HITACHI INVERTER

J300 SERIES

SERVICE MANUAL
(ADJUSTMENT AND MAINTENANCE)

Model: J300-055LFU to J300-550LFU
J300-055LF to J300-550LF
J300-055HFE to J300-550HFE
J300-055HFU to J300-550HFU
J300-055HF to J300-550HF

After reading this manual, keep it at hand for future reference.

NBS481BX

Hitachi, Ltd.
Tokyo Japan

TABLE OF CONTENTS

1. PRE-OPERATION CHECK

Before starting adjustment and maintenance, be sure to check the following specifications of the inverter and motor.

1.1 Check of the Inverter Model Name and Manufacturing No.

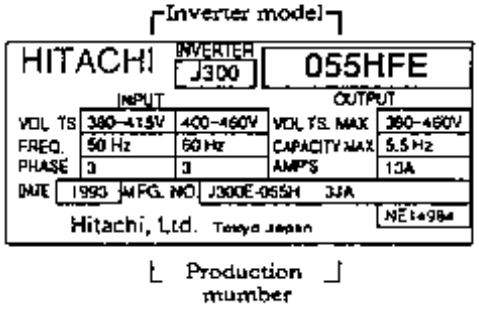
Inverter model J300 [ ]

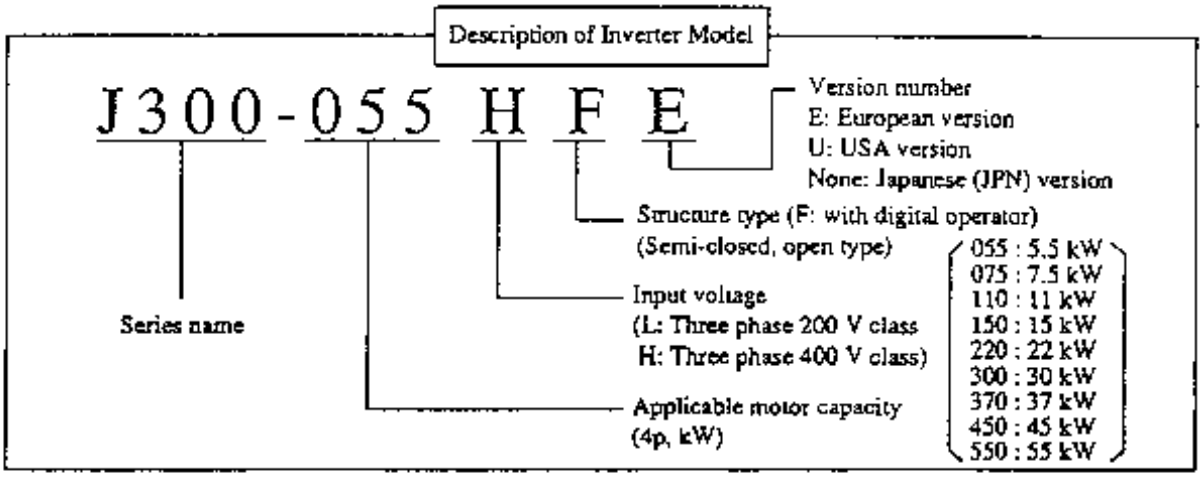
MFG. NO. [ ]

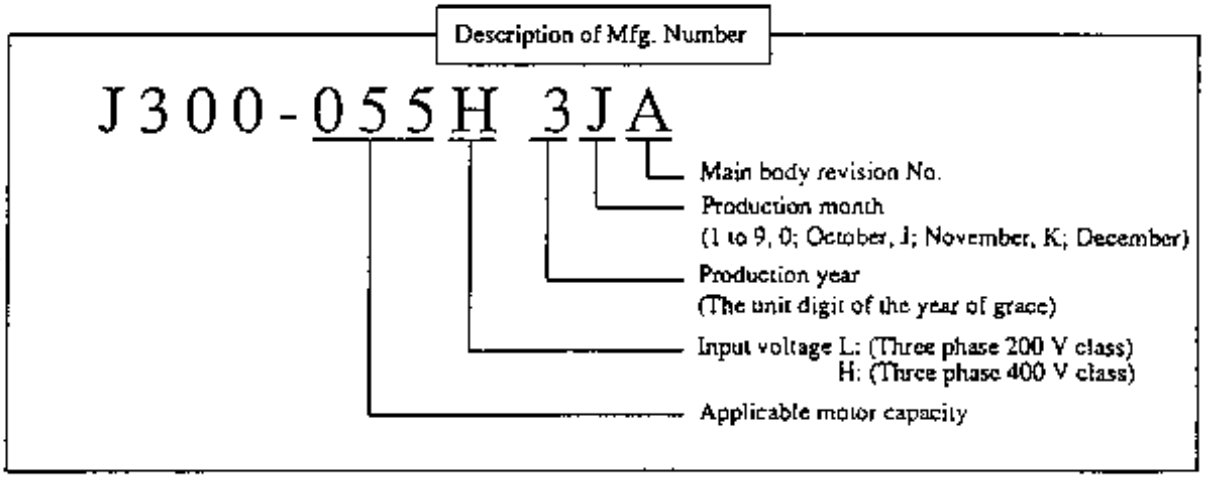
} This information is written on the name plate on the side cover of the inverter

Example of contents of specification label

- The example is for the J300-055HFE







1.2 Check of Inverter and Motor Specifications

(1) Inverter specifications

Monitor mode and function mode

Display order	Function name	Type	Screen display	Initial value			Remarks
			Code display	Europe	USA	JPN	
1	Output frequency monitor	Monitor	d 0	–	–	–	
2	Motor revolution speed monitor	Monitor	d 1	–	–	–	
3	Output current monitor	Monitor	d 2	–	–	–	
4	Trip Monitor	Monitor	d10	–	–	–	
5	Trip history monitor	Monitor	d11	–	–	–	
6	Output frequency setting	Set value	F 2	0.00	0.00	0.00	
7	Running direction setting	Set value	F 4	F	F	F	
8	V/f pattern setting	Set value	F 5	00	02	02	
9	Acceleration time setting 1	Set value	F 6	30.0	30.0	30.0	
10	Deceleration time setting 1	Set value	F 7	30.0	30.0	30.0	
11	Manual torque boost setting	Set value	F 8	31 NOTE	31 NOTE	31 NOTE	
12	Runn command, frequency command setting	Set value	F 9	03	03	00	
13	Analog meter adjustment	Set value	F10	72	72	72	
14	Motor receiving voltage	Set value	F11	380	230/460	200/400	
15	Extension function setting	Set value	F14	A 0	A 0	A 0	

NOTE: The initial value over 300LF and HF is 11.

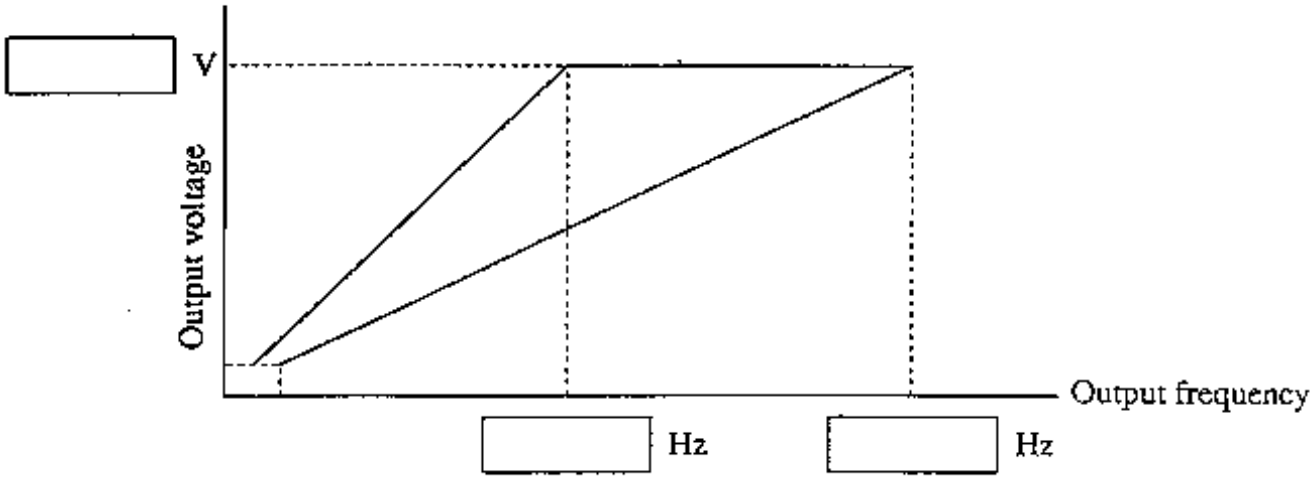
Extention function mode

Display order	Extension function name	Screen display				Remarks
		Code display	Initial value			
			Europe	USA	IPN	
1	Control method setting	A 0	0	0	0	
2	Motor capacity setting	A 1				NOTE 1
3	Motor poles setting	A 2	4	4	4	
4	Speed control response constant setting	A 3	1.00	1.00	1.00	
5	Start frequency adjustment	A 4	0.50	0.50	0.50	
6	Maximum frequency limiter setting	A 5	0	0	0	
7	Minimum frequency limiter setting	A 6	0	0	0	
8	Jump frequency setting 1	A 7	0	0	0	
9	Jump frequency setting 2	A 8	0	0	0	
10	Jump frequency setting 3	A 9	0	0	0	
11	Carrier frequency setting	A10	16.0	16.0	16.0	NOTE 2
12	Multispeed first speed setting	A12	0	0	0	
13	Multispeed second speed setting	A13	0	0	0	
14	Multispeed third speed setting	A14	0	0	0	
15	Electronic thermal level adjustment	A23	100	100	100	
16	Electronic thermal characteristic selection	A24	0	1	1	
17	External frequency setting start	A26	0	0	0	
18	External frequency setting end	A27	0	0	0	
19	Instantaneous restart selection	A34	0	0	0	
20	Dynamic braking usage ratio	A38	1.5	1.5	1.5	
21	Optional arrival frequency for acceleration	A39	0	0	0	
22	Optional arrival frquency for deceleration	A40	0	0	0	
23	Monitor signal selection	A44	0	0	0	
24	Analog input selection	A48	1	1	1	
25	Frequency arrival signal output method	A49	0	0	0	
26	Autotuning setting	A54	00	00	00	
27	Running mode selection	A59	0	0	0	
28	Jogging freguency setting	A61	1.00	1.00	1.00	
29	Base frequency setting	A62	50	60	60	
30	Maximum frequency setting	A63	50	60	60	
31	Preset data program	A65	0	0	0	
32	Input terminal setting 1	C 0	18	18	18	
33	Input terminal setting 2	C 1	16	16	16	
34	Input terminal setting 3	C 2	5	5	5	
35	Input terminal setting 4	C 3	11	11	11	
36	Input terminal setting 5	C 4	9	9	9	
37	Input terminal setting 6	C 5	2	13	2	
38	Input terminal setting 7	C 6	1	1	1	
39	Input terminal setting 8	C 7	0	0	0	
40	Output terminal setting 11	C10	0	0	0	
41	Output terminal setting 12	C11	1	1	1	
42	Input terminal a and b contact setting	C20	08	00	00	
43	Output terminal a and b contact setting	C21	04	04	04	

NOTE 1: The most applicable motor capacity of the inverter is set.

NOTE 2: Carrier frequency initial value
055 to 150LF, HF: 16 kHz, 220LF, HF: 12 kHz, 300 to 370LF, HF: 10 kHz
450 to 550LF, HF: 6 kHz

(2) Motor specifications



Motor MFG. number				
Motor output		kW	Rated current	A
Number of motor poles		P	Rated voltage	V
Motor rated rpm		min^{-1}	Rated frequency	Hz
			Starting current	A

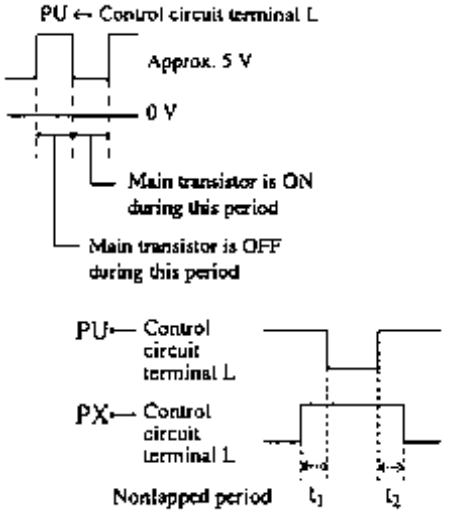
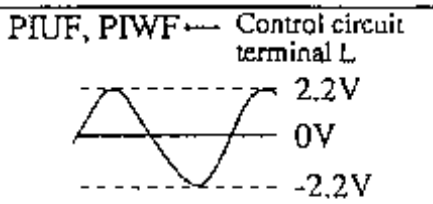
(3) Mating equipment specifications

Equipment name					
Torque characteristics			Acceleration time	Sec	
Required torque		N•m (kgf•m)	Deceleration time	Sec	
Load inertia-J		$kg•m^2$	Variable speed range	Hz	Hz

2. FUNCTION OF CHECK TERMINALS

Table 2-1 below shows the functions of the check round on the printed-circuit board.
Refer to Sub-section 4.1 for the check round location and address.
Addresses are described on the control circuit vertically (figures) and horizontally (alphabets).

Table 2-1 Functions of Check Terminals

Terminal symbol	Check round.	Function	Observation waveform
PV5	Check round P5 Address (2B)	Digital circuit power supply PV5← Control circuit terminal L: 4.9 to 5.2V	DC power supply
P12	Check round P12 Address (3B)	CT/Remote operator power supply P12←Control circuit terminal L: 11.7 to 14.3 V N12←Control circuit terminal L: -11.7 to -14.3 V	DC power supply Note: When the remote operator is connected
N12	Check round N12 Address (3B)		
VDC	Check round PVDC Address (1B)	Main circuit DC voltage detection signal: VPN = 300 VDC(200 V class) VPN = 600 VDC(400 V class) PVDC←control circuit terminal L: 35 to 40 V	DC power supply Note: When the remote operator is connected
⊥	Control circuit terminal L	Common electric potential for the power supply above	
U V W X Y Z	Check round PU Address (3A) Check round PV Address (3A) Check round PW Address (3A) Check round PX Address (2A) Check round PY Address (3A) Check round PZ Address (3A)	PWM waveform logic signal; Period during which the main circuit transistor is ON and OFF is shown. Measurement of nonlapped period is possible by observing waveforms by the pairs, i.e., U and X phase, V and Y phase, and W and Z phase. Allowable nonlapped period range: t1, t2=3 to 5μ sec. **NOTE:** Nonlapped period=dead time	
IU IW	Check round PIUF Address (2B) Check round PIWF Address (1B)	Motor current detection signal: 2.2V peak (approx.) with the inverter at rated load During inverter trip: approx. 4 V peak	

Terminal symbol	Check round	Function	Observation waveform
TRIP	Check round PU Address (3A)	IPM module protect detection signal (approx. 5 V) PU←control circuit terminal L 5 V (approx.) When IPM is tripped, "L" → "H"	DC voltage
PV24	Control circuit terminal P24	Power supply to Fan and Power relay, interface Control circuit terminal P24 ←control circuit terminal CM1: 22.5 to 27.5V	DC voltage
CM1	Control circuit terminasl CM1	Common electric potential for PV24 power supply	

3. TROUBLE SHOOTING PROCEDURE

3.1 Failure Messages and Diagnoses

When the inverter is out of order, be sure to take the actions indicated on Table 3-1. Find and correct the cause of the trouble and then reuse.

Table 3-1 Failure Messages and Diagnoses

Phenomenon					Probable cause [Contents of message]	Method to reset	Check for:	Correction
Breaker MCB	Electromagnetic contactor Mg.	Thermal relay THRY	Digital operator LED display [Remote operator LCD display]	Fault alarm relay				
			E 1 (OC. Drive)	○	Overcurrent during operation of mode at set speed by AC CT detection	A	Rapid changes in load	Eliminate rapid changes in load.
							Short-circuits or grounds of output (Check with a megohm meter)	Check output wiring and motor for shorts or grounds.
			E 2 (OC. Decel)	○	Overcurrent during motor deceleration by AC CT detection	A	Rapid deceleration	Increase the deceleration time.
							Short-circuits or grounds of output (Check with a megohm meter)	Check output wiring and motor for shorts or grounds.
			E 3 (OC. Accel)	○	Overcurrent during motor acceleration by AC CT detection	A	Rapid acceleration	Increase the deceleration time.
							Short-circuits or grounds of output (Check with a megohm meter)	Check output wiring and motor for shorts or grounds.
							Too high starting frequency (When selecting the V/f mode)	Decrease starting frequency.
							Too high torque boost	Decrease torque boost.
							Locked motor	Check motor or load.
			E 4 (Over. C)	○	Overcurrent during motor stop by AC CT detection	A	Faulty CT	Replace CT.

Phenomenon					Probable cause [Contents of message]	Method to reset	Check for:	Correction
Breaker MCB	Electromagnetic contactor Mg	Thermal relay THRY	Digital operator LED display [Remote operator LCD display]	Fault alarm relay				
			E 5 (Over. L)	○	Inverter overloaded (Operation under overload)	A	Excessive load	Decrease load factor.
							Electronic thermal level. (If not changed)	Adjust to proper level.
			E 6 (OL. BRD)	○	Regenerative brake application time exceeding theBRD%ED value setting	A	Dynamic braking usage ratio, BRD%ED	• Increase the deceleration time. • Increase operating duty cycle. • Raise BRD%ED setting.
			E 7 (Over. V)	○	DC smoothing circuit overvoltage	A	Rapid deceleration	Increasethe decelera-tion time.
							Motor forced to rotate by the load	Impossible to apply to continuous regenerative load.
							Grounding (Check with a megohm meter)	Check output wiring and motor for grounds.
			E 8 (EEPROM)	○	E² PROM Error	A	Large noise sources in proximity	Keep noise sources away.
							Ambient temperature (Too high)	Decreace the ambient termperature. Replace the cooling fan.
			E 9 (Under. V)	○	Power failure (undervoltage)	A	Decrease in voltage	Evaluate power supply system.
							Faulty contact of MCB or Mg	Replace MCB or Mg.
							Repeated occurrence of momentary power failure of 100msec or less by 10 times or more in 10 minutes.	Evaluate power supply system.
			E 10 (CT)	○	CT Error	A	Faulty CT	Replace CT.

Phenomenon					Probable cause [Contents of message]	Method to reset	Check for:	Correction
Breaker MCB	Electromagnetic contactor Mg.	Thermal relay THR Y	Digital operator LED display [Remote operator LCD display]	Fault alarm relay				
			E 11 (CPU)	○	CPU Error	A	Large noise sources in proximity	Keep noise sources away.
							Faulty inverter	Repair
			E12 (EXTERNAL)	○	External trip	A	Faulty external device or equipment (When external trip function is selected)	Eliminate external device and equipment faulty conditions.
			E13 (USP)	○	USP Error	A	If power is not turned on with inverter in RUN state (When USP function is selected)	Eliminate external device and equipment faulty conditions.
			E14 (GND. Flt)	○	Grounds at inverter output (When power is turned on)	A	Grounding of wiring between inverter and motor, and motor itself (Check with a megohm meter)	Correct grounded portion.
							Rapid acceleration or deceleration	Increase the acceleration and deceleration time.
			E15 (OV. SRC)	○	High incoming line voltage	A	Check for high line voltage except during deceleration.	• Decrease line voltage. • Minimize the fluctuation of incoming line voltage. • Enter the AC reactor into the input.
			E16 (Inst. P-F)	○	Power failure (instantaneous power failure)	A	Voltage drop	Recovery of the power supply
							Faulty contact of MCB or Mg.	Replace MCB or Mg.
			E17 (NG. OP1)	○	Incorrect connection of option 1 PCB	A	Check for connection part.	Repair

Phenomenon					Probable cause [Contents of message]	Method to reset	Check for:	Correction
Breaker MCB	Electromagnetic contactor Mg.	Thermal relay THRY	Digital operator LED display [Remote operator LCD display]	Fault alarm relay				
			E18 (NG. OP2)	○	Incorrect connection of option 2 PCB	A	Faulty contact	Repair
			E19 (OP1)	○	Abnormality of option 1 PCB	A	Refer to each Instruction Manual.	
			E20 (OP2)	○	Abnormality of option 2 PCB	A	Refer to each Instruction Manual.	
			E31 (PM. Drive)	○	(NOTE 1) Abnormality with the detector in IPM during operation of motor at set speed ,and high temperature in the inverter	A	Rapid changes in load.	Eliminate rapid changes in load.
							Shorts-circuit or grounds of output (Check with a megohm meter)	Check output wiring and motor for shorts or grounds.
			E32 (PM. Decel)	○	(NOTE 1) Abnormality with the detector in IPM during deceleration of motor, and high temperature in the inverter	A	Rapid deceleration	Inclease the deceleration time. Check output wiring
							Shorts-circuit or grounds of output (Check with a megohm meter)	and motor for shorts or grounds.

NOTE 1: Malfunction detections in IPM are overcurrent detection, thermal detection of main element, undervoltage detection of the gate circuit power supply.

Phenomenon					Probable cause [Contents of message]	Method to reset	Check for:	Correction
Breaker MCB	Electromagnetic contactor Mg	Thermal relay THRY	Digital operator LED display [Remote operator LCD display]	Fault alarm relay				
			E33 (PM. Accel)	○	(NOTE 1) Abnormality with the detector in IPM during acceleration of motor, and high temperature in the inverter	A	Rapid acceleration	Increase the acceleration time.
							Rapid changes in load	Eliminate rapid changes in load.
							Shorts-circuit or grounds of output (Check with a megohm meter)	Check output wiring and motor for shorts or grounds.
							Too high starting frequency	Decrease starting frequency.
							Too high torque boost(When selecting the V/f mode)	Decrease torque boost.
							Rocked motor. Vertical installation of the motor and nonflammable installating wall.	Check motor or load. Installation check
			E34 (PM. ERR)	○	(NOTE 1) Abnormality with the detector in IPM during the motor stop, and high temperature in the inverter	A	Cooling fan and high ambient temperature.	Replace the cooling fan.
							Internal power supply.	Repair
							Main element.	Replace the main element.

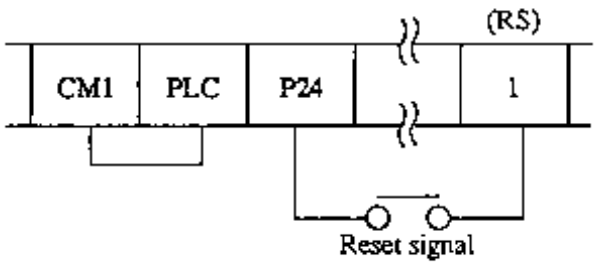
NOTE 1: Malfunction detections in IPM are overcurrent detection, thermal detection of main element, undervoltage detection of the gate circuit power supply.

Phenomenon					Probable cause [Contents of message]	Method to reset	Check for:	Correction
Breaker MCB	Electromagnetic contactor Mg	Thermal relay THRY	Digital operator LED display [Remote operator LCD display]	Fault alarm relay				
		○	———	–	———	C	Overload	Decrease load factor.
							Improper thermal relay set value	Reset to the proper value.
○			———	–	———	B	Grounds and shorts of power supply	Correct shorted or grounded portion.
							Undercapacity of MCB	Increase MCB capacity.
							Damaged inverter module or converter module	Repair
	○		———	–	Power failure	B	Power failure	Correct the power supply.
							Faulty contact of MCB or Mg	Replace MCB or Mg.

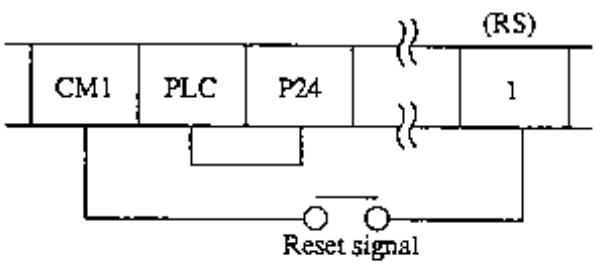
3.2 Description of the Codes A, B and C under the Tabulated Column Heading " Method to reset".

A: After the motor has stopped, close between the terminals RS and P24 (CM1*) on the printed-circuit board, or press the stop/reset key of the digital operator on the front cover.
B: Operate the breaker and electromagnetic contactor.
C: Reset the thermal relay after the motor has stopped.

