

The SineUp LR series is designed specifically as a commercial & industrial surge protective device (SPD) for installation at the electrical service entrance. As a lightning arrester, the LR series limits damaging voltage spikes to harmless levels. The LR SPDs with UL 1283 filtering are ideal for facilities containing modern electronics including computerized building control, data centers, computer workstations and automation equipment.

Description:	Parallel connected, AC power Surge Protective Device.								
Application:	ANSI/IEEE C62.72-2016, ANSI/IEEE C62.41.1 & C62.41.2-2002, ANSI/IEEE C62.62-2010 environments: Suitable for Categories: A, B & C (Most Severe Electrical Environments); UL 1283 EMI Filters, NFPA 780 & UL 96A Lightning Protection Systems; National Electric Code, Art. 285, 700.10 & 708.20; CSA C22.2 No. 269.2-13 or No. 8-13.								
Warranty:	5 Years								
Unit Listings:	Listed to ANSI/UL 1449 4th Edition & CSA C22.2. No. 269.2-13 (VZCA & VZCA7, E484255); ANSI/UL 1283 and CSA C22.2 No. 8-13 (FOKY & FOKY7, E484255)								
Circuit Design:	Parallel configured Threshold Clamping Circuitry circuit design incorporating a per-element thermal disconnection technology. UL 1283 Filtering models also contain the same Threshold Clamping Circuitry.								
Protection Modes:	Industry-best practice of L-N & N-G (4-mode) protection elements for installation at a facilities electrical service entrance.								
Input Frequency:	50-60 Hz (60 Hz typical)								
Insertion Loss Data: (L-N for 3Y1)	<table border="0"> <tr> <td>Frequency:</td> <td><u>10 kHz</u></td> <td><u>100 kHz</u></td> <td><u>1 MHz</u></td> </tr> <tr> <td>Attenuation:</td> <td>20 dB</td> <td>26 dB</td> <td>47 dB</td> </tr> </table>	Frequency:	<u>10 kHz</u>	<u>100 kHz</u>	<u>1 MHz</u>	Attenuation:	20 dB	26 dB	47 dB
Frequency:	<u>10 kHz</u>	<u>100 kHz</u>	<u>1 MHz</u>						
Attenuation:	20 dB	26 dB	47 dB						
EMI/RFI Filtering:	Up to 41 db normal mode, 39 db common mode								
Circuit Diagnostics:	Green LED normally on, Red LED indicates the SPD needs to be replaced, and an off LED indicates power is off and/or the SPD needs to be replaced.								
Connection/mounting:	#10 Wire (pre-installed), hub (pre-installed on base models, installed at time of installation on optional enclosures) and integral, multi-point mounting feet.								
Short Circuit Current Rating:	200 kA								
Nominal Discharge Current (I_n) Rating:	20 kA (Complies with the requirements of UL 96A Master Label for Installation Requirements for Lightning Protection Systems)								





