

INSTRUCTION MANUAL

FOR

AC STABILIZER

PCE SERIES

KIKUSUI ELECTRONICS CORPORATION

852033

# Power Requirements of this Product

Power requirements of this product have been changed and the relevant sections of the Operation Manual should be revised accordingly.

(Revision should be applied to items indicated by a check mark )

Input voltage

The input voltage of this product is \_\_\_\_\_ VAC,  
and the voltage range is \_\_\_\_\_ to \_\_\_\_\_ VAC. Use the product within this range only.

Input fuse

The rating of this product's input fuse is \_\_\_\_\_ A, \_\_\_\_\_ VAC, and \_\_\_\_\_.

### WARNING

- To avoid electrical shock, always disconnect the AC power cable or turn off the switch on the switchboard before attempting to check or replace the fuse.
- Use a fuse element having a shape, rating, and characteristics suitable for this product. The use of a fuse with a different rating or one that short circuits the fuse holder may result in fire, electric shock, or irreparable damage.

AC power cable

The product is provided with AC power cables described below. If the cable has no power plug, attach a power plug or crimp-style terminals to the cable in accordance with the wire colors specified in the drawing.

### WARNING

- The attachment of a power plug or crimp-style terminals must be carried out by qualified personnel.

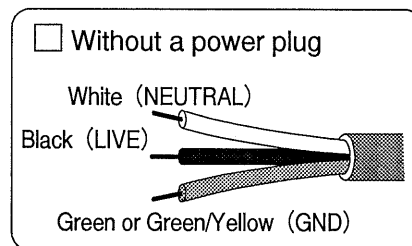
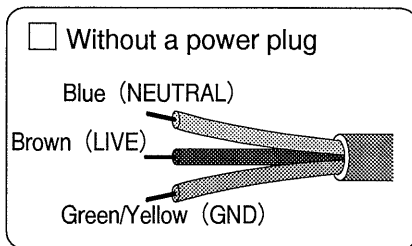


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## 1. GENERAL

The PCE Series AC Stabilizer is an industrial AC power equipment featured with excellent reliability, high accuracy, fast response speed, and low distortion factor. It is a thyristor-type equipment and is more compact as compared with the conventional type of equipment. The features of the PCE Series AC Stabilizer can be summarized as follows:

(1) Applicable to both 50 Hz and 60 Hz:

The equipment can be used either on a 50-Hz or 60-Hz line simply by selecting the corresponding frequency with the snap switch installed on the rear panel of the equipment.

(2) Wide input voltage range and ambient temperature range:

Input voltage range: 100 V  $\pm$ 15%, AC

Ambient temperature range: 0 to 40°C (32 to 104°F)

(3) High efficiency:

Standard efficiency 90% (with output voltage 95 - 105 V and rated resistive load)

(4) Adjustable output voltage:

The output voltage is adjustable for a range of 95 - 105 V with a VOLT ADJ control.

(5) Protective circuits

(a) Output overvoltage protector

(b) Output overcurrent protector

(c) Overheat protector

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## 2. SPECIFICATIONS

- (1) Input Power: 100 V  $\pm 15\%$ , single-phase AC (with 50Hz/60Hz selector switch)

Note: Model of output rating 5 kVA or over are provided with a 200 V input

- (2) Rated Output:

Model	Output Voltage	Output Rating
PCE 2K-100	100 V	2 kVA
PCE 3K-100	100 V	3 kVA
PCE 5K-100	100 V	5 kVA
PCE 5K-200	200 V	5 kVA
PCE 10K-100	100 V	10 kVA
PCE 10K-200	200 V	10 kVA

Note: Models of 11 kVA or over are available upon special order.

