Right choice for ultimate yield

LSIS strives to maximize customers' profit in gratitude of choosing us for your partner.

SV-iG5A

0.4 ~ 22kW

Service Manual

LS Industrial Systems

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고객지원팀

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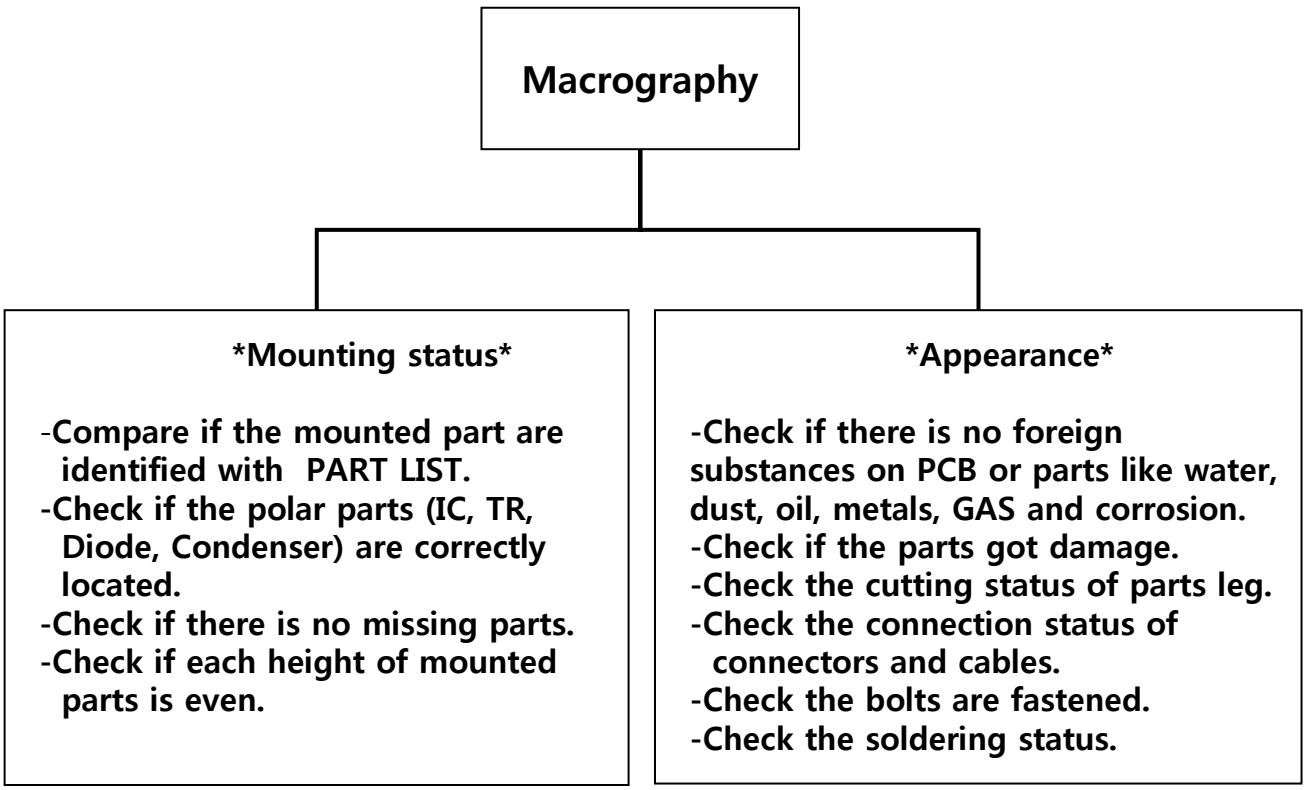
고객지원팀

Chap. 1 Basic Inspection

(1) Macrography : When malfunction or error on product is registered, please conduct macrography test first for checking mounting status and appearance.



※Customer Service : Contacting with user, more information can be secured by checking additional findings on problem,

-Check if it is proper for the using purpose. (load, capacity, peripheral devices)
-Check if the wiring is done correctly. (power, analog input)
-Check if the power specification can match with product specification.

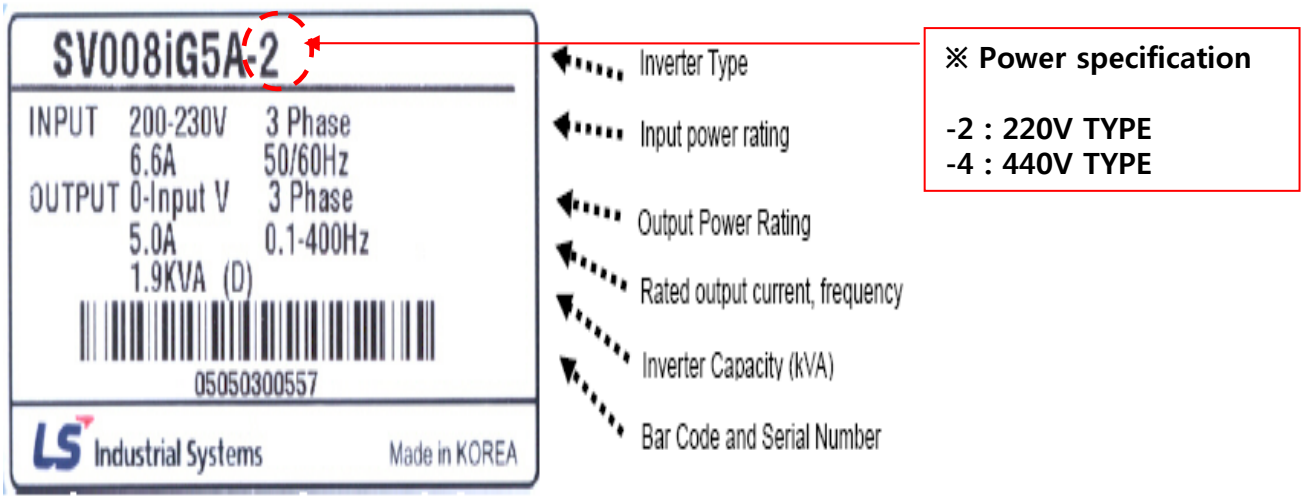
고객지원팀

(2) Load Test : If the malfunction of the product is fixed , please conduct the final load test to confirm the normal operation .

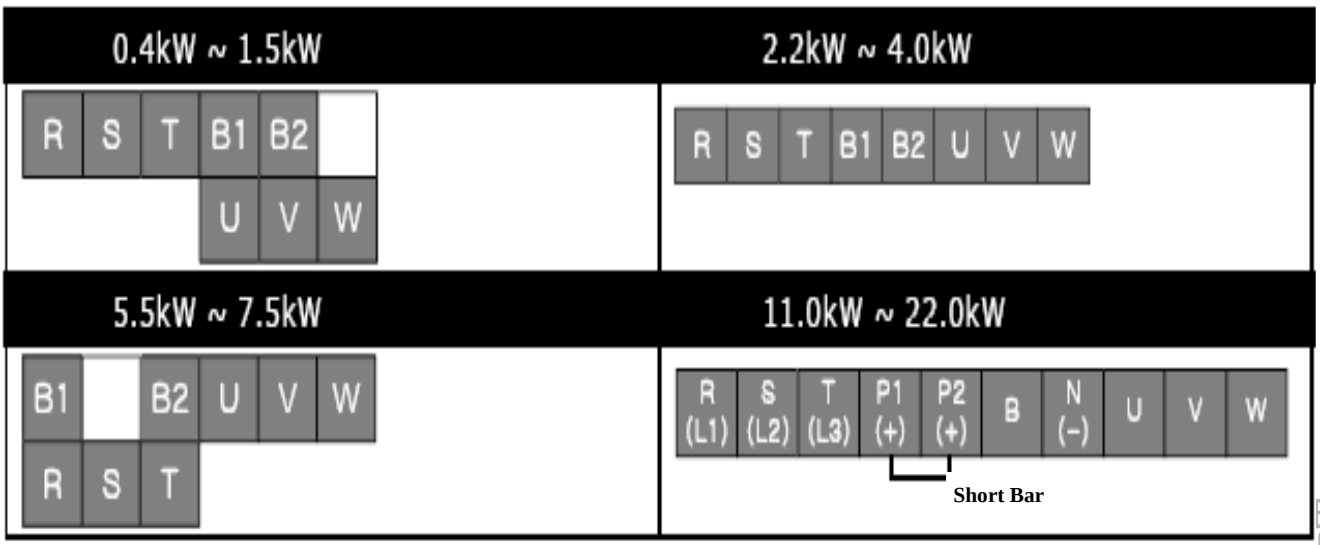
① Power specification and POWER terminal

-Be careful for different terminal arrangement according to capacity, and wire for input power (R,S,T) and motor connection (U,V,W) after checking input power specification (220V/440V).

