

GROUND-FAULT PROTECTION

Create safer working environments and reduce incidents of Arc Flash without affecting the uptime of critical operations. Vital in manufacturing and processing environments, sensitive ground-fault relays with advanced filtering will detect breakdown in insulation resistance without nuisance trips. Breakdown in insulation resistance can be caused by moisture, vibration, chemicals and dust.

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For More Information... and to download our White Paper on Ground-Fault Protection with VFDs, visit Littelfuse.com/TechnicalCenter

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EL3100 SERIES

Ground-Fault & Phase-Voltage Indicator



Image: Second second

Simplified Circuit Diagram



Ordering Information

ORDERING NUMBER	MOUNTING
EL3100-00	DIN, Surface
ACCESSORIES	REQUIREMENT
RK-310X-0Y	Optional

Note: X=R for red LED and G for green LED Y=0 for no label and 1 for a ground-fault label

Description

The EL3100 is a self-powered ground-fault and phase-voltage indication system for 3-phase systems. The EL3100 meets the National Electrical Code (NEC) and the Canadian Electrical Code (CEC) requirements for ground detectors for ungrounded alternating-current systems. Voltage connections are provided on the EL3100 for 208, 240, 480, and 600-V systems. Three green LED's on the EL3100 indicate the presence of phase-to-ground voltage and one red LED indicates a ground fault. The EL3100 can operate stand-alone or with up to five remote LED indicators. A solid-state relay output provides indication of a ground fault. The output relay is closed when the 3-phase neutral voltage shifts as the result of ground leakage.

Features & Benefits

FEATURES	BENEFITS		
NEC [®] and CEC Code compliant	Meets National Electrical Code (NEC®) Article 250.21 and Canadian Electrical Code Part 1, Section 10-106 (2) requirements for ungrounded systems		
Low-voltage remote LEDs	System voltage is not present at the remote LED location		
Phase-voltage indication	Indicates the presence of voltage on both grounded and ungrounded systems		
Output relay	Allows for remote ground-fault indication		

Accessories



Remote LEDs

High-intensity 16-mm IP67 LED lamps available in red and green colors.

Specifications

Input Voltage

Dimensions

Approvals

Conformally Coated Warranty Mounting Input L: 208/240 Vac Input H: 480/600 Vac H 87.0 mm (3.43"); W 112.5 mm (4.43") D 56.0 mm (2.2") CSA certified, UL Listed (E340889), RCM (Australia) Standard feature 5 years DIN, Surface

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www.littelfuse.com/EL3100

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PGR-3100 SERIES

Ground-Fault Indication System



Simplified Circuit Diagram



Ordering Information

ORDERING NUMBER	MOUNTING
PGR-3100	Panel mount

ACCESSORIES						
ORDERING NUMBER		OPTIONS	POWER SUPPLY		ENCLOSURE	INDICATION
PGR-3100-PNL	-	А	В	-	С	D
		0 = No Options, customer supplied 120 V lamp test 1 = Transformer included for 120 V lamp test	0 = Low Voltage (120, 208, 240), c/w fusing 1 = High Voltage (480, 600), c/w fusing		0 = NEMA 4 Enclosure 1 = 316 Stainless Steel	Future Options

Description

The PGR-3100 indicates the presence of voltage on each phase of a three-phase system. The LEDs on the panel illuminate when voltage is present. When a ground-fault occurs, the voltage on the faulted phase reduces to ground potential, causing the LEDs for the faulted phase to dim and the LEDs for the unfaulted phases to become brighter. Ungrounded ac systems are required by the National Electrical Code (NEC[®]) Article 250.21(B) and the Canadian Electrical Code Part 1, Section 10-106 (2) to have ground detectors, such as the PGR-3100, installed on the system. External potential transformers (PTs) can be used to step down system voltage, allowing the PGR-3100 to be applied to any system voltage. PTs are not required for system voltages up to 600 Vac.

