

NoiseKen

INSTRUCTION MANUAL

**COUPLING CLAMP
FOR FNS**

MODEL 15-00012A

NOISE LABORATORY CO., LTD.

Edition 1.00
AEH00221-00E-0A

NOTICE

- The contents of this instruction manual (the “Manual”) are subject to change without prior notice.
- No part of the Manual may be reproduced or distributed, in any form or by any means, without the authorization of Noise Laboratory Co., Ltd. (the “Company”).
- The contents of the Manual have been thoroughly examined. However, if you find any problems, misprints, or missing information, please feel free to contact our sales agent who you purchased our product from.
- The Company assumes no responsibility for any loss or damage resulting from improper usage, failure to follow the Manual, or any repair or modifications of this product undertaken by a third party other than the Company or the agent authorized by the Company.
- The Company assumes no responsibility for any loss or damage resulting from remodeling or conversion solely undertaken by the user.

Please note that the Company cannot be held responsible for any consequences arising from the use of this product.

1. Important safety precautions

As the following items are very important in handling this unit, thoroughly read them before use.

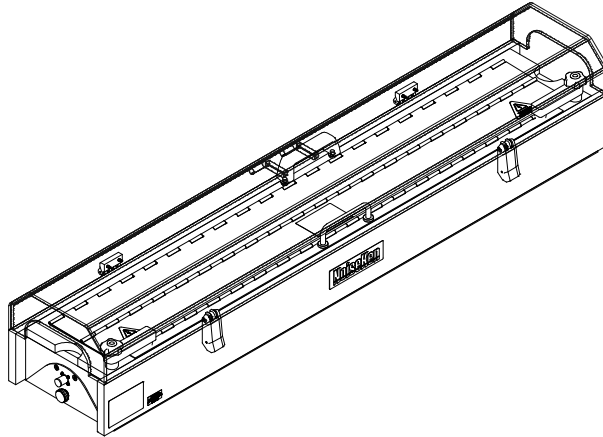
1. Use of this unit and a noise generator connected to it in an explosive area, such as “No fire” area, etc., is prohibited. If used in such an area, they are liable to cause combustion or ignition due to discharge.
2. Any person who has an implanted pacemaker or other electronic device in the body should not operate this unit and a noise generator connected to it. Furthermore, such a person should not enter the test area while this unit is operating.
3. When connecting and setting this unit, turn off the high voltage output of the noise generator beforehand. Otherwise, you may receive an electric shock.
4. As high voltage is generated in the unit while noise is being applied, fit the insulation cover for the coupling clamp completely. Do not try to touch the metallic part. Otherwise, you may receive an electric shock.
5. Fully insert the coaxial connector of each part and securely fix the connector by turning it clockwise.

Safety recommendations are listed in “Basic safety precautions for using this unit” mentioned later. Be sure to read them before setting test environments, connection, and starting a test.

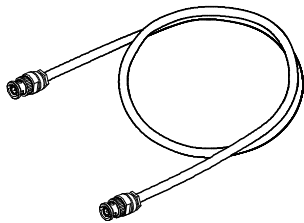
2. Check before use

Before using the product, check the items supplied with it.

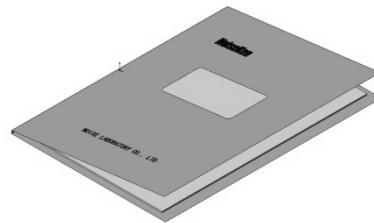
A



B



C



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B: Coaxial cable 1m (02-00130A)	1
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3. Application form for instruction manual

To: Noise Laboratory Co., Ltd. via sales agent

We place an order for an instruction manual.

Model Name

15-00012A

Serial No.

Applicant
Address

Company Name

Department

Contact Person

Phone No.

FAX No.

Cut off this page "PURCHASE ORDER 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 your nearest sales agent of Noise Laboratory or Noise Laboratory.