Product Specification



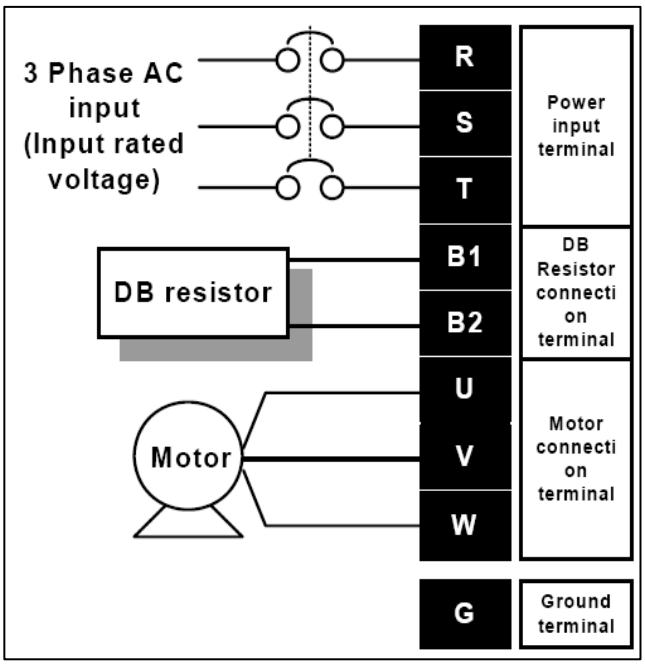
POWER terminal (classified by capacity)



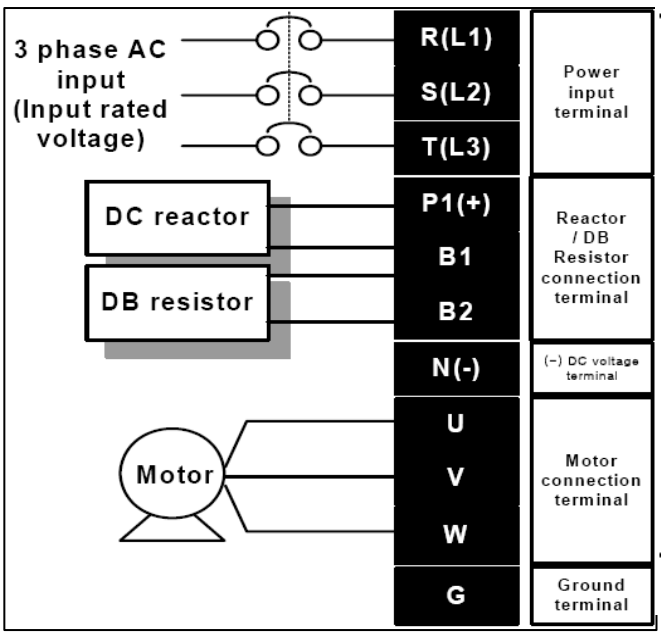
② POWER terminal wiring

-Connect input power (R,S,T) and motor wiring (U,V,W) as below. If needed, braking resistor can be used according use purpose. Powering up with input power connected to output terminal (U,V,W) or making braking resister terminals (B1,B2) SHORT can cause the product damage.

0.4~7.5kW



11~22kW



Braking resistor specification

Input Voltage	Inverter capacity [kW]	100 % braking		150% braking	
		[Ω]	[W]*	[Ω]	[W]*
200V	0.4	400	50	300	100
	0.75	200	100	150	150
	1.5	100	200	60	300
	2.2	60	300	50	400
	3.7	40	500	33	600
	5.5	30	700	20	800
	7.5	20	1000	15	1200
	11.0	15	1400	10	2400
	15.0	11	2000	8	2400
	18.5	9	2400	5	3600
	22.0	8	2800	5	3600
400V	0.4	1800	50	1200	100
	0.75	900	100	600	150
	1.5	450	200	300	300
	2.2	300	300	200	400
	3.7	200	500	130	600
	5.5	120	700	85	1000
	7.5	90	1000	60	1200
	11.0	60	1400	40	2000
	15.0	45	2000	30	2400
	18.5	35	2400	20	3600
	22.0	30	2800	10	3600

* The wattage is based on Enable duty (%ED) 5% with continuous braking time 15 sec.

③ Load Test

-If wiring job is done normally, start motor operation with parameter setting for drive and frequency command.

-Check the output voltage among U,V,W phases measuring with DMM during operation. (Voltage Balance rate should be within ±3%) (output voltage can be different according to input voltage and operation frequency.)

-Check the output current among U,V.W phases measuring with SCOPMETER and current PROBE (Current Balance rate should be within ±10%) (output current can be different according to operation frequency and load.)

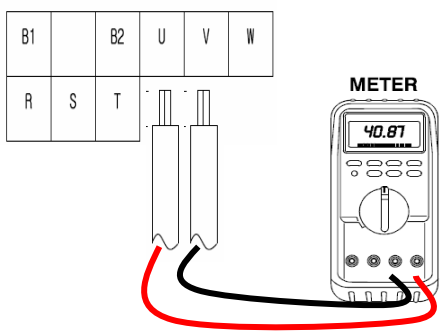
<parameter>

drv	[Drive mode]	0 ~ 3	0	Run/Stop via Run/Stop key on the keypad		1	X
			1	Terminal operation	FX: Motor forward run RX: Motor reverse run		
			2		FX: Run/Stop enable RX: Reverse rotation select		
			3	RS485 communication			
Frq	[Frequency setting method]	0 ~ 7	0	Digital	Keypad setting 1	0	X
			1		Keypad setting 2		
			2	Analog	V1 1: -10 ~ +10 [V]		
			3		V1 2: 0 ~ +10 [V]		
			4		Terminal I: 0 ~ 20 [mA]		
			5		Terminal V1 setting 1 + Terminal I		
			6		Terminal V1 setting 2+ Terminal I		
			7		RS485		

※Voltage measurement

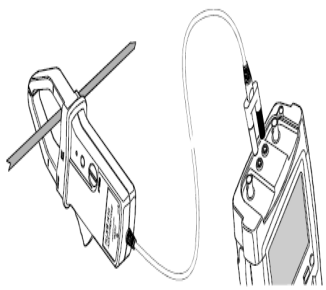
-Measure the voltage between each phases U-V, V-W, U-W.

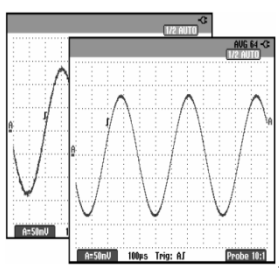
SV055iG5A-2/ SV055iG5A-4/ SV075iG5A-2/ SV075iG5A-4



※ Current measurement

-Measure the wiring of output phases U, V, W with the current PROBE.





Chap. 2 Inspection order

Inspection order for each Trip

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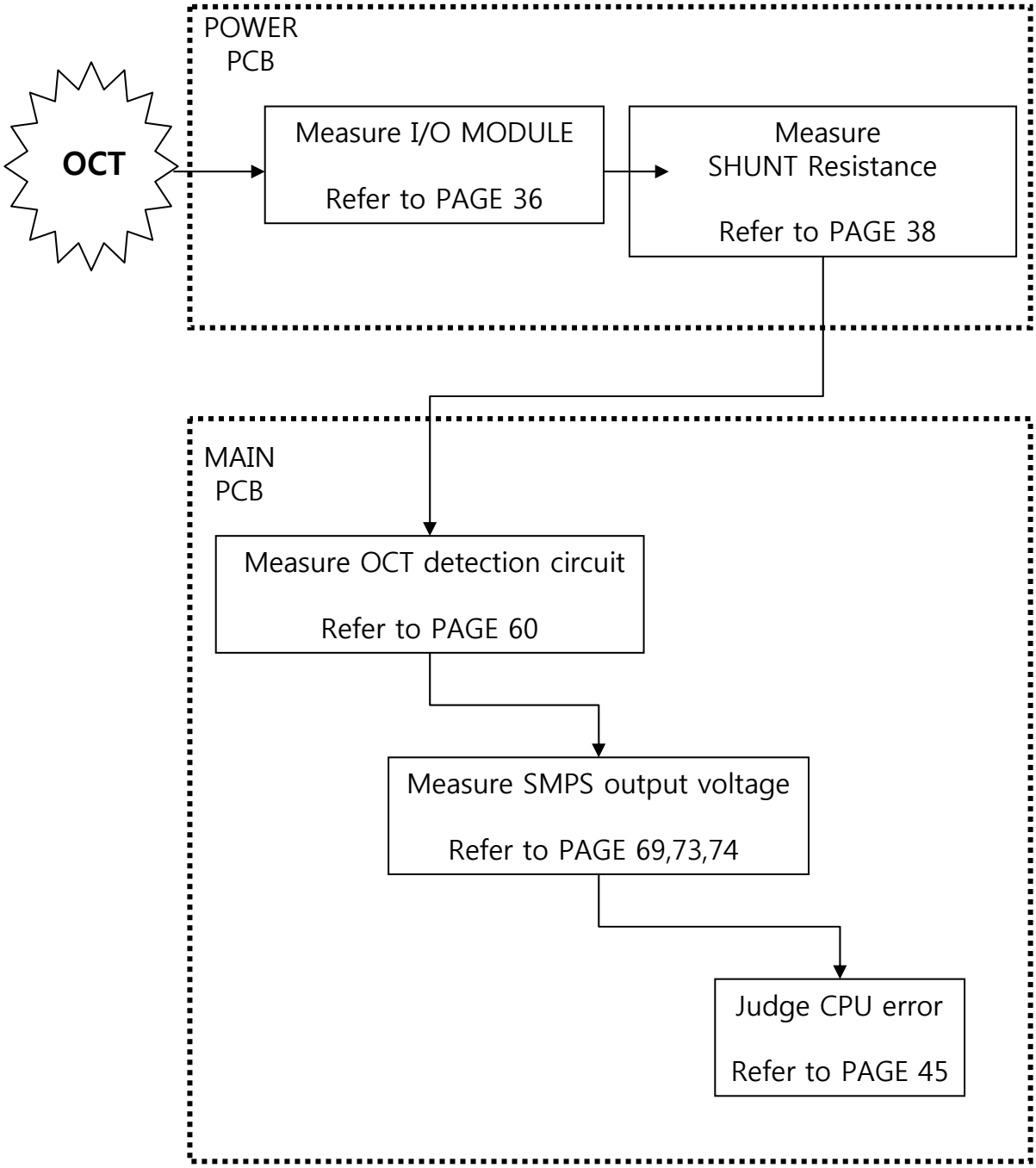
고객지원팀

- OVER CURRUNT TRIP (1/4)