- (3) Variable Range of Output Voltage:  $\pm 5\%$
- (4) Stability of Output Voltage:  $\pm 1\%$  or better

Note: Including load change (0 $\leftrightarrow$ 100%) and input change (-15 $\leftrightarrow$ 0 $\leftrightarrow$ +15%)

- (5) Output Frequency: Corresponding to input frequency
- (6) Output Waveform: Sinusoidal
- (7) Output Waveform Distortion Factor: 3% or less (when input waveform distortion factor is less than 3%)
- (8) Load Power Factor: 1 - 0.8 (lag)
- (9) Response Speed: 200 msec or faster  
(300 msec or faster for models of output rating 10 kVA or over)
- (10) Efficiency: Standard efficiency 90% (with output voltage 95 - 105 V and resistive load)

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- (11) Indicating Meters: Output analog meters, JIS Class 2.5

Model	Voltmeter	Ammeter
PCE 2K-100	150 V	24 A
PCE 3K-100	150 V	35 A
PCE 5K-100	150 V	60 A
PCE 5K-200	300 V	30 A
PCE 10K-100	150 V	120 A
PCE 10K-200	300 V	60 A

- (12) Protective Circuits: The input breaker trips when any one of the following protectors is activated.

- (a) Overcurrent Protector: Fixed at approx. 120%
- (b) Overvoltage Protector: Fixed at approx. 110%
- (c) Overheat Protector: At approx. 90°C of cooling package

- (13) Ambient Conditions

- (a) Ambient Temperature: 0 to 40°C (32 to 104°F)
- (b) Ambient Humidity: 90% RH or less

- (14) Cooling System: Forced air cooling with fan

- (15) Insulation Resistance

Between conductor and case: 30 MΩ or over, with 500 VDC

(10 MΩ or over for models of output rating 10 kVA or over)

- (16) Withstanding Voltage

Between conductor and case: 1.5 kV AC, for 1 minute

- (17) Finish

- (a) Panel: Kikusui's standard color: 7.5GY 8.5/1 semi-glossy
- (b) Cover: Kikusui's standard color: 7.5GY 5/4.5 sharkskin

(18) Dimensions and Weights

Model	W mm in.	H mm in.	D mm in.	Weight kg lbs
PCE 2K-100	210 (220) 8.27 (8.66)	300 (355) 11.81 (13.98)	300 (370) 11.81 (14.57)	Approx. 32 Approx. 71
PCE 3K-100	210 (220) 8.27 (8.66)	300 (355) 11.81 (13.98)	400 (470) 15.75 (18.50)	Approx. 38 Approx. 84
PCE 5K-100	315 (325) 12.40 (12.80)	300 (355) 11.81 (13.98)	400 (480) 15.75 (18.80)	Approx. 54 Approx. 119
PCE 5K-200	315 (325) 12.40 (12.80)	300 (355) 11.81 (13.98)	400 (470) 15.75 (18.50)	Approx. 54 Approx. 119
PCE 10K-100	450 (460) 17.72 (18.11)	700 (850) 27.56 (33.46)	600 (710) 23.62 (27.95)	Approx. 190 Approx. 419
PCE 10K-200	450 (460) 17.72 (18.11)	700 (850) 27.56 (33.46)	600 (710) 23.62 (27.95)	Approx. 190 Approx. 419

Notes: The top rows are for mm or kg and the bottom rows for inch or lbs. The dimensions enclosed in the parentheses are the maximum dimensions including the extrusions.

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### 3. NOTES BEFORE USE

#### 3.1 Unpacking and Inspection

Upon receipt of the equipment, immediately unpack and inspect it for any damage which might have been sustained when in transportation and check that there are no missing parts. Check especially carefully the following items:

- (1) Check that there is no sign of damage or distortion of the front and side panels.
- (2) Check that the terminals, switches, meters and knobs indicate no signs of damage.
- (3) Check that there is no missing item. The supplied items are as follows:

(a) Mainframe	1	
(b) Instruction manual	1	
(c) Accessories		
Guard cap	1	
Power cord, approx. 3 m (9.8 ft)		1 set
Indicator lamp	1	

#### 3.2 Notes for Installation

- (1) Allow a space of 50 cm (20 in.) or more for each of the ventilation holes of the equipment.
- (2) Do not place any object which is not heat resistant near the fan air outlet from which hot air comes out.
- (3) Note that equipment failure may be caused if the equipment is used in dusty, highly humid atmosphere.
- (4) Install the equipment in a place where is reasonably free from mechanical vibration.



