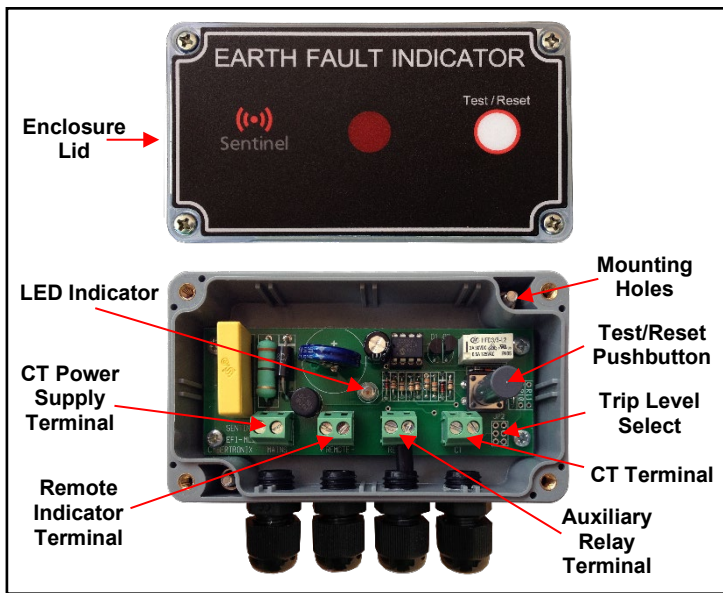


## Sentinel™ EFI-CLZ Earth Fault Indicator

- CT powered
- Flashing LED
- SCADA relay output contact
- Remote indicator output contact
- 50A trip level

Please read safety instructions carefully



## INSTALLATION INSTRUCTIONS

### PACKING CONTENTS:

- Control Unit: Grey ABS box enclosure with product information and warning labels
- Current Transformer: CT100 (standard) or CT120, CT150, CT300
- CT Power Supply: 3 meter lead (standard option), or as ordered
- Remote LED Indicator (optional): 2 meter lead (standard option), or as ordered
- Auxiliary Relay Cable (optional): 2 meter lead (standard option), or as ordered

### INSTALLATION INSTRUCTIONS

#### Installing the Control Unit

The Control Unit is surface mounted using the two 4mm mounting holes provided. To access the mounting holes, unscrew the four screws securing the lid of the Control Unit. Two M4 × 16mm bolts are located inside the enclosure for mounting the unit. After mounting, replace the cover of the unit, and secure tightly with the four screws to ensure good sealing.

#### Installing the Remote Indicator (optional)

The remote indicator consists of a M10 bolt and should be mounted in a secure place where the indication is required.

#### Connecting the Auxiliary Relay (optional)

For additional remote fault signaling the auxiliary relay cable is connected through a cable gland to the two-way screw terminal marked "RELAY". This is a normally-open circuit.

#### Connecting the CT Supply

The CT Power Supply is mounted around one of the phases being monitored and draws power from the load current flowing in that phase. It must be mounted on the screened part of the cable, at earth potential as shown in Figure 1.

A 3 meter lead from the CT Power Supply is connected through a cable gland to the two-way screw terminal marked "POWER".

#### Installing the Current Transformer (CT)

The current transformer comprises of a flexible iron-core belt with a magnetic pickup coil. The CT is wrapped tightly around the three-phase system to be monitored using the adjustable cable ties provided.

NOTE: The CT should not encircle the HV cable earth lead as well. Instead the earth lead should by-pass the CT, as shown in Figure 1 and Figure 2.

#### Multi-Core Cable System

The CT100 and CT150 sensors are used for multi-core cable systems. The CT is mounted on the screened part of the cable below the strip-back point as shown in Figure 1. The center cable-tie of the CT sensor is used to secure the sensor firmly on the cable. The flexible iron-core of the sensor is wrapped in a closed overlapping circle around the cable and pulled tightly with the second cable-tie as far as is possible. The screen of the cable is turned back underneath the sensor and terminated as shown.

#### Single-Core Cable System

For single-core cable systems a larger CT300 sensor is used. The flexible iron-core of the sensor is wrapped in a closed overlapping circle around the cable as tightly as possible and secured in place with cable-ties. Care should be taken to ensure that the sensor is mounted on the screened part of the cable. The screen of all three conductors should be turned underneath the core and terminated as shown in Figure 2.