The address, company name, individual's name, and other personal information (henceforth referred to as "personal information") entered in the application form will only be used for the purpose of sending the Instruction Manual and will not be shown or passed to any third party without a valid reason.

Noise Laboratory Co., Ltd. will manage customer's personal information in an appropriate manner.

Cut Line

Cut Line

4. Preface

We thank you very much for your buying the COUPLING CLAMP (15-00012A).

In order to obtain the maximum performance of your COUPLING CLAMP, thoroughly read this book and the instruction manual for the Electrical Fast Transient/Burst (EFT/B) simulator (FNS-AX series recommended) before use.

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- **This Instruction Manual is intended to allow a person who can obey the connecting method and instructions to handle and utilize 15-00012A safely.**
 - **Keep this Instruction Manual in a readily accessible place.**
 - **This COUPLING CLAMP has been developed as a capacitive coupling clamp in accordance with the requirements prescribed by IEC 61000-4-4 Ed. 3: 2012.**
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Features

- A protection cover is provided to prevent an electric shock hazard.
- Coupling plates can be fixed by using two clampers to provide maximum coupling capacitance.
- Two functionally identical pulse input connectors are located on the sides of the clamp; they can be used according to the test arrangement.
- The clamp has a carrying handle for portability.

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6. Basic safety precautions for using this unit

- The following items are very important instructions which users must follow to take precautions against possible injury and harm.
- The indications are provided as an explanation of potential danger involved if the safety precautions are not observed correctly.

6-1. Symbols of Hazard

- ◆ The following display classifications describe degree, to which injury or harm might occur when the contents of the display are not followed or the Unit or related equipment is operated incorrectly.

DANGER

The contents of this display indicate “the assumption that imminent danger might occur resulting in death or serious injury” if the Unit or related equipment is handled incorrectly.

WARNING









The contents of this display indicate “the assumption that there is a possibility of death or serious injury” if the Unit or related equipment is handled incorrectly.

CAUTION



The contents of this display indicate “the assumption that there is a possibility of harm and the assumption that there is a possibility of physical damage” if the Unit or related equipment is handled incorrectly.

6-2. Symbols of Instruction, Warning and Caution



- ◆ The following display classifications describe details that should be followed.

	Indicates attention (a matter that must be paid attention fully)		
	Indicates prohibition (an action that must not be taken)	 Prohibited	 Do not disassemble
	Indicates a compulsory action (an action that must be taken)	 Compulsory	


◆ The contents of following signs indicate warnings and cautions when using the Unit.

	<p>Noticing possibility of an electric shock It indicates that there is possibility of an electric shock.</p>
	<p>Notifying danger of electric shock and the Manual should be referred.</p> <p><u>Warning</u> To avoid electrical shock close the safety cover during test.</p>

DANGER

 <p>Do not disassemble</p>	<p>Do not take the Unit apart or do not remodel. Repair, internal adjustment, and inspection of the Unit should be performed by a qualified service engineer. Ask the Company or its sales agent.</p>
 <p>Prohibited</p>	<p>Do not use the Unit in an explosive are or fire-prohibited area etc. Use of the Unit in such an area is liable to cause combustion or ignition.</p> <p>A person who has a pacemaker on should not operate the Unit and also should not enter the area where it is operating. It may result in a fatal or serious accident.</p>

WARNING

 <p>Compulsory</p>	<p>When connecting and setting the coupling clamp, turn off the high voltage output of this unit beforehand. Otherwise, you may receive an electric shock.</p>
	<p>As high voltage is generated in the unit while noise is being applied, fit the insulation cover for the coupling clamp completely. Do not try to touch the metallic part. Otherwise, you may receive an electric shock.</p>
	<p>Fully insert the coaxial connector of each part and securely fix the connector by turning it clockwise.</p> <p>Connect the connectors securely and avoid using damaged connectors or cables. Failure to do so may cause electric shock or damage to equipment.</p>
	<p>Install the Unit on a stable place.</p> <p>If the Unit is installed on an unstable place, human body may be in danger due to drop or overturn of the Unit.</p>



WARNING



Prohibited

Do not put any substance into the Unit or its connectors.