Resetting by the terminals RS



SOURCE TYPE wiring

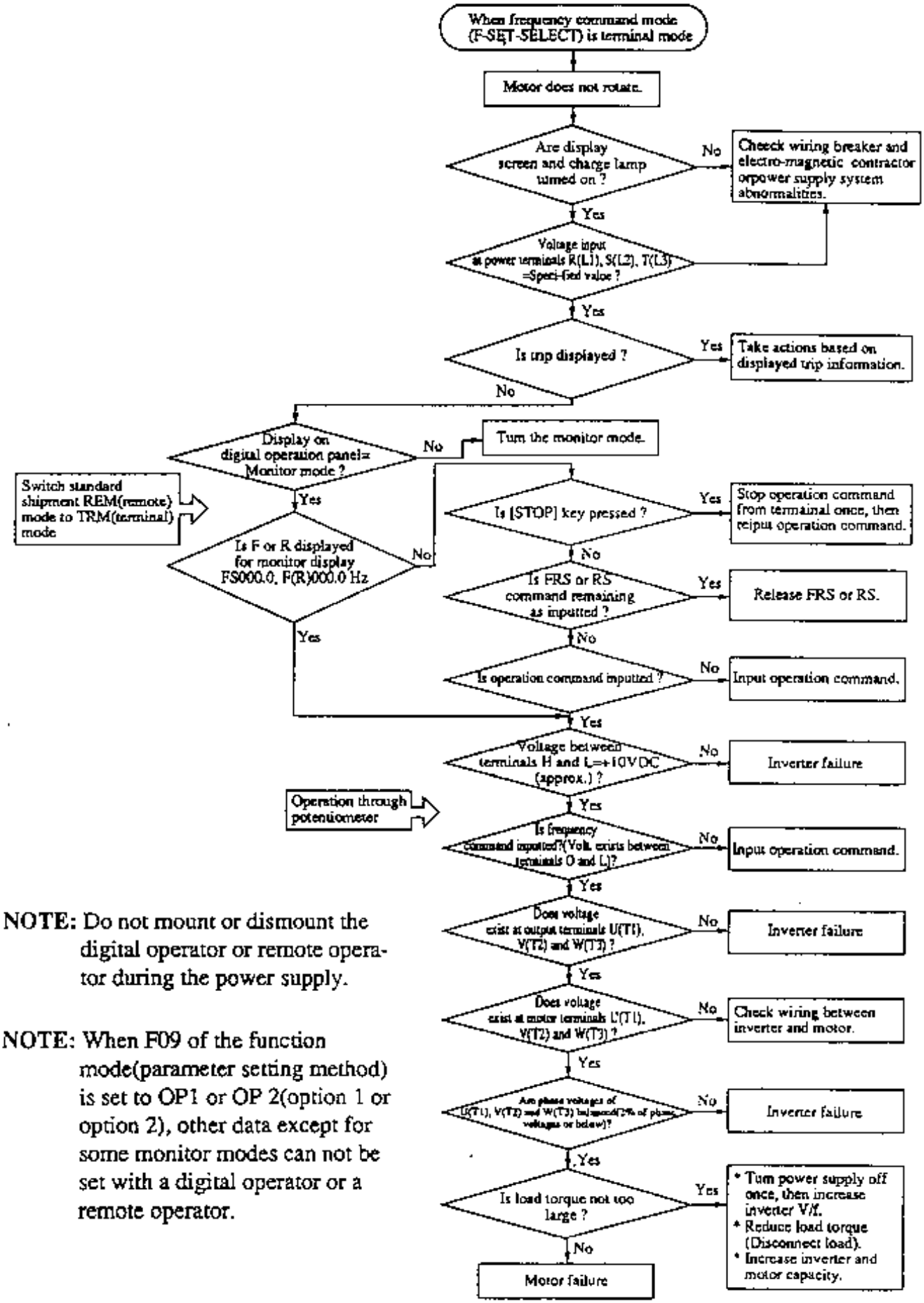


* SINK TYPE wiring

(Factory setting for European version)	(Factory setting for USA & JPN version)

3.3 Troubleshooting Procedure Based on Diagnoses by the Remote Operator

(1) Flowchart when the motor will not rotate

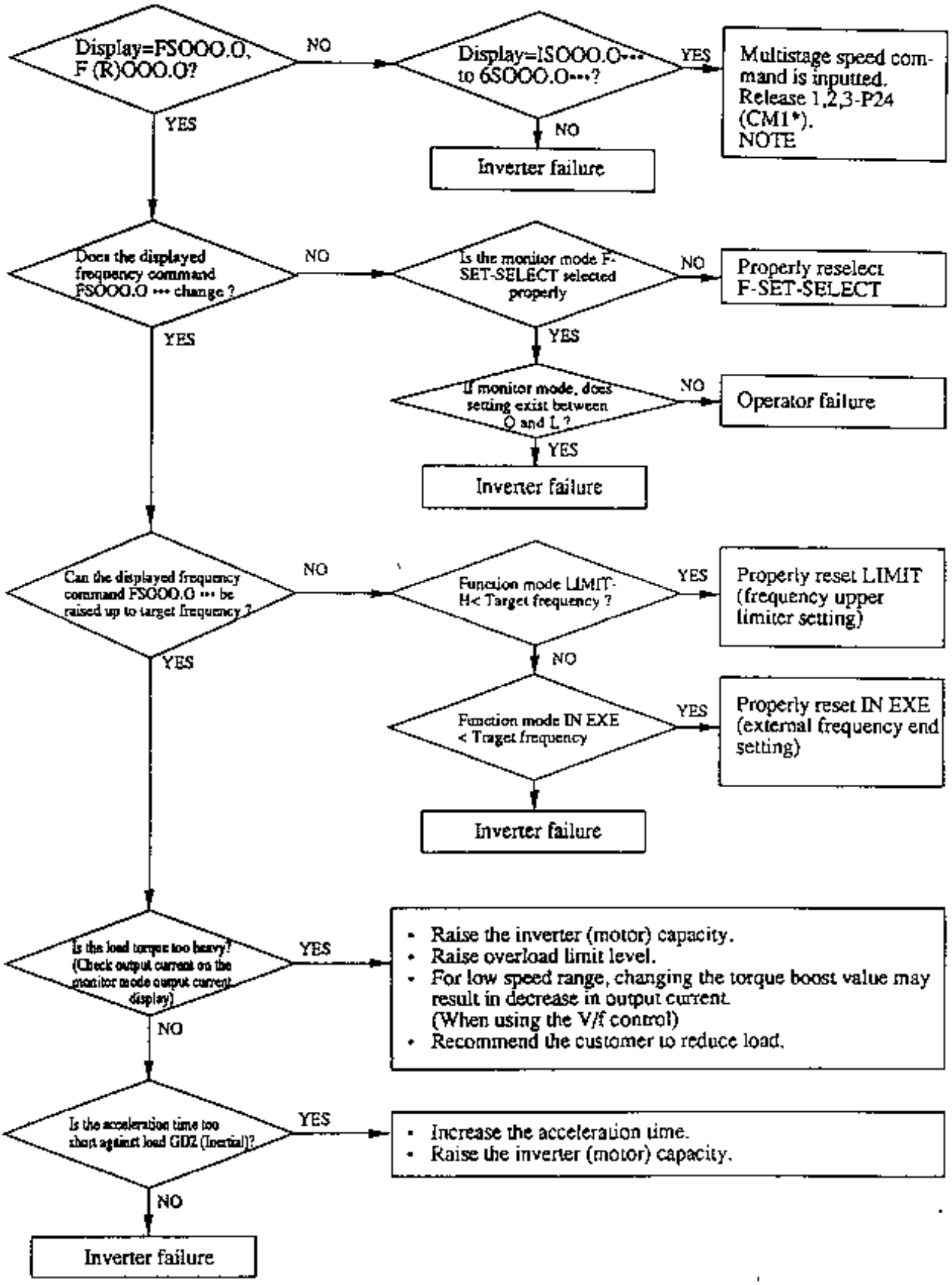


NOTE: Do not mount or dismount the digital operator or remote operator during the power supply.

NOTE: When F09 of the function mode(parameter setting method) is set to OP1 or OP 2(option 1 or option 2), other data except for some monitor modes can not be set with a digital operator or a remote operator.

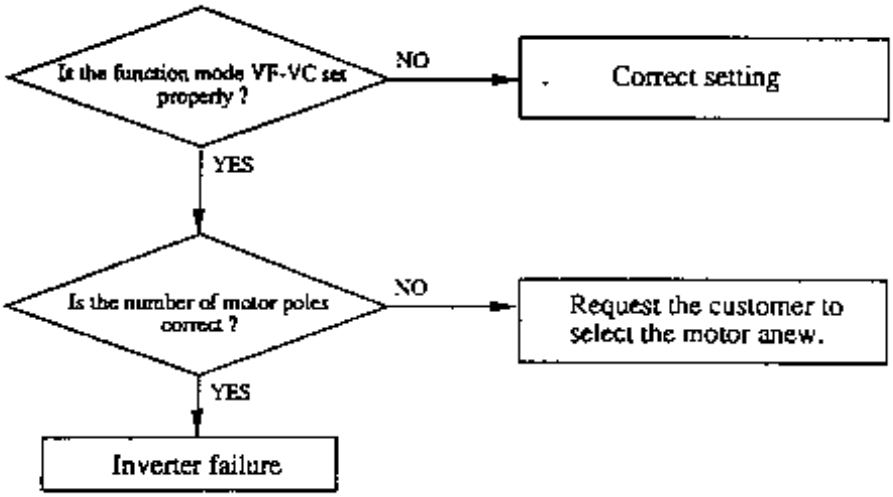
(2) Flowchart when the motor will not accelerate

Select one item of the monitor mode. (Press the FUN key once, then press the MON key)

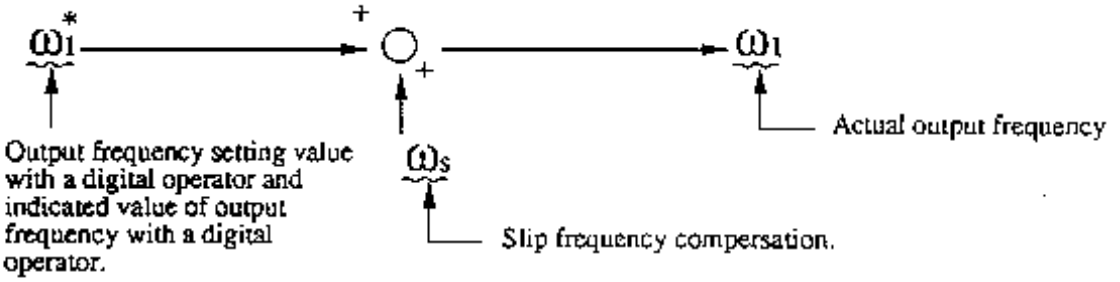


NOTE: * Symbols are indicated for Sink type wiring, Factory settings for USA & JPN version.

(3) Flowchart when the motor speed is too high



NOTE: When vector control(SLV, V2 mode) is used, the speed of the motor may increase more than the synchronous speed because of slip frequency compensation.



(4) When inverter operation can not be done

Check item	Correction
Is the STOP key on the digital operation panel not pressed while in the TRM (terminale) mode ?	Stop the operation command from the TRM (terminale) mode once, then reinput the operation command.
Is the DB command not inputted ?	After cutting the DB command off, input the operation command.
Is the RS/FRS command not inputted ?	After cutting the RS/FRS command off, input the operation command.
Is the frequency setting not 0 ?	Correct the frequency setting to a desired frequency.
Is the display on the remote operator not the function mode ?	Go to the monitor mode by pressing the MON key.
Is trip not effected ?	Reset
If the frequency setting command mode (F-SET-SELECT) is "TRM (terminal)", does the speed command exist between terminals O and L, or OI and L on printed board ?	Evaluate the speed command circuit.
There is input on the printed board at multistage speed input terminals intelligent input terminals; but is the setting of "SPEED1" to "SPEED7" not made OHz ?	Set "SPEED 1 to 7" to a desired frequency or cutoff the command to terminals intelligent input terminals.
Is the command input not made externally by selecting the internal command [REM (remote) OP1, OP2 (option 1, option 2)] mode or is the command input not made from the digital operation panel by selecting the external command TRM (terminal) mode ?	Check the operation mode. (Input the operation command with the mode currently set)
Are the external command TRM (terminal) mode and the FW and RV terminals on the printed board not inputted simultaneously ?	Be sure to allow either forward or reverse operation to function.
Minimum frequency > Frequency set value ?	Set the frequency to minimum frequency or above.
Does communication error occur? (The display of the dijital operation panel is displayed as E--- .)	① Release the RS command. (NOTE) ② Replace the dijital operation panel. ③ Replace the control PCB.

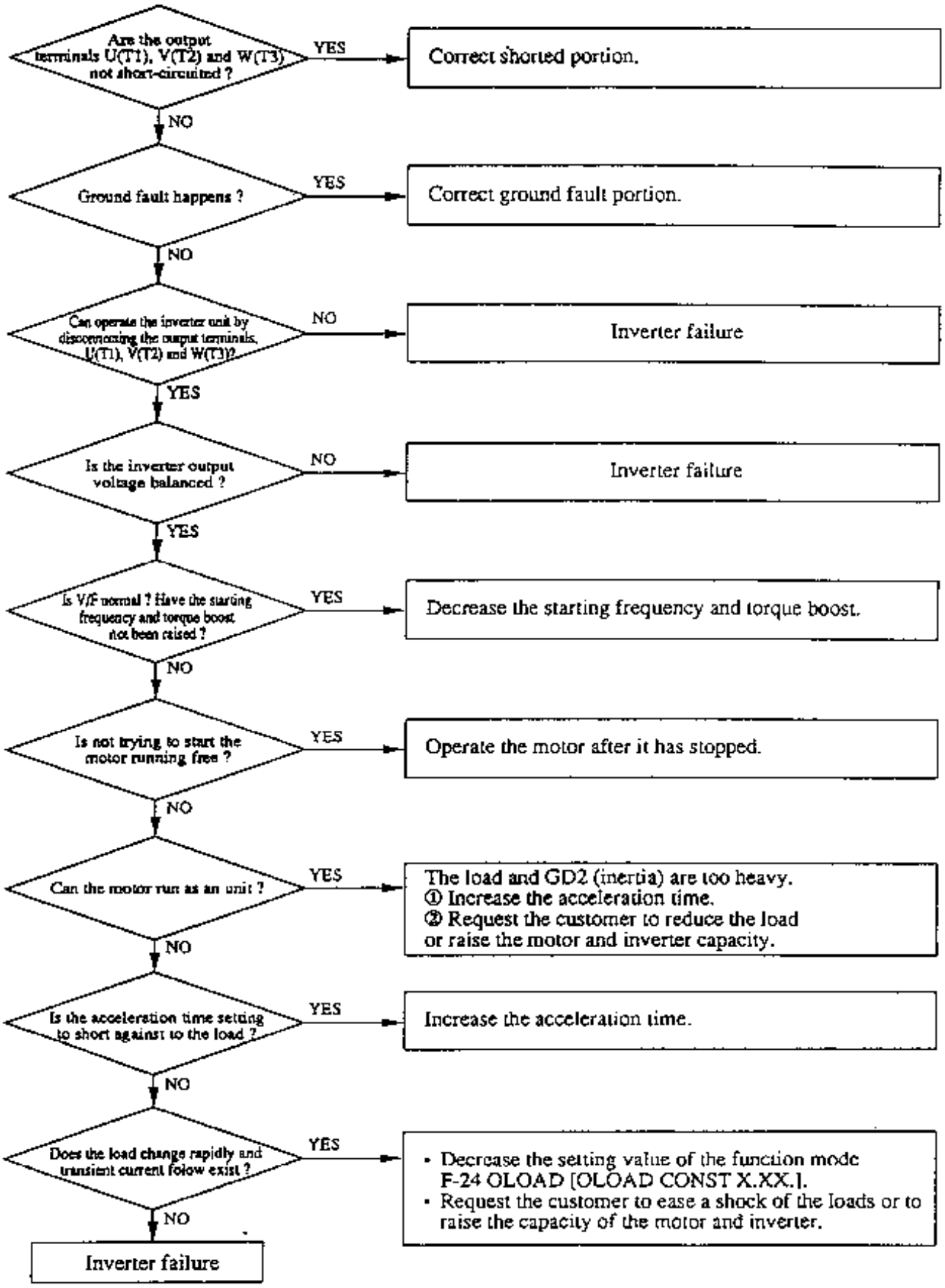
NOTE: In J300 series, be sure to check which of the 1 to 8 terminals is the RS terminal because that the selection of the terminal is allowed. (The initial setting value of the terminal 1 is the RS command.)

For terminal input specification, when the terminal is selected from N.O. (normal open) to N.C.(normal close) (refer to the extended function C20), the inverter can be operated when the PV24 (CM1*) terminal and RS terminal are short-circuited. (When pressing a key on the digital operation panel, the display will recover.)

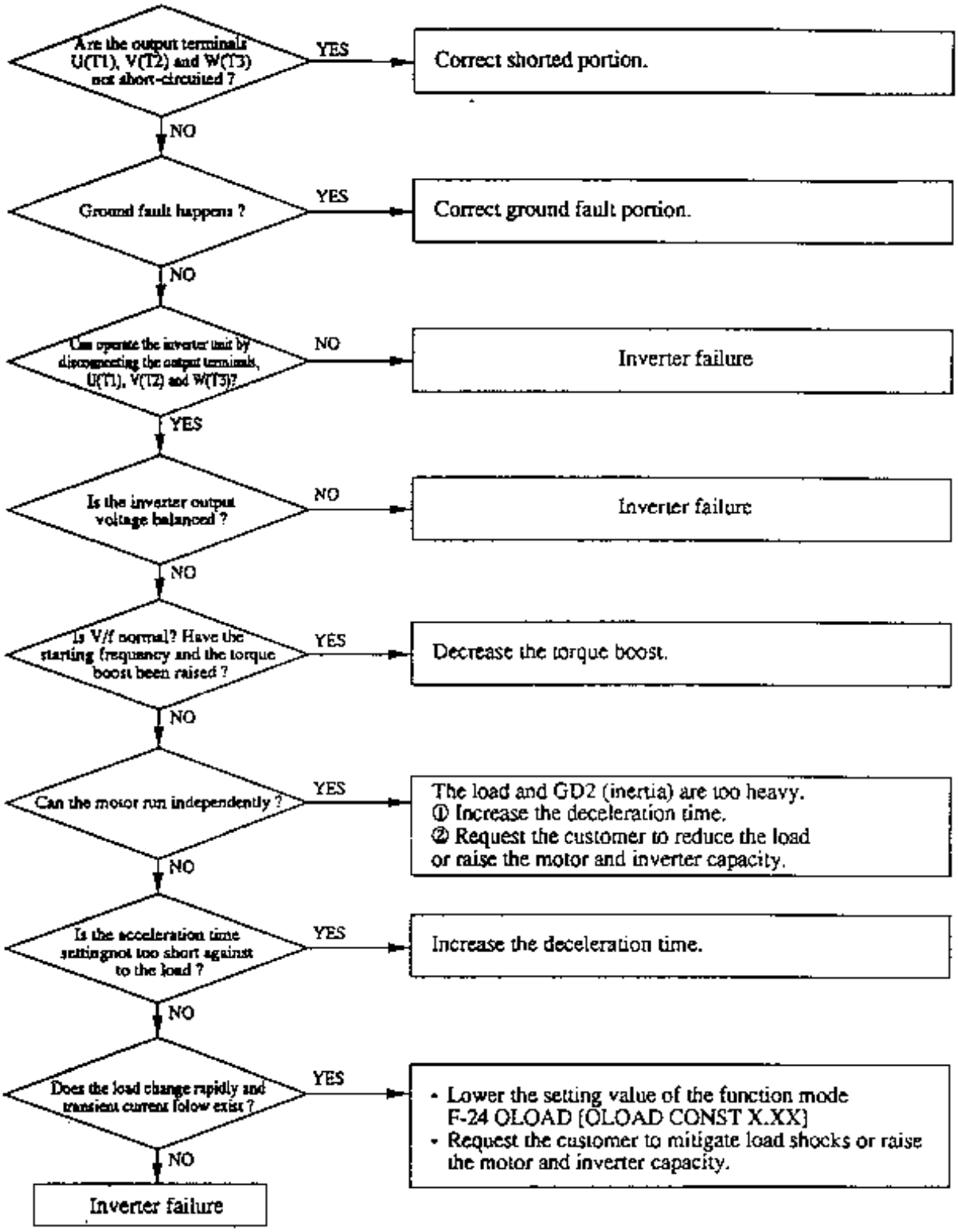
* Factory settings for USA & JPN version.

(5) Trouble shooting based on displayed trip

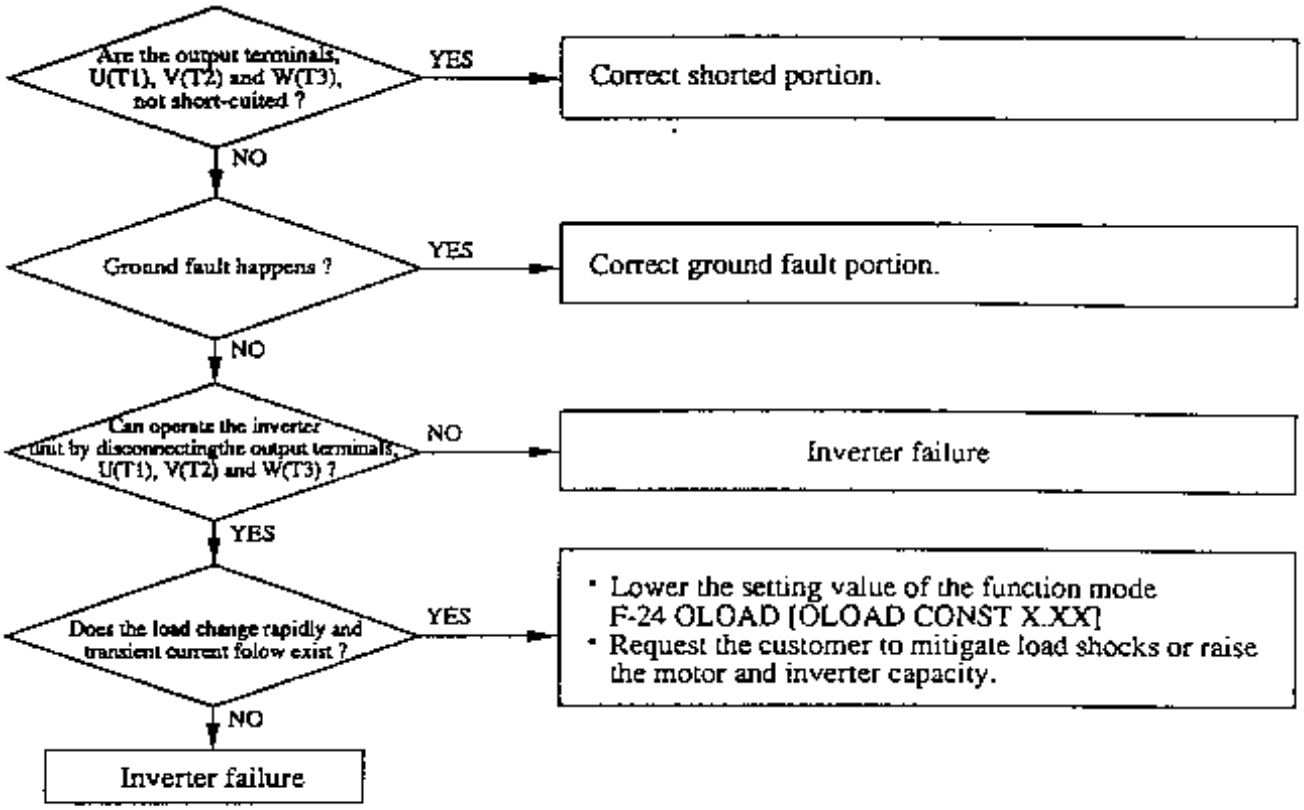
(a) Overcurrent trip (PM. Accel) is actuated



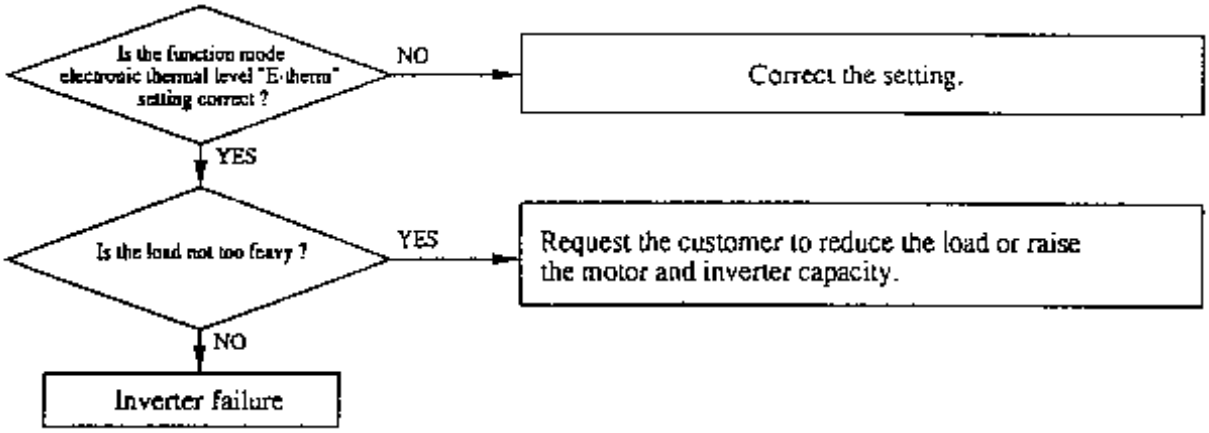
(b) Overcurrent trip (PM. Decel) is actuated



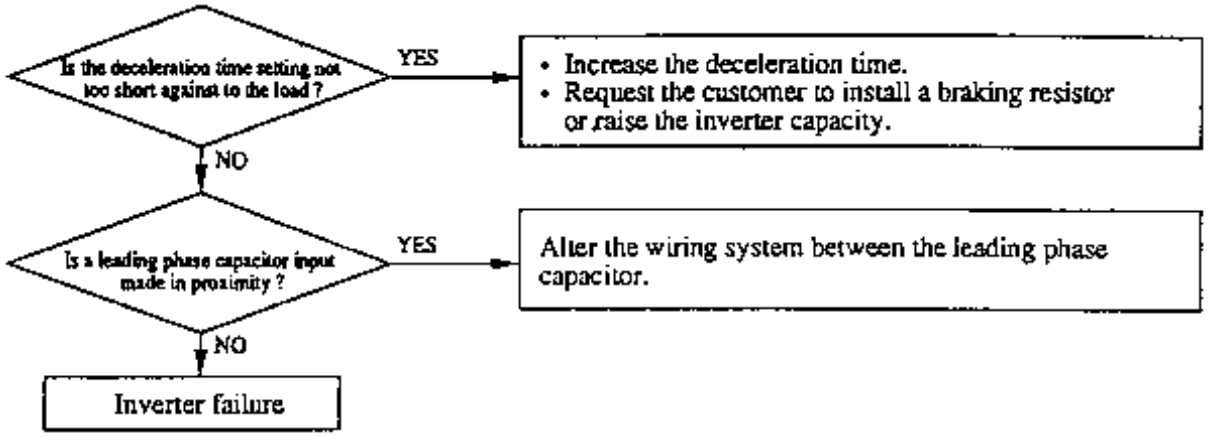
(c) Overcurrent trip (PM. Decel) is actuated



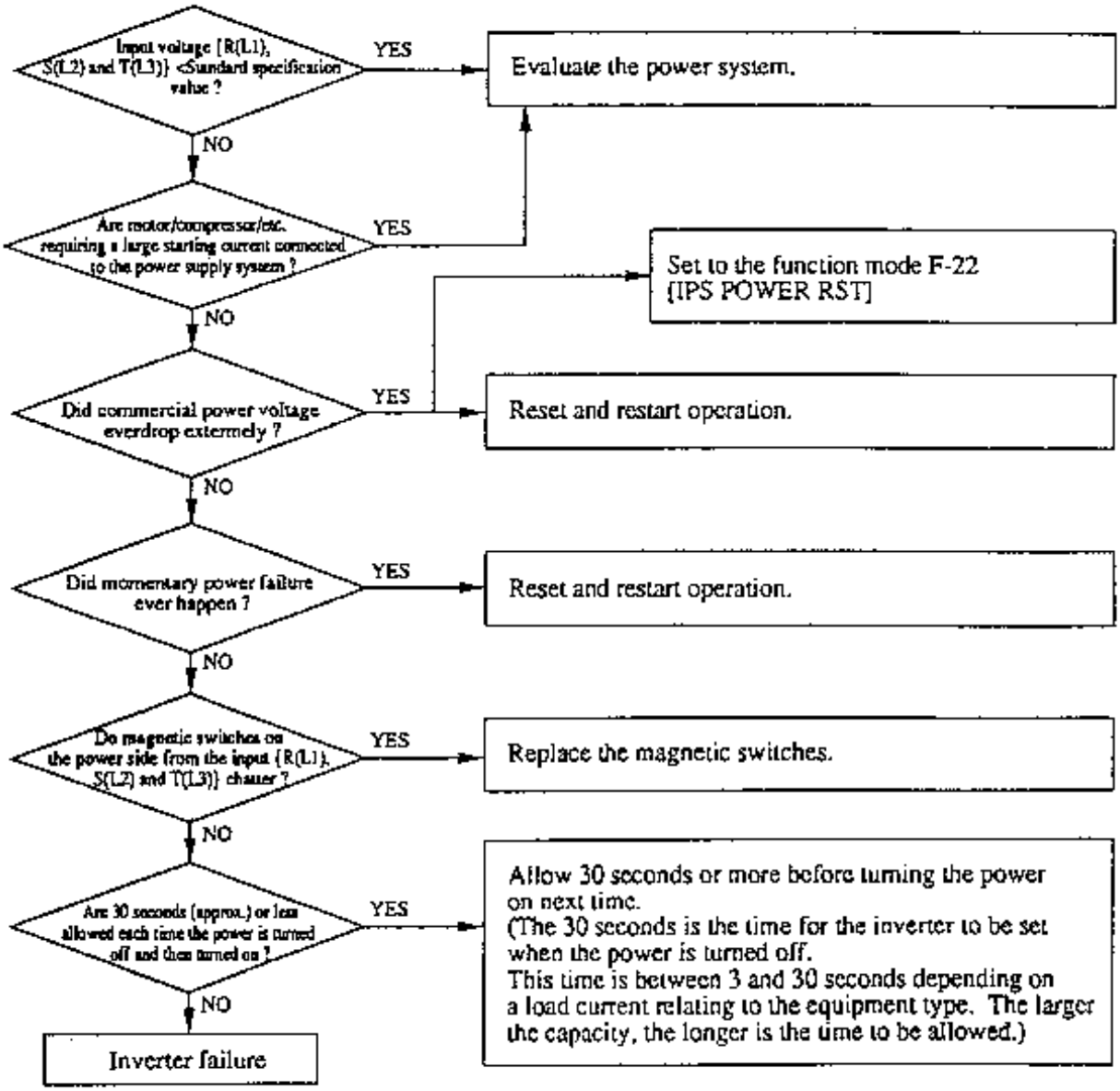
(d) Overload (OverL) is actuated



(e) Overvoltage trip (OverV) is actuated



(f) Undervoltage trip (UnderV) is actuated



(6) Other

(A) Phase failure

European and USA version inverter are provided with the phase failure protection on the power supply.