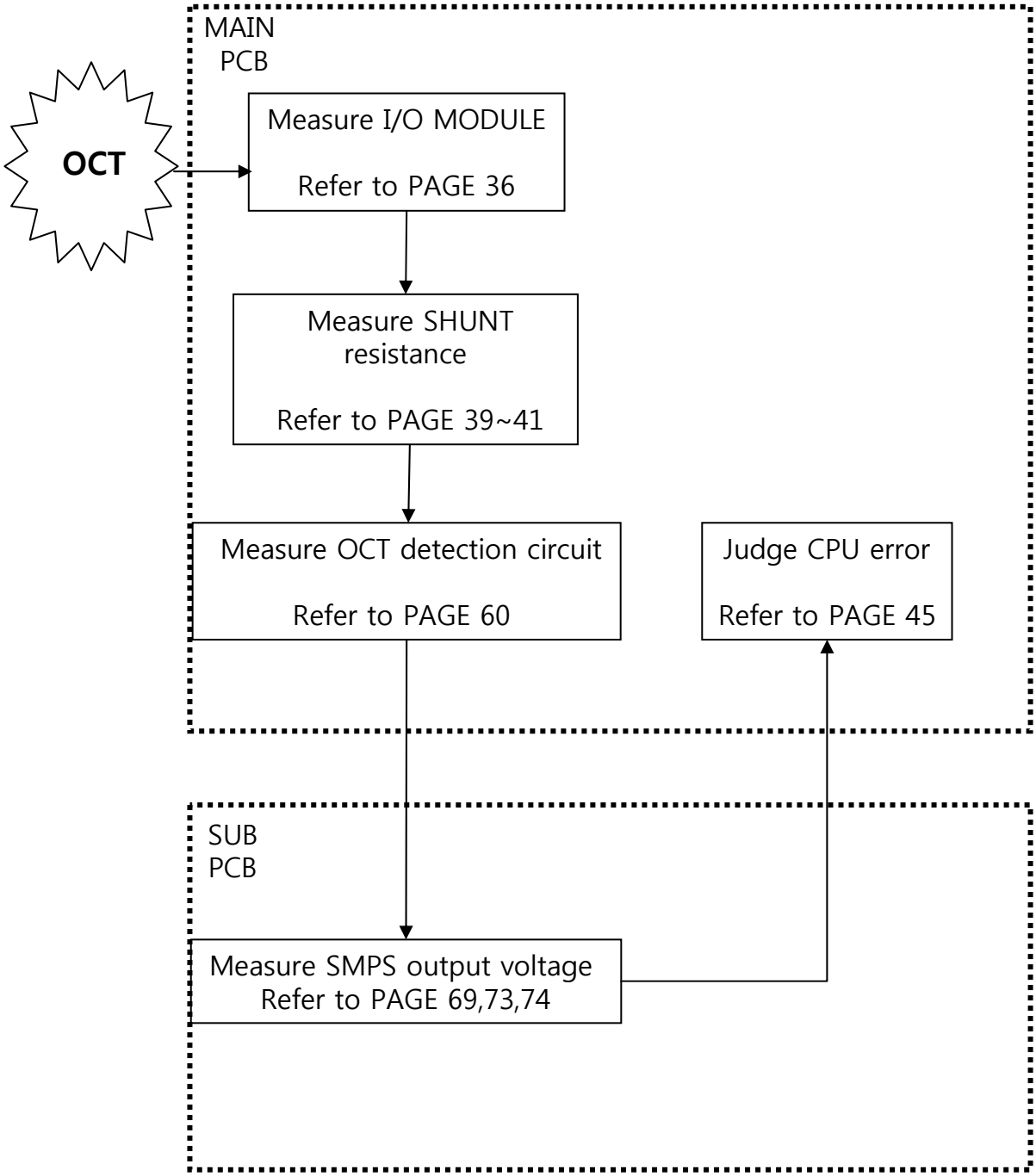
***Product: SV004~008IG5A-2/4**



고객지원팀

- OVER CURRUNT TRIP (2/4)

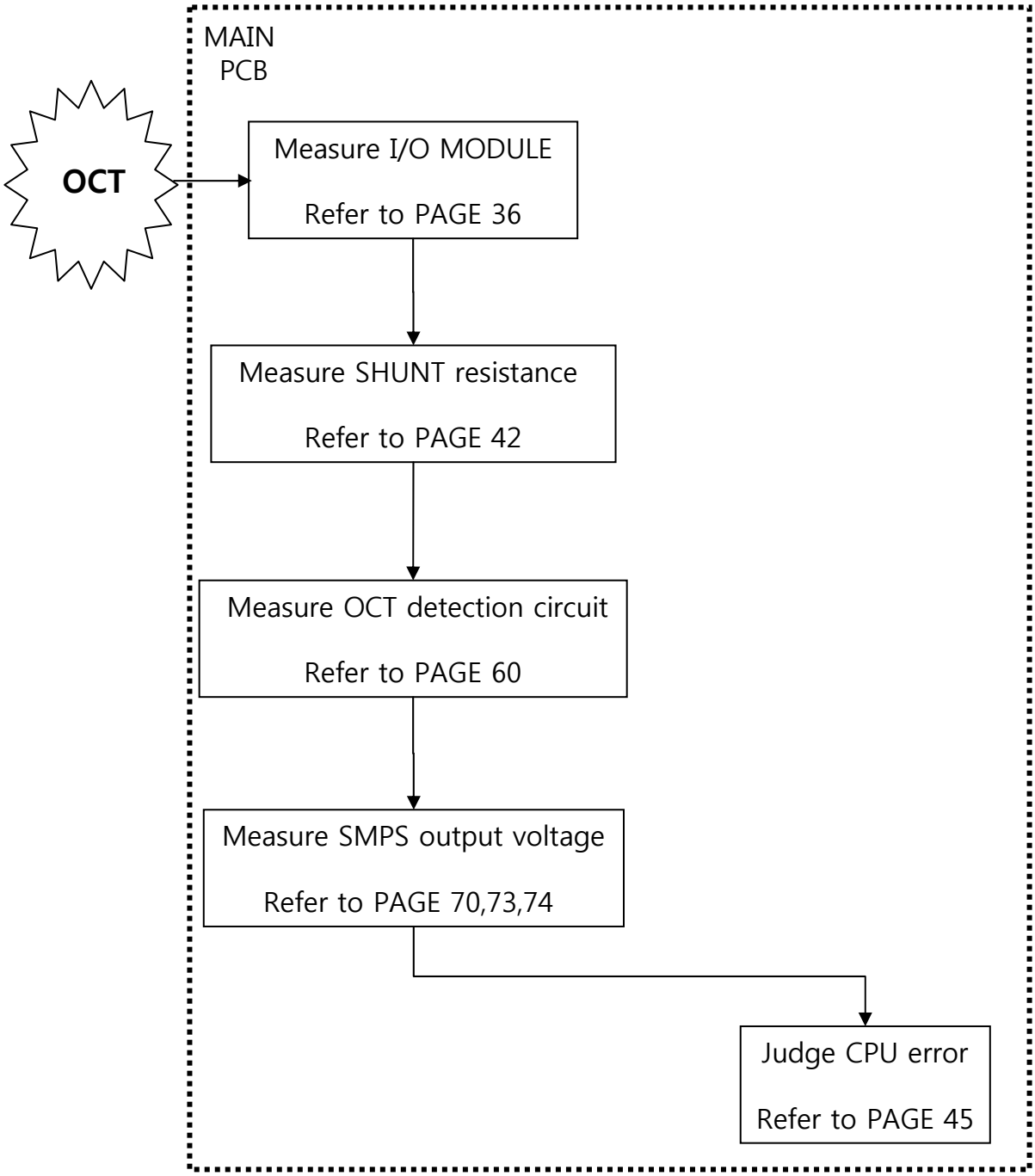
***Product: SV015~040IG5A-2/4**



고객지원팀

- OVER CURRUNT TRIP (3/4)

