

MODEL 7316 A
REGULATED DC POWER SUPPLY
OPERATION MANUAL

KIKUSUI ELECTRONICS CORP.

77.12.23 773300

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. INTRODUCTION

Model 7316A is a series type regulated DC power supply employing transistors and the voltage range of 1~ 18V is varied continuously by a double type variable resistor, resulting in utilization of maximum output current of 2A.

It is a compact and light weight power supply provided with a voltmeter and an ammeter on the panel.

The output current limiting circuit surely is operated against overload and output short circuit accident.

The limiting current can be set continuously in the range of 10% ~ 100% of the maximum rating.

At the same time, it serves also as constant current power supply.

This unit can be operated in series or parallel.

2. SPECIFICATION

AC input		100 V, AC $\pm 10\%$ 50/60Hz
	Full load	Approx. 90 VA
Ambient temperature		Max. 40°C
Dimensions		* 106(W) x 145(H) x 301(D) mm
	(Max.)	111(W) x 158(H) x 345(D) mm
Weight		Approx. 4.7 kg
Accessories supplied		Short bar 1
		Operation Manual 1
Output Terminals		Classified in color, red, white and black
		19 mm interval, equilateral triangle arrangement
Polarity		Positive or negative polarity
Floating Voltage		$\pm 100V$
Voltage		1 ~ 18V continuously variable
Current		2 A
Ripple		2mVp-p
Regulation	Line regulation	5 mV for $\pm 10\%$ fluctuation of AC INPUT voltage
	Load regulation	5 mV for load fluctuation 1 ~ 18V, ** 0 ~ 2 A.

Current limiting (automatic crossover type)	0.2 ~ 2.0 A	Continuously variable
Voltmeter	20V	Class 0.5 (JIS)
Ammeter	2.2A	Class 2.5 (JIS)

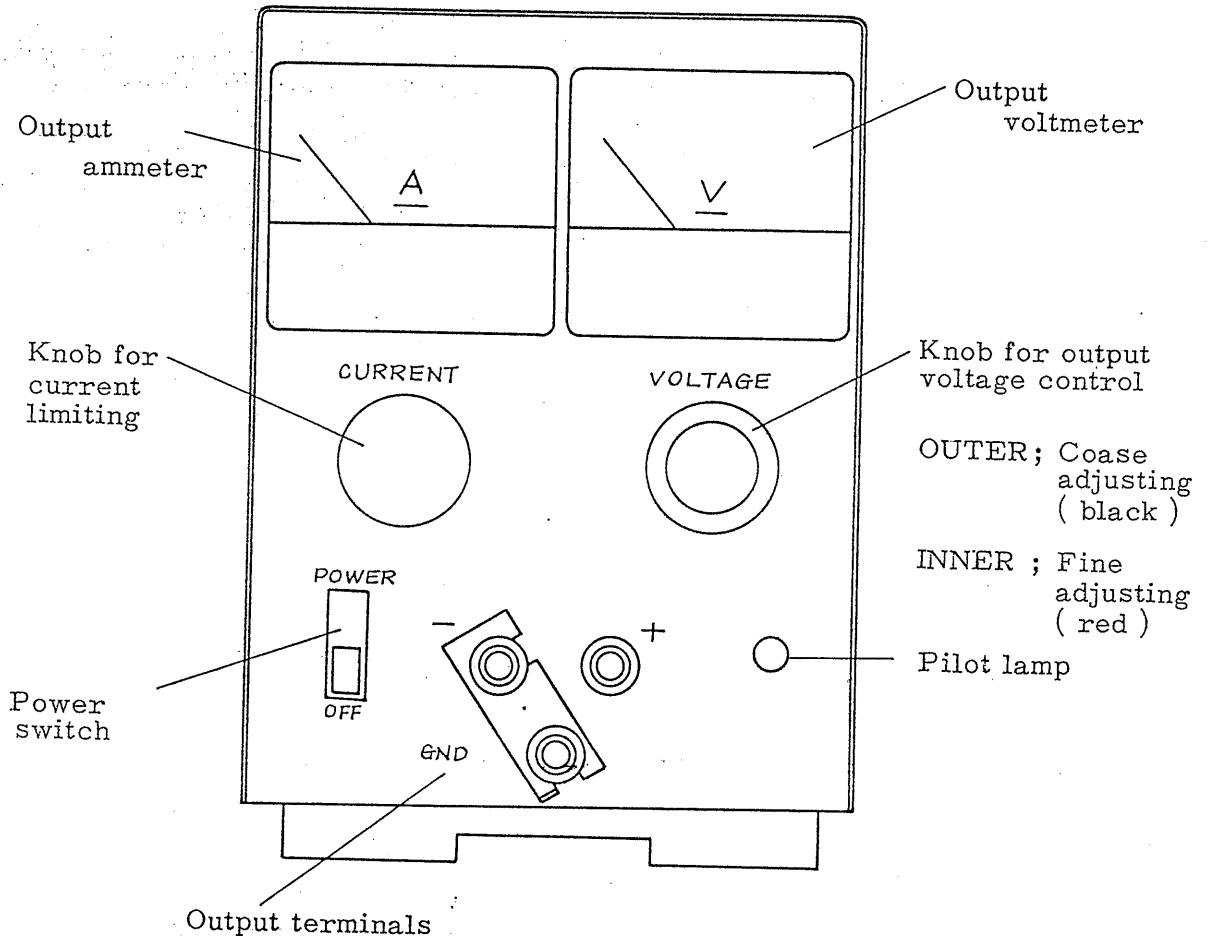
Possible to operate in series or in parallel.

