

MODEL 7337A
REGULATED DC POWER SUPPLY
OPERATION MANUAL

印刷表紙使用のこと

KIKUSUI ELECTRONICS CORP.

69.10.6

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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GENERAL

Kikusui Electronics Model 7337A is a transistorized regulated DC power supply of series type. It is provided with a knob for continuously varying voltage in a range from 0 to 50 V and a knob for making fine adjustment of ± 1 V. The maximum applicable output current is 5 A. As the output current can be limited to 1, 1.5, 2, 3, or 5 A respectively, the Model 7337A is capable of operating safely even in case of a non-linear load or short-circuit of output. A voltmeter and an ammeter of large size are provided on the front panel, and sampling terminals are equipped for output. The Model 7337A renders it possible to perform series operation between the same models and also remote programming for them. Further, both series and parallel operations are possible between the Models 7337A and 7337.

SPECIFICATIONS

AC Input	-----V 50 or 60 Hz
	Full load: approx. 600 VA
Dimensions	430 (W) x 256 (H) x 350 (D) mm
(Max)	435 (W) x 275 (H) x 430 (D) mm
Weight	Approx. 25 kg
Ambient Temperature	Max: 40°C
Accessories Supplied	Short bar (long) 1
	Operation manual 1
	Test data sheet 1
OUTPUT: :	
Terminals	Horizontally aligned; classified by colors
Polarity	Positive or negative
Floating Voltage	Max. <u>+100</u> V
Voltage	0 - 50 V, 1 range; continuously variable
Current	Max. 5 A
Ripple	1 mVrms
Regulation	Line regulation (against <u>+10</u> % fluctuation of input voltage) : (0.01 % + 1 mV)
	Load regulation (against 0 - 100 % fluctuation of load) : (0.01 % + 2 mV)
Overload Protection	Current limit: switchable to 1, 1.5, 2, 3 or 5 A
	Overload lamp lights when short circuit occurs or any load exceeding preset

value is connected. Normal voltage regulating operation resumes automatically when the load becomes less than the preset value.

Operation

Single, series, parallel, and remote programming

Meter

Voltmeter:	50 V	Accuracy:	2.5 % of full scale
Ammeter:	5.5 A	Accuracy:	2.5 % of full scale

FRONT PANEL

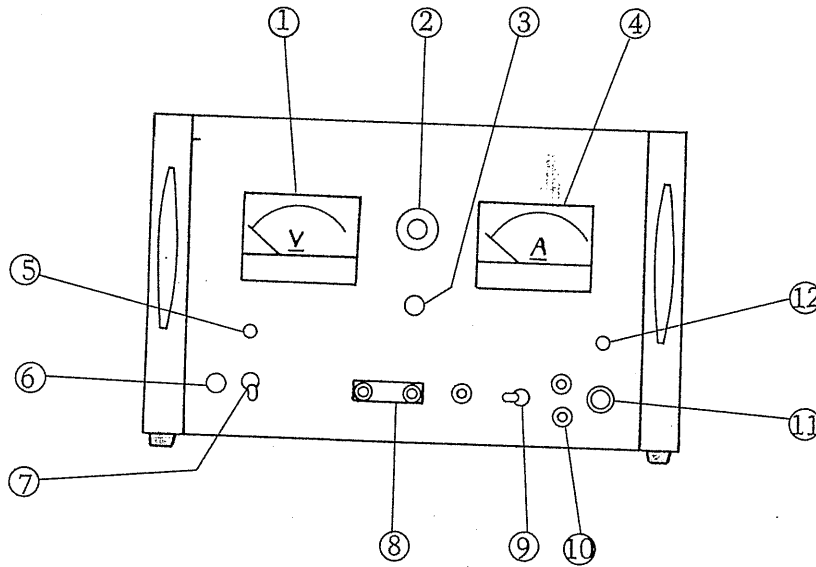


Fig. 1

- ① Output voltmeter (full scale: 50 V)
- ② Output voltage control knob: Clockwise rotation increases voltage, which can be continuously varied in a range from 0 to 50 V.
- ③ Knob for fine adjustment of 2 : Capable of varying approximately ± 1 V.
- ④ Output ammeter (full scale: 5.5 A)
- ⑤ Input display lamp
- ⑥ 7-A slow-blow type fuse provided on AC input side
(5-A fuse for output circuit is located at right of rear panel terminal strip.)
- ⑦ Power switch: Setting to ON-side turns on power and lights input display lamp.

