



Expertise Applied | Answers Delivered

SPECIAL-PURPOSE  
GFCI FOR  
INDUSTRIAL  
APPLICATIONS



SB6100



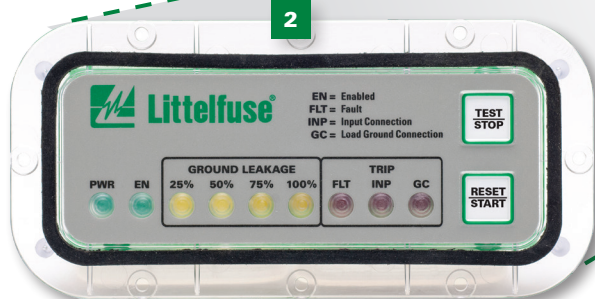
# The First Special-Purpose

## 1. NEMA 4X Enclosure

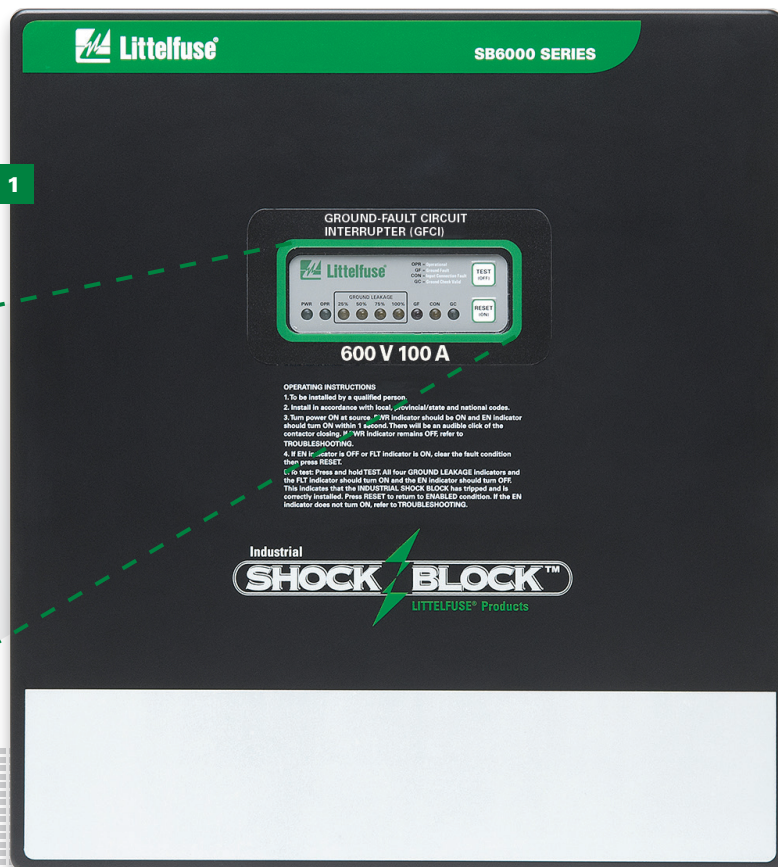
Prevents access to hazardous parts and provides protection against water, humidity and corrosion.

## 2. Operator Interface

Shows unit status, alarm types, % of leakage current and also has Test and Reset capabilities which can be used as a motor or pump starter.



Operator Interface (OPI)



Enclosed Model

(Patented)

