MODEL 7133

REGULATED DC POWER SUPPLY

OPERATION MANUAL

印刷表紙使用のこと

KIKUSUI ELECTRONICS CORP.

# 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.

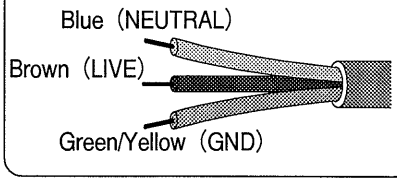
☐ AC power cable

The product is porvided 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.

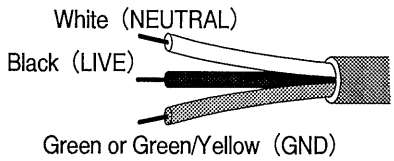
**WARNING**

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

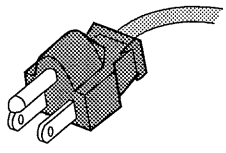
☐ Without a power plug



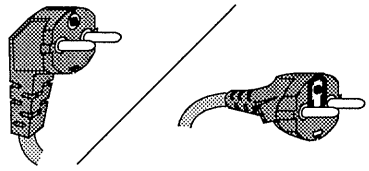

☐ Without a power plug




☐ Plugs for USA



☐ Plugs for Europe



☐ Provided by Kikusui agents

Kikusui agents can provide you with suitable AC power cable.
For further information, contact your Kikusui agent.

☐ Another Cable _____

 Kikusui Part No. Z9-000-027 IB001681

KIKUSUI

- C O N T E N T S -

## 1. Summary

This instrument is a transistorized series type low voltage regulated DC power supply provided with a knob, by which output voltage can be varied continuously through 0 ~ 70V as one range, and with another knob, by which the voltage can be adjusted finely within ±1V. And this power supply enables to make use of the output current of 2.5A maximum and to limit current to 2.5A, 2A, 1.5A, 1A and 0.5A. Furthermore, this power supply is equipped with a large size voltmeter and ammeter as well as an automatic reset type overload protective circuit for preventing troubles to be caused by output short-circuiting. Some of the most remarkable features of this instrument are.

1.1 Some sets of this power supply can be used in series or parallel operation and be remote-controlled in either state of operation. (in the connecting method as described afterwards)

1.2 In the state of series or parallel operation, the whole output voltage can be varied by the output voltage control knob (COARSE knob) of one of those sets.

## 2. Specification

Power supply _____V 50/60 Hz

| | | |
|---|---|---|
| No load | (output 10V, 0A) | Approx. 20 VA |
| Full load | (output 70V, 2.5A) | Approx. 420 VA |

