



INSTRUCTION MANUAL
POWER LINES CDN UNIT
FOR **LSS-6000 series**
MODEL LSS-INJ6350

NOISE LABORATORY CO., LTD.

1.09 EDITION
AEE00029-00E-0J

NOTICE

The contents of this booklet are subject to change without prior notice.

No part of this booklet may be reproduced or transferred, in any form, for any purpose, without the permission of Noise Laboratory Co., Ltd.

The contents of this booklet have been thoroughly checked. However, if a doubtful point, an error in writing or a missing is found, please contact us.

Noise Laboratory Co., Ltd. shall have no liability for any trouble resulting from the misuse or improper handling of this product regardless of the contents of this booklet or arising from the repair or remodeling of this product by a third party other than Noise Laboratory Co., Ltd. or its authorized person.

Noise Laboratory Co., Ltd. shall have no liability for any trouble resulting from the remodeling or modification of this product.

In no event shall Noise Laboratory Co., Ltd. be liable for any results arising from the use of this product.

1. IMPORTANT SAFETY PRECAUTIONS

Thoroughly understand the following precautions before use, as they are important matters for handling this unit in safety.

1. As the surge output part of this unit and Lightning Surge Simulator (Models **LSS-6000 series**) generate high voltage and great electric current (**6.6kV 3300A** maximum), carefully handle it. Mishandling or careless operation may result in a fatal wound.
2. This unit and Lightning Surge Simulator (Models **LSS-6000 series**) cannot be used in an explosive area, fire prohibited area, etc. Use of this unit in such an area is liable to cause combustion or ignition.
3. A person who has a pacemaker on should not operate this unit and Lightning Surge Simulator (Models **LSS-6000 series**), and also should not enter the area where they are operating.
4. Test rig to be used with this unit should be capable of withstand voltage at least **6.6kV**. EUT test using this unit should be performed in a protective enclosure or cover against scattering broken pieces, fire electric shock, etc.
5. When make connections between this unit, associated surge generator, accessories, optional equipment and other equipment, press STOP SWITCH of the Lightning Surge Simulator and check to see that STOP SWITCH switch of the Lightning Surge Simulator is lighting up beforehand. And then turn off a breaker for LINE INPUT of this unit beforehand. Otherwise, you may receive an electric shock.
6. When using the main unit, be sure to have the line switch of the Lightning Surge Simulator (Models **LSS-6000 series**) "OFF".
7. Read the description of important safety precautions of the instruction manual for Lightning Surge Simulator (Models **LSS-6000 series**) before testing.

2. APPLICATION FORM FOR INSTRUCTION MANUAL

We place an order for an instruction manual.

Model: LSS-INJ6350

Serial No.: _____

Applicant:

Company name: _____

Address: _____

Department: _____

Person in charge: _____

Tel No.: _____

Fax No. _____

Cut off this page "APPLICATION FORM FOR INSTRUCTION MANUAL" from this volume and keep it for future use with care.

When an INSTRUCTION MANUAL is required, fill in the above Application Form and mail or fax it to the following sales department of our company.

To: Noise Laboratory Co., Ltd.

1-4-4, Chiyoda, Sagamihara City

Kanagawa 229-0037, Japan

TEL: +81 (0)42 712 2051 FAX: +81 (0)42 712 2050

Cut
line

3. TABLE OF CONTENTS

1. IMPORTANT SAFETY PRECAUTIONS	1
2. APPLICATION FORM FOR INSTRUCTION MANUAL	3
3. TABLE OF CONTENTS	5
4. PREFACE.....	7
4-1. PREFACE	7
4-2. FUNCTIONS AND CAPABILITIES	7
5. APPEARANCE OF THE UNIT AND POSITION OF SERIAL NUMBER.....	8
5-1 APPEARANCE OF THE UNIT.....	8
5-2 NAME OF EACH PART AND FUNCTION	9
5-3 SURGE INJECTION PHASE.....	11
6. HOW TO CONNECT EQUIPMENT	12
6-1. HOW TO CONNECT EQUIPMENT	12
6-2. HOW TO SET THE TEST CONDITIONS	13
7. SPECIFICATIONS.....	14
8. STANDARD ACCESSORIES.....	15
8-1. STANDARD ACCESSORIES	15
9. WARRANTY.....	17
10. MAINTENANCE	19
11. NOISE LABORATORY SUPPORT NETWORK.....	20

4. PREFACE

4-1. Preface

We thank you for your purchase of the POWER LINES CDN UNIT for [LSS-6000 series](#) Model: LSS-INJ6350. This manual contains how to use the LSS-INJ6350 and other important information. In order to obtain the highest performance from your LSS-INJ6350, thoroughly understand the contents of this manual and use as ready reference for operation.