But JPN version inverter is not provided with the phase failure protection on the power supply; hence the following are expected to happen when the phase failure has occurred.

(a) When the R phase is an phase failure
An instantaneous power failure will occur indicating the following display and then the inverter will stop.

Digital operator: [-|--]

Remote operator: [POWER OFF]

(b) When the S phase or T phase is an phase failure
The resistor RS overheats because that the relay 84 does not close(ON), and the lines will break down.

(B) Be careful of the following conditions because the converter module may be damaged.

- When the power supply voltage unbalance ratio is 3% or above.
- When the power supply capacity is ten times that of the inverter, and it is 500 kVA or greater.
- When a severe voltage transients occur

  Examples: When multiple inverters are connected to a short bus.

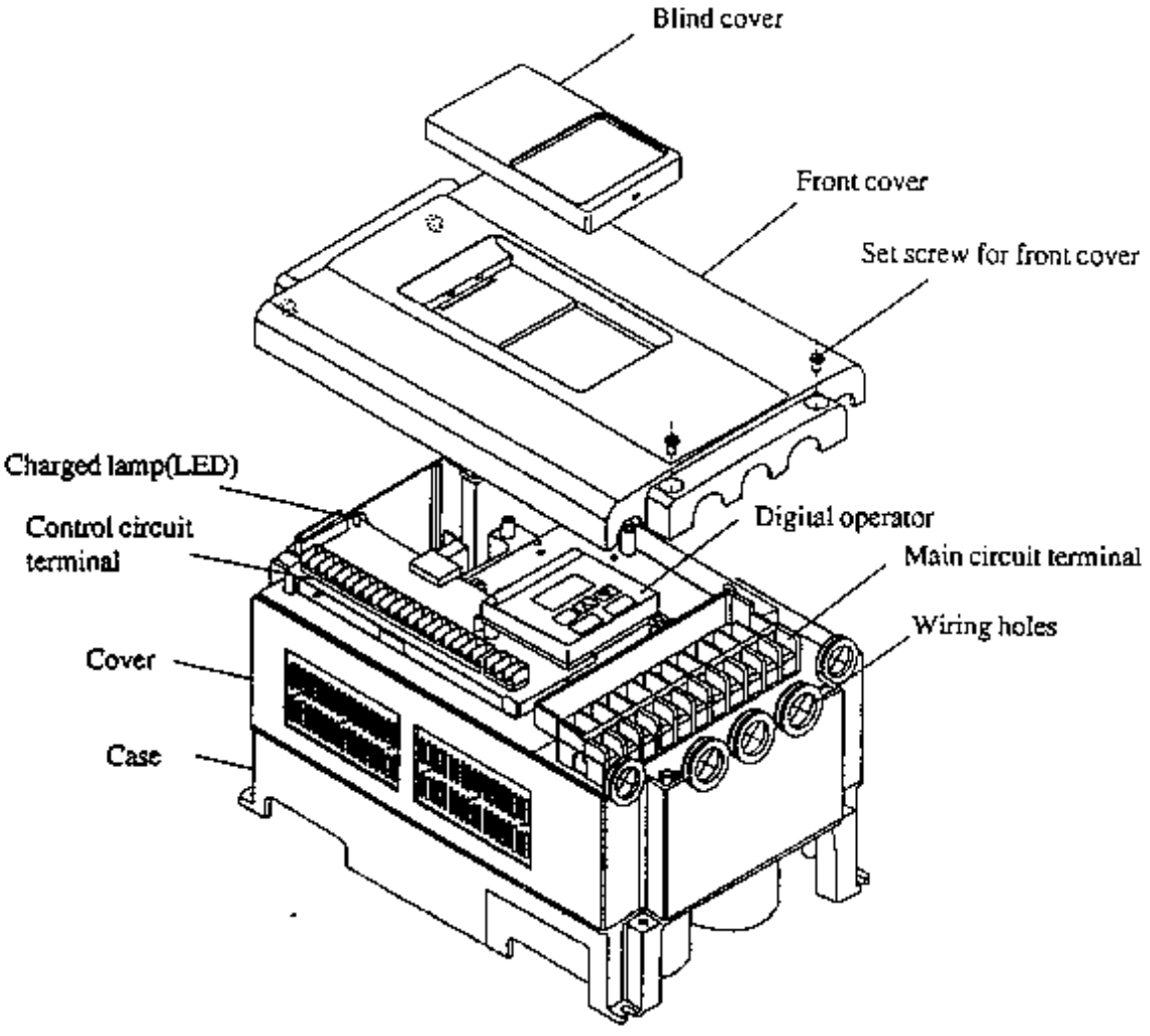
When a leading phase capacitor is turned on/off.

In the cases above, it is recommended that a reactor of about 3 percent of the power supply voltage (voltage drop at the rated current) be inserted on the power supply.

4. MEASUREMENT AND ADJUSTMENT OF CONTROL CHARACTERISTICS

4.1 Controlled Power Supply Voltage

Description	Allowable voltage range (V)	Measurement location	
		+	–
PV5 (for +5 V) power supply	4.9 to 5.2	Check round P5 (Address 2B)	Control circuit terminal L
PV12(for +12 V) power supply	11.7 to 14.3	Check round P12 (Address 3B)	Control circuit terminal L
NV12 (for -12 V) Power supply	-11.7 to -14.3	Check round N12 (Address 3B)	Control circuit terminal L
PV24 (for +24 V) power supply	22.5 to 27.5	Control circuit terminal P24	Control circuit terminal CM1
VDC voltage (for detection of P to N voltage) Vpn=300VDC/600VDC (200 V class/400 V class)	35 to 40	Check round PVDC (Address 1B)	Control circuit terminal L



Appearance of J300(example: 055 to 075 LF and 055 to 075 HF)

4.2 Overvoltage Detection Characteristics [Without motor]

Make detections of the following by varying the main circuit voltage {R (L1), S (L2) and T (L3)} which have been adjusted with the variable transformer. When checking the BRD function, connect a resistance of hundreds kΩ between P and RB.
A BRD circuit is supplied to the inverters 055 to 075 LF and 055 to 075 HF as standard. A resistor is an option. (European version 055 to 075HFE are provided with a internal discharge resistor as standard.)

Description		Detected voltage (between P and N on main circuit)	Criteria
NOTE 1 BRD	ON	DC AVR set value + 138 VDC or more (200 V class) DC AVR set value + 276 VDC or more (400 V class)	Connect an oscilloscope from RB to P (+). The voltage waveform must become "L".
	OFF	DC AVR set value + 138 VDC or less (200 V class) DC AVR set value + 276 VDC or less (400 V class)	Connect an oscilloscope from RB to P (+). The voltage waveform must become "H".
NOTE 2 OV-TRIP		369 to 404 V (200 V class) 756 to 827 V (400 V class)	• The output power turned off: Logic PCB: Control circuit: check round PU ← control circuit terminal L must be "H" LEVEL • ALARM OUTPUT: ALO-AL1 ON → OFF • Overvoltage trip display: "?ERROR Over. V" (Remote operator display)

NOTE 1: When detecting BRD, set the usage ratio to 10.0 using the dynamic braking. After detecting, reset to the setting value before change.

NOTE 2: When detecting OV-TRIP, set the usage ratio to 0.0 using the dynamic braking. This operation should be done within 100 seconds because incoming voltage protection is effective.

NOTE 3: Be careful of high voltage to check BRD operation.

4.3 Overcurrent (Overload) Detection Characteristics

With the motor running, gradually increase the load and then make the following measurement.

Description	Method to test	Criteria	Remarks
Overload limit level	① F-24 LM.CONS 50% 01.0 setting: Apply a load of 40 to 60 percent of the inverter rated current. ② F-24 LM.CONS 150% 01.0 setting: Apply a load of 140 to 160 percent of the inverter rated current.	Output frequency must start decreasing.	Possible to change LM.CON setting with the remote operator connected
Overload trip	Apply a load of 180 percent of the inverter rated current.	• Overload trip must occur in about 10 to 20 seconds • The output power turned of. (Check round PU ← Control circuit terminal L: "H" level) • Alarm output (AL0-AL1 ON → OFF). • Overload trip display: (?"ERROR Over. L" (Remote operator display))	LM.CONS 150% (Use the remote operator.)
Overcurrent trip	Apply a load of 170 to 180 percent of the inverter rated current.	• The output power turned off> Check round PU ← Control circuit terminal L: "H" level) • Alarm output (AL0-AL1 ON → OFF) • Overcurrent trip display: ("?ERROR OC. Drive" (Remote operator display)	LM.CONS 150% (Use the remote operator.)

4.4 Undervoltage Detection Characteristics

Operate the inverter at the maximum output frequency
As the main circuit power supply voltage {R (L1), S (L2) and T (L3)} is gradually decreased through the variable transformer, the output has to be turned off or Undervoltage trip must occur (this operation to be carried out at the rated load).

Description	Operating voltage (Input voltage)	Criteria
Undervoltage	140 to 160 V (200 V class) 280 to 320 V (400 V class)	* The output power turned off. Check round PU (Address 3A) ← Control circuit terminal L: "H" level) * Alarm output: AL0-AL1, ON → OFF * Undervoltage display: ("?ERROR Under. V")

Following the detective operation, execute a latching. After resetting (by short-circuiting RS to L, or pressing the [STOP] key,) release the latching.

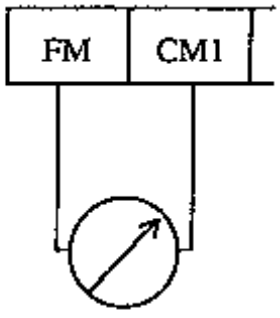
4.5 Forced Resetting Characteristics

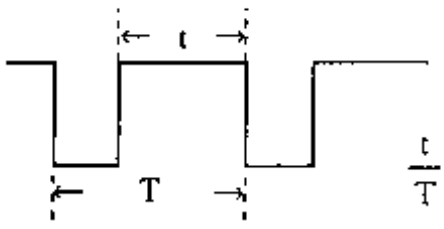
Description	Operation	Criteria
Forced resetting	Short circuit RS to P24 (CM1*) on the printed board.	The abnormal mode must be rest.

*: Factory settings for USA & JPN version.

4.6 External Frequency Indicator (Analog Meter) Adjustment Characteristics (Monitor Mode M-ADJ)

Connect the remote operator. Select [F-10 (when the dijital operator is used)] with the function mode. In this state, an output (t/T) which is proportional to the output frequency is available between FM- control circuit terminal L.
Adjust the constant on the monitor mode so the meter reading becomes maximum at the maximum frequency.





$\frac{t}{T}$ t/T is variable

4.7 Returning to the initialization (State set at factory before shipment)

When returning the equipment to the initial state set at factory before shipment for some reason, follow the following procedure.

① Allocate STN (set value [7]) to one of the input intelligent terminals.
(Use [C 1] to [C 7] in the extension function mode to set the intelligent terminals.)
(However, can [C 8] not be used since resetting RS is initially set.)

② Short-circuit the STN terminal and P24 (CM1*), then turn power off and on. (When the power is turned off, do not turn it on again until the CHARGE lamp of the logic PCB goes off.)

③ Keep the STN terminal open for more than 6 seconds. (When keying, resetting, or turning power off is performed within 6 seconds, the equipment may not be initialized.)

④ Turn the power off after more than 6 seconds. (When the power is turned off within 6 seconds, the equipment may not be initialized.)

4.8 How to Delete Trip History Data (F10, and F11)

To delete trip history data for some reason, follow the instructions shown below using the remote operator (DOP or HOP) or copy unit (DRW or HRW).

1. Using the remote operator (DOP-OA) or copy unit (DRW-OA)

   ① Display [INIT TCNT] (trip history count clear) or the function mode initial setting [F-38 INIT].
   ② Move the cursor to beneath the initial set values. Select CLR and store it.
   ③ Turn the power off once and then turn it on. or close the reset terminal RS-P24 (CM1*) for approx. a second. By this, trip history data is deleted.
   ④ When trip history is deleted, data of [F-38] is set to [CNT]. Trip counting restarts.

2. Using high-performance remote operator (HOP-OJ) or high-performance copy unit (HRW-OJ)

   ① Display [TCNT 0: CNT] (trip history count clear) or the function mode initial setting [2-2 INIT].
   ② Enter a count clearing value [0: CLR] from the 10-key pad.
   ③ Turn the power off once and then turn it on. or close the reset terminal RS-P24 (CM1*) for approx. a second. By this, trip history data is deleted.
   ④ When trip history is deleted, data of [2-2 INIT] is set to [CNT]. Trip counting re-starts.

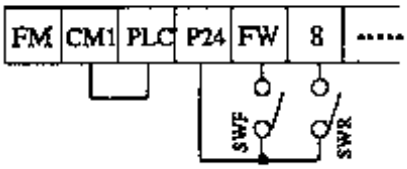
NOTE: * Symbols are indicated for Sink type wiring, Factory settings for USA & JPN version.

5. OPERATIONAL ADJUSTMENT

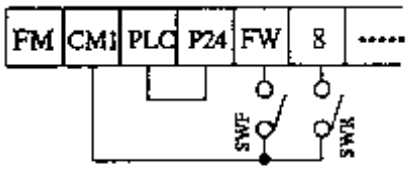
5.1 Motor Without Load, Forward and Reverse Run

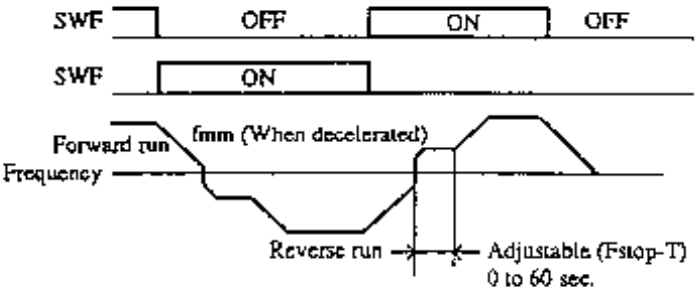
The motor must accelerate without allowing the OC-TRIP to occur, when the motor is run forward first, and then with the use of the selection switch, the speed is decreased and the operation is switched over to the reverse run.

SOURCE TYPE wiring
(Factory settings for European version)



SINK TYPE wiring
(Factory settings for USA & JPN version)





5.2 Motor Operation with Load (100% Load)

Description	Operation	Criteria
Balance of output voltage and current	Make measurements of the voltage and current at the inverter output (U, V and W). (See Section 7.)	• Free from open phase, etc. • Balanced output voltage and current • Motor operation free from abnormal noises
Current monitor	Check the output current values on the operation monitor (d2).	90 to 110% of the inverter rated current (approx.)
Voltage monitor (NOTE)	Check the DC voltages(Vpn) .	The value depends on input voltages: 270 V (approx.) against the 200VAC input 540 V (approx.) against the 400 VAC input

NOTE: Be sure to check the voltage monitor display using the remote operator(DOP, HOP) or copy unit(DRW, HRW) according to the following procedures:

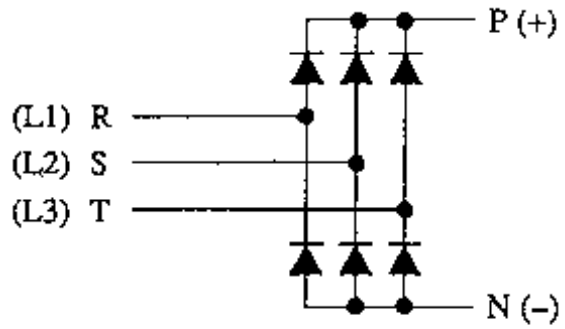
1. When setting with the remote operator(DOP-OJ) or copy unit(DRW-OJ)
   ① Display the function mode F—38 INIT DEBG.
   ② Move the cursor to the position to be set, then enter ON to store.
   ③ Press the monitor key once and the ▽ key seven times to display PN-V OOO.OV.
   This displayed value is the voltage monitor value.

2. When setting with the high performance remote operator(HOP-OG) or high performance copy unit(HRW-OJ)
   ① Display the function mode [2-2 INIT] and initial setting [DEBG 0: OFF]
   ② Set and store the debug ON setting value [1: ON] using the ten key.
   ③ Press the monitor key and ▽ key to display OPN-V OOO.OV.
   This displayed value is the voltage monitor value.

6. ACTIONS TO TAKE IN AN OCCURRENCE OF ABNORMALITIES

6.1 How to Check the Converter Module

Possible to check the module with the tester



Circuit diagram of the converter module

Turn the power off and start the work after the voltage between P (+) and N (–) has become 15 volts or below. Use the Ω range when making measurements with the tester. (A simple way to check the module as assembled)

Tester terminal	Resistance value
Three different ways for ~→~ (corresponding to R-S, S-T and R-T)	50kΩ or above
P(+) →Each of R, S and T	50kΩ or above
Each of R, S and T→P(+)	50Ω or below
N(-) →Each of R, S and T	50Ω or below
Each of R, S and T →N(-)	50kΩ or above

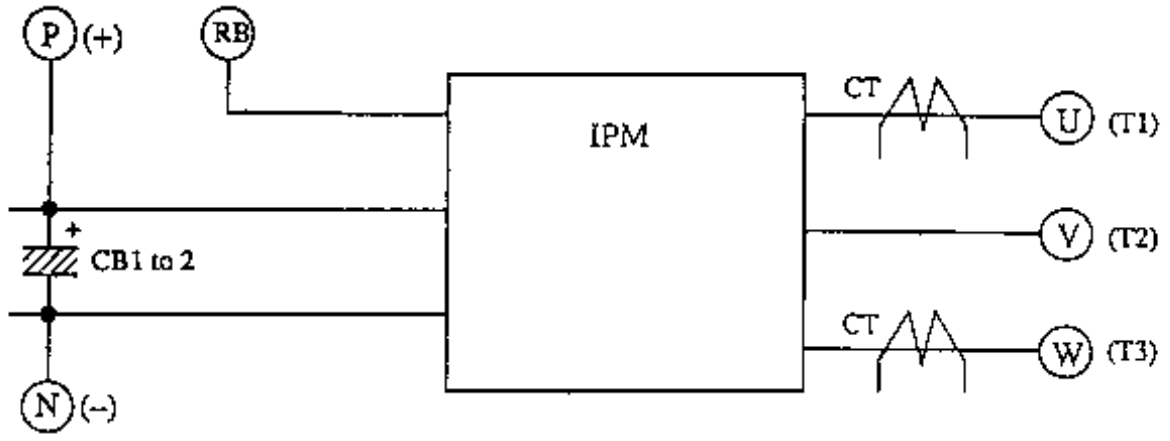
~ : AC terminal {R(L1), S (L2) and T(L3)}

Replace the converter module if any of the measurements is out of the values shown above.

- Trouble to occur when the converter module fails: MCB trip (Short-circuit of the power supply)

6.2 How to Check the PM Module and Transistors Used with BRD

Check the module with the tester



Inverter module circuit diagram (example: 055 to 075LF and 055 to 075HF)

Turn the power off and start the work after the voltage between P (+) and N (–) has become 15 volts or below. Use the 1Ω range when making measurements with the tester. (A simple way to check the module as assembled)

NOTE: There is a possibility that the module is out of order even when judged to be up to standards.

Tester terminal	Resistance value	Location to check
P → U	50kΩ or below	U phase arm
P → V		V phase arm
P → W		W phase arm
N → U	50Ω or above	U phase arm
N → V		V phase arm
N → W		W phase arm
U → P	50Ω or below	U phase arm
V → P		V phase arm
W → P		W phase arm
U → N	50kΩ or above	U phase arm
V → N		V phase arm
W → N		W phase arm

Troubles to occur:

When the IPM module fails:

- The OC trip occurs even when the motor is not connected.

When the BRD transistors (BRD transistors within IPM) fail:

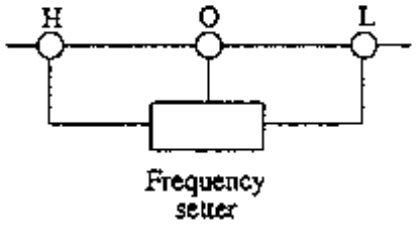
- BRD discharge resistor heats up

6.3 How to Check the Printed-Circuit Board

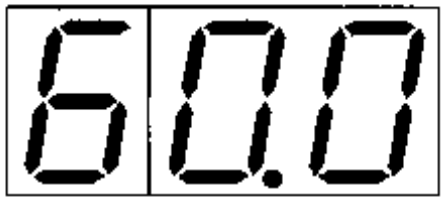
Visually check the mounted printed-circuit board for damaged resistor and thick-film module (called PSM), short-circuited IC lead due to deposited foreign matter and abnormal or disconnected connector.

6.4 How to Check the Digital operator

Select "01" for F9 with [FUNC] key and [▲] [▼] key on the digital operator, and connect the frequency setter betweenthe terminals O and L on the printed-circuit board.
Set the frequency to a maximum, select F1 with the [FUNC] key on the operation panel and press the [RUN] key. (In the case of the remote operator, select "Terminal" for F-SET-SELECT)



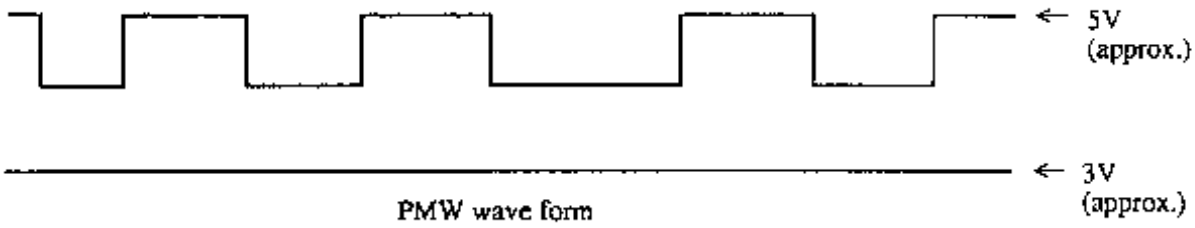
Be sure to check if the frequency can be set to a maximum setting value. (Example)



6.5 How to Check Control Signals

While operating the inverter, PWM waveforms appear between the check round PU or PX and control circuit terminal L. Note that these PWM waveforms are different depending on the frequency setting.

When the PWM waveform is incorrect, replace the control substrate.



PMW wave form

- Check round PU ← Conrol circuit terminal L
  Check round PX ← Conrol circuit terminal L

- Check round PV ← Conrol circuit terminal L
  Check round PY ← Conrol circuit terminal L

- Check round PW ← Conrol circuit terminal L
  Check round PZ ← Conrol circuit terminal L

7. MAINTENANCE AND INSPECTION PROCEDURE

7.1 Maintenance and Inspection Precautions

(1) Precautions before starting maintenance and inspection

Be sure to confirm the following before starting maintenance and inspection because there is a danger of receiving a electric shock.

- The display on the digital operation panel has turned off and the charge lamp on the PCB has gone out.
- The voltage between P(+) and N(-) is 15V or below when measured with the tester.
- A discharge resistor (30 W500 Ω: 200 V class, 60 W 1 kΩ:400 V class) has been connected between P(+) and N(-) for 15 seconds or longer after the power was turned off.

(2) General precautions

Always keep the unit clean so that dust or other foreign matter does not enter the inverter. Use special care with respect to broken lines and faulty connections. Firmly connect terminals and connectors. Keep electronic equipment away from moisture and oil. Dust, steel filings and other foreign matter can damage insulation, causing unexpected accidents, so take special care.

7.2 Measurement of Input/Output Voltage, Current and Power

General measuring instruments for input/output voltage, current and power are shown in Figure 7-3 and Table 7-1.

The voltage to be measured is the fundamental wave effective value and the power to be measure is the total effective value.

(1) Measurement of output voltage

The moving-iron type instrument does not give accurate readings for measurement of the output voltage. Make measurements according to the method shown in Figure 7-3 (Table 7-1) or using the circuits indicated in Figures 7-1 and 7-2.

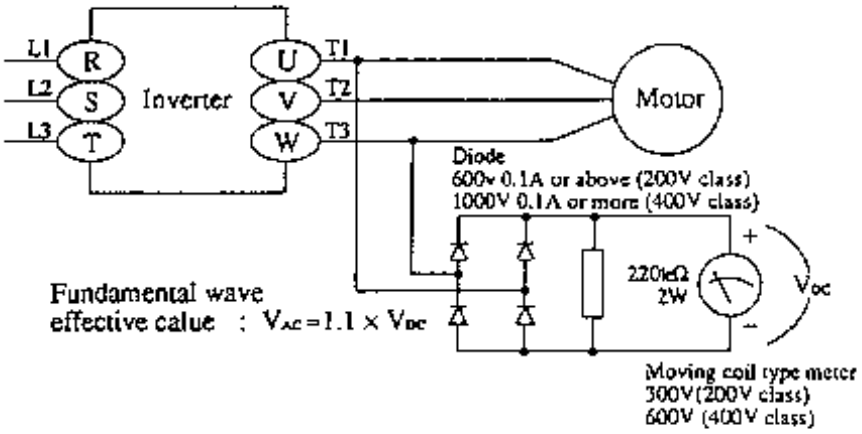


Figure 7-1 Output Voltage Measurement Circuit

When a load is not connected to the output terminals U(T1), V(T2) and W(T3), a voltage is present at them because of the leakage current of semiconductors (about 2mA) even when the output frequency command is made naught.

When connecting the voltmeter to the output terminals under the conditions mentioned above, make connections as indicated in Figure 7-2 to prevent the indication error of the meter.

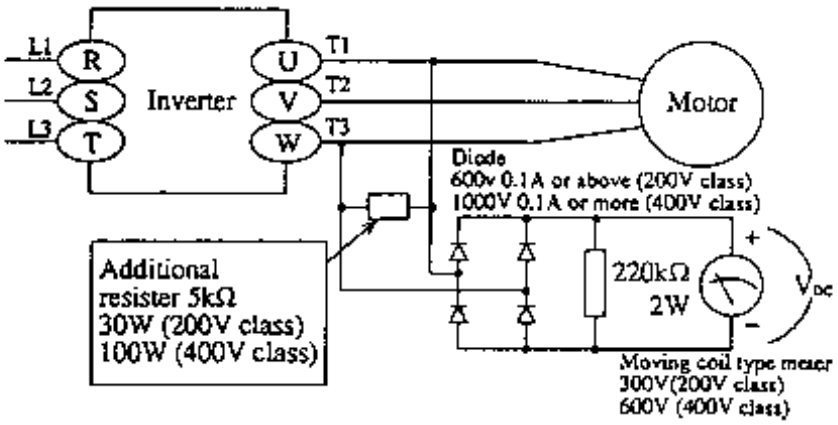


Figure 7-2 Output Voltage Measurement Circuit

(2) Measurement of input voltage and input/output current

Make measurements of the input voltage and input/output current for all of the three phases with the moving-iron type meter (See Figure 7-3 and Table 7-1).

