SOLAR PRODUCTS CATALOG

1500 V DC PRODUCTS
OVERVOLTAGE PROTECTION
IN-LINE FUSES

PROTECTION RELAYS
SURGE PROTECTION
SWITCH PRODUCTS
With over 25 million devices installed in photovoltaic power systems, Littelfuse understands the global challenges of the solar market. Littelfuse offers numerous circuit-protection products that are uniquely suited to protect the equipment and systems subject to the harsh environments of standard photovoltaic installations.
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**Description**

The Littelfuse SPXV solar string fuse has been specifically designed for the protection of photovoltaic (PV) systems. It is available in multiple ampere ratings to match various requirements in a range of applications.

**Features/Benefits**
- Offers higher amperage protection in less space for increased design flexibility
- Full range, fast-acting fuse helps eliminate common low-overload faults
- Up to 50,000 A interrupting rating

**Applications**
- Inverters
- Combiner boxes

**Recommended Accessories**
- **1–32 Amperes**
  - Fuse Holder: LFPXV001
  - Fuse Clips: 125003
- **35–60 Amperes**
  - Fuse Block and Cover: LFXV15060-BC

**Web Resources**
Download technical resources at: Littelfuse.com/spxv

**Specifications**

- **Voltage Rating**: 1500 V dc
- **Amperage Rating**: 1, 2, 2.25, 2.5, 3, 3.5, 4, 4.5, 5, 6, 8, 10, 12, 15, 16, 20, 25, 30, 32, 35, 40, 45, 50, 55, 60 A
- **Interrupting Rating**
  - SPXV 1 A–20 A: 30 kA (50 kA Self-Certified)
  - SPXV 35 A–60 A: 50 kA
  - SPXV-M 25 A–32 A: 50 kA
- **Time Constant**: ≤ 1ms
- **Material**
  - Body: melamine
  - Caps: copper alloy (nickel plated)
- **Approvals**
  - UL 248-19 Listed (File: E339112)
- **Applicable Standards**
  - UL 248-1, 248-19
  - IEC 60269-6
- **Environmental**
  - RoHS Compliant
  - REACH
- **Country of Origin**: Mexico

**Part Numbering System**

- **Series**: SPXV
- **Ampere Code**: Refer to Ampere Code Column in Ordering Information Table
- **Options**
  - Blank = 1–20 A 10 x 85 mm
  - 35–60 A 20 x 127 mm
  - XM = 25–32 A 10 x 85 mm
- **Package Quantity**
  - T = 10
  - L = 50

**Catalog Numbers**

<table>
<thead>
<tr>
<th>Series</th>
<th>Ampere</th>
<th>Package Quantity</th>
<th>Catalog Number</th>
<th>Ordering Number</th>
</tr>
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<tbody>
<tr>
<td>SPXV 6</td>
<td>10</td>
<td>SPXV006</td>
<td>SPXV006.T</td>
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</tr>
<tr>
<td>SPXV 20</td>
<td>50</td>
<td>SPXV020</td>
<td>SPXV020.L</td>
<td></td>
</tr>
<tr>
<td>SPXV 32</td>
<td>10</td>
<td>SPXV032-M</td>
<td>SPXV032.TXM</td>
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<td>SPXV 60</td>
<td>10</td>
<td>SPXV060</td>
<td>SPXV060.T</td>
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</tr>
</tbody>
</table>
SPXV Dimensions mm (in)

1–20 A

84.65 (3.333)

10.31 (.406)

35–60 A

127.00 (5.000)

20.65 (0.813)

SPXV-M Dimensions mm (in)

25–32 A

84.65 (3.333)

10.31 (.406)
Solar Products
SPXI SERIES IN-LINE SOLAR FUSE

1500 V dc • 1–60 A

Description
The Littelfuse SPXI solar fuse is specifically designed for the protection of photovoltaic (PV) systems. It integrates into an in-line assembly within a wire harness and can be electrically insulated by either overmolding or using heat-shrink.

Littelfuse offers multiple ampere ratings to match specific requirements in a variety of applications.

Features/Benefits
- Offers higher amperage protection in less space for increased design flexibility
- One-piece cap design, without joints, offers easier wire crimping and more streamlined molding
- No fuse holder required helps save space, time, and money
- 50,000 A interrupting rating

Applications
- Photovoltaic high-capacity homerun, trunk harness, and wire harness

Recommended Crimping Tool
10-12 AWG: T&B Sta-Kon ERG4002
8 AWG: T&B Sta-Kon ERG4
6 AWG: Burndy MRC840AL

Specifications
- Voltage Rating: 1500 V dc
- Amperage Rating: 1, 2, 2.25, 2.5, 3, 3.5, 4, 4.5, 5, 6, 8, 10, 12, 15, 16, 20, 25, 30, 32, 35, 40, 45, 50, 55, 60 A
- Interrupting Ratings:
  - SPXI 1–20 A and SPXI-B 1–20 A: 30 kA
  - SPXI 35–50 A and SPXI-B 35–60 A: 50 kA
  - SPXI-M and SPXI-BM 25–32 A: 50 kA
- Time Constant: ≤ 1 ms
- Material:
  - Body: melamine
  - Caps: copper alloy (nickel plated)
- Approvals:
  - UL Recognized (File: E339112)
  - TUV (Cert: J 50495785)
- Applicable Standards:
  - UL 248-1, 248-19
  - IEC 60269-6 (electrically only)
- Environmental:
  - RoHS Compliant
  - REACH
- Country of Origin: Mexico
- US Patent: 9,564,281

Part Numbering System
SPXI xxx T XB
- Series
- Ampere Code: Refer to Ampere Code Column in Ordering Information Table
- Options: Refer to Ordering Number column in Ordering Information Table
- Package Quantity:
  - T = 10
  - L = 50

Web Resources
Download additional technical information and view the complete solar portfolio: Littelfuse.com/spxi
## Dimensions

<table>
<thead>
<tr>
<th>SERIES</th>
<th>AMPS</th>
<th>DIMENSIONS IN MM (INCHES)</th>
<th>WIRE RANGE</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>SPXI</td>
<td>2.5–4</td>
<td>81.41 (3.205)</td>
<td>10.31 (0.406)</td>
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<tr>
<td></td>
<td>4.5–20</td>
<td>110.06 (4.333)</td>
<td>10.31 (0.406)</td>
</tr>
<tr>
<td></td>
<td>35–50</td>
<td>158.04 (6.222)</td>
<td>20.65 (0.813)</td>
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<tr>
<td>SPXI-B</td>
<td>2.5–4</td>
<td>85.4 (3.362)</td>
<td>10.31 (0.406)</td>
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<tr>
<td></td>
<td>4.5–20</td>
<td>114.05 (4.49)</td>
<td>10.31 (0.406)</td>
</tr>
<tr>
<td></td>
<td>35–60</td>
<td>163.58 (6.44)</td>
<td>20.65 (0.813)</td>
</tr>
<tr>
<td>SPXI-M</td>
<td>25–32</td>
<td>110.06 (4.333)</td>
<td>10.31 (0.406)</td>
</tr>
<tr>
<td>SPXI-BM</td>
<td>25–32</td>
<td>114.05 (4.49)</td>
<td>10.31 (0.406)</td>
</tr>
</tbody>
</table>
SPNH SERIES SOLAR FUSE

Description
The SPNH series has been designed to meet the emerging circuit protection needs for 1500 volt photovoltaic systems. These fuses provide full range protection for all potential overcurrent conditions that exist in PV applications. Suitable for PV inverter protection and array combiner applications.

Features/Benefits
- Compact NH XL sizes
- Low watt loss design
- 1500 V dc rating for high efficiency designs
- Designed to protect against a full range of overcurrents

Applications
- Inverters
- Re-combiner boxes
- Array/re-combiner application
- PV inverter dc input protection

Web Resources
- Download technical documents: Littelfuse.com/SPNH

Specifications
- Voltage Rating: 1500 V dc
- Amperage Rating: 50, 63, 80, 100, 125, 160, 200, 250, 315, 350, 400
- Interrupting Rating: 30 kA
- Time Constant: ≤ 2 ms
- Body: ceramic
- End Bells: copper alloy
- UL 248-19 Listed (File: E339112)
- UL 248-1, 248-19
- IEC 60269-6
- RoHS Compliant

Part Numbering System
- Series: SPNH
- Amp Code: Refer to Amp Code Column in Ordering Information table
- Package Quantity: X = 1
- Termination*: Blank = solid blade w/Microswitch tab
  DL = S blade
  DE = U blade
  DLMS = S blade w/Microswitch tab
  DEMS = U blade w/Microswitch tab
- Case Size*: X = 1XL size
  2XL = 2XL size
  3L = 3L size

Recommended Accessories
1XL Case Size
- Fuse Holder: LFNH152001CST
- Fuse Terminal Covers: LFNH15200FBC

2XL Case Size
- Fuse Holder: LFNH154001CST
- Fuse Terminal Covers: LFNH15400FBC

3L Case Size
- Fuse Holder: LFNH156301CST
- Fuse Terminal Covers: LFNH15630FBC
- Microswitch: MSSPNH1500X

*Solid blade option for 1XL case size does not require a case or termination designator for the part number.
Dimensions Millimeters (in)

Size: 1 XL w/ Microswitch Tab

Size: 2 XL w/ Microswitch Tab

Size: 3 L w/ Microswitch Tab
Dimensions Millimeters (in)

**Size: 1XL DE Blade**
Recommended Torque: 44 Nm*

![Diagram of 1XL DE Blade Fuse]

**Size: 1XL DL Blade**
Recommended Torque: 44 Nm*

![Diagram of 1XL DL Blade Fuse]

**Size: 2 XL DE Blade**
Recommended Torque: 77 Nm*

![Diagram of 2 XL DE Blade Fuse]

*Recommended torque values are for grade 8 steel hardware*
Dimensions Millimeters (in)

Size: 2 XL DL Blade
Recommended Torque: 44 Nm*

Size: 3 L DE Blade
Recommended Torque: 77 Nm*

Size: 3 L DL Blade
Recommended Torque: 44 Nm*

*recommended torque values are for grade 8 steel hardware
**Dimensions Millimeters (in)**

**Size: 1 XL DL Blade w/ Microswitch Tab**
Recommended Torque: 44 Nm*

*recommended torque values are for grade 8 steel hardware*
**Dimensions Millimeters (in)**

**Size: 2 XL DE Blade w/ Microswitch Tab**  
Recommended Torque: 77 Nm*

- 30.00 [1.181]
- 13.00 [0.512] (2x)
- 37.00 [1.457]
- 11.00 [0.433]

**Size: 3 L DL Blade w/ Microswitch Tab**  
Recommended Torque: 44 Nm*

- 77.00 [3.023]
- 13.00 [0.512] (2x)

**Size: 3 L DE Blade w/ Microswitch Tab**  
Recommended Torque: 77 Nm*

- 37.00 [1.457]
- 13.00 [0.512] (2x)

---

*recommended torque values are for grade 8 steel hardware*
Description
The Littelfuse LFXV15 series fuse block and cover is designed
to hold 1500 V size 20 x 127 mm fuses rated 35–60 amperes.
Suitable for photovoltaic systems (string and high-capacity
combiner boxes) with fault currents up to 50 kA.

With available ampere ratings up to 60 A, more strings can be
pre-combined in harnesses to reduce the number of inputs into
combiner boxes, thereby decreasing installation time and labor
costs.

Features/Benefits
- Dead-front cover design offers personnel protection
- Ventilated design keeps the fuse running cooler, even at
  high ambient temperatures and current ratings, to increase
  fuse longevity
- Narrower width accommodates more blocks in a panel to
  maximize space
- Designed for easy fuse removal and replacement to
  minimize maintenance time. No tools required
- 35 mm DIN-rail mounting option for quick assembly and
  installation
- Accepts both wire and busbar for added flexibility
- Positive lock feature secures the fuse puller in the block
  when the fuse is absent

Recommended Fuses
Littelfuse SPXV 20 x 127 mm fuses rated 35–60 amperes.

Specifications
- Voltage Ratings: 1500 V dc
- Amperage Rating: 60 A
- Withstand Rating: 50 kA
- Power Acceptance: 24.1W Maximum
- Fuse Size: 20 x 127 mm
- Material: Thermoplastic
  - Fuse Clip: Tin-plated copper alloy
  - Screws: Tin-plated aluminum
- Operating Temperature: -55 °C to +125 °C
- Flammability Rating: UL94 V-0
- Temperature Stability: Base: 130 °C
  - Cover: 140 °C
- Approvals: Block: UL 4248-19 Listed
  (File E345481)
  - Cover: UL Listed Fuse Accessory
    (File E184929)
- Environmental: RoHS compliant, Lead (Pb) free, REACH
- Recommended DIN Rail: TH 35-7,5 per IEC 60715

Recommended DIN Rail

WIRE TYPE
- 75 °C or 90 °C
  - UL Class B and Class C wire
  - IEC Class 5 Flexible Wire (self-certified)

BUSBAR SPECIFICATIONS

<table>
<thead>
<tr>
<th>TERMINAL</th>
<th>THICKNESS</th>
<th>WIDTH</th>
<th>TORQUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum</td>
<td>0.250 in</td>
<td>0.290 in</td>
<td>25 lb-in</td>
</tr>
<tr>
<td></td>
<td>(6.35 mm)</td>
<td>(7.37 mm)</td>
<td>(2.8 N-m)</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.125 in</td>
<td>0.200 in</td>
<td>25 lb-in</td>
</tr>
<tr>
<td></td>
<td>(3.18 mm)</td>
<td>(5.08 mm)</td>
<td>(2.8 N-m)</td>
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</table>

Recommended Fuses
Littelfuse SPXV 20 x 127 mm fuses rated 35–60 amperes.

Ordering Information

<table>
<thead>
<tr>
<th>VOLTAGE (V dc)</th>
<th>AMPERE RATING</th>
<th>POLES</th>
<th>FUSE BLOCK &amp; COVER ORDERING NUMBER</th>
<th>CONNECTOR TYPE</th>
<th>DRIVE</th>
<th>TORQUE</th>
<th>WIRE RANGE</th>
<th>WIRE TYPE</th>
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<tbody>
<tr>
<td>1500</td>
<td>60</td>
<td>1</td>
<td>LFXV15060-BC*</td>
<td>Box Lug</td>
<td>3/16</td>
<td>5.6 N-m</td>
<td>2–4 AWG</td>
<td>CU only</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Inch Hex</td>
<td>(50 lb-in)</td>
<td>(35–25 mm²)</td>
<td>Stranded</td>
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<td></td>
<td></td>
<td>2.9 N-m</td>
<td>(25 lb-in)</td>
<td>6–14 AWG</td>
<td>(16–2.5 mm²)</td>
</tr>
</tbody>
</table>

*For replacement only: Fuse Block LFXV150601C or Cover LFXV15060FBC
LFXV15 Features & Benefits

- Narrow width of holder accommodates more blocks in a panel to maximize space (34.79 mm; 1.37 in)
- Fuse puller hooks facilitate easy removal
- Thermoplastic barriers for additional safety
- #10 panel mounting holes available for installation flexibility
- Positive lock feature secures the fuse puller in the block when the fuse is absent
- Handle designed for easy fuse removal and replacement to minimize maintenance time. No tools required.
- Dead-front cover design offers personnel protection
- Ventilated design keeps fuse running cooler, even at high ambient temperatures and current ratings, to increase fuse longevity
- Accepts both wire and busbar for added flexibility
- SPXV Solar Fuse (not included)
- 35 mm DIN-rail clip mounting option for quick assembly and installation
Dimensions Millimeters (in)

Fuse Block & Cover Assembly: LFXV15060-BC

Fuse Cover: LFXV15060FBC

Fuse Block: LFXV150601C
Description
The Littelfuse LFPXV fuse holder is designed to hold 1500 V 10x85 mm fuses.