If some metal or flammable things are put into the Unit through a connector or a vent, it may result in a fire or an electric shock.



CAUTION

Use the Unit in proper environment.

Operating temperature range is 15~35°C. Operating humidity range is 25~75%. If these precautions are not followed, the unit may be broken or the prescribed performance may not be warranted.



Compulsory

When the body is dirty, wipe the body with a dry cloth.

Do not wipe the Unit and Probe with thinner, alcohol or other solvent.
When the body is very dirty, soak a cloth into neutral detergent, squeeze out the detergent from the cloth and wipe the body with the cloth.

Make hazardous labels always noticeable.

When the caution or warning label is peeled off, missing or dirty, attach a new one for securing safety. When the caution or warning label is missing, ask the sales department or maintenance section of our company to send a new label.

Do not install the Unit on following places.

Setting up the Unit on wrong places as follows may result in a fire, an electric shock, or an injury.

- A very humid or dusty place
- A hot place, e.g. a place exposed to direct rays of the sun, a place close to a heater.
- A place easy to bedew, e.g. a place close to a window.



Prohibited

Do not put any container containing water on the Unit.

If water is spilled or gets into the Unit, it may result in a fire or an electric shock.

Do not drop or shock the Unit excessively.

The misuse may cause trouble or damage.

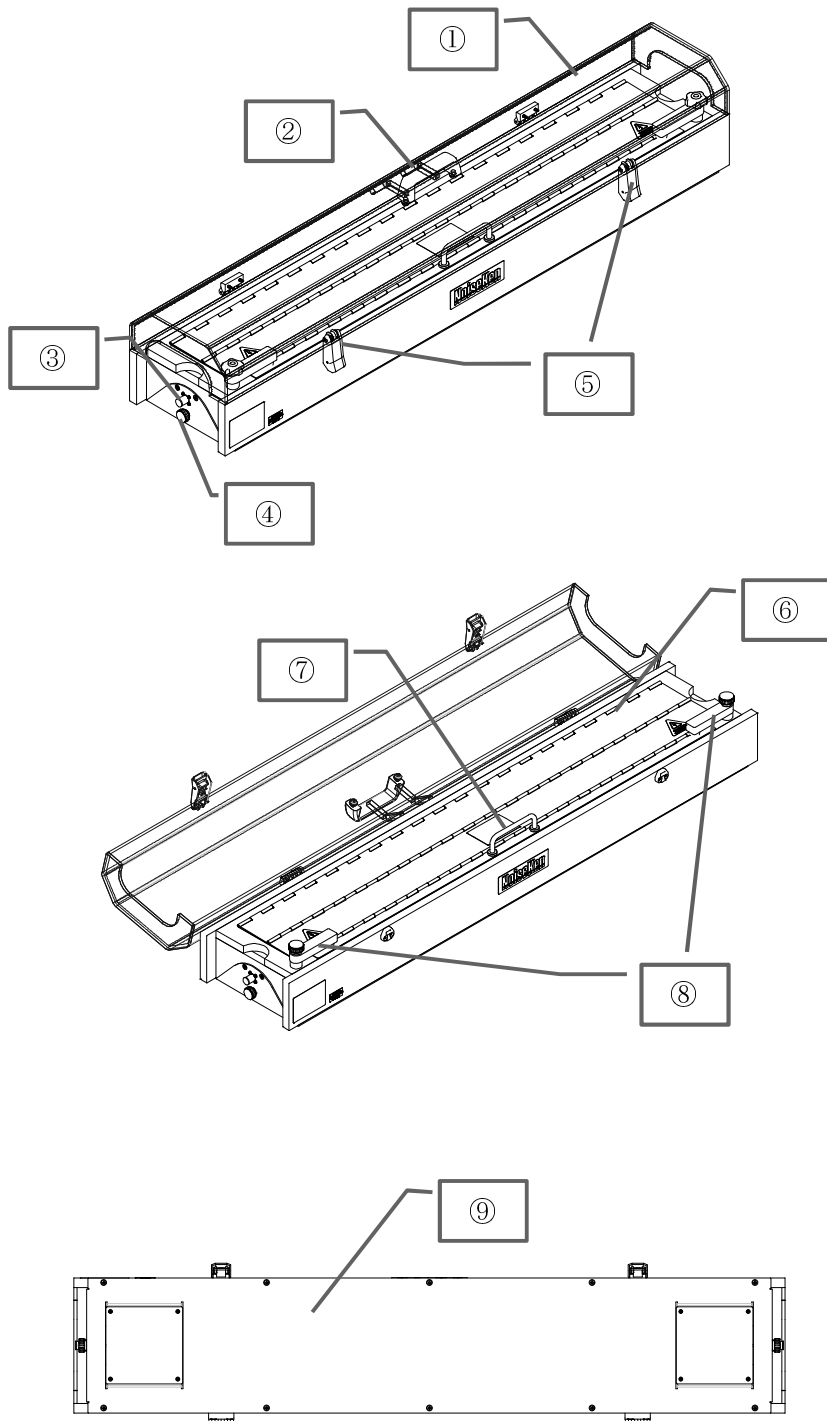
Do not bump or rub the Unit against something hard.