(3) Measurement of input/output power

Make measurements of the input/output power with the electrodynamic type wattmeter for single phase use. Make measurements for all of the three phases in cases where there is an unbalance in voltages and currents.

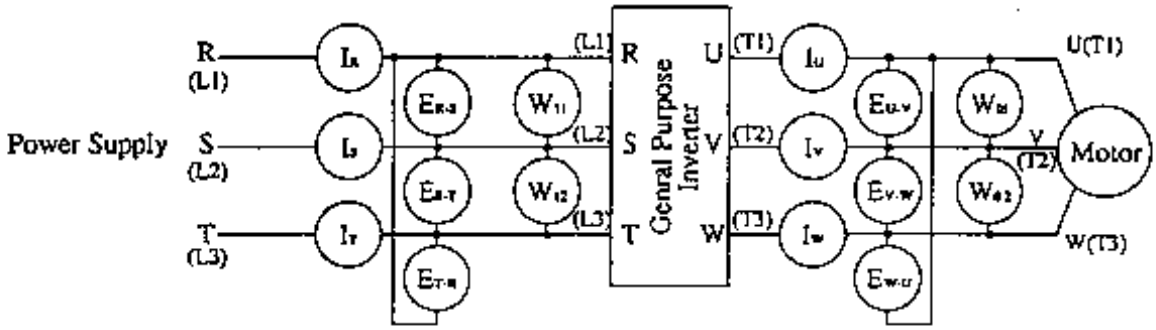


Figure 7-3 Parts to be Measured

Table 7-1 Measuring Instruments

Measuring item	Parts to be measured	Measuring instrument	Remarks
Supply voltage E_1	Between R and S, S and T, T and R (E_{R-S})(E_{S-T}) (E_{T-R})	Moving-iron type voltmeter or rectifier type voltmeter	Fundamental wave effective value
Supply current I_1	Amperage at R, S and T (I_R)(I_S)(I_T)	Moving-iron type ammeter	Total effective value
Supply power W_1	Between R and S, and S and T (W_{11}) (W_{12})	Electrodynamic type wattmeter	Total effective value
Supply power factor Pf_1	Calculate the supply power factor from the measured supply voltage, E_1, supply current I_1 and supply power W_1 $Pf_1 = \frac{W_1}{\sqrt{3} \cdot E_1 \cdot I_1} \times 100(\%)$		
Output voltage E_0	Between U and V, V and W, W and U (E_{U-V}) (E_{V-W}) (E_{W-U})	Refer to Figure 7-2 or rectifier moving-iron type ammeter	Total effective value
Output current I_0	Amperage at U, V and W (I_U)(I_V)(I_W)	Moving-iron type ammeter	Total effective value
Output power W_0	Between U and V, V and W (W_{01})(W_{02})	Electrodynamic type wattmeter	Total effective value
Output power factor Pf_0	Calculate the output power factor from the output voltage E_0, output current I_0 and output power W_0 $Pf_0 = \frac{W_0}{\sqrt{3} \cdot E_0 \cdot I_0} \times 100(\%)$		

NOTE 1: Use a meter indicating a fundamental wave effective value for voltage, and meters indicating total effective values for current and power.

NOTE 2: Since the inverter output waveform is a distorted wave, the measuring instruments shown in the table above are liable to cause errors at low frequencies. The measuring method and instruments indicated above provides comparatively accurate values.
Some testers (general-purpose products) are not applicable to the distorted wave.

NOTE 3: For the input and output current, measurements of the power are made with the digital power meter, e.g., YEW 2503 and 2504.

7.3 Method to Measure Insulation Resistance and Withstand Voltage

Make these measurements and tests by short-circuiting the terminals as shown in Figure 7-4, and by following the conditions described.

(Conditions)

a) Make insulation resistance measurements between the terminals and grounding with the 500DCV megaohm-meter, and make sure that 5 M-ohms or greater is indicated.

b) Withstand voltage test

Make withstand voltage tests by supplying 1500VAC (200V class) , and 2000 VAC (400 V class) to between the terminals and grounding for one minute, and make sure that there are no abnormalities.

- Do not conduct withstand voltage tests for terminals other than those indicated in Figure 7-4.

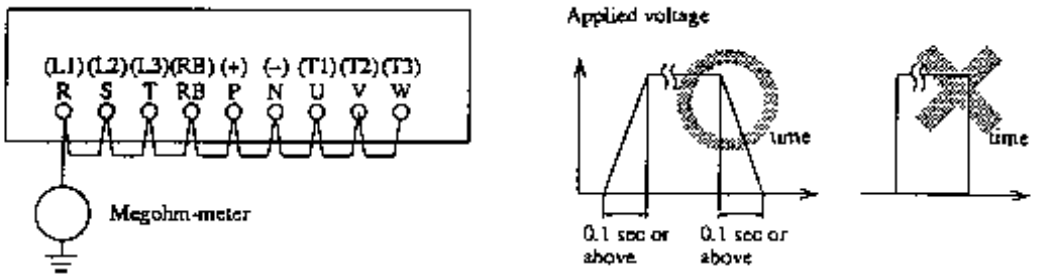


Figure 7-4 Insulation Resistance Tests and Withstand Voltage Tests

7.4 Maintenance of parts

(1) Printed-circuit boards are maintenance-free under normal applications. However, in cases in which maintenance and inspection are necessary, pay attention to the prevention of damage caused by static electricity as shown below, and be sure to follow the instructions in Section 4. MEASUREMENT AND ADJUSTMENT OF CONTROL CHARACTERISTICS and Section 5. OPERATIONAL ADJUSTMENT.

* Prevent damage caused by static electricity

The MCUs and LSIs on a printed-circuit board can be destroyed by static electricity, so be sure to ground work benches, soldering irons, and yourself before working on a printed-circuit board.

(2) Maintenance of smoothing capacitor and cooling fan

We recommend that smoothing capacitors CB and cooling fans be regularly replaced every three years taking their lives into account. Note that their lives shorten when they are used, in particular, under high temperatures and heavy loads.

8. APPENDIX

Appendix 1 **Plural Motor Operation and Precautions on Operation**

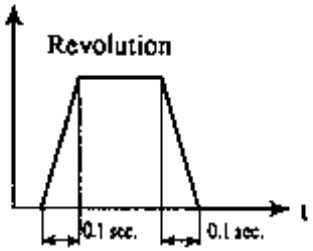
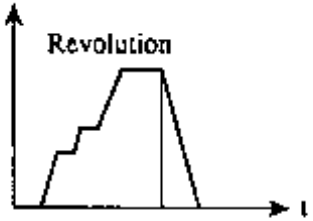
Appendix 2 **J300 Series Logic, Main Circuit, and Power Circuit Connection Diagram**

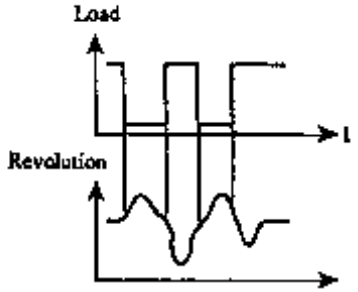
Type	Logic PCB drawing	Main circuit drawing	Power PCB drauing No.	IPM PCB drawing No.
J300-055,075LF	2T800873 2T800874 2T800875	3T812513	3T812883	3T813164
J300-110LF				3T813165
J300-150LF				3T813166
J300-220LF				3T813167
J300-300, 370LF		3T812884	2T800884 3T812886	2T800885
J300-450LF				
J300-550LF				2T800886
J300-055, 075HF		3T8125514 * 3T8125514E	3T812883	3T813164
J300-110,150HF				3T813166
J300-220HF				3T813167
J300-300, 370HF		3T812885 * 3T812885E	2T800884 3T812886	2T800885
J300-450, 550HF				2T800886

*: Symbols are indicated for European version

Appendix 3 **J300 Series Structural Drawing**

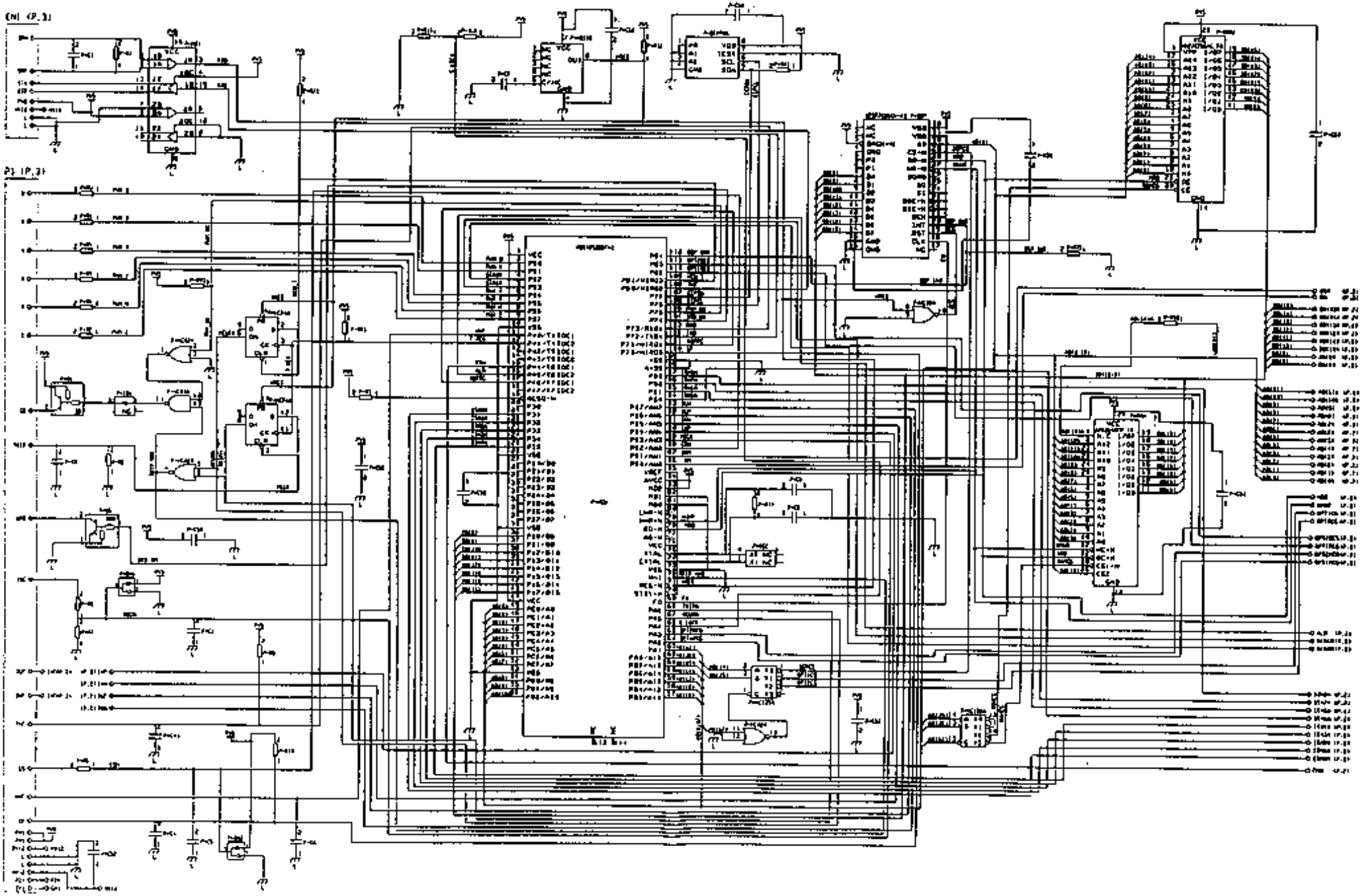
Type	Structural drawing No. (200 V class)	Structural drawing No. (400 V class)
J33-055	3T812194	3T812195
J300-075		
J300-110	3T812497	3T812499
J300--150	3T812498	
J300-220	3T812511	3T812512
J300-300	3T812871	3T812875
J300-370		
J300-450	3T812873	3T812876
J300-550		

No.	Operation conditions	Phenomena	Improvements NOTE: The setting methods shown below apply to DOP and DRW operations.	Display, etc.
1	Trial running of motor only	The motor runs unsmoothly, and the revolution fails to increase. The motor current pulsates.	1. When V/f control or sensor-less vector control is selected Function mode • F-36 CARRIER 16.0 kHz → 8.0 kHz Decrease the initial value.	12.3 Function mode F-36 (P.12-16) in Instruction Manual
2	Light load, low inertia load			
3	Acceleration and deceleration of light load or low inertia load	  The motor revolution fails to increase smoothly	2. When V/f control is selected Function mode • F-04 CONTROL VC • F-05 AUX R1 00.223 → 00.323 Increase the initial value. 3. When sensor-less vector control is selected Function mode • F-04 CONTROL SLV • F-05 AUX DATA NOR ① AUX J 001.22 kgm2 → 000.22 kgm2 Decrease the initial value. ② AUX Kp 002.00 → 003.00 Increase the initial value. Use ① and ② solely or combine any of ① and ② to adjust the motor constant.	12.3 Function mode F-04 (P.12-5) 12.3 Function mode F-05 (P.12-5) NOTE: Select AUT if the automatic tuning data is used.) Use the second function for switching operation of two motors.

No.	Operation conditions	Phenomena	Improvements NOTE: The setting methods shown below apply to DOP and DRW operations.	Display, etc.
4	Quickly varying load	 The motor revolution varies when the load varies.	When sensor-less vector control is selected Function mode • F-04 CONTROL SLV • F-05 AUX DATA NOR ① AUX J 00.122 kgm2 → 003.22 kgm2 Increase the initial value. ② AUX Kp 002.00 → 001.00 Decrease the initial value.	NOTE: Select AUT if the automatic tuning data is used.)

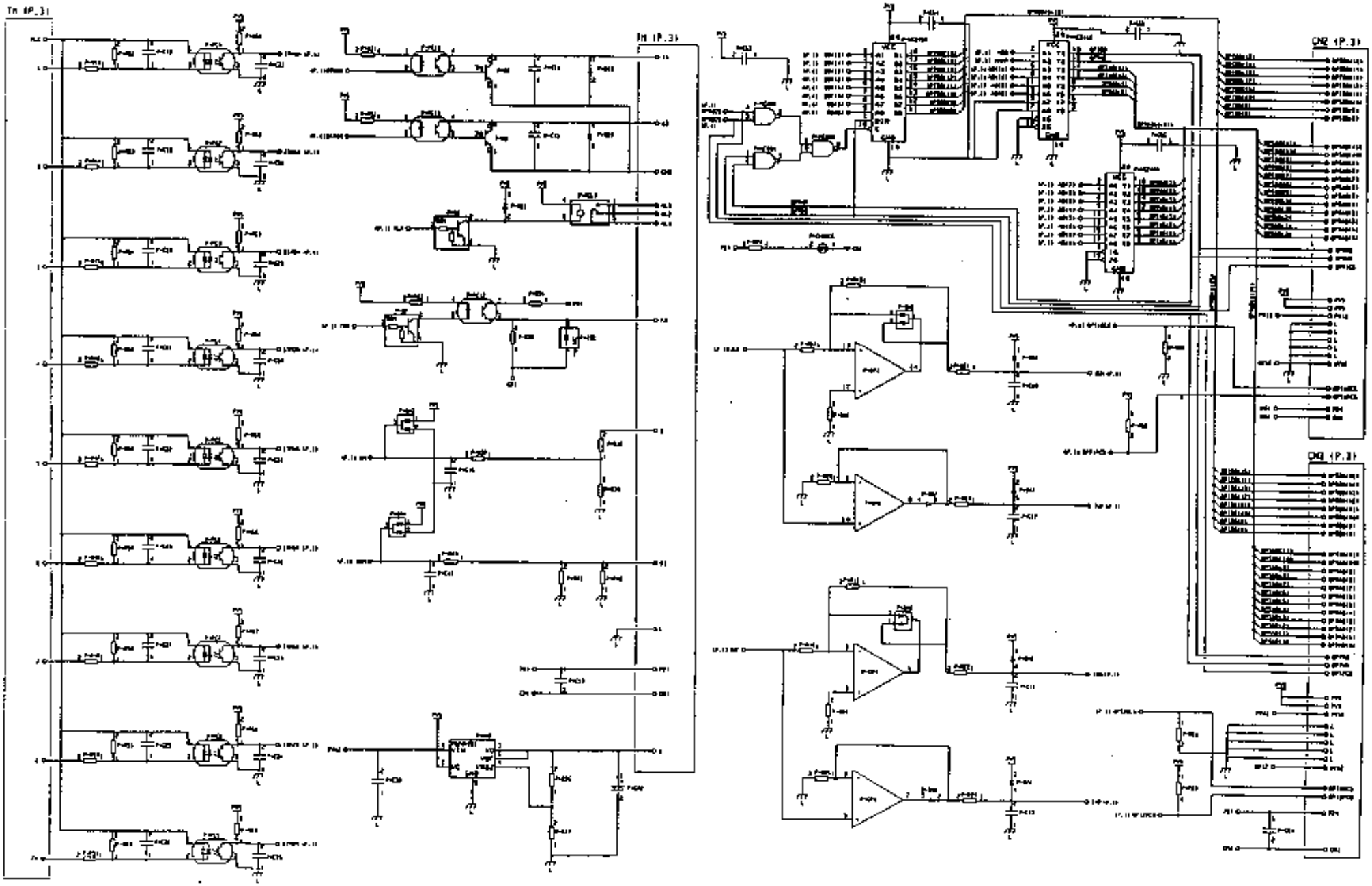
NOTE: When sensor-less vector is selected, driving of motor at low speed whose constant is different from the factory settings may cause reverse run. In this case, measure the motor constant using the automatic tuning mode or reduce the setting value of primary resistor (R1) of the motor.

No.	Operation conditions	Phenomena	Improvements NOTE: The setting methods shown below apply to DOP and DRW operations.	Display, etc.
5	Parallel motor operation	Operation cannot be started at high torque, since the inverter does not know the load sharing of the motors.	1. When sensor-less vector control is selected Function mode • F-04 CONTROL SLV → VC Reset to V/f control. Select the motor capacity which is the most approximate to the total capacity of the motors used. (For example, 7.5 kW, 5.5 kW, and 3.7 kW.) Function mode Total capacity of the motors: 7.5 + 5.5 + 3.7 = 16.7kW • F-05 AUX K 022.00 kW → 015.00 kW Select the most approximate value to the total capacity. If two or more motors are changed in operation, select the most approximate value to the motor capacity. Example 1: One 5.5 kW motor is used • F-05 AUX K 022.00 kW → 005.50 kW Select the most approximate value. Example 2: One 5.5 kW motor is changed into parallel operation of four 5.5 kW motors Total capacity of the motors: 5.5 x 4 = 22.0 kW • F-04 AUX K 005.50 kW → 022.00 kW Select the most approximate value.	12.3 Function mode F-04 (P.12-5) The sensor-less vector control is not applicable to multi-motor parallel operation.



Logic PCB drawing (1/3)

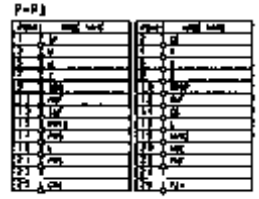
2T800873



Logic PCB drawing (2/3)

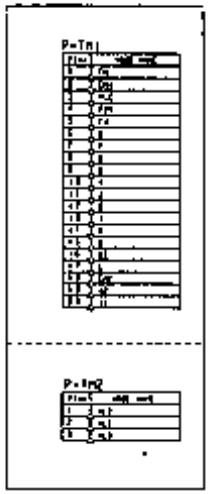
2T800874

Connector for main circuit

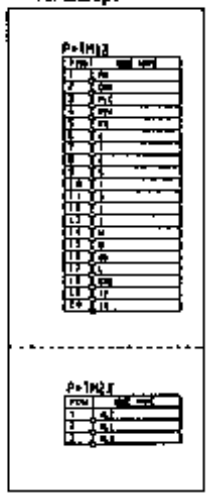


Connector for operator

Terminal block for domestic

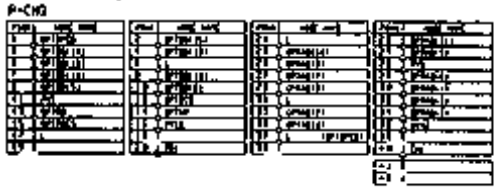


Terminal block for Europe

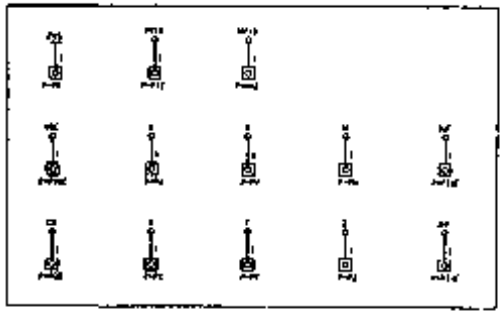


Connector for option 1

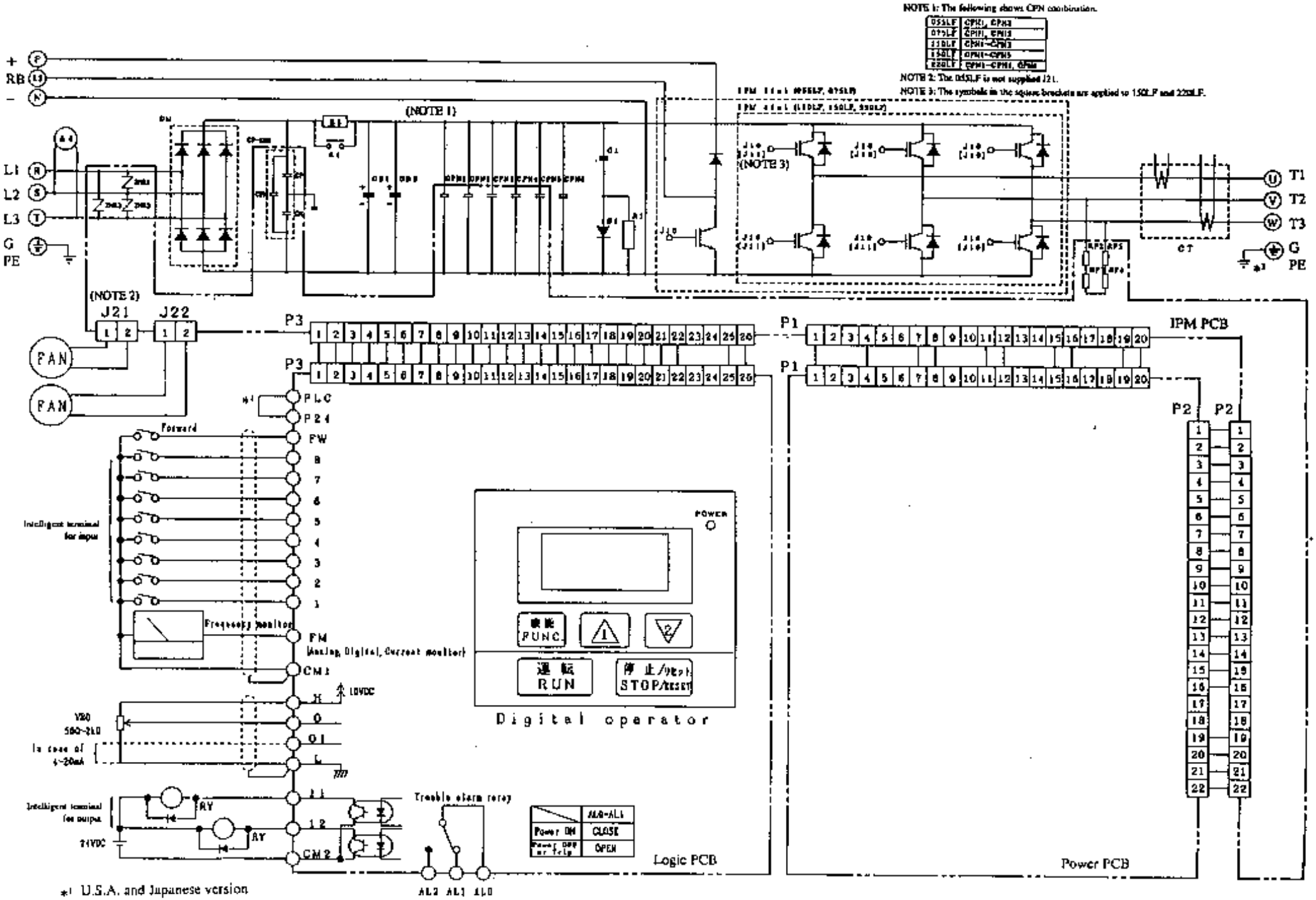
Connector for option 2



Check round

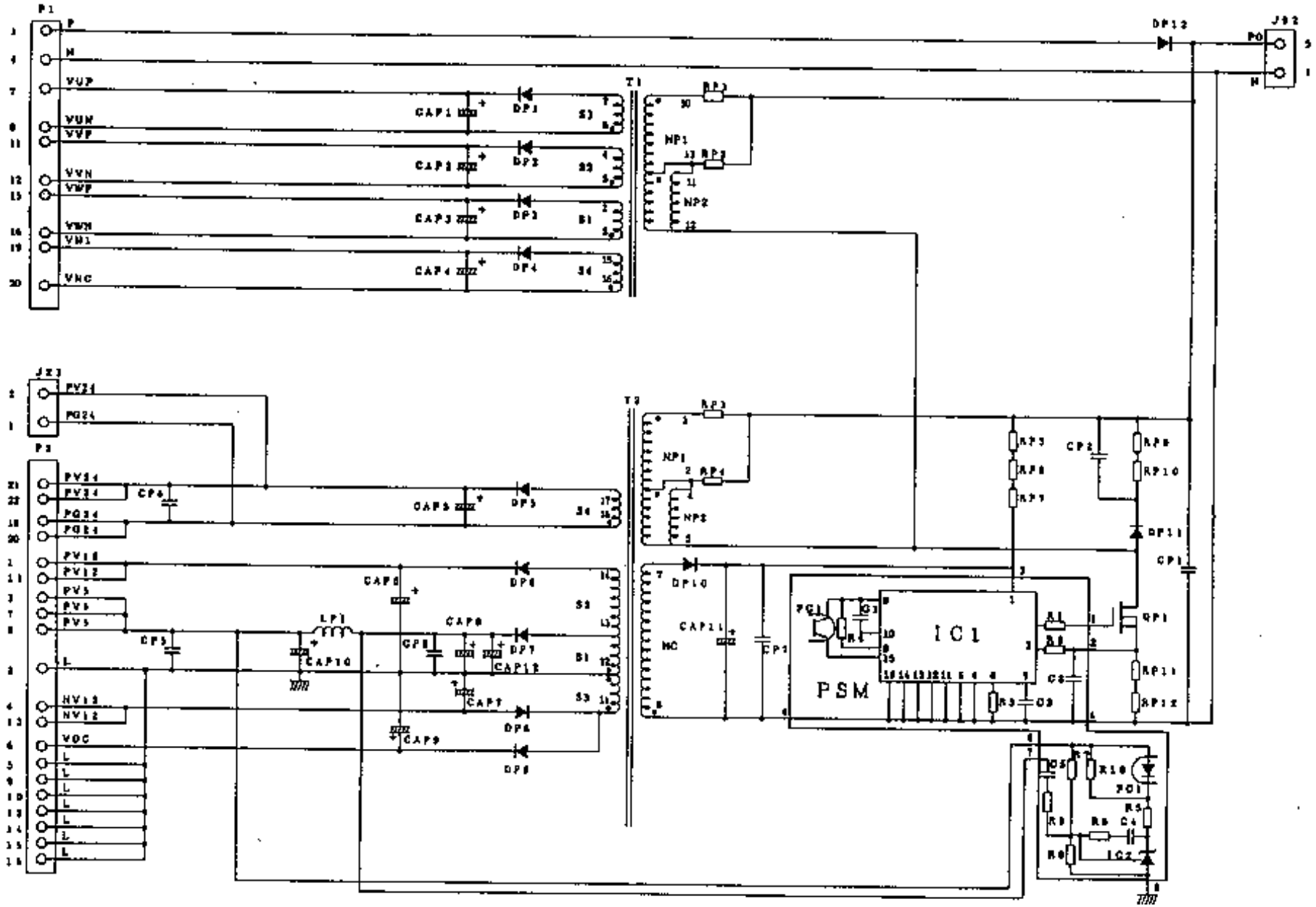


NOTE
(1) IC power connection: HCXX >> PV5 power supply
OP1 >> PV12, NV12 power supply