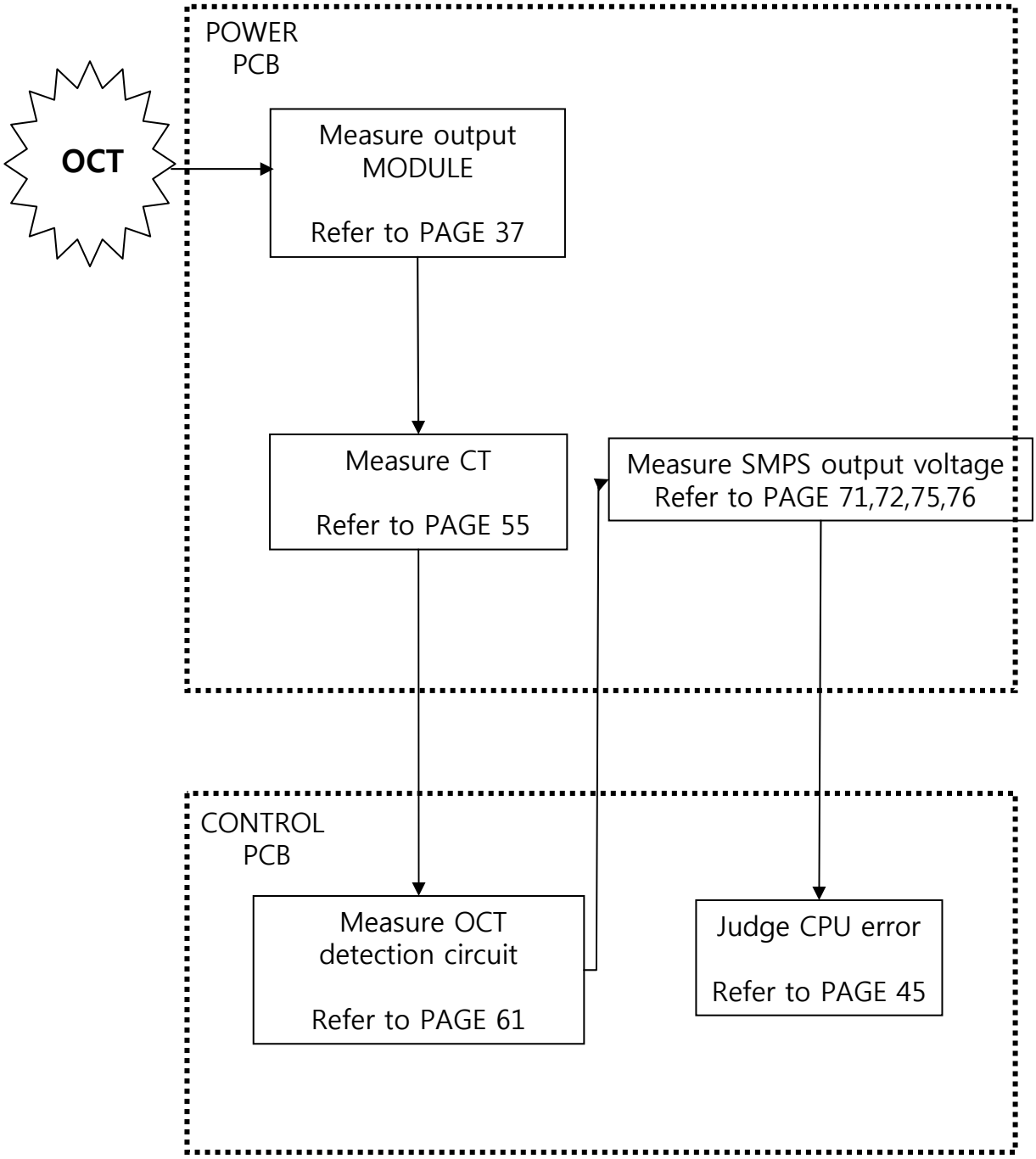
*Product: SV055~075IG5A-2/4



고객지원팀

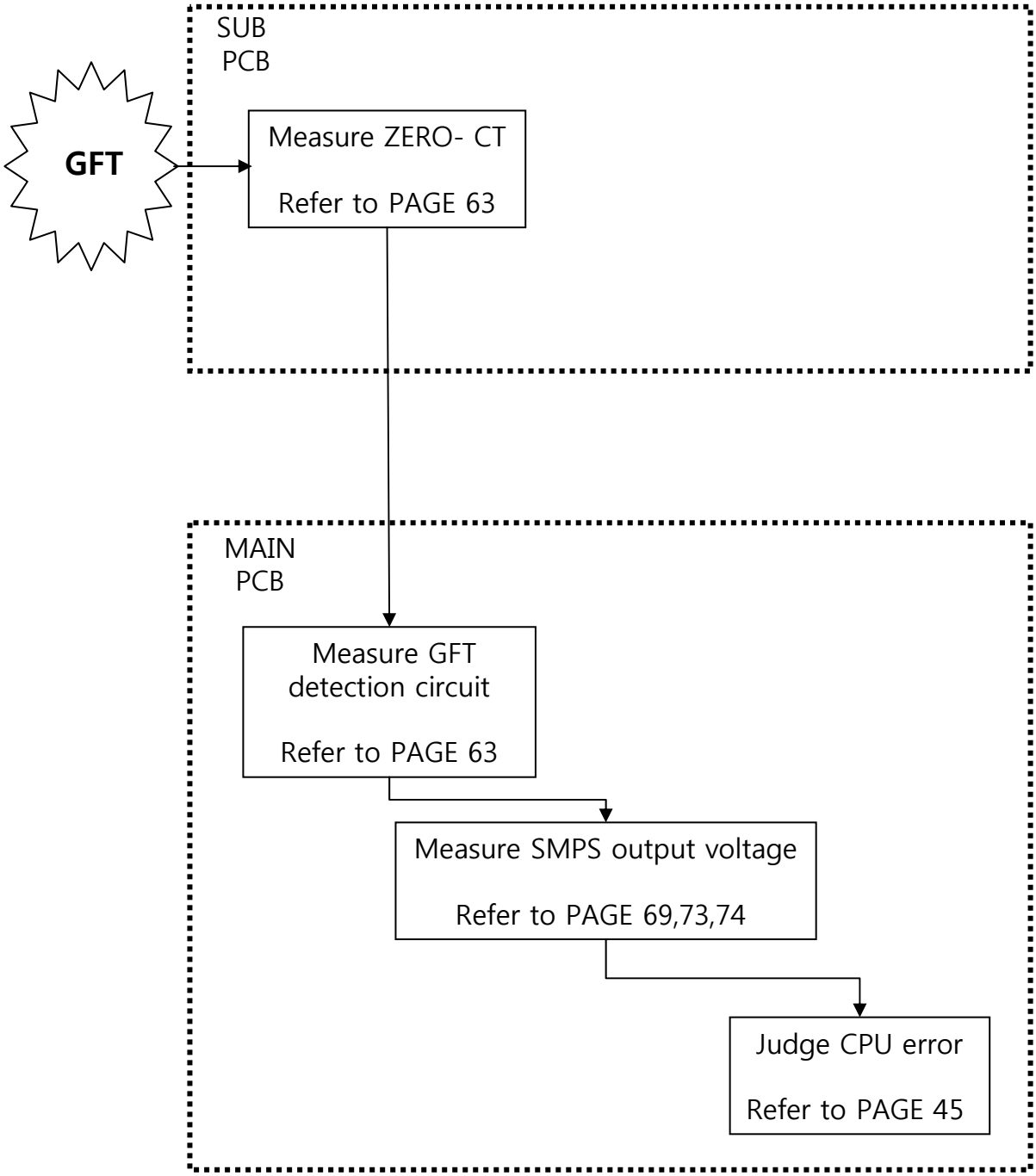
- OVER CURRUNT TRIP (4/4)

***Product: SV110~220IG5A-2/4**



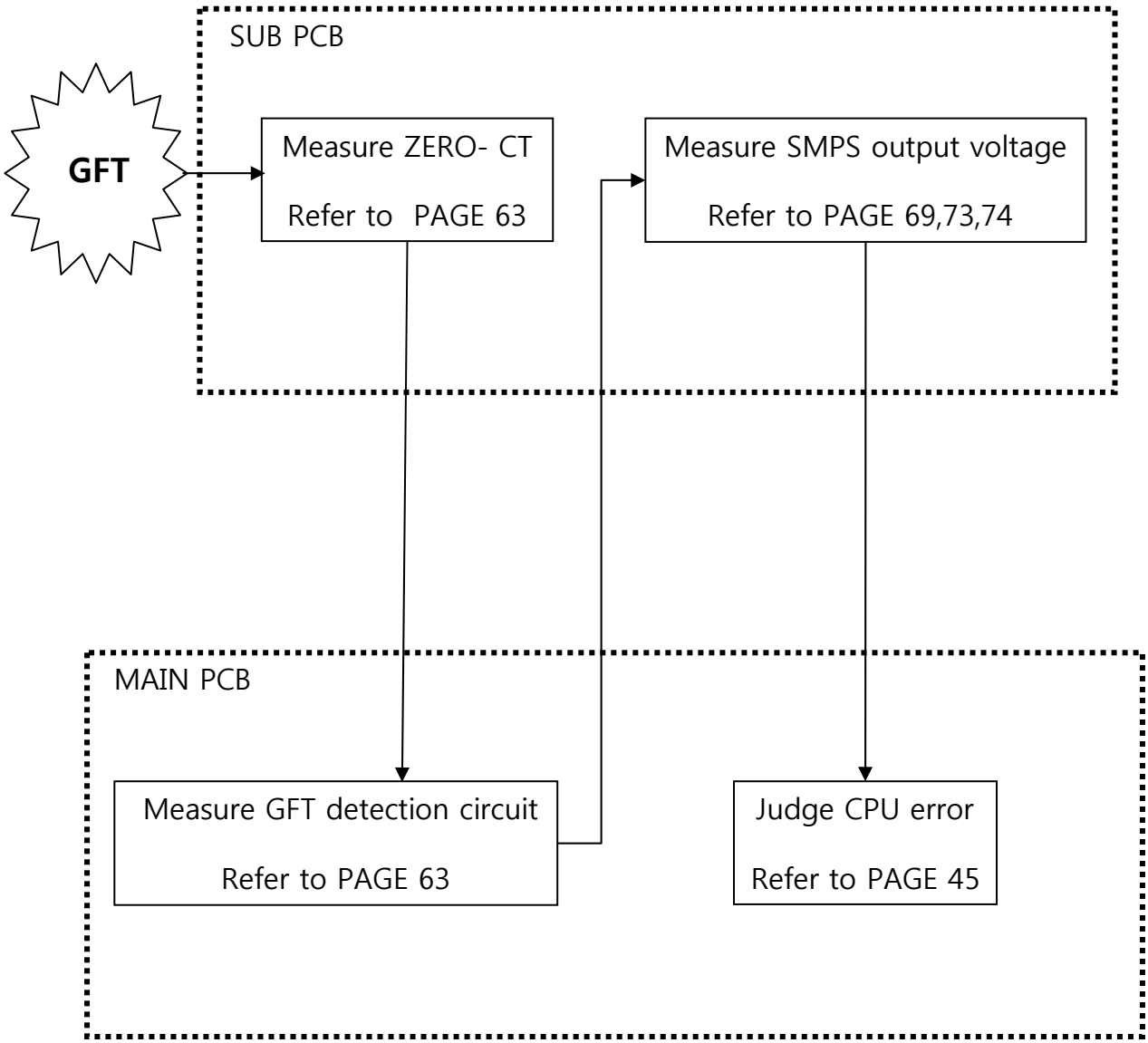
- GROUND FAULT TRIP (1/4)

