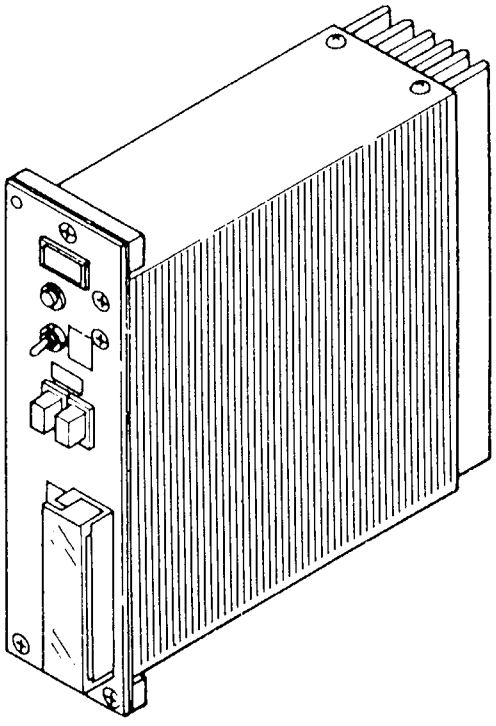
Instruction Manual

POWER SUPPLY UNIT

TYPE: PXJ3



Fuji Electric Systems Co., Ltd.

INP-TN3PXJ3-E

C O N T E N T S

1. GENERAL DESCRIPTION

The power supply unit (Type: PXJ3) is a constant-voltage power unit which supplies 24V DC to the FUJI FC Series systems designed for operation with DC power.
The power supply operates with input power of 100V AC and is capable of emitting, in case of power failure, power alarm signal which is usable for taking countermeasures for Compact Controllers and other system components.
In order to insure improved safety, the power supply comprises protective circuits against overvoltage and overcurrent as well as alarm functions.
The power supply PXJ3 has a construction as shown in Fig. 1-1.