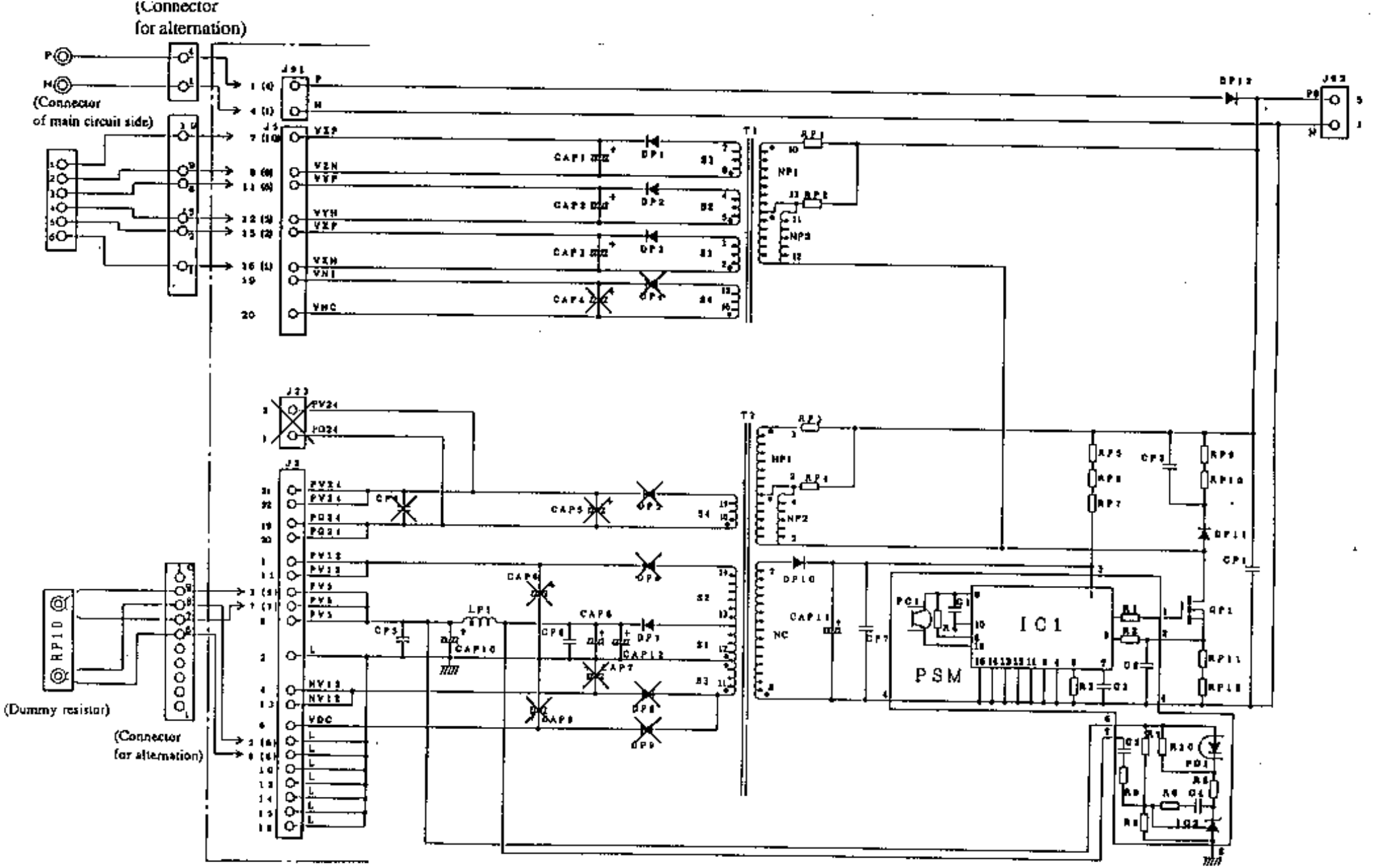
J300-055-220LF
Main Circuit drawing

3T812513



J300-055-220LF, HF
Power PCB drawing

3T812883



NOTE 1: The figures in the parentheses show the pin No. of the connector for alternation.
NOTE 2: The mark x shows that no parts are suppplied.

J300-300-550LF, HF
Auxiliary power PCB drawing

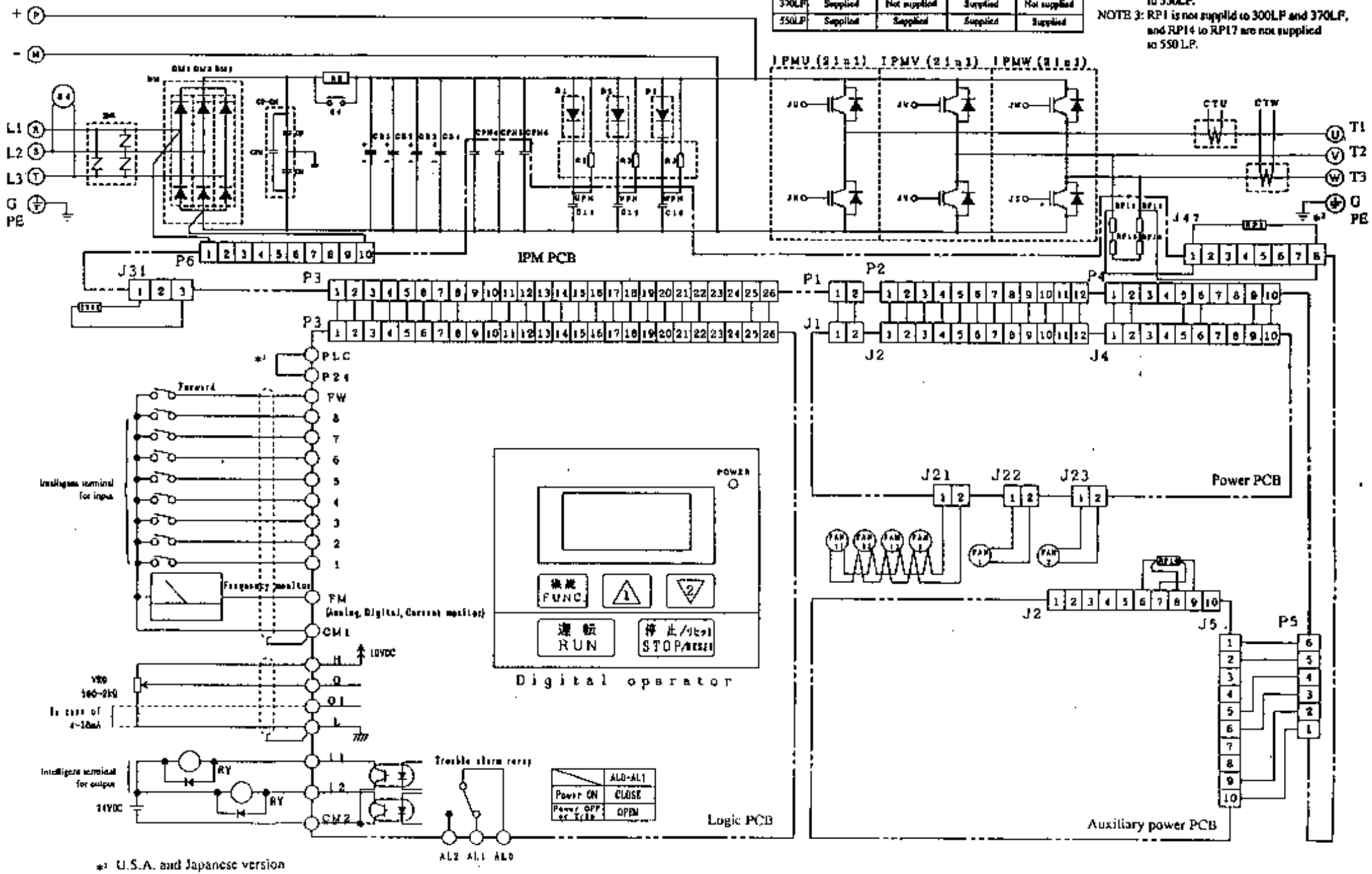
3T812886

NOTE 1: The following shows FAN combination.

	FAN1,2	FAN3	FAN11, 12	FAN13
300LF	Supplied	Not supplied	Supplied	Not supplied
370LF	Supplied	Not supplied	Supplied	Not supplied
550LF	Supplied	Supplied	Supplied	Supplied

NOTE 2: DM is applied to 300LF and 370LF, and DM1, DM2, and DM3 are applied to 550LF.

NOTE 3: RP1 is not supplid to 300LF and 370LF, and RP14 to RP17 are not supplied to 550LF.



*1 U.S.A. and Japanese version

*2 U.S.A. version

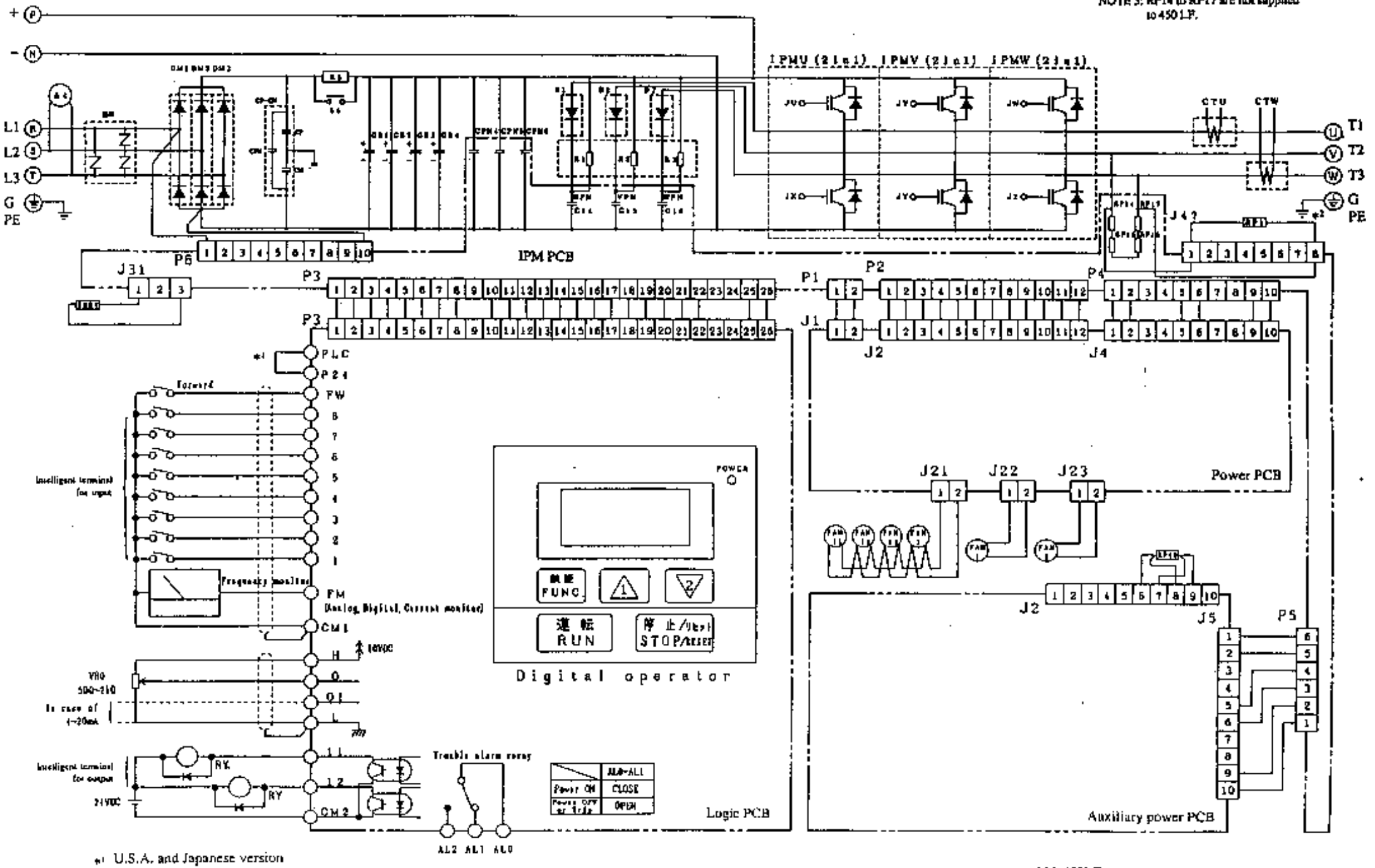
J300-300, 370, 550LF
Main Circuit drawing

3T812884 (1/2)

NOTE 1: The following shows FAN combination.

	FAN1,3	FAN3	FAN1, 12	FAN13
450LF	Supplied	Supplied	Supplied	Not supplied

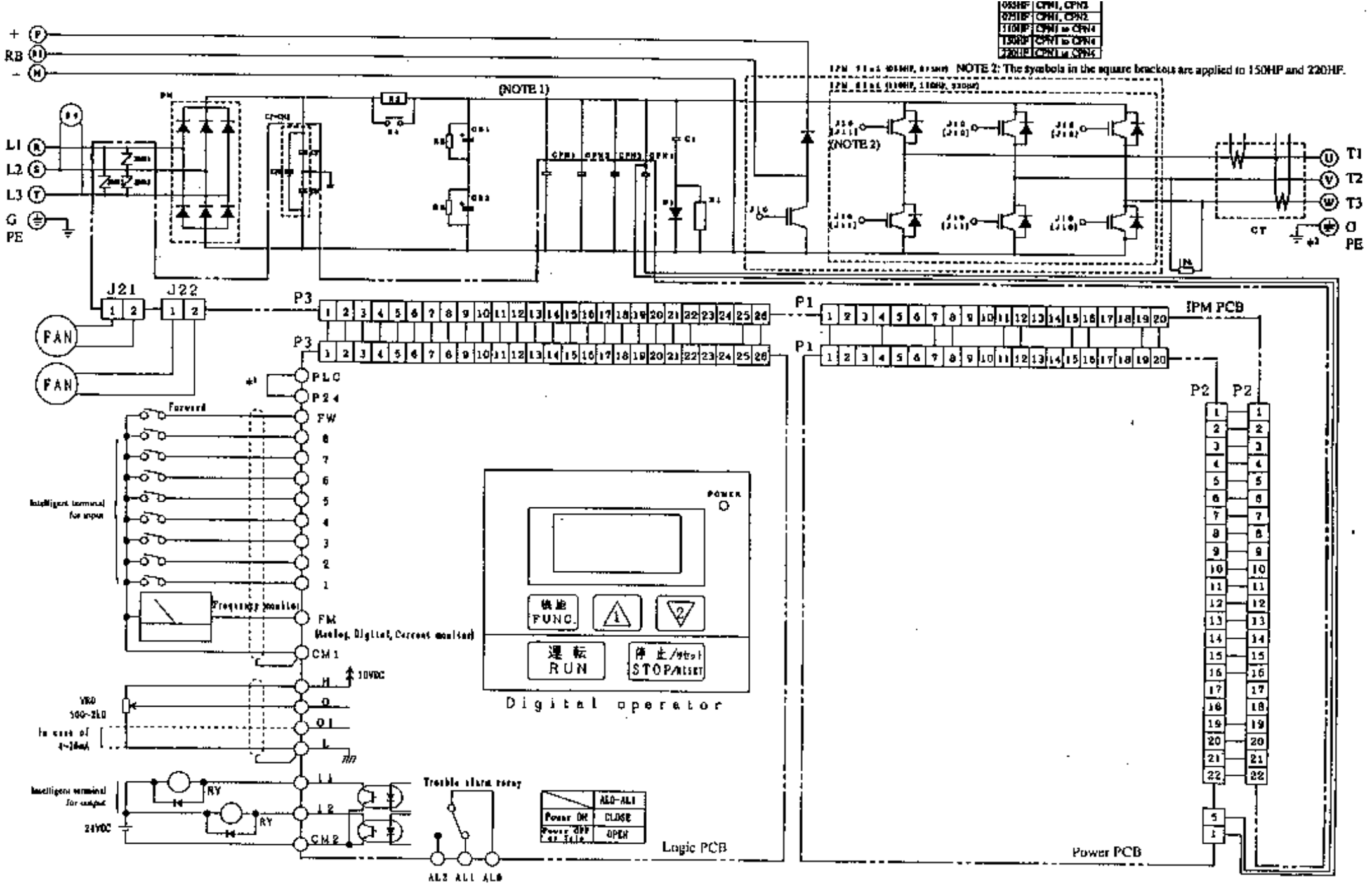
NOTE 2: DM1, DM2, and DM3 are applied to 450LF.
NOTE 3: RP14 to RP17 are not supplied to 450LF.



*1 U.S.A. and Japanese version
*2 U.S.A. version

3300-450LF
Main Circuit drawing

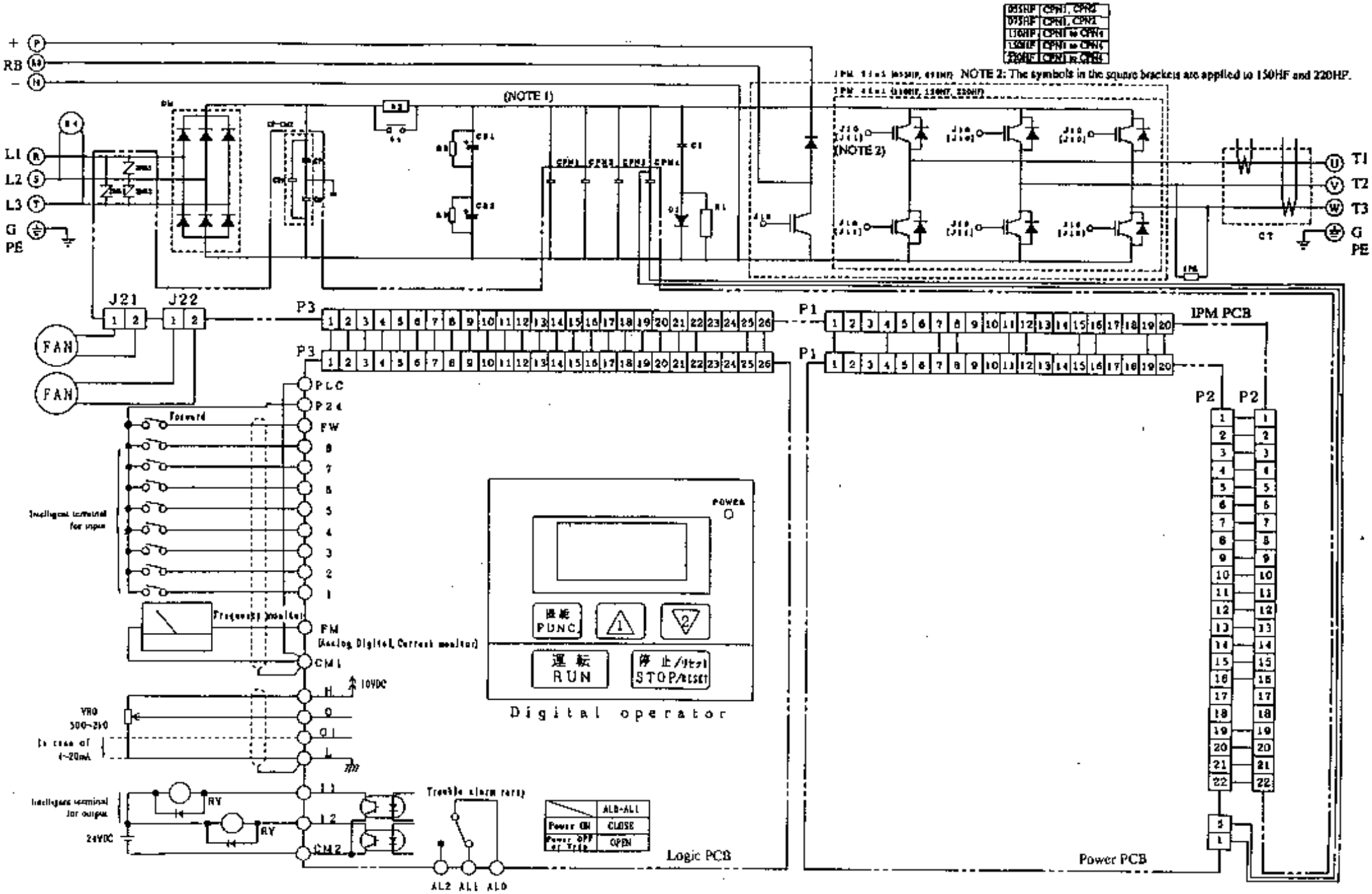
3T812884 (2/2)