Features & Benefits

FEATURES	BENEFITS
NEC [®] and CEC Code compliant	Meets National Electrical Code (NEC®) Article 250.21(B) and Canadian Electrical Code Part 1, Section 10-106 (2) requirements for ungrounded systems
Phase LEDs	Indicates presence of a ground fault and the faulted phase as well as phase-to-ground voltage on an energized bus
Redundant LEDs	Redundant long-life LEDs (two per phase) to ensure reliability
Lamp test button	Verifies LEDs are operating

Accessories



PGR-3100-PNL Panel-Mount Enclosure

PGR-3100-PNL is the PGR-3100 integrated into compact stainless steel enclosure for ease of installation and retrofits. Options include visual alarm, audible alarm with silence and reset. Dimensions are 8"W x 8"H x 4" D.

Specifications

Input Voltage Indicator Off Voltage Dimensions

Test Button Approvals Conformally Coated Warranty Mounting Up to 600 Vac 50/60 Hz < 30 Vac line to ground H 88.9 mm (3.5"); W 108 mm (4.3"); D 54 mm (2.1") Local CSA certified, UL Listed Standard feature 5 years Panel **1** GROUND-FAULT PROTECTION

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Protection Relays Ground-Fault Protection – Ungrounded AC System

PGR-3200 SERIES **Insulation Monitor**





Simplified Circuit Diagram



Ordering Information

ORDERING NUMBER	CONTROL POWER
PGR-3200	240 Vac ⁽¹⁾
PGR-3200-120	120 Vac
ACCESSORIES	REQUIREMENT
PGH Series	Required >1,300 V
PGA-0510	Optional

Note: For optional conformal coating please consult factory. To convert to a resistance grounded system, see neutral-grounding-resistors packages. (1) UL Not Available

Description

The PGR-3200 detects ground faults by continuously monitoring the insulation integrity of ungrounded electrical systems. The relay monitors the insulation for damage and assists with predictive maintenance and troubleshooting of developing ground faults by providing two warning and an alarm level. The PGR-3200 operates on one- or three-phase ungrounded systems up to 6 kV.

The PGR-3200 can also be used on a grounded system to monitor the insulation for damage, while the power system is de-energized. The mode-of-operation terminals (27-28) are connected to the circuit breaker or contactor auxiliary contacts to toggle the relay off when the contactor or breaker is closed.

Features & Benefits

FEATURES	BENEFITS
NEC [®] and CEC Code compliant	Meets National Electrical Code (NEC®) Article 250.21(B) and Canadian Electrical Code Part 1, Section 10-106 (2) requirements for ungrounded systems
Output contact (50 kΩ)	Form C output contact for alarming when the insulation resistance is below 50 $\ensuremath{k\Omega}$
Output contact (10 kΩ)	Form C output contact for tripping when the insulation resistance is below 10 $\ensuremath{k\Omega}$
Analog output (0-1 mA)	Provides means for connecting to an optional meter (PGA-0510) or control system
DIN-rail or surface mount	Flexible options for ease of installation

Accessories



PGH Series High-Tension Coupler

A PGH Series high-tension coupler is required for systems between 1,300 V and 6,000 V.



PGA-0510 Analog Ohm Meter Optional PGA-0510 Analog Meter allows

for metering of insulation resistance.

Specifications

IEEE Device Numbers

Input Voltage Dimensions **Resistance Ratings**

Contact Operating Mode Test Button Reset Button Output Contacts Analog Output Conformally Coated Approvals Warranty Mounting

Undervoltage Relay (27) Ground Detector Relay (64) See ordering information H 75 mm (3"); W 100 mm (3.9"); D 115 mm (4.5") Insulation warning (30 k Ω and 50 k Ω) Insulation alarm (10 k Ω) Non-fail-safe Local Local and remote Two Form C 0-1 mA Consult factory UL Listed (E183688) 5 years DIN, Surface

www.littelfuse.com/pgr-3200

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SE-601 SERIES (PGR-2601)

