

USER'S GUIDE

LEONICS®

TVSS ⚡ DC SURGE DIVERTER

LSDxxx-20kA series

Power DC Surge Protector



TECHNICAL SPECIFICATIONS

MODEL	LSD150-20kA	LSD250-20kA	LSD450-20kA	LSD600-20kA	LSD750-20kA	LSD850-20kA
ELECTRICAL SYSTEM	POS. (+), NEG. (-), EARTH (DC and PV system)					
NOMINAL VOLTAGE	48 / 72 V	120 V	240 V	400 V	500 V	850 V
MAXIMUM VOLTAGE	170 V	250 V	460 V	615 Vdc	770 V	1,000 V
APPLICATION RANGE (MCOV)	40 - 150 V	100 - 250 V	200 - 450 V	400 - 600 V	500 - 750 V	500 - 900 V
LET THROUGH VOLTAGE	400 V	600 V	1,200 V	1,500 V	1,800 V	2,400 V
SURGE ENERGY DISSIPATION	756 joules	1,125 joules	2,160 joules	2,475 joules	5,040 joules	6,320 joules
SURGE CAPABILITY (Imax) (8/20 µs)	20 kA (25 kA, 40 kA are optional)					
TVSS PROTECTION MODE	POS. - NEG., POS. - EARTH, NEG. - EARTH					
LOCATION CATEGORY	ANSI/IEEE C62.41-1991: CAT A1, A2, A3, B1, B2, B3, C1, C2					
AMBIENT TEMPERATURE	-40°C to 60°C					
DIMENSIONS (W x H x D) (mm.)	38 x 215 x 82			44 x 251 x 106		

Continuous product development is our commitment. In that manner, the above specifications may be changed without prior notice.

Authorized Distributor

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SAFETY INSTRUCTIONS

Please read and follow this user's guide carefully and completely.

Important: Please keep this user's guide for reference in order to use LEONICS Surge Diverter properly and safety. This user's guide consists of safety instruction, introduction, installation, operation and technical specifications.

For product safety, please check this product annually by our service qualified personnel or if there are any symptoms of problems which are not mentioned in this guide or any queries about our products, please contact your LEONICS local distributors, LEONICS service center or send e-mail to marketing@lpsups.com.

For your convenience and quick reference for LEONICS Surge Diverter service, please fill the requested information in the blanks below:
Surge Diverter Model: _____
Serial Number: _____
Purchased date: _____
Purchased from: _____

CAUTION

Risk of electric shock, DO NOT remove cover. No user serviceable part inside, please refer servicing to qualified service personnel.

- Before installing or using this unit, read all instructions and caution markings on the unit and other system compartments and all sections of this user guide.
- Do not work alone where there are electrically hazardous conditions. Only qualified electricians should install or service this unit.
- Contact with live conductors will cause burns and dangerous electric shock.
- The Surge Diverter, which is mentioned in this user's guide, is designed for DC electrical system only.
- Install this unit in a temperature and humidity controlled indoor area with adequate air flow and away from chemical particles or flammable

substances. Avoid installing the unit near radio transmission station, heat dissipation eqment and direct sunlight.

- To achieve maximum performance, Surge Diverter must be connected to grounded electrical system to work properly. Connecting to non-grounded electrical system, it will not be able to properly protect your electrical equipments from transient voltage surge suppression.
- To reduce risk from electric shock , turn off main circuit breaker before connecting the unit to DC power source.
- Use insulated tools to reduce your risk of electric shock.
- Remove all jewelry or other metal objects such as rings, necklace, bracelets and watches when installing this product.
- Verify correct all terminal block connections to prevent the damage occurs. Improper wiring or installation can cause product inefficient operation.