*1 U.S.A. and Japanese version
*2 U.S.A. version

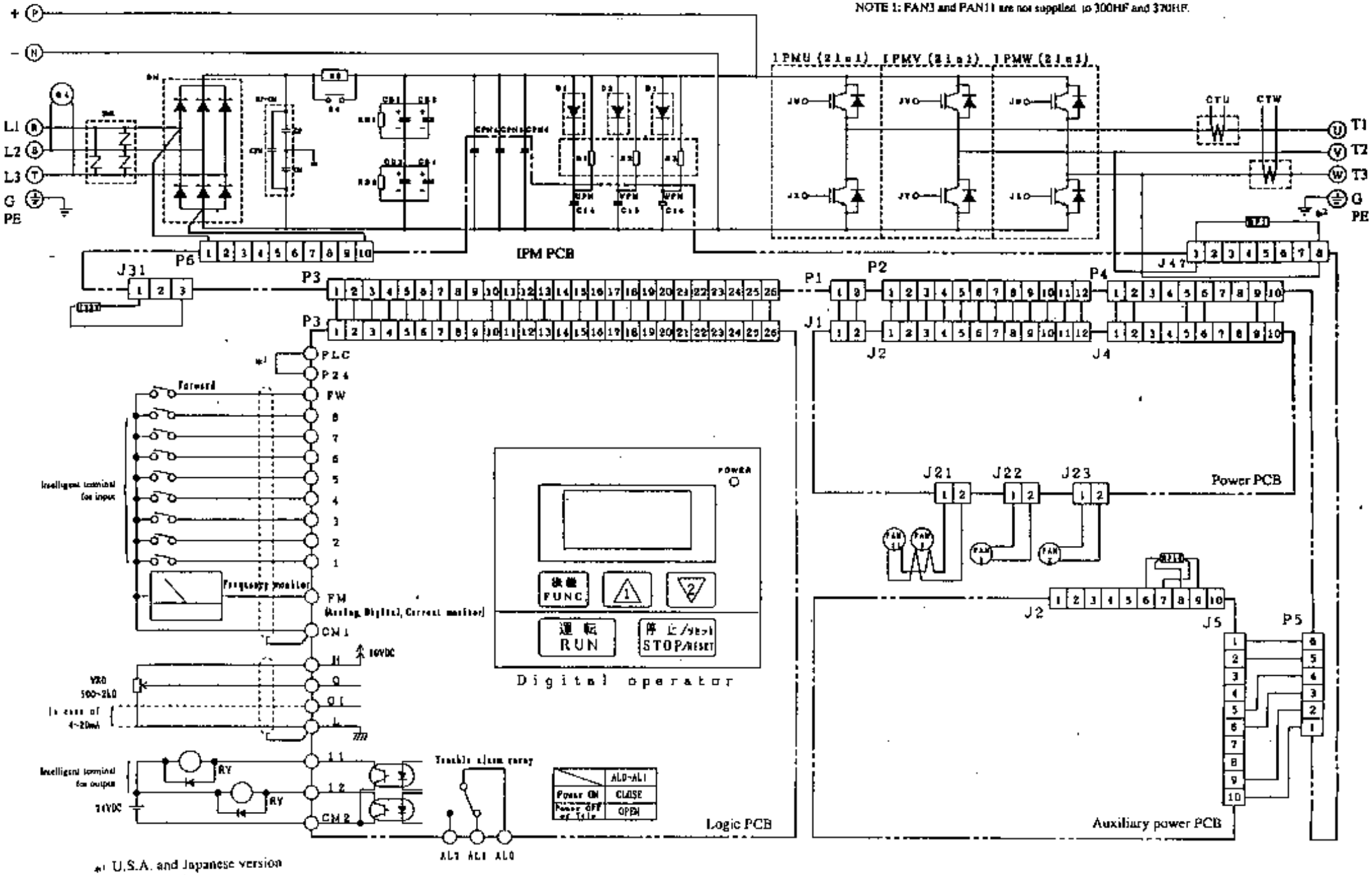
J300-055-220HF
Main Circuit drawing

3T812514



J300-055-220HFE
Main Circuit drawing

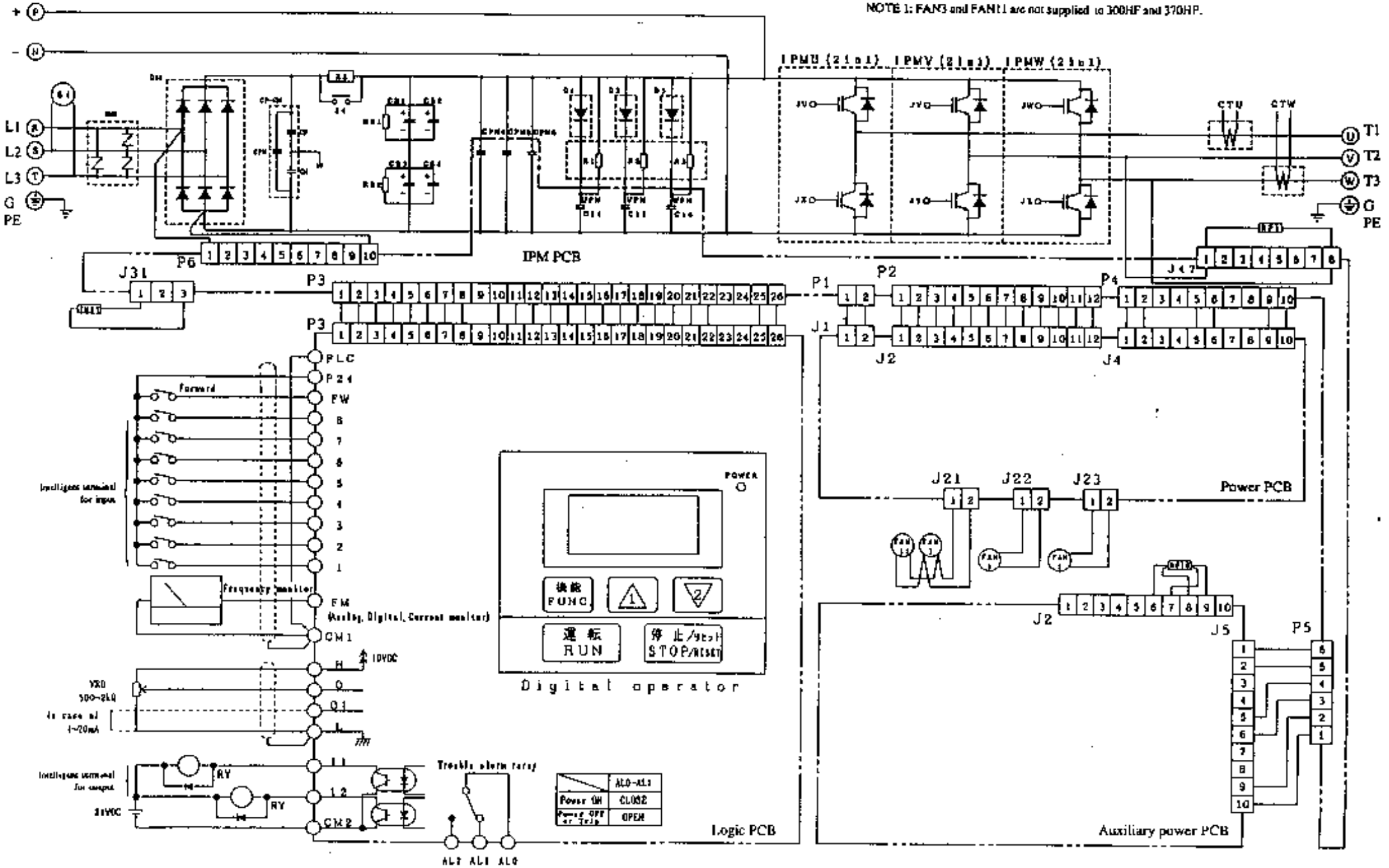
3T812514E



*1 U.S.A. and Japanese version
*2 U.S.A. version

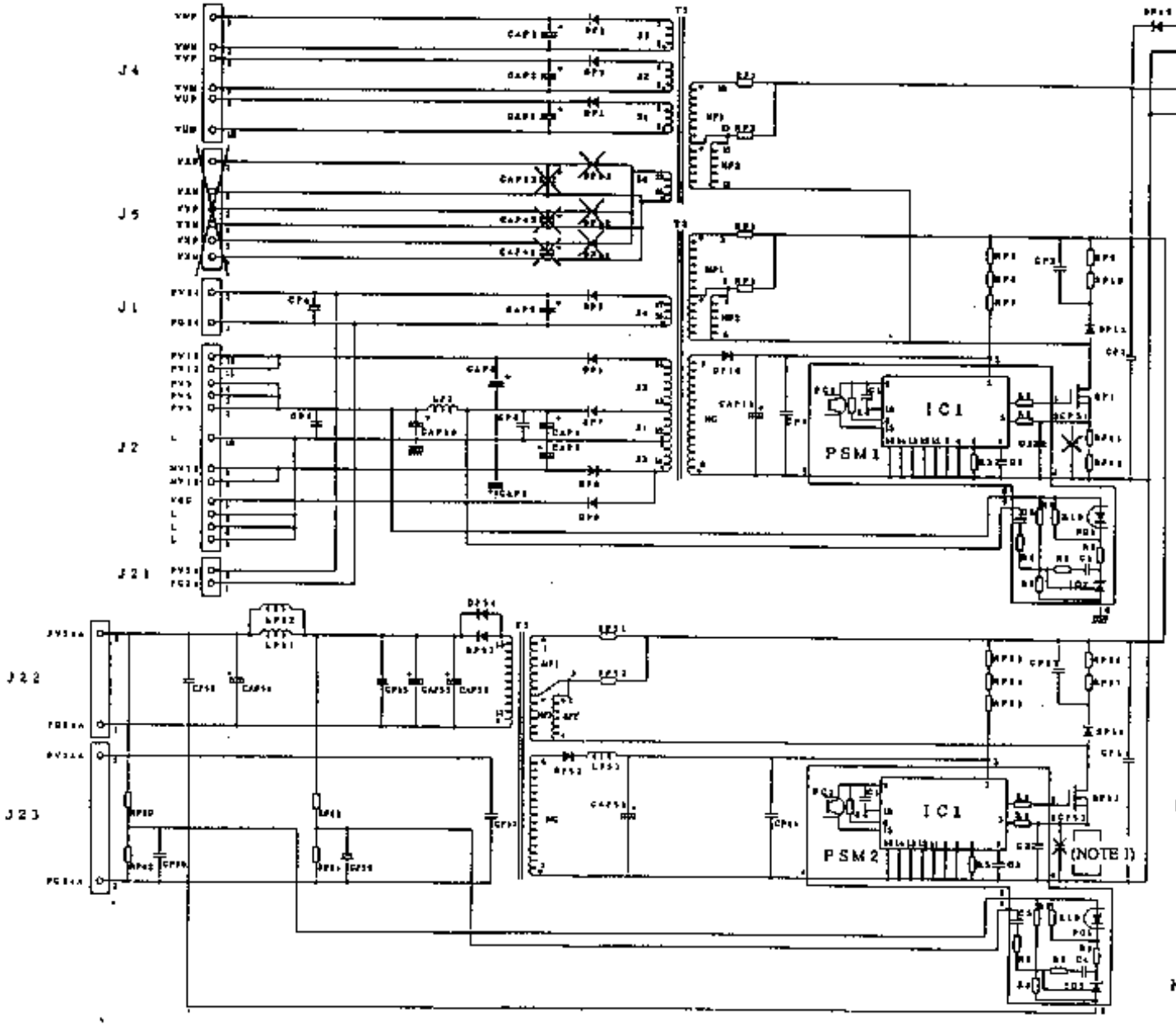
J300-300-550HF
Main Circuit drawing

3T812885

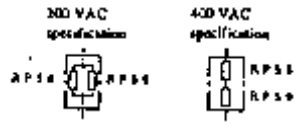


J300-300-550HFE
Main Circuit drawing

3T812885E



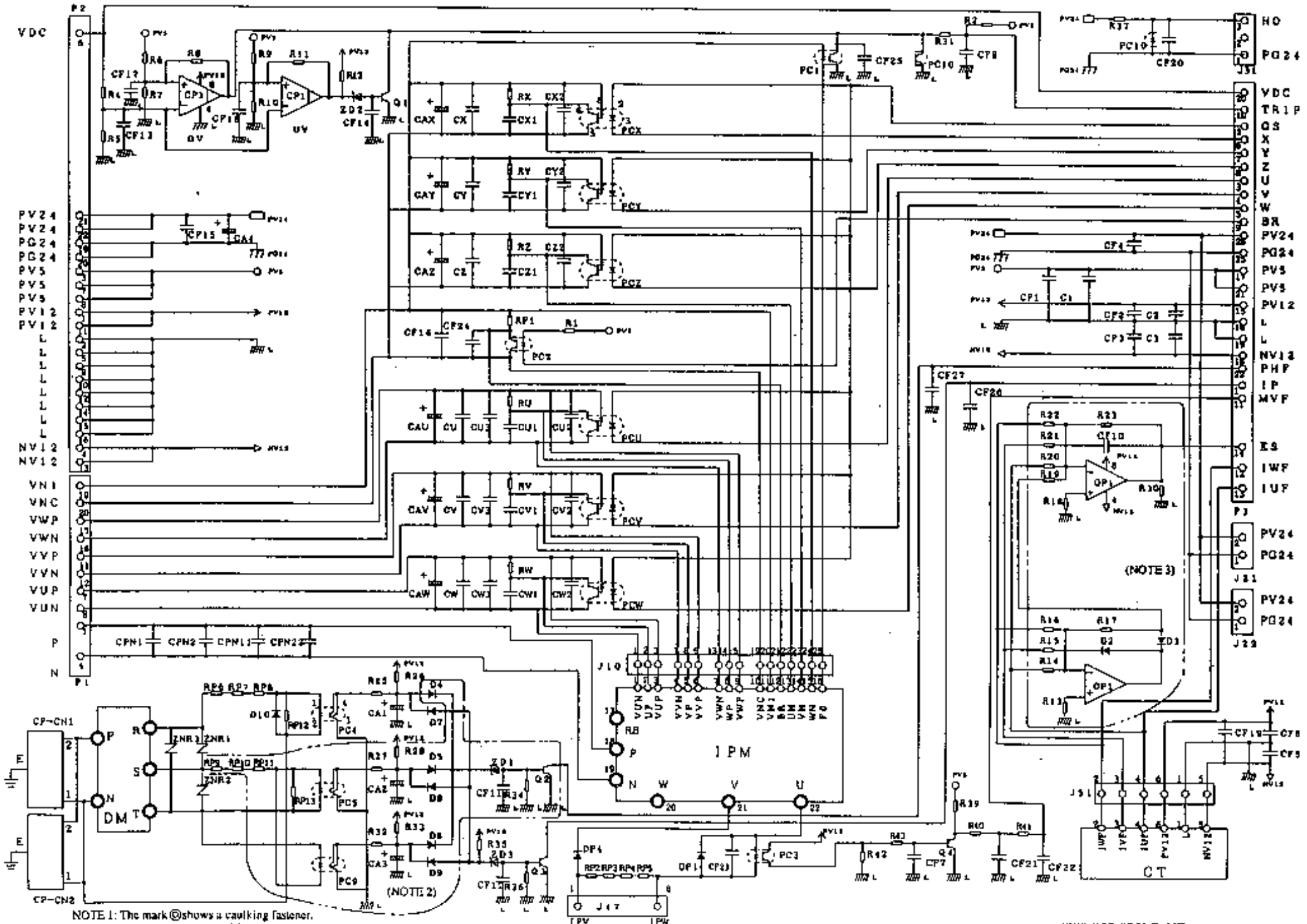
NOTE 1: The following shows the 200 VAC specification and 400 VAC specification.



NOTE 2: The mark × shows that no parts are supplied.

J300-300-550LP, HF
Power PCB drawing

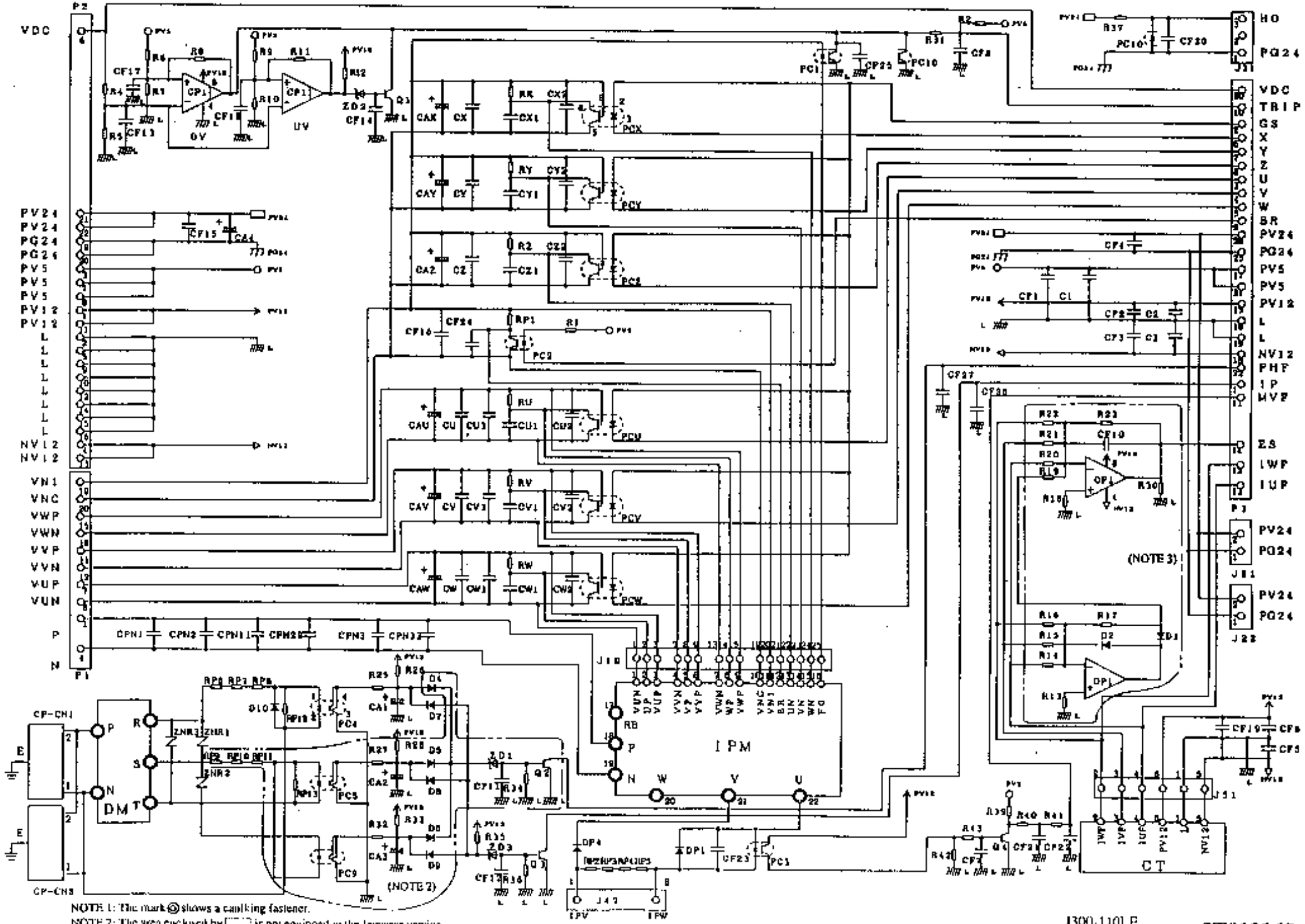
2T800884



NOTE 1: The mark ⓐ shows a caulking fastener.
NOTE 2: The area enclosed by [ ] is not equipped in the Japanese version.
NOTE 3: Option

J300-055-075LF, HF
IPM PCB drawing

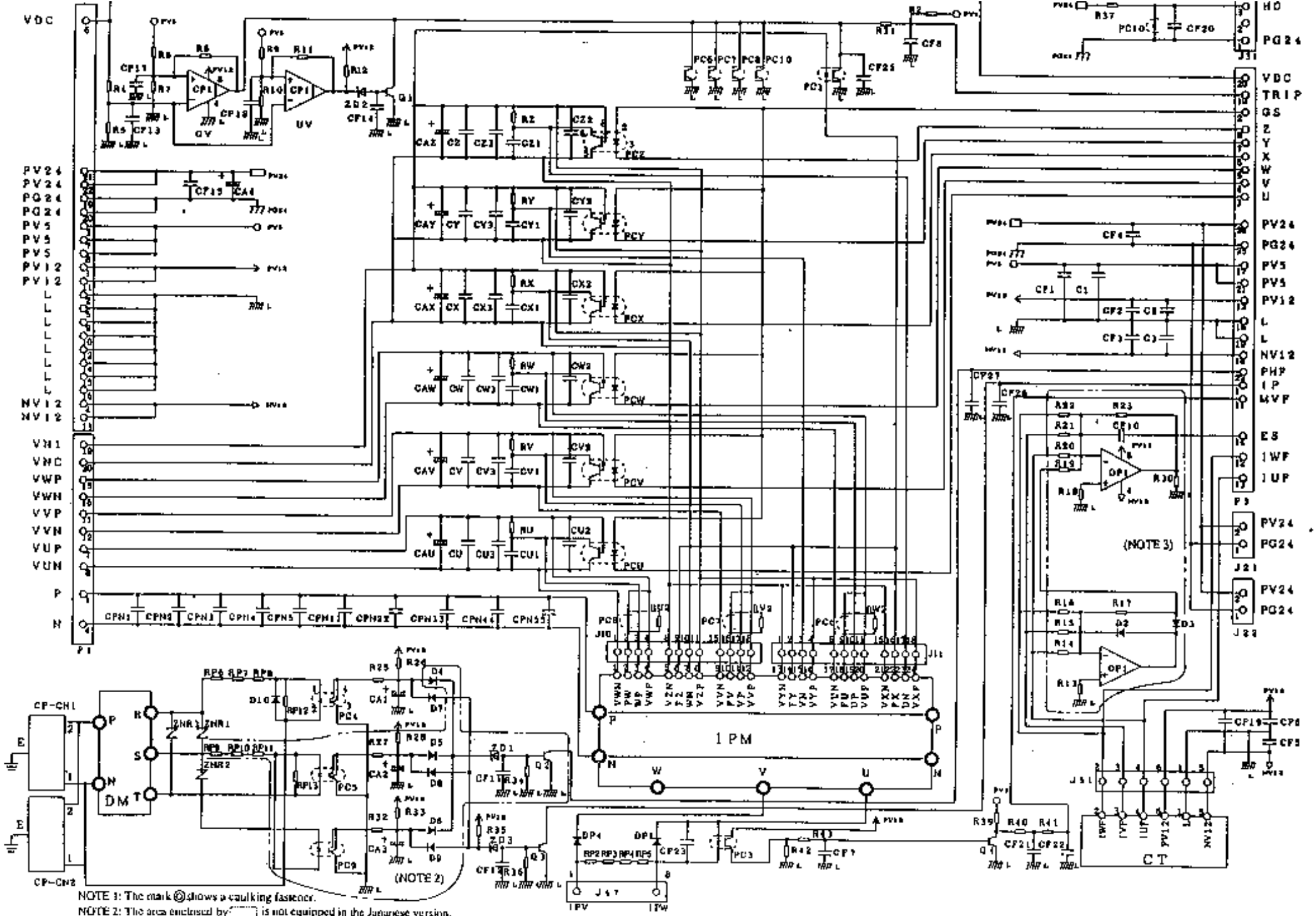
3T813164



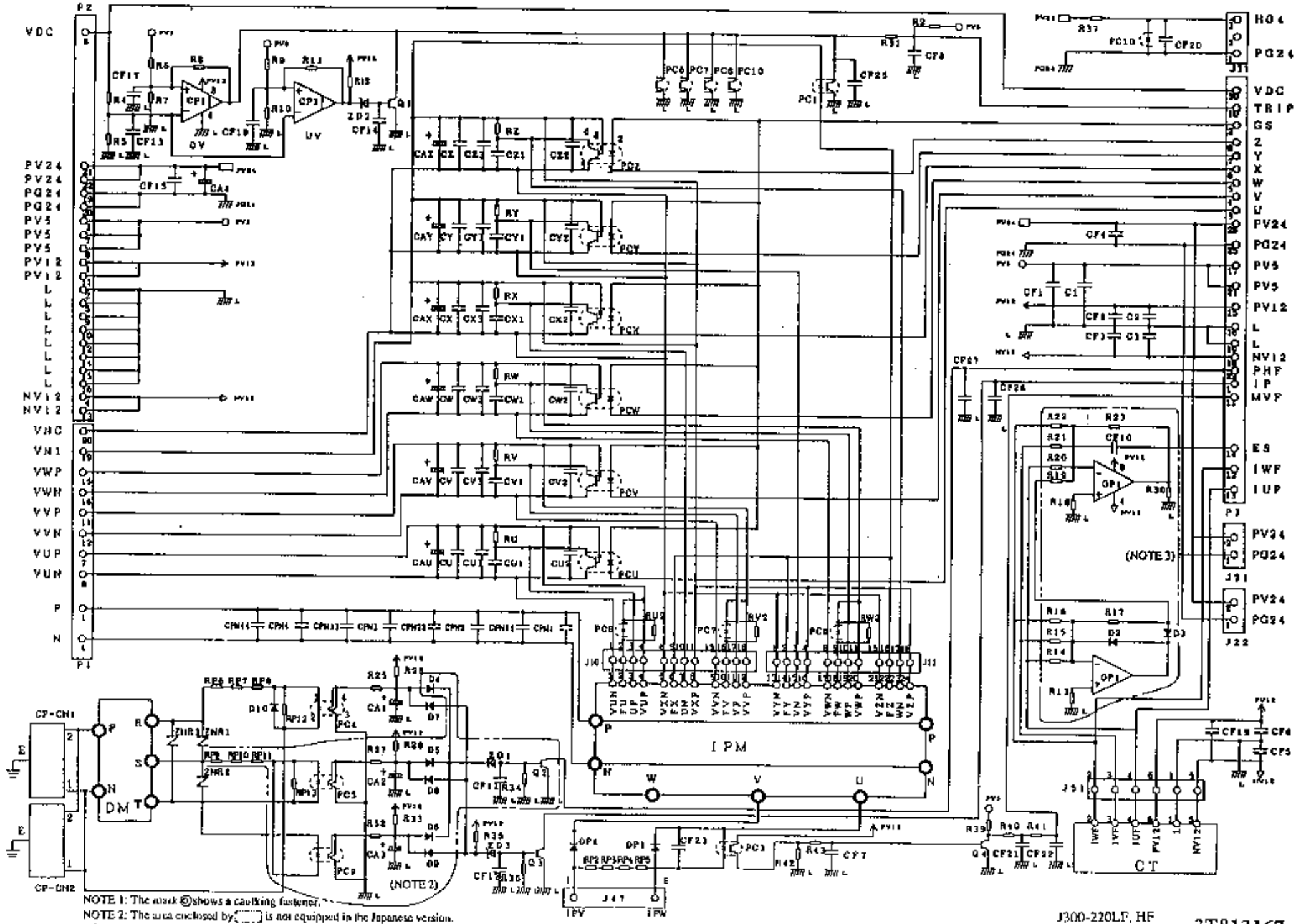
NOTE 1: The mark ⓖ shows a caulking fastener.
NOTE 2: The area enclosed by [ ] is not equipped in the Japanese version.
NOTE 3: Option

J300-110LP
IPM PCB drawing

3T813165



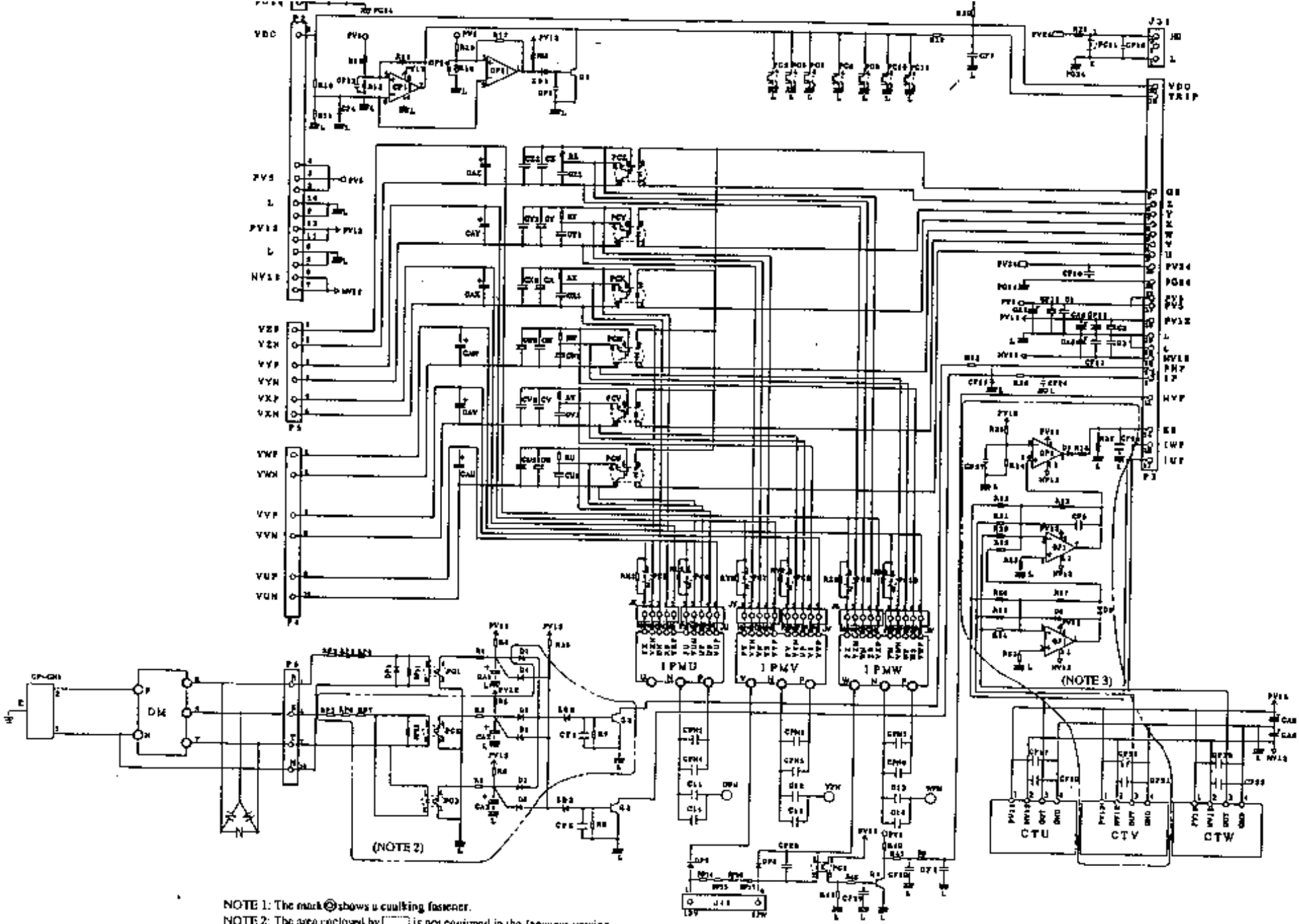
NOTE 1: The mark ◎ shows a caulking fastener.
NOTE 2: The area enclosed by [ ] is not equipped in the Japanese version.
NOTE 3: Option



NOTE 1: The mark ◎ shows a caulking fastener.
NOTE 2: The area enclosed by [ ] is not equipped in the Japanese version.
NOTE 3: Option