Features/Benefits
- Finger-safe design offers personnel protection
- No fuse pullers or tools required for fuse removal
- 35 mm DIN-rail mountable
- Evaluated for use with copper alloy busbars
- Compact design

Recommended Fuses
Littelfuse SPXV/SPXV-S Fuses

Web Resources
Download the complete datasheet and other technical documents: Littelfuse.com/LFPXV

Specifications
- **Voltage Ratings**: 1500 V dc
- **Amperage Rating**: 30 A UL, 32 A Littelfuse self-certified
- **SCCR Rating**: 50 kA
- **Power Dissipation**: 8W maximum
- **Fuse Type**: 10 x 85 mm
- **Material**: Thermoplastic
- **Operating Temperature**: -55 °C to +125 °C
- **Flammability Rating**: UL94 V-0
- **Temperature Stability**: Body: 130 °C
- **Carrier: 140 °C**
- **Approvals**: UL 4248-19 Listed (File: E345481)
- **IEC 60268-6**
- **Environmental**: RoHS compliant, Lead (Pb) free, REACH
- **Recommended DIN Rail**: TH 35-7.5 per IEC 60715

Ordering Information

<table>
<thead>
<tr>
<th>SERIES</th>
<th>VOLTAGE (V dc)</th>
<th>POLES</th>
<th>CATALOG NUMBER</th>
<th>ORDERING NUMBER</th>
<th>PACK QTY</th>
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<td>LFPXV</td>
<td>1500</td>
<td>1</td>
<td>LFPX001</td>
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**TERMINAL INFORMATION**

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<tr>
<th>TERMINAL TYPE</th>
<th>NUMBER OF WIRES</th>
<th>WIRE SIZE</th>
<th>TORQUE</th>
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<tr>
<td>1</td>
<td>4-14 AWG</td>
<td>24-28 lb-in</td>
<td>(2.71-3.16 N-m)</td>
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<tr>
<td></td>
<td>(25-2.5 mm²)</td>
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<td></td>
</tr>
<tr>
<td>1</td>
<td>16-18 AWG</td>
<td>18-22 lb-in</td>
<td>(2.03-2.49 N-m)</td>
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<tr>
<td></td>
<td>(1.5-0.75 mm²)</td>
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<td></td>
</tr>
<tr>
<td>2*</td>
<td>5-14 AWG</td>
<td>26-30 lb-in</td>
<td>(2.94-3.69 N-m)</td>
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<tr>
<td></td>
<td>(16-2.5 mm²)</td>
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</tr>
<tr>
<td>2*</td>
<td>16-18 AWG</td>
<td>20-24 lb-in</td>
<td>(2.6-2.71 N-m)</td>
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<tr>
<td></td>
<td>(1.5-0.75 mm²)</td>
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</tr>
</tbody>
</table>

*Must be the same cross-sectioned size
Dimensions Millimeters (in)

Side View

Top View

Front View
Description
The LFNH series fuse block is specifically designed for the Littelfuse SPNH 1500 V solar fuse. It meets UL electrical requirements, is available in multiple case sizes and has an optional cover to enclose the lugs.

Features/Benefits
- Narrow width increases space savings
- Range of amperages to match all SPNH fuse options

Specifications
- Voltage Rating: 1500 V dc
- Ampere Rating: 200, 400, 630 A
- Interrupt Rating: 30 kA
- Termination Type: Stud Mount
- Approvals: UL4248-1, UL4248-19
- FILE: E345481 Vol. 2
- RoHS Compliant
- Material:
  - Fuse Clip: Silver-Plated Copper
  - Spring: Zinc-Plated Steel
  - Mounting Plate: Zinc-Plated Steel
  - Insulator: Ceramic

Recommended Fuses
SPNH Series

Web Resources
For sample requests, downloadable CAD drawings, dimensions and other technical information:
Littelfuse.com/LFNH

For a comprehensive overview of solar market solutions, visit:
Littelfuse.com/solar

Ordering Information

<table>
<thead>
<tr>
<th>AMPERAGE</th>
<th>ORDERING NUMBER</th>
<th>FUSE SIZE</th>
<th>RECOMMENDED TORQUE</th>
<th>TERMINAL COVER ORDERING NUMBER*</th>
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<tr>
<td>200</td>
<td>LFNH152001CST</td>
<td>NH1XL</td>
<td>283 in-lb (32 N-m)</td>
<td>132 in-lb (15 N-m)</td>
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<td></td>
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<td></td>
<td>LFNH15200FBC</td>
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<tr>
<td>400</td>
<td>LFNH154001CST</td>
<td>NH2XL</td>
<td>283 in-lb (32 N-m)</td>
<td>132 in-lb (15 N-m)</td>
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<td>LFNH15400FBC</td>
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<tr>
<td>630</td>
<td>LFNH156301CST</td>
<td>NH3L</td>
<td>283 in-lb (32 N-m)</td>
<td>132 in-lb (15 N-m)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>LFNH15630FBC</td>
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*Terminal covers sold separately
Specifications

**Voltage Rating:** 1500 V  
**Ampere Rating:** 200 amperes  
**Flammability Rating:** UL 94 V-0  
**Material:** V0-rated Nylon  
**Packaging:** Sold in pairs
Dimensions Millimeters (in)

Fuse Block
LFNH154001CST

Specifications
Voltage Rating: 1500 V
Ampere Rating: 400 amperes
Flammability Rating: UL 94 V-0
Material: V0-rated Nylon
Packaging: Sold in pairs
Dimensions Millimeters (in)

Fuse Block
LFNH156301CST

Specifications
Voltage Rating: 1500 V
Ampere Rating: 630 amperes
Flammability Rating: UL 94 V-0
Material: V0-rated Nylon
Packaging: Sold in pairs
Description

The SPFJ series is the smallest 1000 V dc 70–450 A photovoltaic (PV) fuse available in the market. The SPFJ series is manufactured in Class J case sizes that allows for both fuse holder and busbar mounting configuration. The SPFJ meets both UL and IEC requirements.

Features/Benefits

• Meets UL and IEC photovoltaic standards
• Small footprint reduces panel size
• Flexibility of fuse holder or busbar mounting
• Higher amperage solar fuses in standard sizes
• UL Listed branch and feeder circuit rated
• Class J case sizes for the 125-450 A ratings

Applications

• Inverters
• Re-combiner boxes

Recommended Fuse Holder

LFJ1000 Solar Series

Web Resources

Download technical documents: Littelfuse.com/spfj

Specifications

Voltage Rating 1000 V dc
Amperage Rating 600 V ac (125-450 A)
70, 80, 90, 100, 125, 160, 200, 250, 300, 350, 400, 450
Interrupting Rating Ac: 200 kAIC (125–450 A)
Dc: 70-200 A: 20 kAIC
250-400 A: 10 kAIC
450 A: 20 kAIC
Time Constant ≤ 1 ms
Material
Body: Melamine
End Bells: Copper Alloy
Approvals
UL 248-19 Listed (File: E339112)
UL 248-8, Class J (125-450 A)
cULus (125-450 A)
IEC 60269-6 (125-450 A)
Environmental
RoHS Compliant
Country of Origin
Mexico

Part Numbering System

SPFJ xxx X —

Series
Amp Code
Refer to Amp Code Column in Electrical Specifications Table
Mounting Options
Blank = Std. Class J Dimensions
XL = 8.5mm Slot (125 - 200A Only)

Package Quantity
X = 1

<table>
<thead>
<tr>
<th>SERIES</th>
<th>AMPERAGE</th>
<th>PACKAGE QUANTITY</th>
<th>CATALOG NUMBER</th>
<th>ORDERING NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPFJ</td>
<td>70</td>
<td>1</td>
<td>SPFJ070</td>
<td>SPFJ070.X</td>
</tr>
<tr>
<td>SPFJ</td>
<td>200</td>
<td>1</td>
<td>SPFJ200</td>
<td>SPFJ200.XXL</td>
</tr>
</tbody>
</table>

Dimensions Inches (mm)

* SPFJ L option = 8.5 mm (UL 248-19 approval only)
Solar Products
SPF SERIES SOLAR FUSES

1000 V dc • 1–30 A

Description
The SPF Solar Protection Fuse series has been specifically designed for the protection of photovoltaic (PV) systems. This family of midget-style fuses (10 x 38 mm) can safely protect PV modules and conductors from reverse-overcurrent conditions.

As PV systems have grown in size, so have the corresponding voltage requirements. This increase in system voltage has typically been intended to minimize power loss associated with long conductor runs. Standard circuit protection devices are not designed to completely protect photovoltaic panels. However, the SPF series is UL Listed to safely interrupt faulted circuits up to this demanding voltage level.

Littelfuse offers multiple ampere ratings to match specific requirements in a variety of applications.

Features/Benefits
- Full range, fast-acting fuse helps eliminate common low-overload faults
- Prevents power generation losses due to nuisance tripping from changes in temperature
- Both PCB mount and dead-front holder options available

Applications
- Inverters
- Combiner boxes
- Battery charge controllers

Recommended Accessories
Fuse Holder: LPHV 1000 V dc POWR-Safe Series
Fuse Clips: 125003

Web Resources
Download technical documents: Littelfuse.com/SPF

Specifications

<table>
<thead>
<tr>
<th>Voltage Rating</th>
<th>1000 V dc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amperage Rating</td>
<td>1, 2, 3, 3.5, 4, 5, 6, 8, 10, 12, 15, 20, 25, 30</td>
</tr>
<tr>
<td>Max. Interrupting Rating</td>
<td>20 kA - 1 A - 20 A</td>
</tr>
<tr>
<td></td>
<td>50 kA - 25 A - 30 A</td>
</tr>
<tr>
<td>Time Constant</td>
<td>≤ 2ms</td>
</tr>
<tr>
<td>Material</td>
<td>Body: Melamine</td>
</tr>
<tr>
<td></td>
<td>Caps: Copper Alloy</td>
</tr>
<tr>
<td>Approvals</td>
<td>UL Listed (File: E339112)</td>
</tr>
<tr>
<td></td>
<td>CSA Certified (File: 029862_0_000)</td>
</tr>
<tr>
<td></td>
<td>TUV (Cert: J 50494849)</td>
</tr>
<tr>
<td>Applicable Standards</td>
<td>UL 248-1, 248-19</td>
</tr>
<tr>
<td>Environmental</td>
<td>RoHS Compliant</td>
</tr>
<tr>
<td>Country of Origin</td>
<td>Mexico</td>
</tr>
</tbody>
</table>

Part Numbering System

| Series | 0SPF xxxxx |
| XR | Mounting Options |
| Blank = Ferrule |
| XR = PCB |
| Package Quantity | T = 10 Fuses |
| H = 100 Fuses |

Dimensions Inches (mm)

<table>
<thead>
<tr>
<th>Ferrule Version</th>
<th>PCB Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.040 ±0.001 (1.02 ±.025)</td>
<td>0.056 REF (1.42)</td>
</tr>
<tr>
<td>0.040 ±0.001 (1.02 ±.025)</td>
<td>0.12 ±0.005 (3.05 ±0.13)</td>
</tr>
<tr>
<td>0.06 REF (1.52)</td>
<td>0.140 REF (3.56)</td>
</tr>
<tr>
<td>0.040 REF (1.02)</td>
<td>0.040 REF (1.02)</td>
</tr>
<tr>
<td>0.12 ±0.005 (3.05 ±0.13)</td>
<td>0.12 ±0.005 (3.05 ±0.13)</td>
</tr>
</tbody>
</table>

Littelfuse.com/solar
© 2023 Littelfuse, Inc.
Description

The Littelfuse SPFI solar fuse is designed to integrate into an in-line assembly within a wire harness. It has been specifically engineered to protect photovoltaic (PV) systems meeting UL 248-19 standards. The SPFI can be electrically insulated by either overmolding or using heat-shrink.

Features/Benefits

- One-piece cap design, without joints, offers easier wire crimping and more streamlined molding
- No fuse holder required helps save space, time, and money
- 20,000 A Interrupting Rating

Applications

- Photovoltaic wire harness

Dimensions mm (in)

| External Dimensions | Typical
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12.26 (0.483)</td>
<td>Typ. 2</td>
</tr>
<tr>
<td>63.50 (2.50)</td>
<td></td>
</tr>
<tr>
<td>9.53 (0.375)</td>
<td>Typ. 2</td>
</tr>
<tr>
<td>5.59 (0.22)</td>
<td>Typ. 2</td>
</tr>
<tr>
<td>10.91 (0.43)</td>
<td>Typ. 2</td>
</tr>
</tbody>
</table>

Specifications

- Voltage Rating: 1000 V dc
- Amperage Rating: 2, 2.5, 3, 3.5, 4, 5, 6, 8, 10, 12, 15, 20, 25, 30 A
- Interrupting Rating: 20 kA
- Time Constant: ≤ 1ms
- Material:
  - Body: Melamine
  - Caps: Copper Alloy (Nickel Plated)
- Approvals:
  - UL 248-19 Recognized (File: E339112)
  - TUV (Cert: J 5050290)
- Applicable Standards:
  - UL 248-1, 248-19
  - IEC 60269-6 (electrically only)
- Environmental:
  - RoHS Compliant
  - REACH
- Country of Origin: Mexico
- US Patent: 9,564,281

Part Numbering System

- Series SPFI xxx T
- Amp Code Refer to Amp Code Column in Ordering Information Table
- Package Quantity T = 10 L = 50

Web Resources

Downloadable CAD drawings and other technical information: littelfuse.com/SPFI

Recommended Crimping Tool

T&B Sta-Kon ERG4002
Specifications

**Voltage Rating**
1000 V dc

**Ampere Rating**
200, 400, 450 A

**Flammability Rating**
UL 94 V-0

**Termination Type**
Box Lug or Stud Mount

**Base Temp Rating**
130 °C

**Approvals**
UL 4248-18 Listed
File: E345481 Vol. 1

**Environmental**
RoHS Compliant

Recommended Fuses

SPFJ Solar Series

Web Resources

Sample requests, downloadable CAD drawings, dimensions and other technical information:
Littelfuse.com/LFJ1000

For a comprehensive overview of solar market solutions visit:
Littelfuse.com/solar

Description

The LFJ1000 series fuse block is specifically designed for the Littelfuse SPFJ 1000 V Solar Fuse. It meets UL electrical requirements, is available in multiple amperages, and comes in a variety of fuse mounting and termination configuration: fuse clip to box lug, fuse stud to wire stud and fuse clip to wire stud.