DC Ground-Fault Monitor



Simplified Circuit Diagram



Ordering Information

ORDERING NUMBER	CONTROL POWER
SE-601-0U	120/240 Vac/Vdc
SE-601-0D	12/24 Vdc
SE-601-OT	48 Vdc
ACCESSORIES	REQUIREMENT
SE-GRM SERIES	Required
PGA-0500	Optional
PMA-55	Optional
PMA-60	Optional



Description

The SE-601 is a microprocessor-based ground-fault relay for ungrounded dc systems. It provides sensitive ground-fault protection without the problems associated with nuisance tripping. Ground-fault current is sensed using an SE-GRM Series Ground-Reference Module—a resistor network that limits ground-fault current to 25 mA. The SE-601 is used on ungrounded dc systems ranging from industrial 24-Vdc control circuits to 1000-Vdc solar and transportation systems.

Features & Benefits

FEATURES	BENEFITS
Adjustable pickup (1-20 mA)	Ten settings provide a wide range of low-level protection
Adjustable time delay (50 ms-2.5 s)	Adjustable trip delay allows quick protection or delayed response
Output contacts	Form A and Form B output contacts for operation of separate annunciation and trip circuits
Analog output (0-5 V)	Provides means for connecting to a meter (PGA-0500) or a control system
Non-volatile trip Memory	Retains trip state when de-energized to simplify troubleshooting
Selectable contact operating mode	Selectable fail-safe or non-fail-safe operating modes allow connection to shunt or undervoltage breaker coil
Microprocessor based	No calibration required saves on maintenance cost

Accessories



SE-GRM Series Ground-Reference Module Required accessory, used to connect the SE-601 DC Ground-Fault Monitor to the DC bus.



PGA-0500 Analog % Current Meter

Optional panel-mounted analog meter displays ground-fault current as a percentage of 22 mA.

Specifications

IEEE Device Numbers DC Overcurrent Relay (76G) **Input Voltage** See ordering information Dimensions H 75 mm (3.0"); W 55 mm (2.2"); D 115 mm (4.5") **Trip Level Settings** 1-20 mA **Trip Time Settings** 0.05-2.5 s **Output Contacts** Isolated Form A and Form B **Contact Operating Mode** Selectable fail-safe or non-fail-safe **Test Button** Local **Reset Button** Local and remote Analog Output 0-5 V **Conformally Coated** Consult factory CSA certified, UL Listed (E340889), Approvals CE (European Union), C-Tick (Australian) Warranty 5 years Mounting DIN, Surface (standard) Panel (with PMA-55 or PMA-60 adapter)

Note: For optional conformal coating please consult factory.



Protection Relays Ground-Fault Protection – AC/DC Earthed System

EL731 SERIES

AC/DC Sensitive Earth-Leakage Relay





Simplified Circuit Diagram



For detailed wiring diagram, see adjacent page.

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

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 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.



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

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

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EL731 SERIES

AC/DC Sensitive Earth-Leakage Relay

Features & Benefits

FEATURES	BENEFITS	
Adjustable pickup (30-5,000 mA)	Adjustable trip setting provides a wide range of low-level protection and system coordination	
Frequency range (0-90 Hz, 20-6,000 Hz)	Operate in either AC or DC mode or both. Use single or combined ranges. Separate metering	
32-char OLED display	Earth-leakage metering, setup and programming	
Local LED indication	Visual Trip, Alarm, CT connection indication	
CT-Loop monitoring	Alarms when CT is not connected	
Analog output (4-20 mA)	Connect to DCS. Allows connection to an optional meter (PGA-0520) or control system	
Adjustable time delay	Adjustable trip delay for quick protection and system coordination	
Alarm and trip settings	Detect a deteriorating condition before damage occurs	
Temperature-sensor input	Drive or motor temperature protection	
Output contacts	3 programmable: Operate 2 alarm and 1 trip circuit	
Network communication	Optional connection to plant network	
Harmonic filtering	Eliminates nuisance tripping due to harmonic noise	
Microprocessor based	No required calibration saves maintenance cost	
Universal power supply	Provides flexibility for numerous applications	