*Product: SV004~008IG5A-2/4



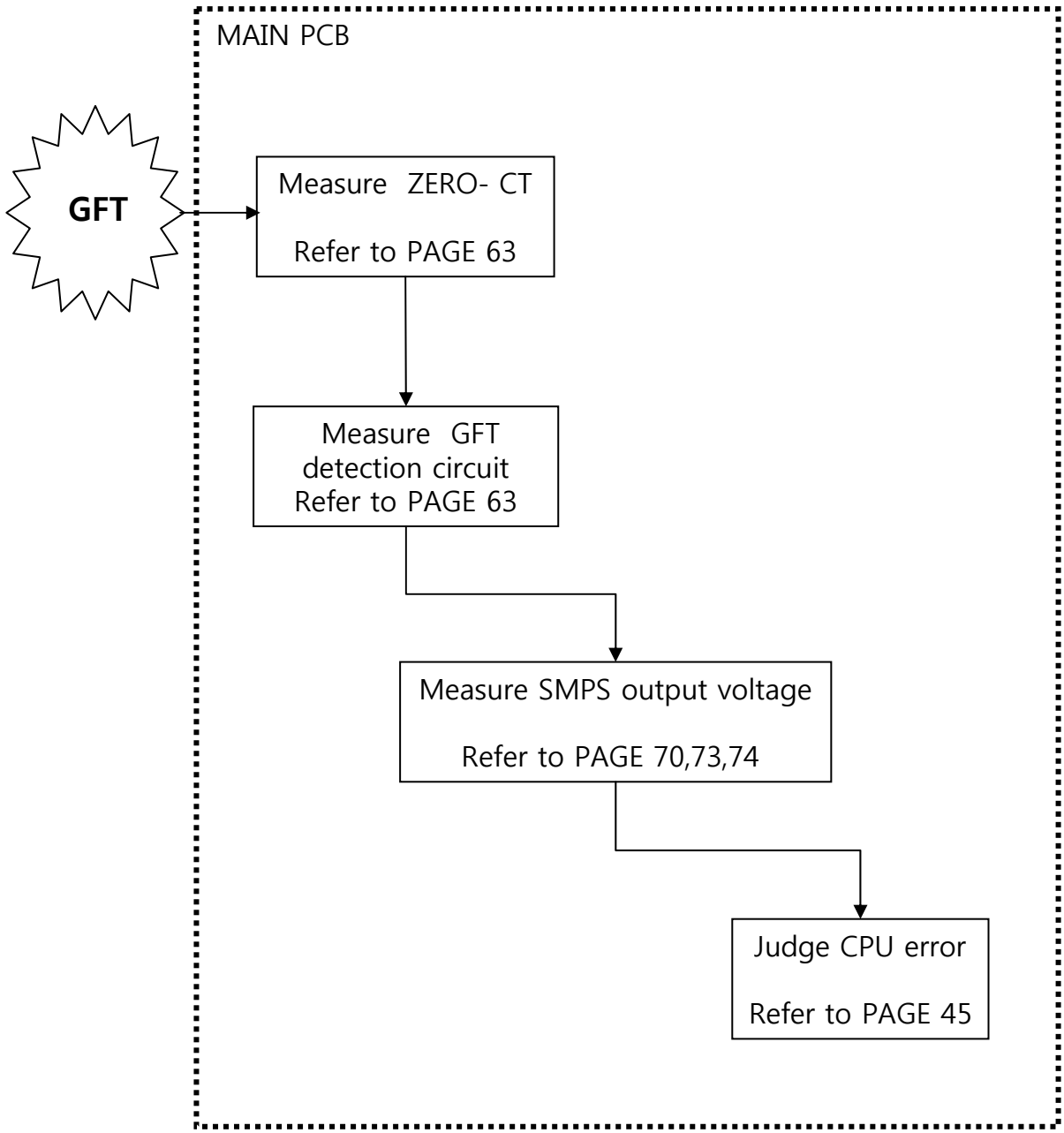
- GROUND FAULT TRIP (2/4)

***Product: SV015~040IG5A-2/4**



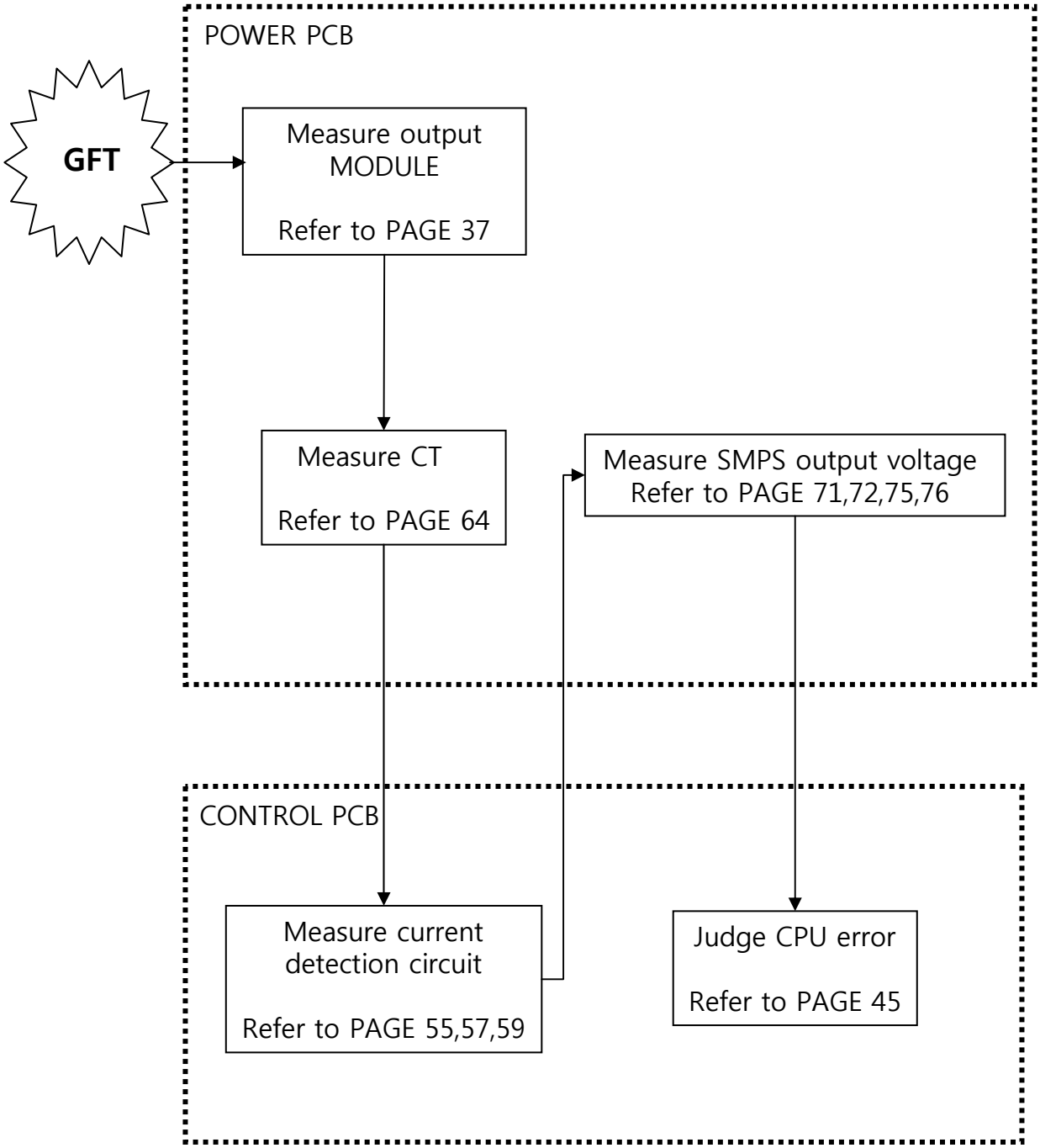
- GROUND FAULT TRIP (3/4)

***Product: SV055~075IG5A-2/4**



- GROUND FAULT TRIP (4/4)

