

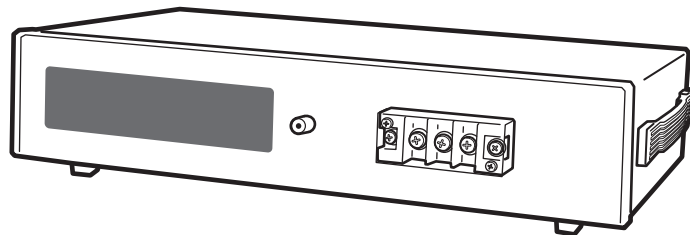
Part No. Z1-003-810, IB010545  
Dec. 2017

# OPERATION MANUAL

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## MULTI OUTLET UNIT

# OT01-KHA



## Using the Operation Manual

Please read through this Operation Manual and make sure you fully understand everything before operating the product. After reading the manual, always keep it nearby so that you may refer to it as needed. When moving the product to another location, be sure to bring the manual as well.

If you find any incorrectly arranged or missing pages in this manual, they will be replaced. If the manual is lost or damaged, a new copy can be provided for a fee. In either case, please contact your Kikusui distributor/agent, and provide the "Kikusui Part No." given on the cover.

This manual has been prepared with the utmost care; however, if you note any errors or omissions, or if you have any questions, please contact your Kikusui distributor/agent.



## 环境保护使用期限 Environment-friendly Use Period

该标记为适用于在中华人民共和国销售的电子信息产品的环境保护使用期限。

只要遵守有关该产品的安全及使用注意事项，从制造年月起计算，在该年度内，就不会对环境污染、人身、财产产生重大的影响。

产品的废弃请遵守有关规定。

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## 有毒有害物质或元素名称及含有标示 Name of hazardous materials and symbol of element in the equipment and quantity

部件名称	有毒有害物质或元素					
	Hazardous material and symbol of element					
	铅 Pb	汞 Hg	镉 Cd	六价铬 Cr(VI)	多溴联苯 PBB	多溴二苯醚 PBDE
内部接线	×	○	○	○	○	○
外壳	×	○	○	○	○	○
底盘组装品	×	○	○	○	○	○
辅助设备	×	○	○	○	○	○

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○：该部件所有均质材料的有毒有害物质的含量不超过 GB/T 26572 标准所规定的极限值要求。

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## How to Read This Manual

### Introduction

Thank you for purchasing the OT01-KHA multi-outlet unit.

This document is intended for those using the OT01-KHA for the first time. It contains an overview and explains how to connect the unit to the KHA1000 harmonics/flicker analyzer.

### Related Manuals

For details on measuring harmonic current/flicker, refer to the Operation Manual of the KHA1000 harmonics/flicker analyzer.

### Intended reader of this manual

This manual is intended for those using the KHA1000 harmonics/flicker analyzer and those teaching operators how to use it.

Explanations are given under the presumption that the reader has electrical knowledge related to harmonic current and voltage fluctuation tests.

### Notations Used in This Manual

- In this manual, the OT01-KHA multi-outlet unit may be called “OT01-KHA.” The KHA1000 harmonics/flicker analyzer may also be called “KHA1000.”
- In this manual, the following symbols are used for explanation:



Indicates a potentially hazardous situation that, if ignored, could result in death or serious injury.



Indicates a potentially hazardous situation that, if ignored, may result in damage to the product and other property.



Indicates information that you should know.



Explanation of terminology or operation principle.

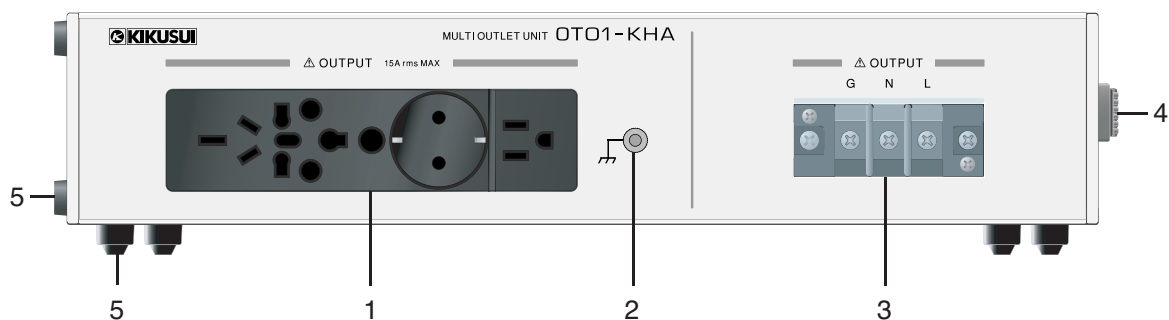


Indicates reference to detailed information.