## Introducing the SB6100 Industrial Shock-Block®

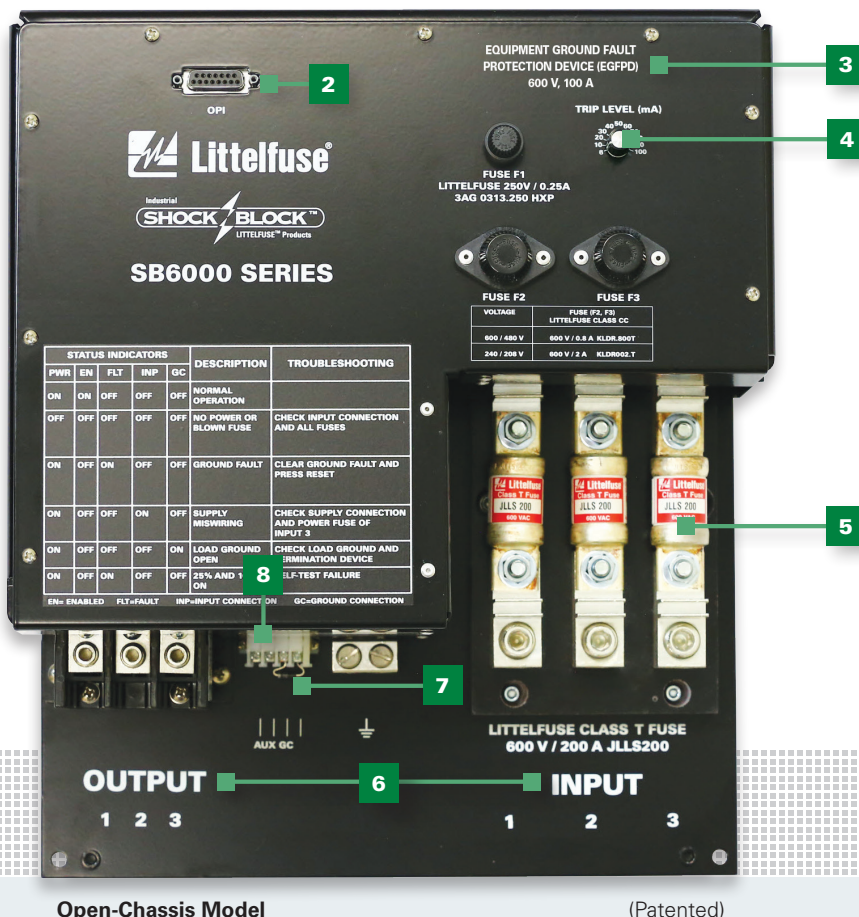
The Industrial SB6100 Special-Purpose Ground-Fault Circuit-Interrupter (Special-Purpose GFCI) is the first UL 943C listed device that provides personnel protection for three-phase 208, 240, 480 and 600 V loads, and:

- Protects personnel from electrical shock where standard GFCI breakers and receptacles have never been available
- Offers an all-in-one solution to detect leakage current and interrupt the power for loads up to 100 A
- Includes overcurrent protection provided by Littelfuse Class T fuses, eliminating the need to install separate contactor protection, saving cost and space while also allowing for a short-circuit current rating (SCCR) of 50 kA
- Is the only Special-Purpose GFCI device currently on the market that monitors the continuity of the ground circuit
- Prolongs the life of the internal contactor by offering undervoltage, brownout and chatter detection
- Is available as a Special-Purpose GFCI and equipment ground-fault protective device (EGFPD). The Special-Purpose GFCI models have a 20-mA trip level and the EGFPD models can be set to trip at 6, 10-100 mA in increments of 10 mA
- All models include CSA C22.2 No. 144-M91 certification



# GFCI Listed to UL 943C

## for Personnel Shock Protection



Open-Chassis Model

(Patented)

### 3. Available in Special-Purpose GFCI and EGFPD Models

GFCI models (fixed 20 mA trip level) and EGFPD models as shown (adjustable trip levels) per UL 943C, UL 943, and UL 1053

### 4. Selectable Trip Levels (EGFPD only)

Provides adjustable trip levels for systems with leakage current higher than GFCI 6 mA and 20 mA standards.

### 5. Built-in Class T Fuses

Provides overcurrent protection for the internal contactor and provides a 50 kAIC.

### 6. Input/Output

Input from incoming power source and output going to the load.