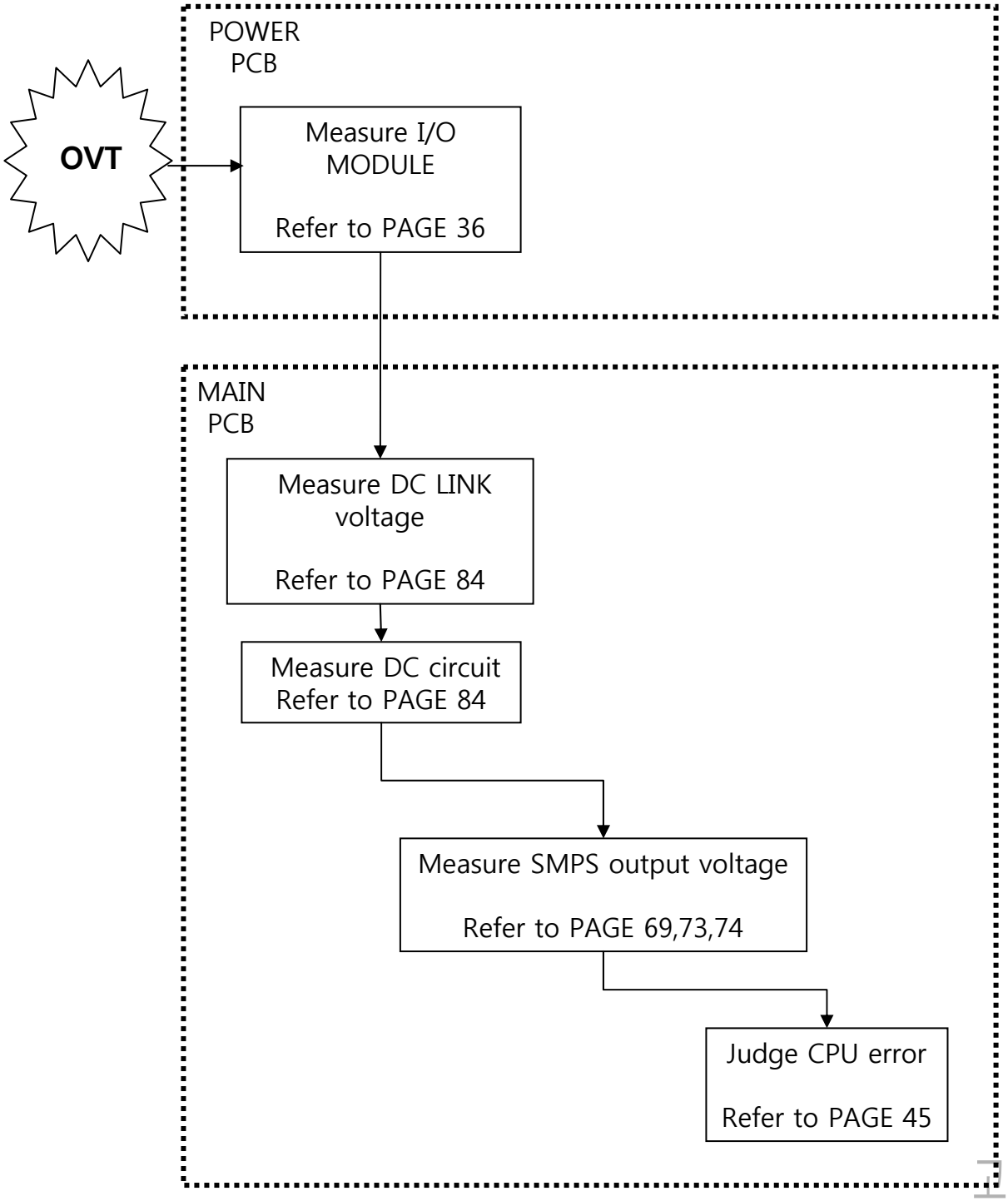
*Product: SV110~220IG5A-2/4



고객지원팀

- OVER VOLTAGE TRIP (1/4)

*Product: SV004~008IG5A-2/4



- OVER VOLTAGE TRIP (2/4)

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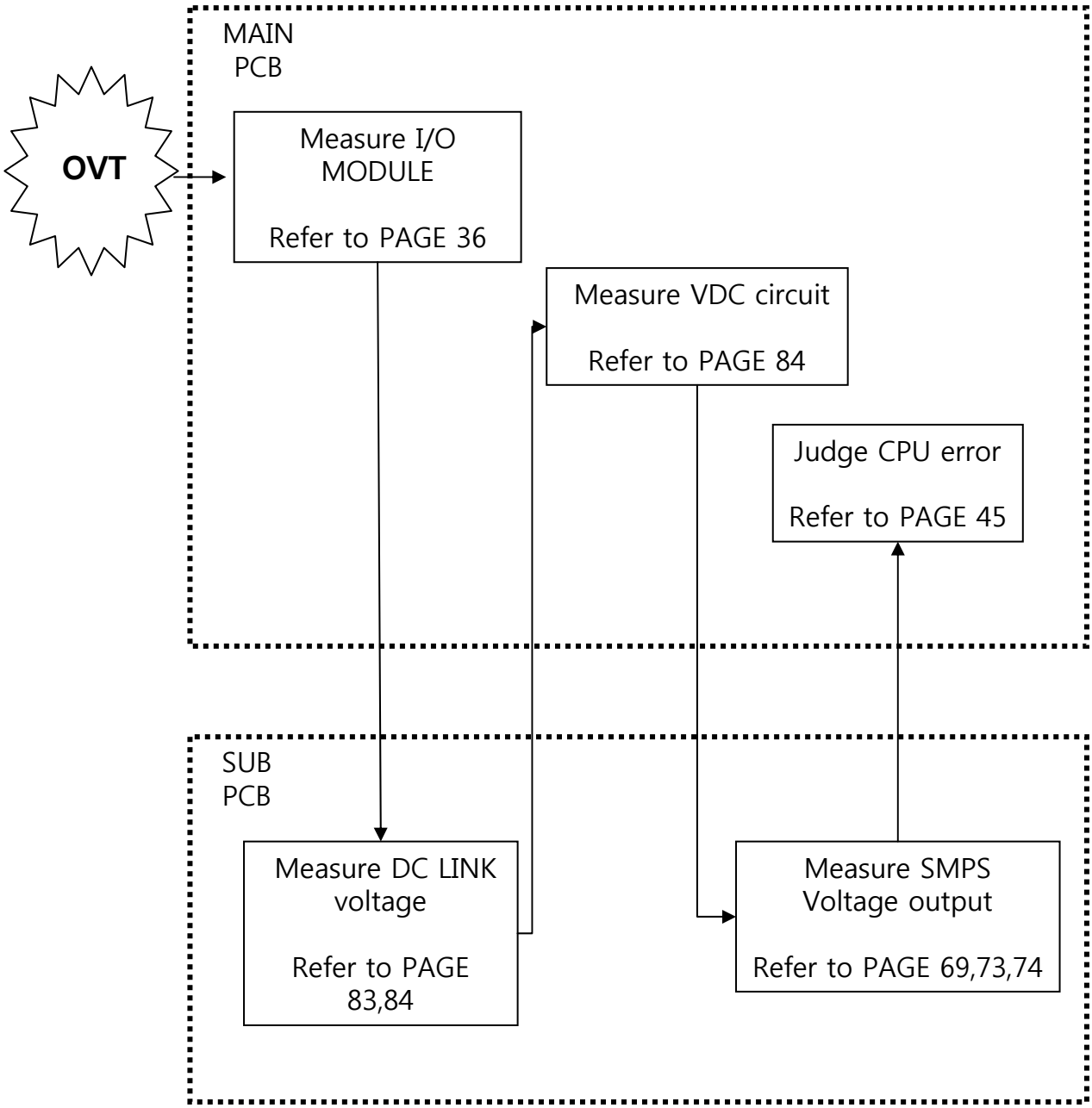
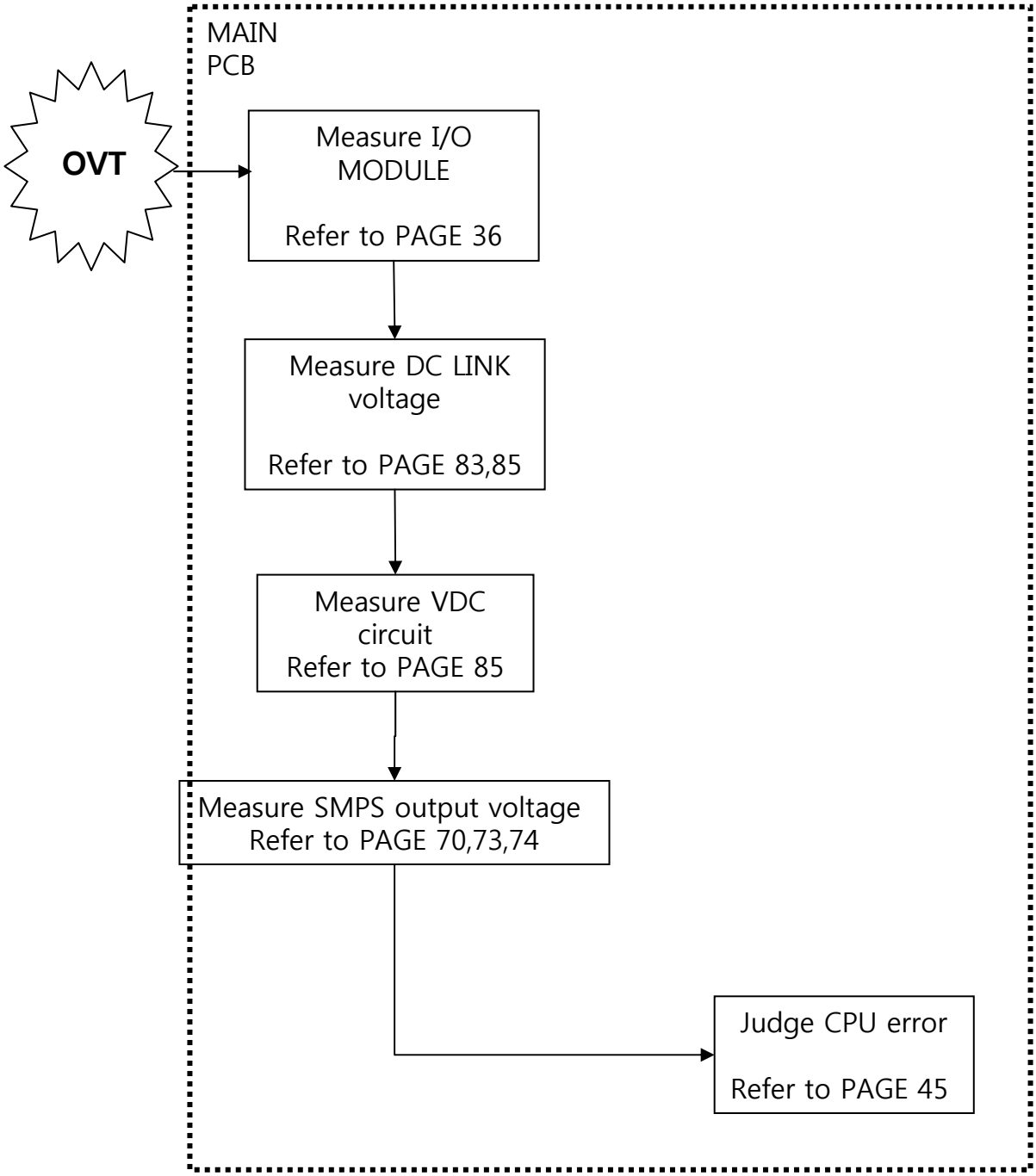


