

OVP LN TYPE

OVER VOLTAGE PROTECTORS

INSTRUCTION MANUAL

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 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.

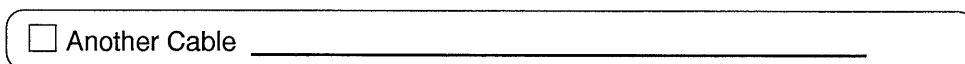
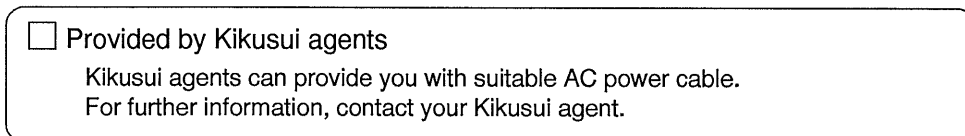
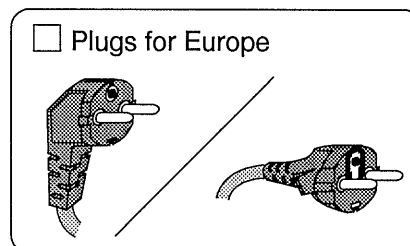
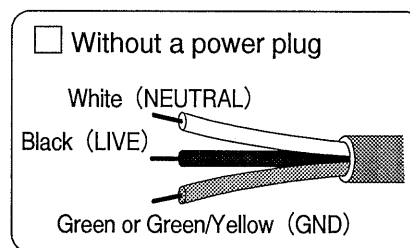


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1. GENERAL INFORMATION

1-1. General

OVP-LN is a series of over voltage protectors for the KIKUSUI PAD-L series of power supplies. They protect the load from higher voltage caused by malfunction, noise or power supply failure.

Voltage setting can be done from the front panel of the power supply.

Standard operating time is 10 msec, and can be changed to 200 msec, by changing one component.

Caution:

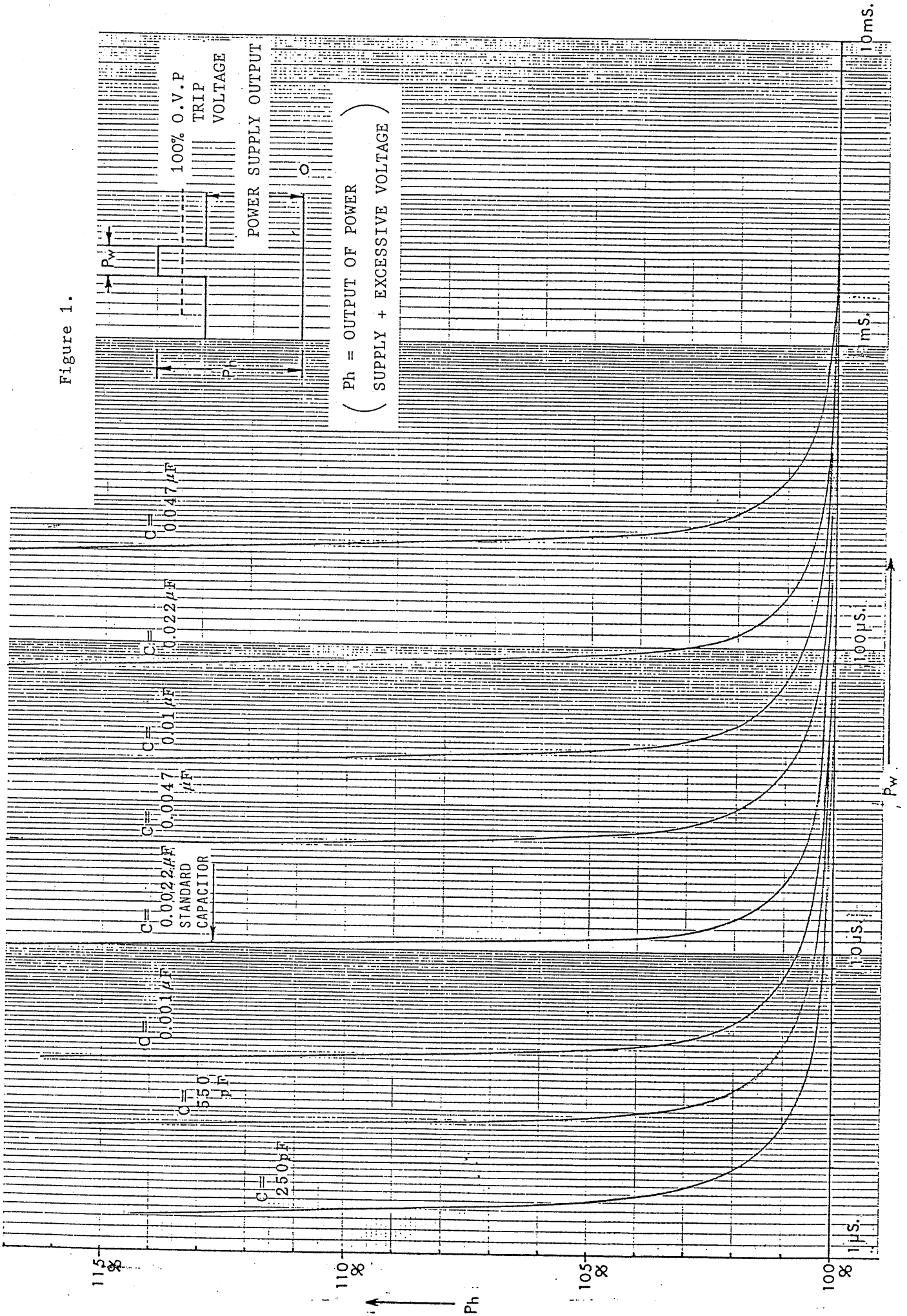
When used with a capacitor load or a battery load, please refer to section 2.3.