Wiring Diagram



Specifications

IEEE Device Numbers Supply Voltage	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 Vda (24 Vac
Trin Level Settings	$30-5000 \text{ m} \Delta \Omega$ and $\Omega \Omega$
Alarm Level Settings	30-5.000 mA AC and DC
Trip Delav	0.05-2 s
Output Contacts	3 Form C (programmable)
Contact Operating Mode	Fail-safe & non-fail-safe
Reset	Front panel and remote
Freq. Response, CT1	0-90 Hz
Freq. Response, CT2	20-6,000, 190-6,000, 20-90, 20-3,000 Hz;
	selectable
Current Transformer	EFCT-x series
CT Detection	Open & short detection
Terminals	Plug-in, wire clamping,
	24 to 12 AWG (0.2-2.5 mm ²)
Communications	EtherNet/IP™, DeviceNet™, Profibus®,
	Modbus® TCP (optional)
Analog Output	4-20 mA (selectable 0-5 A or
	0-100% trip-level setting)
Conformal Coating	Standard feature
Dimensions	H 48 mm (1.9"); W 96 mm (3.8");
	D 129 mm (5.0")
Approvals	UL Listed (E340889), CSA, RCM (Australia), CE
Warranty	b years
Mounting	Panel; Surface and DIN (with optional
	AC/UU-SMK)

GROUND-FAULT PROTECTION

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SE-701 SERIES (PGR-5701)

Ground-Fault Monitor

GROUND-FAULT PROTECTION



Simplified Circuit Diagram



Ordering Information

ORDERING NUMBER	CONTROL POWER
SE-701-0U	120/240 Vac/Vdc
SE-701-0D	12/24 Vdc
SE-701-0T	48 Vdc
SE-701-03	24 Vac
ACCESSORIES	REQUIREMENT
Current Transformer	Required
PGA-0500	Optional
PMA-55, PMA-60	Optional
SE-EFVC Voltage Clamp	Optional

Description

The SE-701 is a microprocessor-based ground-fault relay for resistance- and solidly-grounded systems. In addition to common systems, it is uniquely suited for use on systems with significant harmonic content. The SE-701 can provide main-plant protection, feeder-level protection, or individual-load protection. Proper current transformer selection provides the desired pickup range. The output contacts can be connected for use in protective tripping circuits or in alarm indication circuits. The analog output can be used with a PLC or a meter.

Features & Benefits

FEATURES	BENEFITS
Adjustable pickup (1-99%)	Trip setting based on input CT primary, allows use with any CT. Minimum 50 mA with EFCT Series.
Adjustable time delay (50 ms-2.5 s)	Adjustable trip delay allows quick protection and system coordination
Output contacts	Form A and Form B ground-fault output contacts for operation of separate annunciation and trip circuits
Analog output (0-5V)	Allows for connecting an optional meter (PGA-0500) or a control system
CT-Loop monitoring	Alarms when CT is not connected
Selectable DFT or peak detection filtering	Compatible with variable-speed drives
Harmonic filtering	Eliminates nuisance tripping
Non-volatile trip memory	Retains trip state while de-energized to simplify troubleshooting
Microprocessor based	No calibration required, saves on maintenance cost
Universal power supply	Allows operation in application where one side of PT is faulted, provides flexibility for numerous applications

Accessories



Ground-Fault Current Transformer

Required current transformer model depends on application. We offer a variety of sensitive CTs with 5- and 30-A primaries.



PGA-0500 Analog % Current Meter

Optional panel-mounted analog meter displays ground-fault current as a percentage of the CT primary rating.