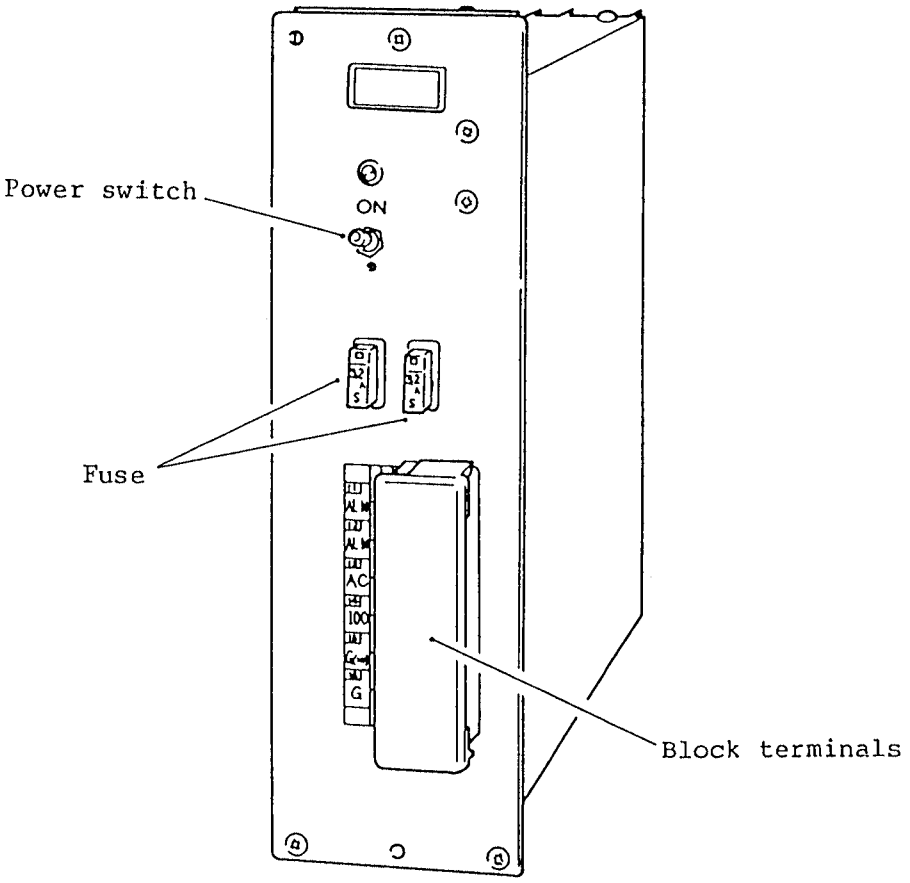


Fig. 1-1 Construction of PXJ3

2. SPECIFICATIONS AND CODE SYMBOLS

2.1 Specifications

- Input voltage: 100V (or 115V) AC ± 10% 45 to 65Hz, Single phase
- Output voltage: 25.8V DC $^{+0.5}_{-1.0}$%
- Output capacity: 3A
- Protective functions: Protection against short-circuit (inverted L-shaped drooping, automatic reset)
  Protection against overvoltage Crova (manual reset)
- Ambient temperature: 0 to 45℃ for operation
  -20 to 80℃ for storage
- Ambient humidity: Less than 90% RH
- Radiation: Natural air cooling
- Efficiency: 80% typ.
- Input current: 1.9A r.m.s., typ.
- Rush current: Less than half cycle of 30A peak
- Power failure detection: Power failure is detected about 30 msec after occurrence and power alarm signal (open collector ON) is emitted for 10 msec. (Refer to Appendix Fig. 2)
- Hold time: Output voltage is held for 40 msec after occurrence of power failure (output of at least 20V DC at input of 90V AC) and then not provided after 100 msec. (Refer to Appendix Fig. 2)
- Ripple and noise: Ripple less than $100mV_{p-p}$
  Noise less than $300mV_{p-p}$
- Mounting: Rack mount
- Mass: Approx. 3.3kg
- Alarm capacity: 100V AC, 0.25A/24V DC, 1A
- Fuse rating: 3.2A (type SMP32)

2.2 Code Symbols

The code symbols of the System Power Supply Unit represent important specification items expressed by symbols.
Each digit of the code symbols has its own meaning as shown below.

1	2	3	4	5	6	7	8	Digit	Description
P	X	J			0		3		
			3						Capacity 3A
				0					Power alarm function None
				1					Equipped
						3			Line power 100V AC
						9			115V AC

3. INSTALLATION

3.1 Unpacking

Unpack the shipping crate while taking care to avoid abnormal shocks to the internal circuits.

3.2 Site Requirements

Service life of the power supply unit is dependent largely on conditions at installation site. Select a location which is free from interfering factors mentioned below:

a) Servere external shock vibration
b) Dusty air and corrosive gas
c) Ambient temperature exceeding 0 to 45℃ or wide temperature variation.
d) Humidity exceeding 90% RH or water splash
e) Electrical inductive interference such as high current or spark
f) Stagnant atmosphere

Note: Obstacle located near the radiating board (attached to the rear of the power supply)

3.3 Installation Layout

Install the power supply referring to the installation dimensional diagram shown below.

Mounting frame dimensions

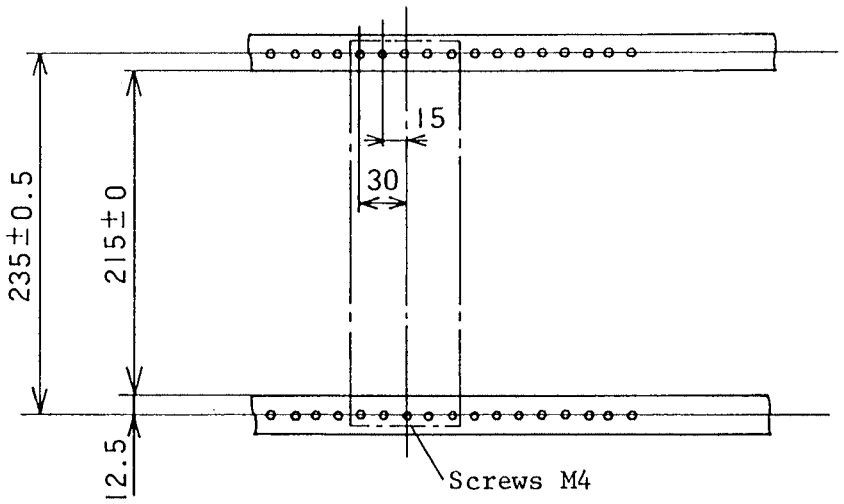


Fig. 3-1 Installation dimensional diagram

3.4 Wiring

a) For wiring, use 600V vinyl cord (JIS C3307) or controlling vinyl cable CVV (JIS C3401) or higher class in combination with solderless terminals. Cables as thick as possible (5.5mm² max.) should be employed for connecting the [VP] and [PC] terminals. Note that a cable of 2mm² causes voltage drop of 0.5V (at 3A) per 10m of length.