1-2 SPECIFICATIONS

NAME	DC - OVERVOLTAGE PROTECTOR				
VOLTAGE	16V	35V	55V	110V	250V
MODEL	OVP16-100LN	OVP35-60LN OVP35-100LN	OVP55-35LN OVP55-60LN	OVP110-20LN OVP110-30LN	
VOLTAGE RANGE	4-18V	4-38V	6-61V	11-120V	25-280V
TEMP. COEFFICIENT OF VOLTAGE SETTING	50 pp M/C° (Typical)				
OPERATION TIME	10 msec. (standard refer fig.- 1)				
OPERATION	SCR shorts the output of PAD-L and turns off the power switch.				
AMBIENT TEMPERATURE RANGE	0 - 40°C				
ISOLATION RESISTANCE	Chassis - output terminals DC 500V, more than 20MΩ				
INPUT VOLTAGE	AC 12.6V ±10 00 50/60Hz				
POWER CONSUMPTION	Approx. 0.4VA				

NOTE: Operation time varies with the pulse width of the excessive voltage (refer fig.- 1).

Figure 1.



2. OPERATION

2-1 VOLTAGE SETTING

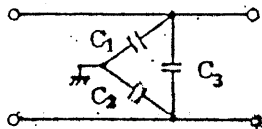
- (1) Turn the coarse and fine adjustment for OVP to the extreme clockwise position before turning on the power switch.
- (2) Turn on the power switch and set the output voltage of power supply to the desired OVP level.
- (3) Turn the coarse adjustment slowly counter clockwise until the OVP trips.
- (4) Turn the coarse adjustment slightly clockwise, then turn on the power switch. Slowly turn the fine adjustment counter clockwise, and stop when the OVP trips.
- (5) Turn the voltage adjustment knob counter clockwise and turn the power switch on.

NOTE: Fine adjustment range

OVP 16 - XX	Approximately	0.8V
OVP 35 - XX	"	1.4V
OVP 55 - XX	"	2.2V
OVP 100 - XX	"	4.2V
OVP 250 - XX	"	13V

Use with a capacitor or battery load, may cause SCR failure. Please refer to section 2.3.