Model Number Selection Format

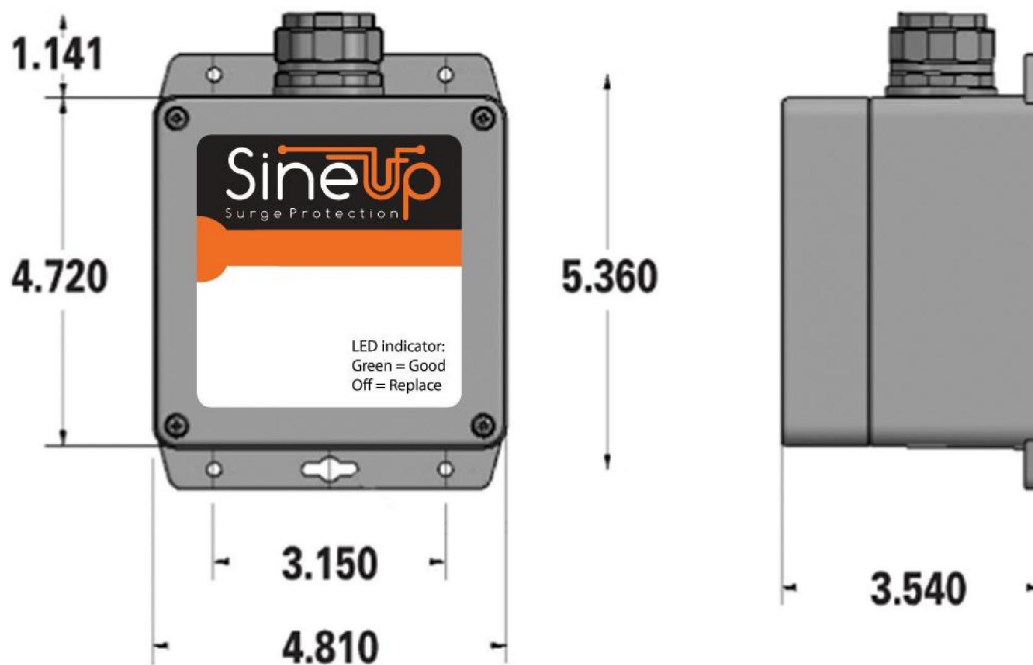
Configuration	PSC	SPD Type	Voltage Code
LR1 - VRC Voltage Responsive Circuitry	2 - 50 kA / mode	1 - Type 1, 20 kA	1S1 - 120/240 V 3Y1 - 208Y/120 V 3Y2 - 480Y/277 V 3N4 - 480 V
LR2 - FRC Frequency Responsive Circuitry		2 = Type 2, 20 kA	

Typical Model Breakdown

LR2221S1

(Frequency Responsive Circuitry, 50 kA Peak Surge Current, Type 2, 120 VAC)

Model Number	Electrical Characteristics					Nominal Discharge Current	Short Circuit Current Rating (SCCR)	UL Voltage Protection Rating (MCOV)				Conduit Size (in.)
	Phase	Nominal Voltage	Per Mode Surge Current	AC Frequency	System			L-L	L-N	L-G	N-G	
1S1	1	120/240V	50kA	50/60 Hz	SPLIT	20 kA	200 kA	1200 (300)	600 (150)	1200 (300)	600 (150)	3/4
3Y1	3	208Y/120V	50kA	50/60 Hz	WYE	20 kA	200 kA	1200 (300)	600 (150)	1200 (300)	600 (150)	3/4
3Y2	3	480Y/277V	50kA	50/60 Hz	WYE	20 kA	200 kA	2500 (640)	1200 (320)	2500 (640)	1200 (320)	3/4
3N4	3	480 V	50kA	50/60 Hz	DELTA	20 kA	200 kA	4000 (552)	-	1800 (552)	-	3/4

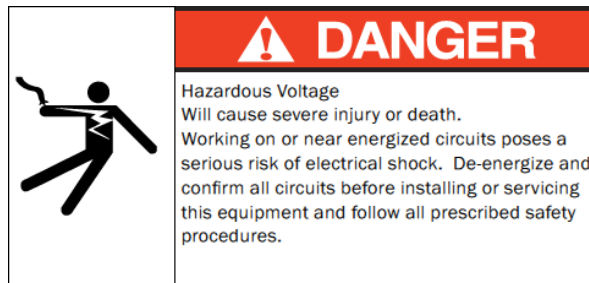


Surge Protective Device (SPD)

Qualified Person

For the purpose of this instruction leaflet, a qualified person:

1. is familiar with the subject equipment and the hazards involved with their application, use, administration and maintenance.
2. is trained and authorized to de-energize, clear, ground, and tag circuits and equipment in accordance with established safety practices.
3. is trained in the proper care and use of personal protective equipment such as rubber gloves, hard hat, safety glasses or face shields, arc-flashclothing, etc., in accordance with established safety practices.
4. is trained to render first aid.
5. has received safety training to recognize and avoid the hazards involved.
6. has the skills and knowledge pertaining to the construction and operation of this equipment and its installation.



Important

The contents of this information sheet are not part of, nor do they modify, any prior or existing agreement, commitment or relationship. The LR Series terms and conditions of sale constitute the entire obligation of LP PARTS, LLC. The warranty is posted at www.LP Parts, LLC.com/warranty. Any statements in this document do not create new warranties or modify any existing warranty.