The misuse may damage a surface of the Unit.

Do not put any heavy thing or sit on the Unit.

The misuse may result in a dent on the body or damage of internal components.

7. Appearance and description of the coupling clamp



- ① **Safe cover**

Provided to protect against an electric shock which may be caused by high voltage of the coupling plate during the test.

The cover has transparent acrylic sight glasses to allow visual inspection of the internal conditions at both ends of the unit.
- ② **Handle (Safe cover)**

Used to open/close the Safe cover.

When carrying the coupling clamp by the handle, be sure to fix the Safe cover with draw latches ② beforehand.
- ③ **Pulse input connectors**

Connects output from the EFT/B simulator.

The two connectors are located on the sides of the unit and functionally identical. Connect the connector on the side near the equipment under test (EUT) according to the test arrangement.

These connectors are coaxial connectors dedicated to Noise Laboratory's products. Use the supplied coaxial cable for connection with the EFT/B simulator.
- ④ **GND terminals**

When using a transducer plate 15-00010A, one of these terminals shall be used.

The two terminals are located on the sides of the unit and functionally identical. Use them according to the calibration arrangement.
- ⑤ **Draw latches**

Fixes the closed Safe cover.

When carrying the coupling clamp, be sure to fix the cover with the latches.
- ⑥ **Coupling plate**

Provided to catch the cable to be tested and make capacitive coupling.

The coupling plate consists of a base plate fixed to the coupling body and a movable plate hinged to the base plate. It catches the cable to be tested between the base plate and the movable plate.

When opening the movable plate, pull up the knob ⑦.
- ⑦ **Movable plate knob**

Used to pull up the movable plate at the upper portion of the coupling plate.
- ⑧ **Clamper**

Fixtures to fix the coupling plates. The positions can adjust (rotated) to adequately fix the upper coupling plate depending on the diameter of the cable/wire under test.
- ⑨ **Grounding plate**

The metal plate for grounding connection. Arrange the clamp so that the grounding plate should touch the ground reference plane (ground plane)

8. Installation and connection to equipment

Install the unit and other equipment connected to it in a stable location.

- ① Place the EFT/B simulator on the ground plane connected to the protective ground and connect its SG terminal to the ground plane.