- ⑧ Output terminals: Normally Model 7337A is used with positive or negative terminal connected with GND terminal (electrically connected with chassis and panel) by means of accessory short bar. It is also possible to operate the equipment by applying DC bias of +100 V maximum.
- ⑨ Internal/external sampling select switch: Normally set to left (INT) in use. In this case, both (+) and (-) sampling terminals are internally connected with output terminals. To perform external sampling, set this switch to right (EXT).
- ⑩ External sampling terminal: To be used when load current is great and lead wire from output terminal to load becomes long, and resultant voltage drop cannot be ignored. In this case, set the switch to EXT, and connect terminals as shown below.

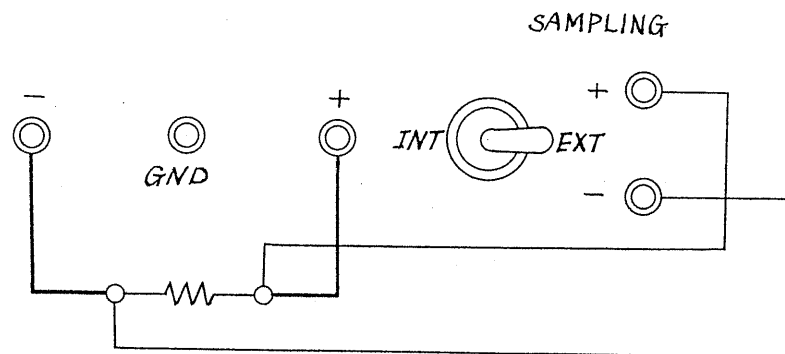


Fig. 2

- ⑪ Knob for selectively switching preset value of current limiting range to 1, 1.5, 2, 3 or 5 A respectively.

It is to be noted that preset value is varied in case of (10) external sampling due to voltage drop resulting from main lead wire.

- ⑫ Overload display lamp: Lights when short circuit occurs or any

load beyond preset value of current limiting range is connected. Be careful not to allow the equipment to operate for many hours under this condition.

OPERATION

1. Preparation

- (1) Confirm that AC input voltage is within a range of the rated voltage +10 %.
- (2) Be particularly careful when using Model 7337A under such conditions as insufficient ventilation, exposure to direct rays of the sun or to radiation from any heat source, high humidity, dusty place, or ambient temperature above 40°C or below 0°C.
- (3) Confirm that the rear terminals are properly connected.

2. Single Operation

This is the case where Model 7337A is singly operated. Connection of the rear terminals is shown below.

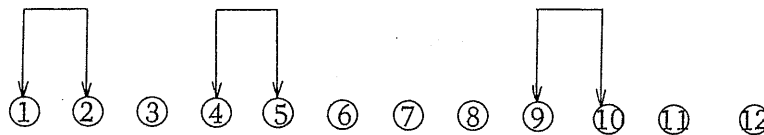


Fig. 3

Just confirm the connection, as it is already completed at the time of shipment.

Set the output voltage by means of the respective output control knobs for coarse and fine adjustment, and set the output current by means of the current limit selector.