LR Series General Specifications

Family	LR
Short-Circuit Current Rating (SCCR)	200 kA
Nominal Discharge Current (8x20 μ s) I_n	20 kA
Voltage Frequency	50 / 60 Hz
Conductor Gauge / Type	Stranded 10 AWG / 6 mm ²
Enclosure	NEMA 1, 2, 3, 3R, 3X, 4, 4X
Degree of Protection (Installed State with liquid tight connections)	IP65
SPD Install Location	Indoor or Outdoor
Operating Temperature	-40° C to +65° C -40° F to +150° F
Warranty	5 yr
Recommended Circuit Breaker	30 Amp

Installation Instructions

IMPORTANT: Read these instructions carefully to assure proper installation and assembly. Ensure all fasteners and connections are properly tightened. Installation in a manner inconsistent with these instructions will void warranty.

To ensure integrity of the finished installation, do NOT install the LR Series SPD if it has been dropped or abused during the installation process.

The LR Series SPD contains no user serviceable parts and cannot be repaired. Performing the following will compromise the unit's performance and will void the warranty. Do NOT:

- Y Megger or IR (Insulation Resistance) test the system with the SPD installed
- Y Install in a system that has a voltage greater than the unit's rated voltage



Ungrounded power systems are inherently unstable and can produce excessively high line-to-ground voltages during certain fault conditions. During these fault conditions any electrical equipment, including an SPD, may be subjected to voltages which exceed their designed ratings. This information is being provided to the user so that an informed decision can be made before installing any electrical equipment on an ungrounded power system.

Safety Concerns

This instruction sheet is not comprehensive. It is assumed the LR Series installer will follow trade and NEC 70E established safety precautions for working in an electrical environment.

- Y Suitable for use on a circuit capable of delivering not more than 200,000 rms symmetrical amperes at the nominal system voltage.
- Y This device features internal protection that will disconnect the surge protective component at the end of its useful life but will maintain power to the load - now unprotected. If the situation is undesirable for the application, follow the manufacturer's instructions for replacing the device.
- Y The LED status indicators report the status of the protection circuitry.
- Y Contains no serviceable parts
- Y Warning - Shock Hazard - Do not open



Required Additional Materials: To maintain outdoor and liquid-tight ratings, the Myers hub (conduit fitting) installed on the SPD should be utilized in conjunction with the sealing washer and chase nipple provided. The sealing washer is placed between the Myers hub and wall of the panelboard or enclosure to which the SPD is to be installed. Further, it is recommended that thread seal tape (aka "Teflon tape") be used to wrap the threads of the chase nipple before installation in addition to using the sealing washer. If other conduit connections are used in place of the provided hardware, follow the manufacturer's instructions on maintaining a liquid tight seal on the connections.

