Littelfuse®

Expertise Applied | Answers Delivered

SOLAR PRODUCTS CATALOG

SOLAR-RATED

1500 V DC PRODUCTS

OVERVOLTAGE PROTECTION

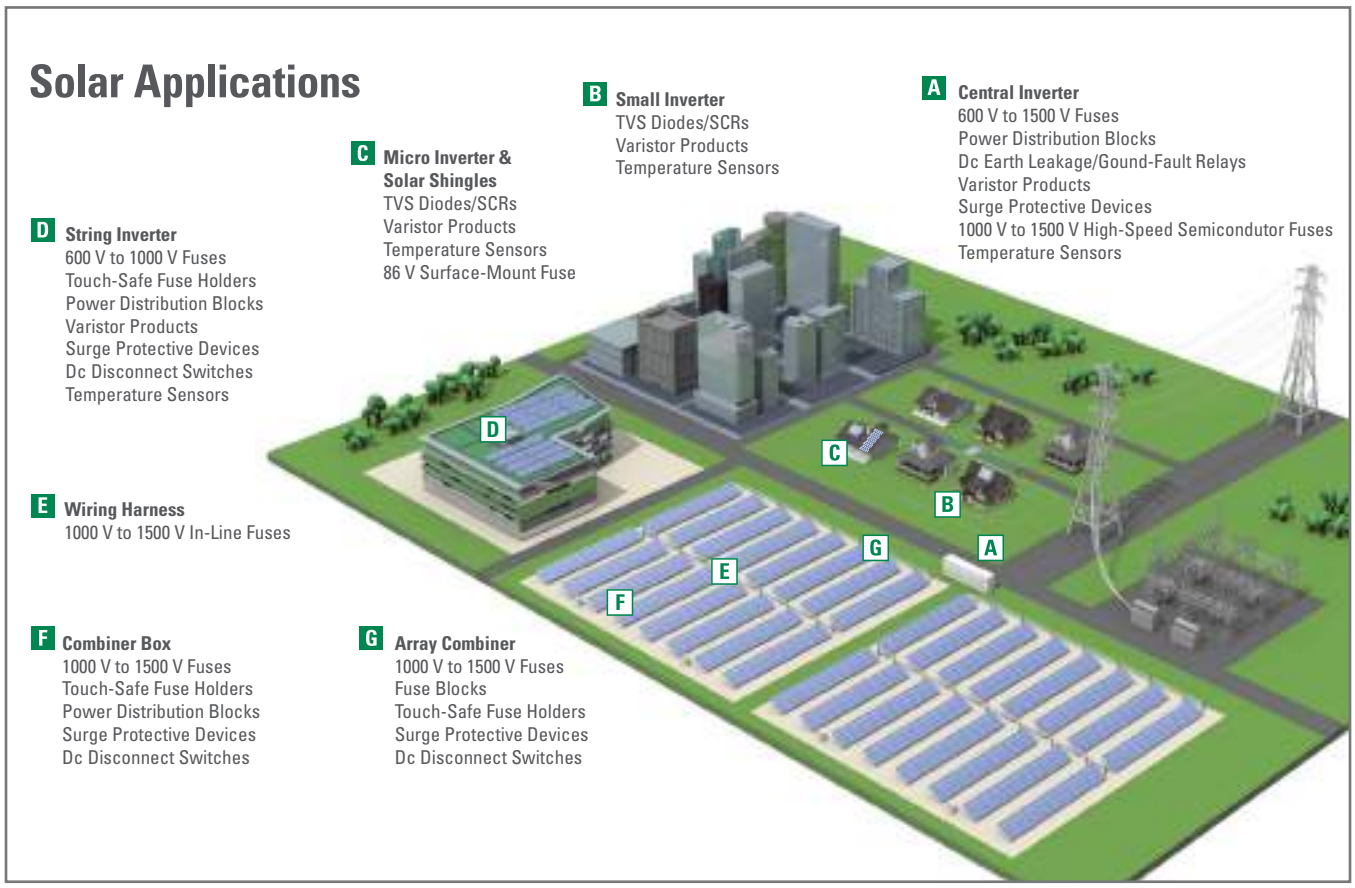
IN-LINE FUSES

PROTECTION RELAYS

SURGE PROTECTION

SWITCH PRODUCTS

Solar-Rated Products by Application



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.

Look for this logo to indicate products that are used in solar applications. Visit our website **Littelfuse.com/Solar** for the latest updates on approvals, certifications, and new products.

Solar Products
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2 1000 V RATED PRODUCTS

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5 OVERVOLTAGE & SWITCHING ELECTRONIC PRODUCTS

6 PROTECTION RELAY PRODUCTS

7 SURGE PROTECTIVE DEVICE PRODUCTS

8 SWITCH PRODUCTS

1500 V dc • 1–60 A

REACH cULus CE gPV RoHS

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: 125004/125005

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-30 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

*SPXV 25 and 30 amp fuses meet electrical performance only.

Part Numbering System

SPXV xxx T –

Series

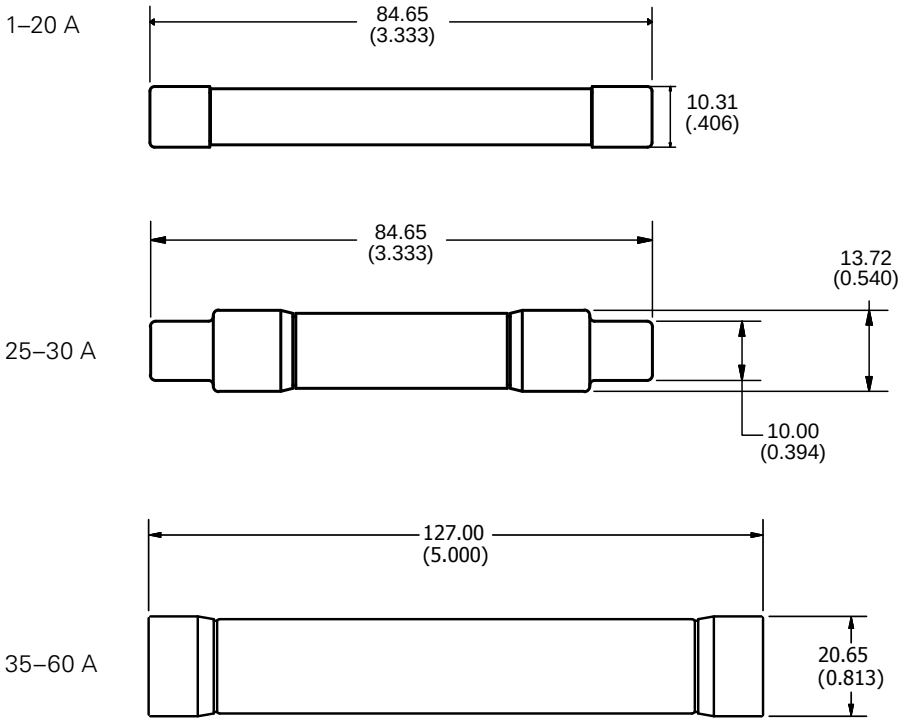
Ampere Code
Refer to Ampere Code Column in Ordering Information Table

Options
Blank = 1–20 A 10 x 85 mm
25–30 A 14 x 85 mm
35–60 A 20 x 127 mm
XM = 25–32 A 10 x 85 mm

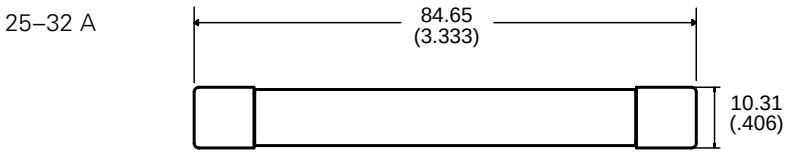
Package Quantity
T = 10
L = 50

SERIES	AMPERAGE	PACKAGE QUANTITY	CATALOG NUMBER	ORDERING NUMBER
SPXV	6	10	SPXV006	SPXV006.T
SPXV	20	50	SPXV020	SPXV020.L
SPXV	32	10	SPXV032-M	SPXV032.TXM
SPXV	60	10	SPXV060	SPXV060.T

SPXV Dimensions mm (in)



SPXV-M Dimensions mm (in)



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 insulted 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 1–30 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 25–32A: 50 kA
Time Constant	≤ 1ms
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

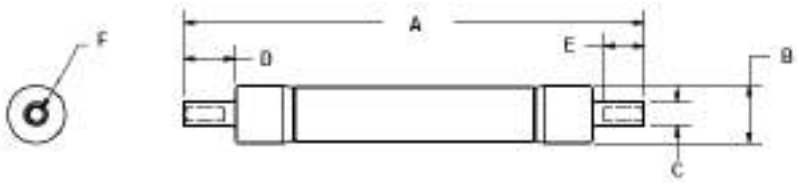
Options
Refer to Ordering Number column in Ordering Information table

Package Quantity
T = 10
L = 50

Web Resources

Download additional technical information and view the complete solar portfolio: **Littelfuse.com/spxi**

Dimensions



SERIES	AMPS	DIMENSIONS IN MM (INCHES)						WIRE RANGE
		A	B	C	D	E	F	
SPXI	2.5–4	81.41 (3.205)	10.31 (0.406)	5.59 (0.22)	12.26 (0.483)	9.53 (0.375)	3.56 (0.14)	10-12 AWG (6-4 mm^2)
	4.5–20	110.06 (4.333)	10.31 (0.406)	5.59 (0.22)	12.26 (0.483)	9.53 (0.375)	3.56 (0.014)	10-12 AWG (6-4 mm^2)
	25–30	110.06 (4.333)	13.72 (0.54)	5.59 (0.22)	12.26 (0.483)	9.53 (0.375)	3.56 (0.014)	10-12 AWG (6-4 mm^2)
	35–50	158.04 (6.222)	20.65 (0.813)	6.7 (0.264)	14.25 (0.561)	10.25 (0.404)	4.7 (0.185)	8 AWG (10mm^2)
SPXI-B	2.5–4	85.4 (3.362)	10.31 (0.406)	6.7 (0.264)	14.25 (0.561)	10.25 (0.404)	4.7 (0.185)	8 AWG (10mm^2)
	4.5–20	114.05 (4.49)	10.31 (0.406)	6.7 (0.264)	14.25 (0.561)	10.25 (0.404)	4.7 (0.185)	8 AWG (10mm^2)
	35–60	163.58 (6.44)	20.65 (0.813)	8.5 (0.335)	17.02 (0.67)	13.72 (0.54)	5.5 (0.217)	6 AWG
SPXI-M	25–32	110.06 (4.333)	10.31 (0.406)	5.59 (0.22)	12.26 (0.483)	9.53 (0.375)	3.56 (0.014)	10-12 AWG (6-4 mm^2)
SPXI-BM	25–32	114.05 (4.49)	10.31 (0.406)	6.7 (0.264)	14.25 (0.561)	10.25 (0.404)	4.7 (0.185)	8 AWG (10mm^2)

1500 V dc • 50–400 A • NH Style

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
Material	Body: ceramic End Bells: copper alloy
Approvals	UL 248-19 Listed (File: E339112)
Applicable Standards	UL 248-1, 248-19 IEC 60269-6
Environmental	RoHS Compliant

Part Numbering System

SPNH XXX .X X DL

Series

Amp Code
Refer to Amp Code Column in Ordering Information table

Package Quantity
X = 1

Case Size*
X = 1XL size
2XL = 2XL size
3L = 3L size

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

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**

SERIES	AMP	PACKAGE QUANTITY	CATALOG NUMBER	ORDERING NUMBER
SPNH	50	1	SPNH050	SPNH050.X
SPNH	200	1	SPNH200	SPNH200.X
SPNH	400	1	SPNH400	SPNH400.XXDLMS

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

Recommended Accessories

1XL Case Size
Fuse Holder: LFNH152001CST
Fuse Terminal Covers: LFNH15200FBC

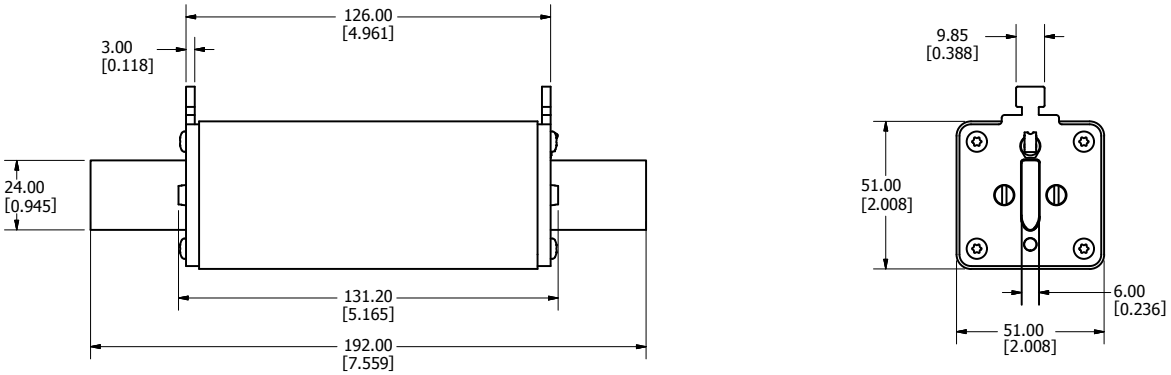
2XL Case Size
Fuse Holder: LFNH154001CST
Fuse Terminal Covers: LFNH15400FBC

3L Case Size
Fuse Holder: LFNH156301CST
Fuse Terminal Covers: LFNH15630FBC

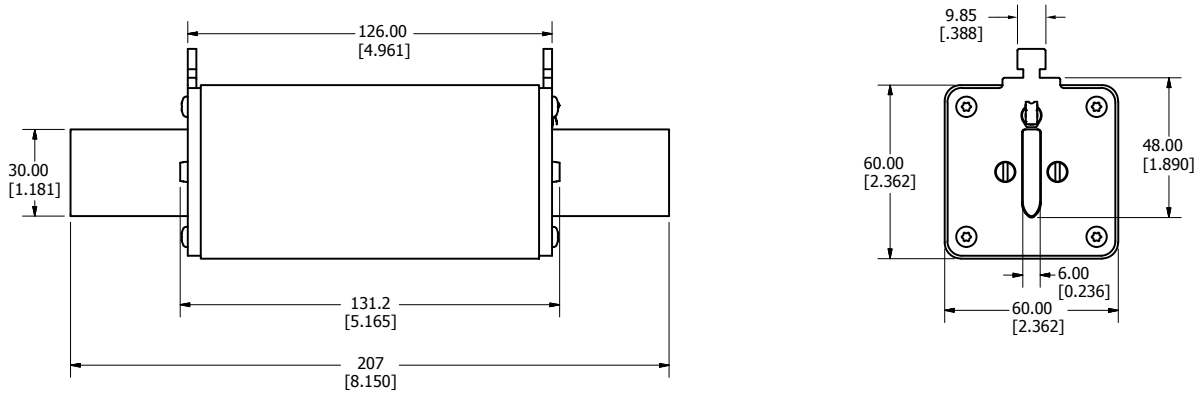
Microswitch
MSSPNH1500X

Dimensions Millimeters (in)

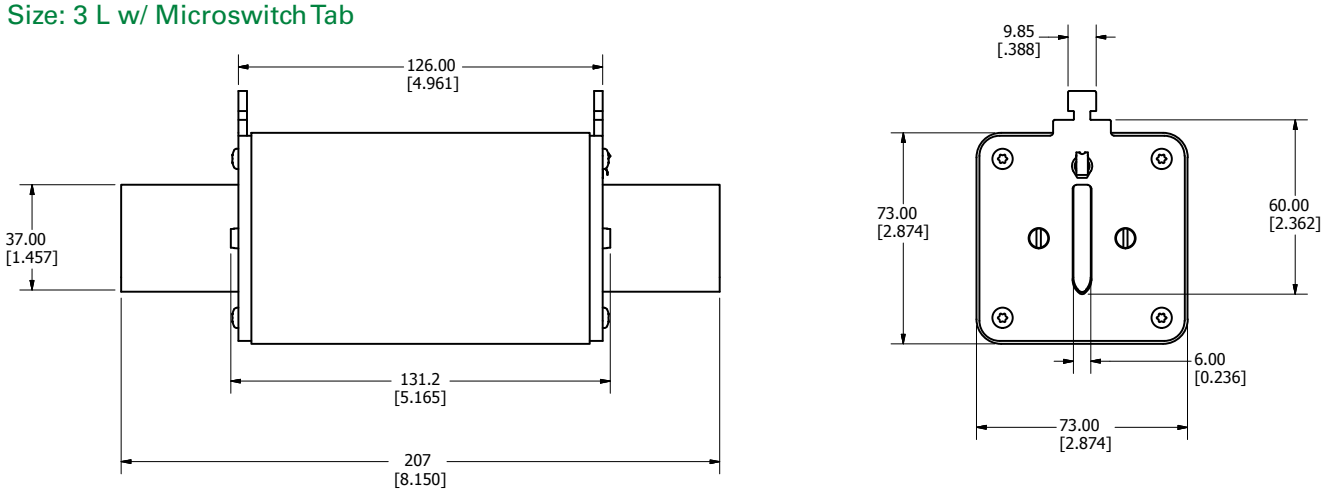
Size: 1 XL w/ Microswitch Tab



Size: 2 XL w/ Microswitch Tab

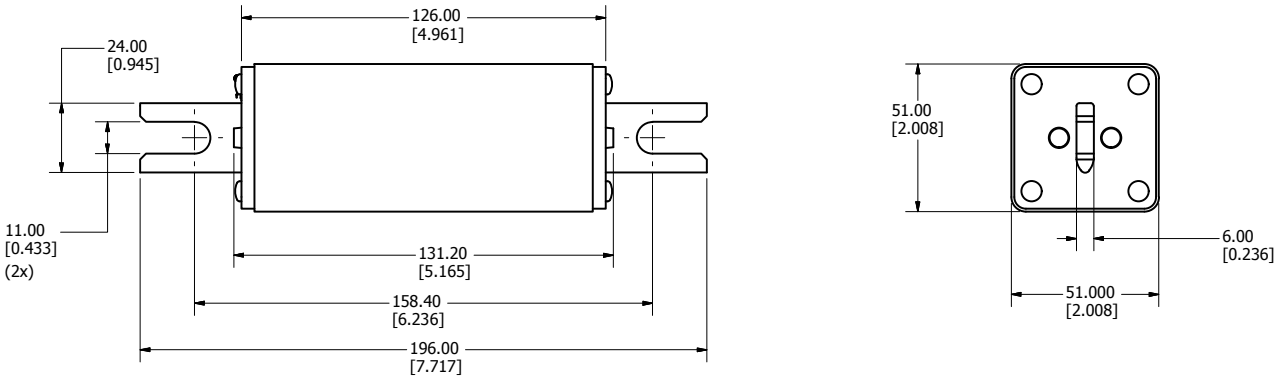


Size: 3 L w/ Microswitch Tab

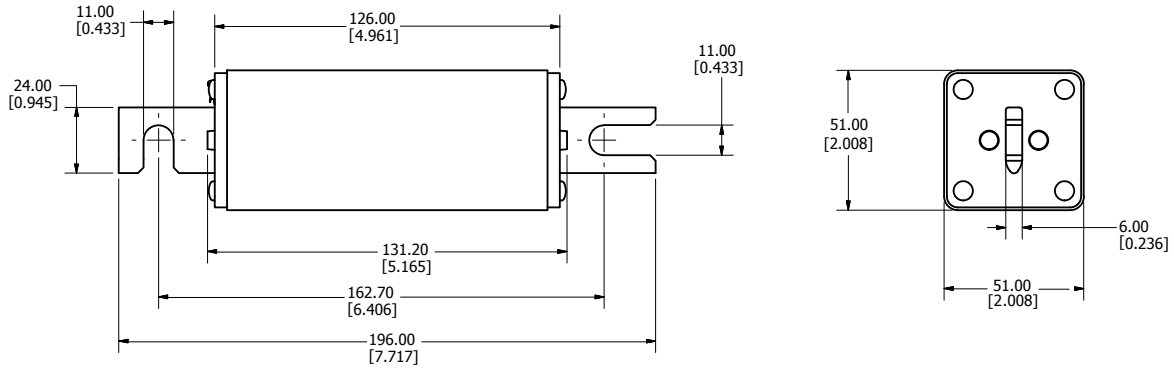


Dimensions Millimeters (in)