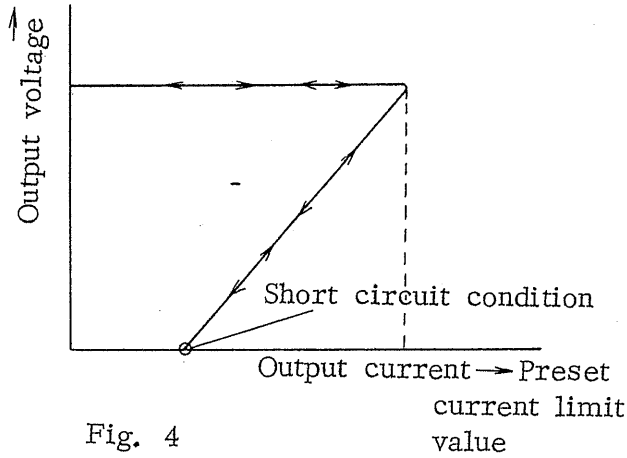


Fig. 4

When a load beyond the preset current limit value is connected, the overload display lamp lights, and both output voltage and output current decrease.

The output current becomes minimum in the case where a load is short-circuited.

When the load returns to be

within the preset current limiting range, the equipment resumes its voltage regulating operation automatically and continuously.

3. Parallel Operation

Parallel operation is performed when it is desired to use more than 5 A of output current. In this case, connection is to be made as shown below. In this operation, one equipment functions as a master while the other as a slave. Output is controlled in a master equipment by a one-control system.