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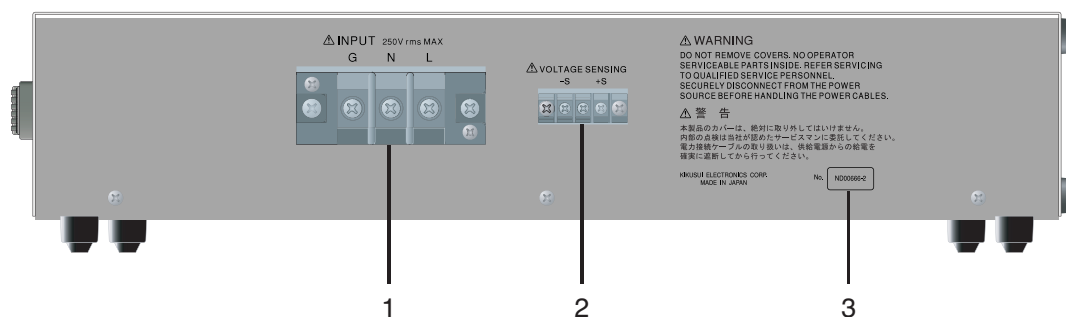
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## Front Panel

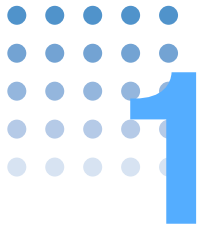


No.	Name	Description	See Page
1	OUTPUT terminal (multi-outlet)	Power input to rear-side INPUT terminal block is output as is. Power plugs of various countries can be used.	Page 12
2	Chassis terminal	Terminal to ground equipment under test (EUT) that has a bipolar plug with a grounding conductor.	
3	OUTPUT terminal block	Power input to rear-side INPUT terminal block is output as is.	
4	Handle	Handle for carriage.	—
5	Rubber feet	4 on bottom surface and 4 on side surfaces.	—

## Rear Panel



No.	Name	Description	See Page
1	INPUT terminal block	Connects to KHA1000 LOAD terminal.	Page 10
2	VOLTAGE SENSING terminal block	Connects to KHA1000 VOLTAGE SENSING terminal. Used for multi-outlet and voltage sensing on OUTPUT terminal block.	Page 11
3	Serial No.	Serial number of this product.	—



# Overview

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This chapter provides an overview of this product and explains its features.

## 1.1 Overview

The OT01-KHA is a multi-outlet unit used to connect equipment under test (EUT) that has a power cord with a plug, to the LOAD terminals on the KHA1000 Harmonics Flicker analyzer.

The multi-outlet mounted on this product supports a wide range of plugs of various countries and facilitates the connection between the KHA1000 and the equipment under test (EUT). The terminal blocks connected in parallel with the multi-outlet make it possible to connect to equipment under test (EUT) with no plug.

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**NOTE**

- This product is an optional device dedicated to the KHA1000. Connect this device only to the LOAD and VOLTAGE SENSING terminals on the KHA1000.
- 

## 1.2 Features

- As this product is designed to have low internal impedance, it can easily include a system that adapts to IEC61000-4-7 (Edition 2.0) standard “Voltage drop requirement for measuring instruments” (0.5 V or lower).
- For measurement with higher accuracy, a sensing terminal is provided to measure voltage at the multi-outlet or OUTPUT terminal block.
- A chassis terminal is mounted on the front panel. It is also easy to ground equipment under test (EUT) that has a bipolar plug with a grounding conductor.

## 1.3 Options

The following option is available for mounting the unit on a rack. For details, contact your Kikusui agent or distributor.

Table 1-1 Rack mounting option

Product Name	Model No.	Applicable Model	Remarks
Rack mount bracket	KRB2-TOS	OT01-KHA	For EIA standard inch rack
	KRB100-TOS		For JIS standard millimeter rack