Specifications

IEEE Device Numbers Input Voltage Dimensions **Trip Level Settings Trip Time Settings Harmonic Filtering Test Button Reset Button CT-Loop Monitoring Output Contacts** Approvals **Analog Output Conformally** coated Warranty Mounting

Ground fault (50G/N, 51G/N) See ordering information H 75 mm (3.0"); W 55 mm (2.2"); D 115 mm (4.5") 1-99% CT-Primary Rating 0.05-2.5 s Contact Operating Mode Selectable fail-safe or non-fail-safe Standard feature Standard feature Standard feature Standard feature Isolated Form A and Form B CSA certified, UL Listed (E340889), CE (European Union), C-Tick (Australian) 0-5 V Consult factory 5 years DIN, Surface (standard)

Panel (with PMA-55 or PMA-60 adapter)

Note: For optional conformal coating please consult factory.

www.littelfuse.com/se-701

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SE-703 SERIES

Earth-Leakage Monitor



Simplified Circuit Diagram



Ordering Information

ORDERING NUMBER	CONTROL POWER
SE-703-0U	120/240 Vac/Vdc
SE-703-0D	12/24 Vdc
SE-703-0T	48 Vdc
SE-703-03	24 Vac
ACCESSORIES	REQUIREMENT
EFCT Series	Required
PGA-0500	Optional
PMA-55	Optional
PMA-60	Optional
SE-EFVC Voltage Clamp	Optional

Description

The SE-703 is a microprocessor-based earth-fault relay for resistance- and solidly earthed systems. It offers sensitive earth-fault detection as low as 25 mA and can be used on systems with significant harmonic content. The SE-703 provides feeder-level protection or individual-load protection. The output contacts can be connected for use in protective tripping circuits or in alarm indication circuits. The analog output can be used with a PLC or a meter. The SE-703 is specifically designed to be AS/NZS 2081:2011 compliant.

Features & Benefits

FEATURES	BENEFITS	
Adjustable pickup (25-500 mA)	Adjustable trip setting provides a wide range of low- level protection and system coordination	
Adjustable time delay (INST-500 ms)	Adjustable trip delay allows quick protection and vsystem coordination	
Output contacts	Form A and Form B ground-fault output contacts for operation of separate annunciation and trip circuits	
Analog output (0-5V)	Allows for connecting an optional meter (PGA-0500) or control system	
CT-Loop monitoring	Alarms when CT is not connected	
Contact operating mode	Fail-safe operating mode for undervoltage applications	
Harmonic filtering	Eliminates nuisance tripping	
Non-volatile trip memory	Retains trip state while de-energized to simplify troubleshooting	
Microprocessor based	No calibration required, saves maintenance cost	
Universal power supply	Allows operation in application where one side of PT is faulted, provides flexibility for numerous applications	

Accessories



EFCT Series Ground-Fault Current Transformer Required zero-sequence current transformer specifically designed for low-level detection.



PGA-0500 Analog % Current Meter

Optional panel-mounted analog meter displays groundfault current as a percentage of the set-point or 5 A.



PMA-60 Series – Mounting Adapter Required when panel mounting for AS/NZS 2081:2011 compliance

Specifications

IEEE Device Numbers Input Voltage Dimensions **Trip Level Settings Trip Time Settings Contact Operating Mode Harmonic Filtering Test Button Reset Button** CT-Loop Monitoring **Output Contacts** Approvals Compliance Analog Output **Conformally Coated** Warranty

Ground fault (50G/N, 51G/N) See ordering information H 75 mm (3.0"); W 55 mm (2.2"); D 115 mm (4.5") 25-500 mA INST-500 ms Fail-safe Standard feature Standard feature Standard feature Standard feature Isolated Form A and Form B CSA certified, UL Listed (E340889), CE (European Union), RCM (Australian) AS/NZS 2081:2011 0-5 V Yes 5 years DIN, Surface (standard), Panel

(with PMA-55 or PMA-60 adapter)

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Mounting

SE-704 SERIES (PGR-4704)

Earth-Leakage Monitor



Simplified Circuit Diagram



Ordering Information

ORDERING NUMBER	CONTROL POWER
SE-704-0U	120/240 Vac/Vdc
SE-704-0D	12/24 Vdc
SE-704-0T	48 Vdc
SE-704-03	24 Vac
ACCESSORIES	REQUIREMENT
SE-CS30 Series	Required
PGA-0500	Optional
PMA-55, PMA-60	Optional

Note: For optional conformal coating please consult factory.