### 7. Ground Monitor/Interrupt

Standard on Special-Purpose GFCI and optional for EGFPD per UL. Monitors continuity of ground wire between Industrial Shock-Block™ and load.

### 8. Remote Indication

Auxiliary contact indicates the internal contactor status.

## UL 943C Requirements – 20 mA is the New UL Trip Level for People Protection in Industrial and Commercial Applications Where Class A GFCI's Cannot be Applied

The SB6100 is the only product that meets all UL 943C requirements and more:

- Reliable performance
  - 85%, 100%, and 110% of the rated voltage
  - Full-load and no-load
  - 20 mA & 500  $\Omega$  ground faults
  - -35°C (-31°F) to +66°C (+151°F)
- Leakage-current return path – ground-wire monitor
- SCCR of 50,000 A
- Surge tests up to 10 kV and 6 kA
- Environmental considerations
  - Humidity, ultraviolet, corrosion & dust
  - RF immunity
- UL 943 inverse time trip curve
- UL 943C fixed trip level (GFCI 20 mA)



# Safeguarding your People in any **Wet Environment**



AN INDUSTRIAL  
SPECIAL-PURPOSE  
GFCI IS VITAL WHERE  
PEOPLE, ELECTRICAL  
EQUIPMENT AND  
WATER ARE PRESENT



1. Waste Water Facilities

4. Amusement Parks/Swimming Pools

7. Mining

2. Food and Beverage

5. Construction

8. Agriculture

3. Offshore Operations

6. Oil and Gas



# Case Studies

## Municipal Water Utility Company Protects Workers From Shock Hazards



A municipal water utility company that supplies water to more than three million residents wanted to protect its workers from shock hazards. The facility has two tanks the size of Olympic swimming pools. Once or twice a year, the tanks must be manually cleaned and workers enter while water is still present and the 600-V submersible pumps are running. The solution was the Littelfuse Industrial Shock-Block™ SB6100 EGFPD. The utility company installed the EGFPDs in the motor control centers that supply power to each pump. The EGFPD is an industrial ground-fault circuit interrupter. If a device senses a ground fault above the trip setting, it will open the circuit very quickly to protect workers from shock.

## Large Solution Mining Company Protects Employees From Electric Shock Near Pumping Station



Solution mining requires a constant supply of water. A large solution mining company has pump stations located near the water supply to supply water for processing. The water needs to be filtered before it is pumped to the mine, so there is a filter screening the water intake. Even though a second filter is installed inside the pumping station, rocks, sand and debris still get into the station. Typically once a year, an employee must clean the debris out of the sump with the help of a submersible pump. Having a submersible pump running while the employee is cleaning puts them at risk of electrical shock. The Industrial Shock-Block™ SB6100 EGFPD was the solution. They mounted the EGFPD on the wall inside the pumping station. The enclosed-version Industrial Shock-Block™ is well-suited for the wall-mount installation used in this application. Now when a worker goes into the pumping station to clean the sump, they will be protected by the Industrial Shock-Block™.

## Brick Manufacturer Protects Workers From Electrocution While Using Wet Saws



A brick manufacturing plant in the Western United States processes clay into bricks and other building materials for residential and commercial projects. Part of this process involves hand-operated wet saws that operate at 480 V. The company wanted to make sure operators were safe from electrical ground faults. The plant electrician discussed his concerns with a Littelfuse distributor in Salt Lake City, Utah, whose representative suggested the use of an equipment ground-fault protection device (EGFPD) from Littelfuse. The Industrial Shock-Block™ SB6100 EGFPD was installed between the motor control center and the face-cut saws on a manufacturing line built in the 80's. It took a little experimentation to determine that 30 mA was the lowest setting that prevented nuisance tripping. If the device senses a ground fault at or above that threshold, it opens the circuit within 20 ms – fast enough to prevent worker injury or death from dangerous electric shock.