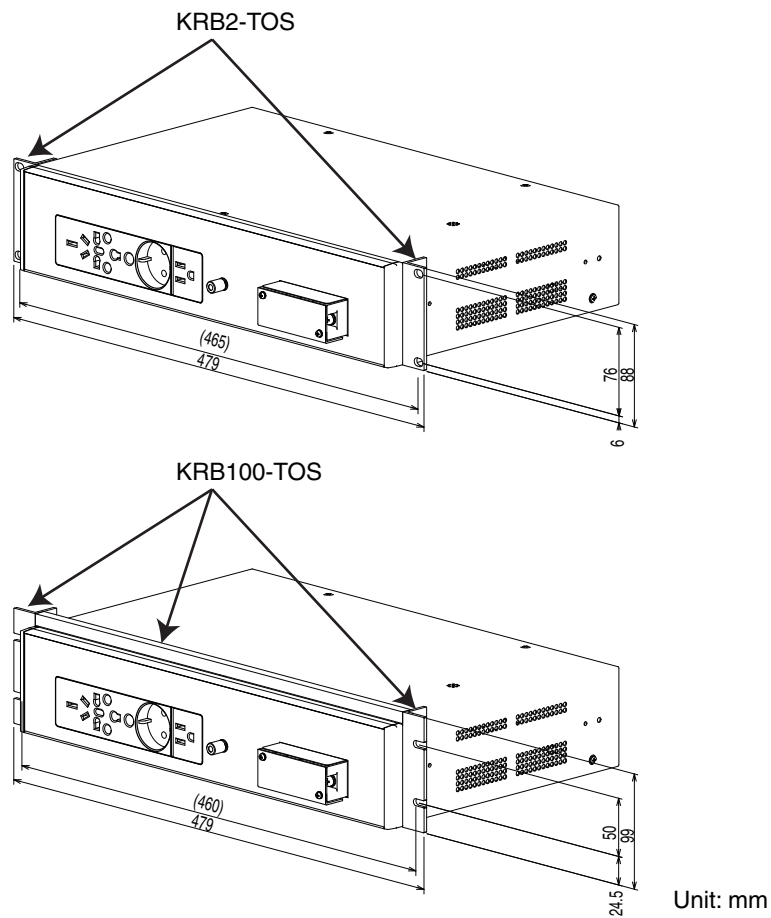


Fig.1-1 Rack mount brackets

# 2

## Installation and Preparation for Use

This chapter explains the unpacking, installation, and connection procedures for the OT01-KHA.

### 2.1 Inspection during Unpacking

When you receive this product, check that its accessories are correctly attached and confirm that the product and accessories are not damaged.

If you find any damage or missing accessories, contact your Kikusui agent or distributor.

**NOTE**

- The packing materials should be saved for future transport of this product.

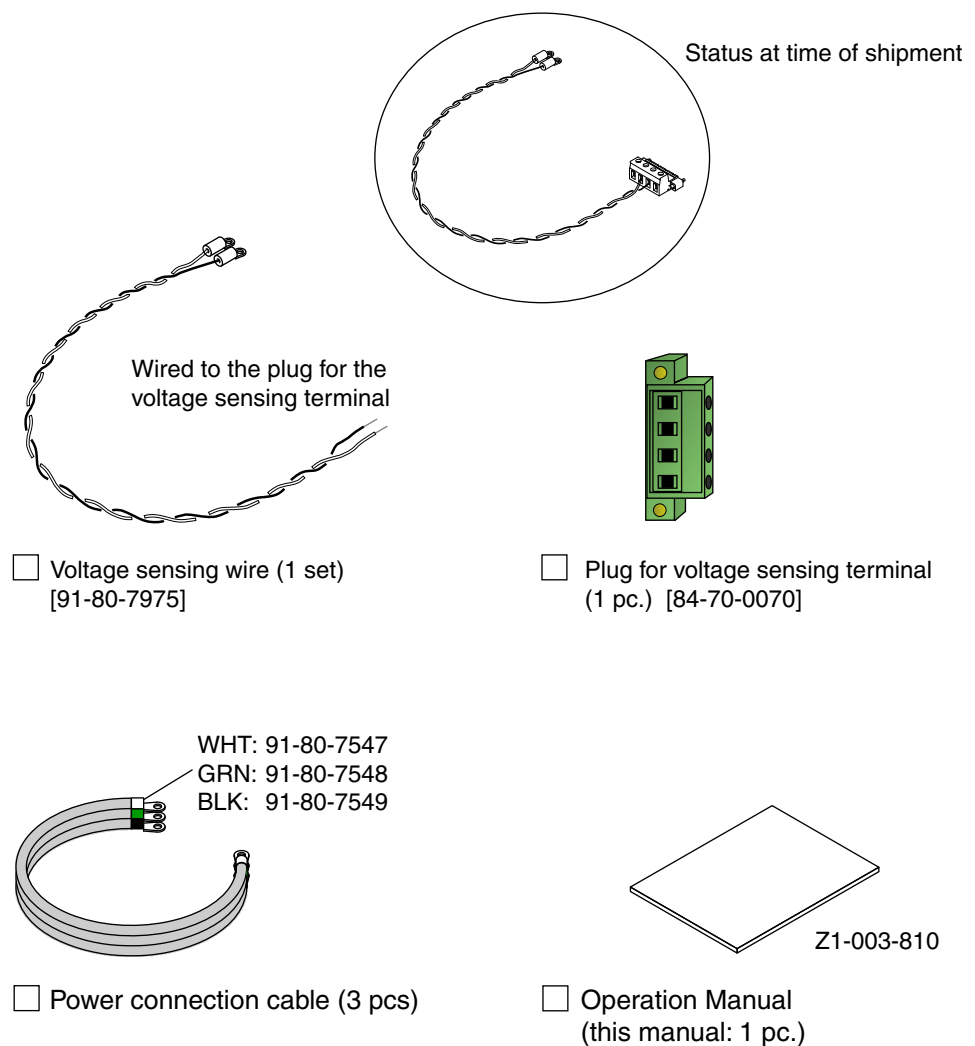


Fig.2-1 Accessories

## 2.2 Notes on Installation Location

Install this product indoors, observing the following conditions:

- Do not use this product in a flammable atmosphere.