Features/Benefits

- Narrow width increases space savings
- Range of amperages to match all SPFJ fuse options
- Box lug termination style accommodates a wide range of cable sizes
- Stud-mounted option increases convenience
- Approval for use with copper or aluminum lugs allowing for design flexibility

Ordering Information

(Clip-to-Box Lug 1000 V)

<table>
<thead>
<tr>
<th>AMPERAGE</th>
<th>ORDERING NUMBER</th>
<th>INTERRUPT RATING</th>
<th>WIRE RANGE STANDARD (METRIC)</th>
<th>WIRE TYPE</th>
<th>RECOMMENDED TORQUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>LFJ102001C</td>
<td>20 kA</td>
<td>250 kcmil - #6 (127 mm² - 16 mm²)</td>
<td>Cu/Al</td>
<td>275 in-lb (31.1 N-m)</td>
</tr>
<tr>
<td>400</td>
<td>LFJ104001C</td>
<td>10 kA</td>
<td>350 kcmil - 1/0 (177 mm² - 55 mm²)</td>
<td>Solid/ Stranded</td>
<td>275 in-lb (31.1 N-m)</td>
</tr>
<tr>
<td>450</td>
<td>LFJ104501C</td>
<td>20 kA</td>
<td>500 kcmil - #4 (253 mm² - 25 mm²)</td>
<td>Cu/Al</td>
<td>375 in-lb (42.4 N-m)</td>
</tr>
</tbody>
</table>

(Stud-to-Stud 1000 V)

<table>
<thead>
<tr>
<th>AMPERAGE</th>
<th>ORDERING NUMBER</th>
<th>INTERRUPT RATING</th>
<th>RECOMMENDED TORQUE FUSE TERMINAL</th>
<th>MAX. BUSBAR THICKNESS</th>
<th>RECOMMENDED BASE TORQUE BOLT SIZE TORQUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>LFJ102001STST</td>
<td>20 kA</td>
<td>65 in-lb (7.3 N-m) 200 in-lb (22.6 N-m)</td>
<td>.774” (19.66 mm)</td>
<td>1/4” 5/16”</td>
</tr>
<tr>
<td>400</td>
<td>LFJ104001STST</td>
<td>10 kA</td>
<td>170 in-lb (19.2 N-m) 200 in-lb (22.6 N-m)</td>
<td>.555” (14.10 mm)</td>
<td>1/4” 5/16”</td>
</tr>
<tr>
<td>450</td>
<td>LFJ104501STST</td>
<td>20 kA</td>
<td>300 in-lb (33.9 N-m) 300 in-lb (33.9 N-m)</td>
<td>.570” (14.18 mm)</td>
<td>1/4” 5/16”</td>
</tr>
</tbody>
</table>

(Clip-to-Stud 1000 V)

<table>
<thead>
<tr>
<th>AMPERAGE</th>
<th>ORDERING NUMBER</th>
<th>INTERRUPT RATING</th>
<th>RECOMMENDED TORQUE TERMINAL</th>
<th>MAX. BUSBAR THICKNESS</th>
<th>RECOMMENDED BASE TORQUE BOLT SIZE TORQUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>LFJ102001CST</td>
<td>20 kA</td>
<td>200 in-lb (22.6 N-m)</td>
<td>.774” (19.66 mm)</td>
<td>1/4” 5/16”</td>
</tr>
<tr>
<td>400</td>
<td>LFJ104001CST</td>
<td>10 kA</td>
<td>200 in-lb (22.6 N-m)</td>
<td>.555” (14.10 mm)</td>
<td>1/4” 5/16”</td>
</tr>
<tr>
<td>450</td>
<td>LFJ104501CST</td>
<td>20 kA</td>
<td>300 in-lb (33.9 N-m)</td>
<td>.570” (14.18 mm)</td>
<td>1/4” 5/16”</td>
</tr>
</tbody>
</table>
**Description**

The Littelfuse LPHV fuse holder is designed to house 1000 V fuses. It is not designed for load break but is ideal for isolating photovoltaic (PV) module strings for maintenance and meets UL requirements for 1000 V solar fuse protection.

**Features/Benefits**

- Touch-safe design offers protection when replacing fuses
- Compact design
- 35 mm DIN-rail mountable
- Available in 1-, 2-, 3- and 4-pole configurations
- No fuse pullers or tools required for fuse removal

**Specifications**

- **Voltage Rating**: 1000 V dc
- **Amperage Rating**: 30 A
- **SCCR Rating**: 20 kA
- **Power Dissipation**: 4 W Maximum
- **Fuse Type**: 10 X 38 mm up to 1000 V dc
- **Material**: Thermoplastic
- **Flammability Rating**: UL 94 V-0
- **Approval**: Self-certified 1000 V dc IEC 60269-2, -4, -6 RoHS compliant, Lead (Pb) Free

**Multi-Pole Assembly Kit**

Kits are used to create multi-pole holders from 1-pole LPHV fuse holders. Please contact factory for more information.

<table>
<thead>
<tr>
<th>ORDERING NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CYHP001</td>
<td>20 Connector Pincers &amp; 10 Handle Pins</td>
</tr>
<tr>
<td>CYHP002</td>
<td>Connector Pincer Only</td>
</tr>
<tr>
<td>CYHP003</td>
<td>Handle Pin Only</td>
</tr>
</tbody>
</table>

**Web Resources**

Sample requests, downloadable CAD drawings and other technical information: [Littelfuse.com/lphv](http://Littelfuse.com/lphv)

More information about solar applications: [Littelfuse.com/solar](http://Littelfuse.com/solar)

**Recommended Fuses**

- 10 x 38 mm 1000 V dc Fuses
- SPF 1000 V Series
- FLU 1000 V Series

**Ordering Information**

<table>
<thead>
<tr>
<th>SERIES</th>
<th>POLES</th>
<th>CATALOG NUMBER</th>
<th>ORDERING NUMBER</th>
<th>TERMINAL TYPE</th>
<th>WIRE TYPE</th>
<th>WIRE RANGE</th>
<th>TERMINAL TORQUE</th>
<th>ROHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPHV</td>
<td>1</td>
<td>LPHV001</td>
<td>LPHV00101</td>
<td>Pressure Plate</td>
<td>75 °C or 90 °C[CU Only]</td>
<td>#8-14 AWG (2-10 mm[2]) / #10-14 AWG (2-6 mm[2])</td>
<td>17.7 in-lbs (2 N-m)</td>
<td>●</td>
</tr>
<tr>
<td>LPHV</td>
<td>2</td>
<td>LPHV002</td>
<td>LPHV00202</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>LPHV</td>
<td>3</td>
<td>LPHV003</td>
<td>LPHV00303</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>LPHV</td>
<td>4</td>
<td>LPHV004</td>
<td>LPHV00404</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
</tbody>
</table>

**Dimensions Inches (mm)**

- Front View
- Side View
Description
A key objective for panel designers is safe distribution of power to multiple fuse holders in a compact design. The Littelfuse UL 508 Listed bus bar system eliminates most wire terminations in a timesaving package. A power distribution block and associated conductors are no longer needed to feed multiple POWR-safe fuse holders.

Features/Benefits
- Touch-safe design offers protection when replacing fuses
- Compact design
- 35mm DIN-rail mountable
- Available in one and three phase configurations
- Can be cut down to optimal size

Recommended Fuse Holders
Littelfuse LFPSM / LFPSC / LPSM / LPSC (600 V)
Littelfuse LPHV (1000 V)

Web Resources
Download technical documents: Littelfuse.com/busbar

Specifications
Voltage Ratings
- 600 V ac/dc
- 1000 V dc*

Current Ratings
- CROSS SECTION (mm²)
  - 18 mm²
    - END FED: 80 A
    - CENTER FED: 160 A
  - 25 mm²
    - END FED: 100 A
    - CENTER FED: 200 A
- SCCR: 10 kA, 100 kA†
- Conductor: Copper
- Pitch: 17.8 mm
- Approvals: UL 508 Listed (File E328654)
- Environmental: RoHS Compliant, Lead (Pb) free

*1 Phase 18 mm² rated 1000 V dc up to 160 A when center fed
1 Phase 25 mm² rated 1000 V dc up to 200 A when center fed
†When protected directly upstream by Class J 175 amperes max (18 mm² bus bar) and Class J 200 amperes max (25 mm² bus bar).

Ordering Information

<table>
<thead>
<tr>
<th>ORDERING NUMBER</th>
<th>1 PHASE, 18 mm² LENGTH (mm)</th>
<th>1 PHASE, 25 mm² LENGTH (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1PH3P18mm</td>
<td>3</td>
<td>50</td>
</tr>
<tr>
<td>1PH4P18mm</td>
<td>4</td>
<td>79</td>
</tr>
<tr>
<td>1PH6P18mm</td>
<td>6</td>
<td>104</td>
</tr>
<tr>
<td>1PH9P18mm</td>
<td>9</td>
<td>155</td>
</tr>
<tr>
<td>1PH12P18mm</td>
<td>12</td>
<td>208</td>
</tr>
<tr>
<td>1PH15P18mm</td>
<td>15</td>
<td>270</td>
</tr>
<tr>
<td>1PH5P18mm</td>
<td>57</td>
<td>1009</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ORDERING NUMBER</th>
<th>3 PHASE, 18 mm² LENGTH (mm)</th>
<th>3 PHASE, 25 mm² LENGTH (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3PH6P18 mm</td>
<td>6</td>
<td>104</td>
</tr>
<tr>
<td>3PH9P18 mm</td>
<td>6</td>
<td>158</td>
</tr>
<tr>
<td>3PH12P18 mm</td>
<td>12</td>
<td>214</td>
</tr>
<tr>
<td>3PH15P18 mm</td>
<td>15</td>
<td>266</td>
</tr>
<tr>
<td>3PH5P18 mm</td>
<td>57</td>
<td>1009</td>
</tr>
</tbody>
</table>

Endcaps are standard with all 3 phase configurations except 57-pole. Endcaps are not needed for the 1 phase configurations from the factory or if the copper bus is trimmed per the supplied instructions. Power feed lugs and protective covers are extra.

Accessories

Power Feed Lug

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>AMPERAGE RATING</th>
<th>VOLTAGE (ac/dc)</th>
<th>WIRE RANGE</th>
<th>WIRE TYPE</th>
<th>TORQUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB17</td>
<td>115</td>
<td>1000</td>
<td>#10 - 1/0 AWG</td>
<td>CU</td>
<td>50 lb-in</td>
</tr>
<tr>
<td>BB18</td>
<td>115</td>
<td>1000</td>
<td>#10 - 1/0 AWG</td>
<td>CU</td>
<td>50 lb-in</td>
</tr>
<tr>
<td>BB19</td>
<td>115</td>
<td>1000</td>
<td>#10 - 1/0 AWG</td>
<td>CU</td>
<td>50 lb-in</td>
</tr>
<tr>
<td>BB20</td>
<td>115</td>
<td>1000</td>
<td>#10 - 1/0 AWG</td>
<td>CU</td>
<td>50 lb-in</td>
</tr>
</tbody>
</table>

Endcaps

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>PHASE</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDCP42</td>
<td>Single</td>
<td>50</td>
</tr>
<tr>
<td>EDCP7</td>
<td>Three</td>
<td>50</td>
</tr>
</tbody>
</table>

Pole Protective Covers

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTPT5</td>
<td>5</td>
</tr>
</tbody>
</table>
Features/Benefits
- Indicating and non-indicating options available
- 1-, 2-, 3- and 4-pole configurations
- Easy installation and fuse removal with no additional pullers or tools required
- 35 mm DIN-rail mountable
- Ventilated design for cooler operation

Specifications
- Voltage Rating: 600 V ac/dc
- Ampere Rating: 30 A
- Interrupting Rating: 200 kA (Class CC)
  100 kA (midget)
- Terminal Type: Pressure plate
- Suggested Torque: 17.7 in–lbs
- Wire Range: #8–#14 CU
- Material: Thermoplastic
- Flammability Rating: UL 94 V-0
- Approvals: UL Listed (LPSC File: E14721)
  UL Recognized (LPSM File: E14721)
  CSA Certified (LPSC/LPSM File: LR7316)

Environmental
- RoHS compliant, Lead (Pb) Free

Ordering Information

<table>
<thead>
<tr>
<th>FUSE TYPE</th>
<th>POLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class CC</td>
<td>1</td>
</tr>
<tr>
<td>Class CC</td>
<td>2</td>
</tr>
<tr>
<td>Class CC</td>
<td>3</td>
</tr>
<tr>
<td>Class CC</td>
<td>4</td>
</tr>
<tr>
<td>Midget</td>
<td>1</td>
</tr>
<tr>
<td>Midget</td>
<td>2</td>
</tr>
<tr>
<td>Midget</td>
<td>3</td>
</tr>
<tr>
<td>Midget</td>
<td>4</td>
</tr>
</tbody>
</table>

Multi Pole Assembly Kit
Ordering No. CYHP0001Z-KIT
(Kit contains 20 connector pincers & 10 handle pins)

Web Resources
Download CAD drawings and other technical information:
littelfuse.com/lpsc
littelfuse.com/lpsm

Recommended Fuses
Class CC
Midget-style (10 x 38 mm)
600 V ac/V dc • 1/10–30 A • Fast Acting

**Description**
The KLKD fuse series is fast-acting with a high dc voltage rating. This family of midget-style fuses (10 x 38 mm) is used in solar combiner boxes and in circuits with dc fault currents up to 50,000 amperes. KLKD fuses are available in standard and board-mount configurations.

In addition, the KLKD series has been designed to meet both the UL and IEC photovoltaic (PV) fuse standards. Littelfuse offers a wide range of ampere ratings to match specific requirements in a variety of applications.

**Features/Benefits**
- Designed to UL and IEC photovoltaic specifications
- 1/10 - 30 A ratings available
- 50,000 A Interrupting Rating
- Available in ferrule or PCB mount options
- 1-5 A meets UL 1741 GFDI requirements

**Applications**
- Combiner boxes and inverters
- Power supplies
- Desktop meters

**Specifications**

- **Voltage Rating**: 600 V ac/V dc
- **Amperage Rating**: 1/10, 1/8, 2/10, 1/4, 3/10, 1/2, 1/2, 2/2, 3
- **Interrupting Ratings**
  - AC: 100 kA
  - DC: 1/10-30: 10 kA (UL 2579)
  - 1/10-30: 50 kA (UL 248-14)
- **Material**
  - Body: Melamine
  - Caps: Copper Alloy

**Part Numbering System**

- **Series**: KLKD
- **Amperage Code**: xxx
- **Mounting Options**
  - Blank = Ferrule
  - XR = PCB 1-tab
- **Package Quantity**
  - T = 10
  - H = 100

**Recommended Fuse Holders**

Littelfuse LPSM and LFPSM dead-front series
Littelfuse L60030M open-face series

**Web Resources**
Download CAD drawings and other technical information: littelfuse.com/klkd
Connectors

Box lug connectors are designed for use with a single or multiple, solid or class B or C stranded conductor. For UL approved use of more than one conductor per connector opening, contact Littelfuse Technical Service. Manufacturers of cable terminations can furnish crimp-on sleeves for fine stranded conductors which permit these conductors to be used with box lugs.