Description



The SE-704 is a microprocessor-based ground-fault relay for resistance- and solidly-grounded systems. It offers very sensitive ground-fault detection as low as 10 mA and can be used on systems with significant harmonic content. The SE-704 provides feeder-level protection or individual-load protection. The output contacts can be connected for use in protective tripping circuits or in alarm indication circuits. The analog output can be used with a PLC or a meter.

Features & Benefits

FEATURES	BENEFITS
Adjustable pickup (10 mA-5 A)	Adjustable trip setting provides a wide range of low-level protection and system coordination
Adjustable time delay (30 ms-2.0 s)	Adjustable trip delay allows quick protection and system coordination
Output contacts	Form A and Form B ground-fault output contacts for operation of separate annunciation and trip circuits
Analog output (0-5 V & 0-1 mA)	Allows for connecting an optional meter (PGA-0500) or control system
CT-Loop monitoring	Alarms when CT is not connected
Selectable contact operating mode	Selectable fail-safe or non-fail-safe operating modes allows connection to shunt or undervoltage breaker coil
Harmonic filtering	Eliminates nuisance tripping
Non-volatile trip memory	Retains trip state when de-energized to simplify troubleshooting
Microprocessor based	No calibration required saves maintenance cost
Universal power supply	Allows operation in application where one side of PT is faulted, provides flexibility for numerous applications

Accessories



SE-CS30 Series Ground-Fault Transformer

Required zero-sequence current transformer specifically designed for low level detection. Flux conditioner is included to prevent saturation.

PGA-0500 Analog % Current Meter Optional panel-mounted analog meter displays ground-fault current as a percentage of the set-point or 5 A.

Specifications

IEEE Device Numbers Input Voltage Dimensions **Trip Level Settings Trip Time Settings Contact Operating Mode Harmonic Filtering Test Button Reset Button CT-Loop Monitoring Output Contacts** Approvals **Analog Output Conformally coated** Warranty Mounting

Ground fault (50G/N, 51G/N) See ordering information H 75 mm (3.0"); W 55 mm (2.2"); D 115 mm (4.5") 10 mA-5.0 A 30-2000 ms Selectable fail-safe or non-fail-safe Standard feature Standard feature Standard feature Standard feature Isolated Form A and Form B UL Listed (E340889), CSA, CE (European Union) C-Tick (Australian) 0-5 V & 0-1 mA Optional 5 vears DIN, Surface (standard) Panel (with PMA-55 or PMA-60 adapter)

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SB6000 SERIES



*Patented

Simplified Circuit Diagram



Ordering Information

ORDERING NUMBER	VOLTAGE (V)	TRIP LEVEL (mA)	UL CATEGORY/CLASS
SB6100-00X-0	208	20(Fixed)	UL 943C Class C special-purpose GFCI
SB6100-10X-0	240		
SB6100-20X-0	480		
SB6100-30X-0	600		UL 943C Class D special-purpose GFCI
SB6100-01X-0	208	6, 10-100 in increments of 10	UL 943/UL 1053 Equipment ground- fault protective device (EGFPD)
SB6100-11X-0	240		
SB6100-21X-0	480		
SB6100-31X-0	600		

Note: x=0 for open-chassis models and 1 for enclosed models

Description

Special-Purpose Ground-Fault Circuit Interrupter (GFCI), Class C and Class D

Industrial Shock Block (ISB) is a personnel protection device designed to meet the new requirements for special-purpose GFCIs defined by UL 943C. ISB is the first and only permanently connected Class C and Class D GFCI on the market. Class C GFCIs are intended to be used on systems where the line-to-line voltage is 480 V or less with a trip level of 20 mA, while Class D GFCIs are intended to be used on 600 V systems. These improvements to the standard Class A GFCI (6 mA trip level used on 240 V systems or less) were made to allow the use of GFCIs in industrial facilities. The ISB includes an automatic self-test feature and is compliant to the UL1998 Software in Programmable Components standard.