b) The [G] , [G(NF)] and [E] terminals are provided as ground terminals for the casing, noise filter and output SC (signal common) respectively. Be sure to connect these terminals to a grounding construction of at least class 3.

c) When cables may be subjected to inductive interference, use shielded cables and connect the shields to the [G] terminal. Especially take care to protect the [PD] terminal from inductive interference.

3.5 Terminal Connection

Terminal symbols and connections are illustrated in Appendix Fig. 2, which should be referred to in connecting the terminals.

a) Connect a line power outlet of 100V AC, 50/60Hz to the power terminals [AC] [100] .

b) Connect the [G(NF)] , [E] and [G] terminals to a grounding means. (A shorting plate is arranged between the G(NF) and G terminals.)
Disconnect the G(NF) terminal from the earth point when checking with a megger.

c) The [ALM] terminal is provided as an alarm terminal which provides output in case where line power voltage is too high or too low.

d) The [VP] terminal provides output of 24V DC.

e) The [PC] and [SC] terminals are provided as 0V power common and 0V signal common terminals respectively. These four terminals are internally.

f) Connection modes of PXJ3 are exemplified in Fig. 3-2.

3.6 Operation

a) After the power supply has been wired correctly, turn on the power switch to place it in operating condition. Make sure that the operation indicator lamp stays lit on the front panel.

b) Coordination of load current with load to be connected
This unit supplies a maximum of 3A to the load. It should be noted that the current flowing into the load at power-ON may exceed the steady state current. When the power is set ON, be sure to check that the total load current does not exceed 3A. Before operating the unit, turn ON and OFF the power of the unit, with full load connected, to ensure that normal output is obtained.

