

## TECHNICAL SPECIFICATIONS

MODEL	LS-231C	LS-231C-ENCL	LS-431C	LS-431C-ENCL
ELECTRICAL SYSTEM	Three phase (3 wire + neutral + earth)			
NOMINAL VOLTAGE	380 Vac or 415 Vac			
FREQUENCY RANGE	45 - 65 Hz			
TVSS PROTECTION MODE	L-L, L-N, L-E, N-E			
APPLICATION RANGE (MCOV)	310 - 480 Vac			
LET THROUGH VOLTAGE	600 V			
SURGE ENERGY DISSIPATION	3 x 1,560 joules		3 x 3,080 joules	
SURGE CAPABILITY (Imax)(8/20 μs)	20 kA/phase		40 kA/phase	
LEAKAGE CURRENT (phase to earth)	<200 μA		<400 μA	
LOCATION CATEGORY	A1, A2, A3, B1, B2, B3, C1, C2			
DESIGN REGULATION	ANSI/IEEE C62.41-1991, ANSI/IEEE C62.42-2000			
AMBIENT TEMPERATURE	-40°C to 60°C			
DIMENSIONS (W x H x D) (mm.)	120 x 270 x 120	250 x 350 x 160	120 x 270 x 120	250 x 350 x 160

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 with enclosure, which is mentioned in this user's guide, is designed for three phase 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

# USER'S GUIDE

## LEONICS®

## TVSS ⚡ SURGE DIVERTER

### LS-x31C series

### Three Phase Power Line Surge Protector



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

- To achieve maximum peuprformance, 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 AC 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.

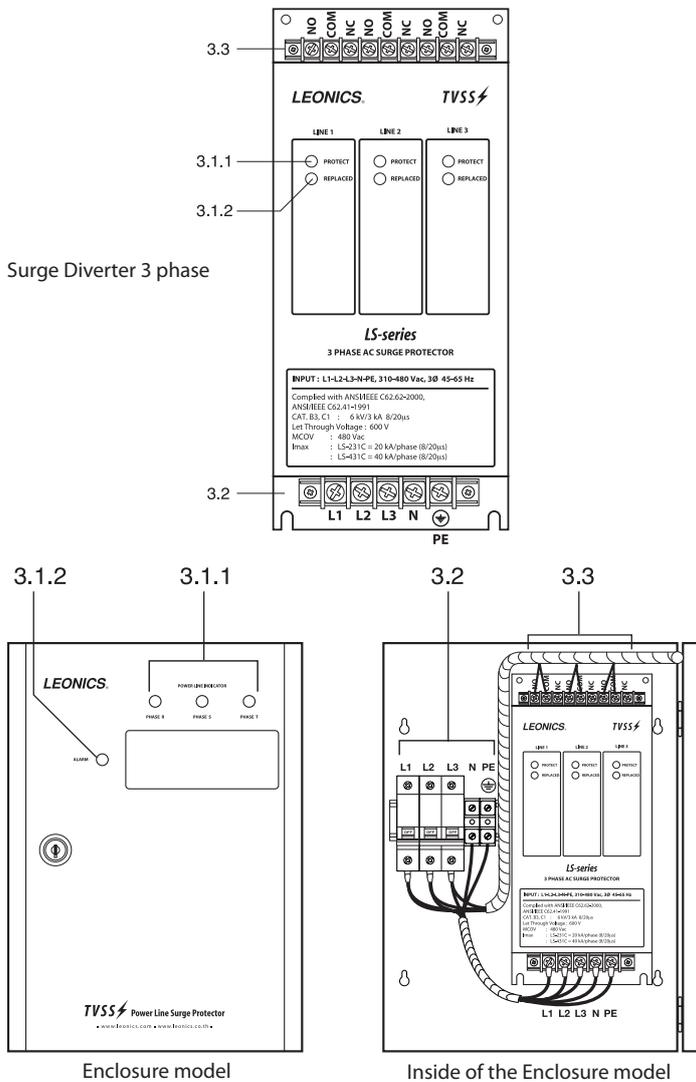
## INTRODUCTION

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**
- Installed in parallel, 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 system, computer or IT network, communication systems, control system, security system, etc.

## FRONT PANEL AND COMPONENTS



### 3.1 LED indicators

- 3.1.1 **PROTECT/POWER LINE INDICATOR:** Indicates that the Surge Diverter is operating normally.
- 3.1.2 **REPLACED/ALARM:** Indicates that the Surge Diverter is deteriorating. The protection system operates inefficiently. Recommend to replace the new surge diverter.

**3.2 R (L1), S (L2), T (L3), N, PE terminals:** The terminals for connecting to three phase electricity 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.

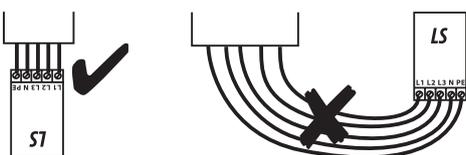
**3.4 Fuse breaker/Circuit breaker:** The circuit breakers which are provided in the enclosure, use for isolate Surge Diverter from electrical system during maintenance.

## INSTALLATION

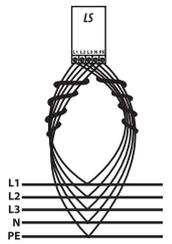
4.1 Before installation, check voltage and environment as following

- The ground system is properly installed and the earth resistance is less than 10 ohms.
- The Line-Neutral and Line-Earth voltages are less than 280 Vac (application range).
- The Neutral-Earth voltage must be less than 60 Vac.

4.2 Use 10 mm<sup>2</sup> stranded cable or looped 2 sets of 4 mm<sup>2</sup> 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.

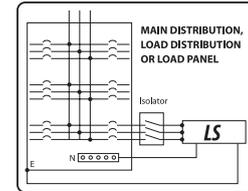
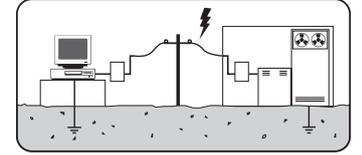
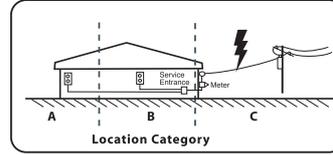


4.3 In case that it is not possible to wire the system with 25 cm. cable length, use two sets of 4 mm<sup>2</sup> cables which each length is shorter than 50 cm. Split them into 2 sets (L1, L2, L3, N and PE) with minimum space 10 cm. or 4 inches. Tie the cables with cable tie or spiral wrap for the whole length.

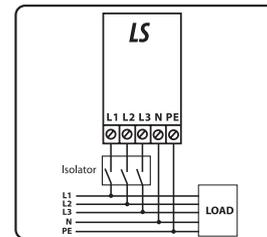


4.4 There are 2 types of installation

4.4.1 **Service entrance installation:** Install Surge Diverter at main distribution boards (MDB). It can be installed as shown.



4.4.2 **Surge source installation:** Install Surge Diverter at load distribution or load panel to protect surge from the start-stop equipment or in the special protection areas such as signal control room and server room.



4.5 Recommend to install a circuit breaker to separate Surge Diverter from electrical system for maintenance and protection of the cables from the 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 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  $\Omega$ .

## OPERATION

5.1 After the installation, starts the 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 of each phase	
	PROTECT / POWER LINE	REPLACED/ ALARM
Surge diverter operates normally	Lit	Off
The protection system operates inefficiently. Recommend to replace the new surge diverter	Lit	Lit
The protection system does not operate. Surge diverter is deteriorating. Replace the new one.	Off	Lit
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 250 Vac, 6 A or 30 Vdc, 5 A.