The following noise filter is recommended to reduce malfunction of the OVP due to AC-line noise. (refer to fig. 2-2)



C1, C2: 4700 PF 3KV
ceramic capacitor.
C3: 0.1 μ F 600WV
polyester film
capacitor.

2-2 MALFUNCTION

Occasionally the OVP trips when there is nothing wrong with either the power supply or OVP itself. In this case noise may be causing the problem. This is especially true when the OVP trip voltage is set very close to the output voltage.

Usually the noise comes from:

1. The AC - line
2. The load itself.
3. Outside wiring of the power supply to the load.

Wherever possible the problem noise should be eliminated. Additionally, our trip voltage should not be set too close to the output voltage.

(1) A.C. LINE NOISE

Most cases of OVP - malfunctionings are caused by line noises.

It is strongly recommended to insert a line filter in the AC line.

Line filters, which are shown below, are effective for reducing normal - mode and common mode noises.

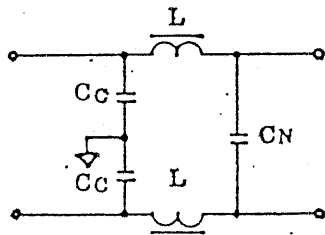


Fig. A. Provides superior filtering for noises. However, "L" may become big and expensive for high current applications

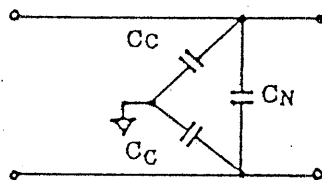
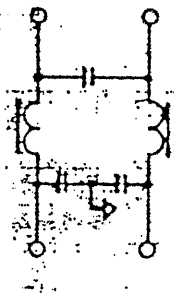


Fig. B. Also provides enough filtering for noises.

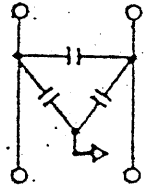
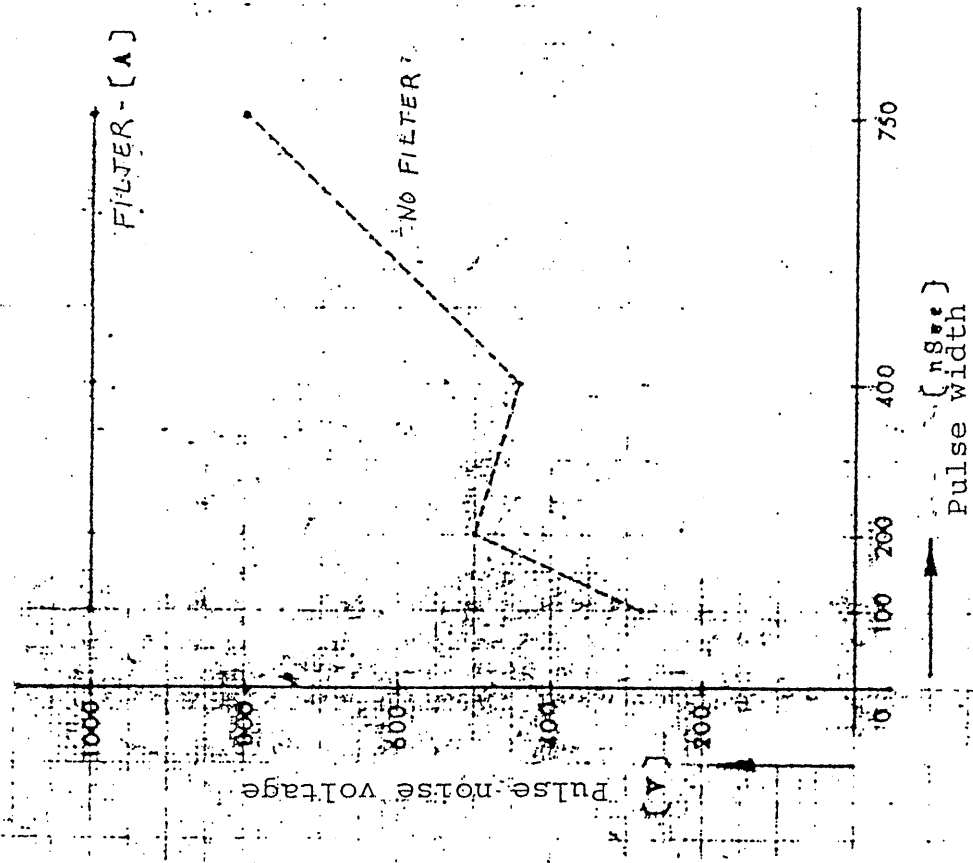
Example Cc: 0.0047MF 3KV ceramic
 Cn: 0.1MF 600V polyester film
 L: 50 - 100MH