* Possible to install 4 units on the 19" and 500 mm standard rack.

** The voltage drop of the ammeter is compensated in circuit.

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3. EXPLANATION FOR PANEL



Output terminals.

Usually, plus (+) or minus (-) terminal is connected to the GND terminal which is connected electrically to chassis/panel with the attached short bar and the unit is used.

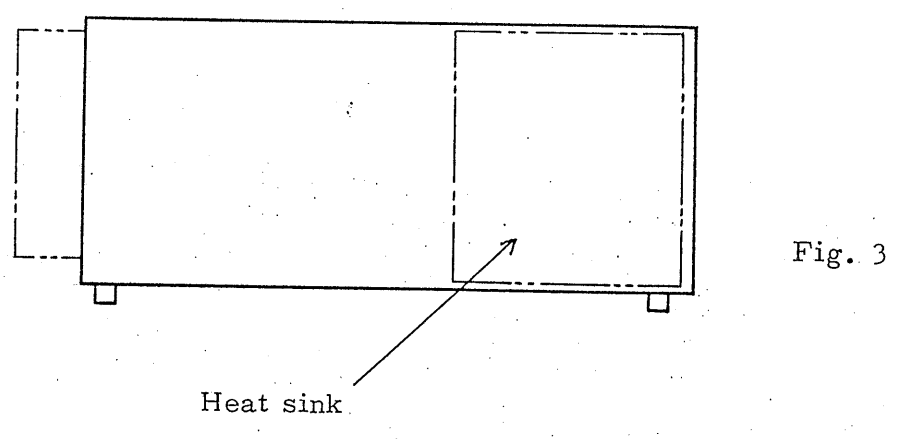
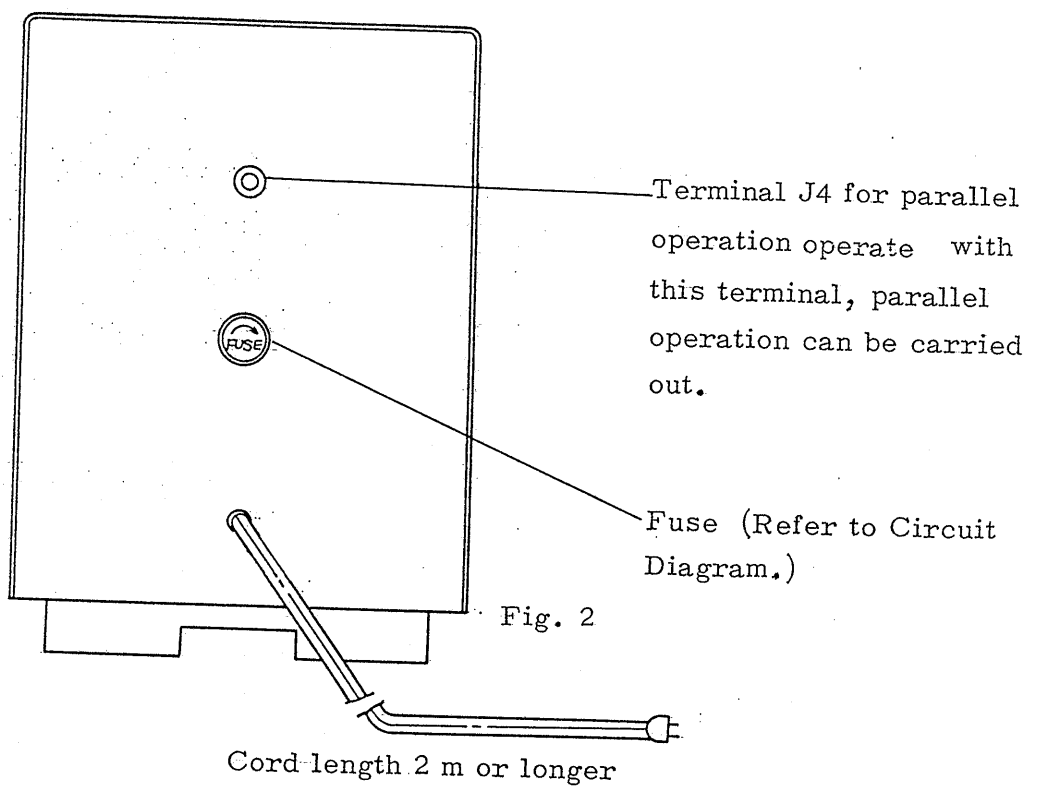
It can be operated by applying DC bias. (Refer to Item Floating Voltage.)