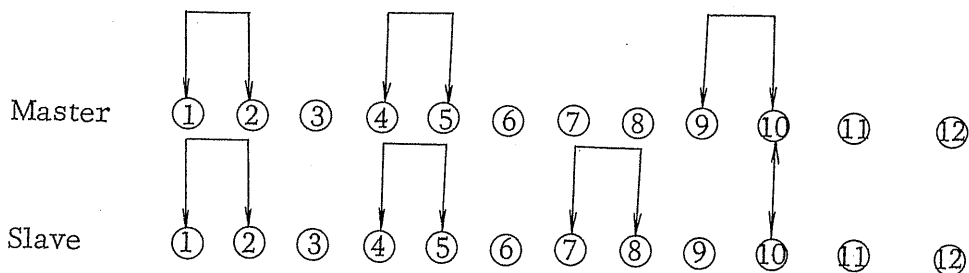


Fig. 5

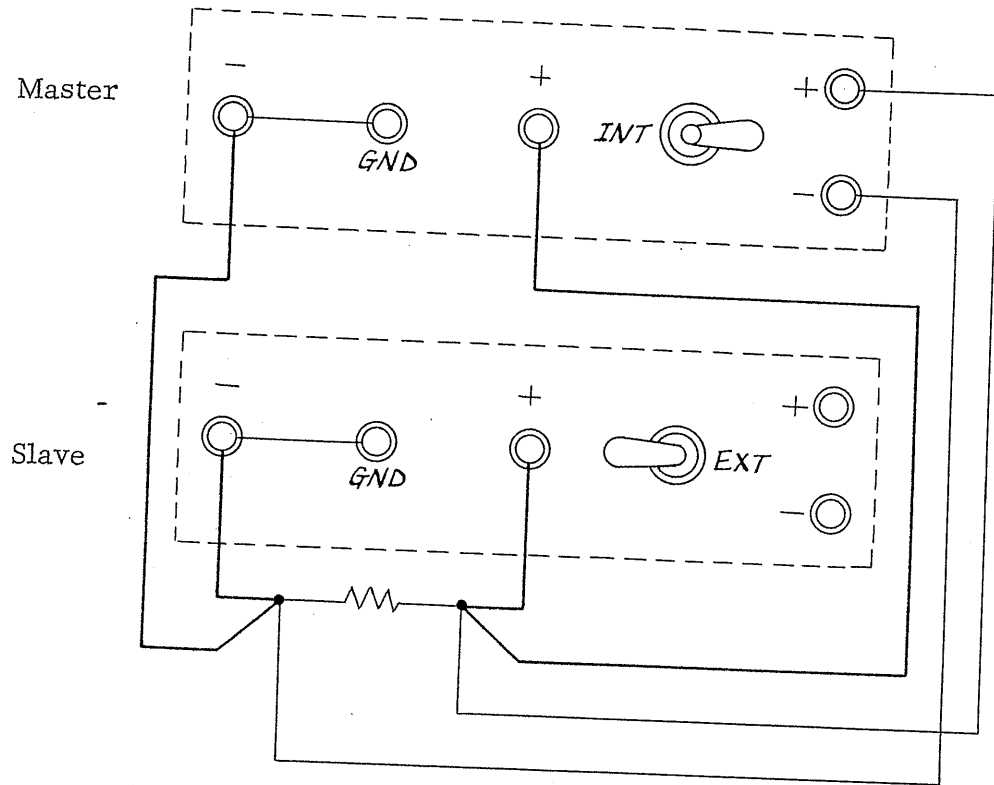


Fig. 6

Parallel operation by external sampling (negative grounding)

- (1) Turn the output voltage control knob of the slave clockwise to its extreme position, and set the output current limit knob to the same range as that of the master.
- (2) Turn on the power switch. Then the output voltages of both master and slave can be increased or decreased at the same rate by means of the output voltage control knob of the master.
- (3) The master and slave must be so grounded by the short bars that they may become coincident with respect to the polarity. Never ground them in different polarity.

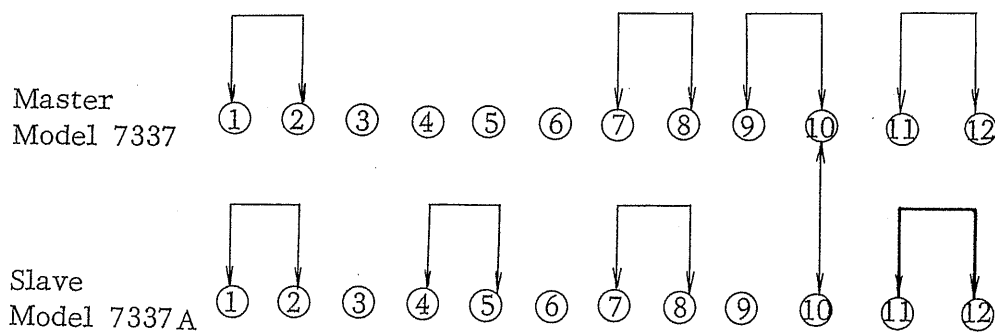
(4) Output fluctuation in parallel operation somewhat increases as compared with the case of single operation.

4. Parallel Operation of Models 7337A and 7337

Connection of the output terminals is the same as shown in Fig. 6.

In this case, Model 7337 is a master and Model 7337A is a slave.

Connection on the rear terminal strip is shown in Fig. 7



The operation is the same as described in 3. Parallel Operation.

It is desired that a thick wire be used for connecting 11 and 12 of the slave.

5. Series Operation

Connect the output terminals in series as shown below in case of using a voltage higher than 50 V.

