# STEK 1812 ELCB/ RCD / Loop Impedance Tester

STEK 1812 ELCB/RCD Tester effortlessly performs comprehensive Residual Current Device (RCD) testing and loop impedance measurements, allowing you to quickly diagnose faults and verify the integrity of your electrical installations. With its intuitive interface and advanced features, such as auto-ranging and data logging, the RCD/Loop Tester is your go-to solution for maintaining high standards of electrical safety.

It seamlessly integrates RCD trip time testing, loop impedance verification, and insulation resistance measurements into a single, user-friendly device. Whether you're working on residential, commercial, or industrial projects, the STEK 1812 RCD/Loop Tester ensures that your electrical systems meet all relevant safety standards and regulations.

Lightweight, portable, and equipped with a bright, clear display, it's the perfect companion for electricians on the go.


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# Measurement data storage

After the measurement is stopped, you can press the key to display the stored number and store the data in the instrument. The meter can store up to 1000 sets of data.

1000 groups


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## Extra-large backlight digital display

Hd digital display backlight function facilitates measurement in dark environment


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General characteristics:

- Conforms to IEC/EN 61010-1 1000V CAT III, 600 V CAT IV safety standards
- Maximum common mode voltage: 600V AC RMS
- Display type: LCD display
- Range selection: Fully automatic range
- Frequency detection: automatic
- Over-range display: ">"
- Power supply: 8 x 1.5V AA batteries
- Power consumption: 100mW
- Storage temperature: -20'C-70°C
- Operating temperature: O'C to 40°C
- Temperature coefficient: for temperatures below 18 •c or above 28 'C, the coefficient is per ('C) x 0.05 x (specified accuracy)
- 12,000m Storage altitude: 12,000m
- Operating altitude: 2,000m CAT III 600V; 3,000m CAT II 600V
- Dimensions: 200mm x 155mm x 76mm
- Weight: approx. 500g (including battery)

1). Carton
2). Carrying Case
3).Instrument
4). Manual
5). CD
6).USB Cable
7).Test Leads
8).Crocodile Clips
9): AA Batteries, 8 Nos

## Technical specifications

| Items | Range | Accuracy | Resolution |
|---|---|---|---|
| **Jump off time** | X1 $I_{\Delta N}$ 300ms ( slow 500ms)<br>X5 $I_{\Delta N}$ 40ms(slow 150ms) | ±3ms | 0.1ms |
| **Jump off current** | (0.2-1.1) $I_{\Delta N}$ | ±0.1 $I_{\Delta N}$ | 0.05 $I_{\Delta N}$ |
| **Contact voltage** | 0-99.9V | ± (10% +0.2V | 0.01, 0.1V |
| **AC current** $U_{L-N}$ $U_{L-L}$ $U_{L-E}$ | 0-440V | ± (3% +3V) | 1V |
| **Frequency** | DC, 45-65Hz | ±1Hz | 1Hz |
| **Contact voltage** $U_C$ | 0-19.9V | ± (10% +0.2V) | 0.01V |
| | 10.0V-99.9V | | 0.1V |
| **Loop resistance ( RL)** | 0.1-2000Ω | ± (10% +0.2V) | |
| $R_L$ **Test current** | 0.5 $I_{\Delta N}$ | ± (10% +10d) | 0.05 $I_{\Delta N}$ |
| **Test current multiplier** | x0.5, x1, x5 | | |
| **Current Stages** ( $I_{\Delta N}$ ) | 10,30,100,300,500 | | |
| **Trigger phase angle** | 0° or 180° | | |

## RCD Test Current Selection Table

| $I_{\Delta N}$ (mA) | I△x1/2 (mA) | I△x1 (mA) | I△x5 (mA) | Auto (mA) |
|---|---|---|---|---|
| 10 | 5 | 10 | 50 | |
| 30 | 15 | 30 | 150 | |
| 100 | 50 | 100 | 500 | |
| 300 | 150 | 300 | 1500 | |
| 500 | 250 | 500 | ---- | |