Please read the instruction manual of the [LSS-6000 series](#) for the details on the operation of the [LSS-6000 series](#) Lightning Surge Simulator..

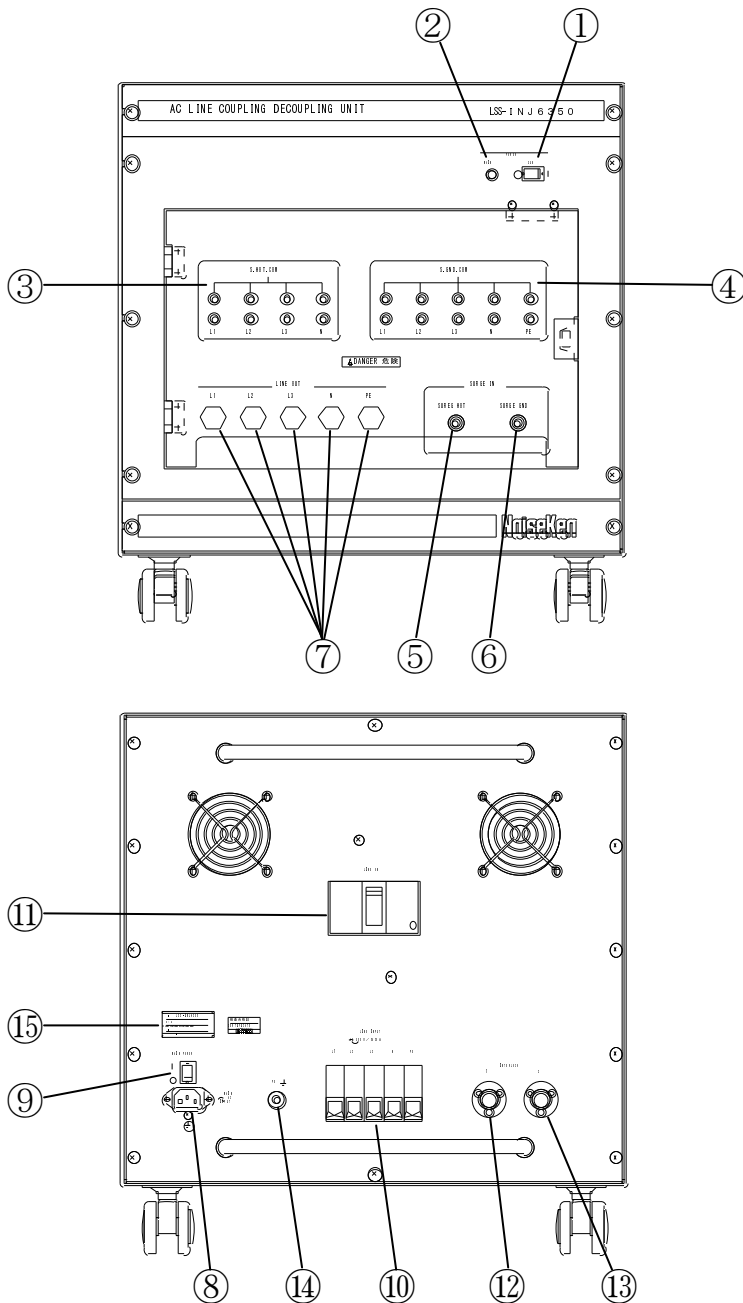
- **This Instruction Manual will help operators handle and utilize the POWER LINES CDN UNIT, LSS-INJ6350 in safety.**
- **Keep this Instruction Manual in a place where it is readily available.**

4-2. Functions and capabilities

1. A Coupling/Decoupling Network (abbreviated CDN) unit, used in conjunction with the [LSS-6000 series](#) Lightning Surge Simulator, applies combination waveform pulses to the power lines of the equipment under test. The circuit configuration complies with the IEC 61000-4-5 standard prescriptions.
2. The maximum EUT power of this unit is AC500V/50A.
3. Coupling mode can be manually selected.
4. Pulse generation can be synchronized with AC line to this unit.