Patented

## Technical Specifications



### SB6100 Industrial Shock-Block™

<b>Voltage Rating</b>	See ordering information (p.7)
<b>Current Rating</b>	100 A (continuous)
<b>Load</b>	3-phase, 3-wire (no neutral) , 60 Hz
<b>Short Circuit Rating</b>	50,000 A
<b>Trip Time Setting</b>	UL 943 inverse time trip curve
<b>Enclosure</b>	NEMA 4X, polyester, lockable
<b>Conformal Coating</b>	Internal circuits are conformally coated to protect against corrosion and moisture
<b>Operating Temperature</b>	–35°C (–31°F) to +40°C(104°F), up to +66°C(151°F) with derating
<b>Wiring Requirements</b>	2/0 AWG (maximum)
<b>Approval</b>	Special-Purpose 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 to C22.2 No. 144-M91
<b>Dimensions</b>	Enclosed: <b>H</b> 453.8 mm (17.9") <b>W</b> 406.2 mm (16.0") <b>D</b> 223.3 mm (8.8")  Open-chassis: <b>H</b> 455.0 mm (17.9") <b>W</b> 340.7 mm (13.4") <b>D</b> 174.9 mm (6.8")
<b>Warranty</b>	1 year

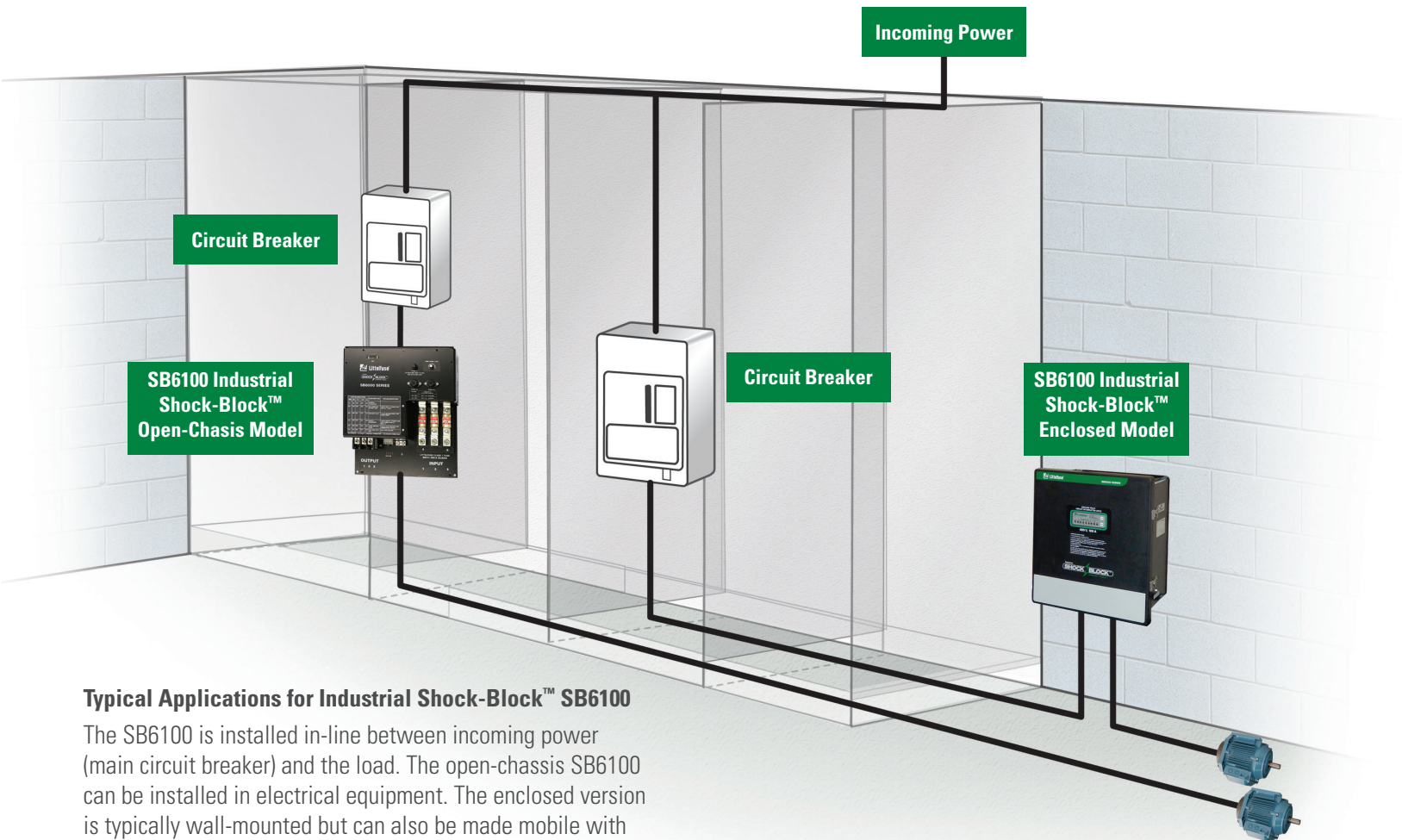
### AC6000-CART-00 Two-Wheeled Cart

<b>Dimensions</b>	<b>H</b> 1064 mm (42") <b>W</b> 648 mm (25.5") <b>D</b> 662 mm (26")
<b>Weight</b>	9 kg (22 lbs.)
<b>Material/Finish Wheels</b>	Aluminum/Powder Coat Solid Polypropylene (maintenance free)

### AC6000-MNT-00 Mounting Frame

<b>Dimensions</b>	<b>H</b> 705 mm (28") <b>W</b> 648 mm (25.5") <b>D</b> 152 mm (6")
<b>Weight</b>	1 kg (2.2 lbs.)
<b>Material/Finish</b>	Aluminum/Powder Coat

## Connection Diagram

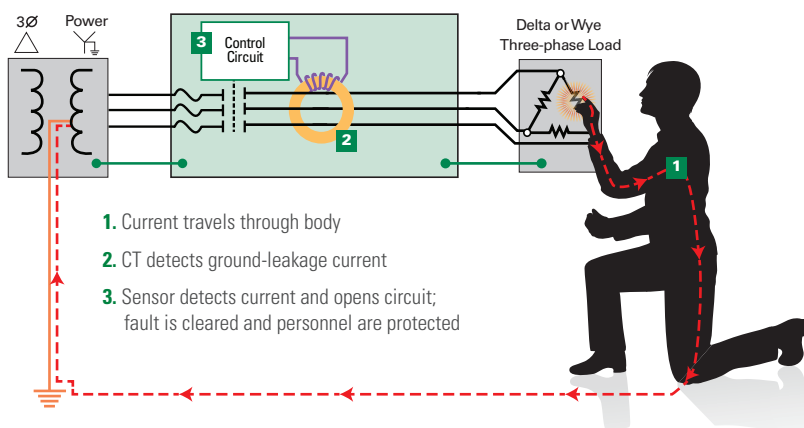


### Typical Applications for Industrial Shock-Block™ SB6100

The SB6100 is installed in-line between incoming power (main circuit breaker) and the load. The open-chassis SB6100 can be installed in electrical equipment. The enclosed version is typically wall-mounted but can also be made mobile with the Industrial Shock-Block™ Cart.