Ambient temperature Max. 40°C

Dimensions (maximum) 430(435)W x 167(179)H x 390(440)D mm

Weight Approx. 19 kg

Accessories Short Type Long Type

Short bar----2, -----1

Instruction manual & Test data----1 each

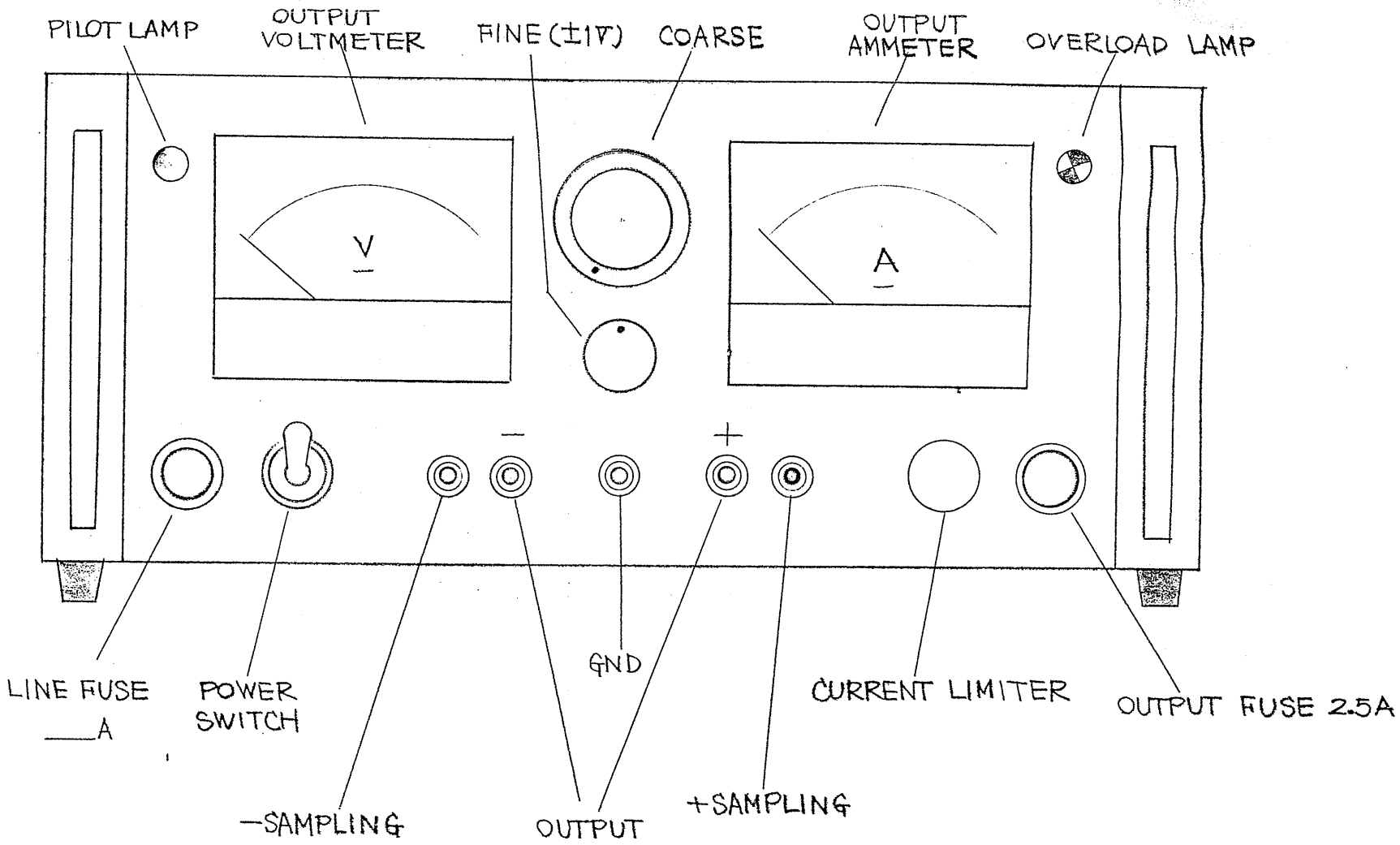
Output

| | | |
|---|---|---|
| Terminal | Color distinction, horizontal disposition<br>Output terminal ±, sampling terminal ±, and<br>GND terminal | |
| Polarity | Positive or negative polarity | |
| Voltage to ground | Maximum | ±200V |
| Voltage | 1 range continuously variable | 0 ~ 70V |
| Current | Continuous | 2.5A max. |
| Ripple | | 2mV p-p |

Current limitation

Current is limited to 2.5A, 2A, 1.5A, 1A or 0.5A.
Current is in the range of +3% ~ +15% of set value.
When a short-circuit or a load exceeding the set value of current limitation is connected thereto, the lamp of overload indication is lighted.
When the load returns to a value in the range of current limitation of this instrument, automatic reset is attained.

| | | |
|---|---|---|
| Stability | Against ±10% of power voltage | 5 mV |
| | Against 0 ~ 2.5A of output current | 10 mV |
| Voltmeter | Full scale 70V | Class 2.5 |
| Ammeter | Full scale 2.5A | Class 2.5 |


PILOT LAMP
OUTPUT VOLTMETER
FINE (±1V)
COARSE
OUTPUT AMMETER
OVERLOAD LAMP
V
A
—
+
LINE FUSE ___A
POWER SWITCH
GND
CURRENT LIMITER
OUTPUT FUSE 2.5A
—SAMPLING
OUTPUT
+SAMPLING

## 3. Explanation of Panel

POWER — is power switch, and, when turned to ON side, the pilot lamp is lighted and indicates that power is on.

COARSE — is output voltage coarse adjusting knob and can vary the voltage to 0 ~ 70V continuously. The voltage is raised by rotating this knob CW (clockwise).

FINE — is output voltage fine adjusting knob and enables the fine adjustment of ±1V approximately.

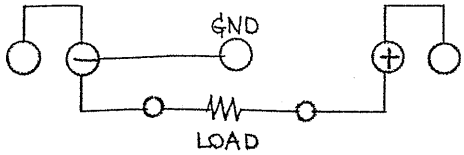
+, - terminal
GND terminal — is output terminal and is ordinarily used by connecting the plus or minus terminal to GND terminal (electrically connected to the chassis/panel) by means of the accessory short bar, but also can be functioned by giving DC bias of ±200V maximum thereto. See the following Figs. 1, 2 and 3.

SAMPLING terminal — is a terminal to be used mainly in case that load current is large, and, when the drop of the lead wire or the like to which load terminal is connected comes in question, it can be compensated by using this sampling terminal. See the following Fig. 4.

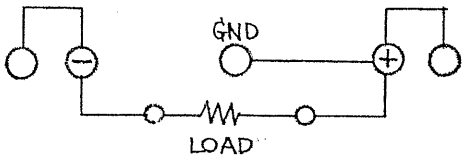
The method is as mentioned below.

Take off the short bar connected between the sampling terminal and output terminal, and connect the sampling terminal to the load terminal by means of other lead wire (this resistance is out of the question).