Ampere Ratings

The ampere rating per pole for power distribution blocks is based on the line ampacity of 75 °C insulated conductors per NEC* Table 310.16. If 60 °C insulated conductors are used, load must not exceed the ampacity of 60 °C conductors. Use of conductors rated in excess of 75 °C is permitted (for example 90 °C), however, load must not exceed the ampacity of 75 °C conductors.

Specifications

- **Voltage Rating**: 600 V
- **Current Rating**: Based on NEC Table 310.16, using 75 °C copper wire
- **SCCR**: Consult factory
- **Material**: Phenolic rated at 150 °C and Thermoplastic rated at 125 °C (LD1400 and LS1300 series only)
- **Connector**: Aluminum: Highly conductive aluminum, tin plated
- **Flammability Rating**: UL 94 V-0
- **Approvals**: UL Recognized - 0LD/0LS Series (File: E171395)
- **LFD/LFS Series (File: E309688)
- **CSA Certified - 0LD/0LS Series (File: LR700111)
- **LFD/LFS Series (File: 007316_0_000)
- **UL Listed - 0LD57xxxx (File: E482231)
- **Environmental**: RoHS compliant, Lead (Pb) free

Web Resources

For dimension, CAD and 3-D drawings, visit:
littelfuse.com/powrbloks

*NEC is a trademark of its respective owner
2410 Photovoltaic Fuse

Description
Littelfuse 400PV Series is a 2410 size Surface Mount Fuse which offers relatively low resistance. It provides UL 248-19 compliant overcurrent protection for photovoltaic (PV) cells.
The 400PV series meets environment standards and is able to operate at high temperatures.

Features & Benefits
- Wide operating temperature range
- 100% lead-free, halogen-free, and RoHS compliant
- Reliable overcurrent performance in high temperature environments
- Small and compact
- Surface mountable
- Compatible with common soldering assembly processes
- Recognized to UL/CSA 248-1 and UL/CSA 248-19

Agency Approvals

<table>
<thead>
<tr>
<th>Agency</th>
<th>Agency File Number</th>
<th>Ampere Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL</td>
<td>E339112</td>
<td>0.375 A</td>
</tr>
</tbody>
</table>

Applications
- Photovoltaic shingles
- Photovoltaic cells

Electrical Characteristics

<table>
<thead>
<tr>
<th>% of Ampere Rating</th>
<th>Ampere Rating</th>
<th>Opening Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>0.375 A</td>
<td>4 hours, Minimum</td>
</tr>
<tr>
<td>135%</td>
<td>0.375 A</td>
<td>3600 seconds Maximum</td>
</tr>
<tr>
<td>200%</td>
<td>0.375 A</td>
<td>240 seconds Maximum</td>
</tr>
</tbody>
</table>

Electrical Specifications

<table>
<thead>
<tr>
<th>Ampere Rating (A)</th>
<th>Max Voltage Rating (V)</th>
<th>Interrupting Rating</th>
<th>Nominal Cold Resistance (Ohms)</th>
<th>Nominal Melting I^2t (A2 Sec.)</th>
<th>Agency Approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.375</td>
<td>86</td>
<td>10,000 A @ 86 VDC</td>
<td>0.31</td>
<td>0.010</td>
<td>X</td>
</tr>
</tbody>
</table>

Note
1. Nominal Melting I^2t measured at 1 msec. opening time

Additional Information
2410 Photovoltaic Fuse

**Temperature Re-rating Curve**

Note
Rerating depicted in this curve is in addition to the standard derating of 25% for continuous operation.

Example
For continuous operation at 85 degrees Celsius, the fuse should be rerated as follows:

\[ I = (0.75)(0.90)I_n = (0.675)I_n \]

**Soldering Parameters – Reflow Soldering**

<table>
<thead>
<tr>
<th>Reflow Condition</th>
<th>Pb-free assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre Heat</strong></td>
<td></td>
</tr>
<tr>
<td>Temperature Min ((T_{S(min)}))</td>
<td>150°C</td>
</tr>
<tr>
<td>Temperature Max ((T_{S(max)}))</td>
<td>200°C</td>
</tr>
<tr>
<td>- Time (Min to Max) ((t_s))</td>
<td>60–180 secs</td>
</tr>
<tr>
<td><strong>Average ramp up rate</strong></td>
<td></td>
</tr>
<tr>
<td>(Liquidus Temp ((T_L)) to peak</td>
<td>3° C/second max.</td>
</tr>
<tr>
<td>(T_{S(max)}) to (T_L) - Ramp-up Rate</td>
<td>5° C/second max.</td>
</tr>
<tr>
<td><strong>Reflow</strong></td>
<td></td>
</tr>
<tr>
<td>- Temperature ((T_L) (Liquidus))</td>
<td>217°C</td>
</tr>
<tr>
<td>- Temperature ((T_j))</td>
<td>60–150 seconds</td>
</tr>
<tr>
<td><strong>Peak Temperature ((T_J))</strong></td>
<td>260–265°C</td>
</tr>
<tr>
<td><strong>Time within 5°C of actual peak Temperature ((t_p))</strong></td>
<td>10–30 seconds</td>
</tr>
<tr>
<td><strong>Ramp-down Rate</strong></td>
<td>6° C/second max.</td>
</tr>
<tr>
<td><strong>Time 25°C to peak Temperature ((T_P))</strong></td>
<td>8 minutes max.</td>
</tr>
<tr>
<td><strong>Do not exceed</strong></td>
<td>260°C</td>
</tr>
</tbody>
</table>

**Wave Soldering**

260°C, 10 seconds max.
2410 Photovoltaic Fuse

**Product Characteristics**

<table>
<thead>
<tr>
<th>Materials</th>
<th>Body: Epoxy resin (UL 94 V-0 certified)</th>
<th>Terminations: Cu/Ni/Sn (100% Pb-free)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture Sensitivity Level</td>
<td>IPC/JEDEC J-STD-020C, Level 1</td>
<td></td>
</tr>
<tr>
<td>Solderability</td>
<td>IPC/EIC/JEDEC J-STD-002B, Condition B</td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>UL 248-19 Section 6.7.3</td>
<td></td>
</tr>
<tr>
<td>Thermally Induced Drift</td>
<td>UL 248-19 Section 6.6.1</td>
<td></td>
</tr>
<tr>
<td>Moisture Resistance</td>
<td>MIL-STD-202, Method 106G</td>
<td></td>
</tr>
<tr>
<td>Mechanical Shock</td>
<td>MIL-STD-202, Method 213B, Condition A</td>
<td></td>
</tr>
<tr>
<td>Vibration</td>
<td>MIL-STD-202, Method 201A</td>
<td></td>
</tr>
<tr>
<td>Vibration, High Frequency</td>
<td>MIL-STD-202, Method 204D, Condition D</td>
<td></td>
</tr>
<tr>
<td>Dissolution of Metallization</td>
<td>IPC/EIC/JEDEC J-STD-002B, Condition D</td>
<td></td>
</tr>
<tr>
<td>Terminal Strength</td>
<td>IEC 60127-4</td>
<td></td>
</tr>
<tr>
<td>Temperature Extremes</td>
<td>UL 248-19 Section 6.6.2</td>
<td></td>
</tr>
</tbody>
</table>

**Dimensions**

```
E PV
```

```
2.5 (0.098) 6.3 (0.248) 3.0 (0.118)
```

**Part Numbering System**

```
04000027 M R
```

**Packaging**

<table>
<thead>
<tr>
<th>Packaging Option</th>
<th>Packaging Specification</th>
<th>Quantity</th>
<th>Quantity &amp; Packaging Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 mm Tape and Reel</td>
<td>EIA-481/IEC 60286-3</td>
<td>1000</td>
<td>MR</td>
</tr>
</tbody>
</table>
**Specifications**

**Voltage Rating**  
600 / 1200 V

**Amperage Rating**  
- S Package: 75, 100, 150, 200
- D Package: 100, 150, 200, 300, 400
- WB Package: 225, 300, 450, 600

**Circuit Type**  
Half-Bridge

**Approvals**  
UL Listed (File: E71639)

**Environmental**  
RoHS Compliant

**Part Numbering System**

- **Product Type**  
  M: Power Module

- **Module Type**  
  G: IGBT

- **Voltage Rating**  
  06: 600 V  
  12: 1200 V

- **Current Rating**  
  2x (IGBT + FWD)

**Ordering Information**

<table>
<thead>
<tr>
<th>ORDERING NUMBER</th>
<th>VOLT</th>
<th>AMPERAGE</th>
<th>PACKAGE TYPE</th>
<th>MOUNTING METHOD</th>
<th>M.O.Q.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG1250S-BA1MM</td>
<td>1200</td>
<td>50</td>
<td>S</td>
<td>SCREW</td>
<td>100</td>
</tr>
<tr>
<td>MG12100S-BN2MM</td>
<td>1200</td>
<td>100</td>
<td>S</td>
<td>SCREW</td>
<td>100</td>
</tr>
<tr>
<td>MG12150S-BN2MM</td>
<td>1200</td>
<td>150</td>
<td>S</td>
<td>SCREW</td>
<td>100</td>
</tr>
<tr>
<td>MG1275S-BA1MM</td>
<td>1200</td>
<td>75</td>
<td>S</td>
<td>SCREW</td>
<td>100</td>
</tr>
<tr>
<td>MG06100S-BN4MM</td>
<td>600</td>
<td>100</td>
<td>D</td>
<td>SCREW</td>
<td>60</td>
</tr>
<tr>
<td>MG06150S-BN4MM</td>
<td>600</td>
<td>150</td>
<td>D</td>
<td>SCREW</td>
<td>60</td>
</tr>
<tr>
<td>MG06300D-BN4MM</td>
<td>600</td>
<td>300</td>
<td>D</td>
<td>SCREW</td>
<td>60</td>
</tr>
<tr>
<td>MG06400D-BN4MM</td>
<td>600</td>
<td>400</td>
<td>D</td>
<td>SCREW</td>
<td>60</td>
</tr>
<tr>
<td>MG12200D-BA1MM</td>
<td>1200</td>
<td>200</td>
<td>D</td>
<td>SCREW</td>
<td>60</td>
</tr>
<tr>
<td>MG12300D-BA1MM</td>
<td>1200</td>
<td>300</td>
<td>D</td>
<td>SCREW</td>
<td>60</td>
</tr>
<tr>
<td>MG12300D-BN3MM</td>
<td>1200</td>
<td>300</td>
<td>D</td>
<td>SCREW</td>
<td>60</td>
</tr>
<tr>
<td>MG12400D-BN2MM</td>
<td>1200</td>
<td>400</td>
<td>D</td>
<td>SCREW</td>
<td>60</td>
</tr>
<tr>
<td>MG06500WB-BN4MM</td>
<td>600</td>
<td>600</td>
<td>WB</td>
<td>PRESS FIT</td>
<td>60</td>
</tr>
<tr>
<td>MG12225WB-BN2MM</td>
<td>1200</td>
<td>225</td>
<td>WB</td>
<td>PRESS FIT</td>
<td>60</td>
</tr>
<tr>
<td>MG12300WB-BN2MM</td>
<td>1200</td>
<td>300</td>
<td>WB</td>
<td>PRESS FIT</td>
<td>60</td>
</tr>
<tr>
<td>MG12450WB-BN2MM</td>
<td>1200</td>
<td>450</td>
<td>WB</td>
<td>PRESS FIT</td>
<td>60</td>
</tr>
</tbody>
</table>

**Dimensions Inches (mm)**

- **S Package Type**
  - Width: 3.15 x 0.5
  - Height: 0.5

- **D Package Type**
  - Width: 0.8
  - Height: 0.8

**Web Resources**

Download the complete datasheet and other technical information: [littelfuse.com](http://littelfuse.com)
What Are Voltage Transients?

Voltage transients are unwanted short duration surges of electrical energy. They may result from the sudden release of previously stored energy, and can come from internal and external sources. If the voltage magnitude of the transient is large enough, circuit component damage or malfunction of the circuit may result.

Transients can occur either repeatedly or as random impulses. Repeatable transients are frequently caused by the operation of other system components, such as motors, generators or the switching of reactive circuit components. Random transients, are often caused by lightning, electrostatic discharge (ESD), and other outdoor environment events.

### Transient Voltage Suppression Diodes

TVS Diodes are used to protect semiconductor components from high-voltage transients. Their p-n junctions have a larger cross-sectional area than those of a normal diode, allowing them to conduct large currents to ground without sustaining damage. Littelfuse supplies TVS Diodes with peak power ratings from 200 W to 30 kW, and reverse standoff voltages from 5 V to 512 V. For more information visit Littelfuse.com/tvsdiodes

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>VOLTAGE</th>
<th>CURRENT</th>
<th>RISE-TIME</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lightning</td>
<td>25 kV</td>
<td>20 kA</td>
<td>10 µs</td>
<td>50 ms</td>
</tr>
<tr>
<td>Load Switching</td>
<td>600 V</td>
<td>500 A</td>
<td>50 µs</td>
<td>500 ms</td>
</tr>
<tr>
<td>Electromagnetic (EMP)</td>
<td>1 kV</td>
<td>300 kV</td>
<td>20 ns</td>
<td>1 ms</td>
</tr>
<tr>
<td>Electrostatic Discharge (ESD)</td>
<td>15 kV</td>
<td>30 A</td>
<td>1–5 ns</td>
<td>100 ns</td>
</tr>
</tbody>
</table>

### TVS and Solar Inverter Protection

Integration of Transient Voltage Suppression (TVS) components within solar system designs help to prevent the damaging effects of transient events and assure compliance to safety and reliability standards. Solar power inverters are vulnerable to transient voltage effects and its direct connection to other system components allows transient voltage transfer. For example:

- Lightning-induced transient events may pass through the solar array and outdoor cabling to the inverter
- Transients originating from the outside utility power grid may pass through the main circuit panel and cabling to the inverter
- Startup of motorized equipment enables vulnerabilities produced by repeated load changes
- Electrostatic discharge events generated internally and externally to the system may pass between the inverter and sensitive electronic control equipment

It is important to build surge protection in the inverter and at other locations before damaging transients may reach sensitive equipment.
Protection Application and Needs

Description:
Microprocessor-controlled inverter with the ac output synchronized to the ac grid stores energy in utility company and maximizes photovoltaic (PV) array energy output.