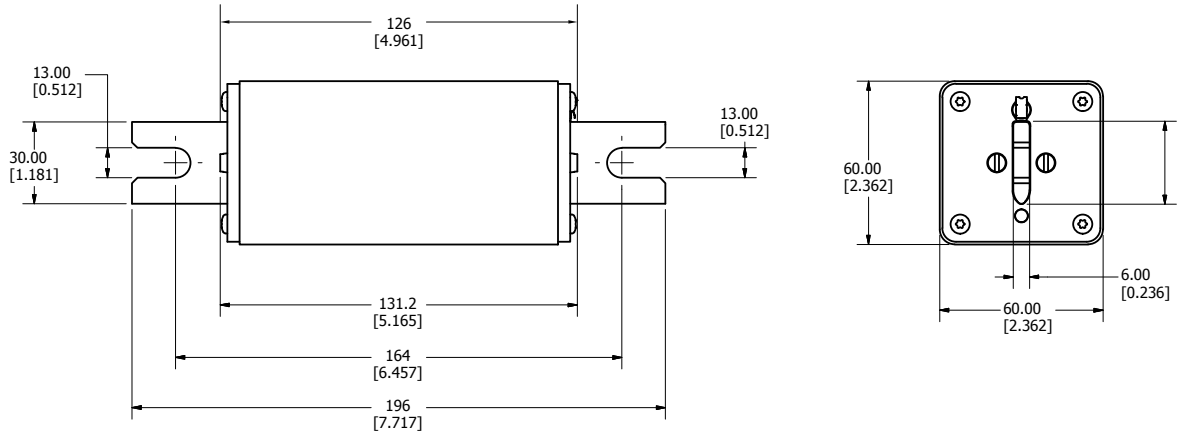
Size: 1XL DE Blade
Recommended Torque: 44 Nm*



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



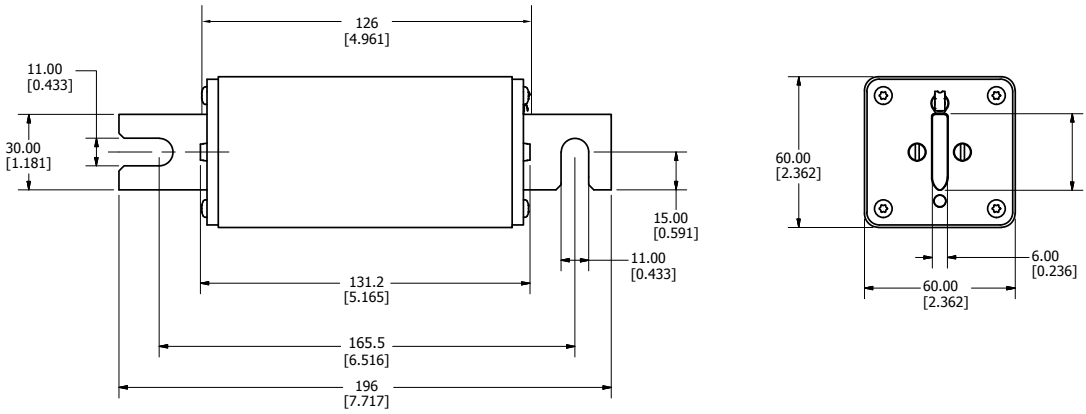
Size: 2 XL DE Blade
Recommended Torque: 77 Nm*



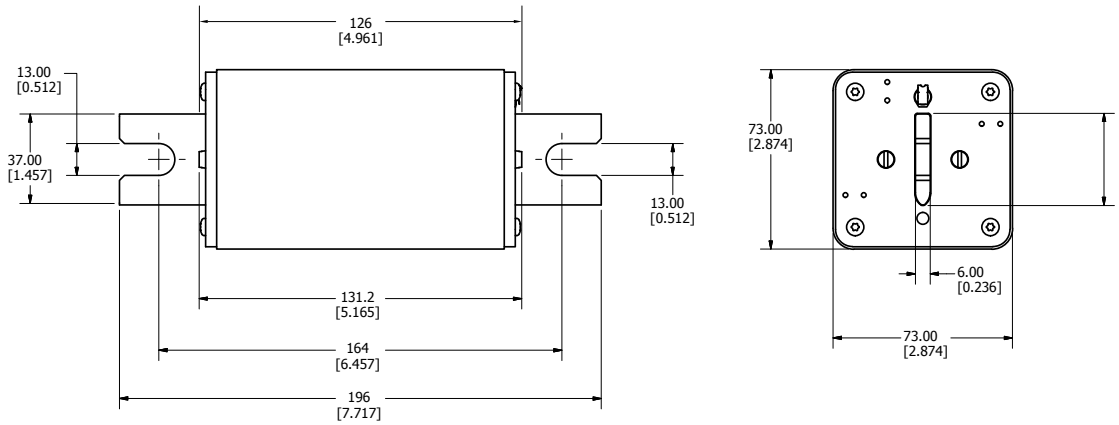
*recommended torque values are for grade 8 steel hardware

Dimensions Millimeters (in)

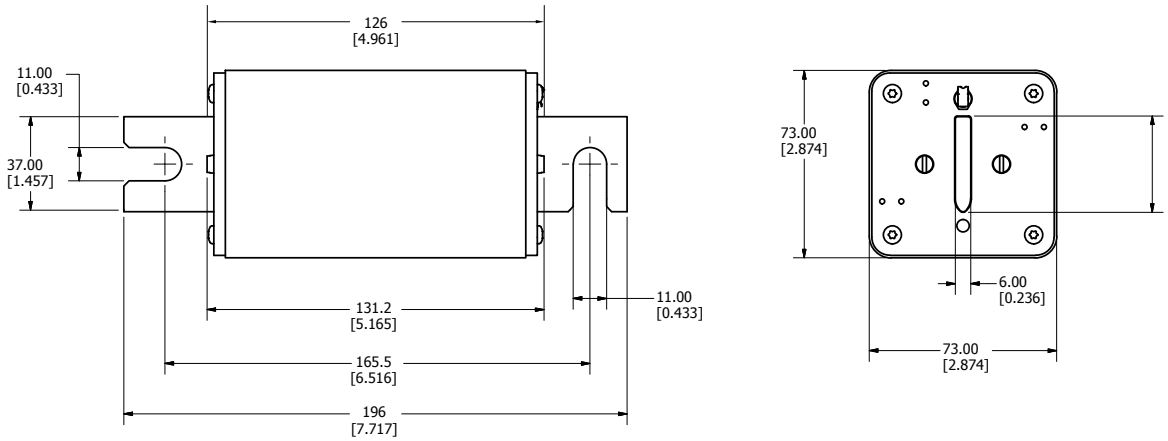
Size: 2 XL DL Blade
Recommended Torque: 44 Nm*



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



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

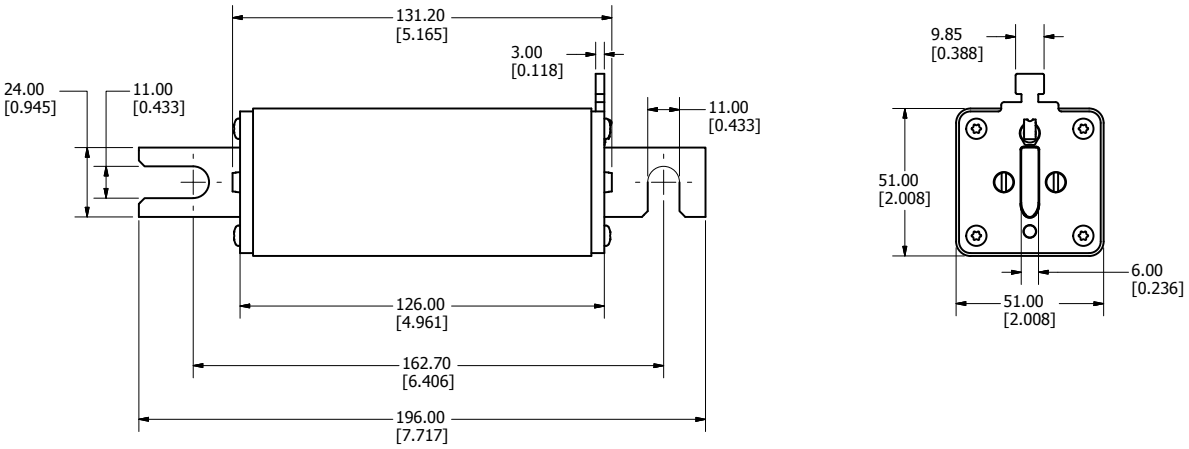


*recommended torque values are for grade 8 steel hardware

Dimensions Millimeters (in)

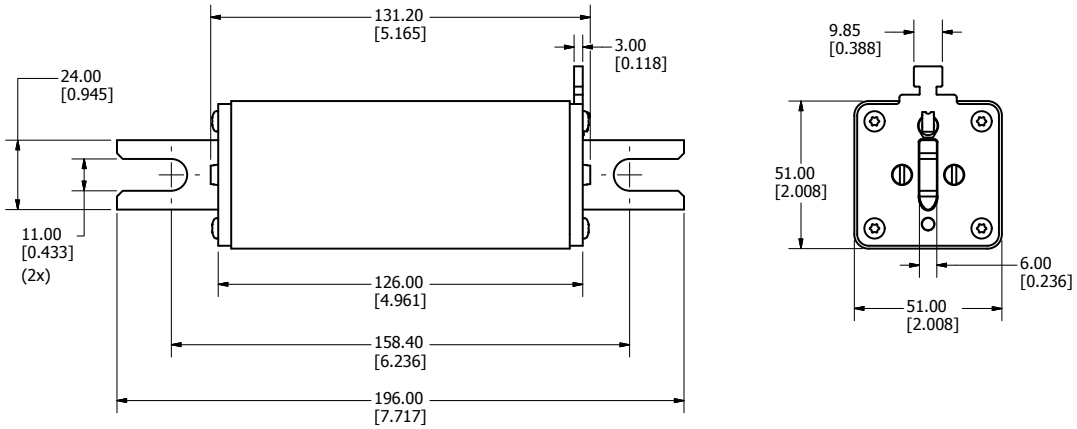
Size: 1 XL DL Blade w/ Microswitch Tab

Recommended Torque: 44 Nm*



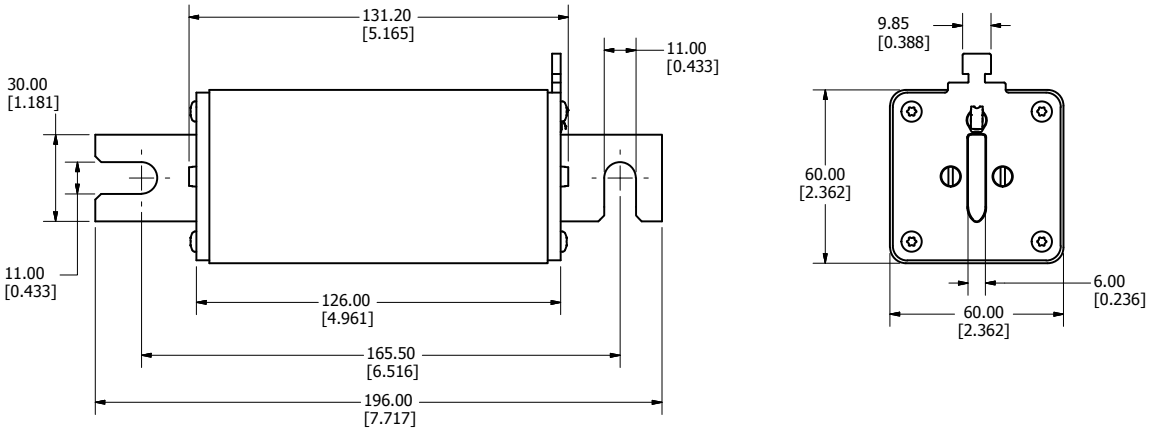
Size: 1 XL DE Blade w/ Microswitch Tab

Recommended Torque: 44 Nm*



Size: 2 XL DL Blade w/ Microswitch Tab

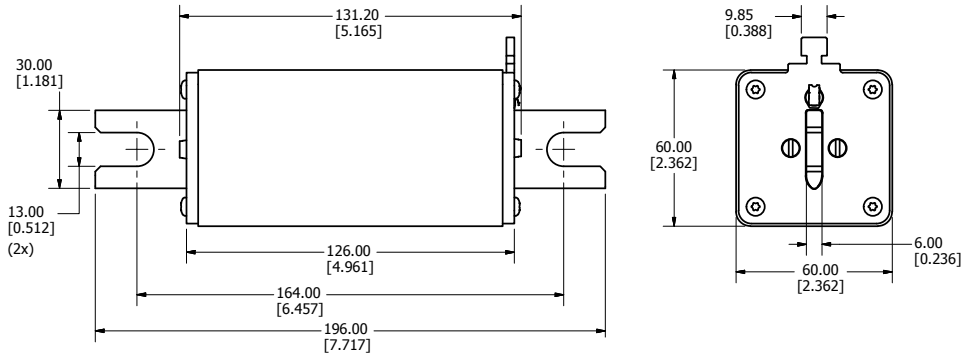
Recommended Torque: 44 Nm*



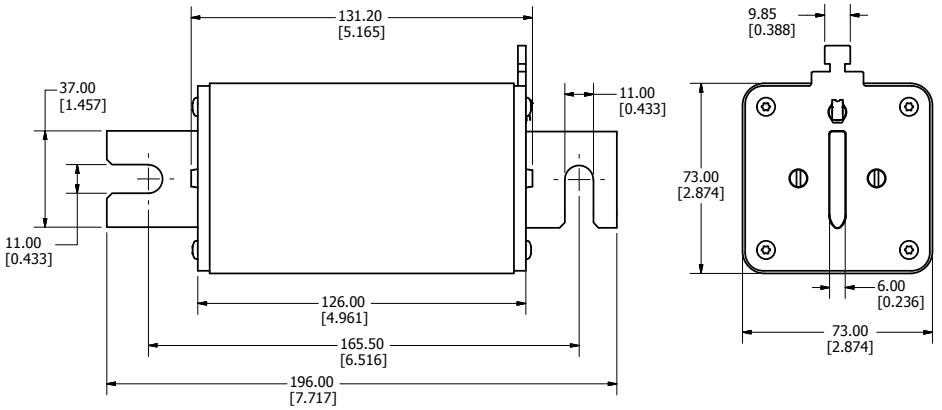
*recommended torque values are for grade 8 steel hardware

Dimensions Millimeters (in)

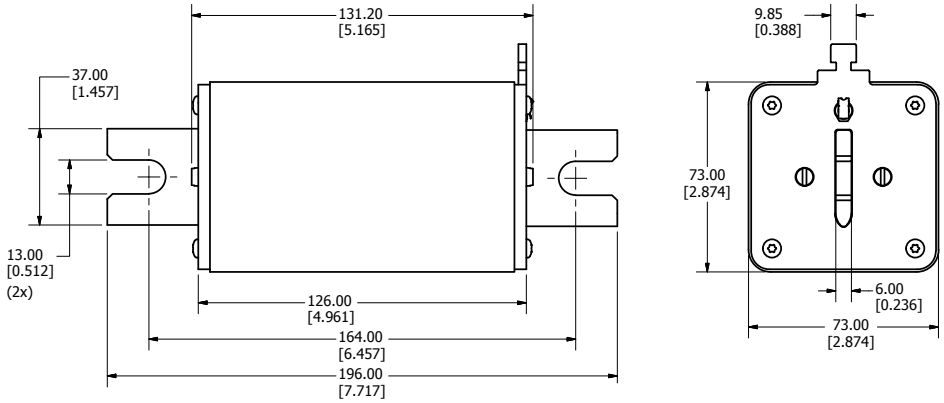
Size: 2 XL DE Blade w/ Microswitch Tab
Recommended Torque: 77 Nm*



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

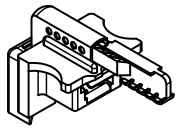


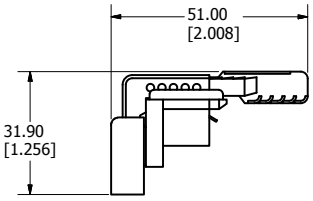
Size: 3 L DE Blade w/ Microswitch Tab
Recommended Torque: 77 Nm*



*recommended torque values are for grade 8 steel hardware

Microswitch
MSSPNH1500X





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1500 V • 35–60 A

REACH RoHS

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

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

BUSBAR SPECIFICATIONS			
TERMINAL	THICKNESS	WIDTH	TORQUE
Maximum	0.250 in (6.35 mm)	0.290 in (7.37 mm)	25 lb-in (2.8 N-m)
Minimum	0.125 in (3.18 mm)	0.200 in (5.08 mm)	25 lb-in (2.8 N-m)