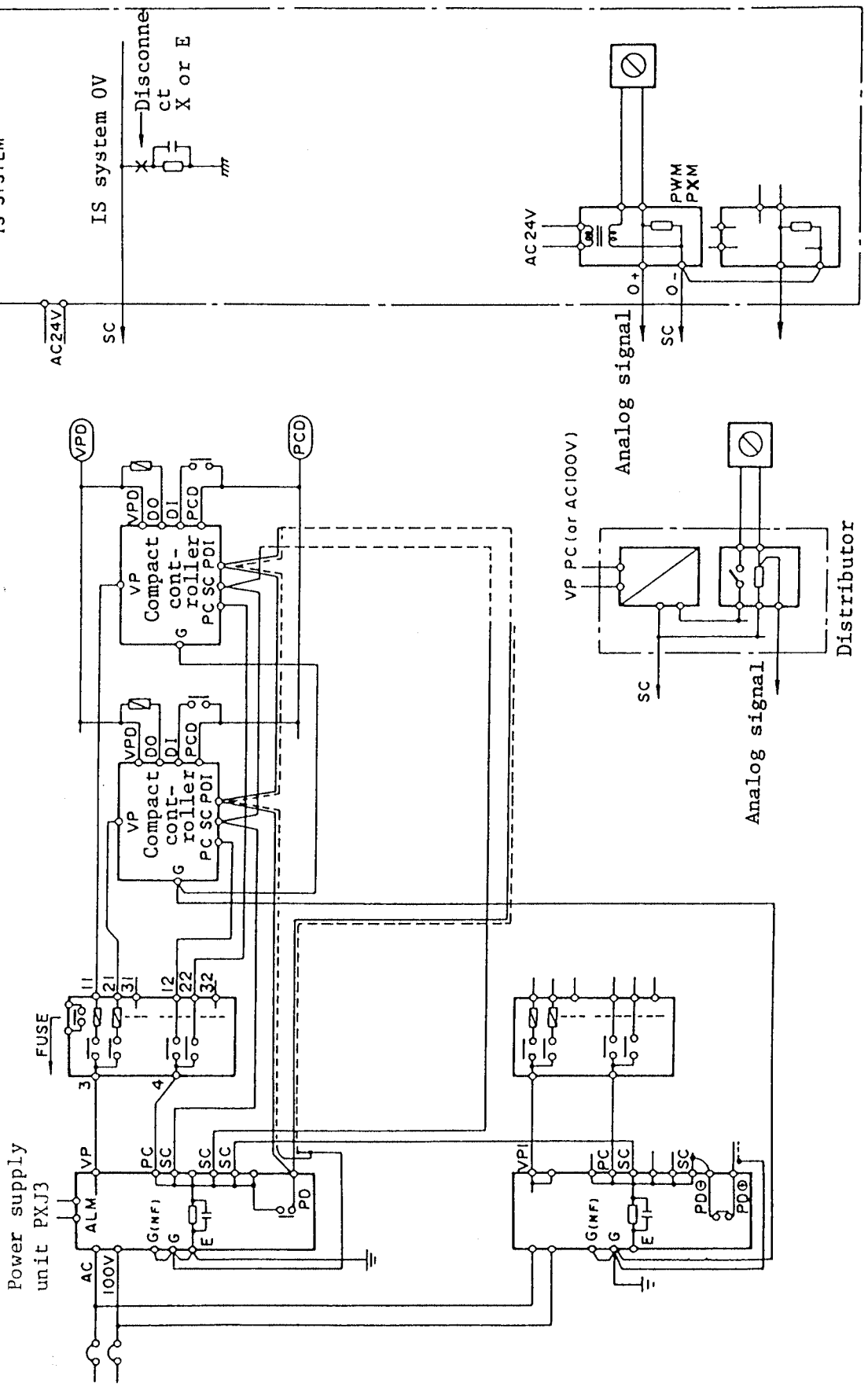


Fig. 3-2 System connection diagram

4. OPERATING PRINCIPLE

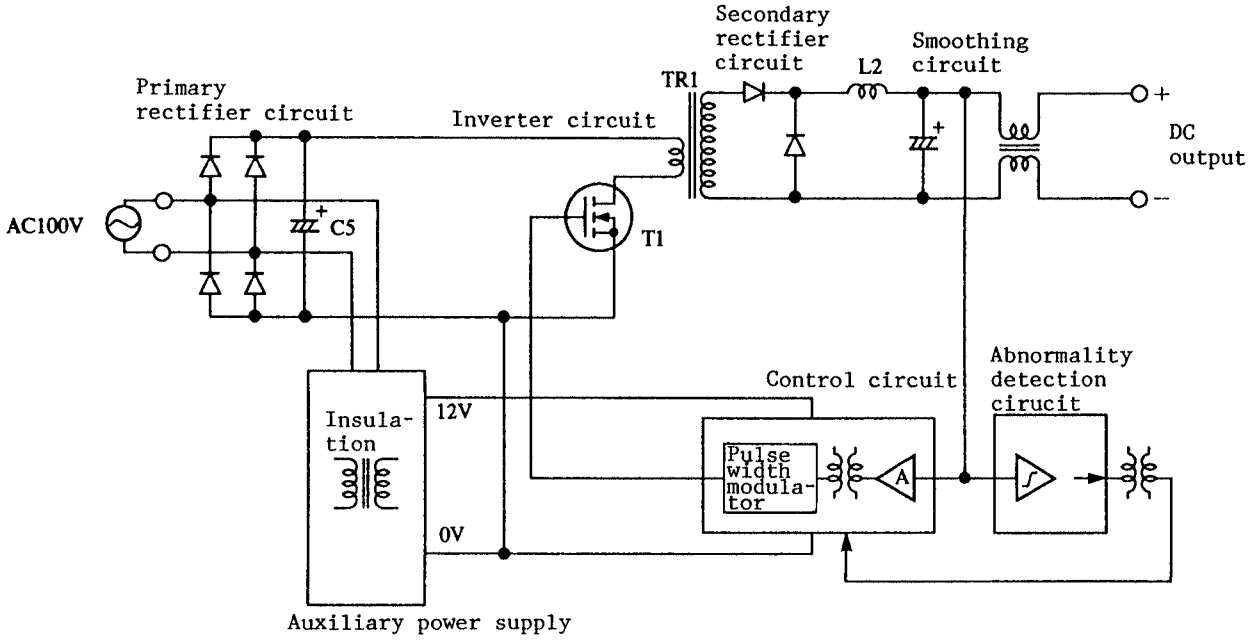


Fig. 4-1 Operating principle diagram

The power supply consists of a line-operation type of switching regulator. When input power of 100V AC is applied, energy is accumulated in capacitor C_5 through the primary rectifier circuit. It is converted into rectangular waves by the inverter circuit, subjected to voltage drop by transformer T_{R1}, rectified and smoothed to prepare DC output.
In order to maintain the output voltage at a constant level, it is sensed and amplified by an error amplifier (A), whose output is subjected to pulse width modulation and used for controlling ON time of T_1 in the inverter