



# INSTRUCTION MANUAL

ATTENUATOR

00-00018A

NOISE LABORATORY CO., LTD

Edition 1.02

AEH00222-00E-0

## Contents

1. Important Safety Precautions .....	1
2. Introduction .....	1
3. Basic Precautions for Safety in use of this unit .....	1
4. Main unit and accessory .....	2
5. Operation .....	3
6. Specifications .....	4
7. Warranty .....	4
8. Maintenance .....	6
9. Service Support Contact .....	6
10. Application Form for an Instruction Manual .....	7

## 1. IMPORTANT SAFETY PRECAUTIONS

The Attenuator Model 00-00018A has been developed to observe high voltage pulses.

This unit is used in conjunction with a high voltage pulse generator.

Thoroughly read "IMPORTANT SAFETY PRECAUTION" for such high voltage pulse generator and "BASIC PRECAUTIONS FOR SAFETY IN USE OF THIS UNIT" beforehand.

## 2. INTRODUCTION

Thank you very much for your purchase of high-voltage broadband Attenuator Model: 00-00018A.

- This operation manual describes the function, operation and safety precautions of 00-00018A.
- Thoroughly read this operation manual before use and keep it as a ready reference.

### § Features

1. Attenuates high voltage pulses of up to 5000V at a ratio of 1000: 1.
2. Wide frequency range of DC to 400MHz
3. This attenuator is designed to observe high voltage pulse waveforms with fast rise times being generated by Electrical Fast Transient/Burst Simulators (Models: FNS series). The input and output impedance is 1000 ohm and 50 ohm, respectively.

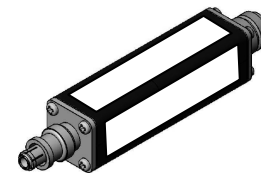
## 3. BASIC PRECAUTIONS FOR SAFETY IN USE OF THIS UNIT

### Basic safety precautions

1. Mishandling or careless operation may result in serious injury. (Precautions for human body, operation, environment and connection)
2. This unit is provided with a special input connector (NMHV-P). When a suitable connector is not used, accurate measurement cannot be performed and the operator may receive an electric shock depending on circumstances. (Precautions for human body and connection)
3. Before connecting this unit to a high voltage pulse generator, turn off the high voltage circuitry beforehand. Otherwise, the operator may receive an electric shock due to the generated high voltage pulses. (Precautions for human body and connection)
4. Fully insert the coaxial connector to make connection securely. (Precautions for human body and connection)

5. Our company and its distributors/agents shall have no liability for any injury or damage resulting from careless operation of this unit and any resultant damage or loss. (Precautions for human body, operation, environment and connection)
6. Do not apply high voltage to the OUTPUT connector of this unit, otherwise resulting in damages and an electric shock due to high voltage. (Precautions for human body and connection)
7. The maximum input voltage is 5000V. Never input higher voltages.
8. Do not input continuous AC. Failure to follow this instruction may result in damage of this unit or an electric shock due to high voltage. (Precautions for human body and connection)
9. Do not input DC voltage. It may cause failure of this Unit.(Precautions for connection)
10. For allowable pulse duration and its repetition frequency, follow the maximum values given in Section "Specifications". If the specified tolerance is exceeded, this unit may be broken and the operator may receive an electric shock. (Precautions for human body and connection)
11. This unit has an attenuation ratio of 1000: 1. When high voltage pulse of 4,000V is input and the output of this unit is terminated by 50Ω, the output voltage becomes 4V. Be careful of maximum input voltage of the oscilloscope. When this unit is used for attenuation to observe and make measurements using an oscilloscope, the input port of the oscilloscope may be broken according to its impedance of input port. Terminate the high impedance port by using a 50 Ω terminator. It is recommended that a 50Ω attenuator be put between this unit and oscilloscope when necessary. (Precautions for operation)

## 4. MAIN UNIT AND ACCESSORY



00-00018A

- A : 00-00018A main unit .....1pc.  
 B : Output cable .....1pc.  
 (BNC-N 1m)  
 Instruction Manual(this document) .....1pc.

## 5. OPERATION

### 1. Connection to a pulse generator

Connect the Input connector of this unit to the PULSE OUT connector of your Fast Transient Burst Simulators (Models: FNS series) .