Web Resources

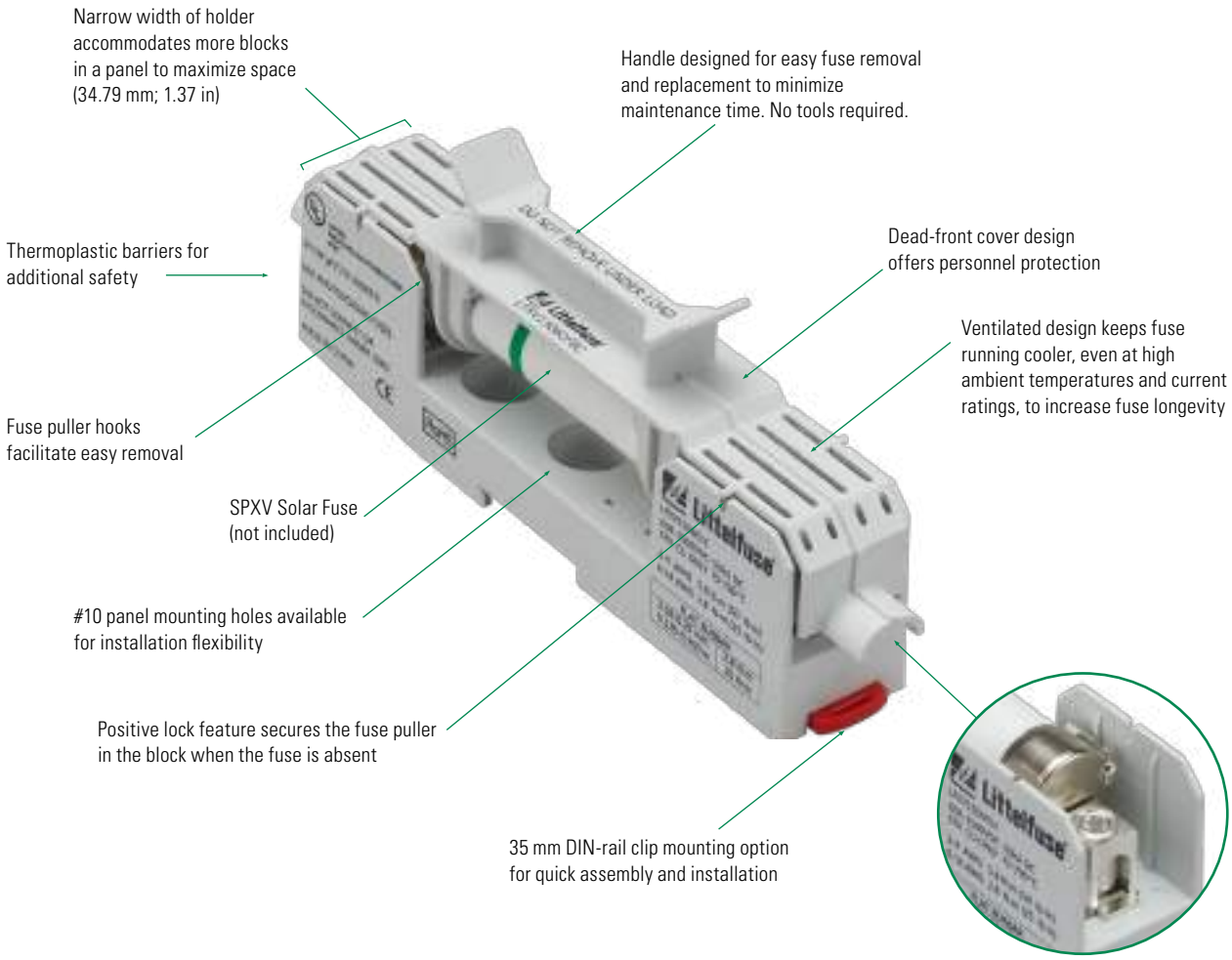
Download the complete datasheet and other technical documents: **Littelfuse.com/LFXV15**

Ordering Information

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

*For replacement only: Fuse Block LFXV150601C or Cover LFXV15060FBC

LFXV15 Features & Benefits



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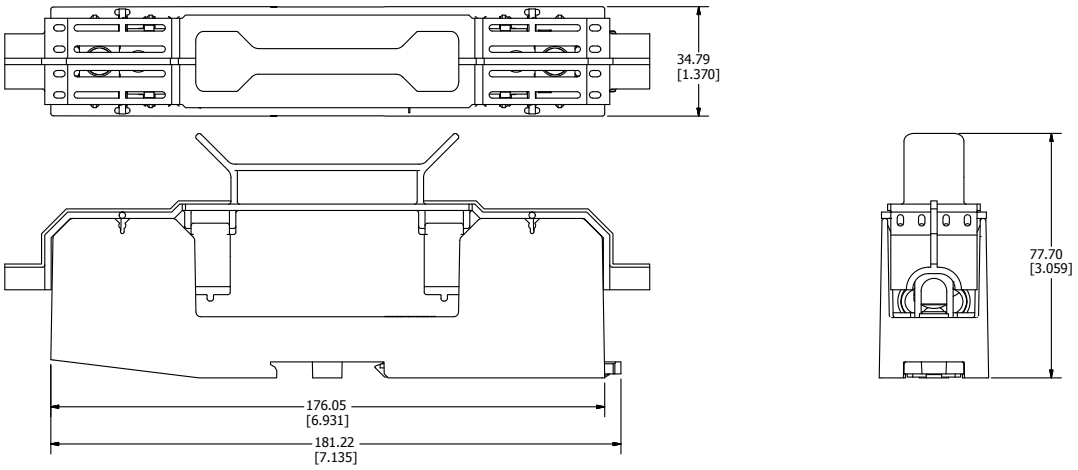
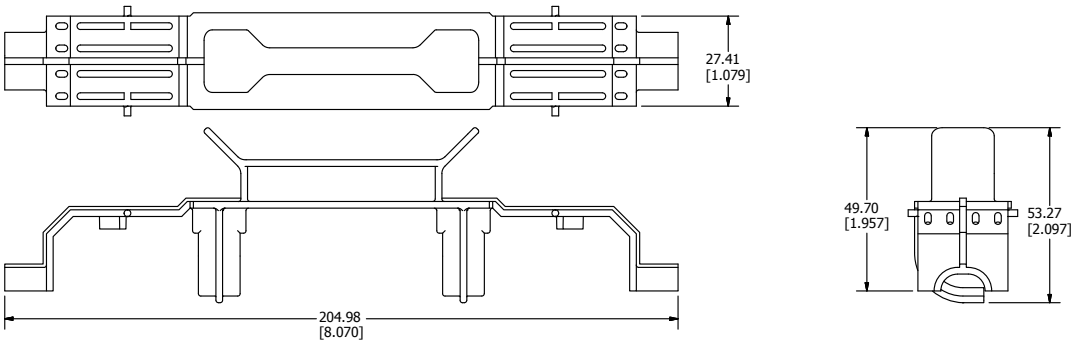
Dimensions Millimeters (in)

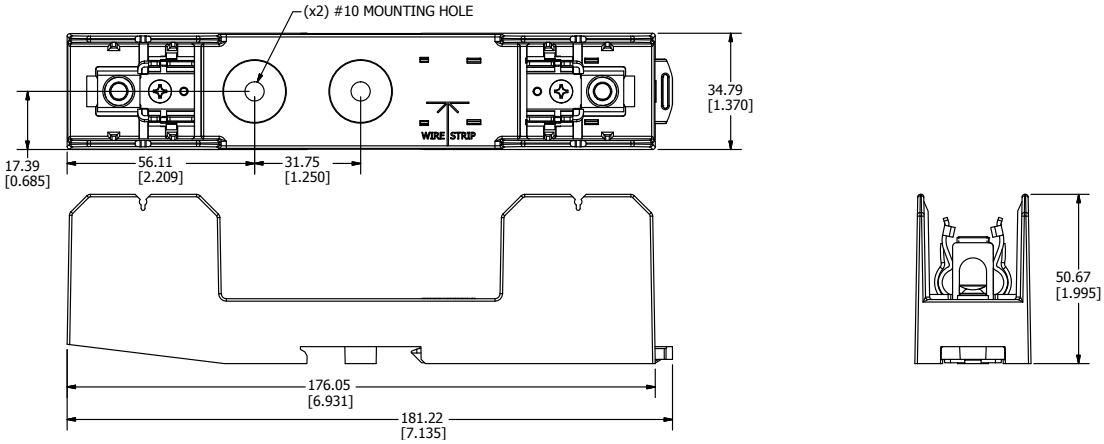
Fuse Block & Cover Assembly: LFXV15060-BC



Fuse Cover: LFXV15060FBC



Fuse Block: LFXV150601C



Look for this logo to indicate products that are used in solar applications. Visit our website **Littelfuse.com/Solar** for the latest updates on approvals, certifications, and new products.

1500 V • 30 A

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 Fuse Clip: Silver-plated copper alloy Screws: Zinc-plated steel
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 60269-6
Environmental	RoHS compliant, Lead (Pb) free, REACH
Recommended DIN Rail	TH 35-7,5 per IEC 60715

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**

MATERIAL AND TEMP RATING	WIRE TYPE
75 °C or 90 °C CU Only Stranded	UL Class B and Class C wire
	AlphaWire PV Series Photovoltaic Wire
	IEC Class 5 Flexible Wire

BUSBAR SPECIFICATIONS			
TERMINAL	THICKNESS	WIDTH	TORQUE
Maximum	0.188 in (4.78 mm)	0.290 in (7.37 mm)	24-28 lb-in (2.71-3.16 N-m)
Minimum	0.125 in (3.18 mm)	0.200 in (5.08 mm)	

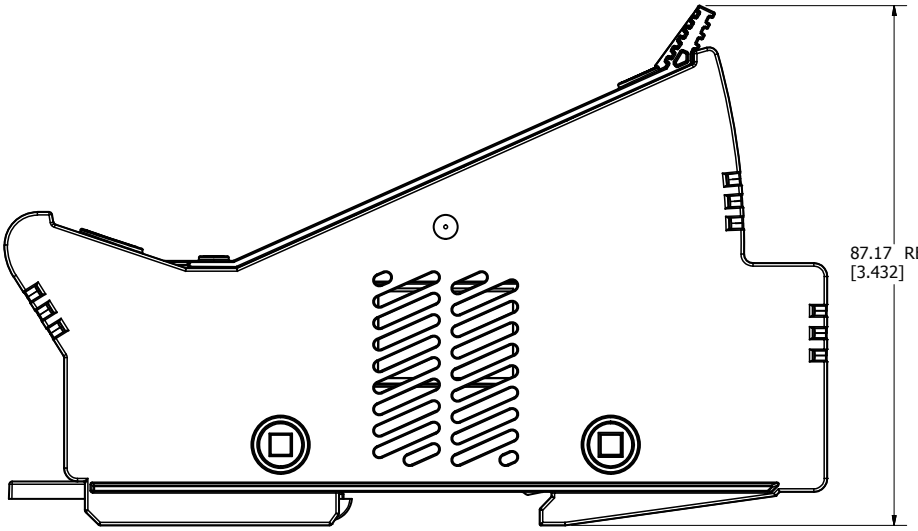
Ordering Information

SERIES	VOLTAGE (V dc)	POLES	CATALOG NUMBER	ORDERING NUMBER	PACK QTY	TERMINAL INFORMATION			
						TERMINAL TYPE	NUMBER OF WIRES	WIRE SIZE	TORQUE
LFPXV	1500	1	LFPXV001	LFPXV0001Z	20	Box Lug	1	4-14 AWG (25-2.5 mm^2)	24-28 lb-in (2.71-3.16 N-m)
							1	16-18 AWG (1.5-0.75 mm^2)	18-22 lb-in (2.03-2.49 N-m)
							2*	6-14 AWG (16-2.5 mm^2)	26-30 lb-in (2.94-3.69 N-m)
							2*	16-18 AWG (1.5-0.75 mm^2)	20-24 lb-in (2.26-2.71 N-m)

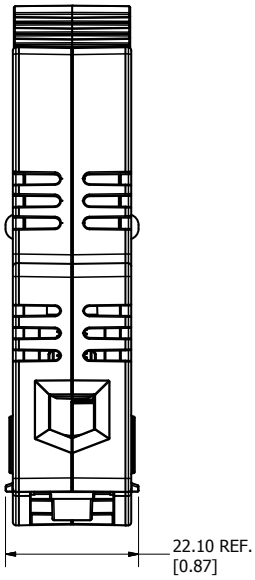
*Must be the same cross-sectioned size

1

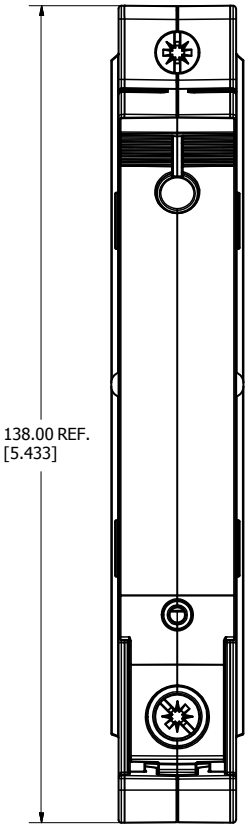
Dimensions Millimeters (in)



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
Base Temp Rating	
Approvals	UL4248-1 UL4248-19 FILE: E345481 Vol. 2
Environmental	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

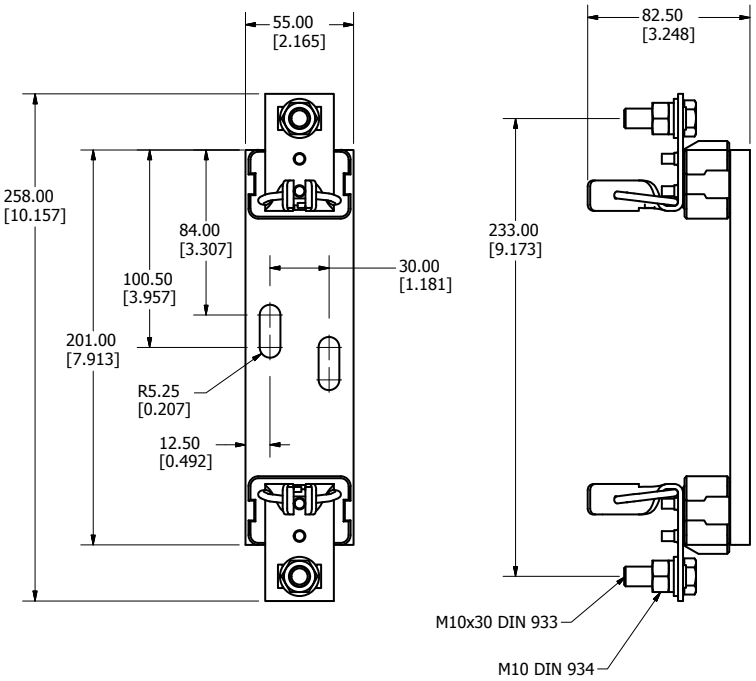
Ordering Information

AMPERAGE	ORDERING NUMBER	FUSE SIZE	RECOMMENDED TORQUE		TERMINAL COVER ORDERING NUMBER*
			TERMINAL	BASE	
200	LFNH152001CST	NH1XL	283 in-lb (32 N-m)	132 in-lb (15 N-m)	LFNH15200FBC
400	LFNH154001CST	NH2XL	283 in-lb (32 N-m)	132 in-lb (15 N-m)	LFNH15400FBC
630	LFNH156301CST	NH3L	283 in-lb (32 N-m)	132 in-lb (15 N-m)	LFNH15630FBC

*Terminal covers sold separately

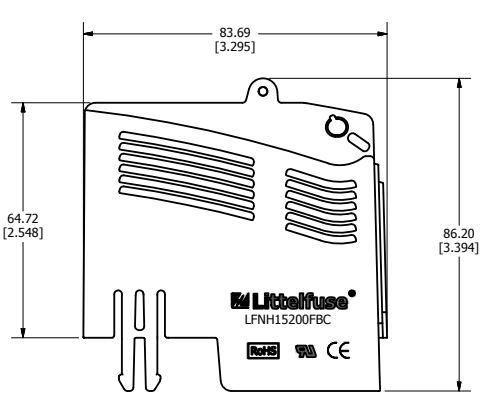
1

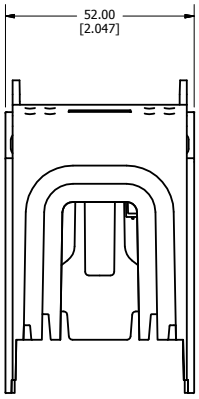
Dimensions Millimeters (in)



Fuse Block

LFNH152001CST





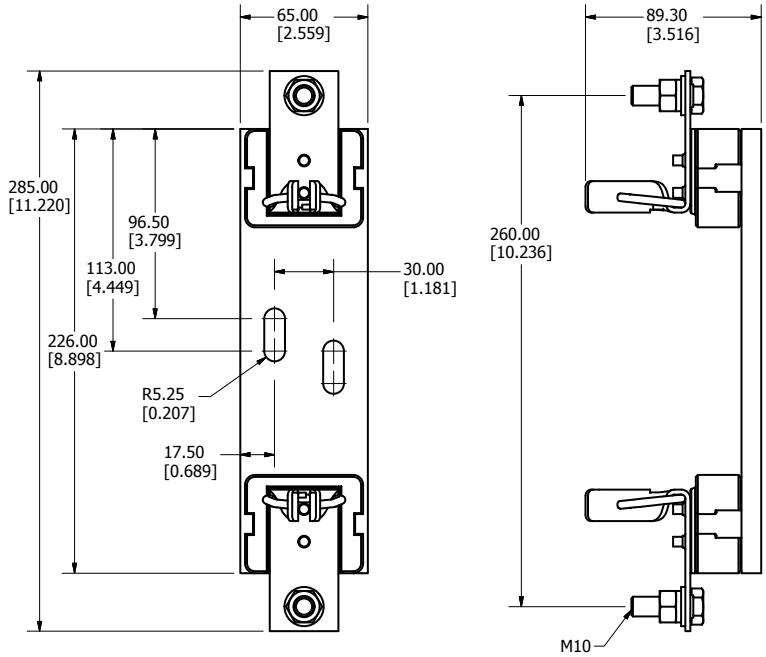
Fuse Terminal Cover

LFNH15200FBC

Specifications

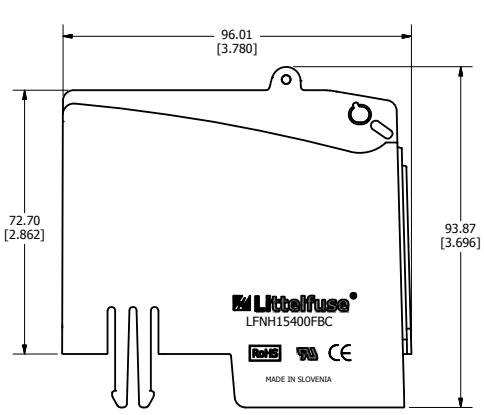
Voltage Rating:	1500 V
Ampere Rating:	200 amperes
Flammability Rating:	UL 94 V-0
Material:	V0-rated Nylon
Packaging:	Sold in pairs