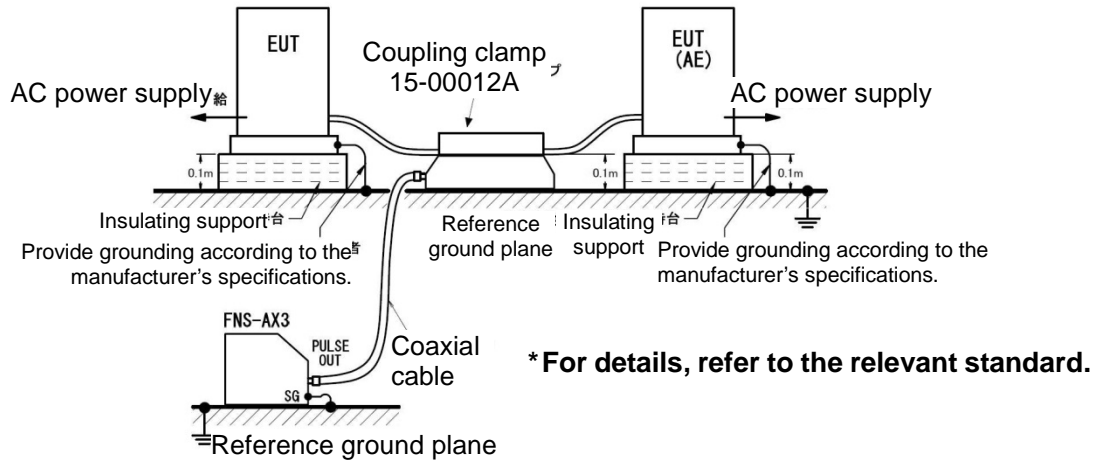


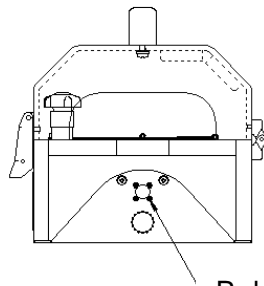
Fig. 8-1 Exemplary test arrangement

- ② Place the coupling clamp on the ground plane.



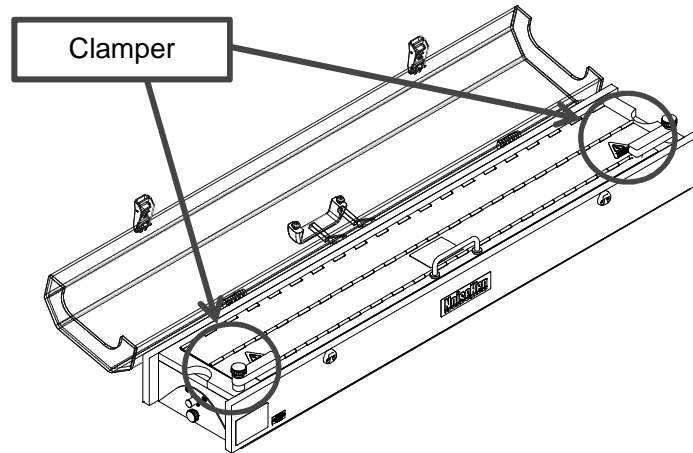
Place the unit on a level and flat ground plane. Poor contact between the ground plane and the ground plate may interfere with the test results.

- ③ Connect the PULSE OUT connector of the EFT/B simulator to the pulse input connector of the coupling clamp with the supplied coaxial cable.

