

# Protection Relays & Controls

## EL731 SERIES

Earth-Leakage Protection–Grounded AC or DC Systems •  
AC/DC Sensitive Earth-Leakage Relay



### Description

The EL731 is a microprocessor-based AC/DC Sensitive Earth-Leakage Relay that offers complete coverage for all frequencies from 0 to 6,000 Hz. Two CTs are required for the entire frequency range, or one CT can be used for only low- or high-frequency detection. An RTD/PTC sensor input allows over-temperature and under-temperature protection for a motor or drive. The EL731 offers metering, password-protected alarm and trip settings and optional network communications. It is primarily used to add low-level ground-fault protection to variable-speed drives, and to dc circuits.

### Features & Benefits

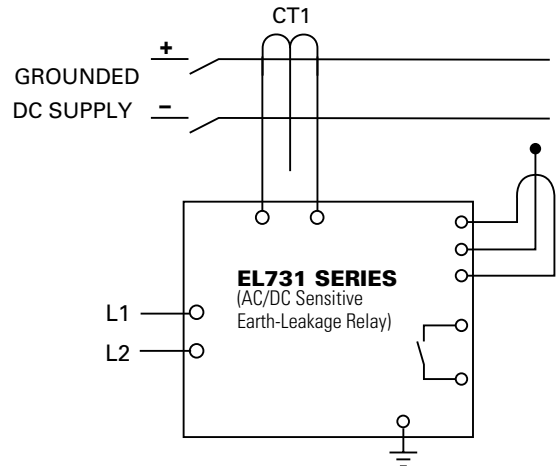
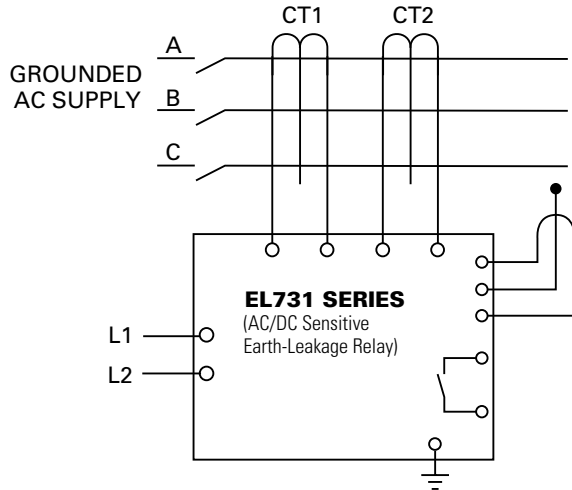
| FEATURES                                      | BENEFITS  |
|---|---|
| <b>Adjustable pickup (30-5,000 mA)</b>        | Adjustable trip setting provides a wide range of low-level protection and system coordination                         |
| <b>Frequency range (0-90 Hz, 20-6,000 Hz)</b> | Operate in either AC or DC mode or both. Use single or combined ranges. Separate metering                             |
| <b>32-char OLED display</b>                   | Earth-leakage metering, setup and programming   |
| <b>Local LED indication</b>                   | Visual Trip, Alarm, CT connection indication  |
| <b>CT-Loop monitoring</b>                     | Proactively monitors for open- or short-circuit CT wiring   |
| <b>Analog output (4-20 mA)</b>                | Connect to DCS. Allows connection to an optional meter (PGA-0520) or control system                                   |
| <b>Adjustable time delay</b>                  | Adjustable trip delay for quick protection and system coordination  |
| <b>Alarm and trip settings</b>                | Detect a deteriorating condition before damage occurs   |
| <b>Temperature-sensor input</b>               | Monitor motor or drive temperature and respond to high- or low-temperature conditions                                 |
| <b>Output contacts</b>                        | Three programmable outputs for tripping or alarming on leakage current, high, or low temperature                      |
| <b>Network communication</b>                  | Optional connection to plant network  |
| <b>Harmonic filtering</b>                     | Eliminates nuisance tripping due to harmonic noise  |
| <b>Panel, Surface, and DIN-rail mounting</b>  | Compact enclosure and flexible mounting options allow for many installation options even in panels with limited space |
| <b>Universal power supply</b>                 | Provides flexibility for numerous applications  |