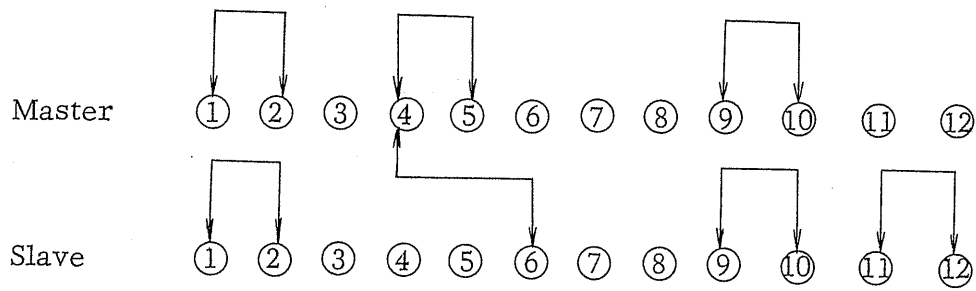


Fig. 8

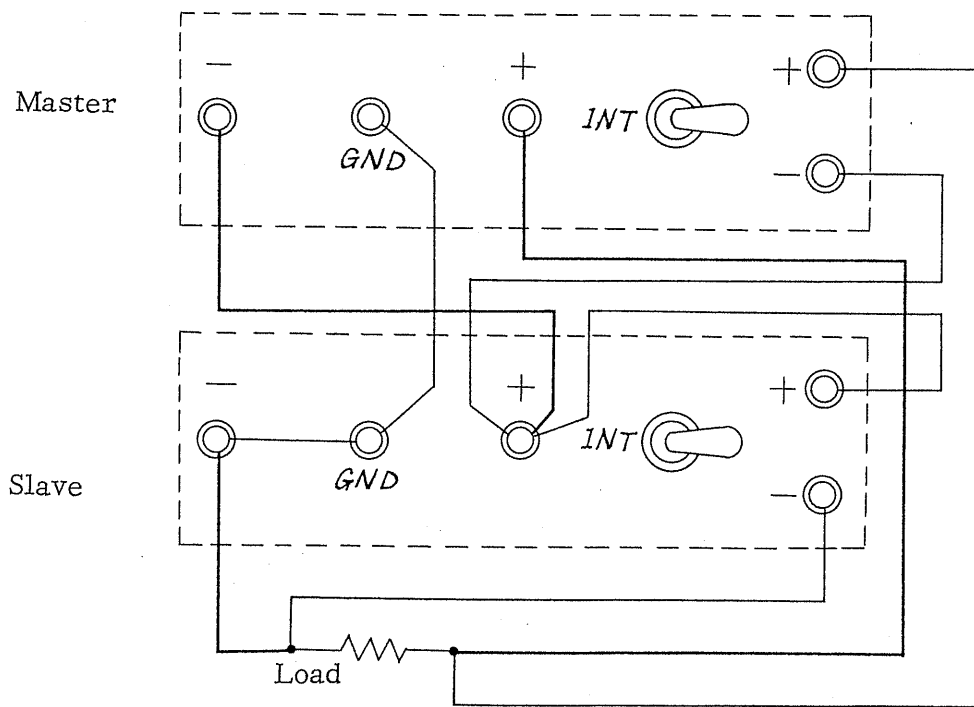


Fig. 9

(Negative grounding)

- (1) After connecting the master and slave equipments as illustrated in Figs. 8 and 9, turn the output voltage control knob of the

clockwise to its extreme position, and then control the output voltage by means of the output voltage control knob of the master. Turning the knob increases or decreases the output voltages of both equipments substantially at the same rate. In this case, be sure to turn on line power for the slave first.

- (2) Output current limit range is set by means of the current limit selector of the master. Set the selector of the slave to a 5-A range.
- (3) Connect the GND terminals by a wire, and ground either positive or negative terminal by the short bar. In this case, be sure to make the wire as short as possible.
- (4) Output fluctuation occurring in series operation becomes about twice as much as that in single operation.
- (5) It is also possible to operate the equipments by connecting the respective output terminals in series.

Overload protection in series operation

When overload condition occurs in the operation of more than two equipments connected in series, an inverse voltage is impressed on the equipment of which overload protection circuit operated first, and it may cause breakdown of the series transistors. In order to prevent this, protective diodes are connected with the output terminals of the respective power supplies as illustrated in Fig. 10.

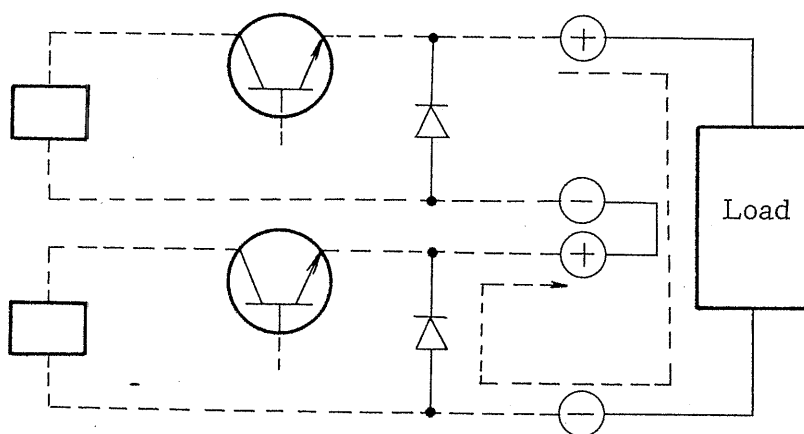


Fig. 10

6. Series Operation of Models 7337A and 7337

The output terminals and the sampling terminals are connected in the same way as Fig. 9. Connections on the rear terminal strips are shown in Figs. 11 and 12.