- (5) Do not place any high sensitivity instrument on or near the equipment lest the indication of the instrument should be degraded due to magnetic flux leakage from transformer and choke coil of the equipment.
- (6) Do not install the equipment on a workbench or a slanted base. Be sure to fix the equipment securely.

### 3.3 Power Line

- (1) The equipment must be operated on a line voltage of 85 - 115 V, 50 or 60 Hz single-phase AC.

Note: Set the snap switch on the rear panel to the 50Hz or 60Hz position in conformity with the line frequency.

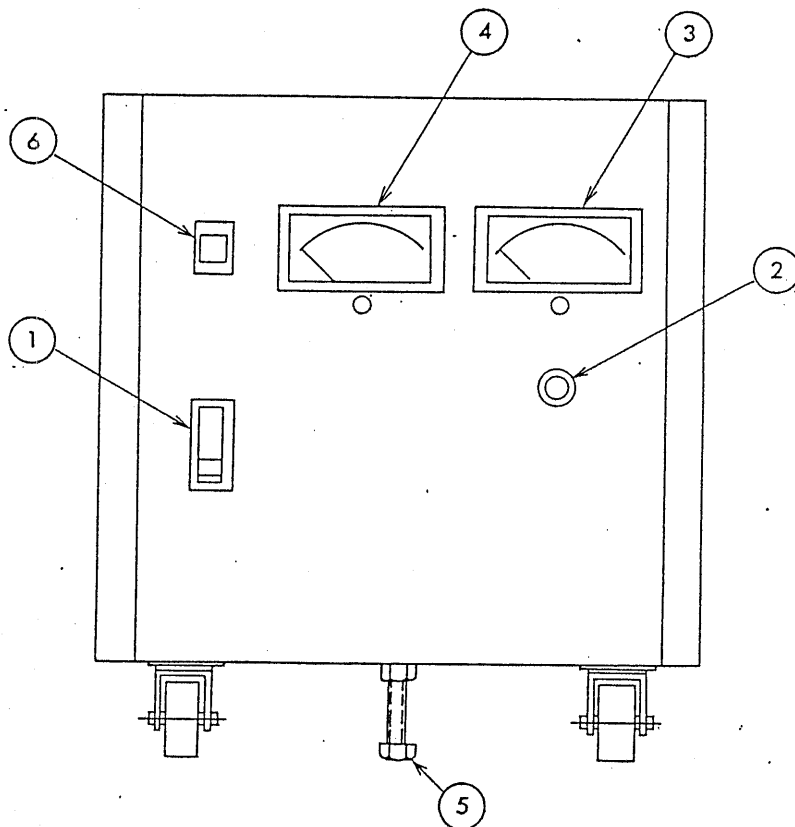
- Precautions:
- (1) Be sure to ground the equipment to prevent electric shock hazards.
  - (2) Never change frequency setting when the equipment is in operation.

