

# SCOPE

## CFL SG 3210 Surge Generator



Locate Cable Faults Easily & Quickly With CFL Series ...

## The Product

Fault occurrence on underground cables cannot be avoided due to many factors in prevailing conditions. Long outage of a cable from service results in heavy loss of revenue to the power distribution company, production loss to industries and unpleasant condition to consumers. Therefore, it is necessary to restore the supply in minimum possible time. This calls for appropriate instruments fulfilling all the requirement of the job.

Surge Generator is the backbone of underground cable fault locator test systems. Surge Generator is used with a Prelocator and SIM Filter for fault distance measurement and also used with Pin Pointer Set for pinpointing the exact fault spot.

SCOPE offers CFL SG 3210, Surge Generator with output of 32kV and 1000 Joules. It is ideal choice for fault location on all types of power cables from LV to EHV. CFL SG Series is equipped with different Protections, Interlocks and Auto-discharge Facility to ensure User Safety during operation. User Friendly controls, adequate form factor, contact free HV terminations makes this CFL SG Series most durable and best-designed sets in the segment.



## Application

### Prelocation of fault distance

- Impulse Current Method (ICM): Surge Generator applies HV Surge across the Faulty Core and Armour of the Cable, which creates a short circuit across the fault point. This momentarily short circuit produces Current Transients, captured by Current Coupler connected on the return HV path. These transients will be analysed on Prelocator connected to the Current Coupler, to calculate approximate Fault Distance.
- Secondary Impulse Method (SIM) : The Surge Generator plays vital role in conjunction with a SIM Filter and Prelocator instrument to produce arc at the fault point for short term. The standing arc at fault point facilitates easy and accurate fault distance measurement.

### Pinpointing

Surge Generator can produce repetitive surges across the Faulty Core and Armour of the Cable, which will create Electromagnetic Field across the Cable Path and a thumping sound at fault point. These Electromagnetic and Acoustic Signals will be detected by Pinpointing Sensor (Ground Microphone) and Receiver with Headphones used to find exact fault point.

### DC Hi-Pot Test (Optional Mode)

DC Hi-Pot test mode is used for safe and accurate measurement of leakage current to evaluate insulation integrity of the Device Under Test. This mode is very useful for testing Dielectric Withstand Capacity of Cable during the Manufacturing, Installation, Acceptance, Routine Repair and Maintenance. DC Hi-Pot mode is equipped with Settable Trip Current and Timer function. Also, DC Hi-Pot mode can be used to prelocate cable fault using Voltage Decay Method in conjunction with Prelocator.

### Burn Down (Optional Mode)

Burn Down mode is used to alter the fault conditions to get fault distance using Prelocator. It can be used to create a carbon bridge across high resistance nature fault in Paper Insulated cables and to dry the wet faults in Solid Extruded Cables for ease in Prelocation. In this mode DC High Voltage is applied across the Faulty Core and Armour of the Cable, a high amount of leakage current will be allowed to flow through the Cable. Due the  $I^2R$  effect at the fault point, heat/arc will modify the fault condition.

### Sheath Fault Location (Optional Mode)

When outer PVC jacket of the Cable is damaged, Armour of the Cable is exposed to the Mass of Earth, called as Sheath Faults. Sheath Fault Location Mode can be used to locate such faults with the help of D Frame Receiver. In this mode instrument injects DC Pulse into the Armour of the Cable with respect to Mass of Earth and this will create a pool of potential on ground surface nearby to fault point and D Frame Receiver equipped with a Galvanometer detects the fault location.

## Features

- Compact, Lightweight, and housed in rugged aluminum case
- Ideal choice for fault location on all type of power cables
- Backbone of Cable Fault Locator System
- Generates short duration high voltage surge for fault break down
- Built-in Current Coupler to determine the fault distance in conjunction with Prelocator unit
- Repetitive surges applied for pinpointing the exact fault location in conjunction Pinpointing set
- Supports SIM/ARM/MIM method for locating High resistance and flashing faults along with Prelocator and SIM Filter from CFL Series
- Available with optional modes such as DC Hi-Pot, Burn Down and Sheath Fault Location Mode
- Multiple options in a single instrument to avoid carrying several heavy instruments to the site
- Easy setup and intelligent protections make high voltage testing safe & reliable
- Compatible with other models of SCOPE make CFL Series

## Benefits

### Protections / Interlocks

- Variac Zero Interlock
- Input supply fuse Protection
- Over Current Protection
- MCB trip control under overload condition
- Output Cable Plug Interlock
- Key Lock Switch
- Selection Switch Interlock
- Emergency OFF
- Over Temperature Protection
- Input Voltage Protection
- Earth OK Interlock
- Automatic discharge upon shutdown

\*Applicable for Surge Generator with optional DC Modes

### Indications

- HV ON / OFF
- Overheat
- Error in settings\*
- Variac Zero\*
- Earth OK
- Manual Impulse
- I/P Voltage Error