5. APPEARANCE OF THE UNIT AND POSITION OF SERIAL NUMBER

5-1. Appearance of the unit



Dimension: (W) 488 × (H) 520 × (D) 550 mm

Weight: Approx. 90kgs

5-2. Name of each part and function

① POWER Switch

Used to operate this unit.

② MAIN POWER Lamp

The lamp lights up when the MAIN AC POWER switch⑨ on the rear panel is turned on.

③ SURGE INJECTION PHASE setting part (HOT side)

Used to select the surge injection phase. Insert the supplied short plug to the intended surge injection phase.

*Be sure not to select the same phase as surge injection phase setting part (GND side).

④ SURGE INJECTION PHASE setting part(GND side)

Used to select the surge return phase. Insert the supplied short plug to the intended surge return phase.

*Be sure not to select the same phase as surge injection phase setting part (HOT side).

⑤ SURGE input terminal (HOT side)

Surge input terminal to inject a surge into the AC line. Connect this terminal to the surge output (L1) terminal of the [LSS-6000 series](#) Lightning Surge Simulator using the supplied surge input cable.

⑥ SURGE input terminal (GND side)

Surge return terminal to inject a surge into the AC line. Connect this terminal to the surge output terminal (L2 or PE) of the [LSS-6000 series](#) Lightning Surge Simulator using the supplied surge return cable.

⑦ AC injection line output terminals (L1, L2, L3, N, PE)

Output terminals to the AC power lines. Used to supply the power source with the EUT and a surge is injected into the phases selected on ③and ④.

⑧ AC Input terminal

Operating power supply inlet for this unit. Connect the supplied AC line input cable. Be sure to supply the power source mentioned in the specifications.