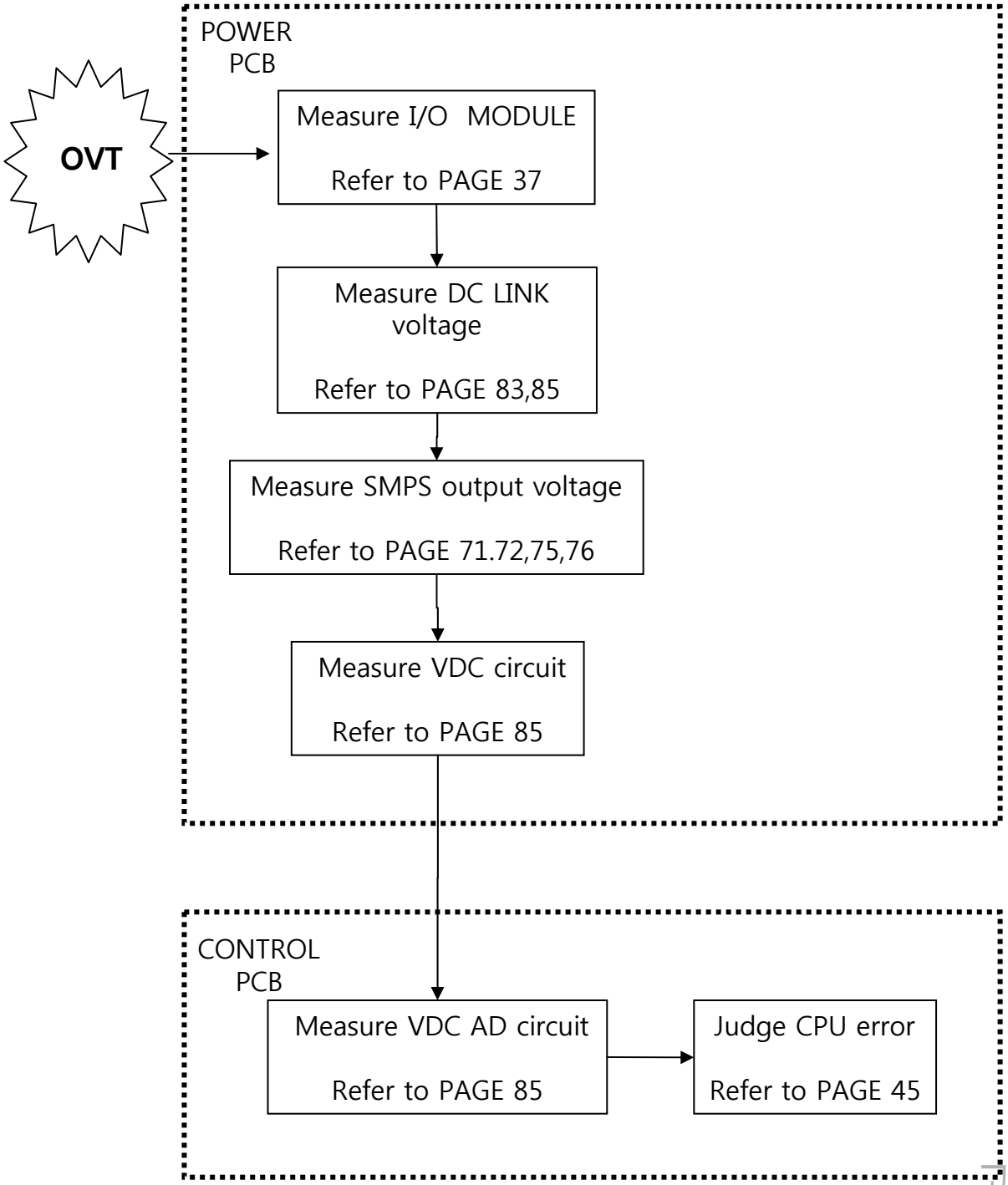
- OVER VOLTAGE TRIP (3/4)

*Product: SV055~075IG5A-2/4



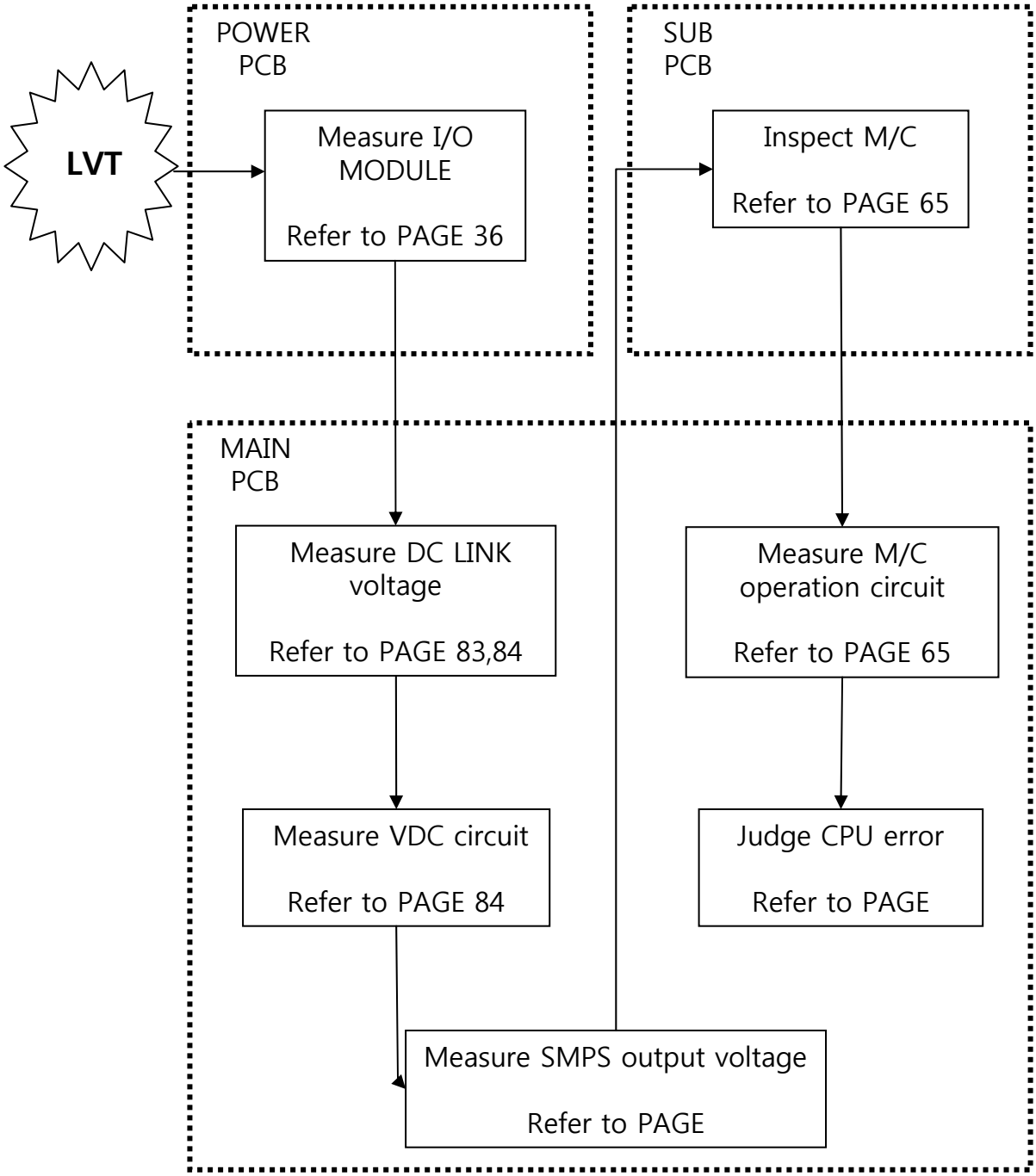
- OVER VOLTAGE TRIP (4/4)

***Product: SV110~220IG5A-2/4**



- LOW VOLTAGE TRIP (1/3)