circuit. This operation makes it possible to provide constant output voltage regardless of variations in input voltage or load.
The abnormality detection circuit serves for controlling the control circuit and backup power supply, and emitting alarm signal in abnormal condition (overvoltage, undervoltag or overcurrent).

5. MAINTENANCE AND CHECKS

The power supply PXJ3 requires no particular routine maintenance. When certain abnormality is found out, however, check and take corrective measure as instructed below.

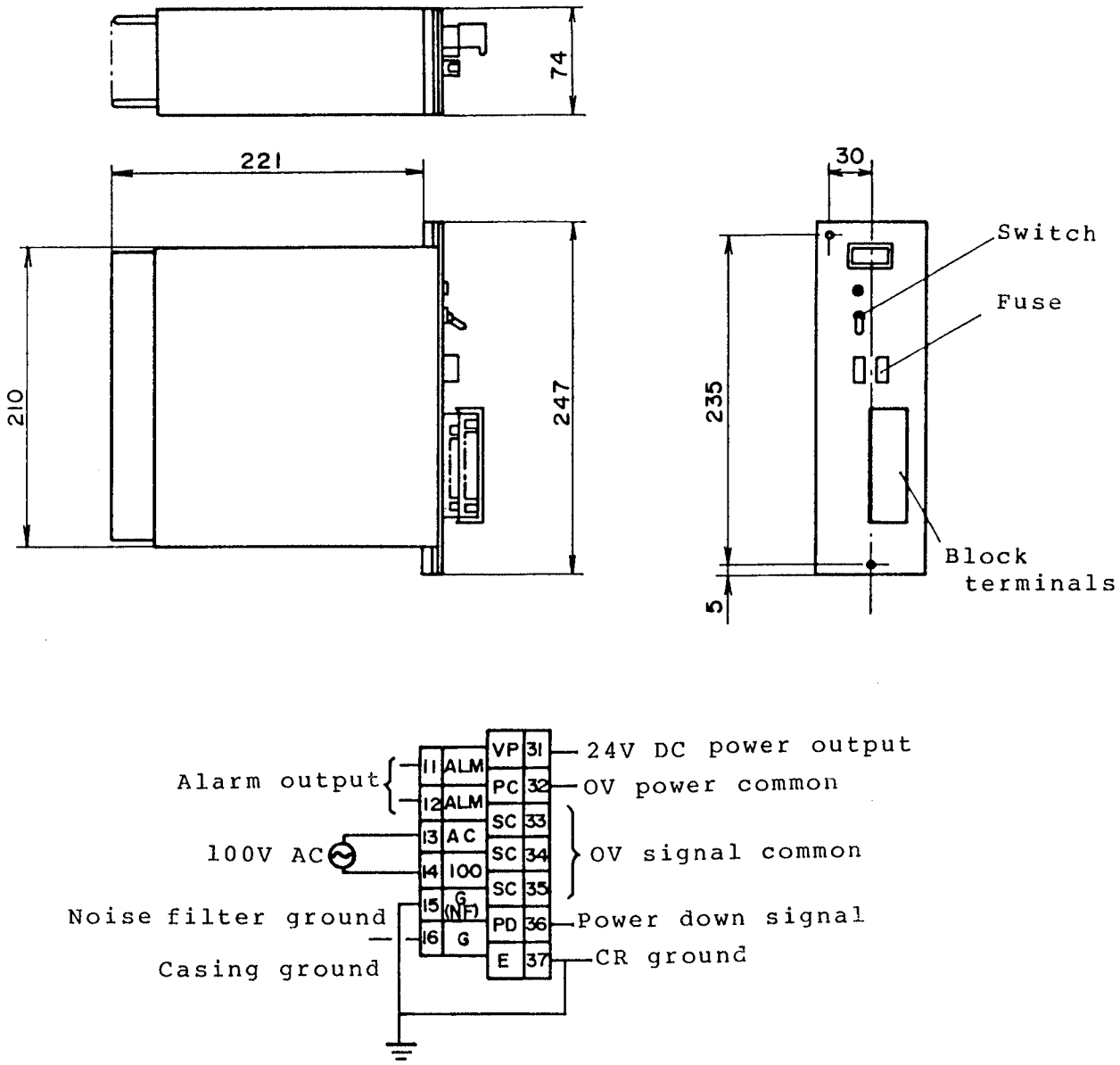
(1) Alarm signal
The ALM terminal provides an alarm signal in the following cases:
a) When output voltage becomes 0V
b) When output voltage becomes too high (30V DC)
... No output is provided.