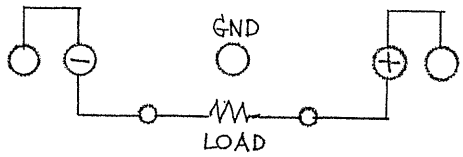
① MINUS GROUNDING



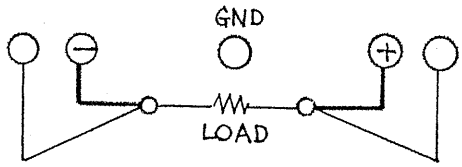

② PLUS GROUNDING




③ FLOATING




④ SAMPLING



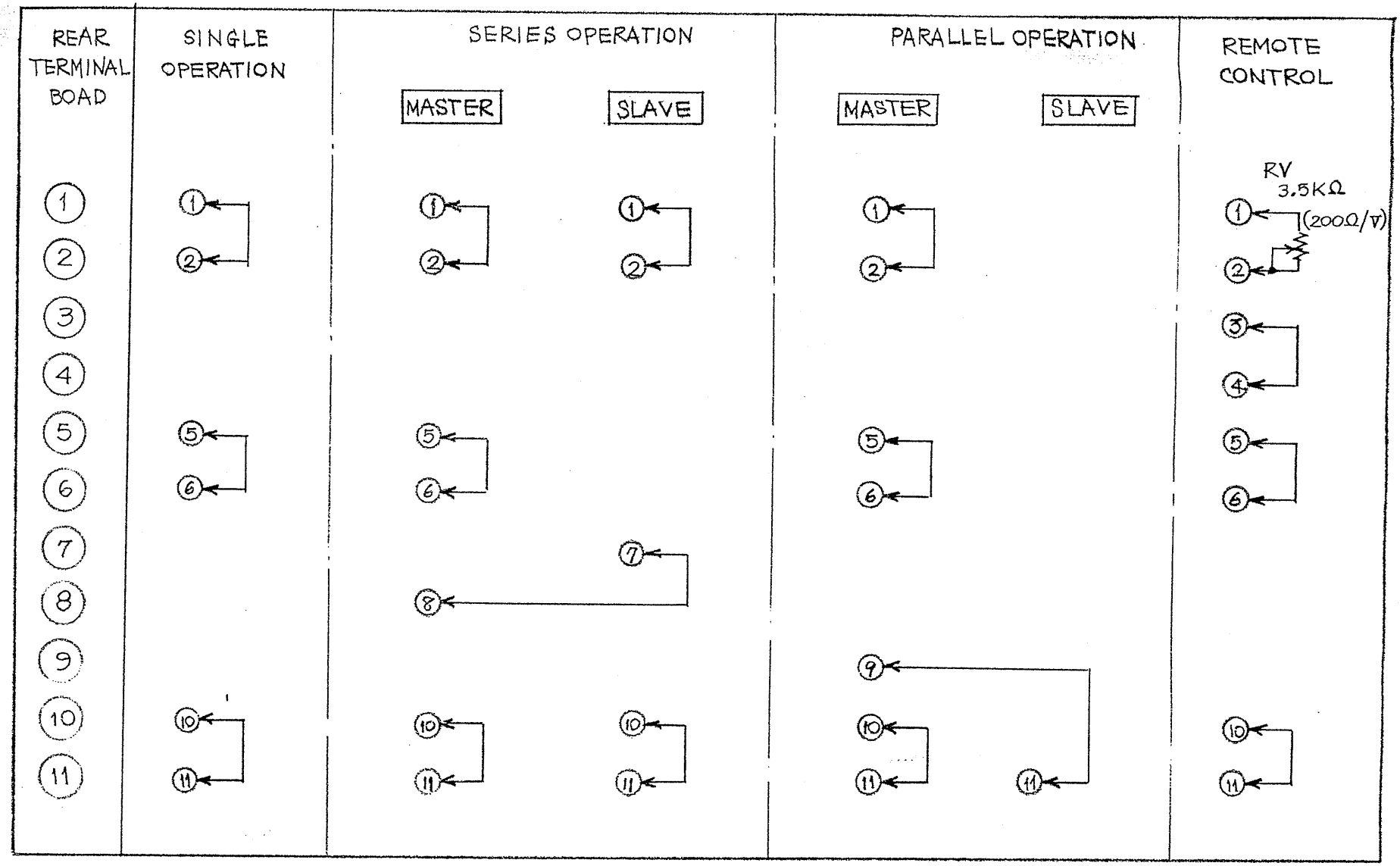

CURRENT LIMITER — is the current limitation selector switch and limits current to 2.5A, 2A, 1.5A, 1A and 0.5A. The operation starting current of the limiter circuit is adjusted to be within the range of +3%～+15% of the set value.

OVERLOAD LAMP — is the overload indication lamp and is lighted when a short-circuit or load exceeding the set value of current limitation is connected thereto.