J300-220LF, HF
IPM PCB drawing

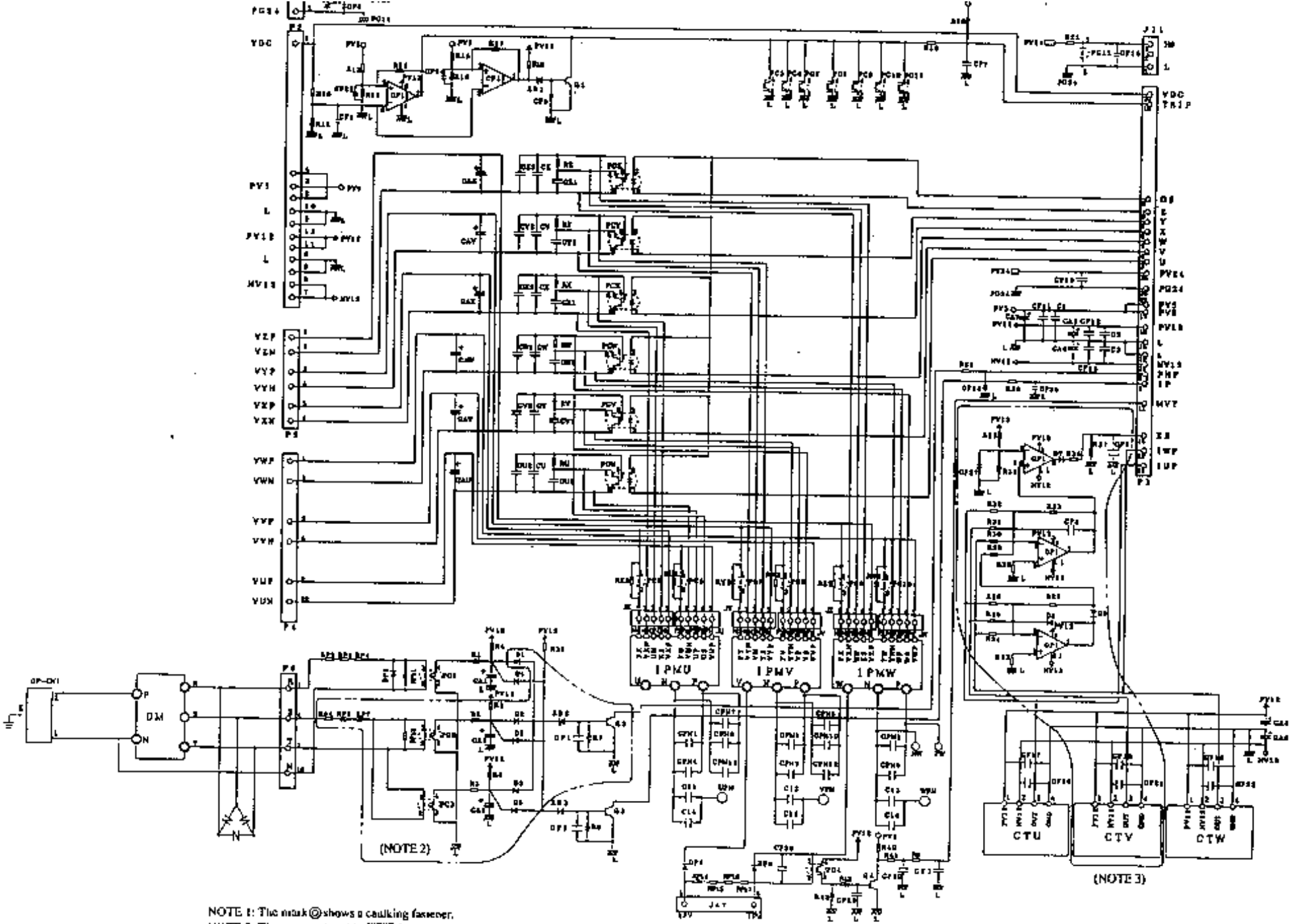
3T813167



NOTE 1: The mark ⓒ shows a caulking fastener.
NOTE 2: The area enclosed by [ ] is not equipped in the Japanese version.
NOTE 3: Option

J3(X)-450LF, 300-370HF
IPM PCB drawing

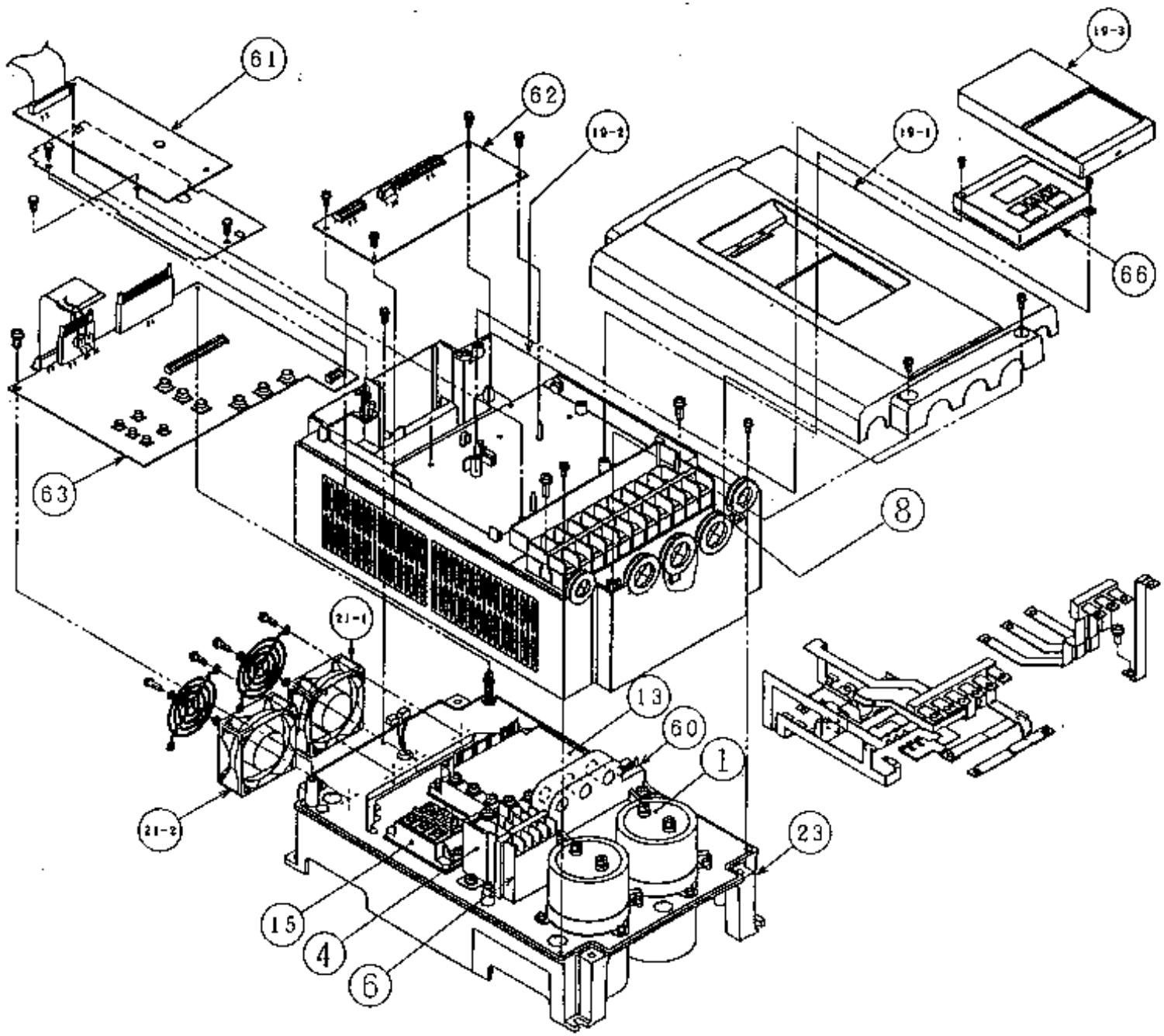
2T800885



NOTE 1: The mark ◎ shows a caulking fastener.
NOTE 2: The area enclosed by [ ] is not equipped in the Japanese version.
NOTE 3: Option

J300-550LF, 450-550HF
IPM PCB drawing

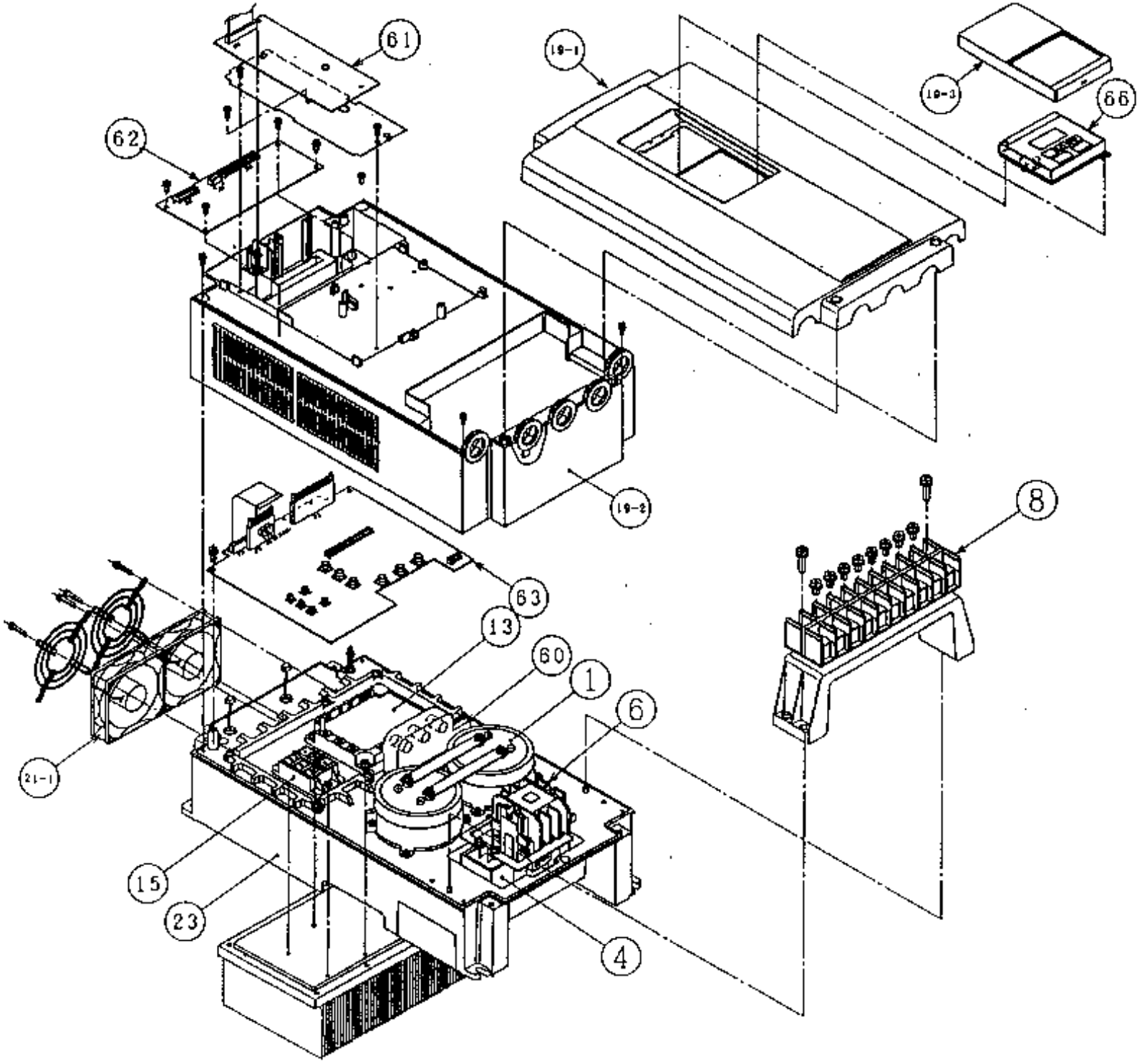
2T800886



Parts No	Short title	Parts name	055LF QTY/unit	075LF QTY/unit
1	CB	Smoothing capacitor	2	2
4	RS	Current limiting resistor	1	1
6	84	Electromagnetic contactor	1	1
8	TM	Main circuit terminal block	1	1
13	PM	Inverter module	1	1
15	DM	Diode module	1	1
19_1	CV	Front cover	1	1
19_2	CV	Cover	1	1
19_3	CV	Digital operator blind cover	1	1
21_1	FAN	Cooling fan	1	1
21_2	FAN	Cooling fan	–	1
23	CS	Case	1	1
60	CT2	CT(for current detection)	1	1
61	PCB	Logic PCB	1	1
62	PCB	Power PCB	1	1
63	PCB	IPM PCB	1	1
66	PANEL	Digital operator	1	1

J300-055-075LF
Structural drawing

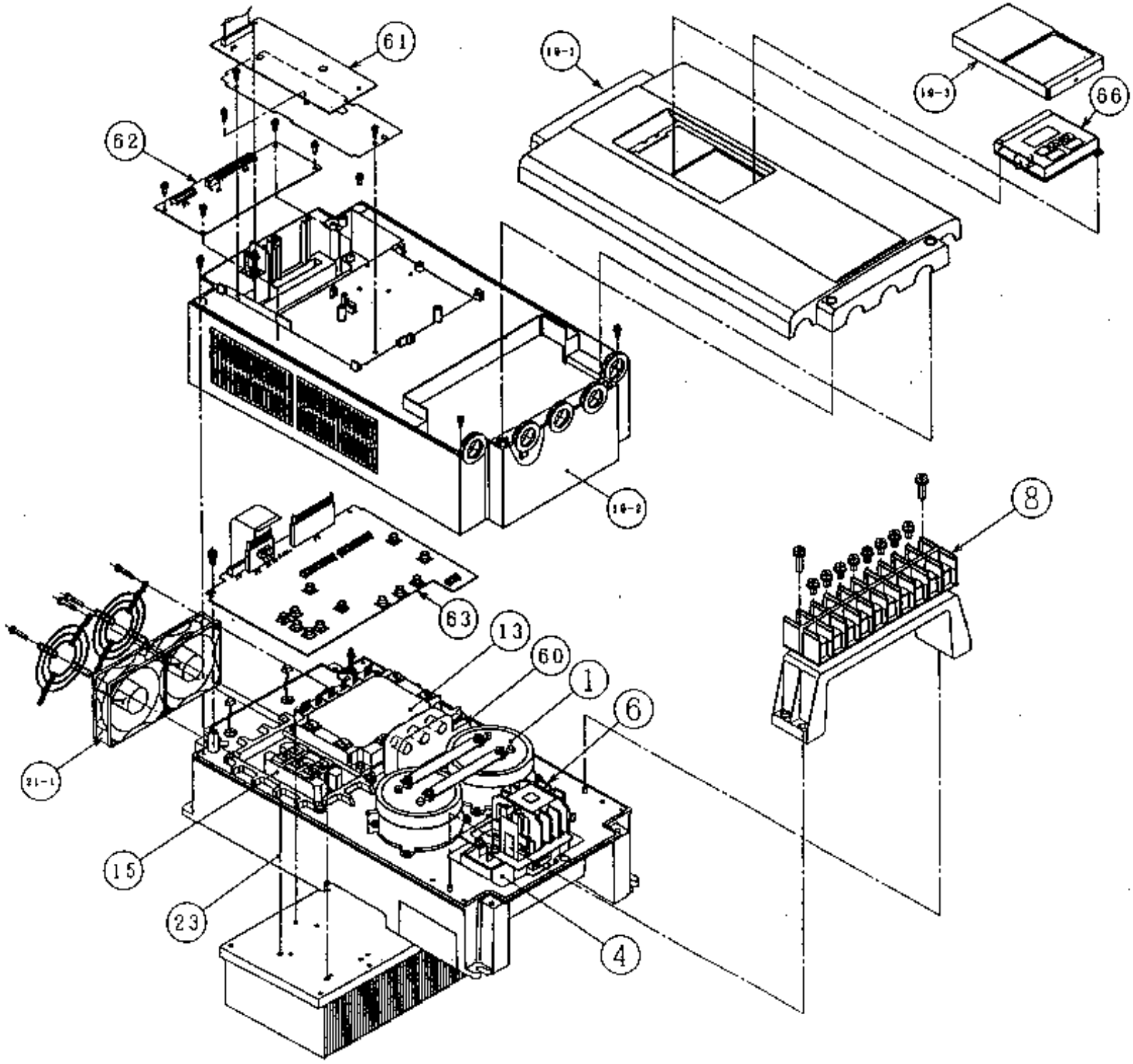
3T812194



Parts No	Short title	Parts name	QTY/ unit
1	CB	Smoothing capacitor	2
4	RS	Current limiting resistor	1
6	84	Electromagnetic contactor	1
8	TM	Main circuit terminal block	1
13	PM	Inverter module	1
15	DM	Diode module	1
19_1	CV	Front cover	1
19_2	CV	Cover	1
19_3	CV	Digital operator blind cover	1
21_1	FAN	Cooling fan	2
23	CS	Case	1
60	CT2	CT(for current detection)	1
61	PCB	Logic PCB	1
62	PCB	Power PCB	1
63	PCB	IPM PCB	1
66	PANEL	Digital operator	1

J300-110LF
Structural drawing

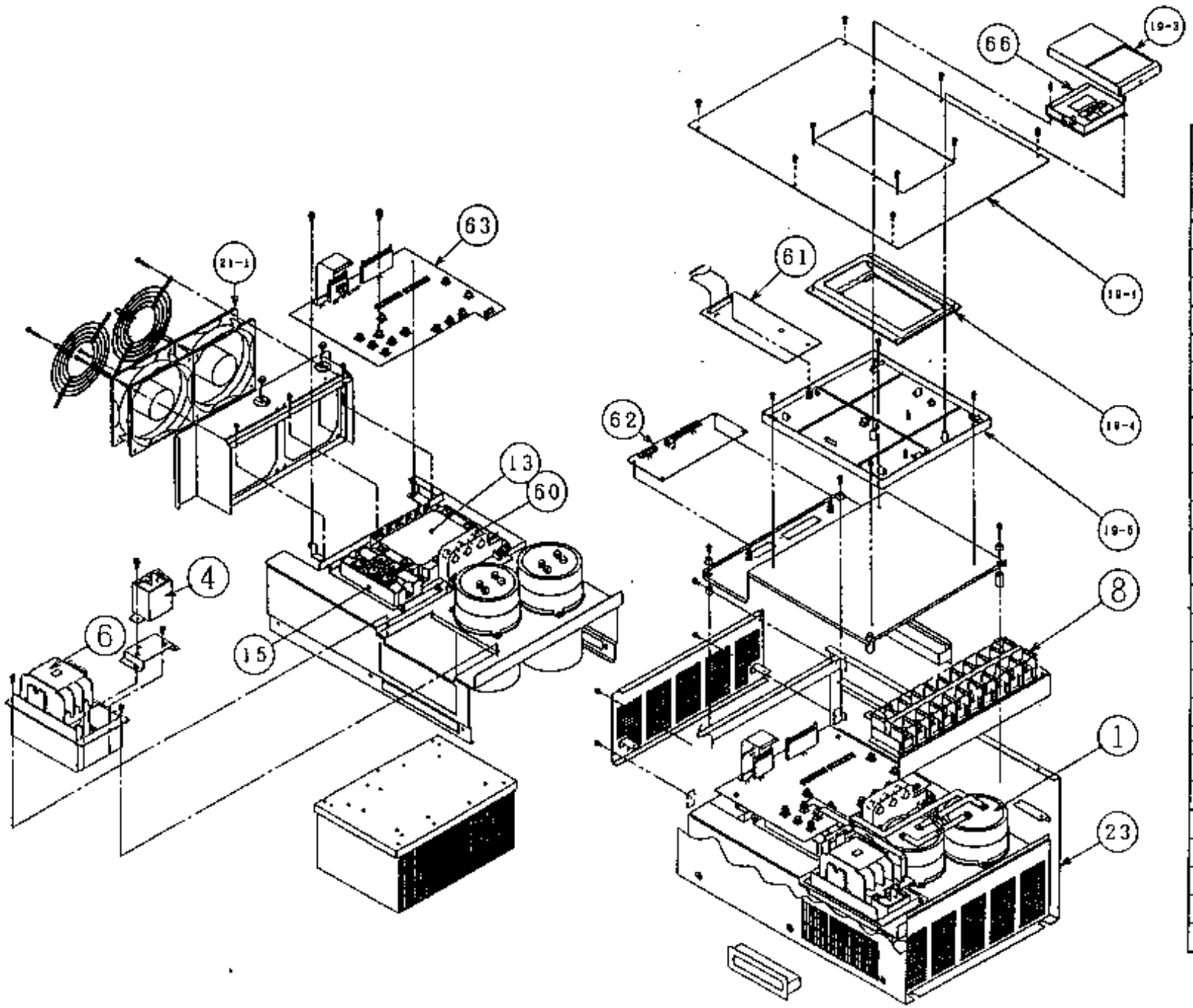
3T812497



Parts No	Short title	Parts name	QTY/ unit
1	CB	Smoothing capacitor	2
4	RS	Current limiting resistor	1
6	84	Electromagnetic contactor	1
8	TM	Main circuit terminal block	1
13	PM	Inverter module	1
15	DM	Diode module	1
19_1	CV	Front cover	1
19_2	CV	Cover	1
19_3	CV	Digital operator blind cover	1
21_3	FAN	Cooling fan	2
23	CS	Case	1
60	CT2	CT(for current detection)	1
61	PCB	Logic PCB	1
62	PCB	Power PCB	1
63	PCB	IPM PCB	1
66	PANEL	Digital operator	1

J300-150LF
Structural drawing

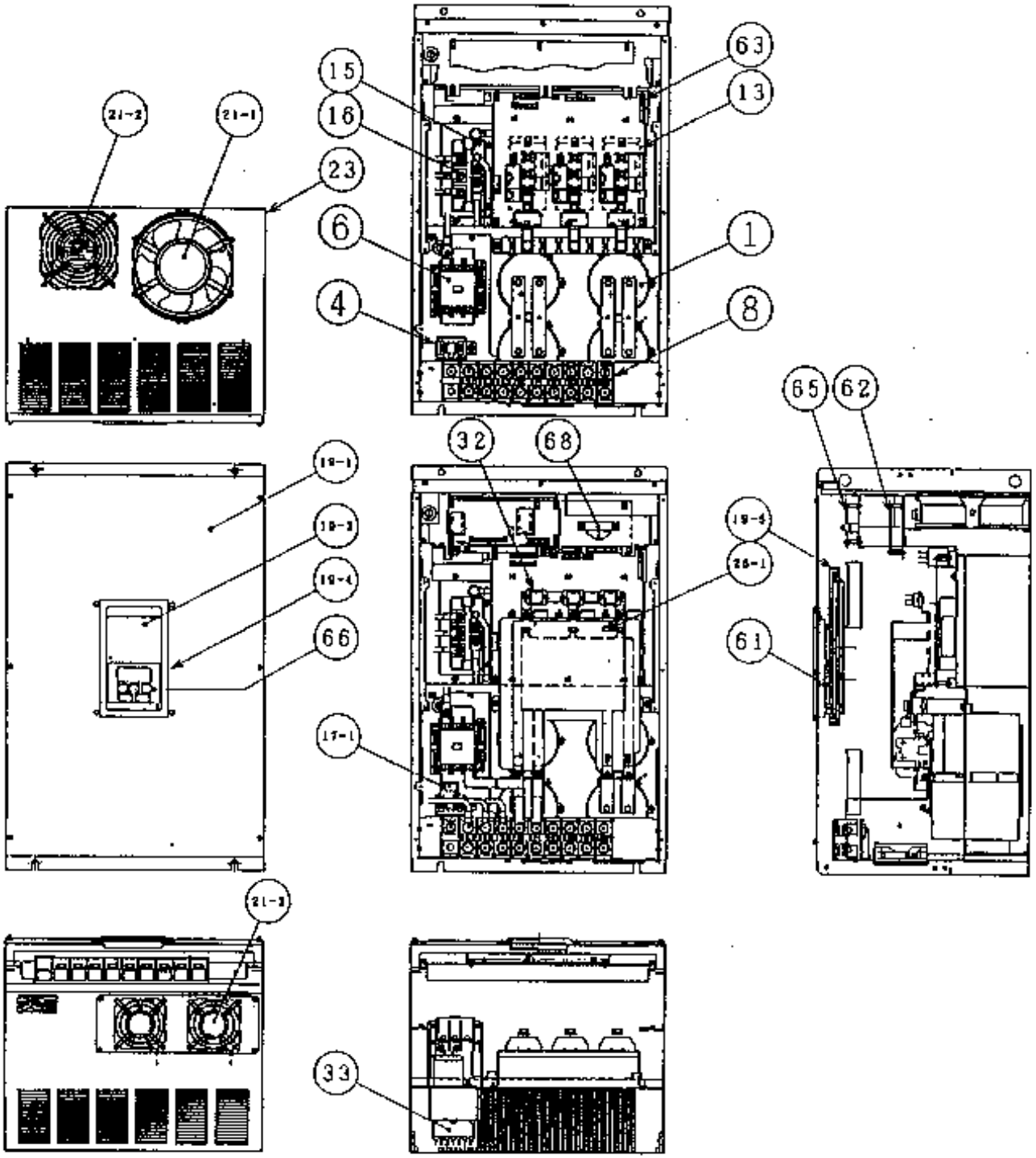
3T812498



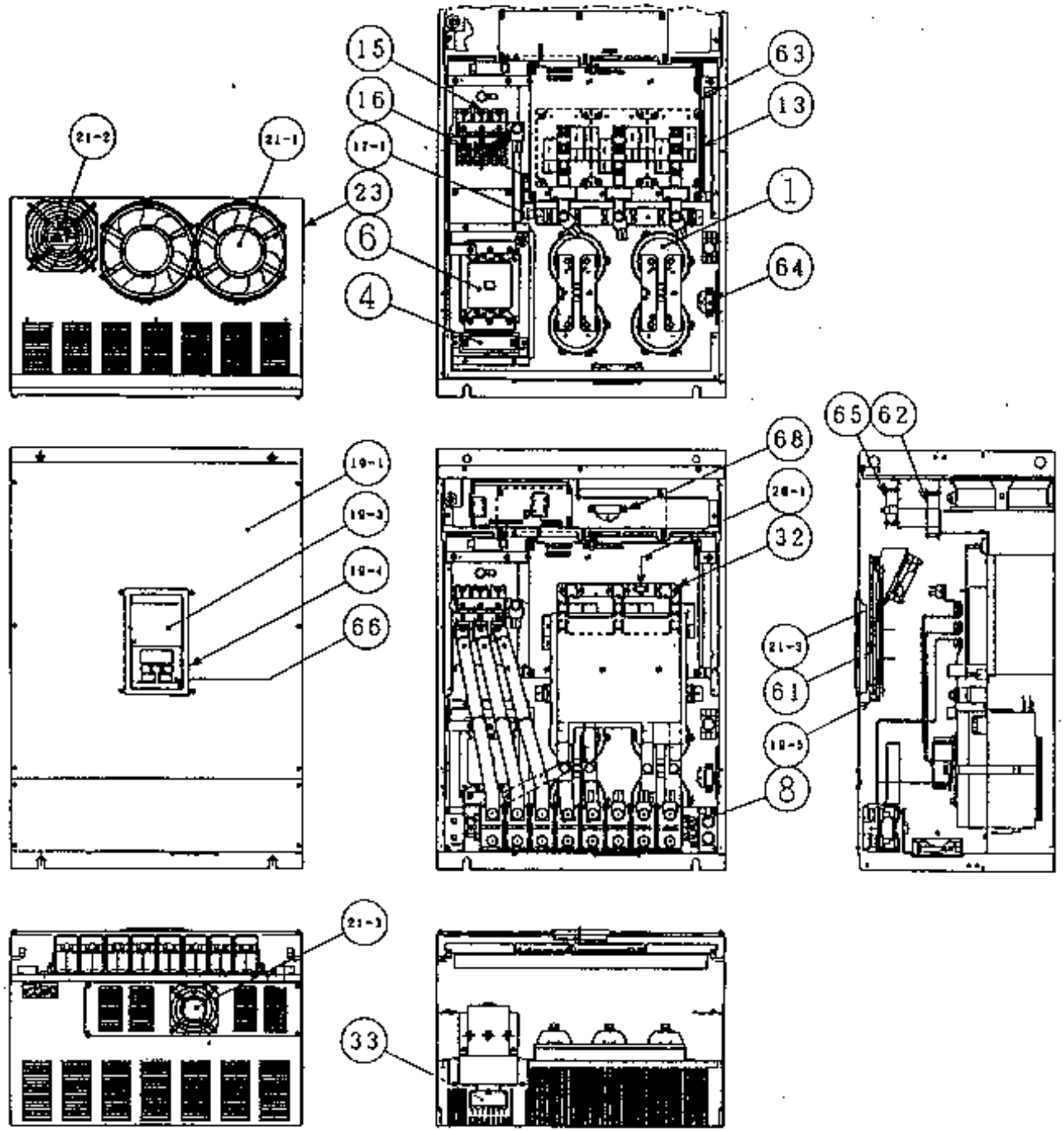
Parts No.	Short title	Parts name	QTY/unit
1	CB	Smoothing capacitor	2
4	RS	Current limiting resistor	1
6	84	Electromagnetic contactor	1
8	TM	Main circuit terminal block	1
13	PM	Inverter module	1
15	DM	Diode module	1
19_1	CV	Front plate	1
19_3	CV	Digital operator blind cover	1
19_4	CV	Front cover	1
19_5	CV	PCB mounting case	1
21_1	FAN	Cooling fan	2
23	CS	Case	1
60	CT2	CT(for current detection)	1
61	PCB	Logic PCB	1
62	PCB	Power PCB	1
63	PCB	IPM PCB	1
66	PANEL	Digital operator	1