Equipment Ground-Fault Protective Device (EGFPD)

ISB is also available with adjustable protection settings as an EGFPD. The EGFPD models can be set to trip at 6 mA or from 10-100 mA in increments of 10 mA. This offers more flexibility since GFCI devices are not allowed to have an adjustable trip level.

Rating and Models

ISB (GFCI & EGFPD) is available for voltages from 208 to 600 V with a maximum full load current of 100 A, and a built-in overcurrent protection supplied by Littelfuse Class T fuses. The load can be 1-phase (line-to-line) or 3-phase, however, cannot have a neutral. The power system can either be solidly-grounded or high-resistance grounded.

Two options for enclosures are available: UL-recognized open-chassis models are available for installation in existing electrical enclosures and UL-listed enclosed models include a NEMA-4X enclosure for standalone installations.

Ground Wire (Load-Ground) Monitor

The ISB also monitors the ground wire (load-ground) connection between the ISB and load. This is a required feature for GFCI devices and is optional for EGFPD devices. If the connection is broken, the ISB will provide an alarm by changing the state of the alarm contacts. This monitoring circuit includes an extra wire (pilot wire) between the ISB and load (since the monitoring current is low, only a small wire is required). At the load, the pilot wire is connected to a termination device. The other end of the termination device is connected to the load ground (typically the enclosure).

Features & Benefits

FEATURES	BENEFITS
UL 943 inverse time trip curve	Detects and interrupts to protect people and reduce the probability of nuisance tripping
Minimum trip time < 20 msec	Reduces the risk of ventricular fibrillation for leakage current of 250 mA and above $% \left({{\rm{T}}_{\rm{T}}} \right) = \left({{\rm{T}}_{\rm{T}}} \right) \left({{\rm{T}}_{\rm{T}}} $
UL 943C fixed trip level (GFCI 20 mA)	Personnel protection for systems with leakage current higher than the standard 6 mA required by UL 943 Class A
Selectable trip levels (EGFPD)	Provides extra safety when a customer is able to operate with a setting below 20 mA (GFCI) and the settings above 20 mA can reduce nuisance tripping on systems with high leakage current.
UL 943C ground monitor/ interrupt	Protects from shock by tripping if continuity of ground wire between Industrial Shock-Block and load is broken.
Undervoltage, brownout, chatter detection	Ensures proper operation and prolongs the internal contactor lifetime
3 x Class T, 600 V incoming fuses	The fuses provide overcurrent protection for a 100 A circuit and a higher short-circuit current rating (SCCR) of 50 kA.
Conformal coating	Internal circuits are conformally coated to protect against corrosion and moisture, yet still repairable
Operator Interface	Shows unit status, alarm types, percentage of leakage current, and allows for Test and Reset capabilities
Auxiliary Contact	Provides a normally-open contact for remote indication
Automatic Self-Test	All ISB options (revision 01 or higher) include an automatic self-test feature
Motor Starter	Allows the user to start and stop the motor from the interface

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SB6000 SERIES

Accessories



Operator Interface (AC6000-OPI-00)



В

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SE-TA6 - Termination Assembly Optional termination assembly with terminals and mounting holes

1N5339B - Termination Device

Axial-lead ground-check termination, included with SB6000 series



SE-TA6-SM Stud-Mount **Termination Assembly** Optional ground-check termination for submersible pumps



AC6000-CART-00 Two-wheeled Cart Optional for mounting ISB to allow for moving the unit while power is off



AC6000-MNT-00 **Mounting Frame** Optional for mounting ISB to a cart or other surface. Included with the AC6000-CART-00.