1) When Model 7337 is a master:

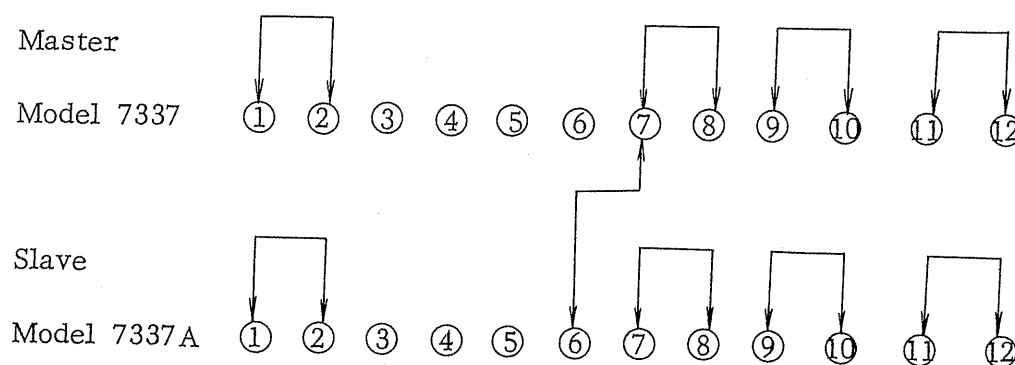


Fig. 11

2) When Model 7337A is a slave:

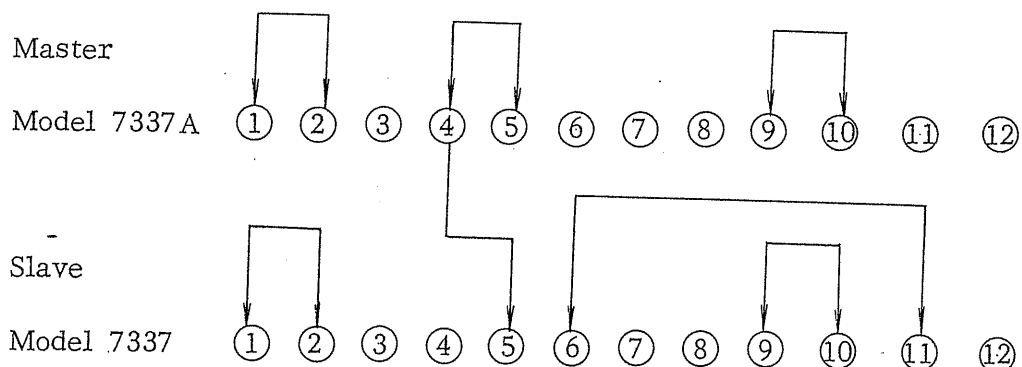


Fig. 12

The operation is exactly the same as the case of series operation between equipments of the same model.

7. Remote Programming

Remote programming is possible for Model 7337A in any case of single, parallel, or series operation. Fig. 13 illustrates connection on the rear terminal strip in the case of single operation.