Explosion or fire may be caused. Do not use this product near inflammables such as alcohol and thinner or in an atmosphere of their gases.

- Avoid places where this product would be exposed to high temperature or direct sunlight.

Do not install this product near a heater or in a place where the temperature undergoes rapid change.

Operating temperature range: 0 to 40°C

Storage temperature range : -20 to 70°C

- Avoid places with high humidity.

Do not install this product in humid places near a water heater, humidifier, or water supply.

Operating humidity range : 85% RH or lower (without condensation)

Storage humidity range : 90% RH or lower (without condensation)

Condensation may occur even within the operating temperature range. In this case, do not use this product until it is completely dried.

- Be sure to use this product indoors.

This product is designed for use indoors so that safety is secured.

- Do not install this product in a corrosive gas atmosphere.

Do not install this product in a corrosive gas and sulfuric acid mist. Doing so may incur conductor corrosion and poor connector contact, resulting in product malfunction and failure, leading to a fire.

- Do not install this product in a dusty place.

Dust adhesion may lead to electric shock and fire.

- Do not use this product in a place that is not well ventilated.

Secure a space wide enough to allow the flow of air around this product.

- Install this product on a flat and stable floor.

The product may drop or fall down, causing damage or human injury.



## Stacking

The KHA1000 can be stacked and used on this product.

- CAUTION** • When the two devices are stacked, fold down the KHA1000 stand; otherwise, it may become damaged.

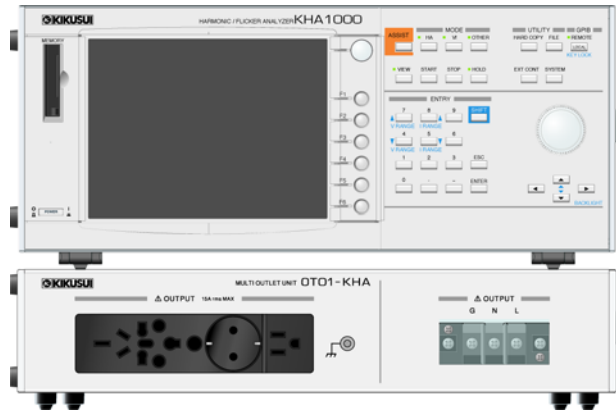


Fig.2-2 Installation by stacking

## 2.3 Notes on Transfer

When transporting or moving this product to its installation location, note the following:

- Remove all connected wiring.  
If this product is moved with its cables still connected, personal injury may be caused by disconnection or overturn.
- When transporting this product, be sure to use the dedicated packing materials.  
Without using packing materials, the product may become damaged by vibration or by falling while in transit.
- Be sure to attach this manual.

## 2.4 Connection to KHA1000

See Page 11

Connect this product as shown in Fig. 2-3 using the accessory power cable.

To use the voltage sensing point as a multi-outlet or OUTPUT terminal block, add the connection to the VOLTAGE SENSING terminal block as shown in Fig.2-4.

After this product has been connected to the KHA1000, complete the connections to the SOURCE terminals, referring to Section 2.5, “Connections to Rear-side Terminals,” in the KHA1000 Operation Manual.



- **You may receive an electric shock. Be sure to remove the power cord from the KHA1000 and AC power supply or turn off the POWER switch.**
  - **The voltage applied to the INPUT terminals appears at the VOLTAGE SENSING terminals.**
- When the VOLTAGE SENSING terminal block is not being used, attach the terminal cover so that the terminals are not exposed.**