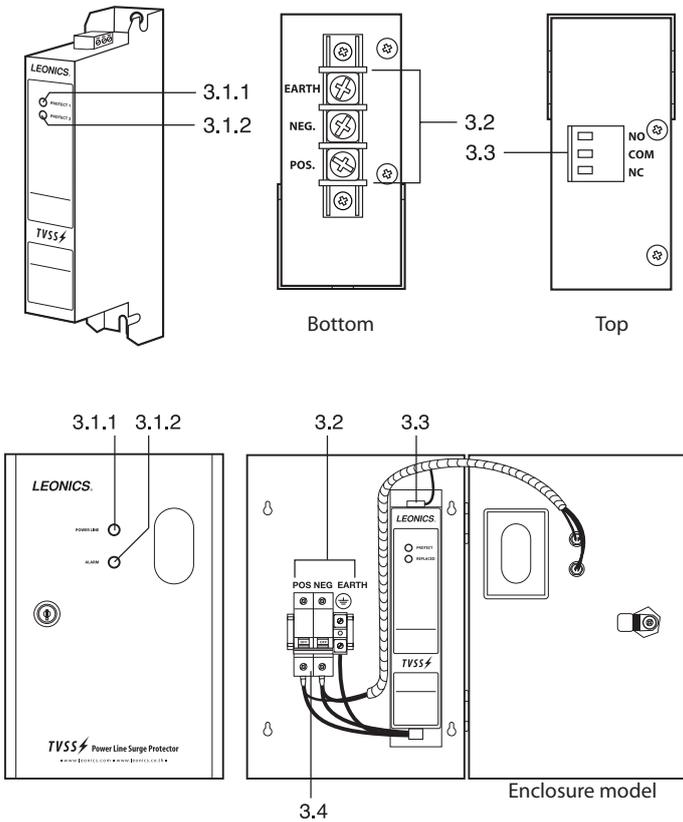
INTRODUCTION

Natural phenomena such as thunderstorm, lightning and the start-stop of the high power motorized equipments such as air conditioner, washing machine, printer, all are the common causes of transient voltage or surge. It can be considered a transient with voltage levels greater than 2,000 Volt and current levels greater than 100 Amp within 1 - 10 microseconds. The effects of surge cause electronic equipments and telecommunication equipments damage, operate incorrectly, shorten their equipment life or lose data.

LEONICS Surge Diverter is a transient voltage surge suppressor (TVSS) or surge protector which create a much lower resistance when voltage is too high and divert extra current into MOV and to ground in order to protect the equipment down stream and reduce loss from surge.

- Feature**
- Parallel installation, no effect to any equipments in the system.
 - LED protected status and replaced indicator
 - Remote indicator port for alarm dry contact.
 - Tested in accordance with ANSI/IEEE C62.41-1999, ANSI/IEEE C62.42-2000
 - Applications for industrial power utility, computer or IT network, telecommunication systems, control system, security system, etc.

FRONT PANEL AND COMPONENTS



3.1 LED indicators

- 3.1.1 **PROTECT 1**: Indicates the DC Surge Diverter operation status.
- 3.1.2 **PROTECT 2**: Indicates the DC Surge Diverter operation status.

3.2 POS (+), NEG (-) and EARTH terminals: The terminals for connecting to DC electrical system.

3.3 Remote alarm contact terminal: Alarm dry contact (NO, COM, NC) terminal for connecting to remote alarm devices such as PLC or buzzer.

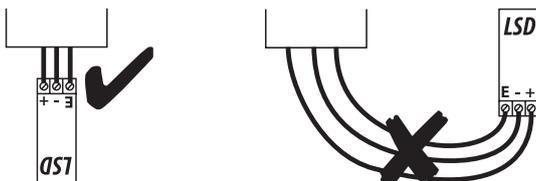
3.4 Fuse breaker/Circuit breaker: The circuit breaker to isolate DC Surge Diverter from electrical system during maintenance (available in Enclosure model only).

INSTALLATION

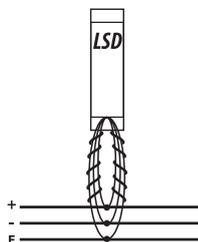
4.1 Before installation, check voltage and environment as following

- The ground system is properly installed and the earth resistance is less than 10 ohms.
- The voltage of POS.-NEG., POS.-EARTH and NEG.-EARTH should not over than the application range of surge diverter.