Threats:
- Power surges on ac or dc input and ac output
- ESD threats through the communication network

Solutions:
1. **Ac Input:** Fuse / MOV / GDT
2. **Dc Input:** Dc-rated fuse / Unidirectional TVS / MOV
3. **Ac Output:** Fuse / TVS / MOV
4. **Local Ethernet:** MLV / SPA
5. **Outside Ethernet:** SEP series SIDACtor® device

Varistor Products

Varistors possess characteristics that divert transient currents away from sensitive components. Littelfuse offers two types: Miniature surface mount Multi-Layer Varistors (MLVs) for small electronics applications and Metal Oxide Varistors (MOVs) for higher energy applications. For more information visit [Littelfuse.com/varistor](http://www.Littelfuse.com/varistor)
**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 V dc control circuits to 1000 V dc solar and transportation systems.

**Features & Benefits**

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

**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")
- **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
- **Approvals**: CSA certified, UL Listed (E340889), CE (European Union), C-Tick (Australian)
- **Warranty**: 5 years
- **Mounting**: DIN, surface (standard)

**Ordering Information**

<table>
<thead>
<tr>
<th>Ordering Number</th>
<th>Control Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE-601-0U</td>
<td>120/240 V ac/V dc</td>
</tr>
<tr>
<td>SE-601-0D</td>
<td>12/24 V dc</td>
</tr>
<tr>
<td>SE-601-OT</td>
<td>48 V dc</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accessories</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE-GRM SERIES</td>
<td>Required</td>
</tr>
<tr>
<td>PGA-0500</td>
<td>Optional</td>
</tr>
<tr>
<td>PMA-55</td>
<td>Optional</td>
</tr>
<tr>
<td>PMA-60</td>
<td>Optional</td>
</tr>
</tbody>
</table>

Note: For optional conformal coating please consult factory.
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 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.

Simplified Circuit Diagram

Ordering Information

<table>
<thead>
<tr>
<th>ORDERING NUMBER</th>
<th>CONTROL POWER</th>
<th>COMMUNICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>EL731-00-X0</td>
<td>120/240 V ac/V dc</td>
<td>None</td>
</tr>
<tr>
<td>EL731-01-X0</td>
<td>120/240 V ac/V dc</td>
<td>DeviceNet*</td>
</tr>
<tr>
<td>EL731-02-X0</td>
<td>120/240 V ac/V dc</td>
<td>Profibus*</td>
</tr>
<tr>
<td>EL731-03-X0</td>
<td>120/240 V ac/V dc</td>
<td>EtherNet/IP*</td>
</tr>
<tr>
<td>EL731-04-X0</td>
<td>120/240 V ac/V dc</td>
<td>Modbus* TCP</td>
</tr>
<tr>
<td>EL731-10-X0</td>
<td>48 V dc &amp; 24 V ac</td>
<td>None</td>
</tr>
<tr>
<td>EL731-11-X0</td>
<td>48 V dc &amp; 24 V ac</td>
<td>DeviceNet</td>
</tr>
<tr>
<td>EL731-12-X0</td>
<td>48 V dc &amp; 24 V ac</td>
<td>Profibus</td>
</tr>
<tr>
<td>EL731-13-X0</td>
<td>48 V dc &amp; 24 V ac</td>
<td>EtherNet/IP</td>
</tr>
<tr>
<td>EL731-14-X0</td>
<td>48 V dc &amp; 24 V ac</td>
<td>Modbus TCP</td>
</tr>
<tr>
<td>EL731-20-X0</td>
<td>24 V dc</td>
<td>None</td>
</tr>
<tr>
<td>EL731-21-X0</td>
<td>24 V dc</td>
<td>DeviceNet</td>
</tr>
<tr>
<td>EL731-22-X0</td>
<td>24 V dc</td>
<td>Profibus</td>
</tr>
<tr>
<td>EL731-23-X0</td>
<td>24 V dc</td>
<td>EtherNet/IP</td>
</tr>
<tr>
<td>EL731-24-X0</td>
<td>24 V dc</td>
<td>Modbus TCP</td>
</tr>
</tbody>
</table>

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.

Note: When building a part number, replace the “X” with “1” for AS/NZS 2081.2011 Compliant product, “0” otherwise.

*DeviceNet, Profibus, EtherNet/IP and Modbus TCP are trademarks of their respective owners.
Solar Products
SPD2 PV SERIES

Class 2 (IEC)/Type 2 (EN)/Type 1CA (UL)
Pluggable Multi-Pole Surge Protective Device
for PV Systems

Description
Surge protective devices (SPDs) provide equipment protection
from transient overvoltage events lasting micro-seconds. By
limiting the overvoltage to the equipment during these events,
costly damage and downtime can be mitigated.

The surge protective devices for solar string box and inverter
applications are available in 1100 and 1500 V dc in the 3+0
configuration.

Features & Benefits

<table>
<thead>
<tr>
<th>FEATURES</th>
<th>BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capability to clamp and withstand high-energy transients</td>
<td>Ensures low-residual voltage during high-energy surge events and higher nominal discharge current to prevent disruption, downtime, and degradation or damage to equipment</td>
</tr>
<tr>
<td>No additional overcurrent protection devices required in UL applications</td>
<td>Reduces the number of components and costs required for protection</td>
</tr>
<tr>
<td>Compact footprint</td>
<td>Increases panel design flexibility</td>
</tr>
<tr>
<td>Visual life indicator</td>
<td>Quick visual determines module replacement status to avoid loss of protection</td>
</tr>
<tr>
<td>Pluggable modules</td>
<td>Fast and simple to replace, minimizing maintenance and downtime. No tools required</td>
</tr>
<tr>
<td>Thermal protection</td>
<td>Eliminates catastrophic failure</td>
</tr>
<tr>
<td>IP20 protection rating</td>
<td>Finger-safe design increases worker protection</td>
</tr>
</tbody>
</table>

Internal Configuration

Legend
- Protective Earth
- RC Optional Remote Contact
- TD Thermal Disconnection

Module & Base Ordering Information

<table>
<thead>
<tr>
<th>Ordering Number</th>
<th>IEC Electrical</th>
<th>UL Electrical</th>
<th>Single Unit Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum Continuous Operating Dc Voltage (U_{CPV})</td>
<td>Nominal Discharge Current (8/20 μs) (I_{n})</td>
<td>Maximum Discharge Current (8/20 μs) (I_{max})</td>
</tr>
<tr>
<td>SPD2-PV11-3P0</td>
<td>1100 V</td>
<td>20 kA</td>
<td>40 kA</td>
</tr>
<tr>
<td>SPD2-PV11-3P0-R</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPD2-PV15-3P0</td>
<td>1500 V</td>
<td>15 kA</td>
<td>40 kA</td>
</tr>
</tbody>
</table>
Module & Base Part Numbering System

SPD2 PV VV XPZ R

- **Series**: Photovoltaic
- **Maximum Continuous Operating DC Voltage in Hundreds**: V
- **Optional Remote Contact**
  - **Neutral**: N (1=yes or 0=no)

Module Only Part Numbering System

SPD2 PV VV M

- **Series**: Photovoltaic
- **Module Only DC Voltage**: M

## Replacement Module Ordering Information

<table>
<thead>
<tr>
<th>Ordering Number</th>
<th>Maximum Continuous Operating DC Voltage (U_{cr}) (V)</th>
<th>Nominal Discharge Current (I_{n}) (8/20 µs) (kA)</th>
<th>Maximum Discharge Current (I_{max}) (8/20 µs) (kA)</th>
<th>Total Discharge Current (I_{T}) (kA)</th>
<th>Voltage Protection Level (U_p) (V)</th>
<th>Short-Circuit Current Rating (I_{SCCR}) (kA)</th>
<th>Maximum Permitted DC Voltage (U_{PVDC}) (V)</th>
<th>Voltage Protection Rating (VPR) (kA)</th>
<th>Single Unit Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPD2-PV550-M</td>
<td>1100 V</td>
<td>20 kA</td>
<td>40 kA</td>
<td>50 kA</td>
<td>4200 V</td>
<td>9 kA</td>
<td>1100 V</td>
<td>3000 V</td>
<td>61 g (0.134 lb)</td>
</tr>
<tr>
<td>SPD2-PV750-M</td>
<td>1500 V</td>
<td>15 kA</td>
<td>40 kA</td>
<td>40 kA</td>
<td>4800 V</td>
<td>9 kA</td>
<td>1500 V</td>
<td>4000 V</td>
<td>71 g (0.157 lb)</td>
</tr>
</tbody>
</table>

## Specifications

- **Mode of Protection**: ( ) - PE, ( - ) - PE, ( + ) - ( - )
- **Nominal Discharge Current (I_{n}) (8/20 µs)**: 20 kA
- **Maximum Discharge Current (I_{max}) (8/20 µs)**: Up to 40 kA
- **Protective Elements**: High Energy MOV
- **Response Time (t_{R})**: < 25 ns
- **Number of Ports**: 1

### Operating State/Fault Indication
- **Green Flag/No Green Flag**
- **Remote Contact Switching Capacity**
  - **Ac**: 250 V/1 A, 125 V/1 A
  - **Dc**: 48 V/0.5 A, 24 V/0.5 A, 12 V/0.5 A

### Remote Contact Conductor
- **Cross Section (max)**
  - 1.5 mm² (16 AWG) (Solid)
- **Standards Passed**
  - UL 1449 4th Edition; E320116

### Product Dimensions
- **3TE Module and Base**
  - H: 90.7 mm (3.57”)
  - W: 53.8 mm (2.11”)
  - D: 45.0 mm (1.77”)
- **1TE Replacement Module**
  - H: 45.0 mm (1.77”)
  - W: 28.0 mm (1.10”)
- **Package Dimensions**
  - **3TE Module and Base**
    - H: 102.0 mm (4.01”)
    - W: 64.0 mm (2.52”)
    - D: 110.0 mm (4.33”)

### Mechanical & Environmental
- **Operating Temperature Range (T_{a})**: -40 °C to +80 °C [-40 °F to +185 °F]
- **Permissible Operating Humidity (RH)**: 5% to 95%
- **Altitude (max)**: 4,000 m (13,123 ft)
- **Terminal Screw Torque (M_{max})**: 4.5 Nm (39.9 lbf-in)
- **Conductor Cross Section (max)**
  - 35 mm² (2 AWG) (Solid, Stranded)/25 mm² (4 AWG) (Flexible)
- **Mounting**
  - 35 mm DIN Rail, EN60715
- **Degree of Protection**: IP20 (built-in)
- **Housing Material**: Thermoplastic: Extinguishing Degree UL 94 V-0
- **Thermal Protection**: Yes

### Warranty
Solar Products

LS7R0250 1500 V DC DISCONNECT SWITCH

1500 V Dc • 250 A

Description
The Littelfuse LS7R dc series is an energy-efficient, compact disconnect switch that quickly breaks or resumes the flow of current safely to prevent shock hazards when trying to isolate circuits or repair systems. It is a 1500 V dc disconnect for ungrounded systems.

Features/Benefits
- The patented operation system minimizes damage caused by arcs upon disconnection to increase product reliability and longevity
- Streamline design eliminates the need for external bridging links (jumpers) to lower heat dissipation for increased energy efficiency, decreased installation and maintenance time, and reduced footprint for added design flexibility
- High-level disconnection insulation provides a barrier to stop conduction when switch is in off position for added safety
- The self-cleaning blade contacts eliminate performance degradation (from increased electrical resistance over time) to ensure consistent behavior across the product’s lifespan
- The internally-located “sandwich-type” 2-contact symmetrical design mitigates the electromagnetic force of repulsion to offer enhanced functionality in short-circuit conditions
- Meets UL 94 flammability requirements with self-extinguishing/non-flammable materials to prevent fires

Applications
- Solar/PV systems: combiner boxes, recombiner boxes and inverters
- Energy storage systems: disconnection of batteries, containerized batteries
- Oil & gas: dc drives
- Railway: earthing switches and battery disconnection
- UPS: switching and isolation of batteries
- Electrical vehicle chargers

Specifications

UL 98B Standards
- Total Voltage Rating: 1500 V dc
- Amperage Rating: 250 A
- SCCR Rating: 10 kA
- Ambient Temperature: -20 to 50 °C (-4 to 122 °F)

IEC 60947-3 Standards
- Insulation Voltage Rating Ui: 1500 V dc
- Impulse Withstand Voltage Rating Uimp: 12 kV
- Operational Current DC21B Rating: 250 A / 1500 V dc

Other Characteristics
- Power Losses at 250 A: 8.26 watts
- Maximum Busbar Connection Range: 1 bar x 5 mm (.20") H x 32 mm (1.25") L
- Number of Circuits/Switches: 1
- Tightening Torque: 159 lbf-in (18 N•m)
- Material: Plastic housing, Silver-plated copper terminals, Screws

Base Mounting
- UL 94 V-0
- UL Guide WHVA
- UL Listed E511898
- NEC Article 690 for PV systems
- IEC-60947-3
- CE
- EAC

Environmental
- RoHS compliant
- REACH

Country of Origin
- Spain

Recommended Accessories
- Panel Handle with Shaft LDSSA11
  For closed panel door access
- Direct Handle LDSS11
  For open panel door access
- Auxiliary Contact LDMAU11
  Remotely indicates switch position
- Spacers LDMEL11
  Increase distance between switch and mounting plate
Part Numbering System

LS7R 0250 2P S 00L

Series 0250 Amperage 2P Configuration Type S UL product 00L Terminal Measurement

Ordering Information

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>VOLTAGE</th>
<th>AMPERAGE</th>
<th>INSTALLATION</th>
<th>CONFIGURATION</th>
<th>SINGLE UNIT WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS7R02502PS00L</td>
<td>1500 V dc</td>
<td>250 A</td>
<td>Ungrounded</td>
<td>Type 2P</td>
<td>3 kg</td>
</tr>
</tbody>
</table>

Dimensions Millimeters (Inches)

**DC Disconnect Switch**

<table>
<thead>
<tr>
<th>QTY</th>
<th>COPPER BUSBAR M (TERMINAL TORQUE) (+5 %</th>
<th>-10 %)</th>
<th>COPPER BUSBAR H MAX (CU)</th>
<th>COPPER BUSBAR L MAX (CU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M10</td>
<td>18</td>
<td>159</td>
<td>5</td>
</tr>
<tr>
<td>M</td>
<td>M</td>
<td>10.6</td>
<td>13.3</td>
<td>10.6</td>
</tr>
<tr>
<td>*</td>
<td>T20</td>
<td>1.2</td>
<td>1.5</td>
<td>1.2</td>
</tr>
<tr>
<td>**</td>
<td>M4</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>***</td>
<td>M5</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
</tr>
</tbody>
</table>
Description
The Littelfuse LS7R dc series is an energy-efficient, compact disconnect switch that quickly breaks or resumes the flow of current safely to prevent shock hazards when trying to isolate circuits or repair systems. It is a 1500 V dc disconnect for ungrounded systems.