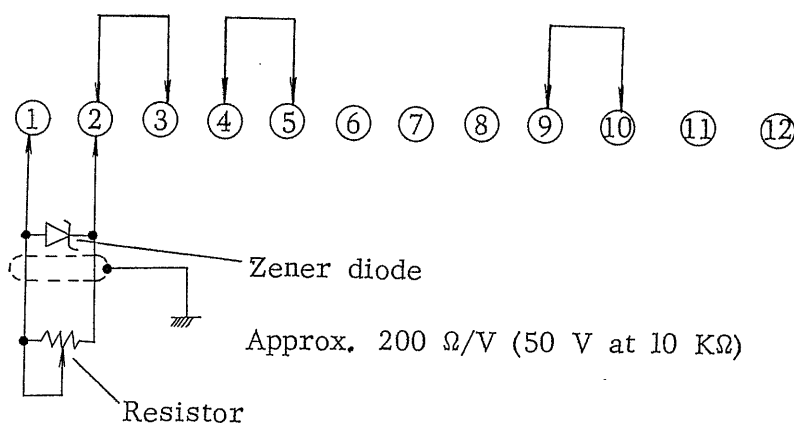


Fig. 13

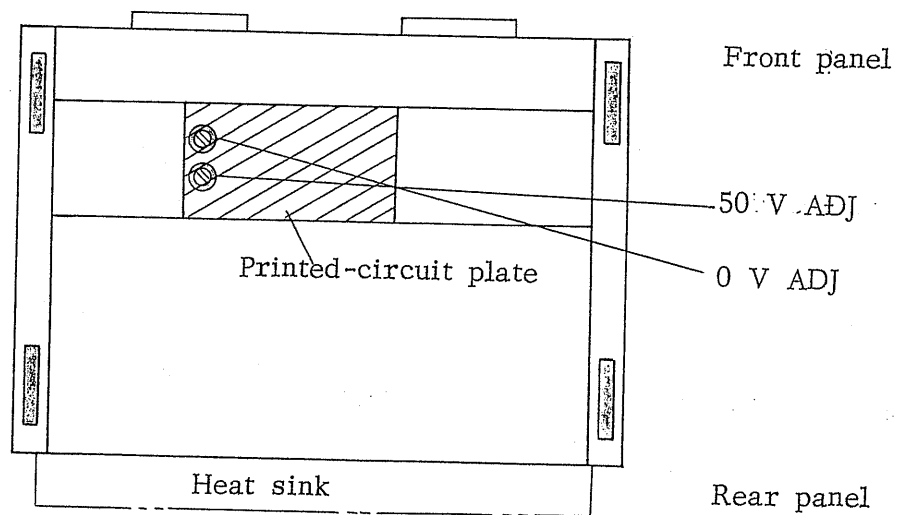
- (1) In remote programming, the output voltage control knob COARSE on the front panel becomes unusable, and the output voltage is controlled by means of the resistor externally connected. Since the value of the resistor is $10\text{ K}\Omega$ at 50 V , the index becomes $200\ \Omega/\text{V}$.
When it is desired to prevent the output voltage from increasing beyond a certain value, connect a zener diode of little leakage current as shown in Fig. 13. Then the output is not increased any further than the desired voltage.
- (2) When a distance between Model 7337A and the external resistor is long, the wire from the resistor picks up induced signals on the way and therefore the output characteristic is deteriorated.
To avoid this, be sure to use a double-conductor shielding wire, and connect its outer conductor with the GND terminal of Model 7337A.
- (3) In remote programming in the case of parallel or series operation, the output voltage is controlled by connecting the external resistor with ① - ② and short-circuiting ② - ③ of the master as in the case of single operation. As for other operations, refer to the respective pages describing the corresponding operations.

MAINTENANCE

When any component part has been replaced in case of trouble, or output voltage indication needs calibration, make 0 V and 35 V adjustments in the following procedure.

With the output voltage control COARSE knob being turned to its maximum position (state of full clockwise rotation) and also to its minimum position, adjust the semi-fixed resistors 50 V ADJ and 0 V ADJ shown in Fig. 14 so that the output voltage may become 50 V and 0 V respectively.

(In this case, set the FINE knob to the center position.) As both adjustments have effects on each other, it is necessary to repeat the above adjustments several times at the two points of 50 V and 0 V.



Bottom view

Fig. 14

Block Diagram

