UNDERGROUND CABLE FAULT LOCATING EQUIPMENTS & SYSTEMS

Power

COMPAC 32

Cable Fault Locating System

Description

Cable Fault Locating System COMPAC 32 is prime system to provide quick, effective, accurate and safe fault location. Specifically designed for service, industrial and power utility companies. It is a multi functional system in a trolley mounting design. The HV surge tester, DC High voltage test set, Arc reflection and Burn / Proof test is given for cable fault location of short circuit, open circuit, high resistance, and intermittent and sheath faults.

- **Pre-location**
  After identifying the type of fault, pre-location of fault can be determined using the latest pre-location methods such TDR, SIM, ICM and MIM is provided in the system.
- **TDR Mode**
  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 was change. The VOP for each cable depending on the cable dielectric material is set. The distance to the fault is then computed automatically and displayed on pre-locator.
- **ICM Mode**
  It is a current transient analysis method of pre-location of fault. During a breakdown or flashover at the fault, transient's waves are generated that oscillate back to the source end which is utilized through a linear current coupler and store and displayed on pre-locator.
- **SIM Mode**
  It is a arc stabilizing mode, faults are stabilized by creating a temporary arc at the fault point through an arc reflection filter and reduce the resistance value of fault as short circuit, and displayed on pre-locator with reference graph.
- **Decay Mode**
  It is a voltage transient analysis method of pre-location of fault. Using DC voltage, at a fault point voltage transients are generate that oscillate back to the source end which is utilized through a voltage divider coupler and store and displayed on pre-locator.

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Description

- **DC Test**
  Used to check the di-electric strength of insulation in the cable and prove the integrity to identify and confirm fault conditions with a test voltage up to 32 kV and current of 20 mA. The over current trip is provided for protection to the system under test in the event of the cable under test breaking down.
- **Pin - Point**
  Accurate pin-pointing of cable fault is carried out using surge wave tester with the help of surge wave receiver in acoustic method. The maximum output voltage of 32 kV in three selectable 8, 16 and 32 kV ranges with 1000J or 2000 Joules of energy.
- **Proof / Burn Test**
  Using the available DC high voltage of 32 kV outputs, the maximum current is applied for stabilizing the unstable cable faults. This allows easier and quick pre-location and pin-pointing of the unstable faults.
- **Sheath Fault Test**
  The variable output 0 - 8 kV voltage can also be used to test and pin-point sheaths faults in extra high voltage cables.

Features

- Optimized surge energy for switchable capacitors values for each range.
- Pin-point location of cable faults in Low, Medium and High voltage cables by acoustic method.
- Perform DC / Proof / Burn test up to 32 kV.
- Output voltage selectable in three ranges 8, 16 and 32 kV.
- Full energy delivering capacity at each select range.
- High energy of 1000 Joules (Optional 2000Joules) Adjustable
- output voltage from 0 to 100 % of selected range. Single
- manual Impulse for pre-location of cable faults.
- Cyclical pulse repetition for precise pin-pointing of cable faults in acoustic Method.
- Fully protected operation with three safety interlocks.
- In-built current coupler for pre-location of cable faults distance on ICM mode.
- Emergency off facility.
- Pre-location of cable faults distance with TDR, ICM, SIM and MIM mode.
- Pin-point of sheath fault.
- 160GB hard disk memories for unlimited storage of fault trace.
- Operation procedure menu guide window.
- Automatic setting of pulse parameter and menu guide operation.
- RS232 Printer interface and DVD-RW driver.
- 1GB RAM and USB interface facility. Connect
- with laptop or LCD touch screen. Zoom
- facility for precise pre-location of fault.
- Automatic discharging facility of cable under test, in case of power failure or after switching off.
- Continues operation for extended period in case of pin-point difficult cable faults.
- Rugged construction and easy to carry on site.