Features/Benefits
- The patented operation system minimizes damage caused by arcs upon disconnection to increase product reliability and longevity
- Streamline design eliminates the need for external bridging links (jumpers) to lower heat dissipation for increased energy efficiency, decreased installation and maintenance time, and reduced footprint for added design flexibility
- High-level disconnection insulation provides a barrier to stop conduction when switch is in off position for added safety
- The self-cleaning blade contacts eliminate performance degradation (from increased electrical resistance over time) to ensure consistent behavior across the product’s lifespan
- The internally-located “sandwich-type” 2-contact symmetrical design mitigates the electromagnetic force of repulsion to offer enhanced functionality in short-circuit conditions
- Meets UL 94 flammability requirements with self-extinguishing/non-flammable materials to prevent fires

Applications
- Solar/PV systems: combiner boxes, recombiner boxes and inverters
- Energy storage systems: disconnection of batteries, containerized batteries
- Oil & gas: dc drives
- Railway: earthing switches and battery disconnection
- UPS: switching and isolation of batteries
- Electrical vehicle chargers

Specifications
- **UL 98B Standards**
  - Total Voltage Rating: 1500 V dc
  - Amperage Rating: 320 A
  - SCCR Rating: 10 kA
  - Ambient Temperature: -20 to 50 °C (-4 to 122 °F)
- **IEC 60947-3 Standards**
  - Insulation Voltage Rating Ui: 1500 V dc
  - Impulse Withstand Voltage: 12 kV
  - Operational Current DC21B Rating: 320 A / 1500 V dc
- **Other Characteristics**
  - Power Losses at 320 A: 13.55 watts
  - Maximum Busbar Connection Range: 1 bar x 5 mm (.20") H x 40 mm (1.58") L
  - Number of Circuits/Switches: 1
  - Tightening Torque: 159 lbf-in (18 N-m)
  - Material: Plastic housing, Silver-plated copper terminals, Screws
  - Base Mounting: UL 94 V-0, UL 98B & UL 94, UL Guide WHVA
  - Approvals: UL Listed E511898, NEC Article 690 for PV systems, IEC-60947-3, CE, EAC
  - Environmental: RoHS compliant, REACH
  - Country of Origin: Spain

Recommended Accessories
- **Panel Handle with Shaft LDSSA11**
  For closed panel door access
- **Direct Handle LDSSI11**
  For open panel door access
- **Auxiliary Contact LDMAU11**
  Remotely indicates switch position
- **Spacers LDMEL11**
  Increase distance between switch and mounting plate
Solar Products
LS7R0320 1500 V DC DISCONNECT SWITCH

Part Numbering System
LS7R 0320 2P S 00L
Series Amperage Configuration Type UL product Terminal Measurement

Ordering Information
<table>
<thead>
<tr>
<th>DC DISCONNECT SWITCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>PART NUMBER</td>
</tr>
<tr>
<td>LS7R0320PS00L</td>
</tr>
</tbody>
</table>

Dimensions Millimeters (Inches)

Dc Disconnect Switch

Switch - Side View

Panel Handle with Shaft

Switch - 3D Installation View

Busbar

| QTY | COPPER BUSBAR M (TERMINAL TORQUE) (+5 % | -10 %) | COPPER BUSBAR H MAX (CU) | COPPER BUSBAR L MAX (CU) |
|-----|---------------------------------|----------------|----------------|
|     | N•M LBF•INCH                    | MM INCH        | MM INCH        |
| 1   | M10 18                          | 5 13/64        | 40 1 37/64     |
| M   | M (+5 % | -10 %)                      | N•M LBF•INCH   | MINIMUM BUSBAR SECTION ACCORDING TO UL 98B |
| *   | T20 M4 1.2                      | 10.6           |
| **  | — M4 1.5                        | 13.3           |
| *** | Allen M5 1.5                    | 13.3           |

MINIMUM BUSBAR SECTION ACCORDING TO UL 98B

Littelfuse.com/solar
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Solar Products
LS7R0400 1500 V DC DISCONNECT SWITCH

1500 V Dc • 400 A

Description
The Littelfuse LS7R dc series is an energy-efficient, compact disconnect switch that quickly breaks or resumes the flow of current safely to prevent shock hazards when trying to isolate circuits or repair systems. It is a 1500 V dc disconnect for ungrounded systems.

Features/Benefits
- The patented operation system minimizes damage caused by arcs upon disconnection to increase product reliability and longevity
- Streamline design eliminates the need for external bridging links (jumpers) to lower heat dissipation for increased energy efficiency, decreased installation and maintenance time, and reduced footprint for added design flexibility
- High-level disconnection insulation provides a barrier to stop conduction when switch is in off position for added safety
- The self-cleaning blade contacts eliminate performance degradation (from increased electrical resistance over time) to ensure consistent behavior across the product’s lifespan
- The internally-located “sandwich-type” 2-contact symmetrical design mitigates the electromagnetic force of repulsion to offer enhanced functionality in short-circuit conditions
- Meets UL 94 flammability requirements with self-extinguishing/non-flammable materials to prevent fires

Applications
- Solar/PV systems: combiner boxes, recombiner boxes and inverters
- Energy storage systems: disconnection of batteries, containerized batteries
- Oil & gas: dc drives
- Railway: earthing switches and battery disconnection
- UPS: switching and isolation of batteries
- Electrical vehicle chargers

Specifications

<table>
<thead>
<tr>
<th>UL 98B Standards</th>
<th>Total Voltage Rating</th>
<th>1500 V dc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amperage Rating</td>
<td>400 A</td>
<td></td>
</tr>
<tr>
<td>SCCR Rating</td>
<td>10 kA</td>
<td></td>
</tr>
<tr>
<td>Ambient Temperature</td>
<td>-20 to 50 °C (-4 to 122 °F)</td>
<td></td>
</tr>
<tr>
<td>IEC 60947-3 Standards</td>
<td>Insulation Voltage Rating Ui</td>
<td>1500 V dc</td>
</tr>
<tr>
<td></td>
<td>Impulse Withstand Voltage Rating Uimp</td>
<td>12 kV</td>
</tr>
<tr>
<td></td>
<td>Operational Current DC21B Rating</td>
<td>400 A / 1500 V dc</td>
</tr>
<tr>
<td>Other Characteristics</td>
<td>Power Losses at 400 A</td>
<td>21.15 watts</td>
</tr>
<tr>
<td></td>
<td>Maximum Busbar Connection Range</td>
<td>2 bars x 4 mm (.16”) H x 32 mm (1.25”) L</td>
</tr>
<tr>
<td></td>
<td>Number of Circuits/Switches</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Tightening Torque</td>
<td>159 lbf-in (18 N•m) for M10 screw</td>
</tr>
<tr>
<td></td>
<td>Material</td>
<td>Plastic housing Silver-plated copper terminals Screws</td>
</tr>
<tr>
<td></td>
<td>Base Mounting</td>
<td>UL 94 V-0 UL 98B &amp; UL 94 UL Guide WHVA UL Listed ES11898 NEC Article 690 for PV systems IEC-60947-3 CE EAC</td>
</tr>
<tr>
<td></td>
<td>Flammability Rating</td>
<td>RoHS compliant</td>
</tr>
<tr>
<td></td>
<td>Approvals</td>
<td>REACH</td>
</tr>
<tr>
<td></td>
<td>Environmental</td>
<td>Spain</td>
</tr>
</tbody>
</table>

Recommended Accessories
- Panel Handle with Shaft LDSSA11
  For closed panel door access
- Direct Handle LDSSI11
  For open panel door access
- Auxiliary Contact LDMAU11
  Remotely indicates switch position
- Spacers LDMEL11
  Increase distance between switch and mounting plate
**Solar Products**

**LS7R0400 1500 V DC DISCONNECT SWITCH**

### Part Numbering System

<table>
<thead>
<tr>
<th>Series</th>
<th>Configuration Type</th>
<th>Terminal Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS7R</td>
<td>2P</td>
<td>00L</td>
</tr>
</tbody>
</table>

**Ordering Information**

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>VOLTAGE</th>
<th>AMPERAGE</th>
<th>INSTALLATION</th>
<th>CONFIGURATION</th>
<th>SINGLE UNIT WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS7R04002PS00L</td>
<td>1500 V dc</td>
<td>400 A</td>
<td>Ungrounded</td>
<td>Type 2P</td>
<td>3 kg</td>
</tr>
</tbody>
</table>

### Dimensions Millimeters (Inches)

#### Dc Disconnect Switch

- Switch - Side View
- Panel Handle with Shaft

#### Switch - 3D Installation View

**Busbar**

<table>
<thead>
<tr>
<th>QTY</th>
<th>COPPER BUSBAR M [TERMINAL TORQUE] (+5 %</th>
<th>-10 %)</th>
<th>COPPER BUSBAR H MAX (CU)</th>
<th>COPPER BUSBAR L MAX (CU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>M10</td>
<td>18 159</td>
<td>4 5/32</td>
<td>32 11/4</td>
</tr>
<tr>
<td>M</td>
<td>M (+5 %</td>
<td>-10 %)</td>
<td>N+M LBF+INCH</td>
<td></td>
</tr>
<tr>
<td>**</td>
<td>T20 M4</td>
<td>1.2 10.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>***</td>
<td>— M5</td>
<td>1.5 13.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MINIMUM BUSBAR SECTION ACCORDING TO UL 98B**

- H
- L

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© 2023 Littelfuse, Inc.
1500 V Dc • 500 A

**Description**
The Littelfuse LS7R dc series is an energy-efficient, compact disconnect switch that quickly breaks or resumes the flow of current safely to prevent shock hazards when trying to isolate circuits or repair systems. It is a 1500 V dc disconnect for ungrounded systems.

**Features/Benefits**
- The patented operation system minimizes damage caused by arcs upon disconnection to increase product reliability and longevity
- Streamline design eliminates the need for external bridging links (jumpers) to lower heat dissipation for increased energy efficiency, decreased installation and maintenance time, and reduced footprint for added design flexibility
- High-level disconnection insulation provides a barrier to stop conduction when switch is in off position for added safety
- The self-cleaning blade contacts eliminate performance degradation (from increased electrical resistance over time) to ensure consistent behavior across the product’s lifespan
- The internally-located "sandwich-type" 2-contact symmetrical design mitigates the electromagnetic force of repulsion to offer enhanced functionality in short-circuit conditions
- Meets UL 94 flammability requirements with self-extinguishing/non-flammable materials to prevent fires

**Applications**
- Solar/PV systems: combiner boxes, recombiner boxes and inverters
- Energy storage systems: disconnection of batteries, containerized batteries
- Oil & gas: dc drives
- Railway: earthing switches and battery disconnection
- UPS: switching and isolation of batteries
- Electrical vehicle chargers

**Specifications**

**UL 98B Standards**
- Total Voltage Rating: 1500 V dc
- Amperage Rating: 500 A
- SCCR Rating: 10 kA
- Ambient Temperature: -20 to 50 °C (-4 to 122 °F)

**IEC 60947-3 Standards**
- Insulation Voltage Rating \( U_i \): 1500 V dc
- Impulse Withstand Voltage \( U_{imp} \): 12 kV
- Operational Current DC21B Rating: 500 A / 1500 V dc

**Other Characteristics**
- Power Losses at 500 A: 33.05 watts
- Maximum Busbar Connection Range: 2 bars x 5 mm (0.20") H x 32 mm (1.25") L
- Number of Circuits/Switches: 1
- Tightening Torque: 212 lbf-in (24 N•m)
- Material:
  - Plastic housing
  - Silver-plated copper terminals
  - Screws
- Base Mounting
- Flammability Rating: UL 94 V-0
- Approvals:
  - UL 98B & UL 94
  - UL Guide WHVA
  - UL Listed E511898
  - NEC Article 690 for PV systems
  - IEC-60947-3
  - CE
  - EAC

**Environmental**
- RoHS compliant
- REACH

**Country of Origin**
- Spain

**Recommended Accessories**
- Panel Handle with Shaft LDSSA11
  For closed panel door access
- Direct Handle LDSSI11
  For open panel door access
- Auxiliary Contact LDMAU11
  Remotely indicates switch position
- Spacers LDMEL11
  Increase distance between switch and mounting plate
Solar Products
LS7R0500 1500 V DC DISCONNECT SWITCH

Part Numbering System

<table>
<thead>
<tr>
<th>Series</th>
<th>LS7R</th>
<th>Amperage</th>
<th>0500</th>
<th>Configuration Type</th>
<th>2P</th>
<th>S</th>
<th>00L</th>
<th>UL product</th>
<th>Terminal Measurement</th>
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</table>

Ordering Information

<table>
<thead>
<tr>
<th>DC DISCONNECT SWITCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>PART NUMBER</td>
</tr>
<tr>
<td>LS7R05002PS00L</td>
</tr>
</tbody>
</table>

Dimensions Millimeters (Inches)

**DC Disconnect Switch**

| QTY | COPPER BUSBAR M (TERMINAL TORQUE) (+5 % | -10 %) | COPPER BUSBAR H MAX (CU) | COPPER BUSBAR L MAX (CU) |
|-----|------------------------------------------------|--------------------------|----------------------------|
| 2   | M12                                            | 24                       | 212                        |
|     | N•M LBF•INCH                                   | 5                        | 13/64                      |
|     | MINIMUM BUSBAR SECTION ACCORDING TO UL 968   |

**Switch - Side View**

**Panel Handle with Shaft**

**Switch - 3D Installation View**

**Busbar**

- QTY: 2
- M*: T20 M4 1.2 16.6
- M**: — M4 1.5 13.3
- M***: Allen M5 1.5 13.3
1500 V Dc • 250 A

**Description**
The Littelfuse LS6R dc series is an energy-efficient, compact disconnect switch that quickly breaks or resumes the flow of current safely to prevent shock hazards when trying to isolate circuits or repair systems.