Dimensions Millimeters (in)



Fuse Block

LFNH154001CST



Fuse Terminal Cover

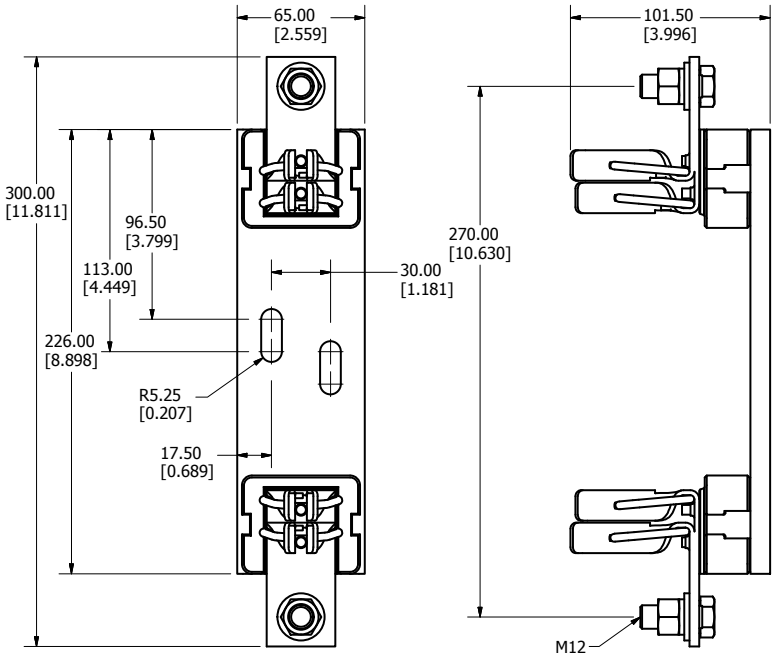
LFNH15400FBC

Specifications

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

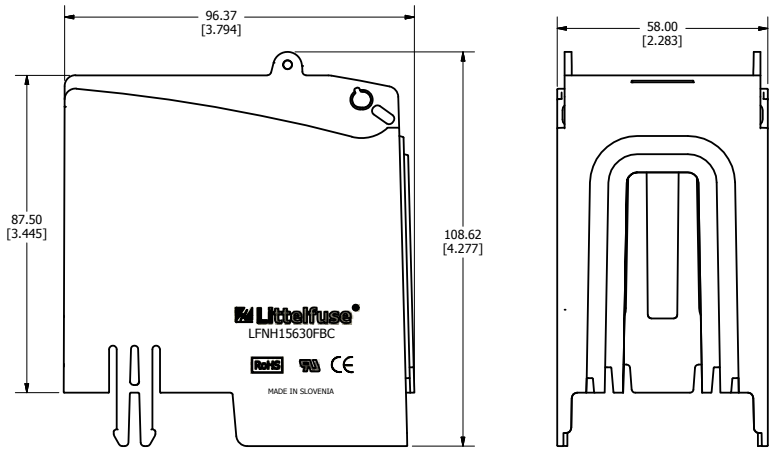
1

Dimensions Millimeters (in)



Fuse Block

LFNH156301CST



Fuse Terminal Cover

LFNH15630FBC

Specifications

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

1000 V dc • 70–450 A

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 600 V ac (125-450 A)
Amperage Rating	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

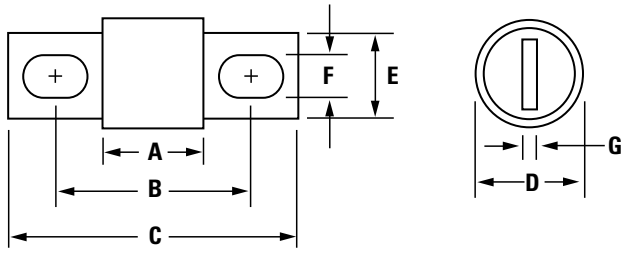
Amp Code
Refer to Amp Code Column in Electrical Specifications Table

Mounting Options
Blank = Std. Class J Dimensions
XL = 8.5mm Slot (125 - 200A Only)

Package Quantity
X = 1

SERIES	AMPERAGE	PACKAGE QUANTITY	CATALOG NUMBER	ORDERING NUMBER
SPFJ	70	1	SPFJ070	SPFJ070.X
SPFJ	200	1	SPFJ200	SPFJ200.XXL

Dimensions Inches (mm)



AMPERAGE	DIMENSIONS IN INCHES (MM)						
	A	B	C	D	E	F	G
70-100	3.02 (76.5)	4.38 (111.3)	5.75 (146.1)	1.5 (38.1)	1.125 (28.3)	.335 (8.5)	.189 (4.8)
125-200	3.02 (76.5)	4.38 (111.3)	5.75 (146.1)	1.5 (38.1)	1.125 (28.3)	.281 (7.1)*	.189 (4.8)
250-400	3.37 (85.7)	5.25 (133.4)	7.125 (181.0)	2.0 (50.8)	1.63 (41.3)	.406 (10.3)	.252 (6.4)
450	3.75 (95.3)	5.98 (152.0)	8.0 (203.2)	2.5 (63.5)	2.0 (50.8)	.531 (13.5)	.374 (9.5)

* SPFJ L option = 8.5 mm (UL 248-19 approval only)

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: 125004/125005

Web Resources

Download technical documents: **Littelfuse.com/SPF**

Specifications

Voltage Rating	1000 V dc
Amperage Rating	1, 2, 3, 3.5, 4, 5, 6, 8, 10, 12, 15, 20, 25, 30
Max. Interrupting Rating	20 kA - 1 A - 20 A 50 kA - 25 A - 30 A
Time Constant	≤ 2ms
Material	Body: Melamine Caps: Copper Alloy
Approvals	UL Listed (File: E339112) CSA Certified (File: 029862_0_000) TUV (Cert: J 50494849)
Applicable Standards	UL 248-1, 248-19 IEC 60269-6
Environmental	RoHS Compliant
Country of Origin	Mexico

Part Numbering System

0SPF xxxx H XR

Series

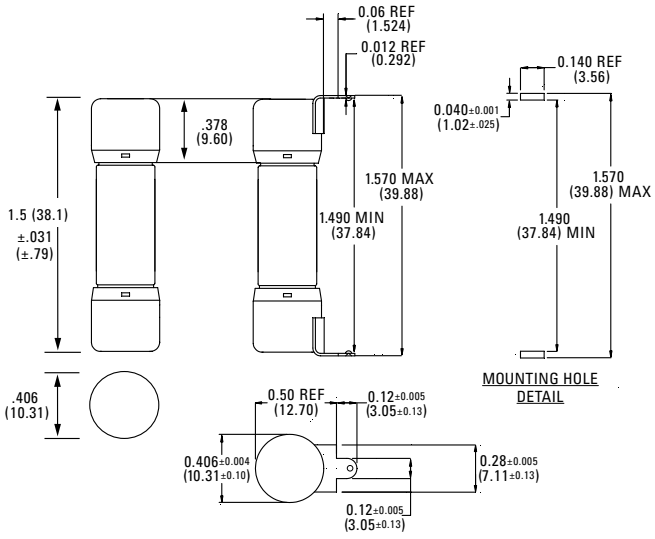
Amp Code
Refer to Ordering Information table

Mounting Options
Blank = Ferrule
XR = PCB

Package Quantity
T = 10 Fuses
H = 100 Fuses

Dimensions Inches (mm)

Ferrule Version **PCB Version**



1000 V dc • 2–30 A

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.

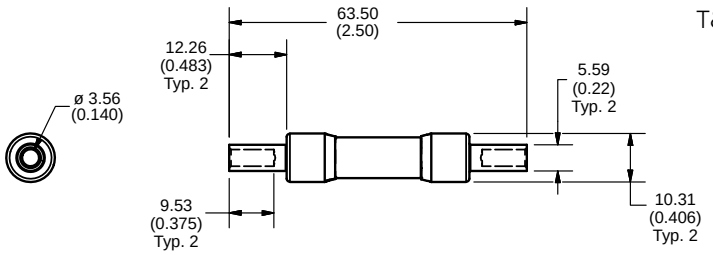
Features/Benefits

- 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)



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 50505290)
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

SPFI xxx T

Series

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

1000 V dc • Clip-to-Box • Stud-to-Stud • Clip-to-Stud

Clip-to-Box Stud-to-Stud Clip-to-Stud

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

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

Ordering Information

(Clip-to-Box Lug 1000 V)

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

(Stud-to-Stud 1000 V)

AMPERAGE	ORDERING NUMBER	INTERRUPT RATING	RECOMMENDED TORQUE		MAX. BUSBAR THICKNESS	RECOMMENDED BASE TORQUE	
			FUSE	TERMINAL		BOLT SIZE	TORQUE
200	LFJ102001STST	20 kA	65 in-lb (7.3 N-m)	200 in-lb (22.6 N-m)	.774" (19.66 mm)	1/4" 5/16"	30-40 in-lb 40-50 in-lb
400	LFJ104001STST	10 kA	170 in-lb (19.2 N-m)	200 in-lb (22.6 N-m)	.555" (14.10 mm)		
450	LFJ104501STST	20 kA	300 in-lb (33.9 N-m)	300 in-lb (33.9 N-m)	.570" (14.18 mm)		

(Clip-to-Stud 1000 V)

AMPERAGE	ORDERING NUMBER	INTERRUPT RATING	RECOMMENDED TORQUE	MAX. BUSBAR THICKNESS	RECOMMENDED BASE TORQUE	
			TERMINAL		BOLT SIZE	TORQUE
200	LFJ102001CST	20 kA	200 in-lb (22.6 N-m)	.774" (19.66 mm)	1/4" 5/16"	30-40 in-lb 40-50 in-lb
400	LFJ104001CST	10 kA	200 in-lb (22.6 N-m)	.555" (14.10 mm)		
450	LFJ104501CST	20 kA	300 in-lb (33.9 N-m)	.570" (14.18 mm)		

1000 V dc

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
Environmental	RoHS compliant, Lead (Pb) Free

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

Multi-Pole Assembly Kit

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

ORDERING NUMBER	DESCRIPTION
CYHP001	20 Connector Pincers & 10 Handle Pins
CYHP002	Connector Pincer Only
CYHP003	Handle Pin Only

Web Resources

Sample requests, downloadable CAD drawings and other technical information: **Littelfuse.com/lphv**

More information about solar applications: **Littelfuse.com/solar**

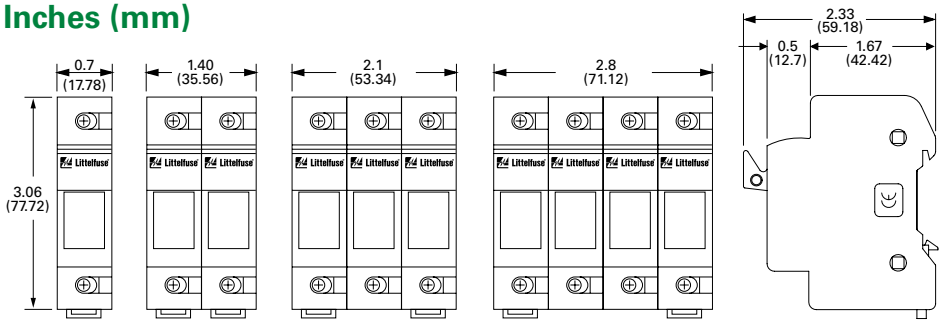
Recommended Fuses

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

Ordering Information

SERIES	POLES	CATALOG NUMBER	ORDERING NUMBER	TERMINAL TYPE	WIRE TYPE		WIRE RANGE	TERMINAL TORQUE	ROHS
LPHV	1	LPHV001	LPHV0001Z	Pressure Plate	75 °C or 90 °C CU Only	Stranded / [Solid]	#8-14 AWG (2-10 mm²) / [#10-14 AWG (2-6 mm²)]	17.7 in-lbs (2 N-m)	•
LPHV	2	LPHV002	LPHV0002Z						•
LPHV	3	LPHV003	LPHV0003Z						•
LPHV	4	LPHV004	LPHV0004Z						•

Dimensions Inches (mm)



Front View

Side View

POWR-BAR Distribution

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	25 mm²
END FED	80 A	100 A
CENTER FED	160 A	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

1 PHASE, 18 mm²		LENGTH (mm)
ORDERING NUMBER	POLES	
1PH3P18mm	3	50
1PH4P18mm	4	79
1PH6P18mm	6	104
1PH9P18mm	9	155
1PH12P18mm	12	208
1PH15P18mm	15	270
1PH57P18mm	57	1009

1 PHASE, 25 mm²		LENGTH (mm)
ORDERING NUMBER	POLES	
1PH3P25mm	3	50
1PH4P25mm	4	79
1PH6P25mm	6	104
1PH9P25mm	9	155
1PH12P25mm	12	208
1PH15P25mm	15	270
1PH57P25mm	57	1009

3 PHASE, 18 mm²		LENGTH (mm)
ORDERING NUMBER	POLES	
3PH6P18 mm	6	104
3PH9P18 mm	6	158
3PH12P18 mm	12	214
3PH15P18 mm	15	266
3PH57P18 mm	57	1009

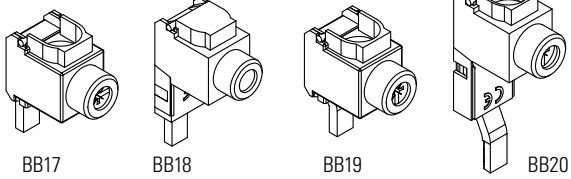
3 PHASE, 25 mm²		LENGTH (mm)
ORDERING NUMBER	POLES	
3PH6P25 mm	6	104
3PH9P25 mm	9	158
3PH12P25 mm	12	214
3PH15P25 mm	15	266
3PH57P25 mm	57	1009

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

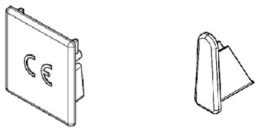
PART NUMBER	AMPERAGE RATING	VOLTAGE (ac/ dc)	WIRE RANGE	WIRE TYPE	TORQUE
BB17	115	1000	#10 - 1/0 AWG	CU	50 lb-in
BB18	115	1000	#10 - 1/0 AWG	CU	50 lb-in
BB19	115	1000	#10 - 1/0 AWG	CU	50 lb-in
BB20	115	1000	#10 - 1/0 AWG	CU	50 lb-in



BB17 BB18 BB19 BB20

Endcaps

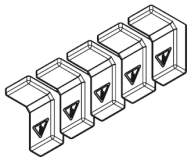
PART NUMBER	PHASE	QUANTITY
EDCP42	Single	50
EDCP7	Three	50



EDCP7 EDCP42

Pole Protective Covers

PART NUMBER	QUANTITY
CTPT5	5



600 V

Description

Littelfuse POWR-Safe dead front holders provide optimum protection to personnel for Class CC and midget-style fuses.

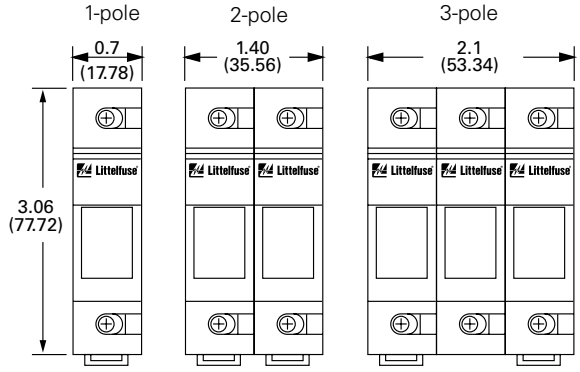
Features/Benefits

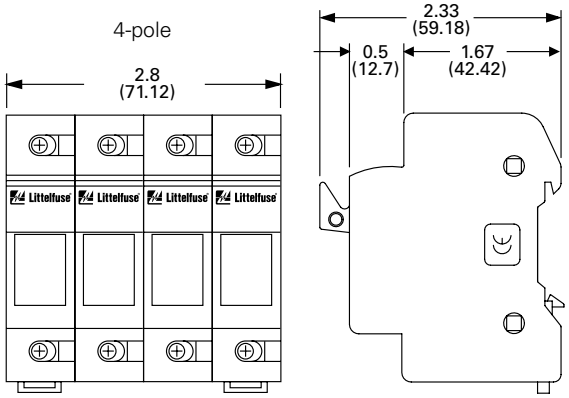
- Indicating and non-indicating options available
- 1-, 2-, 3- and 4-pole configurations
- Easy installation and fuse removal with no additional pullers or tools required
- 35 mm DIN-rail mountable
- Ventilated design for cooler operation

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

Dimensions Inches (mm)





Ordering Information

INDICATING		NON-INDICATING		FUSE TYPE	POLES
CATALOG NUMBER	ORDERING NUMBER	CATALOG NUMBER	ORDERING NUMBER		
LPSC001ID	LPSC0001ZXID	LPSC001	LPSC0001Z	Class CC	1
LPSC002ID	LPSC0002ZXID	LPSC002	LPSC0002Z	Class CC	2
LPSC003ID	LPSC0003ZXID	LPSC003	LPSC0003Z	Class CC	3
LPSC004ID	LPSC0004ZXID	LPSC004	LPSC0004Z	Class CC	4
LPSM001ID	LPSM0001ZXID	LPSM001	LPSM0001Z	Midget	1
LPSM002ID	LPSM0002ZXID	LPSM002	LPSM0002Z	Midget	2
LPSM003ID	LPSM0003ZXID	LPSM003	LPSM0003Z	Midget	3
LPSM004ID	LPSM0004ZXID	LPSM004	LPSM0004Z	Midget	4