Specifications

Operating Mode - Surge, Arc / SIM, DC / Proof Test and Sheath Fault

Surge Mode

Output Voltage Ranges	: 0 - 8, 16, 32 kV
Energy Output	: 1000 Joules Full Energy at each Range (Optional 2000J)
Impulse Mode	: Single and Auto
Auto Impulse Sequence	: 1.5, 3, 6 Seconds intervals OR as per customer request
Indication	: ON / OFF Lamp indication
	Respective mode select lamp indication
	Analog moving coil meter for output voltage (kV) Indication

ARC / SIM Mode

Application	: Pre-location of high resistance intermittent faults
Working Voltage	: 32 kV max
Output Surge Capacity	: 1000 Joules Max (Optional 2000J)
Indication	: Visual lamp indication of ARC/SIM
ARC Stabilization Time	: 20 ms approx

HV DC Test Mode

Output Voltage Ranges	: 32 kV continuously variable
Output / Proof Test Current	: 5, 10, 20 mA
Burn Current	: 60 mA
Indication	: Analog moving coil meter for output voltage (kV) Indication
	Analog moving coil meter for output leakage current (mA) Indication
	Leakage current trip lamp indication
Protection	: Over current tripping

Sheath Faults

Output Voltage	: 0 - 8 kV continuously variable with current 60 mA

Pre-location

Measuring Range	: 50 Km max
Output Voltage of Measuring Pulse	: 160 V
Pulse Width of Measuring Pulse	: 20 ns----40 us
Withstand Voltage of Input	: 400 V AC (50 / 60 Hz)
Output Impedance	: 250 Ohms max
Measuring Accuracy	: 0.1%
Sampling Rate	: 200 MHz
Resolution	: 0.1 m
Velocity Ratio of Waves	: 20 – 150 m/us
Memories	: 160 GB Hard disk

General Specification

Power Supply	: 230 V AC $\pm$ 10%, 50 / 60 Hz Single phase
Over Load Protection	: Input current Limiter switch
	: Fast blow fuse in mains and controlled supply
Safety Protections	: Variac zero inter-lock
	: Output cable plugs inter-lock
	: HV Switch inter-lock
	: Over heat protection
	: Emergency OFF switching
Cooling System	: Air cooled
Earth Discharge	: Soft automatic discharge through in-built solenoid
Operating Temperature	: 0 Deg C ~ 55 Deg C
Storage Temperature	: - 5 Deg C ~ 60 Deg C
Dimensions	: 660 (L) x 700 (W) x 1000 (H) mm with Rubber wheels
Weight	: 195 Kg Approx.

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Application

The Cable Fault Locating System COMPAC 32 is used to perform DC high pot test, Pre-location of fault distance with the help of pre-locator unit and Pin-point underground cable fault in acoustic method with the help of suitable Surge wave receiver and Pin-point sheath faults in power transmission and distribution networks or service provider companies.

Working Principle

The HV surge tester SWT ignites an arc or spark at the fault. This results in a transient, i.e. a spreading and repeatedly reflected travailing wave between the fault and the surge wave generator. Inductive couplers record this transient wave with the help of a pre-locator unit and convert in to fault distance.

Surges of high energy are applied to the fault at the set voltage and time interval for pin-pointing the exact spot on the cable length.

These surges create noise and vibrations at the fault site. The intensity of the noise and vibrations get attenuated during their travel to the ground surface. A ground microphone and a sensitive surge wave receiver SLE90 carried on the route of the cable on the pre-located area pin-point the exact spot of the fault in minimum time.

The high voltage DC test up to 32 kV is carried out to check the dielectric strength or insulation of cable on DC test mode.
The respective voltage and leakage current is indicated on the meters.

Function

The COMPAC 32 system is used to pin-point of cable faults location. It is basically a variable DC high voltage power supply, connected to a high voltage capacitor bank. The value of capacitance is usually selectable by parallel, series parallel and series combination.

This combination being linked with suitable voltage taping to give the constant energy output on low voltage / high capacitance or high voltage / low capacitance in surge mode.

In DC test mode the internal capacitor is isolated through a mode selection switch. This high voltage output is applied to the cable under test through a spark discharge device.

The cable fault pre-locator is a microprocessor based equipment and can be used to pre-locate fault distance with different mode.

Accessories
5 meter 10 sq mm single core screen output HV cable with heavy duty brass clamps.
3 meter mains supply connecting cord.
5 meter yellow/green earthing cable
5 meter BNC to crocodile for TDR measurements.

Standard Warranty: One Year

Standard Models
Cable Fault Locating System COMPAC 40
Cable Fault Locating System COMPAC 20

Associated Receivers
For Pin-point of cable fault - Surge Wave Receiver SLE90
For Pin-point of sheath fault - Sheath Fault Locator EFL1