(2) Fuse
The power supply comprises a fuse in the primary circuit for protecting the internal circuits.
When it is blown, replace it with a new one (SMP32 rated at 3.2A manufactured by Daito Tsushinki, Ltd.).

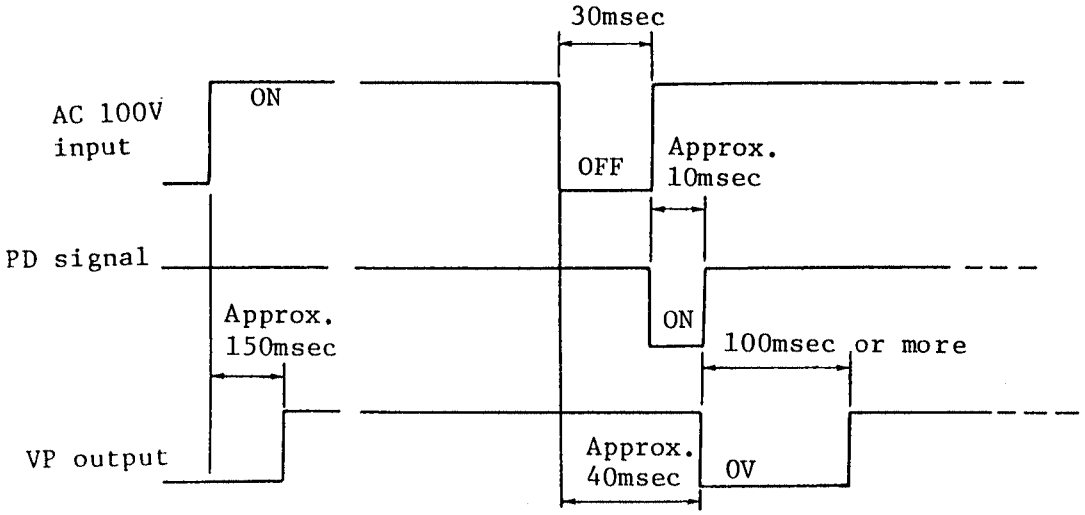
(3) Rush current
PXJ3 is of the switching type which flows rush current upon turning on the power switch. It is therefore required to match it with fuseless circuit breaker or regulator when it is connected to the line.

(4) Others
When checking the AC line with a megger, remove the shorting plate between G(NF) and G. The G(NF) is an earth terminal to ground the noise filter and surge absorber Z-Trap.