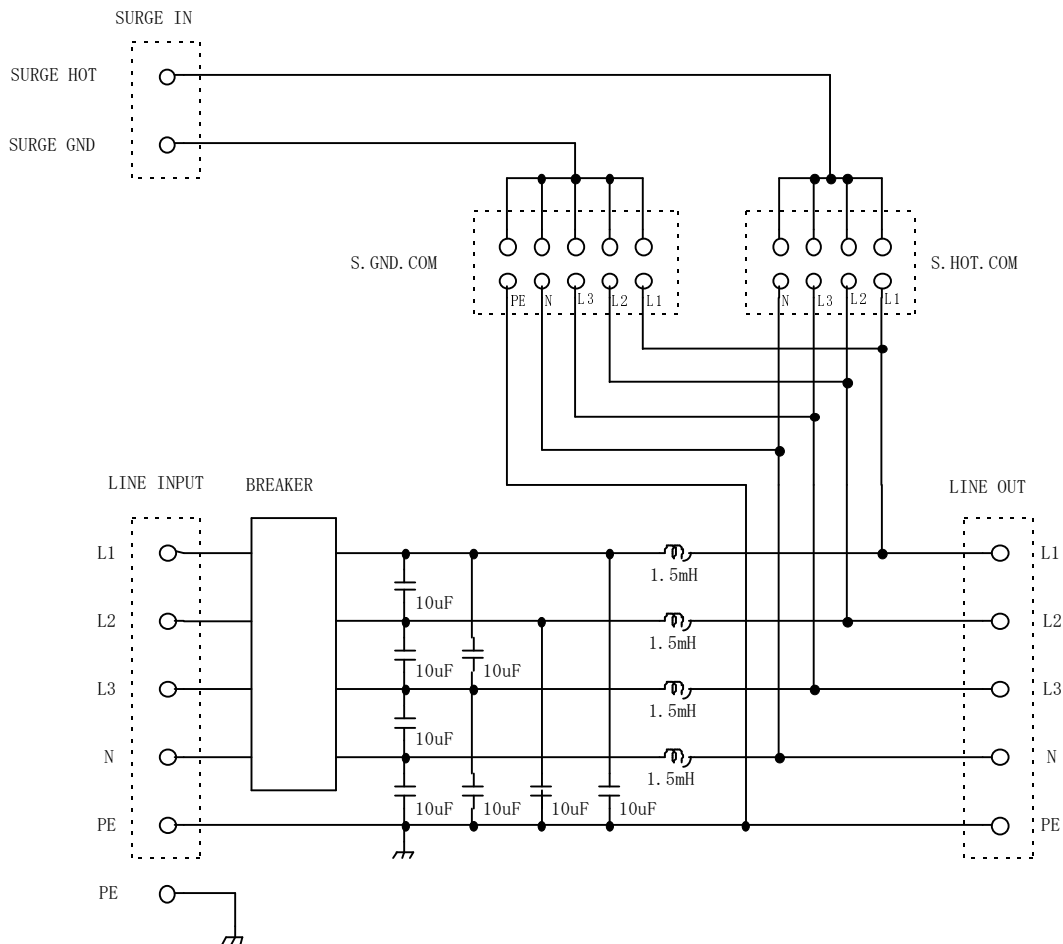
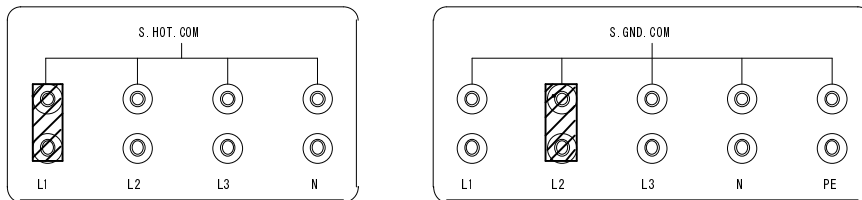
- ⑨ Main AC POWER switch
MAIN AC POWR switch to drive this unit. .
- ⑩ AC line input terminal
Used to supply the power source with the EUT. Connect the supplied AC line input cable.
- ⑪ Breaker for AC line
Used to protect the power source line for EUT. Be sure to supply the voltage and current mentioned in the specifications.
- ⑫ Interlock connector 1
Interlock function for safety use. Connect this terminal to the interlock connector of the [LSS-6000 series](#) using the attached interlock cable otherwise the surge can not be injected. The internal circuit send zero-cross signal to [LSS-6000 series](#) through this connector to synchronize with the LINE INPUT.
- ⑬ Interlock connector 2
Another interlock connector that connects an optional protective fence, etc.
When an optional protective fence, etc. is not used, connect the supplied interlock connector for the [LSS-6000 series](#). It shall be used when connecting safety barrier as an option after taking Interlock off. Otherwise, the surge cannot be injected.
- ⑭ PE terminal (earth)
PE terminal of this unit. (PE: Protective earth) Connect this terminal to PE terminal of the [LSS-6000 series](#) using the supplied PE cable. Be sure to use the supplied cable when connecting PE terminal of this unit with PE terminal of the [LSS-6000 series](#). Otherwise this unit may be damaged.
- ⑮ Serial number label
Label, which shows the model name and serial number of this unit.

5-3. Surge injection phase

- Hot to inject a surge between L1 and L2

Insert the supplied short plugs into the indicated places with slash lines in the following figure.

- ※ Insert each short plug securely into the bottom of the each terminal.