LINE FUSE — is ___A fuse put in the AC power input.

OUTPUT FUSE — is 2.5A fuse put in the output circuit. It is preferred to use the fuse of capacity as small as the use permits.

| | | | |
|---|---|---|---|
| Output Votmeter | Full scale | 70V | Class 2.5 Voltmeter |
| Output Ammeter | Full scale | 2.5A | Class 2.5 Ammeter |



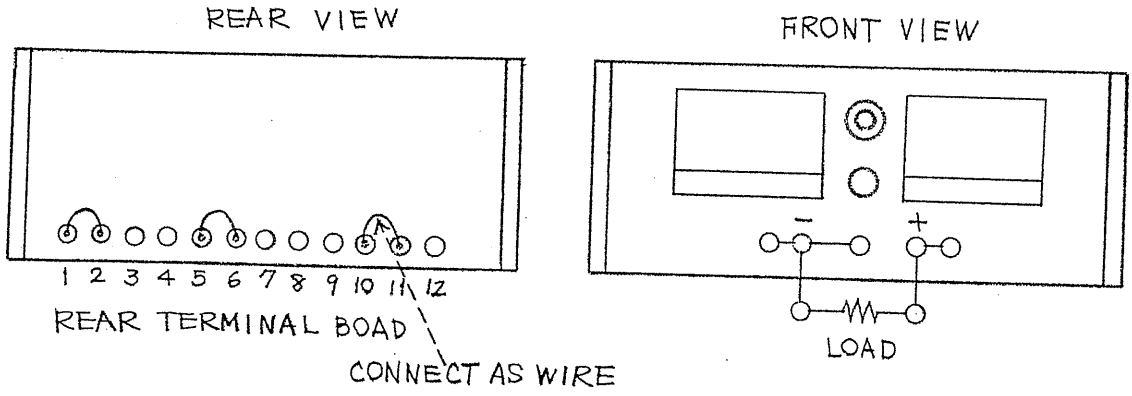

4. CONNECTION DIAGRAM OF REAR PANEL TERMINALS.

## 5. Operation Method

5.1 In order to start this instrument, the terminals shall be connected correctly as shown in the Connection Diagram of Rear Panel Terminals (see Page 9) even if parallel, series or single operation.

The terminals are located at the center of the Rear panel and numbered as 1 up to 12.

5.2 Single operation This is the ordinary way of use to operate one set of this instrument, and the connecting method of the Rear panel terminals is as shown in the drawing below. (see Page 9)