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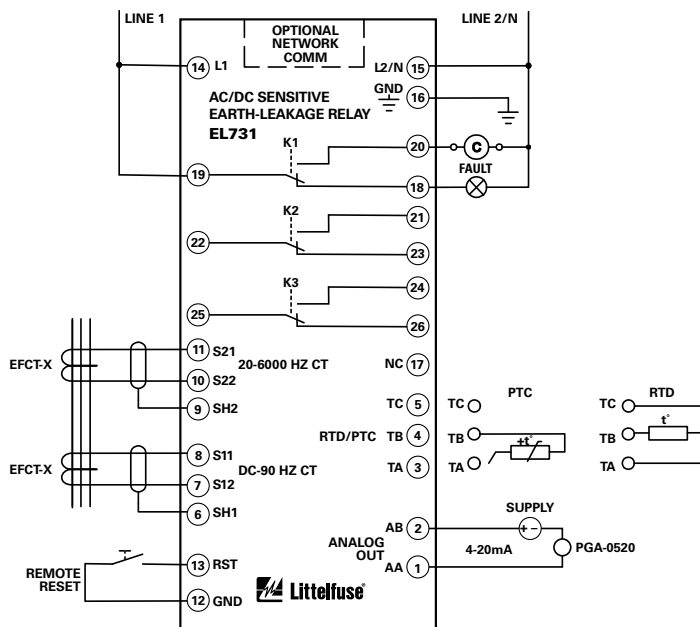
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### Simplified Circuit Diagram



### Wiring Diagram



### Specifications

#### IEEE Device Numbers

AC ground fault (50G/N, 51G/N),  
DC ground fault (79G),  
PTC overtemperature (49),  
RTD temperature (38, 49)  
120/240 Vac/Vdc, 24 Vdc,  
48 Vdc/24 Vac

#### Supply Voltage

**Trip Level Settings**  
**Alarm Level Settings**  
**Trip Delay**  
**Output Contacts**  
**Contact Operating Mode**  
**Reset**  
**Freq. Response, CT1**  
**Freq. Response, CT2**

30-5,000 mA AC and DC  
30-5,000 mA AC and DC  
0.05-2 s  
3 Form C (programmable)  
Fail-safe & non-fail-safe  
Front panel and remote  
0-90 Hz  
20-6,000, 190-6,000, 20-90,  
20-3,000 Hz; selectable

#### Current Transformer CT Detection Terminals

#### Communications

#### Analog Output

#### Conformal Coating Dimensions

#### Approvals

#### Warranty Mounting

EFCT-x series  
Open & short detection  
Plug-in, wire clamping,  
24 to 12 AWG (0.2-2.5 mm<sup>2</sup>)  
EtherNet/IP™, DeviceNet™,  
Profibus®, Modbus® TCP (optional)  
4-20 mA (selectable 0-5 A or  
0-100% trip-level setting)  
Standard feature  
**H** 48 mm (1.9");  
**W** 96 mm (3.8");  
**D** 129 mm (5.0")  
UL Listed (E340889), CSA,  
RCM (Australia), CE  
5 years  
Panel; Surface and DIN (with optional  
AC700-SMK)

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### Accessories



#### EFCT Series Earth-Fault Current Transformer

Required zero-sequence current transformer specifically designed for low level detection.



#### AC700-CUA Series Communication Adapter

Optional network-interface and firmware-upgrade communications adapters field-install in EL731.



#### AC700-SMK DIN-rail & Surface-mount Adapter

EL731 plugs into adapter for back-plane mounting.

| ACCESSORIES   | REQUIREMENT  |
|---|--------------|
| EFCT Series CT  | One Required |
| AC700-CUA Series Com. Unit  | Optional     |
| AC700-SMK Surface-Mount Kit                                       | Optional     |
| AC700-CVR-00 Watertight Cover (IP66) for Panel-Mount Applications | Optional     |
| PGA-0520 Analog Meter   | Optional     |

### Ordering Information

| ORDERING NUMBER | CONTROL POWER   | COMMUNICATIONS |
|-----------------|-----------------|----------------|
| EL731-00-X0     | 120/240 Vac/Vdc | None           |
| EL731-01-X0     | 120/240 Vac/Vdc | DeviceNet™     |
| EL731-02-X0     | 120/240 Vac/Vdc | Profibus®      |
| EL731-03-X0     | 120/240 Vac/Vdc | EtherNet/IP™   |
| EL731-04-X0     | 120/240 Vac/Vdc | Modbus® TCP    |
| EL731-10-X0     | 48 Vdc & 24 Vac | None           |
| EL731-11-X0     | 48 Vdc & 24 Vac | DeviceNet™     |
| EL731-12-X0     | 48 Vdc & 24 Vac | Profibus®      |
| EL731-13-X0     | 48 Vdc & 24 Vac | EtherNet/IP™   |
| EL731-14-X0     | 48 Vdc & 24 Vac | Modbus® TCP    |
| EL731-20-X0     | 24 Vdc          | None           |
| EL731-21-X0     | 24 Vdc          | DeviceNet™     |
| EL731-22-X0     | 24 Vdc          | Profibus®      |
| EL731-23-X0     | 24 Vdc          | EtherNet/IP™   |
| EL731-24-X0     | 24 Vdc          | Modbus® TCP    |

Note: When building a part number, replace the "X" with "1" for AS/NZS 2081:2011 Compliant product, "0" otherwise.

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