6. HOW TO CONNECT EQUIPMENT

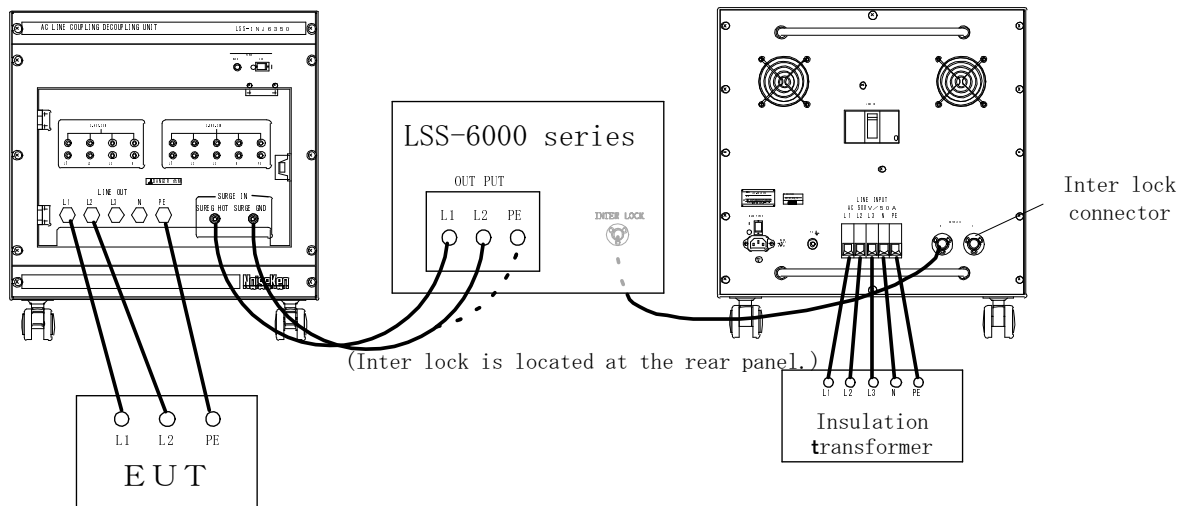
6-1. How to connect equipment

Connect this unit to the **LSS-6000 series** Surge Simulator, the EUT and the insulation transformer unit as shown in the following figure.

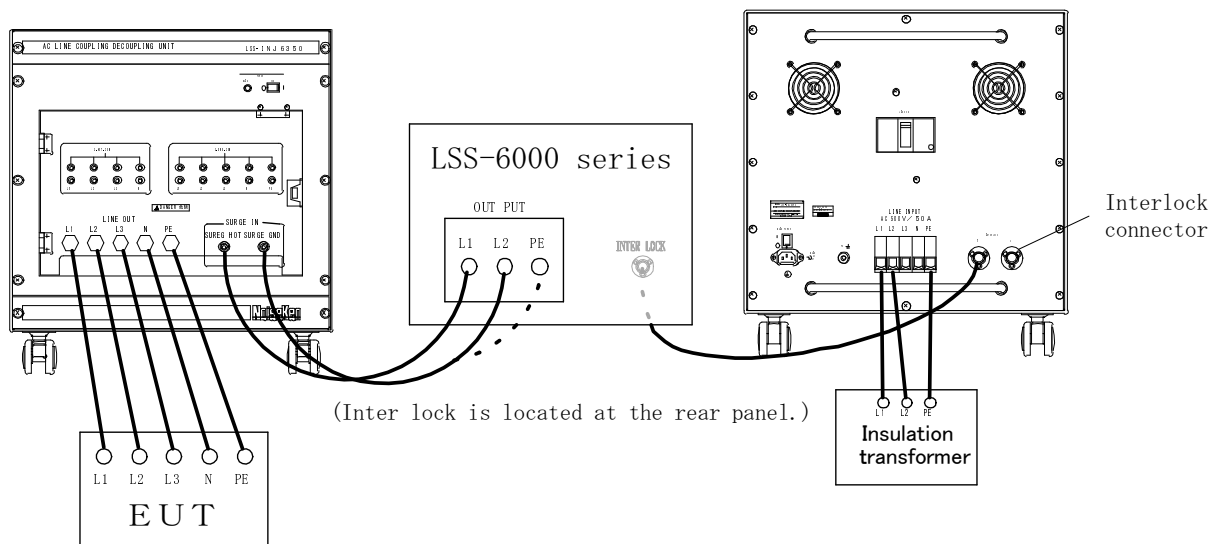
We recommend you to use our insulation transformer unit Model: TF series.

Be sure to connect the insulation transformer.

1. Set up for single-phase test.



2. Set up for three-phase test.

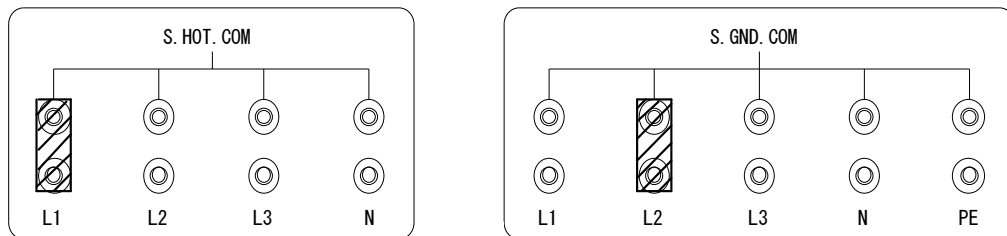


When connecting the insulation transformer to the main unit, plug into a supplied AC line cable or 16-50 mm² single line and twisted wire after ripping off insulation 24mm without soldering to the connector. Clamp the fixing hole properly with the Phoenix Contact driver (SZS1.2×8) or appropriate tool and fasten with bigger torque 6-8Nm than standard one.