#### 4. OPERATION METHOD

##### 4.1 Front Panel

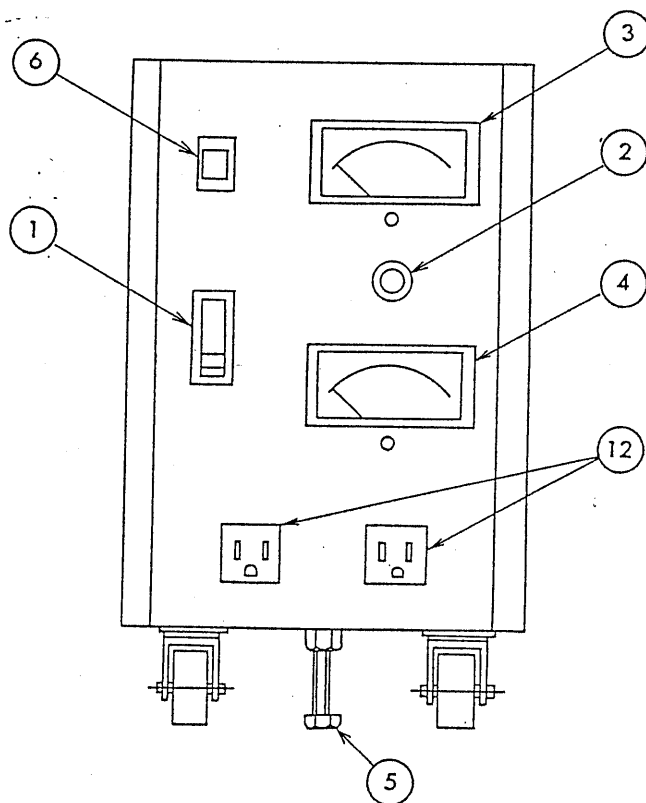
PCE 5K-100

PCE 5K-200



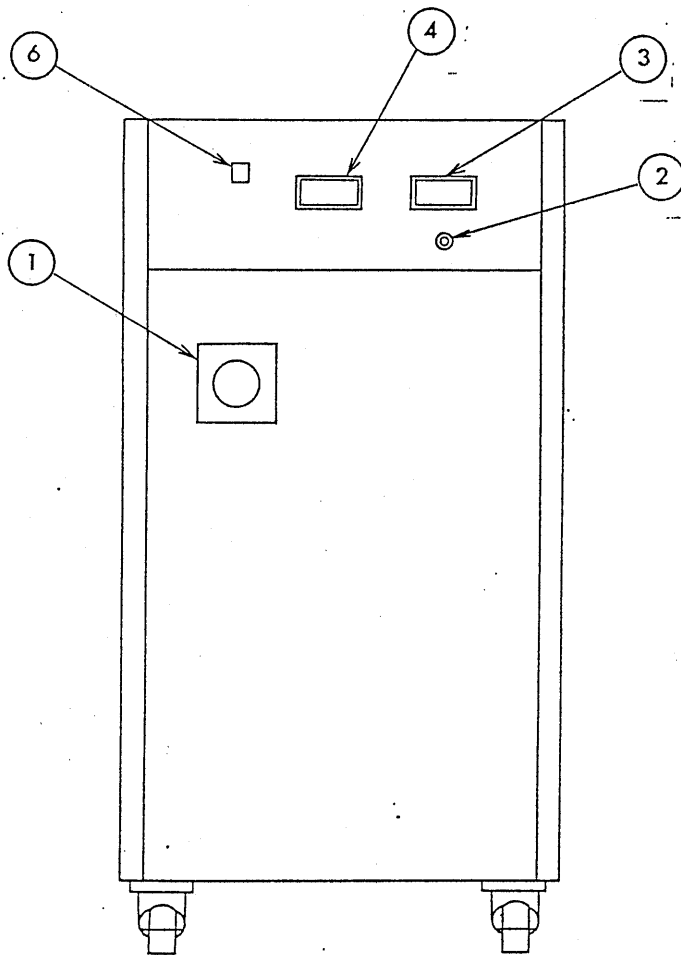
PCE 2K-100

PCE 3K-100



PCE 10K-100

PCE 10K-200

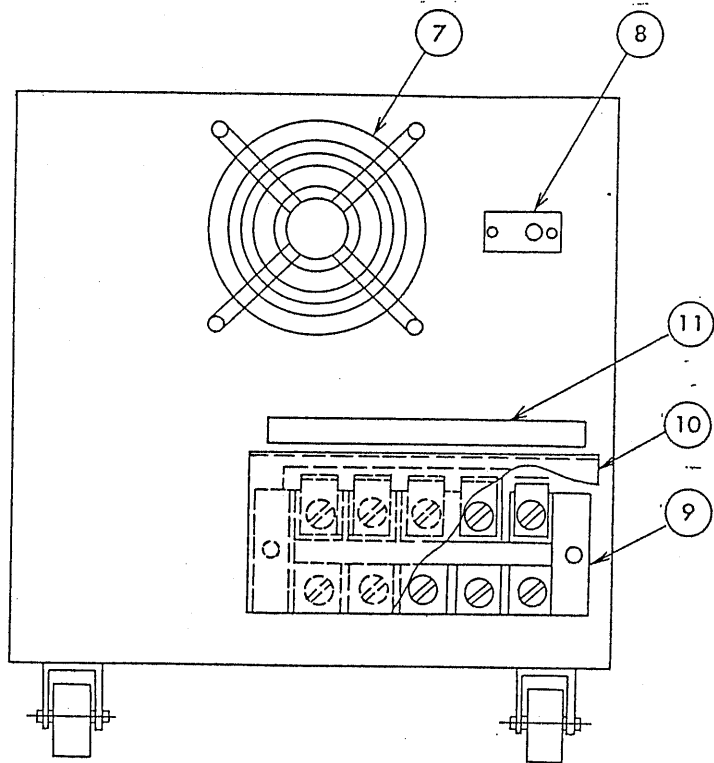


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4.2 Rear Panel

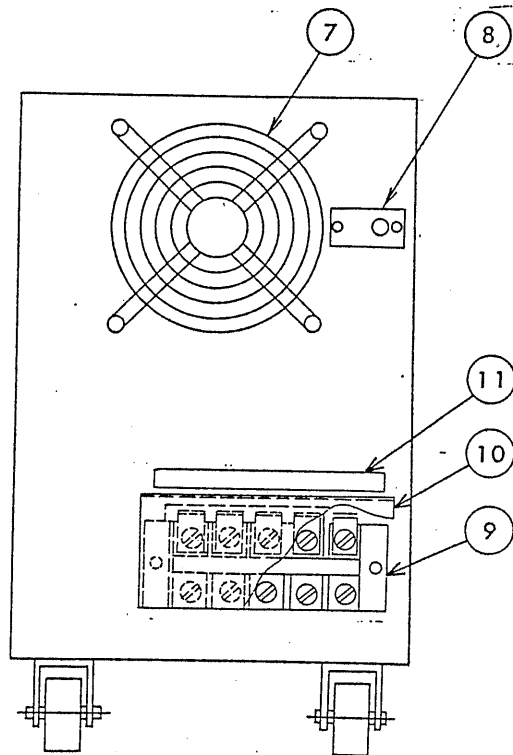
PCE 5K-100

PCE 5K-200



PCE 2K-100

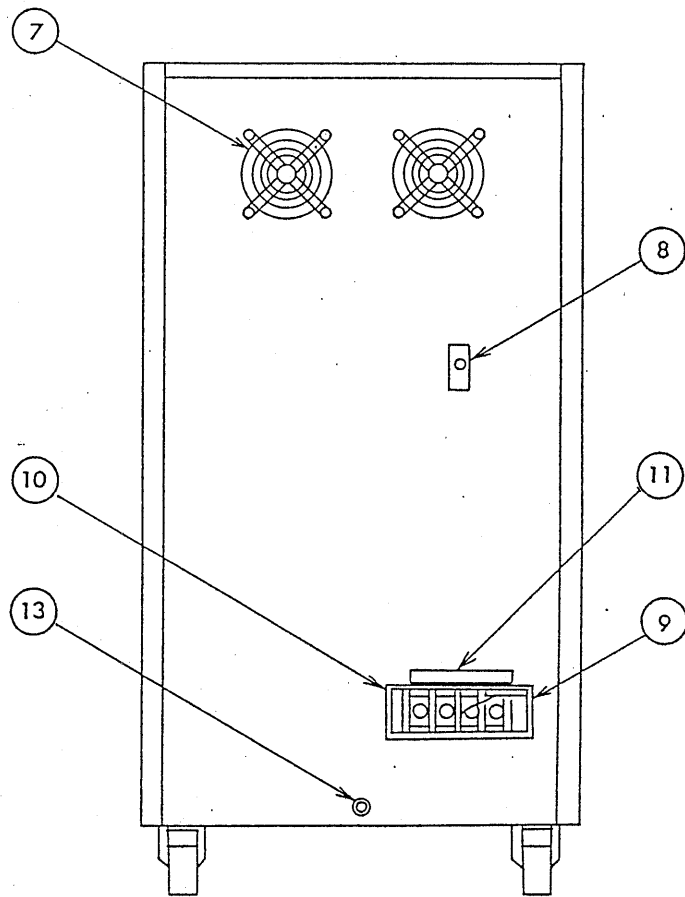
PCE 3K-100



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PCE 10K-100

PCE 10K-200



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### 4.3 Description of Front and Rear Panels

#### ① Power Switch

Main power switch of the equipment. As this switch is thrown to the top position (or turned clockwise in the case of the 10kVA model), equipment power is turned on and the power pilot lamp ⑥ illuminates.

Note: The switch is automatically turned off when a protective circuit (overcurrent, overvoltage, or overheat protector) is activated.