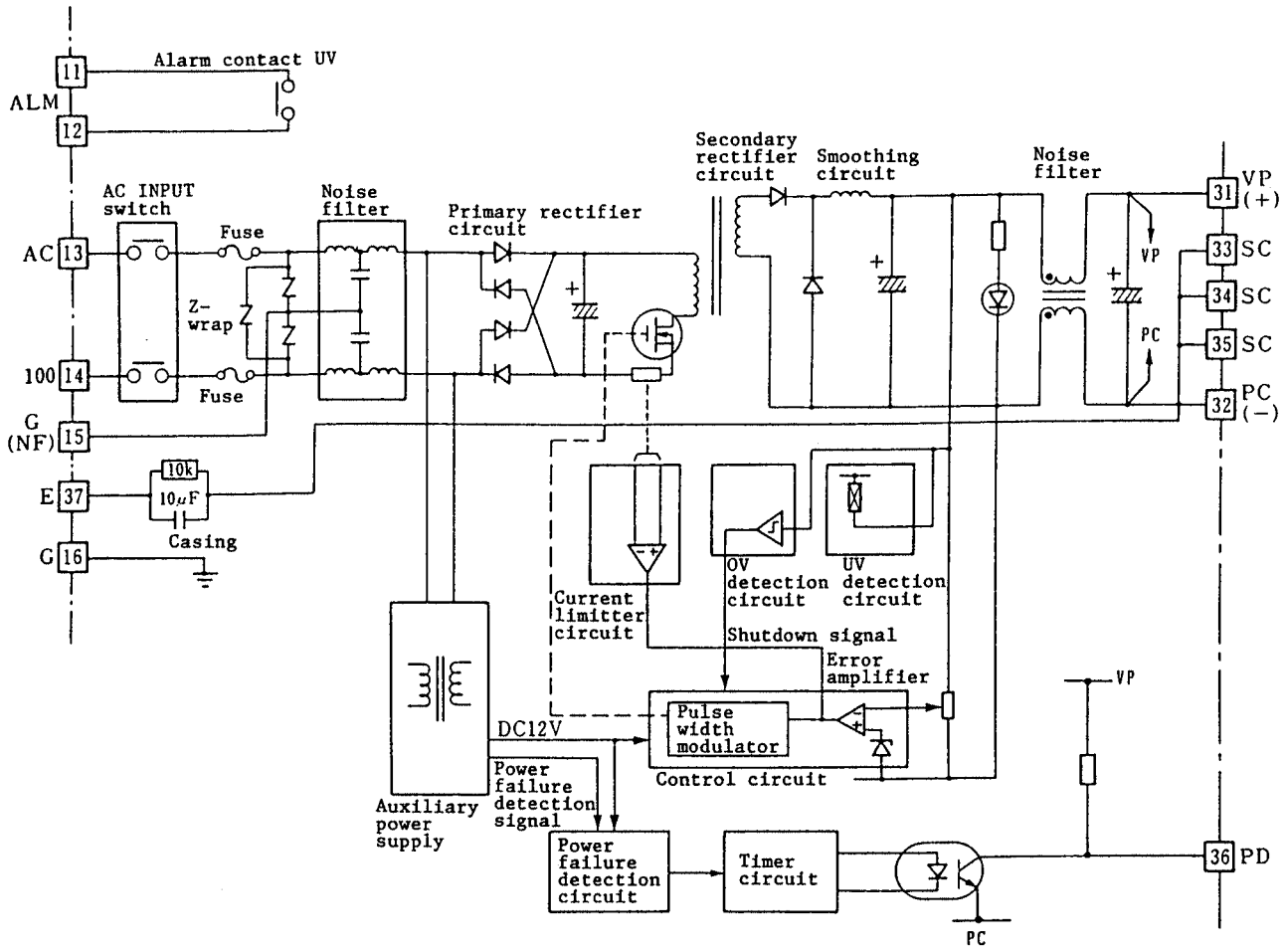
6. APPENDIX DRAWINGS



Appendix Fig. 1 Outline and external connection diagram



Appendix Fig. 2 Power ON/OFF time chart



Appendix Fig. 3 Overall block diagram (PXJ3)

Fuji Electric Systems Co., Ltd.

Head Office
Gate City Ohsaki, East Tower, 11-2, Osaki 1-chome,
Shinagawa-ku, Tokyo 141-0032, Japan
http://www.fesys.co.jp/eng

Instrumentation Div.
International Sales Dept.
No.1, Fuji-machi, Hino-city, Tokyo 191-8502, Japan
Phone: 81-42-585-6201, 6202 Fax: 81-42-585-6187
http://www.fic-net.jp/eng