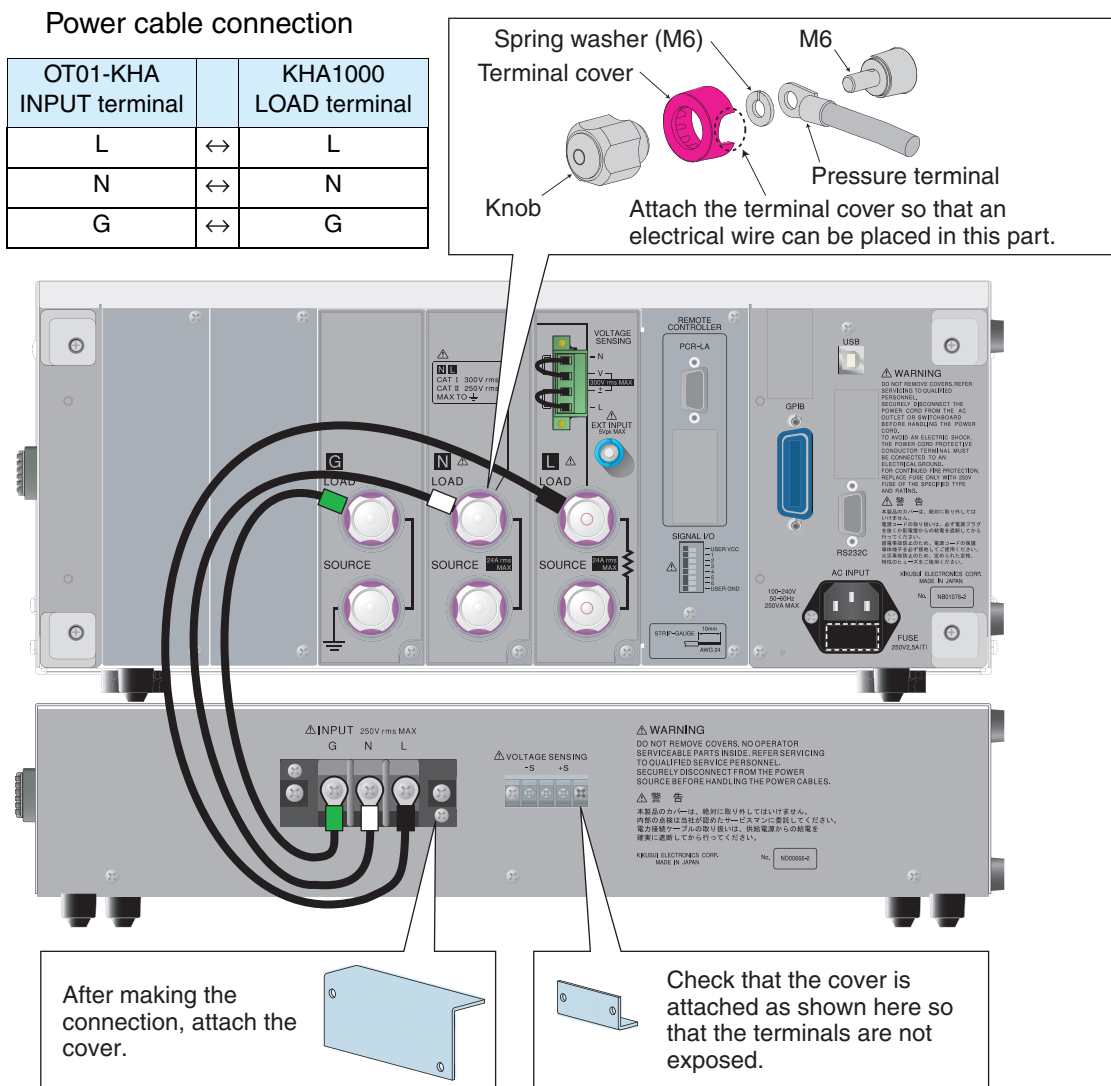


Fig.2-3 Connection to the KHA1000

## Using the VOLTAGE SENSING Terminal Block

If the voltage drop between the LOAD terminals of the KHA1000 and the INPUT terminals of this product causes a problem, use the VOLTAGE SENSING terminal block. This uses the multi-outlet or the OUTPUT terminal block as a voltage sensing point, so that more accurate measurements can be made.

**NOTE**

- When the VOLTAGE SENSING terminals are used, connect to loads only from either the multi-outlet or the OUTPUT terminal block. As the multi-outlet and the OUTPUT terminal block are internally connected in parallel, if loads are connected to both, two or more sensing points are assumed, which makes it impossible to obtain accurate measurements.

Connection of voltage sensing wires

OT01-KHA VOLTAGE SENSING terminal		KHA1000 VOLTAGE SENSING terminal
+S	↔	±
-S	↔	V