Ordering Information - Accessories

ACCESSORIES	REQUIREMENT	PAGE
AC6000-0PI-00	Included	N/A
1N5339B	Included	477
SE-TA6	Optional	477
SE-TA6-SM	Optional	477
SE-TA6ASF-WL	Optional	477
AC6000-CART-00	Optional	N/A
AC6000-MNT-00	Optional	N/A

Connection Diagram

The SB6100 is installed in-line between incoming power or existing over-current protection device and the load.

The open-chassis SB6100 can be installed in electrical equipment and the enclosed version is typically wall-mounted.



Specifications

Voltage Rating	See ordering information
Current Rating	100 A (continuous)
Load	3-phase, 3-wire (no neutral) or 1-phase (line-to-line), 60 Hz
Short-Circuit Current Rating	50,000 A
Trip Level Settings	Selectable (6, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 mA), or fixed at 20 mA
Trip Time Setting	Inverse time trip curve
Enclosure	NEMA 4X, Polyester, Lockable
Operating Temperature	$-35^{\circ}C$ ($-31^{\circ}F$) to $+40^{\circ}C(104^{\circ}F)$, up to $+66^{\circ}C$ ($151^{\circ}F$) with derating
Wiring Requirements	2/0 AWG (maximum)
Approval	GFCI: UL Listed (enclosed models) and UL Recognized component (open-chassis models) EGFPD: cULus Listed (enclosed models) and cURus Recognized Component (open-chassis models); UL1998 Compliant (revision 01 or higher); All models CSA Certified
Dimensions	Enclosed: H 453.8 mm (17.9"); ₩ 406.2 mm (16.0"); D 223.3 mm (8.8")
	Open-chassis: H 455.0 mm (17.9"); W 340.7 mm (13.4"); D 174.9 mm (6.8")
Warranty	1 year

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Generator Ground-Fault Relay



pertise Applied Answers Delivered



Simplified Circuit Diagram



Ordering Information

ORDERING NUMBER	CONTROL POWER
PGR-4300-12	12 Vdc
PGR-4300-24	24 Vdc
PGR-4300-120	120 Vac

ACCESSORIES	REQUIREMENT
PGA-0500	Optional
PMA-55	Optional
PMA-60	Optional

Note: For optional conformal coating please consult factory.

Description

The PGR-4300 Generator Ground-Fault Relay provides a simple method for detecting a ground-fault condition on generators without the need for current transformers (CTs). This greatly simplifies the installation. In addition, it is compatible with both three- and four-pole transfer switches. This relay also monitors the neutral-to-ground path for continuity. The PGR-4300 is ideal for any generator or application where there is not sufficient space to install CTs.

Features & Benefits

FEATURES	BENEFITS
No CTs required	Saves space and simplifies installation
Adjustable pickup (100-1200 A)	Adjustable trip setting provides a wide range of protection and allows system coordination
Adjustable time delay (0 - 1.0 s)	Adjustable trip delay allows quick protection and system coordination
Output contacts	Form C ground-fault output contacts for alarming or tripping purposes
Analog output (0-1 mA)	Provides means for connecting to an optional meter (PGA-0500) or control system
N-G continuity alarm	Monitors neutral-to-ground integrity and alarms if ground path becomes open circuit
Passive filtering	Eliminates nuisance tripping

Accessories



PGA-0500 Analog % Current Meter

Optional panel-mounted analog meter displays ground-fault current as a percentage of the set-point.

Specifications

IEEE Device Numbers Input Voltage Dimensions

Trip Level Settings Trip Time Delay Settings Contact Operating Mode Test Button Reset Button Output Contacts Analog Output Conformally Coated Approvals Warranty Mounting Ground Fault (50G/N, 51G/N) See ordering information H 75 mm (3.0"); W 55 mm (2.2"); **D** 115 mm (4.5") 100-1200 A 0-1.0 s Non-fail-safe Local Local and remote Form C 0-1 mA Consult factory UL Listed (E183688) 5 years DIN, Surface (standard) Panel (with PMA-55 or PMA-60 adapter)



Protection Relays

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