

# 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

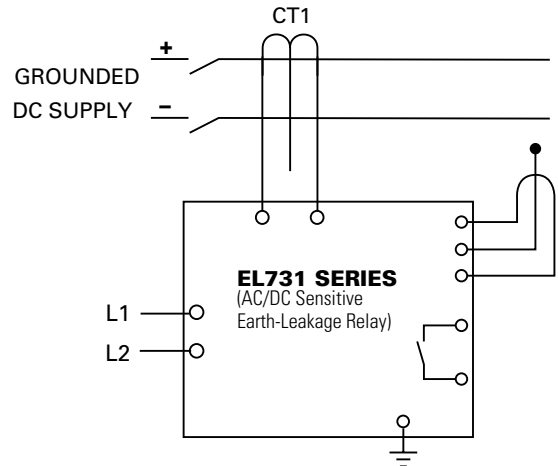
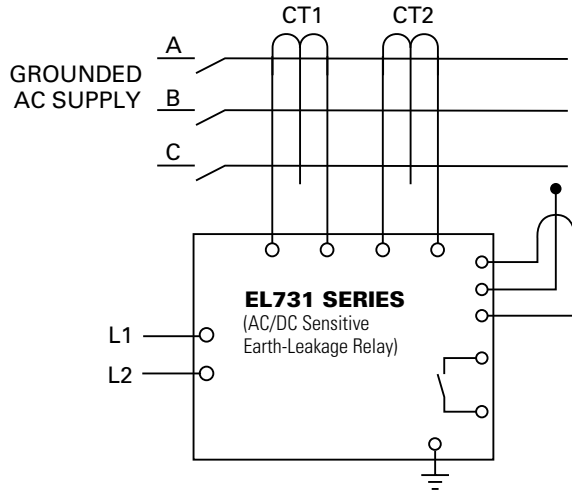
FEATURES	BENEFITS
<b>Adjustable pickup (30-5,000 mA)</b>	Adjustable trip setting provides a wide range of low-level protection and system coordination
<b>Frequency range (0-90 Hz, 20-6,000 Hz)</b>	Operate in either AC or DC mode or both. Use single or combined ranges. Separate metering
<b>32-char OLED 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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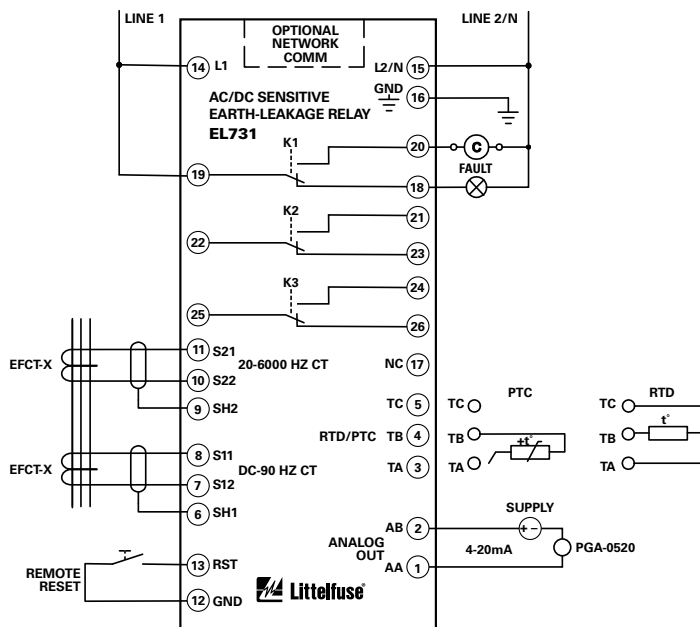
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### Simplified Circuit Diagram



### 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

EFCT-x series  
Open & short detection  
Plug-in, wire clamping,  
24 to 12 AWG (0.2-2.5 mm<sup>2</sup>)

#### Communications

EtherNet/IP™, DeviceNet™,  
Profibus®, Modbus® TCP (optional)  
4-20 mA (selectable 0-5 A or  
0-100% trip-level setting)

#### Analog Output

Standard feature  
**H** 48 mm (1.9");  
**W** 96 mm (3.8");  
**D** 129 mm (5.0")

#### Conformal Coating Dimensions

#### Approvals

UL Listed (E340889), CSA,  
RCM (Australia), CE

#### Warranty Mounting

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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