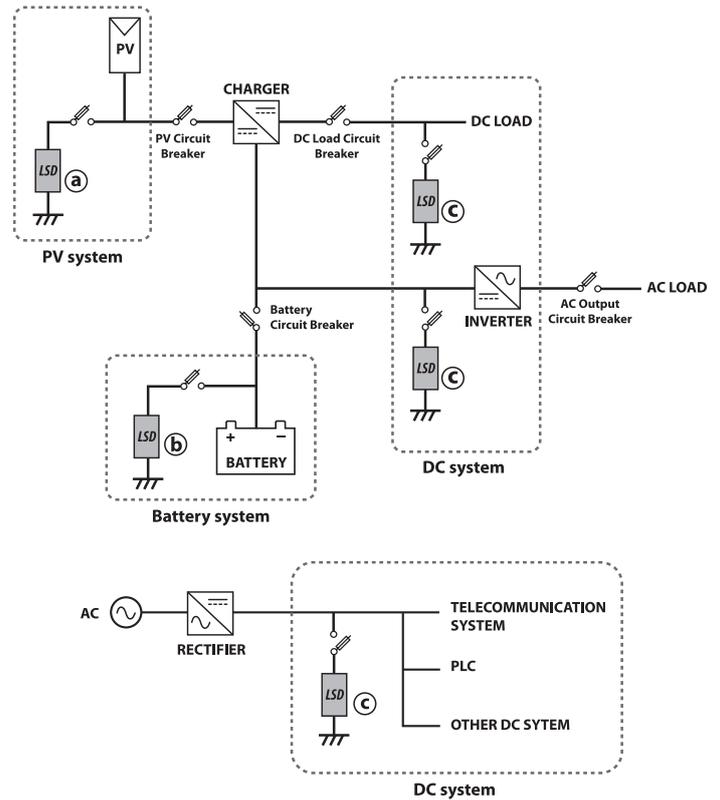
4.2 Use 10 mm² stranded cable or looped 2 sets of 4 mm² cables for connecting to electrical system. The cables are recommended to be as short as possible and not longer than 25 cm. or 10 inches.



4.3 In case that it is not possible to wire the system with 25 cm. cable length, use two sets of 4 mm² cables which each length is shorter than 50 cm. Split them into 2 sets with minimum space 10 cm. or 4 inches. Tie the cables with cable tie or spiral wrap for the whole length.



4.4 The installation of DC Surge Diverter depends on its applications as shown on figure a, b and c.



- a : Installation in PV system
- b : Installation in Battery system
- c : Installation in DC power system

4.5 Recommend to install a circuit breaker to separate DC Surge Diverter from electrical system for maintenance and protection of the cables from the DC surge diverter to the electrical system.

4.5.1 For the electricity system rated current 100 A or lower, use HRC Fuse rating 63 A, $I_c \geq 20$ kA.

4.5.2 For the electricity system rated current higher than 100 A, use HRC Fuse rating 63 A or 100 A or MCCB rating 63 A, $I_c \geq 20$ kA.

4.6 Connect ground cable of DC Surge Diverter directly to the ground system. If it has to be connect to the other ground systems, the resistance between the ground of the surge diverter and the earth should be less than 10 Ω

OPERATION

5.1 After the installation, starts the DC Surge Diverter, check the operation status from two indicator lamps at the front panel. The meaning of the indicators are as follow

Operation Status	Indicator lamps	
	PROTECT 1	PROTECT 2
DC Surge Diverter operates normally	Lit	Lit
The protection system operates inefficiently. Recommend to replace the new surge diverter	Lit	Off
The protection system does not operate. Surge diverter is deteriorating. Replace the new one.	Off	Off
No electricity supplies to the surge diverter or blackout occur.	Off	Off

5.2 User can connect to remote alarm devices such as PLC or buzzer by connecting to dry contact (NO, COM, NC). Maximum rating power of remote alarm devices are 350 Vac, 0.1 A or 30 Vdc, 0.1 A.