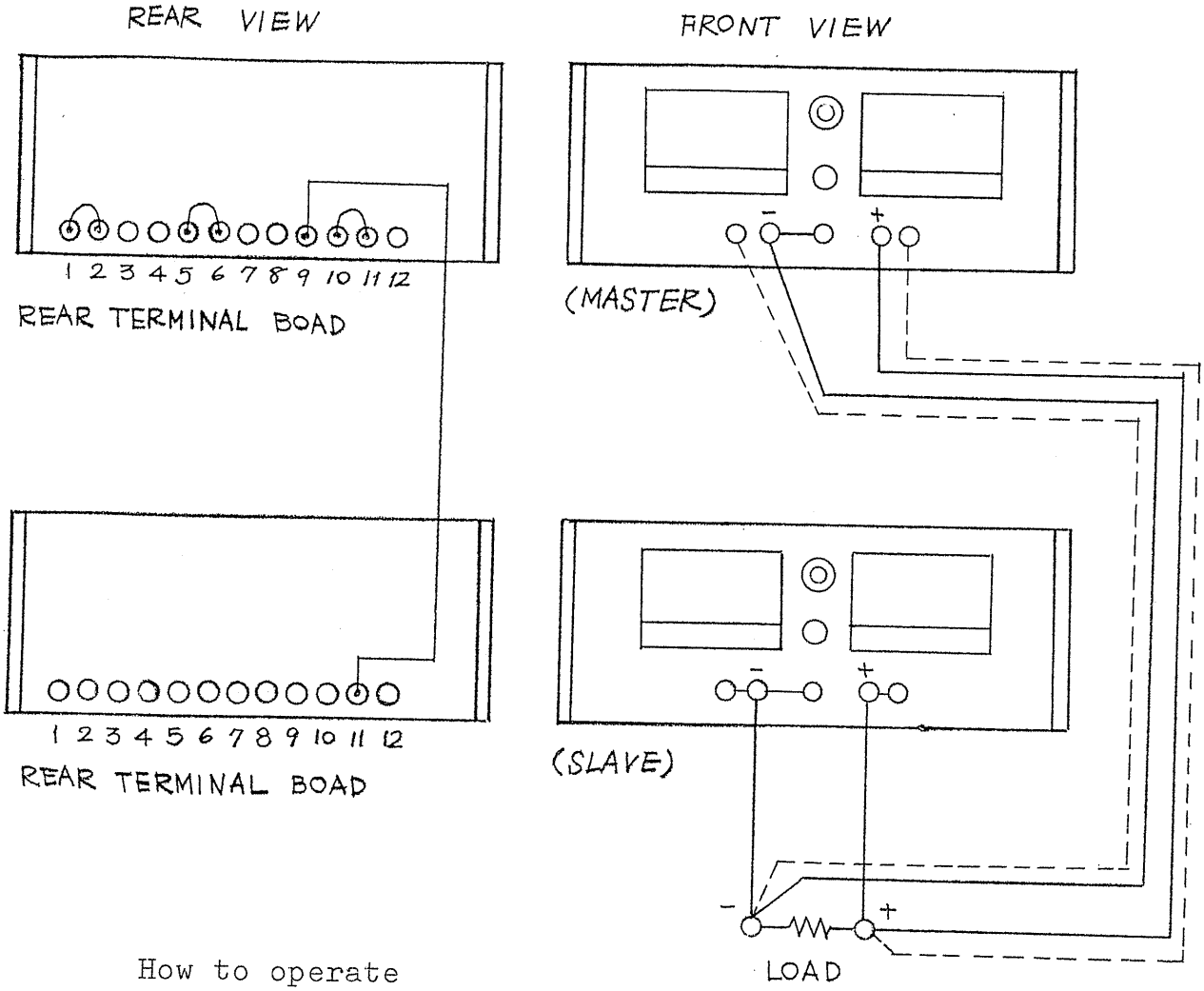



Terminal 1 and 2 shall be connected.

" 5 " 6 shall be connected.

" 10 " 11 shall be connected.

5.3 Parallel operation The connection example of parallel operation by two sets is shown in the drawing below.




How to operate

A. COARSE knob of 「Slave」 set shall be kept in the state rotated CW (clockwise) to the extreme, and output voltage control shall be made by COARSE knob of 「Master」 set. And, when COARSE of 「Master」 set is rotated CW, the output voltage of the both sets rises in approximately equal proportion.

B. The both sets shall be used with their current limiters set to the same value.

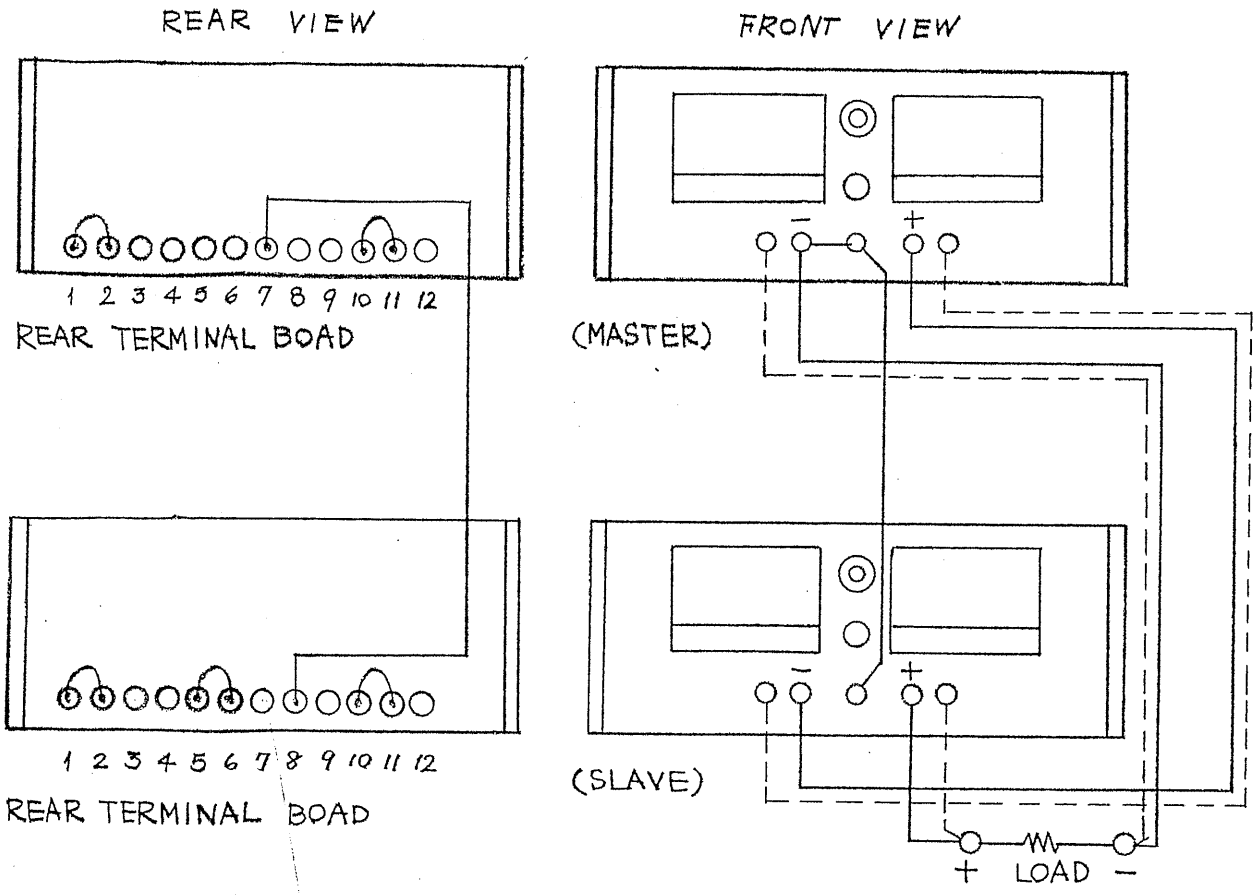
If the both are set to different values, normal operation can not be performed.