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

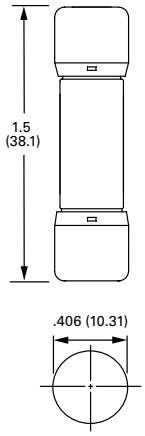
- Designed to UL and IEC photovoltaic specifications
- 1/10 - 30 A ratings available
- 50,000 A Interrupting Rating
- Available in ferrule or PCB mount options
- 1-5 A meets UL 1741 GFDI requirements

Applications

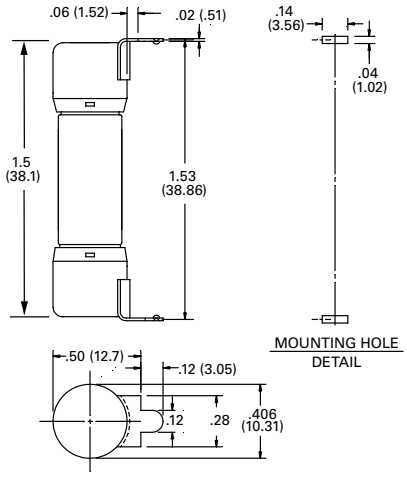
- Combiner boxes and inverters
- Power supplies
- Desktop meters

Dimensions Inches (mm)

Ferrule Version



PCB 1-Tab



Specifications

Voltage Rating	600 V ac/V dc
Amperage Rating	1/10, 1/8, 2/10, 1/4, 3/10, 1/2, 3/4, 1, 1 1/2, 2, 2 1/2, 3, 3 1/2, 4, 5, 6, 7, 8, 9,10, 12, 15, 20, 25, 30
Interrupting Ratings	AC: 100 kA 200 kA Littelfuse self-certified DC: 1/10-30: 10 kA (UL 2579) 1/10-30: 50 kA (UL 248-14)
Material	Body: Melamine / Caps: Copper Alloy
Operating Temperature	See rerating curve
Approvals	UL 2579 Listed (File: E339112) IEC 60269-6 (2-25 A) VDE Certified (No. 40033094) UL 248-14 Listed (File: E10480) CSA Certified Ferrule only (File: LR29862)
Environmental	RoHS Compliant
Country of Origin	Mexico

Part Numbering System

KLKD xxx H XR

Series

Amp Code
Refer to datasheet for amp code

Mounting Options
Blank = Ferrule
XR = PCB 1-tab

Package Quantity
T = 10
H = 100

SERIES	AMPERAGE	PACKAGE QUANTITY	MOUNTING METHOD	CATALOG NUMBER	ORDERING NUMBER
KLKD	1/8	10	FERRULE	KLKD.125	KLKD.125T
KLKD	5	100	FERRULE	KLKD005	KLKD005.H
KLKD	15	10	PCB 1-TAB	KLKD015R	KLKD015.TXR

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

Distribution Blocks • Splicer Blocks • Covers

Description

POWR-BLOKS power distribution blocks offer a safe, convenient way of splicing cables, providing a fixed junction tap-off point or splitting primary power into secondary circuits. Lx2xxx-DIN series offers integral DIN-rail mount and an optional hinged safety cover.

Optional power distribution block covers provide protection against accidental shorting between poles caused by loose wires, tools, or other conductive material. They also protect personnel from accidentally contacting energized connectors.

Applications

Typical applications include heating, air conditioning and refrigeration systems, elevator systems, material handling equipment, control panels, motor controls, switchgear, and anywhere power needs to be distributed to more than one load.

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 Copper: Highly conductive copper, 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

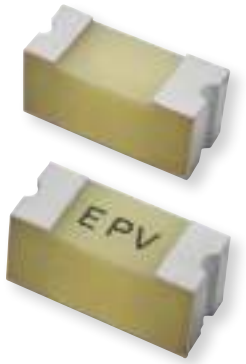
For dimension, CAD and 3-D drawings, visit:
littelfuse.com/powrbloks

Hinged Plastic Covers

Clear Plastic Covers

*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

Applications

- Photovoltaic shingles
- Photovoltaic cells

Agency Approvals

Agency	Agency File Number	Ampere Rating
c UL us	E339112	0.375 A

Electrical Characteristics

% of Ampere Rating	Ampere Rating	Opening Time
100%	0.375 A	4 hours, Minimum
135%	0.375 A	3600 seconds Maximum
200%	0.375 A	240 seconds Maximum

Electrical Specifications

Ampere Rating (A)	Max Voltage Rating (V)	Interrupting Rating	Nominal Cold Resistance (Ohms)	Nominal Melting I^2t (A2 Sec.) [1]	Agency Approvals
					c UL us
0.375	86	10,000 A @ 86 VDC	0.31	0.010	X

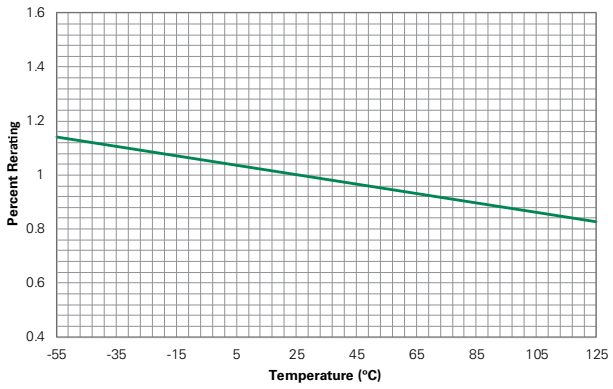
Note
1. Nominal Melting I^2t measured at 1 msec. opening time

Additional Information

Resources | Accessories | Samples

2410 Photovoltaic Fuse

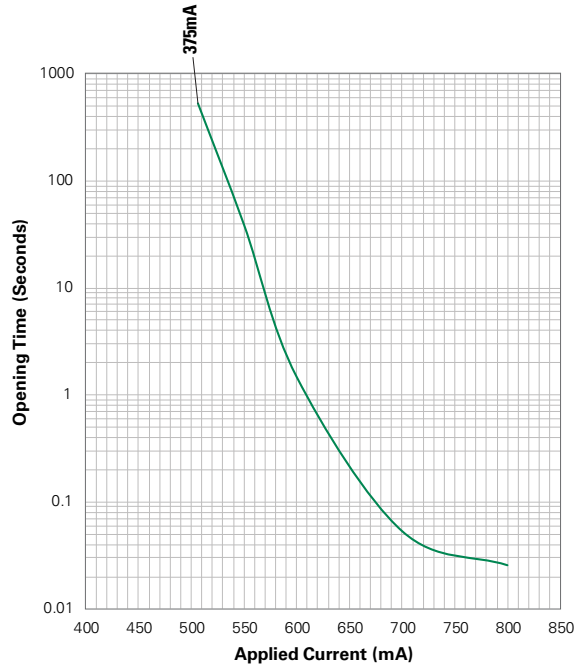
Temperature Re-rating Curve



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:
$I = (0.75)(0.90)I_n = (0.675)\ I_n$

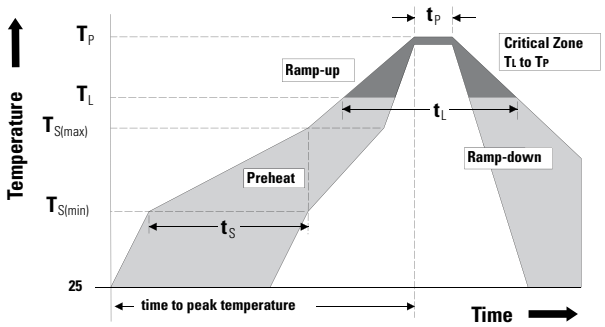
Average Time Current Curve



Soldering Parameters – Reflow Soldering

Reflow Condition		Pb-free assembly
Pre Heat	**- Temperature Min ($T_{s(min)}$)**	150° C
	Temperature Max ($T_{s(max)}$)	200° C
	- Time (Min to Max) (t_s)	60–180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak		3° C/second max.
$T_{S(max)}$ to T_L - Ramp-up Rate		5° C/second max.
Reflow	**- Temperature (T_L) (Liquidus)**	217° C
	- Temperature (t_L)	60–150 seconds
Peak Temperature (T_P)		$260^{+0/-5}$ °C
Time within 5° C of actual peak Temperature (t_p)		10–30 seconds
Ramp-down Rate		6° C/second max.
Time 25° C to peak Temperature (T_P)		8 minutes max.
Do not exceed		260° C

Wave Soldering	260° C, 10 seconds max.



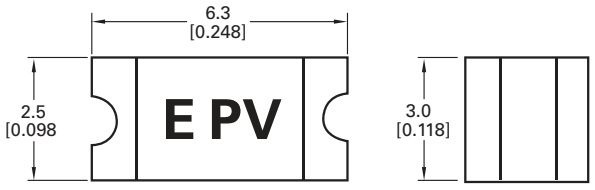
2410 Photovoltaic Fuse

Product Characteristics

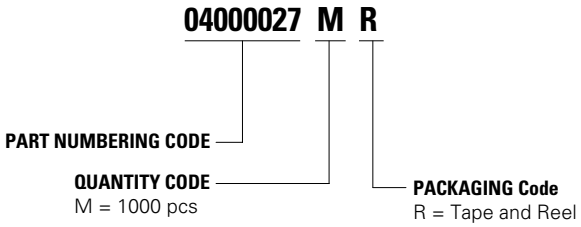
Materials	Body: Epoxy resin (UL 94 V-0 certified) Terminations: Cu/Ni/Sn (100% Pb-free)
Moisture Sensitivity Level	IPC/JEDEC J-STD-020C, Level 1
Solderability	IPC/EIC/JEDEC J-STD-002B, Condition B
Humidity	UL 248-19 Section 6.7.3
Resistance to Soldering Heat	MIL-STD-202, Method 210F, Condition B
Thermally Induced Drift	UL 248-19 Section 6.6.1
Moisture Resistance	MIL-STD-202, Method 106G

Thermal Shock	MIL-STD-202, Method 107G, Condition B-3
Mechanical Shock	MIL-STD-202, Method 213B, Condition A
Vibration	MIL-STD-202, Method 201A
Vibration, High Frequency	MIL-STD-202, Method 204D, Condition D
Dissolution of Metallization	IPC/EIC/JEDEC J-STD-002B, Condition D
Terminal Strength	IEC 60127-4
Temperature Extremes	UL 248-19 Section 6.6.2

Dimensions



Part Numbering System



Packaging

Packaging Option	Packaging Specification	Quantity	Quantity & Packaging Code
12 mm Tape and Reel	EIA-481/IEC 60286-3	1000	MR

600/1200 V • S Package • D Package • WB Package

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

Description

Half-Bridge Circuit IGBT Modules offer the high efficiency and fast switching speeds of modern IGBT technology in a robust and flexible format. Used for power control applications, Littelfuse offers IGBT modules for flexible and efficient motor control and inverter applications.

Features

- Ultra low loss
- High ruggedness
- High short-circuit capability
- Positive temperature coefficient
- With fast free-wheeling diodes

Benefits

- High efficiency and switching speed
- High reliability in demanding applications
- Reduced protection needs
- Easily paralleled
- Integrated solution in compact module package

Applications

- AC motor control
- Inverter
- Motion/servo control
- Power supplies
- Photovoltaic/fuel cell

Web Resources

Download the complete datasheet and other technical information: **littelfuse.com**

Part Numbering System

M G xx xx S-B xx xx

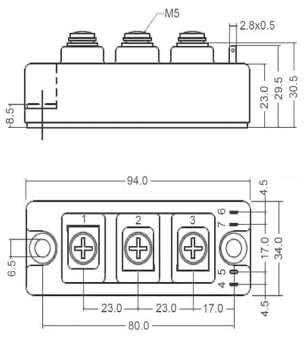
- **Product Type** — M: Power Module
- **Module Type** — G: IGBT
- **Voltage Rating** — 06: 600 V; 12: 1200 V
- **Current Rating**
- **Package Type** — "S" Package; "D" Package; "WB" Package
- **Circuit Type** — 2x (IGBT + FWD)
- **Wafer Type**
- **Assembly Site**

Ordering Information

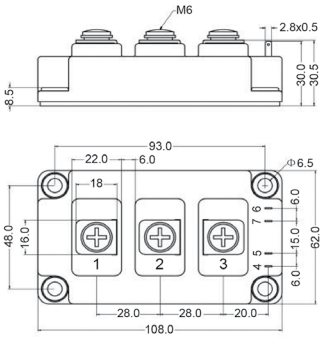
ORDERING NUMBER	VOLT	AMPERAGE	PACKAGE TYPE	MOUNTING METHOD	M.O.Q.
MG1250S-BA1MM	1200	50	S	SCREW	100
MG12100S-BN2MM	1200	100	S	SCREW	100
MG12150S-BN2MM	1200	150	S	SCREW	100
MG1275S-BA1MM	1200	75	S	SCREW	100
MG06100S-BN4MM	600	100	S	SCREW	100
MG06150S-BN4MM	600	150	S	SCREW	100
MG06300D-BN4MM	600	300	D	SCREW	60
MG06400D-BN4MM	600	400	D	SCREW	60
MG12200D-BA1MM	1200	200	D	SCREW	60
MG12300D-BA1MM	1200	300	D	SCREW	60
MG12300D-BN3MM	1200	300	D	SCREW	60
MG12400D-BN2MM	1200	400	D	SCREW	60
MG06600WB-BN4MM	600	600	WB	PRESS FIT	60
MG12225WB-BN2MM	1200	225	WB	PRESS FIT	60
MG12300WB-BN2MM	1200	300	WB	PRESS FIT	60
MG12450WB-BN2MM	1200	450	WB	PRESS FIT	60

Dimensions Inches (mm)

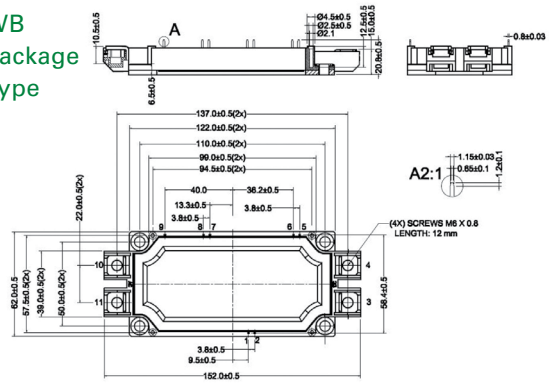
S Package Type



D Package Type



WB Package Type



RoHS HF

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.

SOURCE	VOLTAGE	CURRENT	RISE-TIME	DURATION
Lightning	25 kV	20 kA	10 µs	50 ms
Load Switching	600 V	500 A	50 µs	500 ms
Electromagnetic Pulse (EMP)	1 kV	300 kV	20 ns	1 ms
Electrostatic Discharge (ESD)	15 kV	30 A	1–5 ns	100 ns

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.

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**

SERIES NAME	PHOTO	PACKAGE TYPE	REVERSE STANDOFF VOLTAGE (V_R)	PEAK PULSE POWER RANGE (P_{PP} 10/1000 µs)	PEAK PULSE CURRENT (I_{PP} 8/20 µs)	OPERATING TEMPERATURE	HF	ROHS
SURFACE MOUNT - STANDARD APPLICATION (200-5000 W)								
SMF		SOD-123	5.0-85	200 W	–	-67 °F to +302 °F (-55 °C to +150 °C)	•	•
SMAJ		DO-214AC	5.0-440	400 W	–		•	•
P4SMA		DO-214AC	5.8-468	400 W	–		•	•
SMA6J		DO-214AC	5.0-12	600 W	–		•	•
SMA6L		DO-221AC	5.0-85	600 W	–		•	•
SACB		DO-214AA	5.0-50	500 W	–		•	•
SMBJ		DO-214AA	5.0-440	600 W	–		•	•
P6SMB		DO-214AA	5.8-468	600 W	–		•	•
1KSMB		DO-214AA	5.8-153	1000 W	–		•	•
SMCJ		DO-214AB	5.0-440	1500 W	–		•	•
1.5SMC		DO-214AB	5.8-468	1500 W	–		•	•
4.0SDJ		DO-214AB	24.0	4000W	–		•	•
SMDJ		DO-214AB	5.0-220	3000 W	–		•	•
5.0SMDJ		DO-214AB	12-170	5000 W	–		•	•
AXIAL LEADED - STANDARD APPLICATION (400-5000 W)								
P4KE		DO-41	5.8-468	400 W	–	-67 °F to +347 °F (-55 °C to +175 °C)	•	•
SA		DO-15	5.0-180	500 W	–		•	•
SAC		DO-15	5.0-50	500 W	–		•	•
P6KE		DO-15	5.8-512	600 W	–		•	•
1.5KE		DO-201	5.8-512	1500 W	–		•	•
LCE		DO-201	6.5-90	1500 W	–		•	•
3KP		P600	5.0-220	3000 W	–		•	•
5KP		P600	5.0-250	5000 W	–		•	•
AXIAL LEADED - HIGH POWER (15000-30000 W; 1-15 kA)								
15KPA		P600	17-280	15000 W	–	-67 °F to +347 °F (-55 °C to +175 °C)	•	•
20KPA		P600	20-300	20000 W	–		•	•
30KPA		P600	28-288	30000 W	–		•	•
AK1		Radial Lead	76.0	–	1000 A	-67 °F to +302 °F (-55 °C to +150 °C)	•	•
AK3		Radial Lead	15-430	–	3000 A		•	•
AK6		Radial Lead	30-430	–	6000 A		•	•
AK10		Radial Lead	15-530	–	10000 A		•	•
AK15		Radial Lead	58-76	–	15000 A		•	•

Protection Application and Needs

Description:

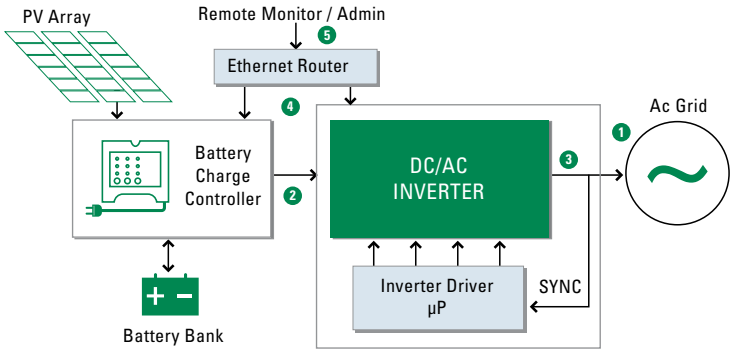
Microprocessor-controlled inverter with the ac output synchronized to the ac grid stores energy in utility company and maximizes photovoltaic (PV) array energy output.