FIGURE 1: EFI INSTALLATION ON MULTI-CORE CABLE SYSTEM

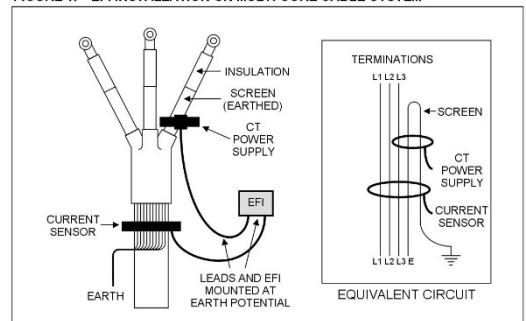
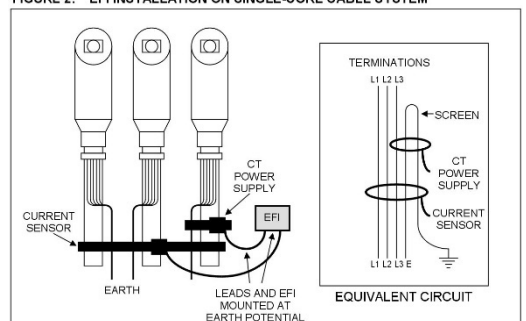


FIGURE 2: EFI INSTALLATION ON SINGLE-CORE CABLE SYSTEM



**POWER UP and MANUAL TEST**

**NOTE:** When the unit is first powered up from the mains supply, a period of up to 10 minutes is required to charge the on-board backup power supply before the unit can become operational. This charge period is assuming a minimum load current of 50A in the phase that the CT Power Supply is attached to. If the load current is less than this a longer period will be required. A minimum load current of 10A is required to trickle charge the unit.

**NOTE:** The charge period is dependent on the amount of load current flowing in the phase to which the CT Power Supply is attached and ranges from a minimum of 10A to a maximum of 650A. If the backup supply is already partly charged then this charge period is reduced.

Following installation it is important that the unit is tested with the Manual test facility provided. The test sequence should be:

- 1) Ensure that the unit is powered up for a period of up to 10 minutes (assuming at least 50A load).
- 2) Press the "Test / Reset" pushbutton on the front of the unit for a minimum of 3 seconds.

The LED indicator in the control unit will commence flashing at approximately 1Hz, as well as the remote indicator (if installed).

The auxiliary relay will latch in the closed position.

This test state will continue for a period of 60 seconds or until healthy load current (>10A) is present for 10 seconds or until the test pushbutton is pressed again to terminate the manual test.

**SAFETY**

**WARNING:** Under certain fault conditions, high voltages can be conducted into the earth fault indicator enclosure through the CT, remote indicator, or the auxiliary relay cables. All parts within the enclosure should be handled as if carrying dangerous voltages.



**WARNING:** Use extreme caution during the installation and use of the earth fault indicator as high voltages and currents may be present in the circuit.

- Ensure that the current sensor is installed at earth potential on the HV cable system.
- Ensure that the current sensor is installed on the screened part of the cable system.
- Use caution during the installation and use of this product; high voltages and currents may be present in the circuit.
- This product must be used only by qualified personnel practicing applicable safety precautions.
- Wear protective clothing and gloves as required.
- Do not install this product on live conductors.
- Always de-energize circuit before installing the current sensor and indicating unit.
- Always inspect the current sensor, indicating unit and all leads for damage before using the product.
- Do not use the product if damaged.

**Technical Data**

Network voltage range:	1-36kV AC
CT Supply charging time:	10 minutes at 50A phase current
CT Supply range:	10A to 650A phase current
Trip current:	50A ±20%
Minimum fault duration:	2.5 cycles (50ms@50Hz)
LED indicator flash rate:	1Hz
LED indicator flash duration:	12 hours nominal
Fault current withstand:	25kA for 1second
Operating temp range:	-20°C to 70°C
Operating humidity range:	0-100% RH
Reset of fault:	10s of healthy (>10A) phase current or manual reset pushbutton

**Remote Indicator (optional)**

Type:	High intensity red LED
Flash rate:	1Hz
Flash duration:	6 hours nominal
Lead type:	2-core, 0.5mm <sup>2</sup> , double insulated
Mounting:	M10 panel hole

**Auxiliary Relay (optional)**

Number of contacts:	1
Type:	Latching, N/O on reset
Rating:	Max voltage: 220VDC, 250VAC
Maximum switching:	60W
Maximum current:	2A