6-2. How to set the test conditions

The surge injection phase setting part is composed of “surge HOT side setting part” and “surge GND side setting part”. S.HOT.COM is connected to the injection phase (L1, L2, L3 or N) into which the surge is injected by inserting a supplied short plug. And S.GND.COM is connected to the return phase (L1, L2, L3, N or PE) by inserting the supplied short plug.

The following figure shows the setting example of the surge injection phase (L1) and the surge return phase (L2).



Note: When using the main unit to perform AC line injection testing, be sure to have the Lighting Surge Simulator (Models [LSS-6000 series](#)) remain “OFF”.

7. SPECIFICATIONS

Specifications of LSS-INJ6350

Items	Specifications
Surge waveform	Combination waveform (※1)
Maximum input level	6.6kV
Maximum EUT power	AC500V 50A (Single phase and three-phase AC)
Coupling mode selection	Manually selectable
Decoupling coil	1.5mH (each line)
Line synchronization function	Detect the phase of AC line
Power supply	AC100~120V, 200~240V, Approx. 40VA (※2)
Dimensions	(W) 488×(H) 520×(D) 550 mm
Weight	Approx. 90 kg

- Specifications and functions of this unit are subject to change without notice.

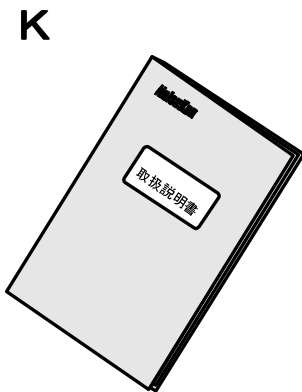
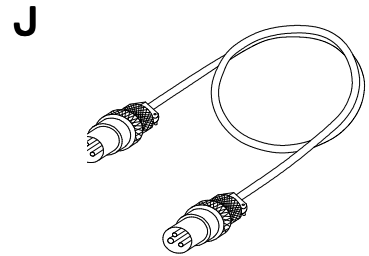
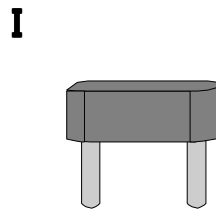
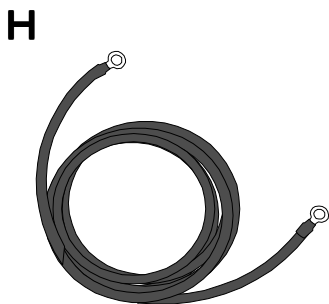
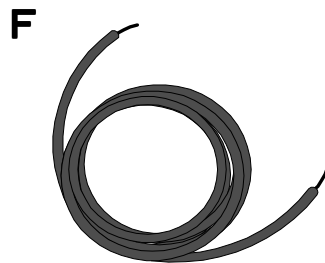
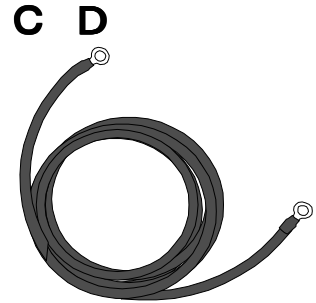
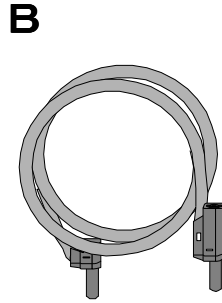
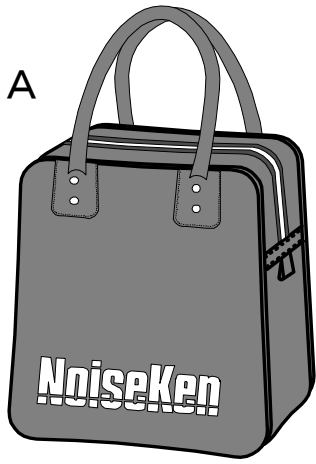
(※1) This CDN unit can apply combination waveform pluses prescribed by the IEC 61000-4-5 standards. When applying 10/700 μ s waveform or ring waveform pulses, surge output waveforms prescribed by the IEC 61000-4-5 standards can not be guaranteed.