## Specifications

| Parameter                               | CFL SG 3210   |
|---|---|
| Output Voltage Ranges                   | 0 - 8kV / 16kV / 32kV selectable  |
| Output Energy                           | Max. 1000J in each voltage range  |
| Impulse Sequence (Surge Rate)           | Single Impulse (Manual) / 3 Sec / 6 Sec / 9 Sec or<br>Single Impulse (Manual) / 2 Sec / 4 Sec / 8 Sec (Optional)                            |
| Output Indication                       | Moving Coil Analog Meter for Output Voltage measurement<br>Moving Coil Analog Meter for Leakage Current measurement<br>in Optional DC Modes |
| Measurement Accuracy                    | ±5% of selected range   |
| Input Supply                            | 230V AC ± 10%, 50/60Hz ± 10%, Single Phase, 1.8 kVA max.  |
| Cooling Type                            | Air Cooled  |
| Dimensions                              | 835 x 810 x 880 mm  |
| Weight (without trolley and test leads) | Without Optional DC Modes: 150kg approx.<br>With Optional DC Modes: 155kg approx.   |
| Environmental (Operation)               | 0°C to 50°C, up to 95% RH (Non-Condensing)  |
| Environmental (Storage)                 | -10°C to 55°C, up to 95% RH (Non-Condensing)  |

| Optional DC Modes |             |              |                        |
|-------------------|-------------|--------------|------------------------|
| Optional DC Modes | Voltage     | Current      | Timer / Pulse Ratio*   |
| Hi-Pot            | 0-32kV      | 6/12/24mA    | 5/10/15min             |
| Burn Down         | 0-8/16/32kV | 240/120/60mA | 3min                   |
| Sheath Fault      | 0-8kV       | 240mA        | *3/6/9s ON & 100ms OFF |

## SCOPE of Supply

| Items   |  | Test Lead Set Configuration |          |          |          |
|---|--|-----------------------------|----------|----------|----------|
|   |  | 5m TLS                      | 10m TLS  | 25m TLS  | 50m TLS  |
|    | CFL SG 3210 mounted on wheels  | 1 No                        | 1 No     | 1 No     | 1 No     |
|    | 1 x HV Output Cable  | 5m                          | 10m      | 25m      | 50m      |
|    | 1 x Auxiliary Earth Cable with Spike                                     | 10m                         | 10m      | 10m      | 10m      |
|   | 1 x Master Earthing Cable  | 5m                          | 10m      | 25m      | 50m      |
|  | 1 x Mains Supply Cable   | 5m                          | 5m       | 5m       | 5m       |
|  | 1 x D Frame with Soft Bag<br>(Applicable for Sheath Fault Location Mode) | Optional                    | Optional | Optional | Optional |
|  | 1 x Cable Drum<br>(Manual/Motorised)                                     | Optional                    | Optional | Optional | Optional |
|  | Test Lead Set (as per Order Code)<br>with Carrying Case                  | 1 No                        | 1 No     | 1 No     | 1 No     |
|  | Factory Test & Calibration Report  | 1 No                        | 1 No     | 1 No     | 1 No     |
|  | Operation Manual   | 1 No                        | 1 No     | 1 No     | 1 No     |
|  | Spare Fuse Set   | 1 Set                       | 1 Set    | 1 Set    | 1 Set    |

## Ordering Code

Example: CFL SG 3210 **N N C 2 F N F N T R I N** #

CFL SG 3210

|          |                            |  |  |  |  |  |  |  |  |  |  |  |                                    |          |
|----------|----------------------------|--|--|--|--|--|--|--|--|--|--|--|------------------------------------|----------|
| <b>N</b> | <b>None*</b>               |  |  |  |  |  |  |  |  |  |  |  | Customized                         | <b>Z</b> |
| <b>A</b> | With DC Hi-Pot Mode        |  |  |  |  |  |  |  |  |  |  |  | <b>None*</b>                       | <b>N</b> |
| <b>N</b> | <b>None*</b>               |  |  |  |  |  |  |  |  |  |  |  | Industrial Plug                    | <b>V</b> |
| <b>B</b> | With Burn Down Mode        |  |  |  |  |  |  |  |  |  |  |  | Universal Plug                     | <b>U</b> |
| <b>N</b> | <b>None*</b>               |  |  |  |  |  |  |  |  |  |  |  | <b>Indian Plug*</b>                | <b>I</b> |
| <b>C</b> | With Sheath Fault Mode     |  |  |  |  |  |  |  |  |  |  |  | 110V ± 10%, 50Hz AC Input          | <b>Q</b> |
| <b>1</b> | Single, 2S, 4S, 8S         |  |  |  |  |  |  |  |  |  |  |  | <b>230V ± 10%, 50Hz AC Input*</b>  | <b>R</b> |
| <b>2</b> | <b>Single, 3S, 6S, 9S*</b> |  |  |  |  |  |  |  |  |  |  |  | Customized Length of Test Lead Set | <b>Z</b> |
| <b>Z</b> | Customized                 |  |  |  |  |  |  |  |  |  |  |  | 50m Test Lead Set                  | <b>G</b> |
| <b>F</b> | Reserved                   |  |  |  |  |  |  |  |  |  |  |  | 35m Test Lead Set                  | <b>D</b> |
| <b>N</b> | <b>None*</b>               |  |  |  |  |  |  |  |  |  |  |  | 25m Test Lead Set                  | <b>E</b> |
| <b>Z</b> | customized                 |  |  |  |  |  |  |  |  |  |  |  | 20m Test Lead Set                  | <b>L</b> |
| <b>F</b> | Reserved                   |  |  |  |  |  |  |  |  |  |  |  | 15m Test Lead Set                  | <b>R</b> |
| <b>N</b> | <b>None*</b>               |  |  |  |  |  |  |  |  |  |  |  | 10m Test Lead Set                  | <b>M</b> |
| <b>1</b> | Manual Cable Drum          |  |  |  |  |  |  |  |  |  |  |  | <b>5m Test Lead Set*</b>           | <b>T</b> |
| <b>2</b> | Motorized Cable Drum       |  |  |  |  |  |  |  |  |  |  |  |                                    |          |

Note: \* Standard accessory / feature

#CFL SG 3210 (Order Code: NNC2FNFNTRIN)- Cable Fault Surge Generator with Sheath Fault Location Mode, Surge Sequence of Single / 3S / 6S / 9S, 5m Test Lead Set, 230V ± 10%, 50/60Hz AC Input, Indian Plug.

Generation, Transmission,  
Distribution, Industry ...

... there is **SCOPE**  
*always!*



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