# STEK 1812 ELCB/ RCD / Loop Impedance Tester

Application Note / Theory


## Terms and Abbreviations

| | |
|---|---|
| ELCB | Earth Leakage Circuit Breaker |
| ELB | Earth Leakage Breaker |
| GFCI | Ground Fault Circuit Interrupter |
| GFI | Ground Fault Interrupter |
| RCCB | Residual Current Circuit Breaker |
| RCB | Residual Current Breaker |
| DCDF | Disjoncteur de Current Differrentiel de Fuite |
| DD | Disjoncteur Differentiel |

RCD,.....

Those are only a few abbreviations used in different countries and, by different manufacturers.

## Why to use Them ?

Ground Fault Circuit Interrupters are used to prevent dangerous and lethal electric shocks to humans and assets.

GFCI, ELCB, RCCB, DCDF are required by many electrical code of practice and legislation in areas such as bathrooms, unfinished basements, home, factories, etc...

The testers are designed to verify accurately their disconnection sensitivity and time

GFCI, ELCB, RCCB, DCDF are classified in mainly two types :

- •Instantaneous (trips above a certain fault level = **sensitivity-mA**).
- •Time Delayed / Inverse Time Delayed (Trips after a certain **time delay -S or mS, if** fault current is above a certain level of sensitivity-A or mA)

If the current leaving the power supply, comes back without taking a grounded path, then the Line and Neutral Currents are equals, no pick up voltage is created on the pick up coil because no unbalance exist between Line and Neutral

Most ELCB's rely on the core-balanced principle for their operation. The current carrying conductors pass through a high permeability core. The vector sum of the fluxes produced in the core by these conductors is Zero if no earth fault is present.

When an earth fault is present, the out-of balance flux generates a voltage in the pick-up coil which in turn is used to trip (open) the circuit breaker !

The specifications are similar for Domestic and Industrial ELCBs.

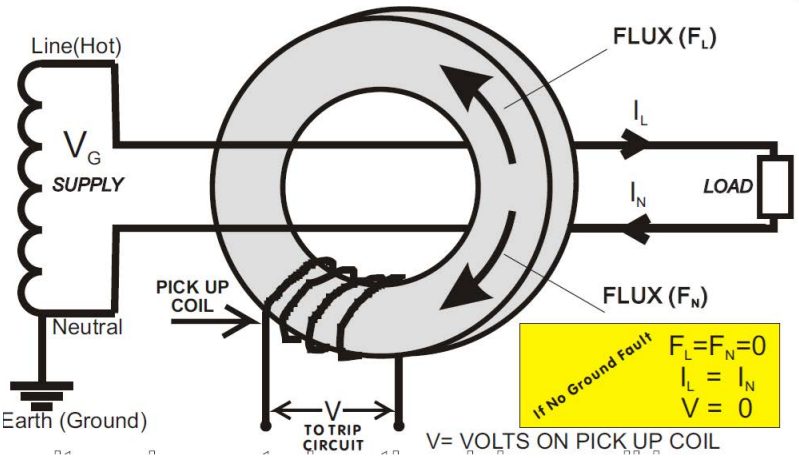
With the early ELCBs, a magnetic amplifier was used to amplify the earth fault in order to trip the Main Circuit Breaker.

Over the years, new ELCB designs have moved away from magnetic amplifiers to passive devices, then to active semi-conductors types.

Today, with modern ELCBs designs, many industrial types are programmable and controlled by micropro-cessor.

The operation of ELCBs was primarily checked by simulating an earth fault equal or greater than the nominal sensitivity of the ELCB and then, checking whether the ELCB tripped.

**It has now become necessary, not only to ensure that tripping takes place, but that ELCBs disconnects at the exact sensitivity and within the correct time, from where a fault occurs.**




In a three phase system, if each line has an earth fault of exactly the same amplitude, the ELCB will not see any leakage current and will not trip