(※2) A power cable for the voltage specified by the user is supplied as a standard accessory.

(※3) By connecting the interlock cable to [LSS-6000 series](#), it can synchronize to the line.

8. STANDARD ACCESSORIES

8-1. Standard accessories



The following accessories are contained:

	<u>Quantity</u>
A : Accessory bag	1
B : Surge input cable [plug: red – red] (0.5m)	1
Surge return cable [plug: green/yellow-green/yellow](0.5m)	1
C : Surge output cable (2m)	4
D : Surge output cable for PE (2m)	1
E : AC line input cable (3m)	1
F : AC line input cable for PE(3m)	1
G : Power cable	1
H : FG cable	1
I : Short Plug	2
J : Interlock cable	1
K : Instruction manual	1

9. WARRANTY

Servicing terms

The following terms are applicable to servicing by Noise Laboratory Co., Ltd., (hereafter referred to as the Company) provided to maintain the intended performance of its products.

1. Scope

The following terms shall apply only to products made by the Company.

2. Technical servicing fee

In the event of a failure of a product within the warranty period (see warranty section), the Company will repair a product without charge. After the warranty expires, repairs will be billed at a nominal cost.

3. Ownership of defective parts

Any defective part exchanged under the Company's servicing belongs to it.

4. Limited liability

In the event that damages resulting from servicing by the Company are intentional or caused by negligence, the Company will pay the cost but at the purchase value of the relevant product maximum. But, notwithstanding the foregoing, the Company shall not be responsible for any incidental or consequential damages of any nature, including without limitation thereof loss of would-be profit or compensation demanded from a third party

5. Refusal to offer servicing

The company may not accept a repair order in the following cases:

- More than 5 years have passed since the product discontinued
- More than 8 years have passed after delivery
- Required component for servicing already discontinued and no alternative is available.
- Product changed, repaired or remodeled without obtaining a prior permission from the Company.
- Product severely damaged to the extent it has lost its original form

Limited warranty

Noise Laboratory Co., Ltd. (hereafter referred to as the Company) warrants its products to be free from defects in materials and workmanship under normal use and service for a period of one year from date of delivery. In the event of failure of a product covered by this warranty, the Company will repair the product or may, at its option, replace it in lieu of repair without charge.

Notwithstanding the foregoing, the Company shall not be responsible for any incidental or consequential damages of any nature, including without limitation thereof loss of would-be profit or compensation demanded from a third party. This warranty is valid only in Japan.

1. Scope

This warranty shall only apply to products made by the Company.

2. Period

One year from date of delivery. The warranty may be valid in 6 months after servicing if the same failure on the same component has repeated.

3. EXCLUSIONS

The followings are exclusions from this warranty:

- Consumable parts (including HV relay)
- Failure caused by misuse, neglect, accident or abnormal conditions of operation
- Failure caused by remodeling on the user side without prior permission from the Company
- Failure caused by servicing by unauthorized personnel by the Company
- Failure due to fore majeure including but not limited to, acts of God, fire, war, riot, rebellion and others
- Failure due to shock or drop in or after transit
- Failure due to operation in environment being out of ambient specifications.
- A unit shipped to overseas.

10. MAINTENANCE

1. When repair, maintenance or internal adjustment of the unit is required, a qualified service engineer takes charge of such work.
2. Maintenance on the user side is restricted to the outside cleaning and functional check of the unit.
3. When checking or replacing the fuse, turn off the switch of the unit and disconnect the plug socket beforehand.
4. When cleaning the unit, turn off the switch of this unit and the connected equipment and disconnect the plug socket beforehand.
5. Avoid using chemicals for cleaning. Otherwise, the coating of the unit may peel off or the sight glass may be broken.
6. Do not open the cover of this unit.

11. NOISE LABORATORY SUPPORT NETWORK

- If a symptom which seems a trouble is found, inform the model name and serial number of the product together with the symptom to Noise Laboratory or your nearest sales agent of Noise Laboratory.
- When the product is returned to Noise Laboratory, write the state of the trouble, contents of your request, model name and serial number in a repair order, and pack the product and repair order sheet in the former package of equivalent suitable for transit and send them back.