Both Fig.A and Fig.B allow for a leak current through Cc capacitor to ground. This leak current should be considered when many power supplies are used.

Power Supply PAD110-10L
 Power Supply output 10V
 OVP setting 11V

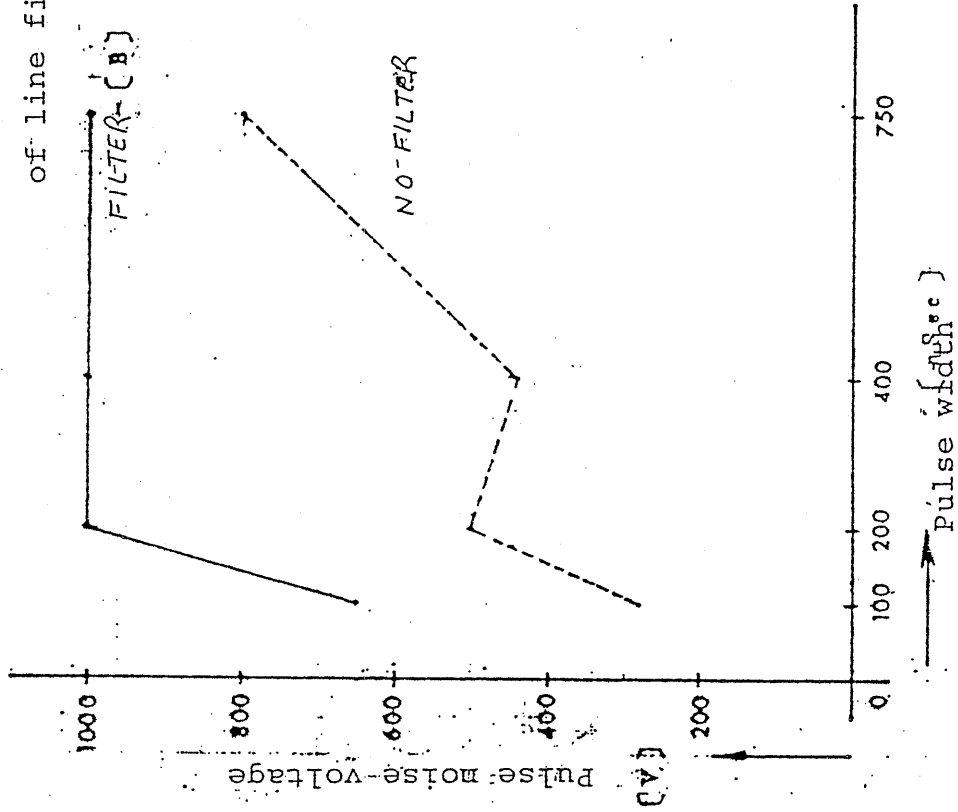


FILTER [A]



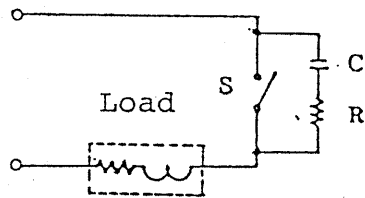
FILTER [B]

Effectiveness
 of line filter



(2) NOISE FROM THE LOAD.

Counter electromotive force should be reduced when the inductive load is switched on or off.



Ex. C:0.1mF, R:47Ω

Fig. 2-2

- High noise voltage will be produced when "SW" is turned on or off. C & R should be used as a noise suppressor.