**Features/Benefits**
- The patented operation system minimizes damage caused by arcs upon disconnection to increase product reliability and longevity
- Streamline design eliminates the need for external bridging links (jumpers) to lower heat dissipation for increased energy efficiency, decreased installation and maintenance time, and reduced footprint for added design flexibility
- High-level disconnection insulation provides a barrier to stop conduction when switch is in off position for added safety
- The self-cleaning blade contacts eliminate performance degradation (from increased electrical resistance over time) to ensure consistent behavior across the product’s lifespan
- The internally-located “sandwich-type” 2-contact symmetrical design mitigates the electromagnetic force of repulsion to offer enhanced functionality in short-circuit conditions
- Meets UL 94 flammability requirements with self-extinguishing/non-flammable materials to prevent fires

**Applications**
- Solar/PV systems: combiner boxes, recombiner boxes and inverters
- Energy storage systems: disconnection of batteries, containerized batteries
- Oil & gas: dc drives
- Railway: earthing switches and battery disconnection
- UPS: switching and isolation of batteries
- Electrical vehicle chargers

**Specifications**

**UL 98B Standards**
- Total Voltage Rating: 1500 V dc
- Amperage Rating: 250 A
- SCCR Rating: 10 kA
- Ambient Temperature: -20 to 50 ºC (-4 to 122 ºF)

**IEC 60947-3 Standards**
- Insulation Voltage Rating $U_i$: 1500 V dc
- Impulse Withstand Voltage Rating $U_{imp}$: 12 kV
- Operational Current DC21B Rating: 250 A/1500 V dc

**Other Characteristics**
- Power Losses at 250 A: 4.13 watts
- Maximum Busbar Connection Range: 2 bars x 4 mm (.16”) H x 30 mm (1.18”) L
- Number of Circuits/Switches: 1
- Mechanical Operations: 8,000
- Tightening Torque: 212 lbf-in (24 N-m)
- Material: Plastic housing, Silver-plated copper terminals, Screws

**Base Mounting**
- UL 94 V-0
- UL 98B & UL 94
- UL Guide WHVA
- UL Listed E511898
- NEC Article 690 for PV systems
- IEC-60947-3
- CE
- EAC

**Environmental**
- RoHS compliant
- REACH

**Country of Origin**
- Spain

**Recommended Accessories**
- Panel Handle with Shaft LDSSA11
  For closed panel door access
- Direct Handle LDSSI11
  For open panel door access
- Auxiliary Contact LD5LAU01
  Remotely indicates switch position
Solar Products
LS6R0250 1500 V DC SERIES DISCONNECT SWITCH

Part Numbering System

**LS6R 0250 CB S 00L**

- **Series**: LS6R
- **Configuration Type**: CB = 2 Pole, 4D = 1 Pole
- **Amperage**: 1
- **UP**: 1
- **DOWN**: 1'
- **Terminal Measurement**: UL product

Configuration

- **Type CB (2 Pole)**
- **Type 4D (1 Pole)**

Ordering Information

<table>
<thead>
<tr>
<th>SERIES</th>
<th>TOTAL VOLTAGE</th>
<th>AMPERAGE</th>
<th>INSTALLATION</th>
<th>CONFIGURATION</th>
<th>POLES</th>
<th>SINGLE UNIT WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS6R02504D000L</td>
<td>1500 V dc</td>
<td>250 A</td>
<td>Grounded</td>
<td>Type 4D</td>
<td>1</td>
<td>4.5 kg</td>
</tr>
<tr>
<td>LS6R0250CB000L</td>
<td>1500 V dc</td>
<td>250 A</td>
<td>Ungrounded</td>
<td>Type CB</td>
<td>2</td>
<td>4.5 kg</td>
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</table>

Dimensions Millimeters

**Dc Disconnect Switch**

**Switch - Side View**

**Panel Handle with Shaft**

**Auxiliary Contact**

**Busbar**

<table>
<thead>
<tr>
<th>BUSBAR H MAX (CU)</th>
<th>BUSBAR L MAX (CU)</th>
<th>COPPER BAR M (TERMINAL TORQUE) (+5%</th>
<th>-10%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM</td>
<td>INCH</td>
<td>MM</td>
<td>INCH</td>
</tr>
<tr>
<td>4</td>
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<td>36</td>
<td>1 3/16</td>
</tr>
</tbody>
</table>

Littelfuse.com/solar
© 2023 Littelfuse, Inc.
LS6R0400 1500 V DC SERIES DISCONNECT SWITCH

1500 V Dc • 400 A

Description
The Littelfuse LS6R dc series is an energy-efficient, compact disconnect switch that quickly breaks or resumes the flow of current safely to prevent shock hazards when trying to isolate circuits or repair systems.

Features/Benefits
- The patented operation system minimizes damage caused by arcs upon disconnection to increase product reliability and longevity
- Streamline design eliminates the need for external bridging links (jumpers) to lower heat dissipation for increased energy efficiency, decreased installation and maintenance time, and reduced footprint for added design flexibility
- High-level disconnection insulation provides a barrier to stop conduction when switch is in off position for added safety
- The self-cleaning blade contacts eliminate performance degradation (from increased electrical resistance over time) to ensure consistent behavior across the product’s lifespan
- The internally-located ‘sandwich-type’ 2-contact symmetrical design mitigates the electromagnetic force of repulsion to offer enhanced functionality in short-circuit conditions
- Meets UL 94 flammability requirements with self-extinguishing/non-flammable materials to prevent fires

Applications
- Solar/PV systems: combiner boxes, recombiner boxes and inverters
- Energy storage systems: disconnection of batteries, containerized batteries
- Oil & gas: dc drives
- Railway: earthing switches and battery disconnection
- UPS: switching and isolation of batteries
- Electrical vehicle chargers

Specifications

<table>
<thead>
<tr>
<th>UL 98B Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Voltage Rating</td>
</tr>
<tr>
<td>1500 V dc</td>
</tr>
<tr>
<td>Amperage Rating</td>
</tr>
<tr>
<td>400 A</td>
</tr>
<tr>
<td>SCCR Rating</td>
</tr>
<tr>
<td>10 kA</td>
</tr>
<tr>
<td>Ambient Temperature</td>
</tr>
<tr>
<td>-30 to 50 °C (-22 to 122 °F)</td>
</tr>
<tr>
<td>IEC 60947-3 Standards</td>
</tr>
<tr>
<td>Insulation Voltage Rating Ui</td>
</tr>
<tr>
<td>1500 V dc</td>
</tr>
<tr>
<td>Impulse Withstand Voltage</td>
</tr>
<tr>
<td>12 kV</td>
</tr>
<tr>
<td>Operational Current</td>
</tr>
<tr>
<td>DC21B Rating</td>
</tr>
<tr>
<td>400 A/1500 V dc</td>
</tr>
<tr>
<td>Power Losses at 400 A</td>
</tr>
<tr>
<td>10.58 watts</td>
</tr>
<tr>
<td>Maximum Busbar</td>
</tr>
<tr>
<td>Connection Range</td>
</tr>
<tr>
<td>2 bars x 4 mm (.16”) H x 32 mm (1.26”) L</td>
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<tr>
<td>Number of Circuits/Switches</td>
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<tr>
<td>1</td>
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<tr>
<td>Mechanical Operations</td>
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<tr>
<td>8,000</td>
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<tr>
<td>Tightening Torque</td>
</tr>
<tr>
<td>212 lbf-in (24 N-m)</td>
</tr>
<tr>
<td>Material</td>
</tr>
<tr>
<td>Plastic housing</td>
</tr>
<tr>
<td>Silver-plated copper terminals</td>
</tr>
<tr>
<td>Base Mounting</td>
</tr>
<tr>
<td>Screws</td>
</tr>
<tr>
<td>Flammability Rating</td>
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<tr>
<td>UL 94 V-0</td>
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<tr>
<td>Approvals</td>
</tr>
<tr>
<td>UL 98B &amp; UL 94</td>
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<tr>
<td>UL Guide WHVA</td>
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<tr>
<td>UL Listed ES11898</td>
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<tr>
<td>NEC Article 690 for PV systems</td>
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<tr>
<td>IEC-60947-3</td>
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<td>EAC</td>
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<tr>
<td>Environmental</td>
</tr>
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<td>RoHS compliant</td>
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<tr>
<td>REACH</td>
</tr>
<tr>
<td>Country of Origin</td>
</tr>
<tr>
<td>Spain</td>
</tr>
</tbody>
</table>

Recommended Accessories
- Panel Handle with Shaft LDSSA11
  For closed panel door access
- Direct Handle LDSS11
  For open panel door access
- Auxiliary Contact LD5LAU01
  Remotely indicates switch position
Solar Products
LS6R0400 1500 V DC SERIES DISCONNECT SWITCH

Part Numbering System

**LS6R** 0400 **CB** D 00L

- **Series**: LS6R
- **Amperage**: 0400
- **Configuration Type**: CB = 2 Pole
- **UL product**: D = 1 Pole
- **Terminal Measurement**: 00L

Configuration

- **Type CB (2 Pole)**
- **Type 4D (1 Pole)**

Ordering Information

<table>
<thead>
<tr>
<th>SERIES</th>
<th>TOTAL VOLTAGE</th>
<th>AMPERAGE</th>
<th>INSTALLATION</th>
<th>CONFIGURATION</th>
<th>POLES</th>
<th>SINGLE UNIT WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS6R04004DD00L</td>
<td>1500 V dc</td>
<td>400 A</td>
<td>Grounded</td>
<td>Type 4D</td>
<td>1</td>
<td>4.5 kg</td>
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<tr>
<td>LS6R0400CBD00L</td>
<td>1500 V dc</td>
<td>400 A</td>
<td>Ungrounded</td>
<td>Type CB</td>
<td>2</td>
<td>4.5 kg</td>
</tr>
</tbody>
</table>

Dimensions Millimeters

**Dc Disconnect Switch**

**Switch - Side View**

**Panel Handle with Shaft**

**Busbar**

<table>
<thead>
<tr>
<th>BUSBAR H MAX (CU)</th>
<th>BUSBAR L MAX (CU)</th>
<th>COPPER BAR M (TERMINAL TORQUE) (+5 %</th>
<th>-10 %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM</td>
<td>INCH</td>
<td>MM</td>
<td>INCH</td>
</tr>
<tr>
<td>4</td>
<td>5/32</td>
<td>32</td>
<td>1/4</td>
</tr>
</tbody>
</table>

**Auxiliary Contact**

LD5AU01

---

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Description

The Littelfuse LS6 dc series is an energy-efficient, compact disconnect switch that quickly breaks or resumes the flow of current safely to prevent shock hazards when trying to isolate circuits or repair systems.

Features/Benefits

- Streamline design eliminates the need for external bridging links (jumpers) to lower heat dissipation for increased energy efficiency, decreased installation and maintenance time, and reduced footprint for added design flexibility
- High-level disconnection insulation provides a barrier to stop conduction when switch is in off position for added safety
- The self-cleaning blade contacts eliminate performance degradation (from increased electrical resistance over time) to ensure consistent behavior across the product’s lifespan
- The internally-located “sandwich-type” 2-contact symmetrical design mitigates the electromagnetic force of repulsion to offer enhanced functionality in short-circuit conditions
- Meets UL 94 flammability requirements with self-extinguishing/non-flammable materials to prevent fires

Applications

- Solar/PV systems: combiner boxes, recombiner boxes and inverters
- Energy storage systems: disconnection of batteries, containerized batteries
- Oil & gas: dc drives
- Railway: earthing switches and battery disconnection
- UPS: switching and isolation of batteries
- Electrical vehicle chargers

Specifications

UL 98B Standards
- Total Voltage Rating: 1000 V dc
- Amperage Rating: 250 A
- SCCR Rating: 10 kA
- Ambient Temperature: -20 to 50 °C (-4 to 122 °F)

IEC 60947-3 Standards
- Insulation Voltage Rating Ui: 1500 V dc
- Impulse Withstand Voltage Rating Uimp: 12 kV
- Operational Current DC21B Rating: 250 A/1000 V dc

Other Characteristics
- Power Losses at 250 A: 19.59 watts
- Minimum Connection Wire Range/AWG: 400 kcmil/MCM (203 mm²)
- Maximum Connection Wire Range/AWG: 500 kcmil/MCM (253 mm²)
- Number of Circuits/Switches: 1
- Mechanical Operations: 8,000
- Tightening Torque: 159 lbf-in (18 N•m)

Material
- Plastic housing
- Silver-plated copper terminals
- Screws

Base Mounting Flammability Rating Approvals
- UL 94 V-0
- UL 98B & UL 94
- UL Guide WHVA
- UL Listed E511898
- NEC Article 690 for PV systems
- IEC-60947-3
- CE
- EAC

Environmental
- RoHS compliant
- REACH

Country of Origin
- Spain

Recommended Accessories

- Panel handle with shaft LDSSA11 for closed panel door access
- Direct handle LDSSI11 for open panel door access
- Auxiliary contacts LD5LAU01 remotely indicate switch position
- Phase barriers LDRSF11 (Type 1M) and LDRSF13 (Type 2E) isolate sections to eliminate arcing between the phases
- Terminal lug LDRTL11W safely connects electrical and mechanical devices (phase barriers must be used in order to maintain the required clearance)
- Terminal shrouds LDRCU13W offer protection against direct contact after wiring
- Spacers LDREL11W increase distance between switch and mounting plate
Solar Products
LS60250 1000 V DC SERIES DISCONNECT SWITCH

Part Numbering System

LS6 0250 1M S 00L

Series
Amperage
Configuration Type
UL product
Terminal Measurement

Configuration

1M (1 Pole) 2E (2 Pole)

Ordering Information

<table>
<thead>
<tr>
<th>SERIES</th>
<th>TOTAL VOLTAGE</th>
<th>AMPERAGE</th>
<th>INSTALLATION</th>
<th>CONFIGURATION</th>
<th>POLES</th>
<th>SINGLE UNIT WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS602501MS00L</td>
<td>1000 V dc</td>
<td>250 A</td>
<td>Grounded</td>
<td>Type 1M</td>
<td>1</td>
<td>2 kg</td>
</tr>
<tr>
<td>LS602502ES00L</td>
<td>1000 V dc</td>
<td>250 A</td>
<td>Ungrounded</td>
<td>Type 2E</td>
<td>2</td>
<td>3 kg</td>
</tr>
</tbody>
</table>

Dimensions Millimeters

Dc Disconnect Switch

Switch + Direct Handle
- Side View

Panel Handle with Shaft
LDSSA11

Auxiliary Contact
LDSSAU01

Terminal Lug Measurements

| LDRTL11W | 3/0 85 MM² MIN. --- 400 KCMIL 240 MM² MAX. | CONDUCTOR TEMPERATURE RATING | COPPER WIRE ONLY M (TERMINAL TORQUE) (+5% | -10%) |
|----------|---------------------------------|-------------------------------|-----------------------------------|
|          | 75 °C                           | M10                           | N•M                               |
|          |                                 | 18                            | 159                               |

Torque and Cable Capacity Instructions

10-32 UNF TORQUE/PAR 26.55 lb.inch/3 Nm
7/8-14 UNF TORQUE/PAR 190-lb.inch/56 Nm
Description
The Littelfuse LS6 dc series is an energy-efficient, compact disconnect switch that quickly breaks or resumes the flow of current safely to prevent shock hazards when trying to isolate circuits or repair systems.

Features/Benefits
- Streamline design eliminates the need for external bridging links (jumpers) to lower heat dissipation for increased energy efficiency, decreased installation and maintenance time, and reduced footprint for added design flexibility.
- High-level disconnection insulation provides a barrier to stop conduction when switch is in off position for added safety.
- The self-cleaning blade contacts eliminate performance degradation (from increased electrical resistance over time) to ensure consistent behavior across the product’s lifespan.
- The internally-located "sandwich-type" 2-contact symmetrical design mitigates the electromagnetic force of repulsion to offer enhanced functionality in short-circuit conditions.
- Meets UL 94 flammability requirements with self-extinguishing/non-flammable materials to prevent fires.

Applications
- Solar/PV systems: combiner boxes, recombiner boxes and inverters.
- Energy storage systems: disconnection of batteries, containerized batteries.
- Oil & gas: dc drives.
- Railway: earthing switches and battery disconnection.
- UPS: switching and isolation of batteries.

