage 40kV DC

Burn Current 200mA (I_{max} 800mA - optional)

Surge / Pin Pointing Mode

DC Voltage 4 / 8 / 16 / 32kV Ranges

Output Energy 4 / 8 / 16 / 32kV - 2000 Joules

Higher Energy upto 4000J on request at each range. Energy at each range can be customised.

Time Set 1 to 99 Seconds (Automatic Surge Mode)

Manual Single Surge

Flexible Voltage Changes During Automatic Operation

Pin-Pointing with an Acoustic Receiver

System operation and parameter programming through Bluetooth Mouse / Touch Screen with Display

Pre-location Mode using SIM (ARF/ARC mode)

Sheath Fault Pin-point of a cable sheath fault & Sheath Test

0 - 10kV/100mA (can be customised)

Measuring Range 160 Km (Max)

Sampling Rate 400MHz

Pulse Width 20ns - 10 μ s

Transmitting Pulse Voltage 160V

Velocity of Propagation (V) 20 - 300 m/ μ s

Time Domain Accuracy \pm 0.1% of FS

Propagation Velocity (V/2) Resolution 0.1 m/ μ s

Output Impedance 5 - 100 Ω

Operation Modes TDR, ARC / MIM, ICE / ICM, DECAY

Automatic Distance Measuring Yes

Inter Data Storage 8 GB (Not Less than 1000 Reflectogram with data)

Technical Details

MERTIX 1.0

Display Dimensions

10" or 15" or 19" or 21" IPC display (Customizable)

Associated Equipment

Cable Route Tracer - CRT 50D

Cable Identification System - CI 60S

Surge wave receiver - SLE 200Z

General Specification of Metrix 1.0

Power Supply	230V AC \pm 10%, 50/60 Hz single phase.
Protection	Mains circuit breaker.
Safety Protections	Over heat protection, External Emergency off, Earth monitoring system, Ground shielding with copper sheet, HV area Door Interlocks.
Working Temp	0°C - 55°C
Generator (Optional)	Honda Petrol 3.0 kVA (optional 5.6 kVa)

Cable Drum

HV Cable	30mtr	Aux Earth Cable	30mtr
Mains Cable	30mtr	RF Cable	30mtr
Earth Cable	30mtr	Note : Cable length make as per customer requirements	

Standard Accessories

■ Insulation Tester	■ Earth Spike
■ Multimeter	■ Cooling Fan
■ Hard discharge Rod	■ Tools Set
■ Road Meter	■ Instruction / Operating Manual
■ Fire Extinguisher	■ Van Flooring - Copper Sheet, Rubber Sheet & Carpet

Note: 1) Other ratings of test / burn / surge / sheath shall be available on request. For details specification, please consult factory.

2) Cable length make as per customer requirements.