#### ② VOLT ADJ: Output voltage setting knob

To adjust the output voltage, continuously variably within a range of 95 - 105 V.

#### ③ Voltmeter

To indicate the output voltage. JIS Class 2.5 voltmeter.

#### ④ Ammeter

To indicate the output current. JIS Class 2.5 ammeter.

#### ⑤ Stopper bolts

These bolts are used to settle the equipment in the place of use. To settle the equipment, turn these bolts so that the casters of the front side are slightly lifted from the floor (for models of output rating 5 kVA or less). Models of output rating 10 kVA or over have caster stoppers.

#### ⑥ Power indicator lamp

Indicates that input power is on.

⑦ Fan air outlet

The air outlet of the cooling package. Hot air comes out of this outlet. Do not place any object which is not heat resistant near this outlet. Allow a clearance of 50 cm (20 in.) or more from the wall.

⑧ 50Hz/60Hz selector switch and guard

To select 50 Hz or 60 Hz of AC line frequency. The switch guard is to guard against inadvertent or unauthorized switching.

Caution: Never change the switch when the equipment is in operation. Note that the equipment may be damaged if the switch is changed when the equipment is in operation.

⑨ Input/output terminals

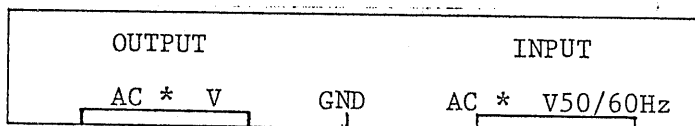
The input and output terminals of the equipment. Connect the input and output cables to these terminals referring to ⑪.

⑩ Input/output terminal cover

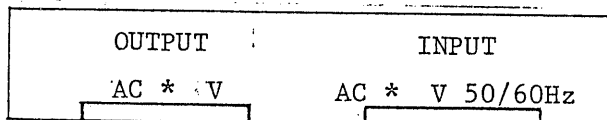
The cover to protect the input and output terminals. It guards the terminals against shorting by entrapped foreign substance. The cover should constantly be placed except when making connections to the terminals.

⑪ Input/output terminal label

(1) Models of output rating 5 kVA or less



(2) Models of output rating 10 kVA



\* Either "100" or "200" is marked for the 100V input or 200V input, respectively

⑫ Outlets

These outlets, which deliver the output power, are provided for Models PCE 2K-100 and PCE 3K-100 only. The current ratings of these outlets are 15 amperes.