Knob for Current Limiting

The output current can be limited in the range of 10% - 100% of the maximum rating.

Within the said range, it can be utilized as constant current power supply.

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When used in the vicinity of low voltage and max. current, pay attention to ventilation of the heat sink.

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4. OPERATING INSTRUCTIONS

4.1 Operation

Single Operation

When this unit is used Single, use it as it is.

Series Operation

When more than 2 units are connected in series, voltage higher than that for one unit can be utilized.

In this case, any terminal should not exceed the rated floating voltage to the panel / chassis.

In series operation of two units, voltage which is two times as big as the rated voltage and the current equal to that of rated portion for one unit can be utilized.

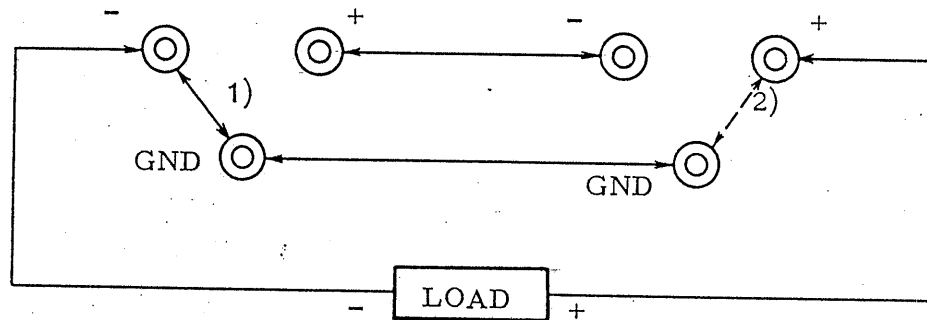


Fig.4

Wiring is provided as follows for connection of GND terminal.

- 1) In the case of minus grounding (connection shown with the bold line of Fig.4)
- 2) In the case of plus grounding (connection shown with the dotted line of Fig.4)

Avoid grounding the respective GND terminals to different polarity.

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Overload protection in series operation

When an overload phenomenon develops upon series connection of more than two units of regulated power supplies, output voltage of the other side will be applied to the unit of which protective circuit is operated earlier in the opposite direction, resulting in damaging the series element of the former.

In order to prevent such a failure is connected between output terminals of the respective regulated power supplies as shown in Fig. 5.