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



Example: Hybrid Solar Inverter Configuration

Varistor Products

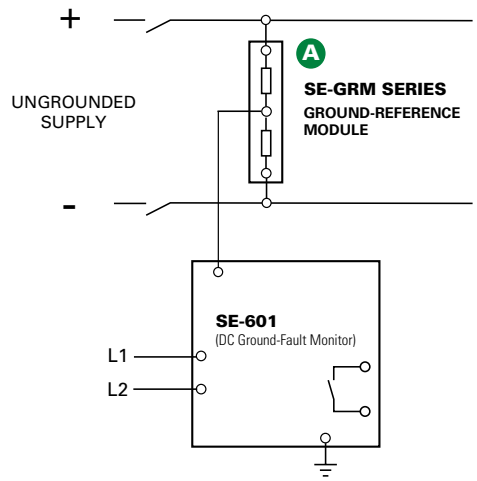
Varistors possess characteristics that divert transient currents away from sensitive components. Littelfuse offers two types: Miniature surface mount Multi-Layer Varistors (MLVs) for small electronics applications and Metal Oxide Varistors (MOVs) for higher energy applications. For more information visit **Littelfuse.com/varistor**

5

SERIES NAME	PHOTO	OPERATING V AC RANGE	OPERATING V DC RANGE	PEAK CURRENT RANGE[2] (A)	PEAK ENERGY RANGE (J)	OPERATING TEMPERATURE	MOUNT/ FORM FACTOR	DISC SIZE	AGENCY APPROVALS				ROHS	HF
									UR	CSA	VDE	CECC		
SURFACE MOUNT MLV / MOV														
ML		2.7-107	5.5-120	4-500	0.02-2.5	-55 to +125 °C	Surface Mount	Not Applicable					•	•
CH		14-275	18-369	100-400	1.0-8.0	-55 to +125 °C	Surface Mount	Not Applicable	•				•	
SM7		115-510	369-675	1200	10-40	-55 to +85 °C	Surface Mount	Not Applicable	•				•	•
SM20		20-320	26	2000-6500	20-150		Surface Mount	Not Applicable	•				•	•
RADIAL LEADED MOV														
UltraMOV™		130-625	170-825	1750-10000	12.5-720	-55 to +85 °C	Radial Leaded	7, 10, 14, 20 mm	•	•	•	•	•	•
UltraMOV™ 25S		115-750	150-970	22000	230-890			25 mm	•	•	•	•	•	•
C-III		130-660	–	3500-9000	40-530			10, 14, 20 mm	•	•	•		•	•
LA		130-1000	175-1200	1200-6500	11-360			7, 10, 14, 20 mm	•	•	•	•	•	•
ZA		4-460	5.5-615	50-6500	0.1-52			5, 7, 10, 14, 20 mm	•		•	•	•	•
THERMALLY PROTECTED MOV														
SMOV™ 25S		115-750	150-970	20000	170-670	-45 to +75 °C	Industrial Packaged Radial Leads	25 mm	•				•	
SMOV™ 34S		115-750	150-970	40000	280-1200	-45 to +75 °C	Industrial Packaged Radial Leads	34 mm	•				•	
TMOV® 25S		115-750	150-970	20000	170-670	-55 to +85 °C	Radial Leaded	25 mm	•		•	•	•	
TMOV® 34S		115-750	150-970	40000	235-1050			34 mm	•		•	•	•	
TMOV®/iTMOV®		115-750	150-970	6000-10000	35-480			14, 20 mm	•		•	•	•	

Dc Ground-Fault Monitor

Simplified Circuit Diagram



Ordering Information

ORDERING NUMBER	CONTROL POWER
SE-601-OU	120/240 V ac/V dc
SE-601-OD	12/24 V dc
SE-601-OT	48 V dc

ACCESSORIES	REQUIREMENT
SE-GRM SERIES	Required
PGA-0500	Optional
PMA-55	Optional
PMA-60	Optional

Note: For optional conformal coating please consult factory.

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

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

Accessories

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

PGA-0500 Analog % Current Meter
Optional panel-mounted analog meter displays ground-fault current as a percentage of 22 mA.

Specifications

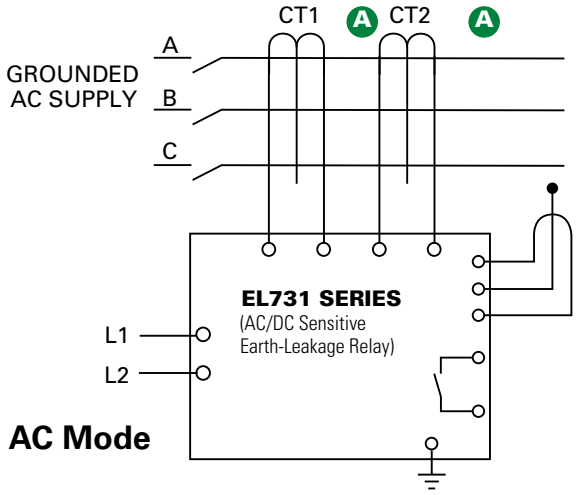
IEEE Device Numbers Dc Overcurrent Relay (76G)
Input Voltage See ordering information
Dimensions **H** 75 mm (3.0"); **W** 55 mm (2.2"); **D** 115 mm (4.5")
Trip Level Settings 1-20 mA
Trip Time Settings 0.05-2.5 s
Output Contacts Isolated Form A and Form B
Contact Operating Mode Selectable fail-safe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

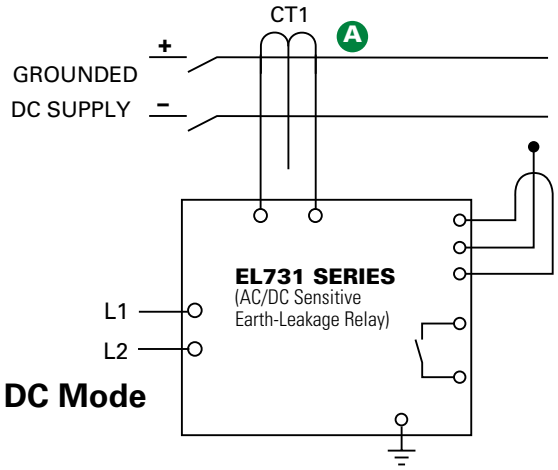
Ac/Dc Sensitive Earth-Leakage Relay

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

ORDERING NUMBER	CONTROL POWER	COMMUNICATIONS
EL731-00-X0	120/240 V ac/V dc	None
EL731-01-X0	120/240 V ac/V dc	DeviceNet*
EL731-02-X0	120/240 V ac/V dc	Profibus*
EL731-03-X0	120/240 V ac/V dc	EtherNet/IP*
EL731-04-X0	120/240 V ac/V dc	Modbus* TCP
EL731-10-X0	48 V dc & 24 V ac	None
EL731-11-X0	48 V dc & 24 V ac	DeviceNet
EL731-12-X0	48 V dc & 24 V ac	Profibus
EL731-13-X0	48 V dc & 24 V ac	EtherNet/IP
EL731-14-X0	48 V dc & 24 V ac	Modbus TCP
EL731-20-X0	24 V dc	None
EL731-21-X0	24 V dc	DeviceNet
EL731-22-X0	24 V dc	Profibus
EL731-23-X0	24 V dc	EtherNet/IP
EL731-24-X0	24 V dc	Modbus TCP

Accessories

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

AC700-CUA Series Communication Adapter
Optional network-interface and firmware-upgrade communications adapters field-install in EL731.

AC700-SMK DIN-rail & Surface-mount Adapter
EL731 plugs into adapter for back-plane mounting.

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

Note: When building a part number, replace the "X" with "1" for AS/NZS 2081:2011 Compliant product, "0" otherwise.
*DeviceNet, Profibus, EtherNet/IP and Modbus TCP are trademarks of their respective owners.

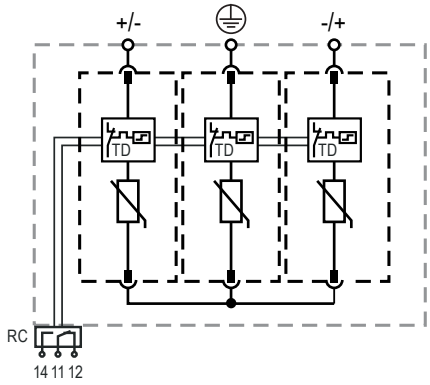
Class 2 (IEC)/Type 2 (EN)/Type 1CA (UL) Pluggable Multi-Pole Surge Protective Device for PV Systems

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.

Internal Configuration



Legend

⏚ *Protective Earth*
RC *Optional Remote Contact*
TD *Thermal Disconnection*

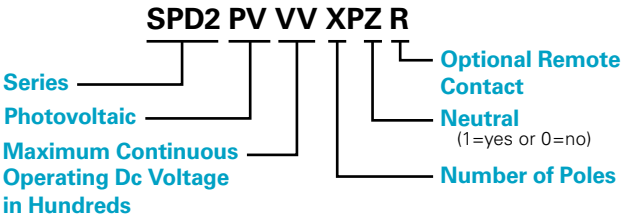
Features & Benefits

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

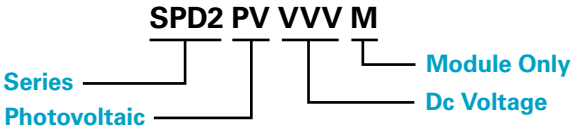
Module & Base Ordering Information

Ordering Number	IEC Electrical						UL Electrical				Single Unit Weight
	Maximum Continuous Operating Dc Voltage (U_{CPV})	Nominal Discharge Current (8/20 µs) (I_n)	Maximum Discharge Current (8/20 µs) (I_{max})	Total Discharge Current (I_{Total})	Voltage Protection Level (U_p)	Short-Circuit Current Rating (I_{SCPV})	Maximum Permitted Dc Voltage (I_{pvdc})	Voltage Protection Rating (VPR)	Nominal Discharge Current (8/20 µs) (I_n)	Short-Circuit Current Rating (SCCR)	
SPD2-PV11-3P0 SPD2-PV11-3P0-R	1100 V	20 kA	40 kA	50 kA	4200 V	9 kA	1100 V	3000 V	20 kA	50 kA	333 g (0.734 lb)
SPD2-PV15-3P0 SPD2-PV15-3P0-R	1500 V	15 kA	40 kA	40 kA	4800 V	9 kA	1500 V	4000 V	20 kA	65 kA	363 g (0.800 lb)

Module & Base Part Numbering System



Module Only Part Numbering System



Replacement Module Ordering Information

Ordering Number	IEC Electrical						UL Electrical				Single Unit Weight
	Maximum Continuous Operating Dc Voltage (U_{CPV})	Nominal Discharge Current (8/20 µs) (I_n)	Maximum Discharge Current (8/20 µs) (I_{max})	Total Discharge Current (I_{Total})	Voltage Protection Level (U_p)	Short-Circuit Current Rating (I_{SCPV})	Maximum Permitted Dc Voltage (I_{pvdc})	Voltage Protection Rating (VPR)	Nominal Discharge Current (8/20 µs) (I_n)	Short-Circuit Current Rating (SCCR)	
SPD2-PV550-M	1100 V	20 kA	40 kA	50 kA	4200 V	9 kA	1100 V	3000 V	20 kA	50 kA	61 g (0.134 lb)
SPD2-PV750-M	1500 V	15 kA	40 kA	40 kA	4800 V	9 kA	1500 V	4000 V	20 kA	65 kA	71 g (0.157 lb)

Specifications

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

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
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 EN 50539-11:2013+A1:2014
UL 1449 4th Edition; E320116

Product Dimensions

3TE Module and Base **H** 90.7 mm (3.57"); **W** 53.8 mm (2.11"); **D** 66.1 mm (2.60")
1TE Replacement Module **H** 45.0 mm (1.77"); **W** 18.0 mm (0.71"); **D** 57.2 mm (2.25")

Package Dimensions

3TE Module and Base **H** 102.0 mm (4.01"); **W** 64.0 mm (2.52"); **D** 110.0 mm (4.33")
1TE Replacement Module **H** 102.0 mm (4.01"); **W** 28.0 mm (1.10"); **D** 110.0 mm (4.33")

Warranty – Visit **www.littelfuse.com/warranty** for details.

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
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 Contact LDMAU11**
  Remotely indicates switch position
- **Spacers LDMEL11**
  Increase distance between switch and mounting plate

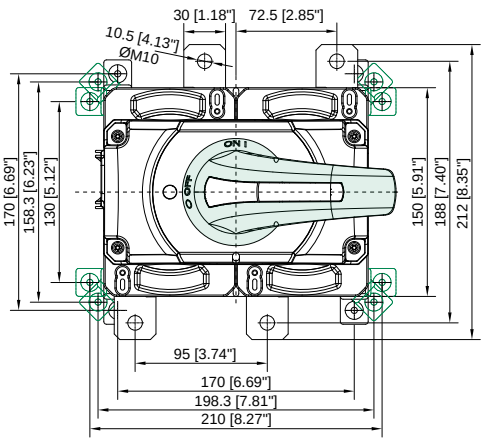
Part Numbering System

Ordering Information

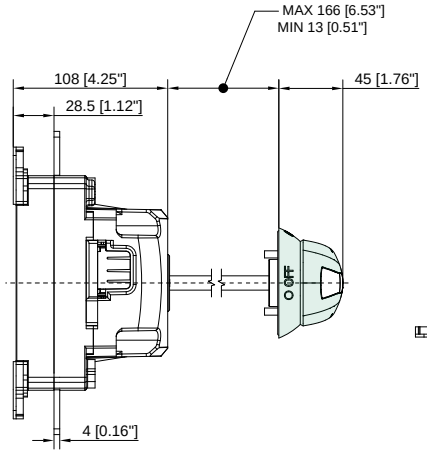
DC DISCONNECT SWITCH					
PART NUMBER	VOLTAGE	AMPERAGE	INSTALLATION	CONFIGURATION	SINGLE UNIT WEIGHT
LS7R02502PS00L	1500 V dc	250 A	Ungrounded	Type 2P	3 kg

Dimensions Millimeters (Inches)

Dc Disconnect Switch

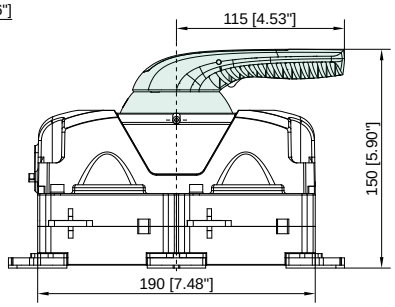


Switch - Side View

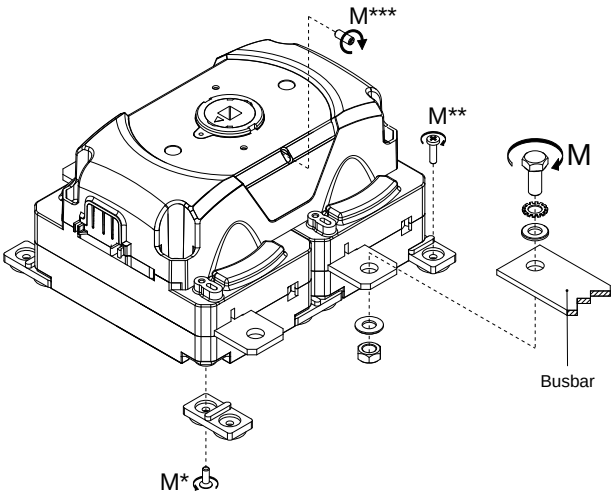


Panel Handle with Shaft

LDSSA11



Switch - 3D Installation View

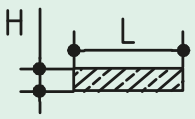


Busbar

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	159	5	13/64	32	1 ¼

M			M (+5 % | -10 %)	
			N•M	LBF•INCH
*	T20	M4	1.2	10.6
**	—	M4	1.5	13.3
***	Allen	M5	1.5	13.3

MINIMUM BUSBAR SECTION ACCORDING TO UL 98B



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1500 V Dc • 320 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	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 Rating Uimp	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
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 Contact LDMAU11**
  Remotely indicates switch position
- **Spacers LDMEL11**
  Increase distance between switch and mounting plate

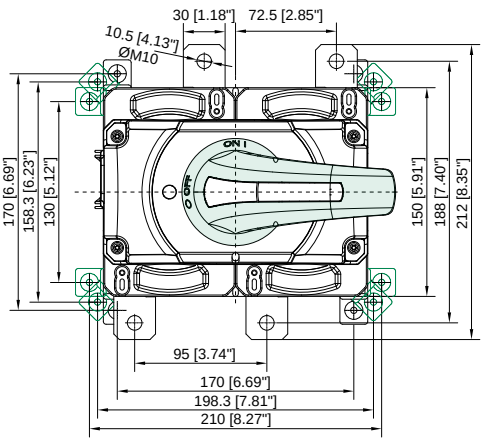
Part Numbering System

Ordering Information

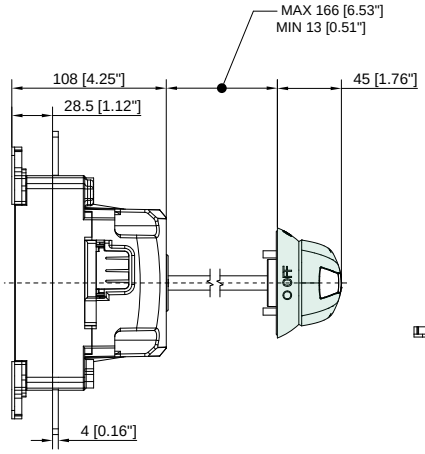
DC DISCONNECT SWITCH					
PART NUMBER	VOLTAGE	AMPERAGE	INSTALLATION	CONFIGURATION	SINGLE UNIT WEIGHT
LS7R03202PS00L	1500 V dc	320 A	Ungrounded	Type 2P	3 kg

Dimensions Millimeters (Inches)