#### Cautions:

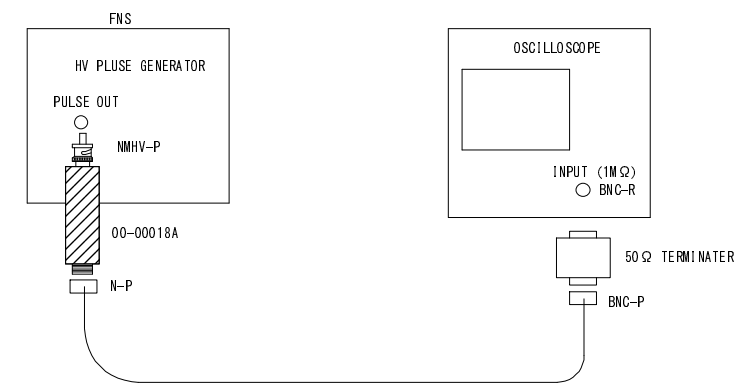
- The input connector of this unit is the mate for the PULSE OUT of the FNS series simulators.
- This unit cannot be supported only with a connector. Support it with a holder to avoid mechanical stress that may lead to damages.
- Before attaching and detaching the connector, check that no pulse is generated.

### 2. Connection of this unit to a measuring instrument

- Connect this unit to a measuring instrument with the supplied Output cable.

#### Cautions:

- **Be careful of input withstanding voltage of the measuring instrument.**  
 With an input of 4000V, the unit outputs 4V. The input withstanding voltage lower than this level according to the type of measuring instruments, insert a 50Ω type attenuator between this unit and measuring instrument.
- **Check to see that the input impedance of the measuring instrument is 50 Ω**  
 The output impedance of this unit is 50 Ω. Therefore, set the input impedance of the measuring instrument to 50 Ω . For high impedance (example: 1MΩ) input, connect a 50 Ω terminator with the input port of the measuring instrument.



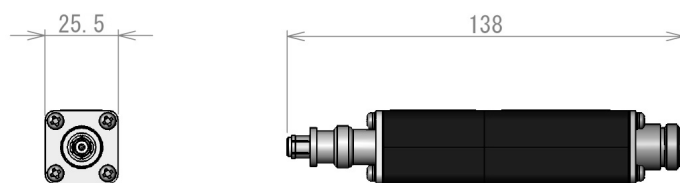
## 6. SPECIFICATIONS

Product description .....ATTENUATOR  
for waveform  
verification

Model number .....00-00018A

Parameters	Specifications
Attenuation	DC~400 MHz.....60 dB 300kHz~under 100MHz : ±1dB 100MHz~400MHz : ±3dB ※at DC 1/1000 ±5%
Input pulse peak voltage	MAX 5000 V
Available input pulse repetition	With conditions of the burst prescribed in IEC 61000-4-4 <ul style="list-style-type: none"> <li>• Pulse frequency ≤5kHz</li> <li>• Burst duration ≤15 ms</li> <li>• Burst period ≥300 ms</li> <li>• Pulse voltage ≤5000V</li> </ul> (Defined in IEC 61000-4-4)
Input impedance	1000 Ω (1000 Ω ±2% at DC)
Output impedance	50 Ω (50 Ω ±2% at DC)

### 【 Dimensions 】



## 7. 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 force 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.

## 8. MAINTENANCE

1. When repair, maintenance or internal adjustment is required, it should be performed only by our company's authorized service engineer.
2. Maintenance to be performed by the customer are limited to the outside cleaning and functional check.
3. For products with fuses, unplug before check or fuse replacement.
4. When cleaning products, turn off the power switch and unplug them beforehand.
5. When the body gets dirty, soak a cloth in water or detergent, squeeze the cloth and gently wipe off it.
6. For check and servicing purpose, open designated covers only.

## 9. SERVICE SUPPORT CONTACT

- If you find a phenomenon, which may be judged as a trouble, please inform our maintenance or sales division of the model name of your machine and serial number together with the detail of such phenomenon.
- When you return the product, fill in a repair request form with the detail of the trouble, symptom, model name, serial number and your request. Put the whole equipment in the original package or pack it in a type of package suitable for transit and send to our company.

### For repair and other services, contact:

International Dept.

Noise Laboratory Co., Ltd.

1-4-4 Chiyoda, Chuo-ku, Sagami-hara, Kanagawa

252-0237, Japan

Tel: +81 (0)42-712-2051 Fax: +81  
(0)42-712-2050

## 10. Application Form for Buying Instruction Manual

We apply for buying INSTRUCTION MANUAL.

Model: 00-00018A

Serial Number: \_\_\_\_\_

Applicant's address: \_\_\_\_\_

Company name: \_\_\_\_\_

Section: \_\_\_\_\_

Name of person in charge: \_\_\_\_\_

Tel: \_\_\_\_\_

Fax: \_\_\_\_\_

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

When an INSTRUCTION MANUAL is required, fill out the above Application Form and mail or fax it to NOISE LABORATORY CO., LTD. or our sales agent.