Specifications

UL 98B Standards
- Total Voltage Rating: 1000 V dc
- Amperage Rating: 400 A
- SCCR Rating: 10 kA
- Ambient Temperature: -20 to 50 °C (-4 to 122 °F)

IEC 60947-3 Standards
- Insulation Voltage Rating (Ui): 1500 V dc
- Impulse Withstand Voltage (Uimp): 12 kV

Operational Current DC 21B
- Power Losses at 400 A: 2 Pole (2E): 18.4 watts/pole
- 1 Pole (1M): 36.11 watts total

Other Characteristics
- Minimum Connection Wire Range / AWG: 300 kcmil/MCM (152 mm²)
- Maximum Connection Wire Range / AWG: 350 kcmil/MCM (177 mm²)
- Number of Circuits/Switches: 1
- Mechanical Operations: 8,000
- Tightening Torque: 212 lbf-in (24 N-m)
- Material: Plastic housing, Silver-plated copper terminals, Screws.
- Base Mounting: Screws
- Flammability Rating: UL 94 V-0
- Environmental: RoHS compliant, REACH.
- Country of Origin: Spain

Recommended Accessories
- Panel handle with shaft LDSLA21 for closed panel door access.
- Direct handle LDSLI21 for open panel door access.
- Auxiliary contacts LDSLAU01 remotely indicate switch position.
- Phase barriers LDRSF21 (Type 1M) and LDRSF23 (Type 2E) isolate sections to eliminate arcing between the phases.
- Terminal lug LDRTL22W safely connects electrical and mechanical devices (phase barriers must be used in order to maintain the required clearance).
- Terminal shrouds LDRCU23W offer protection against direct contact after wiring.
- Spacers LDREL21W increase distance between switch and mounting plate.
Part Numbering System

**LS6 0400 1M S 00L**

- **Series**
- **Amperage**
- **Configuration Type**
  - 1M = 1 Pole
  - 2E = 2 Pole
- **Terminal Measurement**
- **UL product**

Configuration

- Type 1M (1 Pole)
- Type 2E (2 Pole)

Ordering Information

<table>
<thead>
<tr>
<th>SERIES</th>
<th>TOTAL VOLTAGE</th>
<th>AMPERAGE</th>
<th>INSTALLATION</th>
<th>CONFIGURATION</th>
<th>POLES</th>
<th>SINGLE UNIT WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS604001MS00L</td>
<td>1000 V dc</td>
<td>400 A</td>
<td>Grounded</td>
<td>Type 1M</td>
<td>1</td>
<td>2 kg</td>
</tr>
<tr>
<td>LS604002ES00L</td>
<td>1000 V dc</td>
<td>400 A</td>
<td>Ungrounded</td>
<td>Type 2E</td>
<td>2</td>
<td>3 kg</td>
</tr>
</tbody>
</table>

Dimensions Millimeters

- **DC Disconnect Switch**
  - Switch + Direct Handle - Side View
  - Panel Handle with Shaft LDSLA21
  - Auxiliary Contact LD5AU01

Terminal Lug Measurements

<table>
<thead>
<tr>
<th>LDRTL22IW</th>
<th>3/0 85 MM² MIN. 400 KC M 240 MM² MAX.</th>
<th>CONDUCTOR TEMPERATURE RATING</th>
<th>COPPER WIRE ONLY M TERMINAL TORQUE (+5%</th>
<th>-10%)</th>
<th>N•M</th>
<th>LB.INCH</th>
</tr>
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<tbody>
<tr>
<td>75 °C</td>
<td>M10</td>
<td>24</td>
<td>212</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Torque and Cable Capacity Instructions

- 6 AWG
  - 16 mm² min.
  - 350 KC M
  - 185 mm² max.
- Lug Bolt 11/16-16 UNF
- TORQUE / PAR
  - 375 lb.inch
  - 42 N•m
LS60250 500 V DC SERIES DISCONNECT SWITCH

500 V DC • 250 A

Description
The Littelfuse LS6 dc series is an energy-efficient, compact disconnect switch that quickly breaks or resumes the flow of current safely to prevent shock hazards when trying to isolate circuits or repair systems.

Features/Benefits
- Streamline design eliminates the need for external bridging links (jumpers) to lower heat dissipation for increased energy efficiency, decreased installation and maintenance time, and reduced footprint for added design flexibility.
- High-level disconnection insulation provides a barrier to stop conduction when switch is in off position for added safety.
- The self-cleaning blade contacts eliminate performance degradation (from increased electrical resistance over time) to ensure consistent behavior across the product’s lifespan.
- The internally-located “sandwich-type” 2-contact symmetrical design mitigates the electromagnetic force of repulsion to offer enhanced functionality in short-circuit conditions.
- Meets UL 94 flammability requirements with self-extinguishing/non-flammable materials to prevent fires.

Applications
- Solar/PV systems: combiner boxes, recombiner boxes and inverters.
- Energy storage systems: disconnection of batteries, containerized batteries.
- Oil & gas: dc drives.
- Railway: earthing switches and battery disconnection.
- UPS: switching and isolation of batteries.
- Electrical vehicle chargers.

Specifications
UL 98B Standards
- Total Voltage Rating: 500 V dc
- Amperage Rating: 250 A
- SCCR Rating: 10 kA
- Ambient Temperature: -20 to 50 °C (-4 to 122 °F)
- Insulation Voltage Rating Ui: 1500 V dc
- Impulse Withstand Voltage Rating Uimp: 12 kV
- Operational Current DC21B Rating: 250 A/500 V dc
- Other Characteristics:
  - Power Losses at 250 A: 10.08 watts
- Minimum Connection Wire Range/AWG: 400 kcmil/MCM (203 mm²)
- Maximum Connection Wire Range/AWG: 500 kcmil/MCM (253 mm²)
- Number of Circuits/Switches: 1
- Mechanical Operations: 8,000
- Tightening Torque: 159 lbf-in (18 N•m)
- Material:
  - Plastic housing
  - Silver-plated copper terminals
- Base Mounting:
  - Screws
- Flammability Rating:
  - UL 94 V-0
- Approvals:
  - UL 98B & UL 94
  - UL Guide WHVA
  - UL Listed E511898
  - NEC Article 690 for PV systems
  - IEC-60947-3
  - CE
  - EAC
- Environmental:
  - RoHS compliant
  - REACH
- Country of Origin: Spain

Recommended Accessories
- Panel handle with shaft LDSSA11 for closed panel door access
- Direct handle LDSSI11 for open panel door access
- Auxiliary contacts LD5LAU01 remotely indicate switch position
- Phase barriers LDRSF11 (Type 1V) and LDRSF12 (Type 2L) isolate sections to eliminate arcing between the phases
- Terminal lug LDRTL11W safely connects electrical and mechanical devices (phase barriers must be used in order to maintain the required clearance)
- Terminal shrouds LDRGU11W offer protection against direct contact after wiring
- Spacers LDREL11W increase distance between switch and mounting plate.
Solar Products
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500 V dc
M10
Grounded
Type 1V
3/0
1
2 kg
AMPERAGE
LB.INCH
250 A
CONFIGURATION
18
Configuration
3/0
TOTAL VOLTAGE
Ungrounded
2
POLES
3/0
Type 2L
Panel Handle with Shaft
2
SINGLE UNIT WEIGHT
159
INSTALLATION
250 A
3 kg
500 V dc
3/0

Part Numbering System
LS6 0250 1V S 00L
Series
Amperage
Configuration Type
UL product
Terminal Measurement
1V = 1 Pole
2L = 2 Pole

Ordering Information

<table>
<thead>
<tr>
<th>SERIES</th>
<th>TOTAL VOLTAGE</th>
<th>AMPERAGE</th>
<th>INSTALLATION</th>
<th>CONFIGURATION</th>
<th>POLES</th>
<th>SINGLE UNIT WEIGHT</th>
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<tbody>
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<td>250 A</td>
<td>Grounded</td>
<td>Type 1V</td>
<td>1</td>
<td>2 kg</td>
</tr>
<tr>
<td>LS602502LS00L</td>
<td>500 V dc</td>
<td>250 A</td>
<td>Ungrounded</td>
<td>Type 2L</td>
<td>2</td>
<td>3 kg</td>
</tr>
</tbody>
</table>

Dimensions Millimeters

DC DISCONNECT SWITCH

Terminal Lug Measurements

| LDRTL11W | CONDUCTOR TEMPERATURE RATING | COPPER WIRE ONLY M (TERMINAL TORQUE) (+5% | -10%) |
|----------|------------------------------|--------------------------------------------|
| 3/0      | 75 °C                        | N-M                                       |
| 85 MM²  MIN | 240 MM² MAX                 | 18, 159                                   |

Torque and Cable Capacity Instructions

<table>
<thead>
<tr>
<th>UNF TORQUE / PAR</th>
<th>Nm</th>
<th>lb.inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/8-14</td>
<td>10</td>
<td>26.5</td>
</tr>
<tr>
<td>10-32</td>
<td>26.5</td>
<td>3 Nm</td>
</tr>
</tbody>
</table>

COPPER WIRE ONLY

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© 2023 Littelfuse, Inc.
**LS60400 500 V DC SERIES DISCONNECT SWITCH**

500 V dc • 400 A • 1 Pole
500 V dc • 400 A • 2 Pole (250 V dc per pole)

---

**Description**
The Littelfuse LS6 dc series is an energy-efficient, compact disconnect switch that quickly breaks or resumes the flow of current safely to prevent shock hazards when trying to isolate circuits or repair systems.

**Features/Benefits**
- Streamline design eliminates the need for external bridging links (jumpers) to lower heat dissipation for increased energy efficiency, decreased installation and maintenance time, and reduced footprint for added design flexibility
- High-level disconnection insulation provides a barrier to stop conduction when switch is in off position for added safety
- The self-cleaning blade contacts eliminate performance degradation (from increased electrical resistance over time) to ensure consistent behavior across the product’s lifespan
- The internally-located “sandwich-type” 2-contact symmetrical design mitigates the electromagnetic force of repulsion to offer enhanced functionality in short-circuit conditions
- Meets UL 94 flammability requirements with self-extinguishing/non-flammable materials to prevent fires

**Applications**
- Solar/PV systems: combiner boxes, recombiner boxes and inverters
- Energy storage systems: disconnection of batteries, containerized batteries
- Oil & gas: dc drives
- Railway: earthing switches and battery disconnection
- UPS: switching and isolation of batteries

**Web Resources**
For more information, visit: littelfuse.com/DcDisconnectSwitch

---

**Specifications**

**UL 98B Standards**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Voltage Rating</td>
<td>500 V dc</td>
</tr>
<tr>
<td>Amperage Rating</td>
<td>400 A</td>
</tr>
<tr>
<td>SCCR Rating</td>
<td>10 kA</td>
</tr>
<tr>
<td>Ambient Temperature</td>
<td>-20 to 50 °C (-4 to 122 °F)</td>
</tr>
</tbody>
</table>

**IEC 60947-3 Standards**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation Voltage Rating Ui</td>
<td>1500 V dc</td>
</tr>
<tr>
<td>Impulse Withstand Voltage Rating Uimp</td>
<td>12 kV</td>
</tr>
</tbody>
</table>

**Operational Current DC21B Rating**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational Current DC21B</td>
<td>400 A / 500 V dc</td>
</tr>
</tbody>
</table>

**Other Characteristics**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Losses at 400 A</td>
<td>2 Pole (2L): 9.2 watts/pole</td>
</tr>
<tr>
<td></td>
<td>1 Pole (1V): 18.4 watts total</td>
</tr>
<tr>
<td>Minimum Connection Wire Range / AWG</td>
<td>300 kcmil/MCM (152 mm²)</td>
</tr>
<tr>
<td>Maximum Connection Wire Range / AWG</td>
<td>350 kcmil/MCM (177 mm²)</td>
</tr>
</tbody>
</table>

**Number of Circuits/Switches**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Operations</td>
<td>8,000</td>
</tr>
<tr>
<td>Tightening Torque</td>
<td>212 lbf-in (24 N•m)</td>
</tr>
<tr>
<td>Material</td>
<td>Plastic housing</td>
</tr>
<tr>
<td></td>
<td>Silver-plated copper terminals</td>
</tr>
<tr>
<td>Base Mounting</td>
<td>Screws</td>
</tr>
</tbody>
</table>

**Approvals**

- UL 98B & UL 94
- UL Guide WHVA
- UL Listed E511898
- IEC 60947-3
- CE
- EAC

**Environmental**

- RoHS compliant
- REACH

**Country of Origin**

Spain

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**Recommended Accessories**

- **Panel handle with shaft LDSLA21** for closed panel door access
- **Direct handle LDSLI21** for open panel door access
- **Auxiliary contacts LD5LAU01** remotely indicate switch position
- **Phase barriers LDRSF21 (Type 1V) and LDRSF22 (Type 2L)** isolate sections to eliminate arcing between the phases
- **Terminal lug LDRTL22W** safely connects electrical and mechanical devices (phase barriers must be used in order to maintain the required clearance)
- **Terminal shrouds LDRCU21W** offer protection against direct contact after wiring
- **Spacers LREL21W** increase distance between switch and mounting plate
## Part Numbering System

**LS6  0400  1V  S  00L**

- **Series**
- **Amperage**
- **Configuration Type**
  - 1V = 1 Pole
  - 2L = 2 Pole

## Configuration

- **Type 1V (1 Pole)**
- **Type 2L (2 Pole)**

## Ordering Information

<table>
<thead>
<tr>
<th>DC DISCONNECT SWITCH</th>
<th>SERIES</th>
<th>TOTAL VOLTAGE</th>
<th>AMPERAGE</th>
<th>INSTALLATION</th>
<th>CONFIGURATION</th>
<th>POLES</th>
<th>SINGLE UNIT WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS604001VS00L</td>
<td>500 V dc</td>
<td>400 A</td>
<td>Grounded</td>
<td>Type 1V</td>
<td>1</td>
<td>2 kg</td>
<td></td>
</tr>
<tr>
<td>LS604002LS00L</td>
<td>500 V dc</td>
<td>400 A</td>
<td>Ungrounded</td>
<td>Type 2L</td>
<td>2</td>
<td>3 kg</td>
<td></td>
</tr>
</tbody>
</table>

## Dimensions Millimeters

### Dc Disconnect Switch

- **Switch + Direct Handle - Side View**

### Panel Handle with Shaft

- **Panel Handle with Shaft**

### Auxiliary Contact

- **LDLSA21**

## Terminal Lug Measurements

<table>
<thead>
<tr>
<th>LDRTL22W</th>
<th>CONDUCTOR TEMPERATURE RATING</th>
<th>COPPER WIRE ONLY M (TERMINAL TORQUE) (+5%</th>
<th>-10%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 MM² MIN - 350 KCMIL 185 MM² MAX</td>
<td>75 °C</td>
<td>N-M</td>
<td>LB.INCH</td>
</tr>
<tr>
<td></td>
<td>M10</td>
<td>24</td>
<td>212</td>
</tr>
</tbody>
</table>

## Torque and Cable Capacity Instructions

- **DR-TL22**

- **TORQUE / PAR**
  - 6 AWG 16 mm² min
  - 350 kcmil 185 mm² max
  - Lug Bolt 11/16-16 UNF
  - 375 lb.inch
  - 42 N-m
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