Dc Disconnect Switch

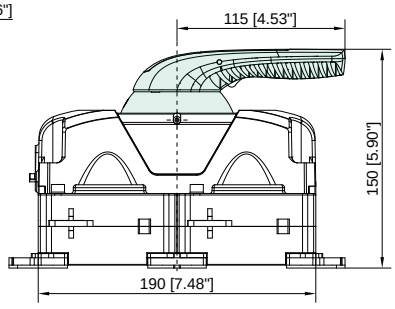


Switch - Side View

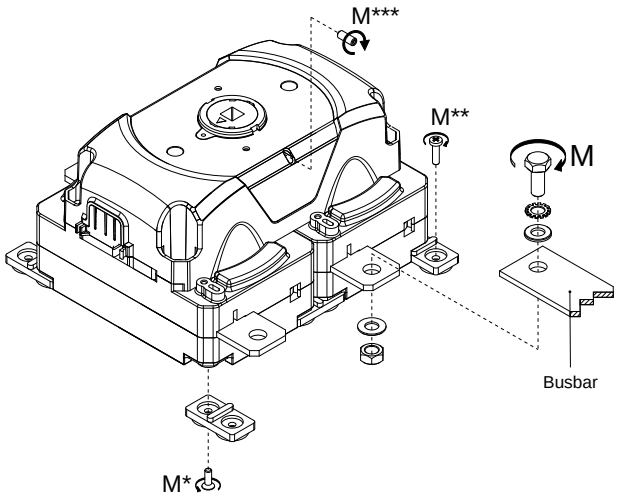


Panel Handle with Shaft

LDSSA11



Switch - 3D Installation View

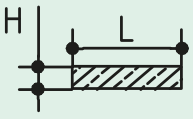


Busbar

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	159	5	13/64	40	1 37/64

M			M (+5 % | -10 %)	
			N•M	LBF•INCH
*	T20	M4	1.2	10.6
**	—	M4	1.5	13.3
***	Allen	M5	1.5	13.3

MINIMUM BUSBAR SECTION ACCORDING TO UL 98B



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

UL 98B Standards	
Total Voltage Rating	1500 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 Rating Uimp	12 kV
Operational Current DC21B Rating	400 A / 1500 V dc
Other Characteristics	
Power Losses at 400 A	21.15 watts
Maximum Busbar Connection Range	2 bars x 4 mm (.16") **H** x 32 mm (1.25") **L**
Number of Circuits/Switches	1
Tightening Torque	159 lbf-in (18 N•m) for M10 screw
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 Contact LDMAU11**
  Remotely indicates switch position
- **Spacers LDMEL11**
  Increase distance between switch and mounting plate

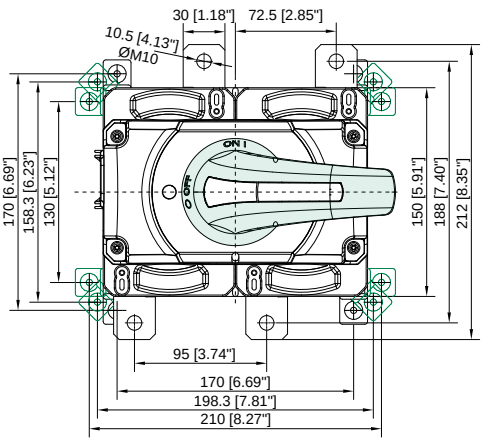
Part Numbering System

Ordering Information

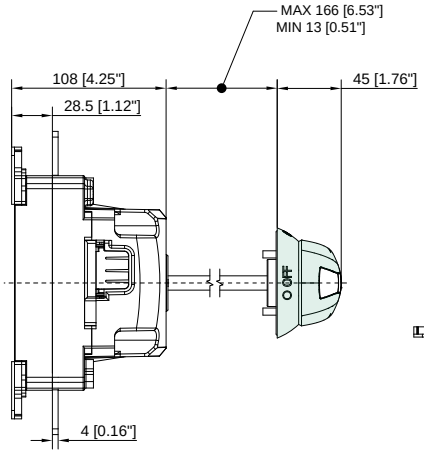
DC DISCONNECT SWITCH					
PART NUMBER	VOLTAGE	AMPERAGE	INSTALLATION	CONFIGURATION	SINGLE UNIT WEIGHT
LS7R04002PS00L	1500 V dc	400 A	Ungrounded	Type 2P	3 kg

Dimensions Millimeters (Inches)

Dc Disconnect Switch

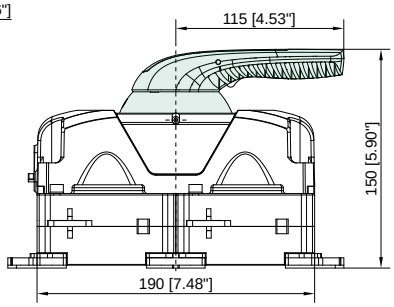


Switch - Side View

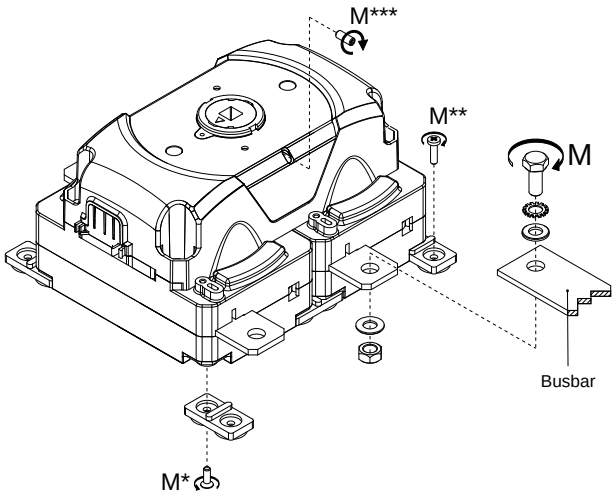


Panel Handle with Shaft

LDSSA11



Switch - 3D Installation View

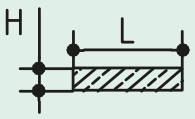


Busbar

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
2	M10	18	159	4	5/32	32	1¼

M			M (+5 % | -10 %)	
			N•M	LBF•INCH
*	T20	M4	1.2	10.6
**	—	M4	1.5	13.3
***	Allen	M5	1.5	13.3

MINIMUM BUSBAR SECTION ACCORDING TO UL 98B



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 Ui	1500 V dc
Impulse Withstand Voltage Rating Uimp	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 (.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
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 Contact LDMAU11**
  Remotely indicates switch position
- **Spacers LDMEL11**
  Increase distance between switch and mounting plate

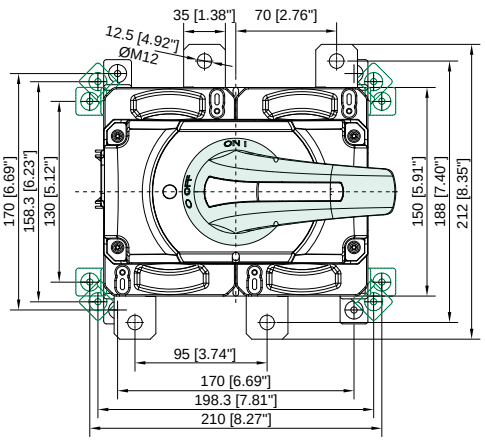
Part Numbering System

Ordering Information

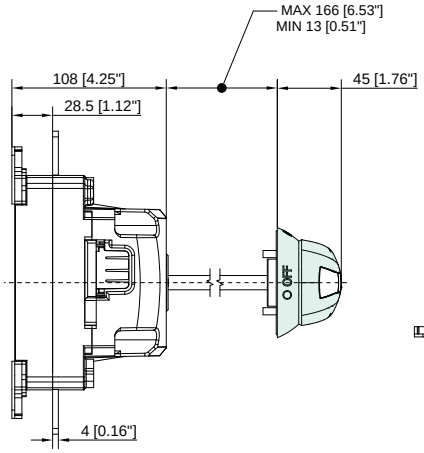
DC DISCONNECT SWITCH					
PART NUMBER	VOLTAGE	AMPERAGE	INSTALLATION	CONFIGURATION	SINGLE UNIT WEIGHT
LS7R05002PS00L	1500 V dc	500 A	Ungrounded	Type 2P	3 kg

Dimensions Millimeters (Inches)

Dc Disconnect Switch

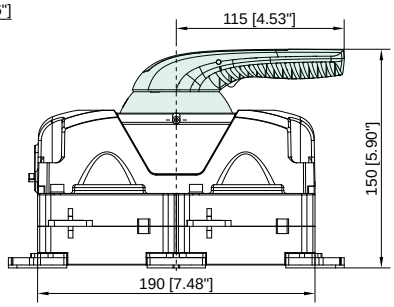


Switch - Side View

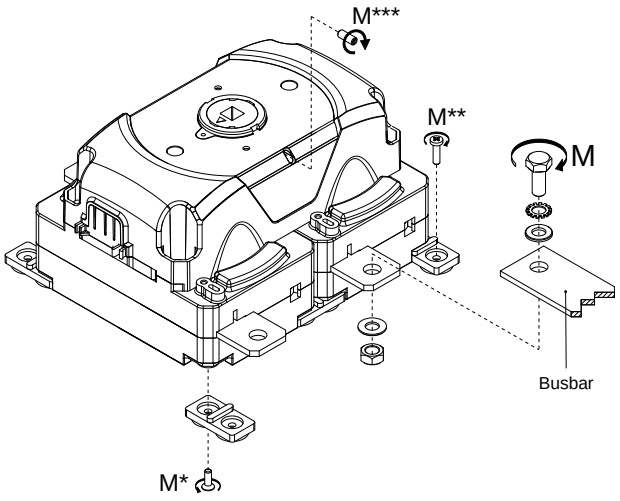


Panel Handle with Shaft

LDSSA11



Switch - 3D Installation View

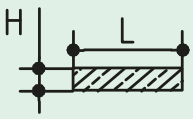


Busbar

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
2	M12	24	212	5	13/64	32	1¼

M			M (+5 % | -10 %)	
			N•M	LBF•INCH
*	T20	M4	1.2	10.6
**	—	M4	1.5	13.3
***	Allen	M5	1.5	13.3

MINIMUM BUSBAR SECTION ACCORDING TO UL 98B



1500 V Dc • 250 A

Type CB
Dc Ungrounded

Type 4D
Dc Grounded with handle attached

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 °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	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
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

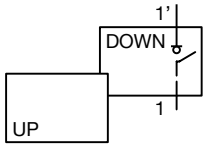
- **Panel Handle with Shaft LDSSA11**
  For closed panel door access
- **Direct Handle LDSSI11**
  For open panel door access
- **Auxiliary Contact LD5LAU01**
  Remotely indicates switch position

Part Numbering System

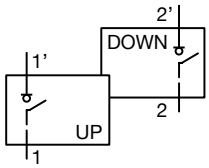
LS6R 0250 CB S 00L

- **Series**
- **Amperage**
- **Configuration Type**
  - CB = 2 Pole
  - 4D = 1 Pole
- **Terminal Measurement**
- **UL product**

Configuration



Type 4D (1 Pole)



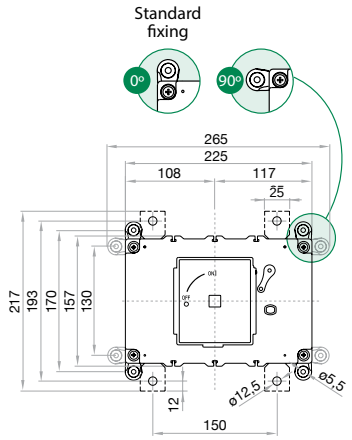
Type CB (2 Pole)

Ordering Information

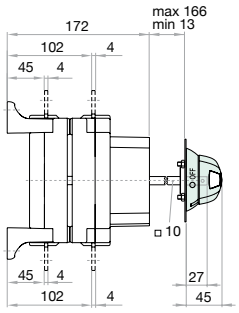
DC DISCONNECT SWITCH						
SERIES	TOTAL VOLTAGE	AMPERAGE	INSTALLATION	CONFIGURATION	POLES	SINGLE UNIT WEIGHT
LS6R02504DS00L	1500 V dc	250 A	Grounded	Type 4D	1	4.5 kg
LS6R0250CBS00L	1500 V dc	250 A	Ungrounded	Type CB	2	4.5 kg

Dimensions Millimeters

Dc Disconnect Switch

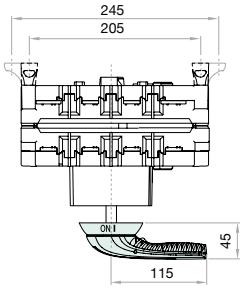


Switch - Side View



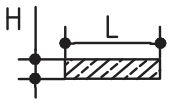
Panel Handle with Shaft

LDSSA11



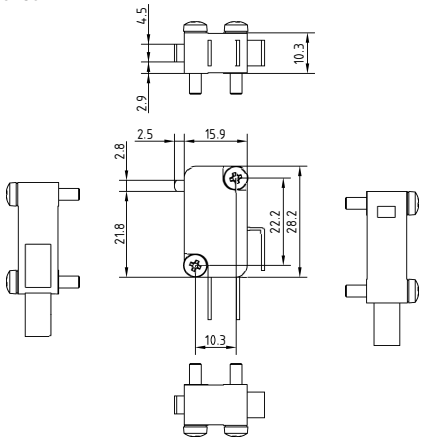
Busbar

BUSBAR H MAX (CU)		BUSBAR L MAX (CU)			COPPER BAR M (TERMINAL TORQUE) (+5 % | -10 %)	
MM	INCH	MM	INCH		N•M	LB.INCH
4	5/32	36	1 3/16	M12	24	212



Auxiliary Contact

LD5AU01



8

1500 V Dc • 400 A

Type CB
Dc Ungrounded

Type 4D
Dc Grounded with handle attached

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	400 A
SCCR Rating	10 kA
Ambient Temperature	-30 to 50 °C (-22 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	400 A/1500 V dc
Other Characteristics	
Power Losses at 400 A	10.58 watts
Maximum Busbar Connection Range	2 bars x 4 mm (.16") **H** x 32 mm (1.26") **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
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

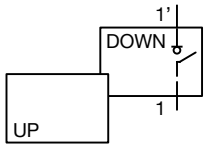
- **Panel Handle with Shaft LDSSA11**
  For closed panel door access
- **Direct Handle LDSSI11**
  For open panel door access
- **Auxiliary Contact LD5LAU01**
  Remotely indicates switch position

Part Numbering System

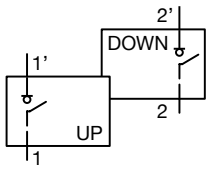
LS6R 0400 CB D 00L

- **Series**
- **Amperage**
- **Configuration Type**
  - CB = 2 Pole
  - 4D = 1 Pole
- **Terminal Measurement**
- **UL product**

Configuration



Type 4D (1 Pole)



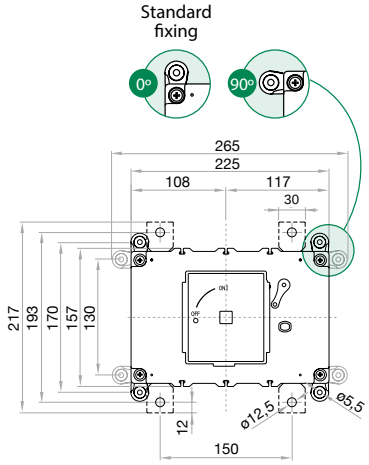
Type CB (2 Pole)

Ordering Information

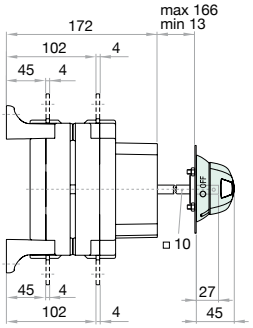
DC DISCONNECT SWITCH						
SERIES	TOTAL VOLTAGE	AMPERAGE	INSTALLATION	CONFIGURATION	POLES	SINGLE UNIT WEIGHT
LS6R04004DD00L	1500 V dc	400 A	Grounded	Type 4D	1	4.5 kg
LS6R0400CBD00L	1500 V dc	400 A	Ungrounded	Type CB	2	4.5 kg

Dimensions Millimeters

Dc Disconnect Switch

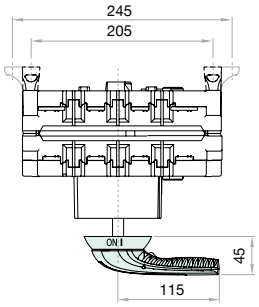


Switch - Side View



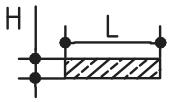
Panel Handle with Shaft

LDSSA11



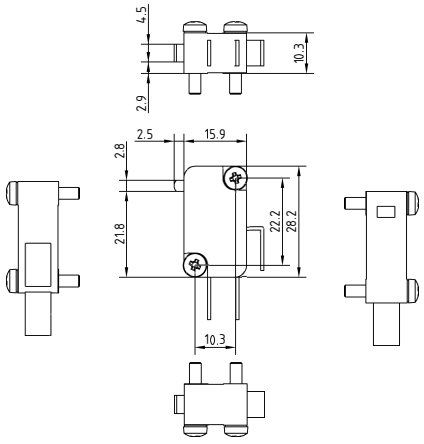
Busbar

BUSBAR H MAX (CU)		BUSBAR L MAX (CU)			COPPER BAR M (TERMINAL TORQUE) (+5 % | -10 %)	
MM	INCH	MM	INCH		N•M	LB.INCH
4	5/32	32	1¼	M12	24	212



Auxiliary Contact

LD5AU01



8

1000 V Dc • 250 A

Type 2E
Dc Ungrounded

Type 1M
Dc Grounded with Handle Attached

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 mm^2)
Maximum Connection Wire Range/AWG	500 kcmil/MCM (253 mm^2)
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

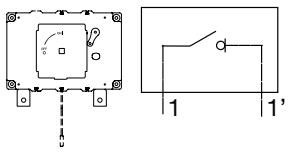
- **Panel handle with shaft LDSSA11** for closed panel door access
- **Direct handle LDSSI11** for open panel door access
- **Auxiliary contacts LD5LAU01** remotely indicate switch position
- **Phase barriers LDRSF11 (Type 1M) and LDRSF13 (Type 2E)** isolate sections to eliminate arcing between the phases
- **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

Part Numbering System

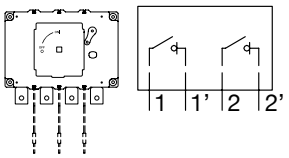
LS6 0250 1M S 00L

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

Configuration



1M (1 Pole)



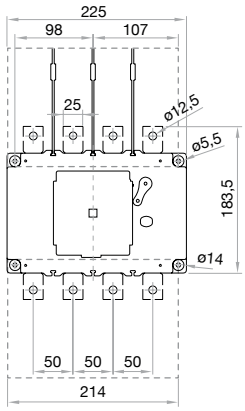
2E (2 Pole)