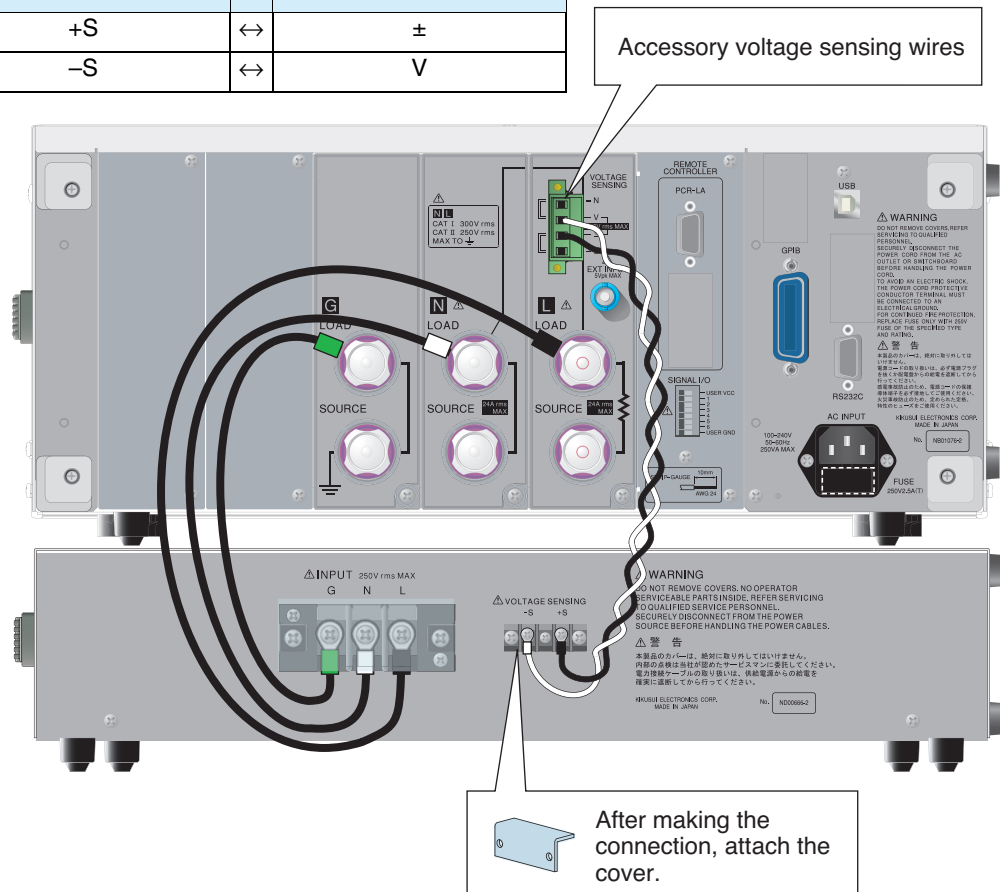


Fig.2-4 Connection to the VOLTAGE SENSING terminal block

## 2.5 Connecting Equipment Under Test (EUT)

See Page 13

Connect the power cord with plug from the equipment under test (EUT) to the multi-outlet.

Table 2-1 lists the plugs that can be connected.

To use the OUTPUT terminal block, connect the power cord of the equipment under test (EUT) using a cramping terminal that adapts to a terminal screw.

- WARNING**
- You may receive an electric shock. Do not apply voltage and current that exceed the ratings of the multi-outlet and OUTPUT terminal block.
  - When the OUTPUT terminal block is not being used, attach the terminal cover so that the terminals are not exposed.