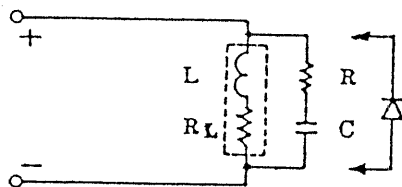


Fig. 2-3

- Absorb the transient voltage by C & R.

$$R = R_L$$

$$C = L/R_L^2$$

Or diode may be used as a commutator.

(3) NOISE ON THE CABLES FROM POWER SUPPLY TO THE LOAD.

- Keep the output cables to the load away from magnetic field and the AC - Cable.

(see fig. 2-4)

- The cables should be wired together.

(see fig. 2-5)

- When remote sensing is used, sensing cables should be twisted and shielded.

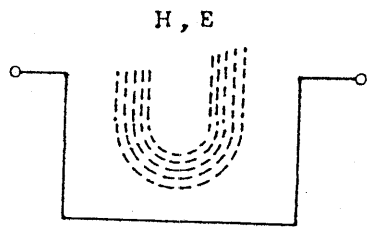


Fig. 2-4

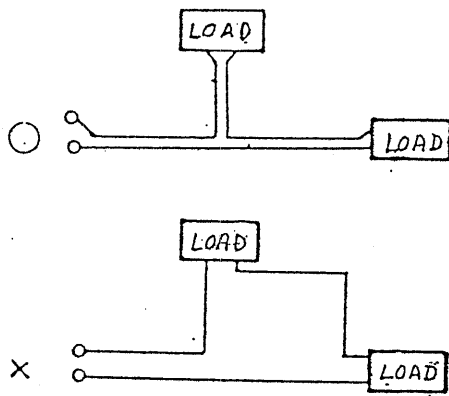


Fig. 2-5

2-3. Wiring information.

Fig. 2-6. Shows wirings.

If the load is a capacitor or a battery, change the wiring as described by the broken line below.