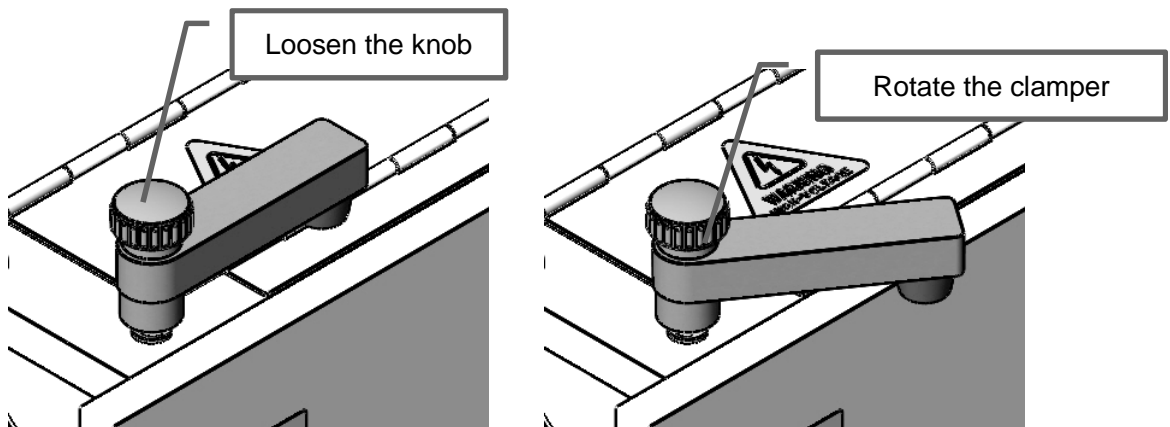


Pulse input connectors

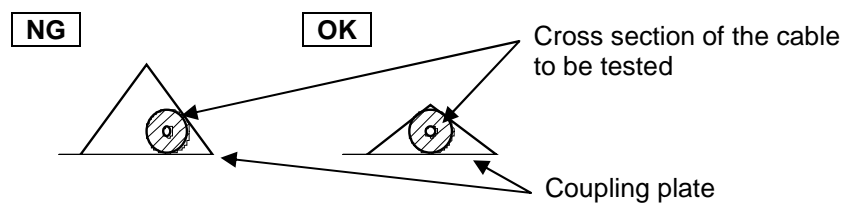
- ④ Open the safety cover and release the two clampers.



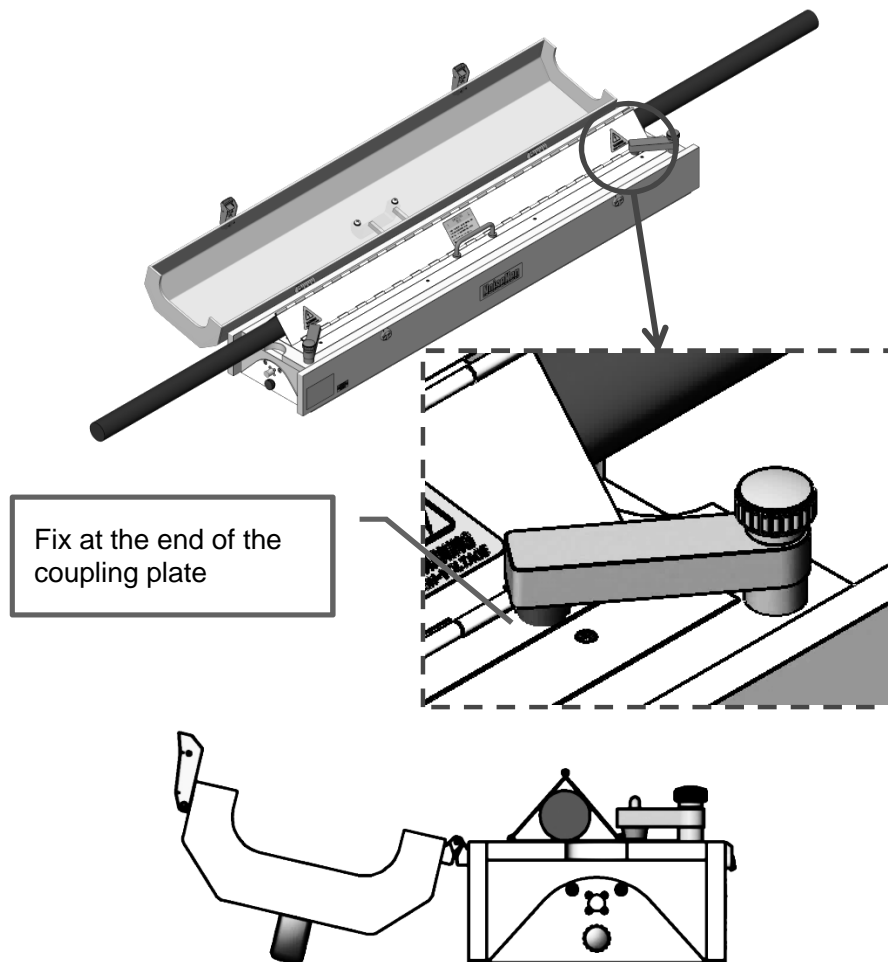
For releasing the clampers, turn the knobs and slightly lift-up the clamper bodies and rotate them.