C. In case of two sets parallel operation, the stability of output voltage against change in load current is approximately the same as the stability of one set against the same output current. And connection with load shall be made by using the sampling terminal of ⌜Master⌟ set as shown in the drawing (Page 11). In this state, the output voltage is stabilized at the both terminals of the load. The short bars shall be used for minus grounding or plus grounding both ⌜Master⌟ set and ⌜Slave⌟ set, but different polarity not be grounded both ⌜Master⌟ set and ⌜Slave⌟ set.

D. In case of two sets parallel operation, these can be used as the power supply of 5A, the maximum output current.

E. The maximum number of this instrument permissible for parallel operation is 3 sets.

5.4 Series operation The connection example of series operation by two sets is as shown in the drawing in the next page.




How to operate

A. Output voltage control shall be performed by COARSE knob of ⌜Master⌟ set with COARSE knob of ⌜Slave⌟ set kept in the state rotated CW (clockwise) tc the extreme. And, when COARSE knob of ⌜Master⌟ set is rotated CW, the output voltage of the both sets rises in approximately equal proportion.

B. In case of two sets series operation, output voltage fluctuation against load current variation becomes approximately double in comparison with that of one set. And, as shown in the drawing (Page 13), the sampling terminal of ⌜Slave⌟ set shall also be used for connecting from ⌜Master⌟ set to ⌜Slave⌟ set. And it is preferable to use also the

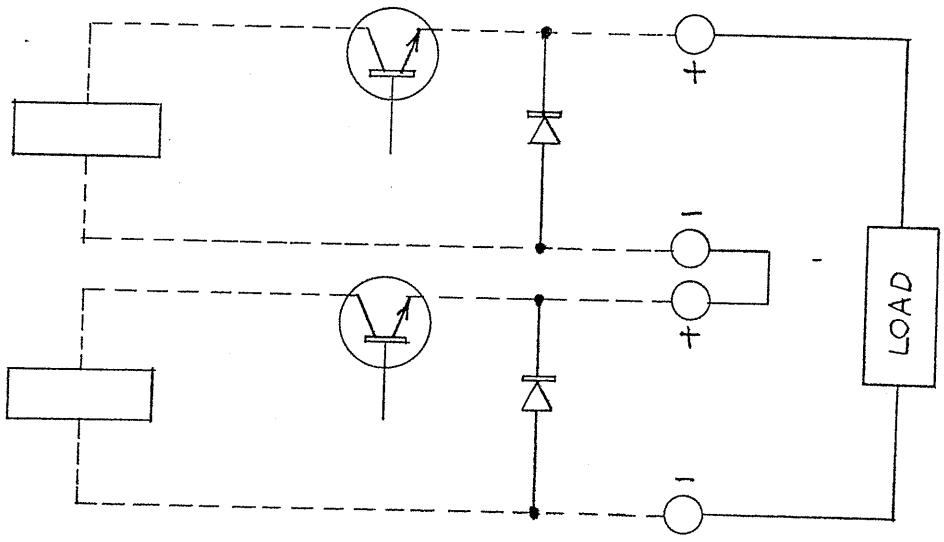
sampling terminal, as shown in the drawing, for connecting ⌜Master⌟ set to load and ⌜Slave⌟ set to load. The short bars shall be used for the minus grounding or plus grounding of ⌜Master⌟ set and for connecting between the grounding terminal of ⌜Master⌟ set and that of ⌜Slave⌟ set by means of lead wire.

C. In case of two sets series operation, these can be used as the power supply of 140V, the maximum output voltage.

D. The maximum number of this instrument permissible for series operation is 3 sets.

E. Overload protection in series operation

In case that two sets or more in series operation are overloaded, inverse voltage is impressed upon the set that operates first as to the overload protective circuit, and the series transistors are damaged. In order to prevent this, diodes are connected to the respective output terminals as shown in the drawing below.

