



# EFI.06 EARTH FAULT INDICATOR

EARTH-FAULT DETECTION AND SIGNALLING  
FOR MEDIUM VOLTAGE CABLES



**CT.01**

## OPTIONAL ACCESSORIES

LAMP EXTERNAL INDICATORS

**LXI.01**



**LXI.02**



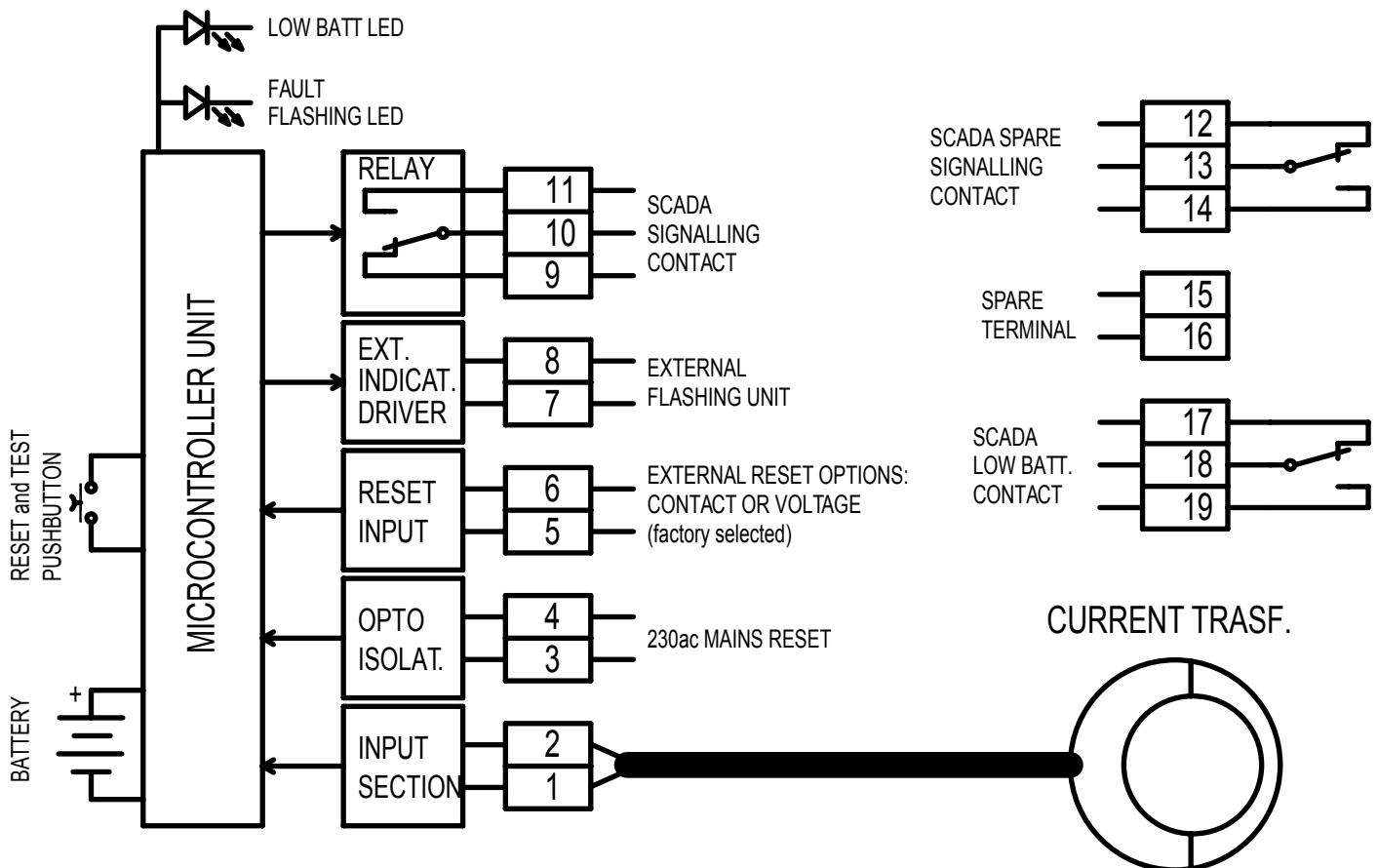
**BXI** BOLT EXTERNAL INDICATOR



**GENERAL DESCRIPTION**

**EFI** Earth-Fault Indicator device for earth-fault detection and signalling on medium voltage networks:

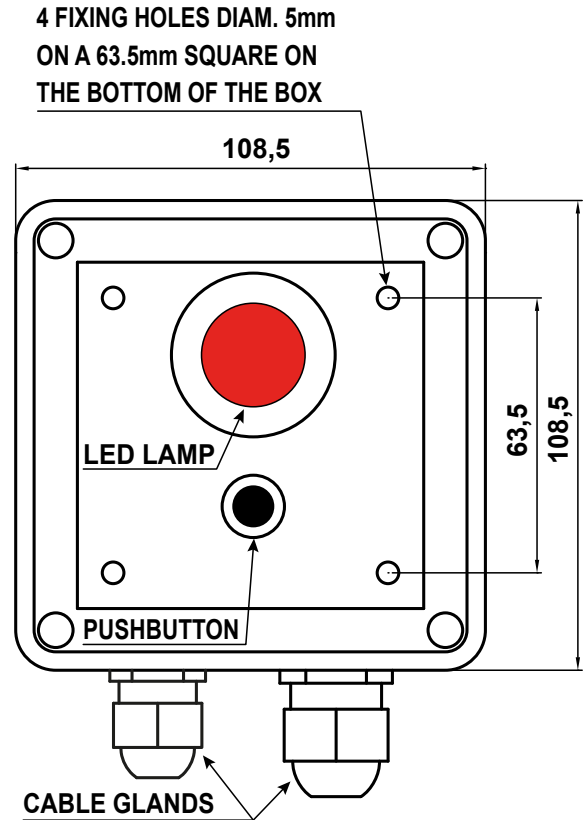
- Designed to be installed on MV cables up to 33kV (underground, switchgears, cells, etc.).
- Local and remote earth fault signalling by means of flashing LED lamp and SCADA relay changeover contact.
- Up to four levels of trip current, selectable by internal jumpers (current values can be customer defined).
- Four reset modes: time-delay, 230Vac mains voltage, pushbutton reset and remote reset via SCADA (either contact or voltage - factory preset)