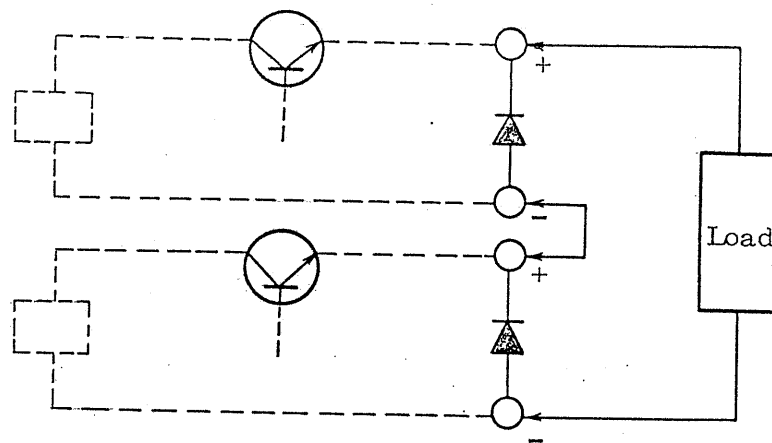


Fig. 5

Parallel Operation (Master- Slave)

For the purpose of utilization of the twice current by parallel operation of two units operate as mentioned here under.

For providing the wiring, be sure to turn off the power switch.

In the case of parallel operation, one unit (master) and the other (slave) are operated respectively.

The setting of output voltage and output current is done by the master unit.

- 1) Remove the perforated plate of the slave unit and move the slide switch

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in the printed board from "MASTER" to "SLAVE".

- 2) Connect J4 of the (SLAVE) unit to the parallel operation terminal J4 located at the back of the master unit.
- 3) Place the knob for CURRENT of (SLAVE) unit at maximum position. That is, turn it to fully clockwise. Place the knob for VOLTAGE at maximum position.
- 4) Fit the perforated plate of the (SLAVE) unit and turn on the power switch. Voltage and current can be varied freely by means of the (MASTER) unit.

Even in this case, output current limit can be selected freely in the range of 10% - 100% of the value which is two times as big as the maximum rated value.

As for the use of the short bar, minus or plus grounding must be provided both for (MASTER) unit and (SLAVE) unit.

Be sure to avoid grounding the different polarity both for (MASTER) unit and (SLAVE) unit.

(Refer to Fig.6.)

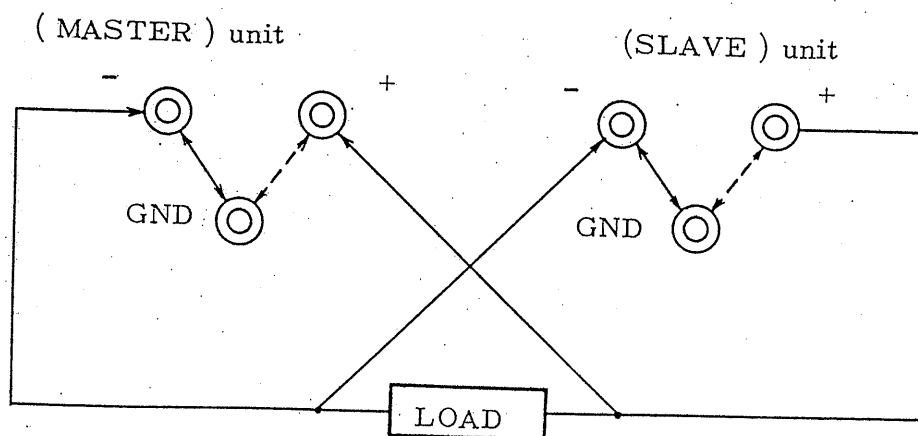


Fig. 6.

The allowable two units to be operated in parallel is two units.

In principle, parallel operation with other types can not be carried out.

Even if the power switch is turned on with the slide switch in the printed board at SLAVE, no output is produced. Pay attention to this point.

The usable range of two units in series or parallel operation is as shown in Fig. 7.