Ordering Information

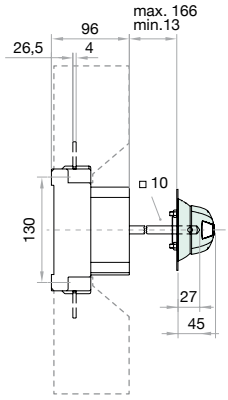
DC DISCONNECT SWITCH						
SERIES	TOTAL VOLTAGE	AMPERAGE	INSTALLATION	CONFIGURATION	POLES	SINGLE UNIT WEIGHT
LS602501MS00L	1000 V dc	250 A	Grounded	Type 1M	1	2 kg
LS602502ES00L	1000 V dc	250 A	Ungrounded	Type 2E	2	3 kg

Dimensions Millimeters

Dc Disconnect Switch

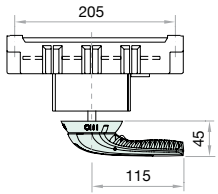


Switch + Direct Handle - Side View



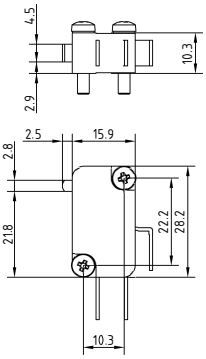
Panel Handle with Shaft

LDSSA11



Auxiliary Contact

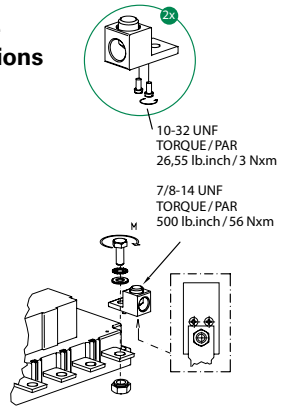
LD5AU01



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%)	
			N•M	LB.INCH
	75 °C	M10	18	159

Torque and Cable Capacity Instructions



8

1000 V dc • 400 A • 1 Pole
1000 V dc • 400 A • 2 Pole (500 V dc per pole)

2 Pole (Type 2E)
Dc Ungrounded

1 Pole (Type 1M)
Dc Grounded with Handle Attached

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 Rating Uimp	12 kV
Operational Current DC21B Rating	400 A/1000 V dc
Other Characteristics	
Power Losses at 400 A	2 Pole (2E): 18.4 watts/pole 1 Pole (1M): 36.11 watts total
Minimum Connection Wire Range / AWG	300 kcmil/MCM (152 mm^2)
Maximum Connection Wire Range / AWG	350 kcmil/MCM (177 mm^2)
Number of Circuits/Switches	1
Mechanical Operations	8,000
Tightening Torque	212 lbf-in (24 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

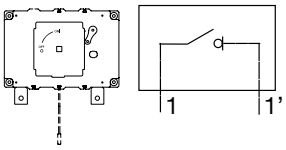
- **Panel handle with shaft LDSLA21** for closed panel door access
- **Direct handle LDSLI21** for open panel door access
- **Auxiliary contacts LD5LAU01** remotely indicate switch position
- **Phase barriers LDRSF21 (Type 1M) and LDRSF23 (Type 2E)** isolate sections to eliminate arcing between the phases
- **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

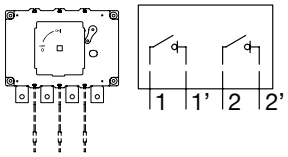
LS6 0400 1M S 00L

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

Configuration



Type 1M (1 Pole)



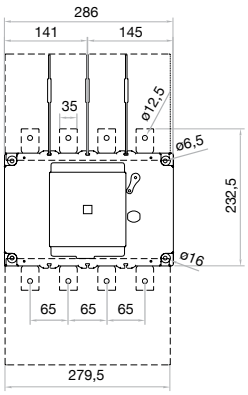
Type 2E (2 Pole)

Ordering Information

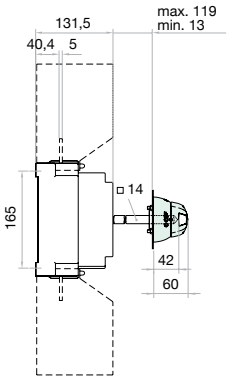
DC DISCONNECT SWITCH						
SERIES	TOTAL VOLTAGE	AMPERAGE	INSTALLATION	CONFIGURATION	POLES	SINGLE UNIT WEIGHT
LS604001MS00L	1000 V dc	400 A	Grounded	Type 1M	1	2 kg
LS604002ES00L	1000 V dc	400 A	Ungrounded	Type 2E	2	3 kg

Dimensions Millimeters

Dc Disconnect Switch

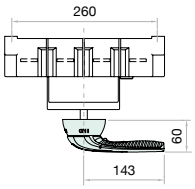


Switch + Direct Handle - Side View



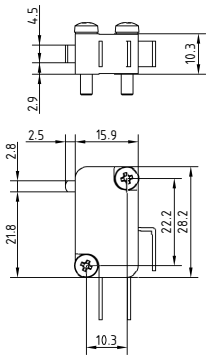
Panel Handle with Shaft

LDSLA21



Auxiliary Contact

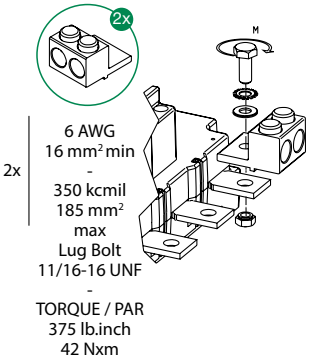
LD5AU01



Terminal Lug Measurements

LDRTL22W				
3/0 85 MM² MIN. --- 400 KCMIL 240 MM² MAX.	CONDUCTOR TEMPERATURE RATING		COPPER WIRE ONLY M (TERMINAL TORQUE) (+5% | -10%)	
			N•M	LB.INCH
	75 °C	M10	24	212

Torque and Cable Capacity Instructions



8

500 V Dc • 250 A

Type 2L
Dc Ungrounded

Type 1V
Dc Grounded with Handle Attached

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)
IEC 60947-3 Standards	
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 mm^2)
Maximum Connection Wire Range/AWG	500 kcmil/MCM (253 mm^2)
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

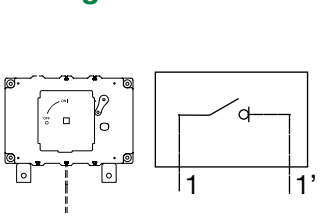
- **Panel handle with shaft LDSSA11** for closed panel door access
- **Direct handle LDSSI11** for open panel door access
- **Auxiliary contacts LD5LAU01** remotely indicate switch position
- **Phase barriers LDRSF11 (Type 1V) and LDRSF12 (Type 2L)** isolate sections to eliminate arcing between the phases
- **Terminal lug LDRTL11W** safely connects electrical and mechanical devices (phase barriers must be used in order to maintain the required clearance)
- **Terminal shrouds LDRCU11W** offer protection against direct contact after wiring
- **Spacers LDREL11W** increase distance between switch and mounting plate

Part Numbering System

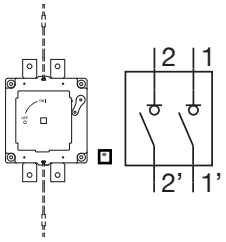
LS6 0250 1V S 00L

- **Series** — LS6
- **Amperage** — 0250
- **Configuration Type** — 1V
  - 1V = 1 Pole
  - 2L = 2 Pole
- **Terminal Measurement** — S
- **UL product** — 00L

Configuration



Type 1V (1 Pole)



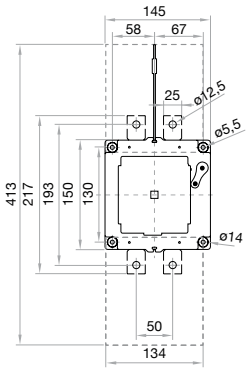
Type 2L (2 Pole)

Ordering Information

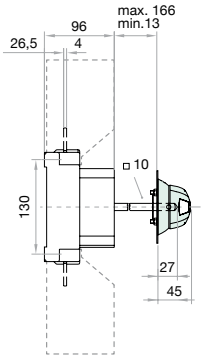
DC DISCONNECT SWITCH						
SERIES	TOTAL VOLTAGE	AMPERAGE	INSTALLATION	CONFIGURATION	POLES	SINGLE UNIT WEIGHT
LS602501VS00L	500 V dc	250 A	Grounded	Type 1V	1	2 kg
LS602502LS00L	500 V dc	250 A	Ungrounded	Type 2L	2	3 kg

Dimensions Millimeters

Dc Disconnect Switch

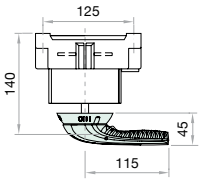


Switch + Direct Handle - Side View



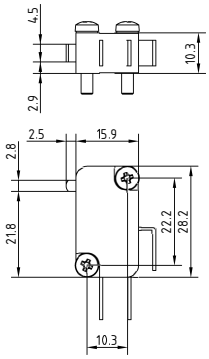
Panel Handle with Shaft

LDSSA11



Auxiliary Contact

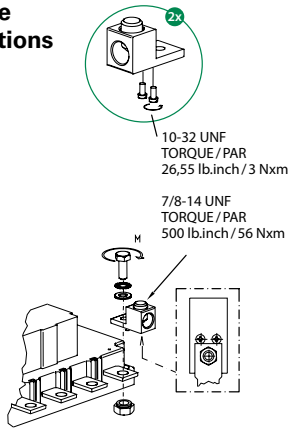
LD5AU01



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%)	
			N·M	LB.INCH
	75 °C	M10	18	159

Torque and Cable Capacity Instructions



8

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

REACH EAC CE IEC UL RoHS

2 Pole (Type 2L)
Dc Ungrounded

1 Pole (Type 1V)
Dc Grounded with Handle Attached

SOLAR-RATED

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	
Total Voltage Rating	500 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 Rating Uimp	12 kV
Operational Current DC21B Rating	400 A / 500 V dc
Other Characteristics	
Power Losses at 400 A	2 Pole (2L): 9.2 watts/pole 1 Pole (1V): 18.4 watts total
Minimum Connection Wire Range / AWG	300 kcmil/MCM (152 mm^2)
Maximum Connection Wire Range / AWG	350 kcmil/MCM (177 mm^2)
Number of Circuits/Switches	1
Mechanical Operations	8,000
Tightening Torque	212 lbf-in (24 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

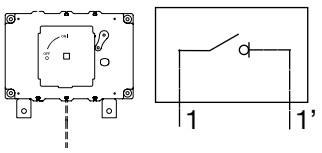
- **Panel handle with shaft LDSLA21** for closed panel door access
- **Direct handle LDSLI21** for open panel door access
- **Auxiliary contacts LD5LAU01** remotely indicate switch position
- **Phase barriers LDRSF21 (Type 1V) and LDRSF22 (Type 2L)** isolate sections to eliminate arcing between the phases
- **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

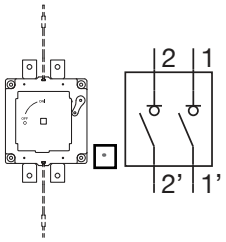
LS6 0400 1V S 00L

- **Series** — LS6
- **Amperage** — 0400
- **Configuration Type** — 1V
  - 1V = 1 Pole
  - 2L = 2 Pole
- **Terminal Measurement** — S
- **UL product** — 00L

Configuration



Type 1V (1 Pole)



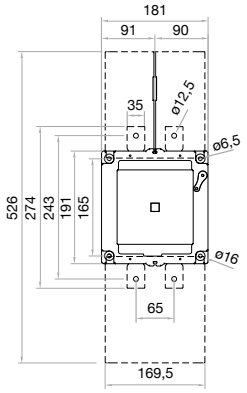
Type 2L (2 Pole)

Ordering Information

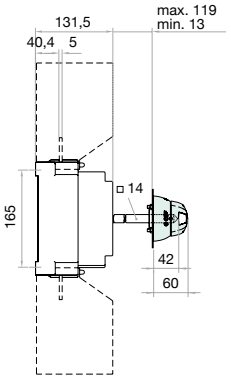
DC DISCONNECT SWITCH						
SERIES	TOTAL VOLTAGE	AMPERAGE	INSTALLATION	CONFIGURATION	POLES	SINGLE UNIT WEIGHT
LS604001VS00L	500 V dc	400 A	Grounded	Type 1V	1	2 kg
LS604002LS00L	500 V dc	400 A	Ungrounded	Type 2L	2	3 kg

Dimensions Millimeters

Dc Disconnect Switch

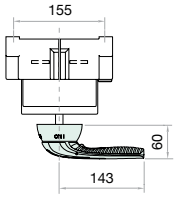


Switch + Direct Handle - Side View



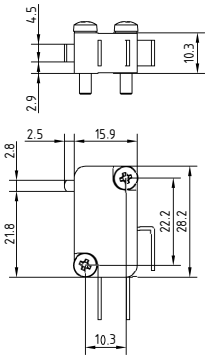
Panel Handle with Shaft

LDSLA21



Auxiliary Contact

LD5AU01

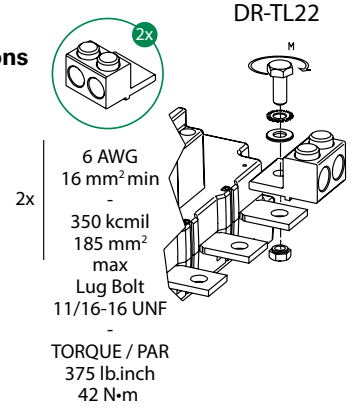


Terminal Lug Measurements

LDRTL22W				
16 MM² MIN --- 350 KCMIL 185 MM² MAX	CONDUCTOR TEMPERATURE RATING		COPPER WIRE ONLY M (TERMINAL TORQUE) (+5% | -10%)	
			N•M	LB.INCH
	75 °C	M10	24	212

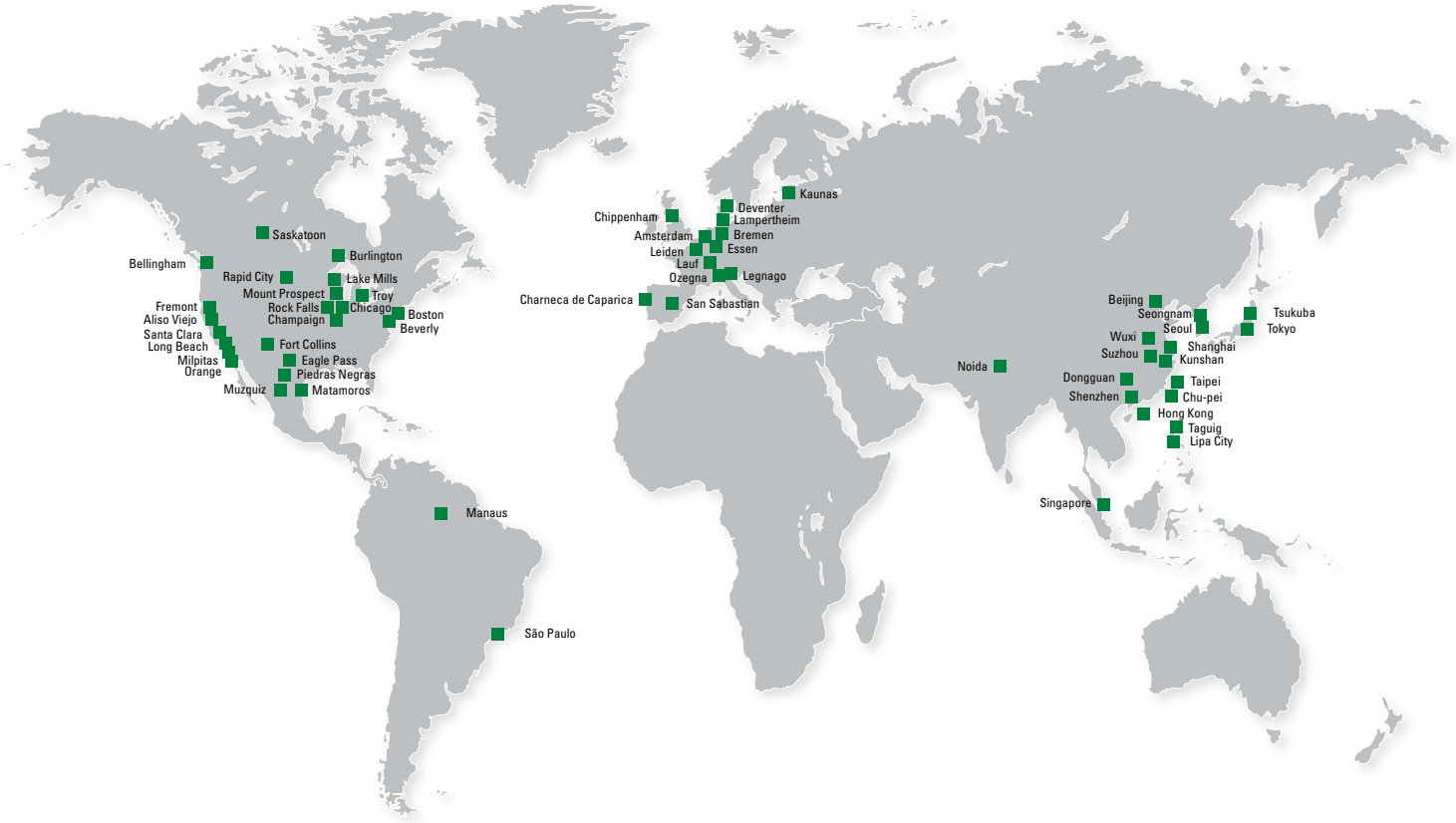
Torque and Cable Capacity Instructions

DR-TL22



8

Local Resources for a **GLOBAL** Market



Sales and Technical Support

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  Phone +49 4244 819149
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- **Singapore**
  Phone +65 6885 9188
- **South Korea**
  Phone +82 2 6000 8600
- **United Arab Emirates (UAE)**
  Phone +971 4341 3660

Protection Relays & Controls Catalog (PF130N)
The comprehensive line of electronic and microprocessor-based protection relays, timers, and flashers safeguard equipment and personnel to prevent expensive damage, downtime or injury due to electrical faults.

Fuses & Fuse Holders Catalog (PF101N)
Littelfuse offers a complete circuit protection portfolio of industrial power fuses, including time-saving indication products for an instant visual blown-fuse identification.

Surge Protection Devices Catalog (PF612)
These surge protection devices safeguard components from transient overvoltage or surges.

Visit Technical Resources at Littelfuse.com
Technical information is only a click away. The Littelfuse Technical Resources section contains datasheets, product manuals, white papers, application guides, demos, on-line design tools, and more.

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Littelfuse products are certified to many standards around the world. To check certifications on specific product please refer to the product datasheet on Littelfuse.com.

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