- Up to four time-delay values for automatic time reset, selectable by internal jumpers (time-delay values can be customer defined).
- Up to four fault delay values for transient cancellation, selectable by internal jumpers (delay values can be customer defined).
- Correct operation (test) can be checked pressing the pushbutton on the front.
- Self-powered by the internal lithium battery with 10 years lifetime and over 1500 flashing hours.
- Battery can be easily replaced with lithium 3,6V - AA type (no soldering or tools required).
- Electronic module enclosed in IP65 box linked to the external current transformer CBCT.
- Split-type resin current transformer CBCT ring-type, composed by two halves that can be installed without MV cables disconnection and held together by 4 allen screws.



**IMPORTANT: FOR DEVICE OPERATION REMOVE BATTERY PAPER STRIP**

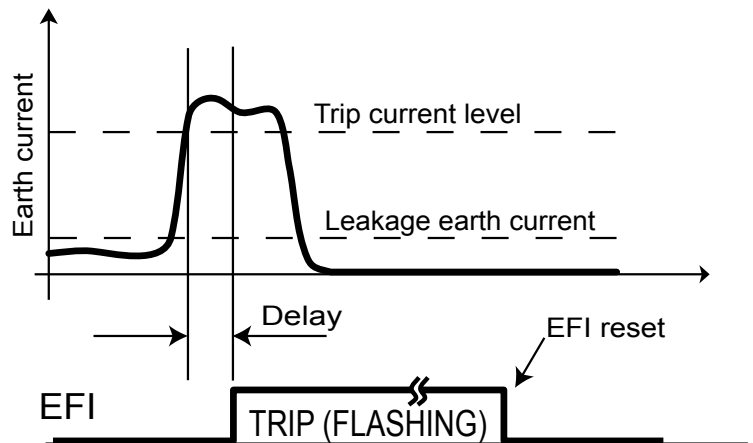
## Device Options (to be specified in purchase order)