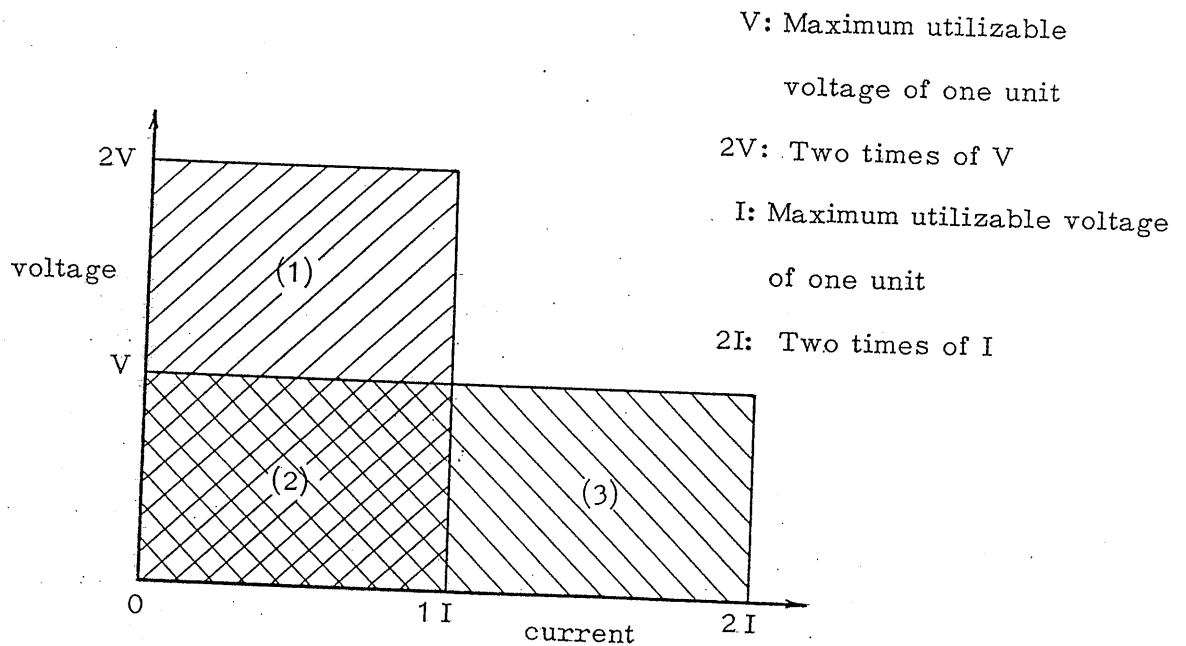


Fig. 7.

- Single operation Within the range of (2)
- Series operation Within the range of (1) + (2)
- Parallel operation Within the range of (2) + (3)
- Possible to use with the above.

Cautions for Installing Place

Be sure to avoid operating this unit where the ambient temperature

exceeds 40°C so far as practicable.

If ventilation is hindered or the unit is subjected to radiation heat or exposed to direct sunlight, limit the continuous max. output current appropriately.

The range of AC input voltage on which this unit is operated safely is 90% - 110% of the rated value.

Overshoot of output voltage

When the power switch is turned ON or OFF, no voltage higher than the set value will be produced between output terminals.

Voltage drop of ammeter

The voltage drop by output ammeter is circuitly compensated.

Current limiting circuit

In order to prevent the series control element and output ammeter from being damaged instantaneously when output terminals are shorted accidentally this unit is provided with an electronic output current limiting circuit which is positive in operation for the purpose of limiting the output current so that it does not run more than the rated value.

The output limit current can be varied continuously freely in the range of 10% - 100% of the maximum rated value.

When the output current reaches the set value, this unit will be operated as constant current power supply.