⑬ Ground terminal

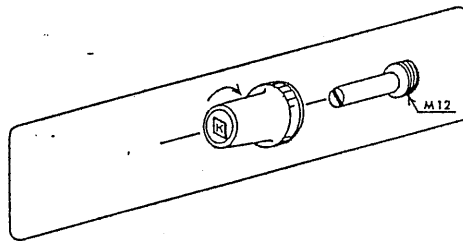
This ground terminal is provided for models PCE 10K-100 and PCE 10K-200 only.

Be sure to ground this terminal.

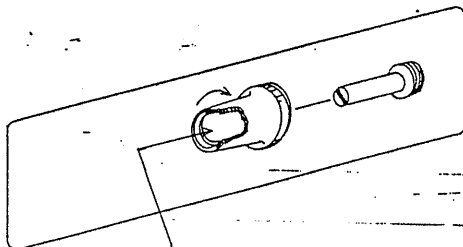
Guard Cap

The guard cap is used to fix or semi-fix the VOLT ADJ knob ②. For how to use the guard cap, see the following illustration.

Fixed



Semi-fixed



Break through the K mark section with a screwdriver.



#### 4.4 Operating Procedure

- (1) Check that the power switch of the equipment and that of the load are set in the OFF state.
- (2) Check that the 50Hz/60Hz selector switch is set in the position corresponding to the frequency of the AC line on which the equipment is to be operated. When the equipment is shipped from the factory, the switch is set in the 50Hz position.

Precaution: Never change this switch when the equipment is in operation.

- (3) Check that the AC line voltage is within the specified range.

Connect the AC line power and the load to the equipment. Turn on the power switch of the equipment. The power indicator lamp will turn on and the output voltage (nominal 100 V or 200 V) will be delivered in about 1 second after turning on the power.

- (4) Set the output voltage at the desired value.
- (5) Turn on the power switch of the load.

Note: Note that when the load is of a nature that it draws a rush current (such as a lamp, capacitor, motor, or transformer), the input breaker may trip due to the rush current.

Note also that, when two or more loads are connected in parallel to the equipment, the smaller loads should be disconnect at first and the largest load lastly. When the largest load is disconnected with the equipment in the operating state, the output voltage may surge up to about 1.4 times of the output voltage thereby causing damage to the loads.

## 5. TROUBLESHOOTING

When the equipment operation is abnormal, check it referring to the following table. When it is found that the equipment has failed, order your Kikusui agent for repair.

Symptom	Check Item	Probable Cause
The power switch cannot be turned on (or it is turned off immediately after turning on).	1. Has not the over-voltage protector tripped?	<ul style="list-style-type: none"> <li>o The output voltage is to high.</li> <li>o The input voltage is not within the specified range</li> </ul>
	2. Has not the over-current protector tripped?	<ul style="list-style-type: none"> <li>o A load current, exceeding the rating is being drawn.</li> </ul>
	3. Has not the fan stopped?	<ul style="list-style-type: none"> <li>o Trip of overheat protector</li> </ul>
	4. Other than the above	<ul style="list-style-type: none"> <li>o Circuit failure</li> </ul>
No output is delivered.	1. Does the power indicator lamp illuminate?	<ul style="list-style-type: none"> <li>o Open-circuited power cable</li> </ul>
	2. Other than the above	<ul style="list-style-type: none"> <li>o Circuit failure</li> </ul>
The output is unstable	1. Is the line voltage normal?	<ul style="list-style-type: none"> <li>o Line voltage not within the specified range</li> </ul>
	2. Is not the load of a particular nature?	<ul style="list-style-type: none"> <li>o Is not the load of a very poor power factor?</li> </ul>
	3. Is not the distortion factor poor?	<ul style="list-style-type: none"> <li>o The 50Hz/60Hz selector switch is not set correctly in conformity with the line frequency.</li> </ul>
	4. Other than the above	<ul style="list-style-type: none"> <li>o Circuit failure</li> </ul>

This equipment operates on an AC line voltage of 200 V.  
When reading this manual, substitute by 200 V the terms of  
the input and output voltages mentioned therein.

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