- ⑤ Use the coupling plate of the coupling clamp to catch the cable to be tested (between the stationary base plate and the movable plate). At this time, adjust the clamp so that the coupling capacity between the cable and the clamp is maximized (the distance between the cable and the clamp is minimized). Arrange the cable so that it runs as much along the center of the coupling plate as possible.



- ⑥ Rotate the clampers to an appropriate position (so that each clamper shall fix an edge of the coupling plate) and firmly fix the coupling plates.



- ⑦ Fit the Safe cover to the coupling clamp and start the test.

	WARNING 警告	
To avoid electrical shock close the safety cover during test.		
感電する恐れがありますので 試験時は安全カバーを必ず閉めて下さい。		



When connecting and setting this unit, turn off the high voltage output of the noise generator beforehand. Otherwise, you may receive an electric shock.

9. Operation

Set the EFT/B simulator to PULSE OUT for pulse output.

For details, refer to the instruction manual for the EFT/B simulator.

 **WARNING**

As high voltage is generated in the coupling plate while high voltage pulses are being applied, close the Safe cover and avoid touching the coupling plate during the test.

10. Specifications

10–1. Coupling clamp body

Item	Specifications
Pulse input connector	NMHV type connector
Coupling waveform	Peak voltage [Vp]: (1000 ± 200) V Ramp time [tr]: (5 ± 1.5) ns Pulse width [td]: (50 ± 15) ns * Refer to “10-2. Waveform verification”.
Coupling plate	Length: (1000 ± 50) mm Width: (140 ± 7) mm, handle attached part excluded Width: (160 ± 7) mm, handle attached part included Height from the ground plane: (100 ± 5) mm
External dimensions	(W) 1110 × (H) 189 × (D) 210 mm: Cover closed (W) 1110 × (H) 189 × (D) 439 mm: Cover open
Weight	About 8.5 kg

10–2. Waveform verification

Refer to Section 6.4.2 of IEC 61000-4-4 Ed. 3.

Input pulses of 2 kV (set voltage) through the PULSE OUTPUT connector of the EFT/B simulator and measure the coupling waveform of the transducer plate (clamp calibration jig: 15-00010A) terminated with 50 Ω.