- Inspect the unit to determine if the unit:
 - has the correct nominal system and Maximum Continuous Operating Voltage (MCOV) ratings and is the correct configuration for the installation site. (See Table 1 for specifications), it is required that the power system voltages be verified with the appropriate meter prior to installation and those values confirmed to be lower than the MCOV. Use Table 2 to record your readings and verify the recorded values are lower than those listed in Table 1 for the unit.
 - is NOT damaged, do not attempt to install if it is damaged. Obtain a proper replacement before proceeding with the installation.
- De-energize the electrical panel or equipment and follow the established lockout / tagout procedures. Confirm the location is de-energized using the appropriate test equipment before proceeding with the SPD installation.
- Select a location on the panel or equipment that allows the SPD leads to reach their intended connection points using the shortest possible lead lengths. A dedicated multipole breaker is recommended.
- Remove a knockout sized for, or make an appropriate sized hole for the conduit hub where the SPD is to be mounted. For an outdoor or liquid-tight installation, follow the instructions provided in the CAUTION statement above.
- Remove the chase nipple from the Myers hub attached to the SPD. Mount the SPD to the panelboard or enclosure by routing the wires from SPD through the sealing washer (if outdoor or liquid-tight installation is needed) and then open knockout or hole into the panel. On the inside of the panel or enclosure, route the wires through the threaded end of the chase nipple. Thread the chase nipple into the Myers hub and tighten so that the SPD is mechanically attached to the panel or enclosure. Be careful not to damage the insulation of the wires during the mounting process. If the sealing washer is used, be sure it is not damaged or displaced by the Myers hub and it maintains a liquid-tight seal. The mounting feet provided with the SPD can also be used to aid in mechanically mounting the SPD as necessary.
- Cut the leads to the shortest possible length to reach the connection point (i.e. breaker or grounding bar). Trim the insulation of the leads so that they can be connected appropriately (review manufacturer's instructions for terminating to the breaker or grounding bar as needed). The shorter the SPD leads, the better the SPD will protect against surges.
- Twist the phase conductors, and avoid sharp bends (NEC Art 285.12). Make electrical connections appropriate for the application (see Power System Diagrams). If your electrical system is not represented in the circuit diagrams, contact your LP PARTS, LLC representative. Tighten the electrical terminals to the terminal manufacturer's specifications.
- Energize panel or equipment and verify the LED status indicator is ON (Blue).
- Option Package - p/n suffix B or D** - Connecting Dry (voltage free) Relay Contacts
 - NOTE: SPD is equipped with sets of colored 18 to 22 AWG wires. Blue = Common, Orange = N/C, Yellow = N/O when power is applied. (SPDT; Form C)
 - Contacts are rated at ≤60 W/125 VA (from 30 VDC @ 2 A to 150 VDC @ 0.4 A), max. switched current = 2 A.
 - Follow rules for NEC class 2 wiring when routing alarm leads. To maintain NEMA-4X (IP65) rating use appropriate cable and liquid tight strain relief if needed (user supplied)
 - Connect alarm circuit(s) to Normally Open (N/O) or Normally Closed (N/C) circuits as required.
 - If not using these contacts, please cap off the wires with a UL Listed wire nut.

GREEN LED = Good

The circuit is energized and protected.

RED LED = Replace SPD

The circuit is energized and unprotected.

Please replace the unit.

Note: The Lid of the enclosure may be rotated 180° for aesthetic reasons while de-energized

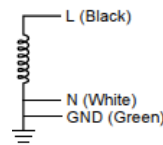
No LED / LED is Out = Investigate:

The circuit could be de-energized

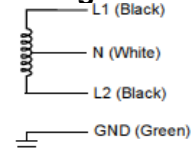
The unit's leads could be disconnected

The unit could be damaged

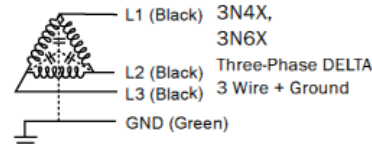
Power System Diagrams Showing SPD Wire Colors



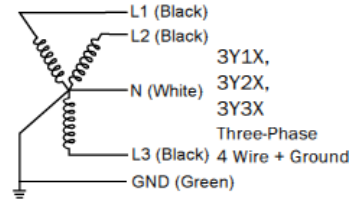
1P1X,
1P2X,
Single Phase
2 Wire + Ground



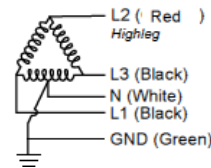
1S1X
Single Phase
3 Wire + Ground



3N4X,
3N6X
Three-Phase DELTA
3 Wire + Ground



3Y1X,
3Y2X,
3Y3X
Three-Phase
4 Wire + Ground



3D1X
Three-Phase
High-Leg Delta
4 Wire + Ground

Voltage Code	Electrical System	Max. Continuous Operating Voltage (MCOV)				
		L-N	L-G	L-L	N-G	Hi - Leg
1P1X	100 to 127 Vac Single Phase	150 V	150 V	-	150 V	-
1P2X	200 to 240 Vac Single Phase	320 V	320 V	-	320 V	-
1S1X	120/240 Vac, Split Phase	150 V	150 V	300 V	150 V	-
3Y1X	208 Y/120 V; 190 Y/110 V; 220 Y/127 V; 3 Φ Wye	150 V	150 V	300 V	150 V	-
3Y2X	480 Y/277 V; 440 Y/254 V; 460 Y/267 V; 3 Φ Wye	420 V	420 V	840 V	420 V	-
3Y3X	600 Y/347 V; 525 Y/305 V; 3 Φ Wye	320 V	320 V	640 V	320 V	-
3D1X	120/240 Vac, 3 Φ, High-Leg Delta	150 V	150 V	320 V	150 V	320 V
3N4X	440 to 480 Vac, 3 Φ Delta or Wye	-	550 V	550 V	-	-
3N6X	525 to 600 Vac, 3 Φ Delta or Wye	-	840 V	840 V	-	-