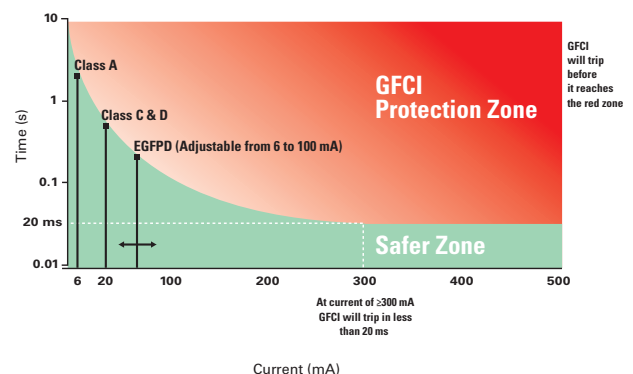
## How the Industrial Shock-Block™ Works

The SB6100 detects leakage current and interrupts the circuit, significantly reducing or eliminating the shock potential. One key part of the additional safety features is that the SB6100 also monitors the ground wire from the SB6100 to the load for continuity. If the wire is broken or becomes loose, the SB6100 will signal an alarm and interrupt power.



## Shock-Block™ SB6100 Special-Purpose GFCI Protection Curve

The UL 943 inverse-time curve allows momentary transient conditions to enable operations in real world installations. The boundary between the green and the red zone defines the maximum trip time allowed by UL 943. Therefore, for any given fault current, the device must operate before that time is exceeded to prevent dangerous current from flowing through the body.

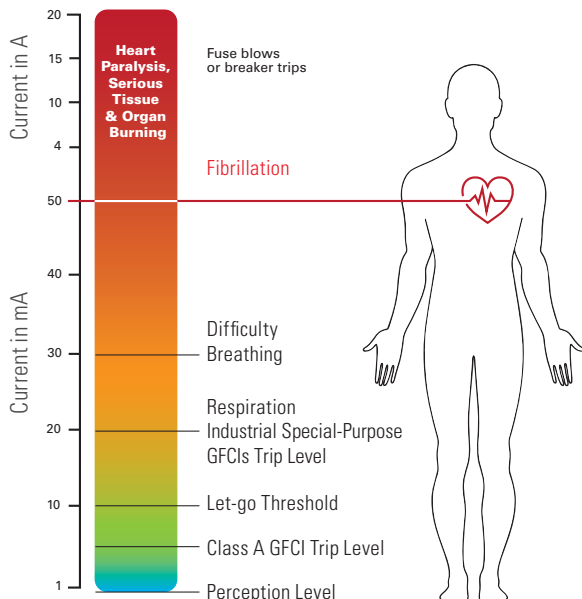




The Industrial Shock-Bock™ Cart was designed to add mobility, allowing you to move the unit wherever it is needed. The cart is used with the enclosed model only.



## Physiological Effects of 50/60 Hz Current Flowing Through the Body



## Ordering Information

### SB6100 Industrial Shock-Block™

Available for voltages from 208 V and a maximum full load current of 100 A.



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

Note: x = 0 for open-chassis models and 1 for enclosed models. All models have CSA certification.

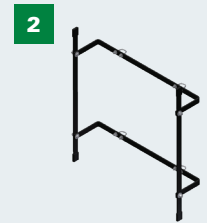
### Accessories

#### 1. AC6000-CART-00 Industrial Shock-Block™ Cart

Cart offers mobility, allowing you to move the Industrial Shock-Block™ wherever it is needed.



AC6000-CART-00



AC6000-MNT-00

#### 2. AC6000-MNT-00 Industrial Shock-Block™ Mounting Frame

Sold separately for mounting the Industrial Shock-Block™ to a cart or wall. Included with AC6000-CART-00



AC6000-OPI-00



SE-TA6

#### 3. AC6000-OPI-00 Operator Interface

Shows unit status, alarm types, % of leakage current and also allows for test and reset capabilities. Included with all models.

#### 4. SE-TA6 Termination Assembly

Termination assembly with terminals and mounting holes.



SE-TA6-SM



1N5339B



SE-TA6ASF-WL

#### 5. SE-TA6-SM Stud-Mount Termination Assembly

Ground-check termination for submersible pumps.

#### 6. 1N5339B Termination Device

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

#### 7. SE-TA6ASF-WL Termination Assembly

Compact 12-W ground-check termination assembly with convenient mounting holes and wire leads.