J300-220LF
Structural drawing

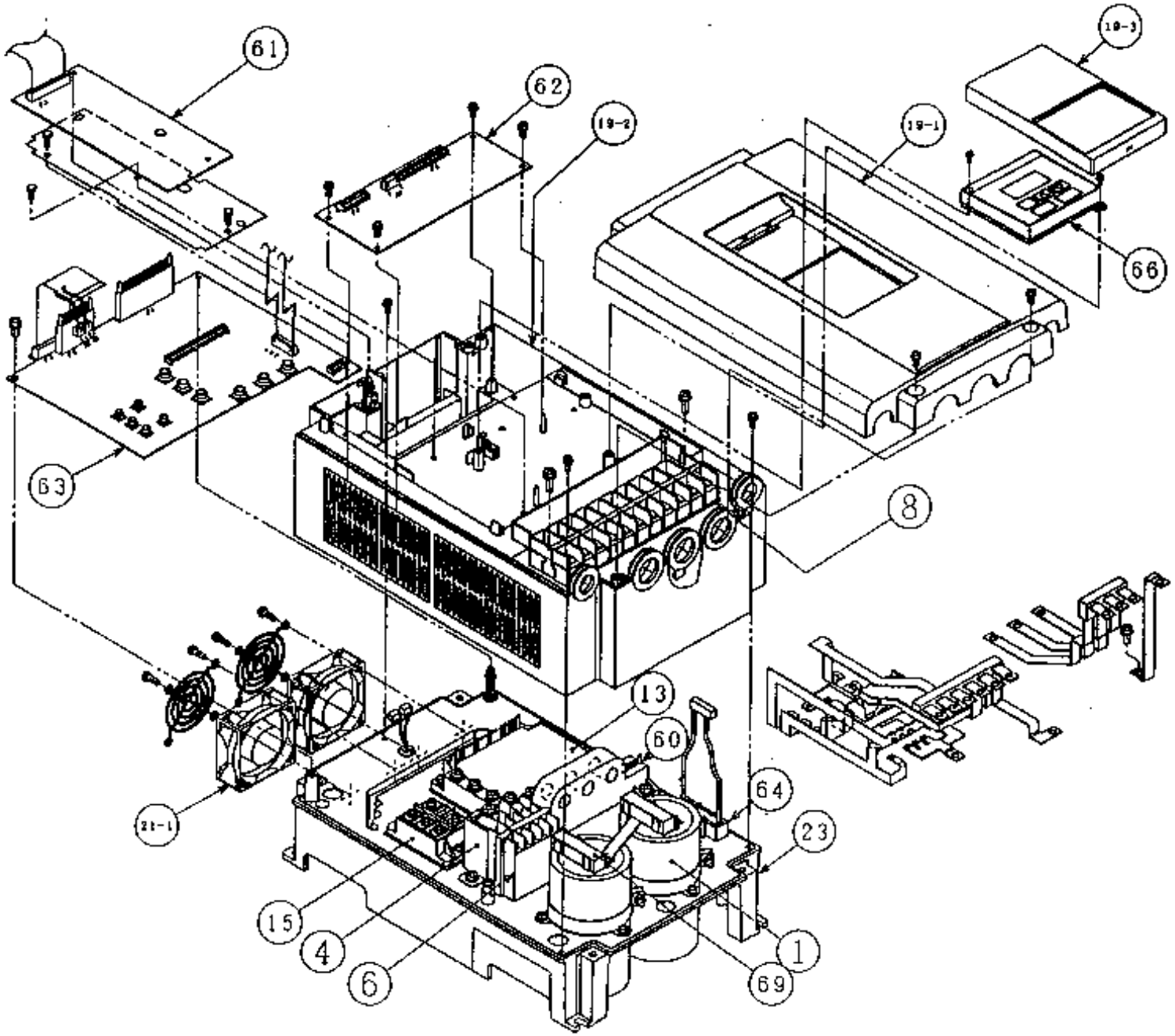
3T812511



Parts No	Short title	Parts name	300LF QTY/ unit	370LF QTY/ unit
1	CB	Smoothing capacitor	4	4
4	RS	Current limiting resistor	1	1
6	84	Electromagnetic contactor	1	1
8	TM	Main circuit terminal block	1	1
13	PM	Inverter module	3	3
15	DM	Diode module	1	1
16	C	Snubber capacitor	1	1
17_1	ZNR	Surge killer	1	1
19_1	CV	Front plate	1	1
19_3	CV	Digital operator blind cover	1	1
19_4	CV	Front cover	1	1
19_5	CV	PCB mounting case	1	1
21_1	FAN	Cooling fan	1	1
21_2	FAN	Cooling fan	1	1
21_3	FAN	Cooling fan	2	2
23	CS	Case	1	1
26_1	THR	Thermal relay	1	1
32	DI	Common snubber diode	3	3
33	RI	Common snubber resistor	1	1
61	PCB	Logic PCB	1	1
62	PCB	Power PCB	1	1
63	PCB	IPM PCB	1	1
65	PCB	Auxiliary power PCB	1	1
66	PANEL	Digital operator	1	1
68	R	Ciment resistor	1	1



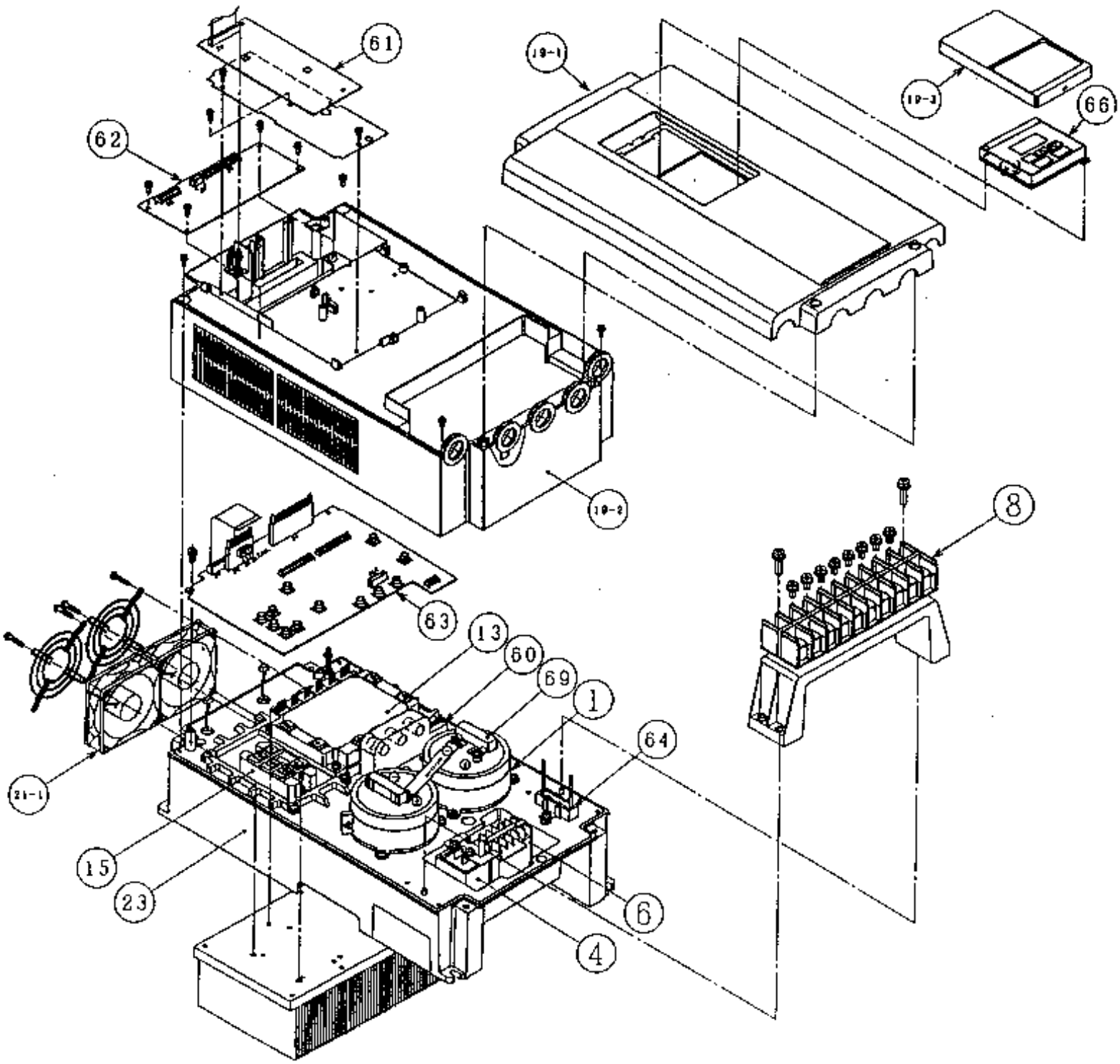
Parts No	Short title	Parts name	450LF QTY/unit	550LF QTY/unit
1	CB	Smoothing capacitor	4	4
4	RS	Current limiting resistor	1	1
6	84	Electromagnetic contactor	1	1
8	TM	Main circuit terminal block	1	1
13	PM	Inverter module	3	3
15	DM	Diode module	3	3
16	C	Snubber capacitor	1	1
17_{-1}	ZNR	Surge killer	1	1
19_{-1}	CV	Front plate	1	1
19_{-3}	CV	Digital operator blind cover	1	1
19_{-4}	CV	Front cover	1	1
19_{-5}	CV	PCB mounting case	1	1
21_{-1}	FAN	Cooling fan	2	2
21_{-2}	FAN	Cooling fan	1	1
21_{-3}	FAN	Cooling fan	3	3
23	CS	Case	1	1
26_{-1}	THR	Thermal relay	1	1
32	D1	Common snubber diode	3	3
33	R1	Common snubber resistor	1	1
61	PCB	Logic PCB	1	1
62	PCB	Power PCB	1	1
63	PCB	IPM PCB	1	1
64	IPR	Resistor for instantaneous power failure restart	1	1
65	PCB	Auxiliary power PCB	1	1
66	PANEL	Digital operator	1	1
68	R	Ciment resistor	1	1



Parts No	Short title	Parts name	QTY/unit
1	CB	Smoothing capacitor	2
4	RS	Current limiting resistor	1
6	84	Electromagnetic contactor	1
8	TM	Main circuit terminal block	1
13	PM	Inverter module	1
15	DM	Diode module	1
19_1	CV	Front cover	1
19_2	CV	Cover	1
19_3	CV	Digital operator blind cover	1
21_1	FAN	Cooling fan	2
23	CS	Case	1
60	CT2	CT(for current detection)	1
61	PCB	Logic PCB	1
62	PCB	Power PCB	1
63	PCB	IPM PCB	1
64	IPR	Resistor for instantaneous power failure restart	1
66	PANEL	Digital operator	1
69	RB	Balance resistor	2

J300-055-075HF
Structural drawing

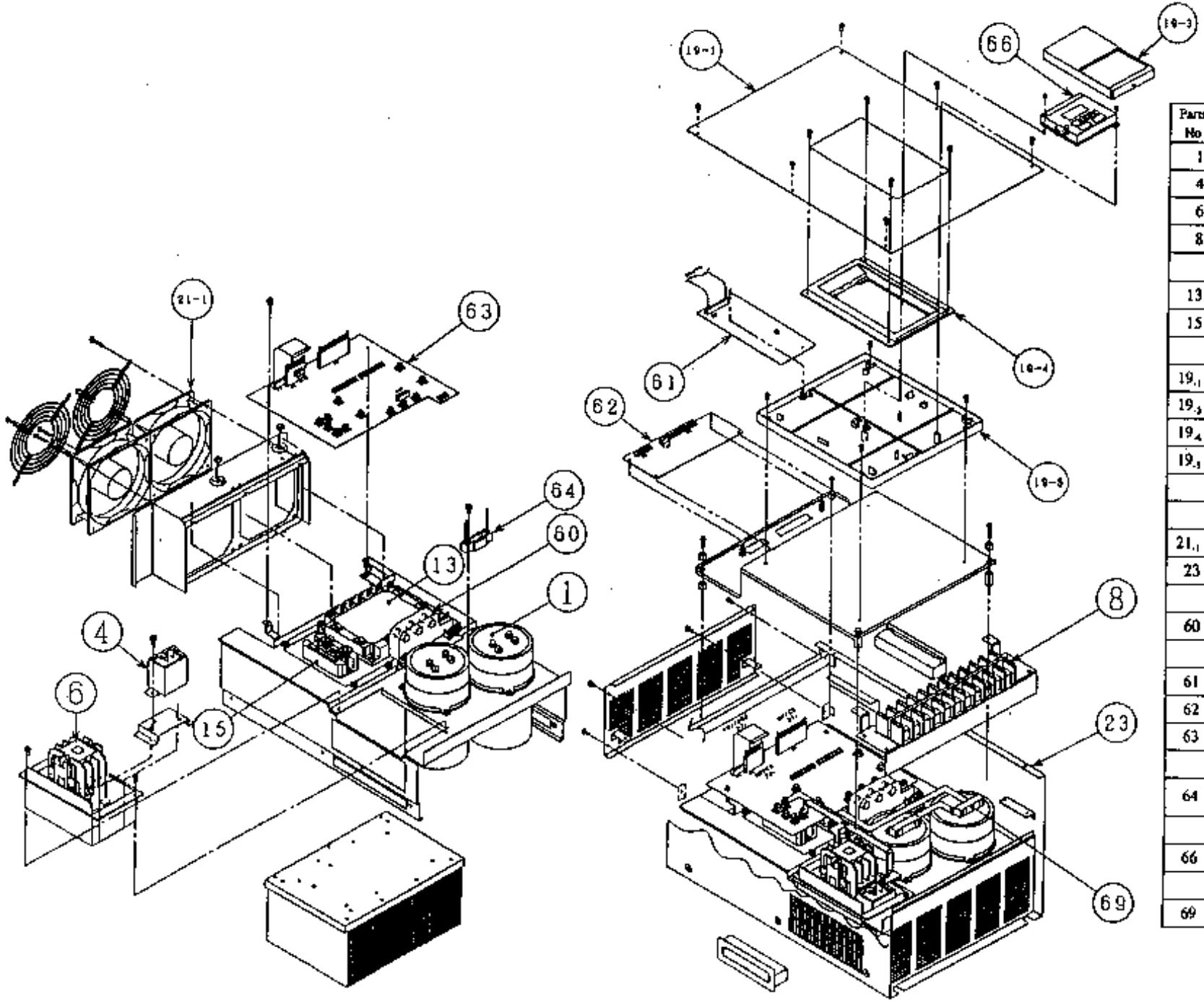
3T812195



Parts No	Short title	Parts name	QTY/unit
1	CB	Smoothing capacitor	2
4	RS	Current limiting resistor	1
6	84	Electromagnetic contactor	1
8	TM	Main circuit terminal block	1
13	PM	Inverter module	1
15	DM	Diode module	1
19_1	CV	Front cover	1
19_2	CV	Cover	1
19_3	CV	Digital operator blind cover	1
21_1	FAN	Cooling fan	2
23	CS	Case	1
60	CT2	CT(for current detection)	1
61	PCB	Logic PCB	1
62	PCB	Power PCB	1
63	PCB	IPM PCB	1
64	IPR	Resistor for instantaneous power failure restart	1
66	PANEL	Digital operator	1
69	RB	Balance resistor	2

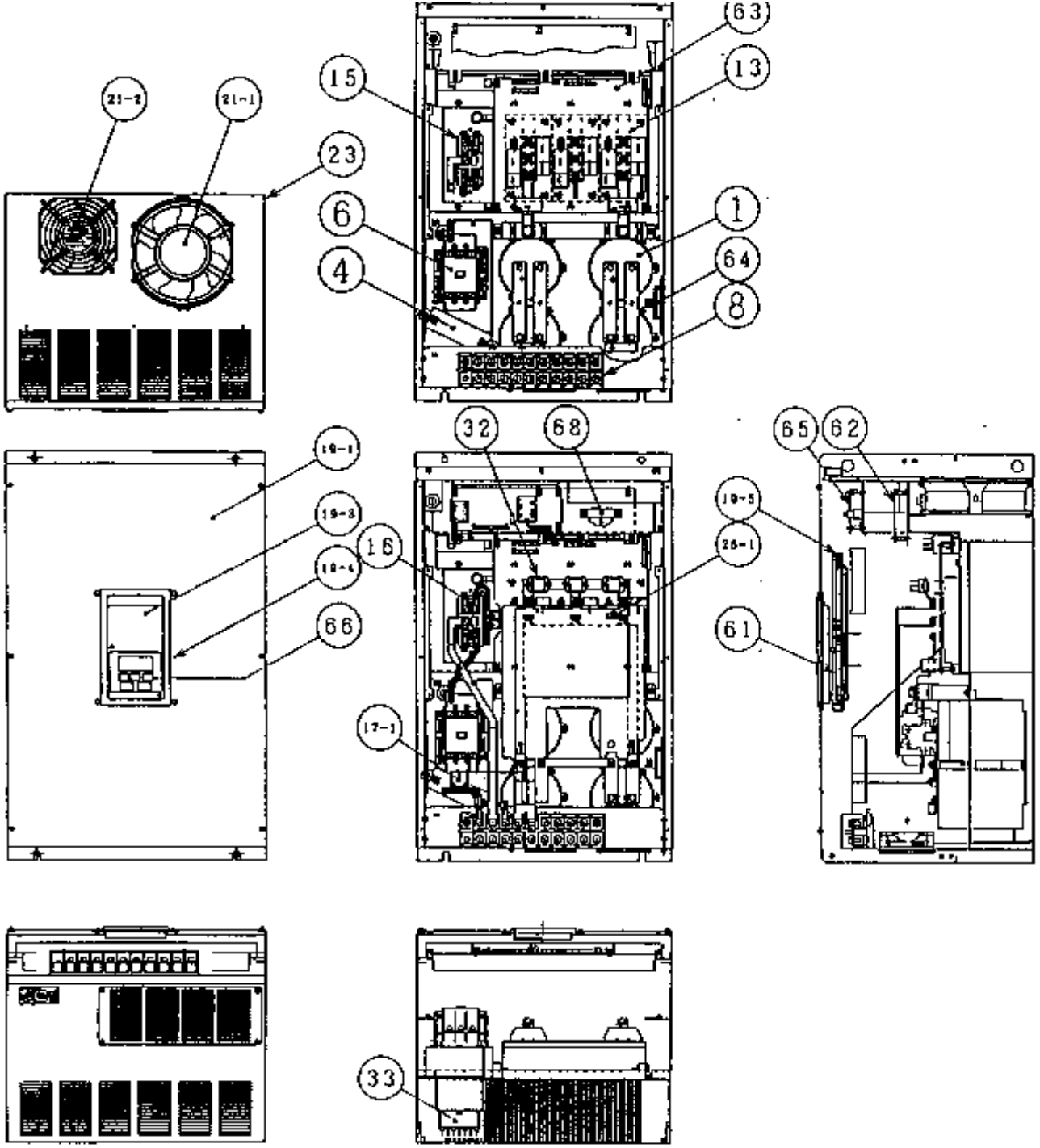
J300-110-150HF
Structural drawing

3T812499



Parts No	Short title	Parts name	QTY/ unit
1	CB	Smoothing capacitor	2
4	RS	Current limiting resistor	1
6	84	Electromagnetic contactor	1
8	TM	Main circuit terminal block	1
13	PM	Inverter module	1
15	DM	Diode module	1
19_{-1}	CV	Front plate	1
19_{-3}	CV	Digital operator blind cover	1
19_{-4}	CV	Front cover	1
19_{-5}	CV	PCB mounting case	1
21_{-1}	FAN	Cooling fan	2
23	CS	Case	1
60	CT2	CT(for current detection)	3
61	PCB	Logic PCB	1
62	PCB	Power PCB	1
63	PCB	IPM PCB	1
64	IPR	Resistor for instantaneous power failure restart	1
66	PANEL	Digital operator	1
69	RB	Balance resistor	2

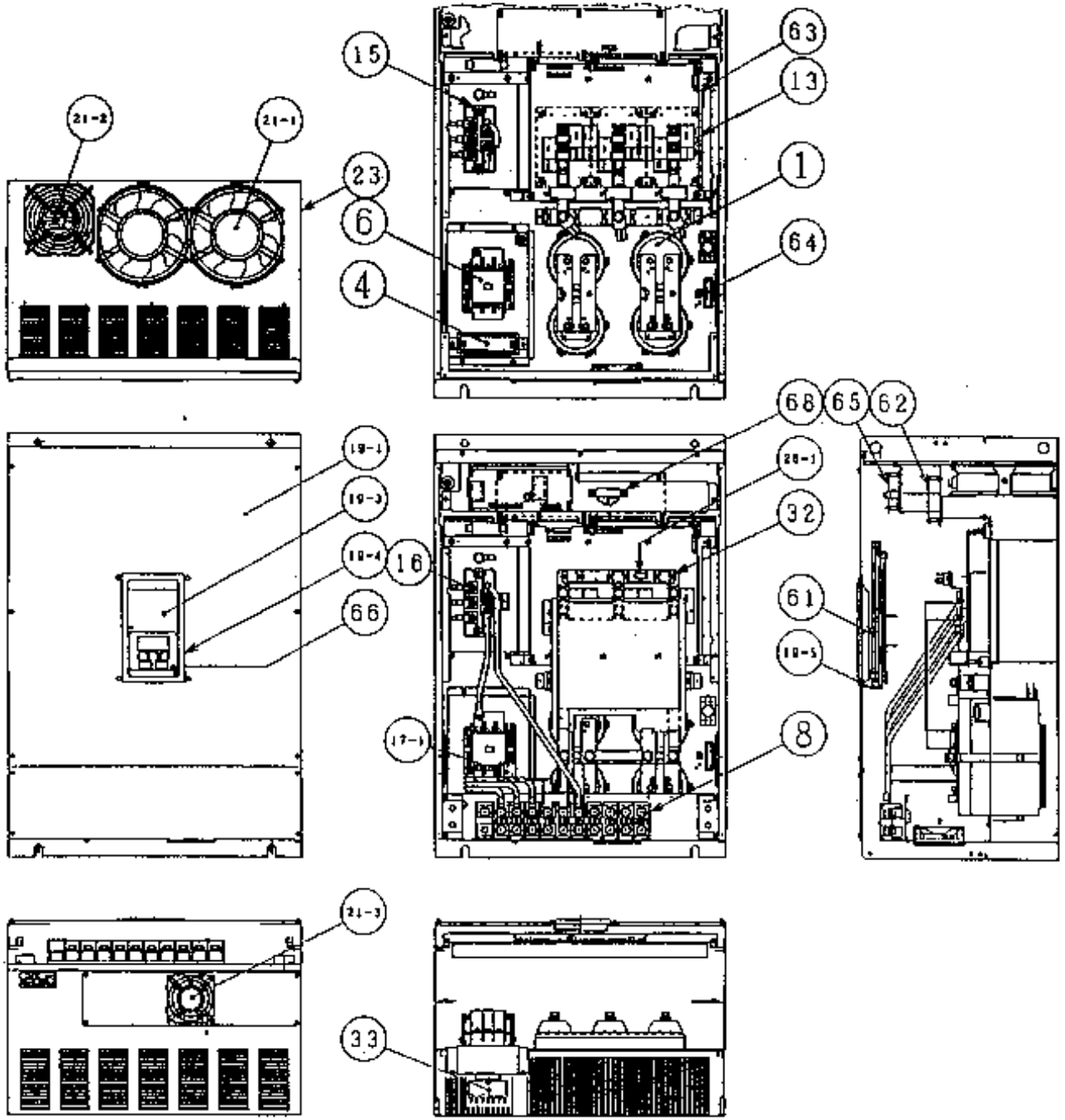
J300-220HF
Structural drawing **3T812512**



Parts No	Short title	Parts name	300HF QTY/unit	370HF QTY/unit
1	CB	Smoothing capacitor	4	4
4	RS	Current limiting resistor	1	1
6	84	Electromagnetic contactor	1	1
8	TM	Main circuit terminal block	1	1
13	PM	Inverter module	3	3
15	DM	Diode module	1	1
16	C	Snubber capacitor	1	1
17_{-1}	ZNR	Surge killer	1	1
19_{-1}	CV	Front plate	1	1
19_{-3}	CV	Digital operator blind cover	1	1
19_{-4}	CV	Front cover	1	1
19_{-5}	CV	PCB mounting case	1	1
21_{-1}	FAN	Cooling fan	1	1
21_{-2}	FAN	Cooling fan	1	1
23	CS	Case	1	1
26_{-1}	THR	Thermal relay	1	1
32	D1	Common snubber diode	3	3
33	R1	Common snubber resistor	1	1
61	PCB	Logic PCB	1	1
62	PCB	Power PCB	1	1
63	PCB	IPM PCB	1	1
64	IPR	Resistor for instantaneous power failure restart	1	1
65	PCB	Auxiliary power PCB	1	1
66	PANEL	Digital operator	1	1
68	R	Ciment resistor	1	1

J300-300-370HF
Structural drawing

3T812875



Parts No	Short title	Parts name	450HF QTY/unit	550HF QTY/unit
1	CB	Smoothing capacitor	4	4
4	RS	Current limiting resistor	1	1
6	84	Electromagnetic contactor	1	1
8	TM	Main circuit terminal block	1	1
13	PM	Inverter module	3	3
15	DM	Diode module	1	1
16	C	Snubber capacitor	1	1
17_1	ZNR	Surge killer	1	1
19_1	CV	Front plate	1	1
19_3	CV	Digital operator blind cover	1	1
19_4	CV	Front cover	1	1
19_5	CV	PCB mounting case	1	1
21_4	FAN	Cooling fan	2	2
21_2	FAN	Cooling fan	1	1
21_3	FAN	Cooling fan	1	1
23	CS	Case	1	1
26_1	THR	Thermal relay	1	1
32	D1	Common snubber diode	3	3
33	R1	Common snubber resistor	1	1
61	PCB	Logic PCB	1	1
62	PCB	Power PCB	1	1
63	PCB	IPM PCB	1	1
64	IPR	Resistor for instantaneous power failure restart	1	1
65	PCB	Auxiliary power PCB	1	1
66	PANEL	Digital operator	1	1
68	R	Ciment resistor	1	1

J300-450-550HF
Structural drawing

3T812876