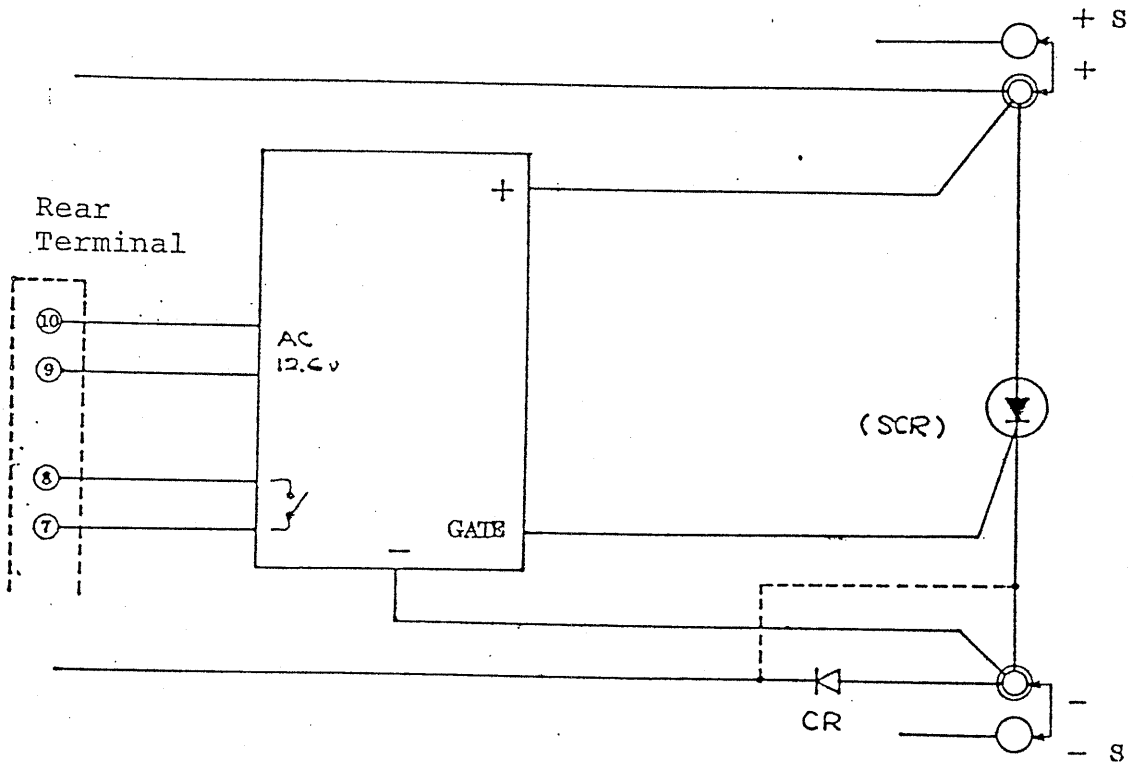


Fig. 2-6

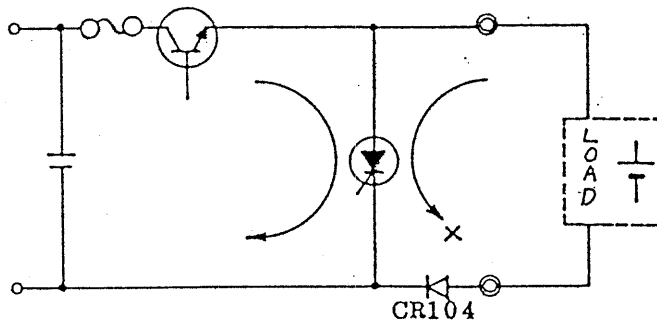
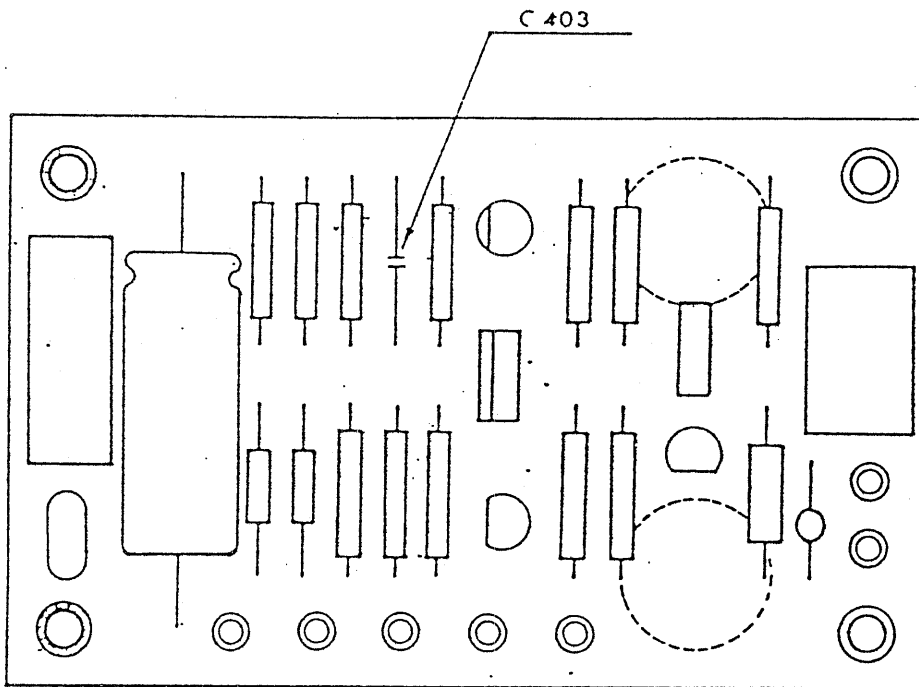


Fig. 2-7

2-4. Operating time

C 403 on P.C.B. A 064 may be changed if slower OVP reaction time is necessary.



(Fig. 2-8)

Reaction time	C403	
5 msec	0.001 MF	50WV
10 msec	0.0022 MF	50WV
40 msec	0.01 MF	50WV
90 msec	0.022 MF	50WV
200 msec	0.047 MF	50WV