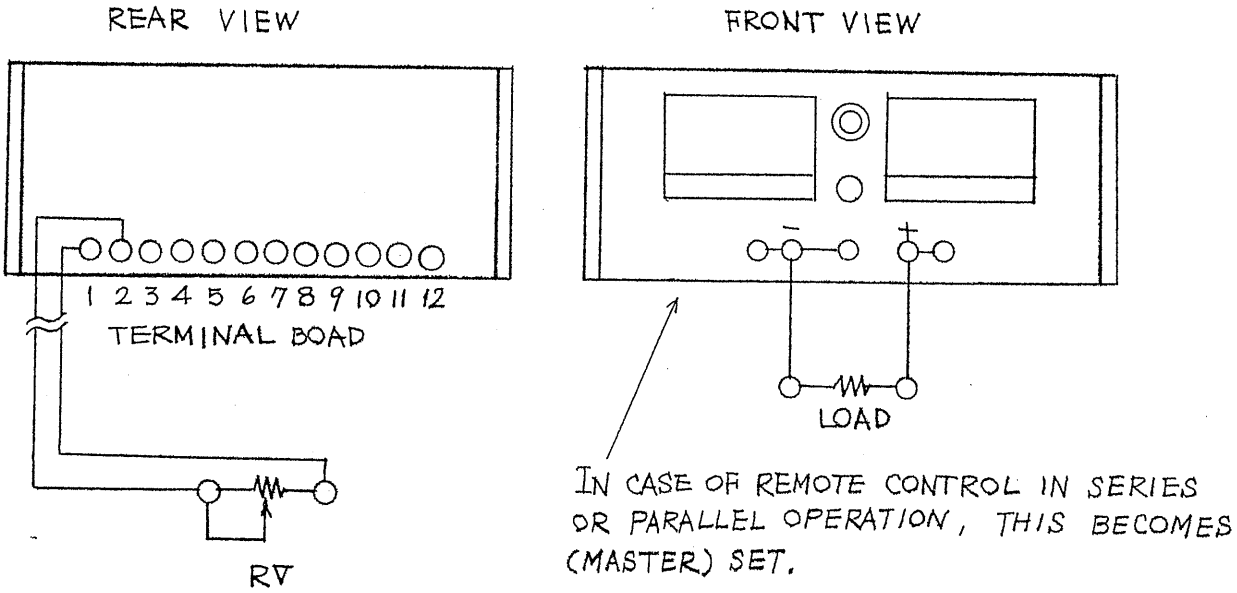



(EXECUTION UNDER JAP. PAT. NO. 308280)

## 5.5 Remote control

In either case of series, parallel or single operation, this instrument enables remote control. The connecting method therefor is shown in the drawing below.

(see Page 9)




How to operate

A. During the time of remote control, COARSE knob provided at the center of the panel is unable to control the output voltage, and RV attached outside controls the output voltage.

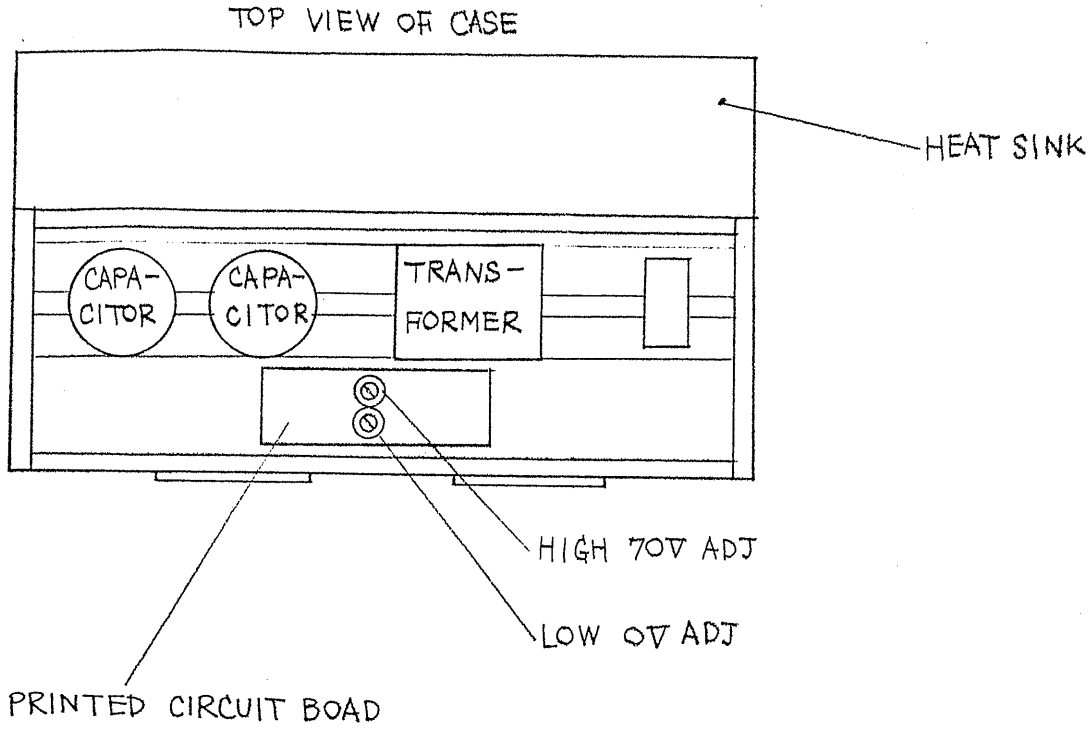
B. RV (potentiometer) is of approximately 200 Ω /V with the resistance value and requires the allowable power of 3W or more.