- Screw terminal output to drive the external flashing indicator
- SCADA Changeover Relay: Momentary or Permanent contact
- SCADA Output signalling spare (extra) changeover contact
- Remote reset by DC voltage in range 9-36Vdc
- Low Battery LED indicator in front of the box (amber LED flashing during EFI test or trip when battery remaining capacity is lower than 20%)
- Low Battery SCADA signalling changeover contact



## OPERATION

The device continuously checks the earth current. When the selected trip level is exceeded for more than the selected delay time, the device trips: the LED starts flashing and the SCADA relay gives a pulse signalling, closing the contact for 500ms. If a second fault occurs when the EFI is already tripped, the SCADA contact will close again for 500ms to indicate that a second fault has occurred. The minimum fault duration (delay) time is designed to discriminate real faults from simple line transients.



**DEVICE TEST:** simply press the pushbutton when the device is not flashing. The EFI will start flashing and the SCADA relay will give a pulse signalling.

**DEVICE RESET:** After the device has tripped, it can be reset in the following ways:

- Pressing the pushbutton on the front.
- TIME RESET: the EFI will reset automatically when the selected preset time has elapsed.
- REMOTE RESET: closing the contact or remote pushbutton connected to the screw terminals.
- 230Vac MAINS RESET: the EFI will reset when the mains 230Vac is back after the fault restoration. Simply connect this input to mains 230Vac voltage.

**Note:** in order to use this reset feature, the 230Vac voltage must disappear when the fault occurs, i.e. it must be cut off by the MV circuit breaker that breaks the faulty line, otherwise the EFI will reset immediately after the fault.



**TECHNICAL SPECIFICATIONS**

Earth fault trip Current	Jumper selectable: 25A, 50A, 100A, 200A ( $\pm 20\%$ ). Factory default 25A. (current values can be customer defined)
Min. Fault Duration (Delay)	Jumper selectable: 40ms, 60ms, 80ms, 160ms ( $\pm 20\%$ ). Factory default 40ms. (delay time values can be customer defined)
CBCT Current Transformer	Resin, split in 2 halves tied by 4 allen screws. Internal standard diameter 110mm (CT.01) - option 150mm (CT.03).
Device link with CBCT	5m 2x1sqmm PVC cable. (custom lengths on request)
Visual Fault Signalling	Flashing red LED lamp covered with red lens. Ultra bright flash at 1 flash per second. Visibility in excess of 15m.
Remote Fault Signalling (SCADA contact)	Changeover SCADA relay contact - Signalling time (pulse): 500ms. Contact ratings: 1A max, 230Vac, 30W max. (option permanent contact) Option: SCADA Output signalling spare (extra) changeover contact
Power Supply	Self-powered by internal lithium battery 3,6V - AA type. 10 years lifetime with over 1500 hours flashing time. Battery can be easily replaced with lithium 3,6V - AA standard type (no soldering or tools required).
Reset modes (All features present)	<ul style="list-style-type: none"> <li>• Automatic after time delay, jumper selectable: 30 min, 1hr, 2hrs or 4hrs (<math>\pm 5</math>min). Factory default: 2hrs. (time values can be customer defined)</li> <li>• When the 230 Vac mains voltage is restored (link cable not provided).</li> <li>• By the pushbutton placed on the cover.</li> <li>• By remote NO reset contact (SCADA) or remote pushbutton.</li> <li>• Option: by remote control DC voltage 9 to 36Vdc</li> </ul>
Device Test	By the pushbutton placed on the cover.
Environment	Device Enclosure IP65 Polycarbonate - Ambient temperature -20 to +55 deg C
<b>OPTIONS</b>	<p>Screw terminal outputs to drive the external flashing indicator.</p> <p>Low Battery amber LED indicator in front of the box</p> <p>Low Battery SCADA signalling changeover contact</p>

We reserve the right to change the design and specification of any item shown herein, therefore the contents shall not form part of any contract or constitute a warranty.

EFI.06 Product Manual  
rev.5 2/11/2015