ACCESSORIES	REQUIREMENT
<b>AC6000-CART-00</b>	Optional
<b>AC6000-MNT-00</b>	Optional
<b>AC6000-OPI-00</b>	Included
<b>SE-TA6</b>	Optional
<b>SE-TA6-SM</b>	Optional
<b>1N5339B</b>	Included
<b>SE-TA6ASF-WL</b>	Optional

# Experts in Shock Protection and Electrical Safety

Since 1927, Littelfuse products have helped protect electrical equipment used in mining, petrochem, alternative energy, HVAC and other industrial applications. We offer Littelfuse protection relays, custom power centers, electronic products for monitoring, protecting and controlling motors and pumps, as well as timing controls and custom designs.

Our product offering includes:

- Arc-Flash Relays
- Neutral-Grounding Resistors
- Multi-Function Relays
- Voltage Protection
- Fuses and Fuse Holders
- Motor Protection
- Ground-Fault Detection
- Feeder Protection
- Custom Power Centers
- Enhanced Overload Relays
- Voltage/Phase Monitors
- Alternating Relays
- Pump Controllers
- Load Sensors
- Timers

Littelfuse products are certified to many standards around the world. To check certifications on a specific product please refer to the product datasheet on [Littelfuse.com](http://Littelfuse.com).

**Littelfuse World Headquarters**  
8755 West Higgins Road, Suite 500  
Chicago, IL 60631, USA

**Technical Support:**  
Tel: +1-800-TEC-FUSE  
E-mail: [techline@littelfuse.com](mailto:techline@littelfuse.com)

**Customer Service:**  
Tel: +1-800-227-0029  
E-mail: [PG\\_CSG@littelfuse.com](mailto:PG_CSG@littelfuse.com)  
Fax: +1-847-787-5190

**Littelfuse SymCom**  
222 Disk Drive  
Rapid City, SD 57701, USA

**Technical Support:**  
Tel: +1-800-832-3873  
E-mail: [techline@littelfuse.com](mailto:techline@littelfuse.com)

**Customer Service:**  
Tel: +1-800-227-0029  
E-mail: [PG\\_CSG@littelfuse.com](mailto:PG_CSG@littelfuse.com)  
Fax: +1-605-348-5685

**Littelfuse Startco**  
3714 Kinnear Place  
Saskatoon, SK S7P 0A6  
Canada

**Technical Support:**  
Tel: +1-306-373-5505  
Fax: +1-306-374-2245  
E-mail: [techline@littelfuse.com](mailto:techline@littelfuse.com)

## WWW.LITTELFUSE.COM/SHOCKPROTECTION

### Additional information:

**Protection Relays & Controls Catalog**  
PF130

**Fuses and Fuse Holders Catalog**  
PF101N

**Motor Protection Relay Brochure**  
PF135

**Arc-Flash Relay Brochure**  
PF136

The comprehensive line of electronic and microprocessor-based protection relays safeguard equipment and personnel to prevent expensive damage, downtime or injury due to electrical faults.

Littelfuse offers a complete circuit protection portfolio of industrial power fuses, including time-saving indication products for an instant visual blown-fuse identification, even on de-energized systems.

Littelfuse provides a wide range of multi-function motor protection products that reliably protect small, medium and large motors.

Littelfuse offers one of the fastest Arc-Flash Protection Relays on the market. The PGR-8800 can detect a developing arc flash extremely fast and send a trip signal before significant damage occurs.

To view all Littelfuse product catalogs, visit our website at [Littelfuse.com/Catalogs](http://Littelfuse.com/Catalogs)

For the full line of Littelfuse protection relays and generator controls, visit [Littelfuse.com/RelaysControls](http://Littelfuse.com/RelaysControls)



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Scan code to download the  
Protection Relays & Controls Catalog.

Codes can be scanned with a smart phone equipped with a QR Reader. To download a reader, visit your App provider and search for QR Reader.



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