## 6. Precautions for Use

1. Ambient temperature — This instrument shall not be used in the place where ambient temperature exceeds 40°C. Also, when it is subjected to radiant heat from the direct rays of the sun or the other sources of heat, the output current shall be limited adequately.

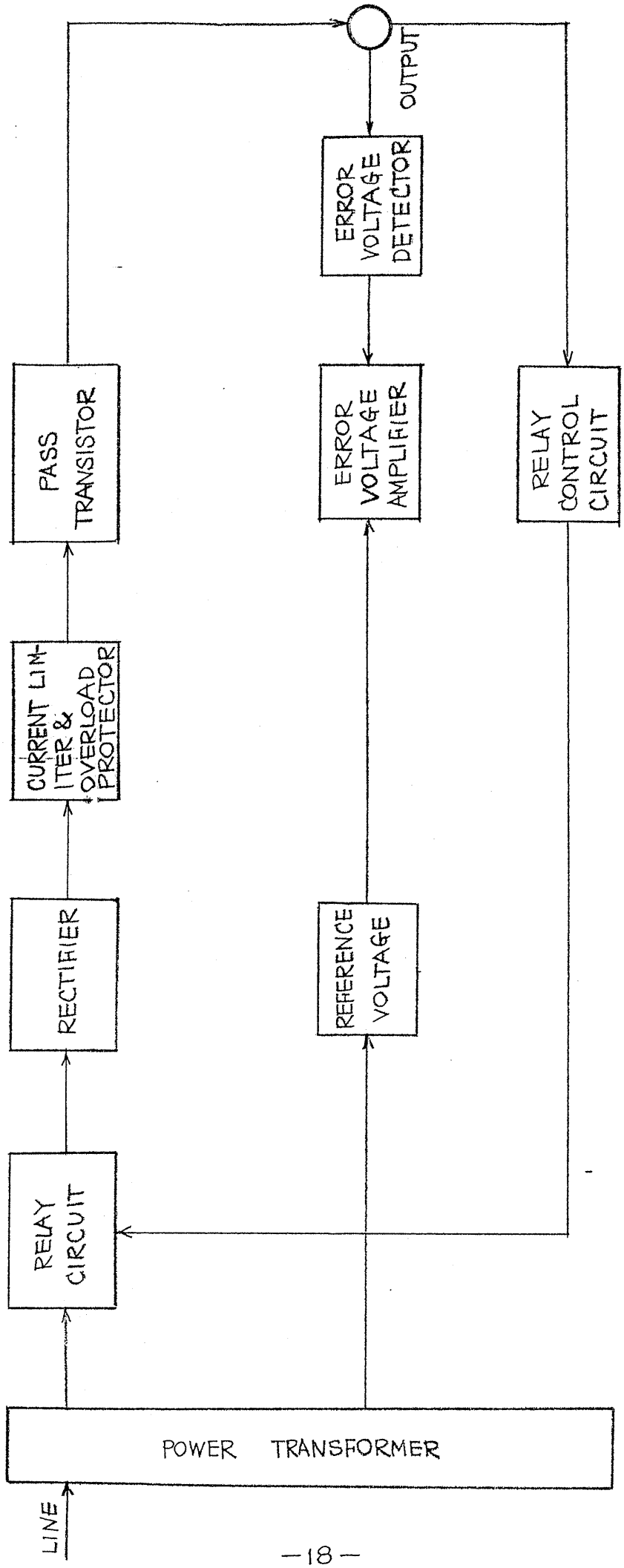
2. Overload protection — Against overload or short-circuit, the current limiter circuit operates for protection, and thus safety is ensured. (When the protective circuit operates, the overload indication lamp lights.

3. OV, 70V ADJ — The semi-fixed resistor HIGH 70V ADJ) and LOW (OV ADJ) as shown in the drawing below shall be adjusted so that the output voltage becomes 70V and OV when [COARSE] knob is set to the maximum position (the position rotated clockwise to the extreme) and to the minimum position. Since the adjustment of the both acts upon another mutually, the adjustment shall be repeated several times at the two points of 70V and OV.




4. Transistors inside this instrument may be damaged, if the connecting operation of the Rear panel terminals is conducted in the state of power turned on.
Sufficiently check the connections thereof prior to turning the power switch on.

BLOCK DIAGRAM.



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