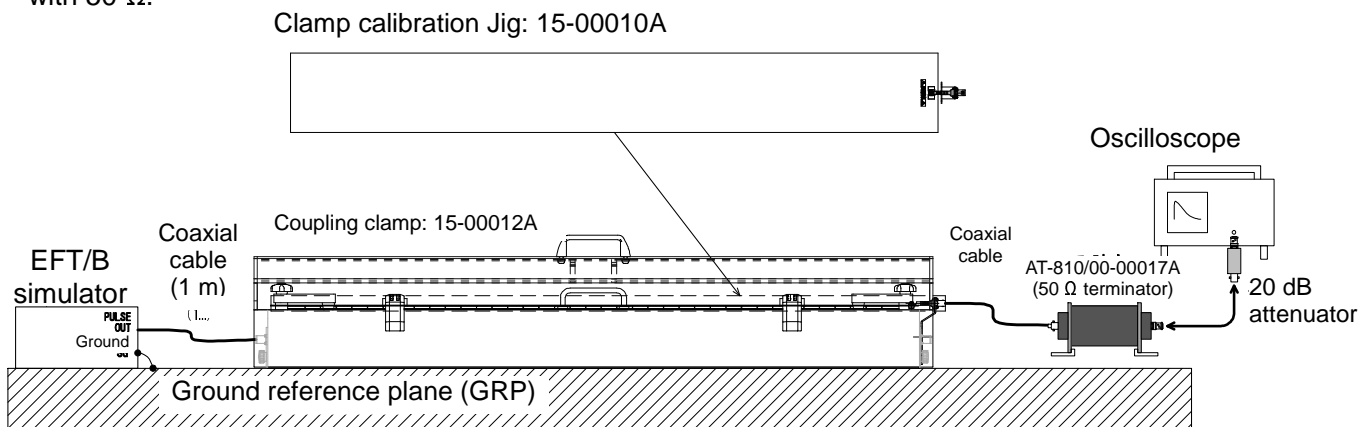


Fig. 10-1 Exemplary connection for verification

[Supplementary information]

The coupling clamp calibration method according to IEC 61000-4-4 Ed. 3 (Figure 8) assumes that a 50 Ω terminator is connected directly downstream of the transducer plate output. In our standard calibration method, a 50 Ω terminator is connected to the transducer plate output via the 1 m coaxial cable. The extended connection using the coaxial cable can ensure impedance matching of 50 Ω and is equivalent to the direct connection of the terminator to the output. Thus, it has been established that the extended connection does not interfere with the waveform verification.

10–3.Options

For details, contact Noise Laboratory or your nearest sales agent of Noise Laboratory.

Model	Product
15-00010A	Clamp calibration jig
00-00017A Or AT-810	Attenuator for waveform observation (50 Ω)

11. Warranty

Services

The following terms are applicable to the services provided by the Company to maintain and repair the Unit.

1. Scope

The Unit and accessories and options provided by the Company are covered under this section.

2. Technical Service Fee

Any repairs provided by the Company during the warranty period will be free of charge in accordance with the Limited Warranty. After expiration of the warranty period, actual cost for the repair will be charged to the user.

3. Ownership of Defective Parts

All the defective parts replaced during the warranty period become the property of the Company. For paid repairs, they also become the property of the Company unless otherwise directed by the user.

4. Maximum Compensation

In the event the user incurs damage due to malfunction of the Unit arising solely from the negligence and/or improper repair on the part of the Company, the Company will compensate for the damage. The maximum compensation amount shall be limited to the amount paid by the user at the time of purchase of the Unit. In no event, shall the company be liable or in any way responsible for incidental or consequential damages such as loss of profit or third party's claims to the user.

5. Wrong Parts, Missing Parts and Damage

The company shall not be liable for loss of profit, business interruption, other incidental damage, special loss, punitive damage or third party's claims to the user directly or indirectly arising from suspension of testing activities due to wrong parts, missing parts, or damage of the Unit.

6. Service Refusal

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

In the event of failure during the warranty period, the Unit will be repaired or replaced free of charge. Decision of the repair method shall be left at the discretion of the Company. This limited warranty is applicable in Japan only.

1. Scope

This warranty is applicable only to the Unit and its accessories.

2. Warranty Period

One year from the date of delivery.

For a location once repaired, the warranty period for same parts / same problems is 6 months from the time of repair completion.

3. Exceptions

Regardless of the above, following will be excluded from the warranty.

- ✧ Consumable parts replacement, including High Voltage Relay (if used)
- ✧ Failure caused by negligence, or damage to the Unit.
- ✧ Failure due to modifications made without the Company's authorization.
- ✧ Failure due to repairs made by personnel not authorized by the Company.
- ✧ Failure directly or indirectly arising from force majeure including but not limited to, acts of god, fire, war, rebellion and others.
- ✧ Failure due to shipping, vibration, falling, or impact shock after delivery
- ✧ Failures due to use of the Unit under the improper environment.
- ✧ When the Unit is taken out of the country.

12. 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 the 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 the Unit and Probe.

13. 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.

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