When the output current returns lower than the set value, it will be operated automatically and continuously as constant voltage power supply again. (Refer to Fig. 8)

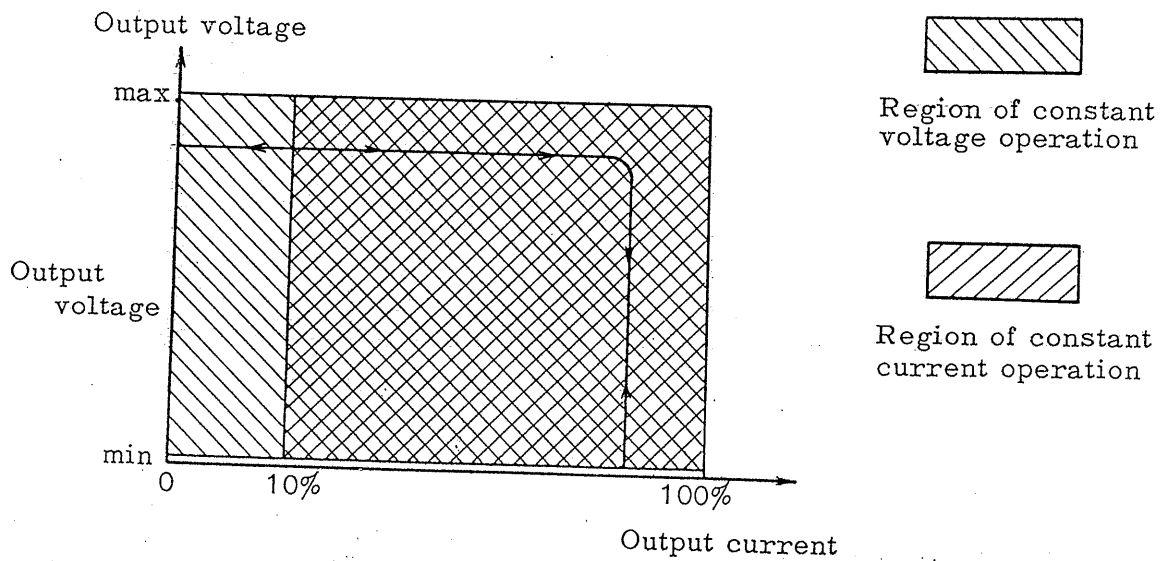


Fig.8

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5. MAINTENANCE

If parts are exchanged for new ones due to trouble or output voltage is incorrect, make the following adjustment.

0V ADJ

With the voltage adjusting knob on panel turned fully to counterclockwise, adjust the semi-fixed resistor in the printed board (one with copper foil in the printed board, semi-fixed resistor in Fig. 9 (1)). In this case, adjust the output voltage within the range of ± 0.5 V.

Max. voltage ADJ

With the voltage adjusting knob on panel turned fully to clockwise (when provided with fine adjustment knob, almost at central position) adjust the semi-fixed resistor in the printed board (semi-fixed resistor of Fig.9 (2) of the semi-fixed resistors with many parts in the printed board).

Repeat the aforementioned adjustment several times.

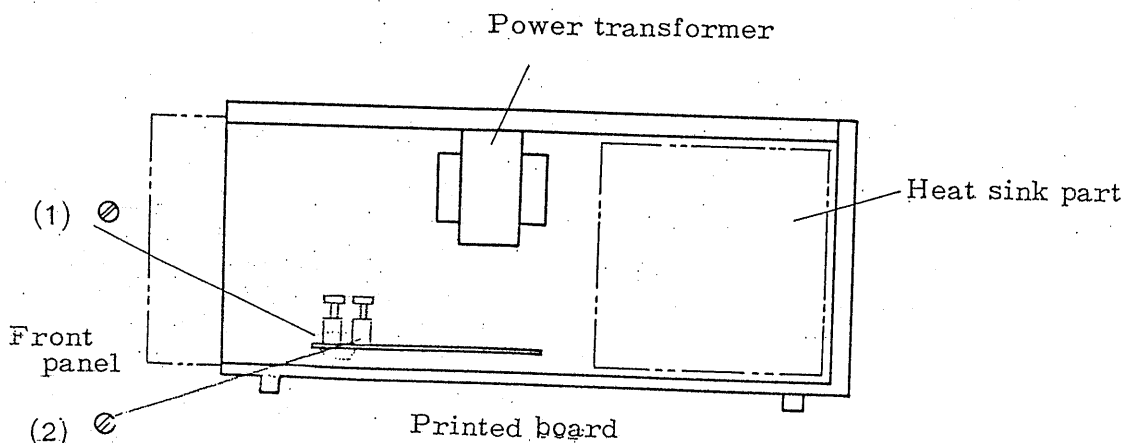


Fig.9

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