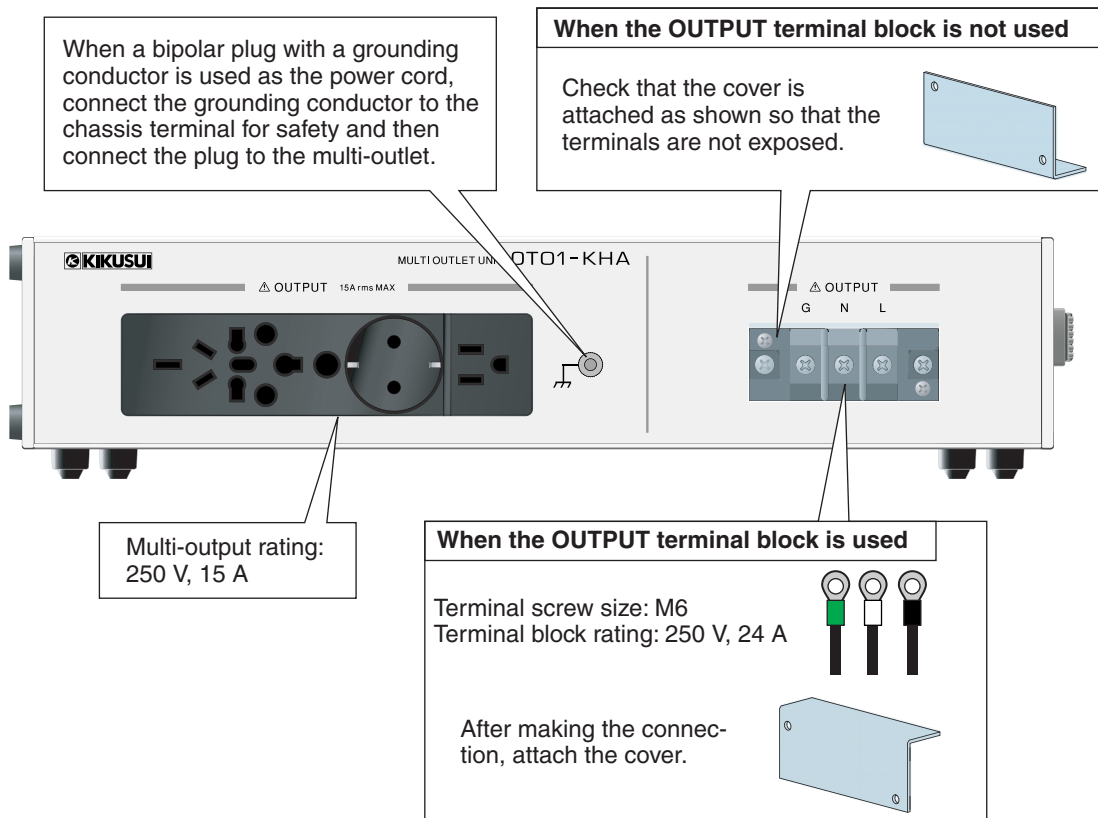



















Fig.2-5 Connecting equipment under test (EUT)

**NOTE**

- Allowable current to multi-outlet  
The allowable current for a test using the multi-outlet that conforms to IEC61000-3-2 (Edition 2.2) and JIS C61000-3-2 (2005) should be a maximum of 5 A, in view of the voltage drop caused by intra-outlet contact resistance. This is in accordance with the maximum voltage drop allowed for measuring systems as specified by IEC61000-4-7 (Edition 2.0).

Table 2-1 Plugs that can be connected to the multi-outlet, and their ratings

Country/Region	Standard	Plug Shape	Plug Rating
Japan America Canada	JIS UL CSA		2P 15 A, 125 V
			Grounding 2P 15 A, 125 V
Australia	AS		2P 10 A, 250 V
			2P 7.5 A, 250 V
			Grounding 2P 10 A, 250 V
			Grounding 2P 15 A, 250 V
Switzerland	SEV		2P 10 A, 250 V
			Grounding 2P 10 A, 250 V
Italy	CEI		Grounding 2P 10 A, 250 V
Europe	CEE DIN		2P 2.5 A, 250 V
			2P 10/16 A <sup>*1</sup> , 250V
			Grounding 2P 10/16 A <sup>*1</sup> , 250 V Side grounding
			Grounding 2P 10/16 A <sup>*1</sup> , 250 V Double grounding
England	BS		2P 5 A, 250 V
			Grounding 2P 5 A, 250 V
			Grounding 2P 15 A, 250 V
			Grounding 2P 13 A, 250 V

\*1 The rated current of the multi-outlet is 15 A. The multi-outlet cannot be used exceeding the rated current.

Source: Panasonic WCF 5901 Catalog



# Maintenance

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This chapter explains cleaning and inspection.

## Cleaning and Checking

Periodic cleaning and checking are required for maintaining the initial performance of this product for a long period.

- 
- ⚠ WARNING** • You may receive an electric shock. Be sure to remove the power cord from the KHA1000 and AC power supply or turn off the POWER switch.
- 

### Cleaning the panel surface

If the panel surface is dirty, wipe it lightly with a soft cloth dampened with neutral detergent diluted with water.

- 
- ⚠ CAUTION** • Do not use volatile matters such as thinner or benzene. Using these materials may cause surface discoloration, deletion of printed characters, or whitening of the display.
- 

### Checking the connection cable

Check for broken insulators, cracked terminals, and backlash.