Table 1

Installation Voltage Measurement Worksheet			
Measure between	Measurement Value, fill-in	Measure Between	Measurement Value, fill-in
L1 - Gnd	____ VAC	L1 - Neut	____ VAC
L2 - Gnd	____ VAC	L2 - Neut	____ VAC
L3 - Gnd	____ VAC	L3 - Neut	____ VAC
Neut - Gnd	____ VAC	L1 - L3	____ VAC
L1 - L2	____ VAC	L2 - L3	____ VAC

Table 2

Use Table 2 above to verify system voltages prior to installation.



FIVE YEAR LIMITED WARRANTY

LP Parts, LLC warrants for a period of **five (5) years** from date of retail purchase that if its product ceases to properly function as a direct result of any electrical anomaly, including lightning, **LP Parts, LLC** will repair or replace the product without charge, subject to the terms and conditions set forth herein. If, in the sole subjective opinion of **LP Parts, LLC** the product has been modified, altered, tampered with, misused or misapplied or repaired by any entity other than **LP Parts, LLC**, or subjected to abuse, the warranty is void. The warranty shall not apply unless the product is installed by a qualified licensed and/or bonded electrician. The warranty period for repaired or replacement products shall be only the remaining portion of the original limited warranty. Any defect appearing more than five (5) years from the date of delivery to purchaser, shall be deemed to be due to ordinary wear and tear. **LP Parts, LLC**, however, assumes no risk or liability resulting from the use of its products, including but without limiting the generality of the foregoing: (1) The use of this product in combination with any electrical or electronic components, circuits, systems, assemblies or any other materials or substances; (2) The improper application or unsuitability of this product for use in any circuit or assembly. All warranty inspections and parts must be obtained at **LP Parts, LLC**. The giving of, or failure to give, any advice or recommendations by **LP Parts, LLC** shall not constitute any warranty by or impose any liability upon **LP Parts, LLC**. THIS WARRANTY DOES NOT GUARANTEE UNINTERRUPTED ELECTRIC SERVICE. REPAIR OR REPLACEMENT OF THIS PRODUCT IS THE EXCLUSIVE REMEDY OF THE RETAIL END USER PURCHASER. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR USE OR PURPOSE; ALL OF WHICH ARE HEREBY EXCLUDED AND EXPRESSLY DISCLAIMED. **LP PARTS, LLC** SHALL IN NO EVENT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES OF ANY KIND OR CHARACTER, INCLUDING, WITHOUT LIMITATION, THE EXPENSE OF INSTALLATION OR REMOVAL OF THIS PRODUCT, LOSS OF REVENUE OR PROFITS, FAILURE TO REALIZE SAVINGS OR OTHER BENEFITS, LOSS OF COMPUTERIZED OR OTHER DATA, DAMAGE TO ANY ELECTRIC OR ELECTRICAL EQUIPMENT, INCONVENIENCE AND/OR FOR THIRD PARTY CLAIMS MADE AGAINST THE WHOLESALE OR RETAIL PURCHASER OF THIS PRODUCT, EVEN IF BEFORE OR AFTER PURCHASE **LP PARTS, LLC** HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. **LP Parts, LLC** TOTAL LIABILITY FOR ANY CLAIM MADE AGAINST IT SHALL IN NO EVENT EXCEED THE PURCHASE PRICE PAID TO **LP PARTS, LLC** FOR THE DEFECTIVE PRODUCT. As a condition precedent to **LP Parts, LLC's** performance pursuant to this Warranty, Purchaser must return this product within the Warranty period FOB **LP Parts, LLC's** place of business in Lacombe, LA. *Please call 1-985-882-2985 for warranty return procedures. Return authorization is required.*



Contact Us

sales@petroguardian.com

985-882-2985