# Specifications

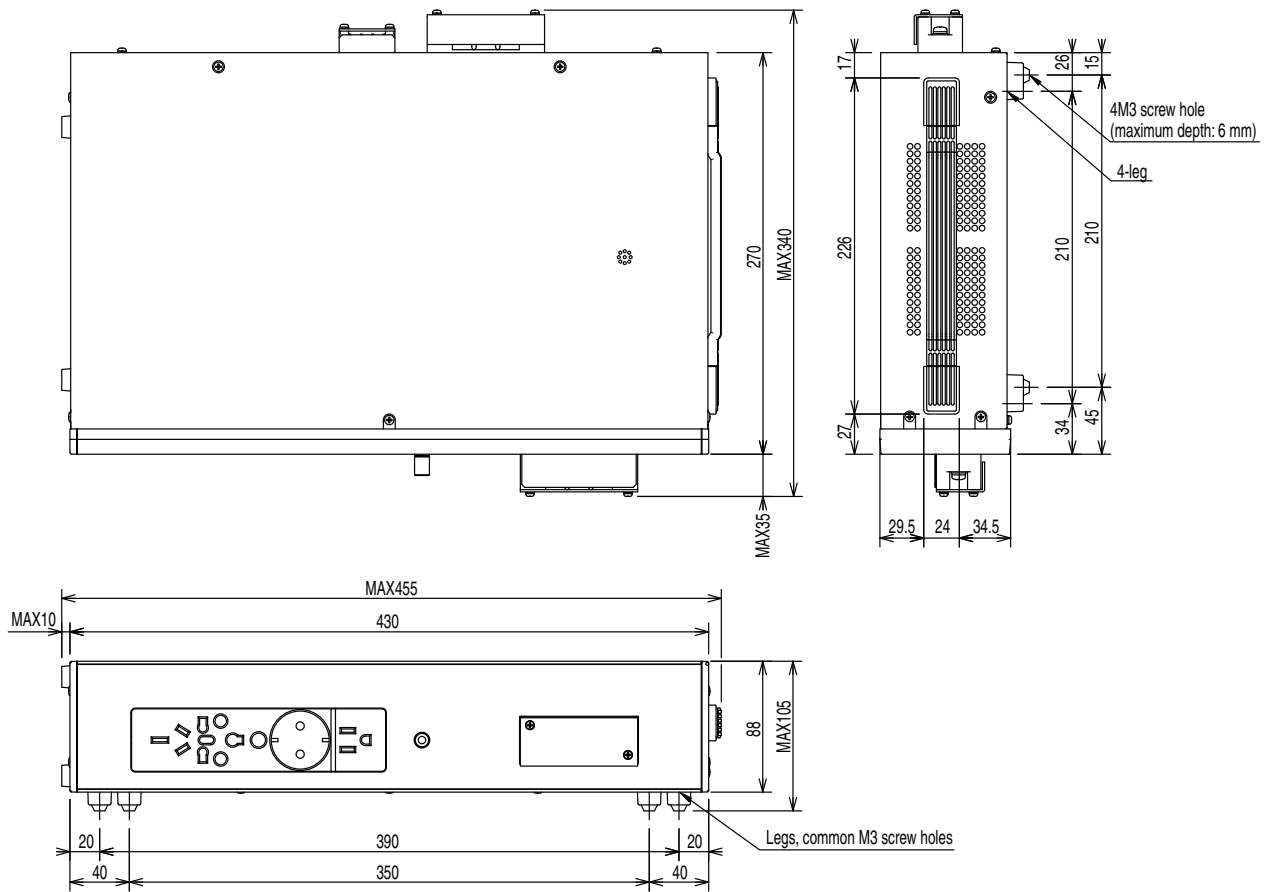
This chapter lists the specifications of this product.

## Functions and performance

Item		Specification
Maximum operating voltage	Multi-outlet/terminal block	250 Vrms
Maximum operating current	Multi-outlet	15 Arms
	Terminal block	24 Arms
Impedance		One way 1 mΩ or less <sup>*1</sup>
Dielectric strength	Between I/O and cabinet	1,830 Vac, 0.3 mA or less for 1 minute
Insulation resistance	Between I/O and cabinet	500 Vdc, 100 MΩ or more
Grounding continuity		25 Aac/0.1Ω or less
Environment	Operating environment	Indoor, over-voltage category II
	Operating temperature range	0°C to 40°C
	Storage temperature range	-20°C to 70°C
	Operating humidity range	85% RH or lower (no condensate)
	Storage humidity range	90% RH or lower (no condensate)
Safety		Conforming to the following standard requirements: IEC 61010-1:2001 (Class I <sup>*2</sup> , Pollution degree 2 <sup>*3</sup> )
Outside dimensions		See Fig.4-1 on Page 16.
Weight		About 5 kg
Accessories	Plug for voltage sensing terminal	1 pc
	Voltage sensing wire	1 set (2 wires) (Shipped wired to the plug for the voltage sensing terminal; with pressure terminal)
	Operation Manual	1 pc
	Power connection cable	1 set (3 cables) (HKIV 14SQ 45 cm, with pressure terminals at both ends)

- \*1. Maximum value between INPUT and OUTPUT terminals at 60 Hz (excluding multi-outlet)
- \*2. This is a Class I equipment. Be sure to ground this product's protective conductor terminal. The safety of this product is only guaranteed when the product is properly grounded.
- \*3. Pollution is addition of foreign matter (solid, liquid or gaseous) that may produce a reduction of dielectric strength or surface resistivity. Pollution Degree 2 assumes that only non-conductive pollution will occur except for an occasional temporary conductivity caused by condensation.

## Outside Dimensions



Unit: mm

Fig.4-1 OT01-KHA outside dimensions