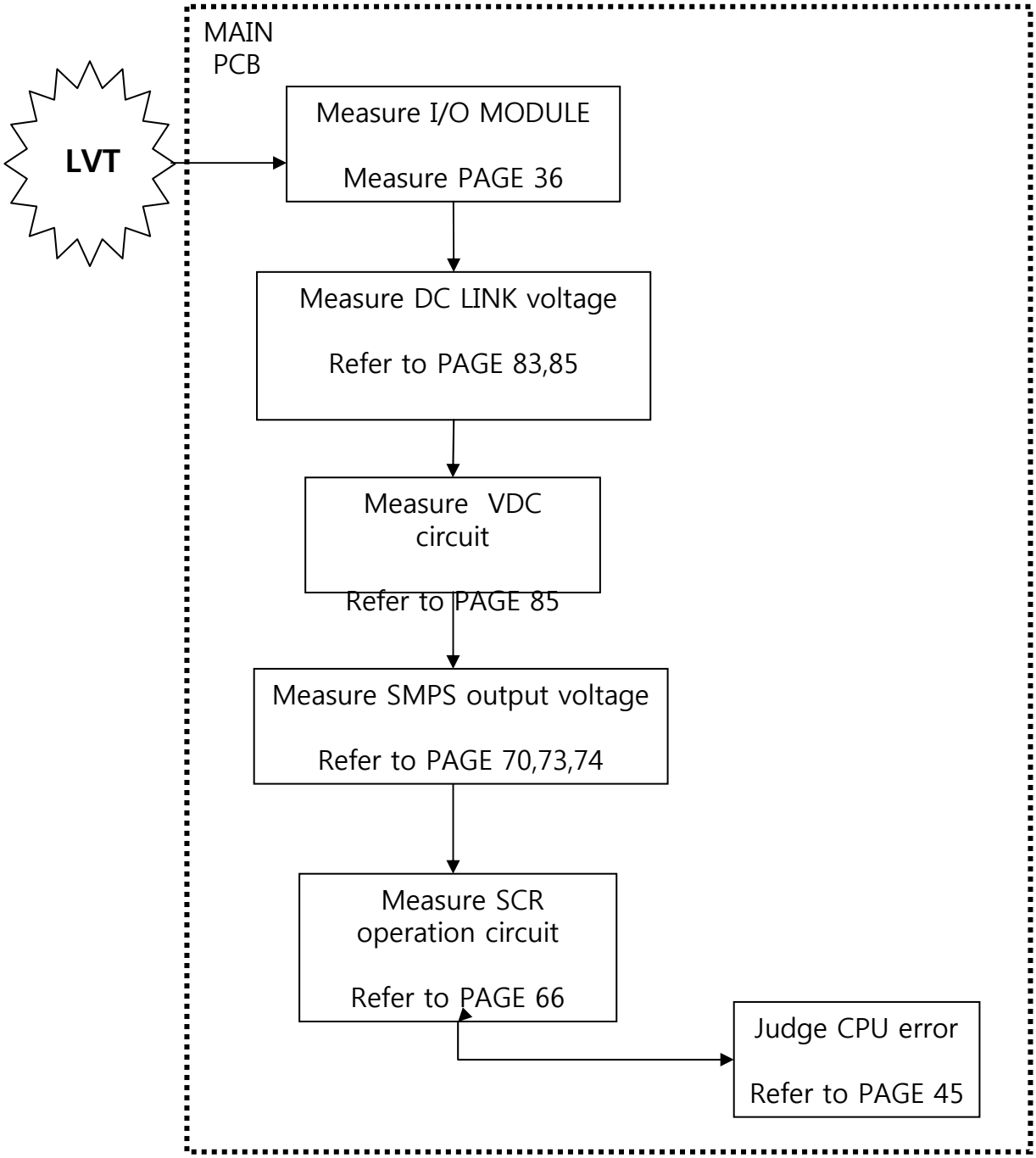
***Product: SV004~040IG5A-2/4**



고객지원팀

- LOW VOLTAGE TRIP (2/3)

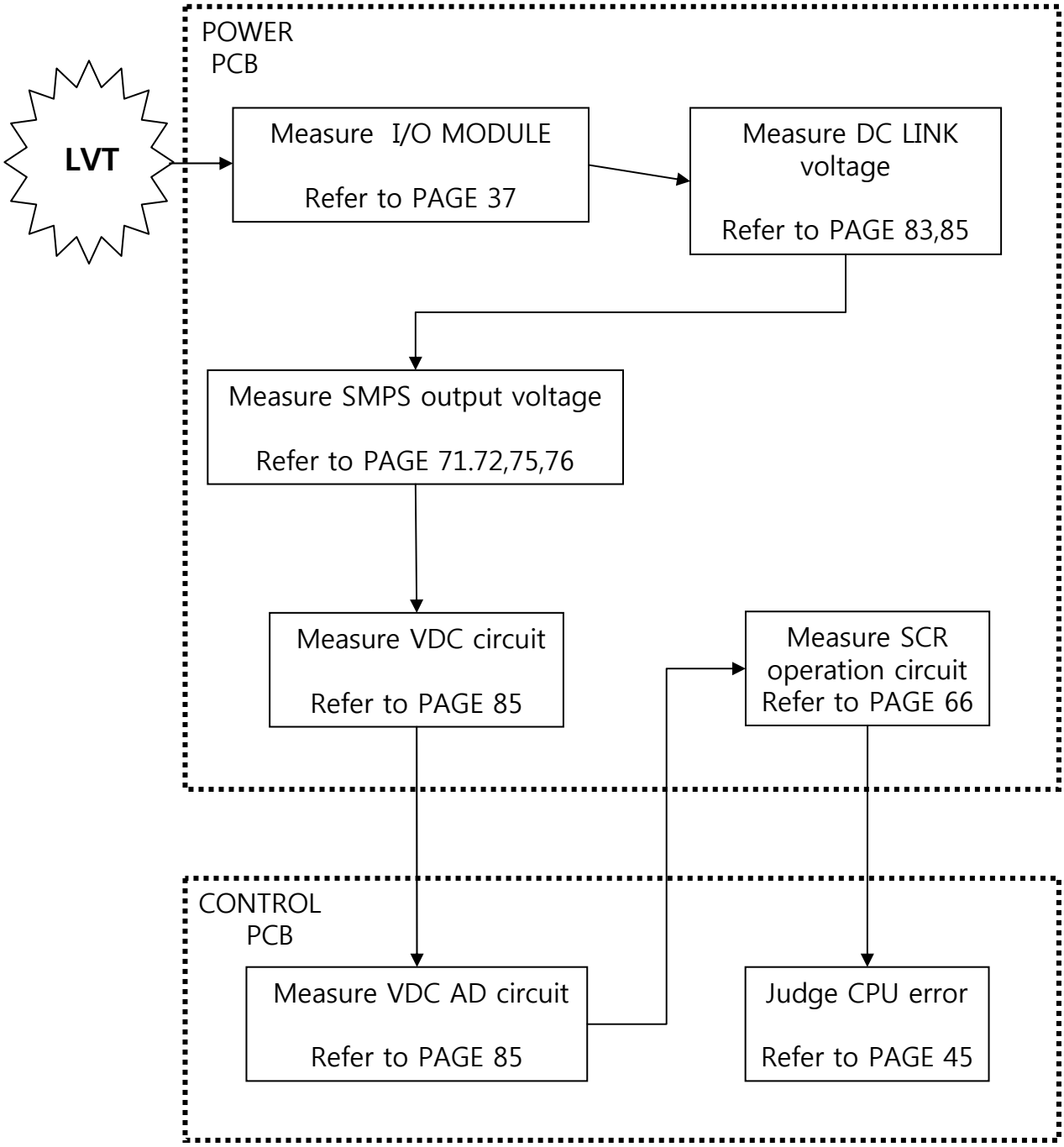
***Product: SV055~075IG5A-2/4**



고객지원팀

- LOW VOLTAGE TRIP (3/3)

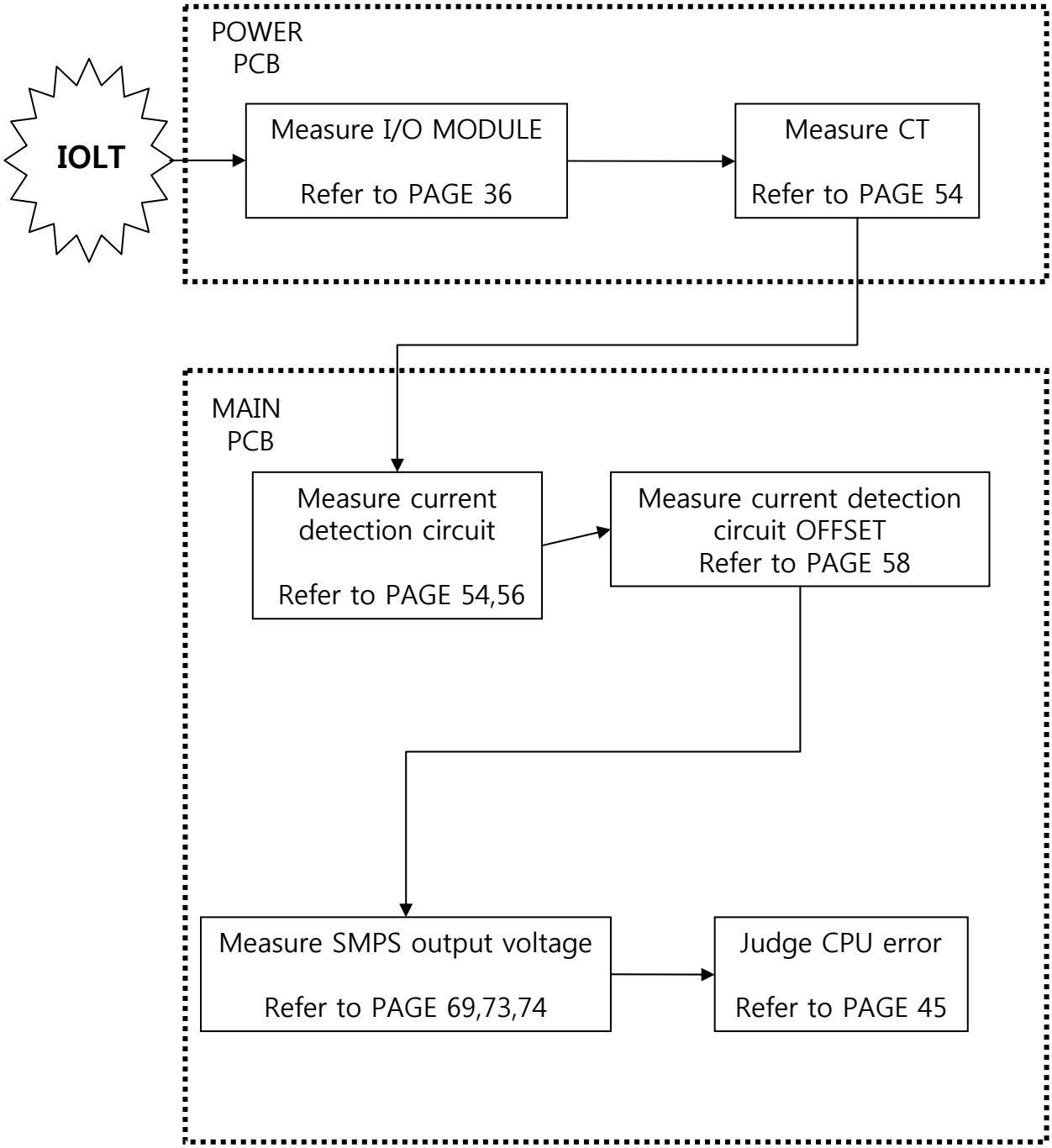
***Product: SV110~220IG5A-2/4**



고객지원팀

- INVERTER OVER LOAD TRIP (1/4)

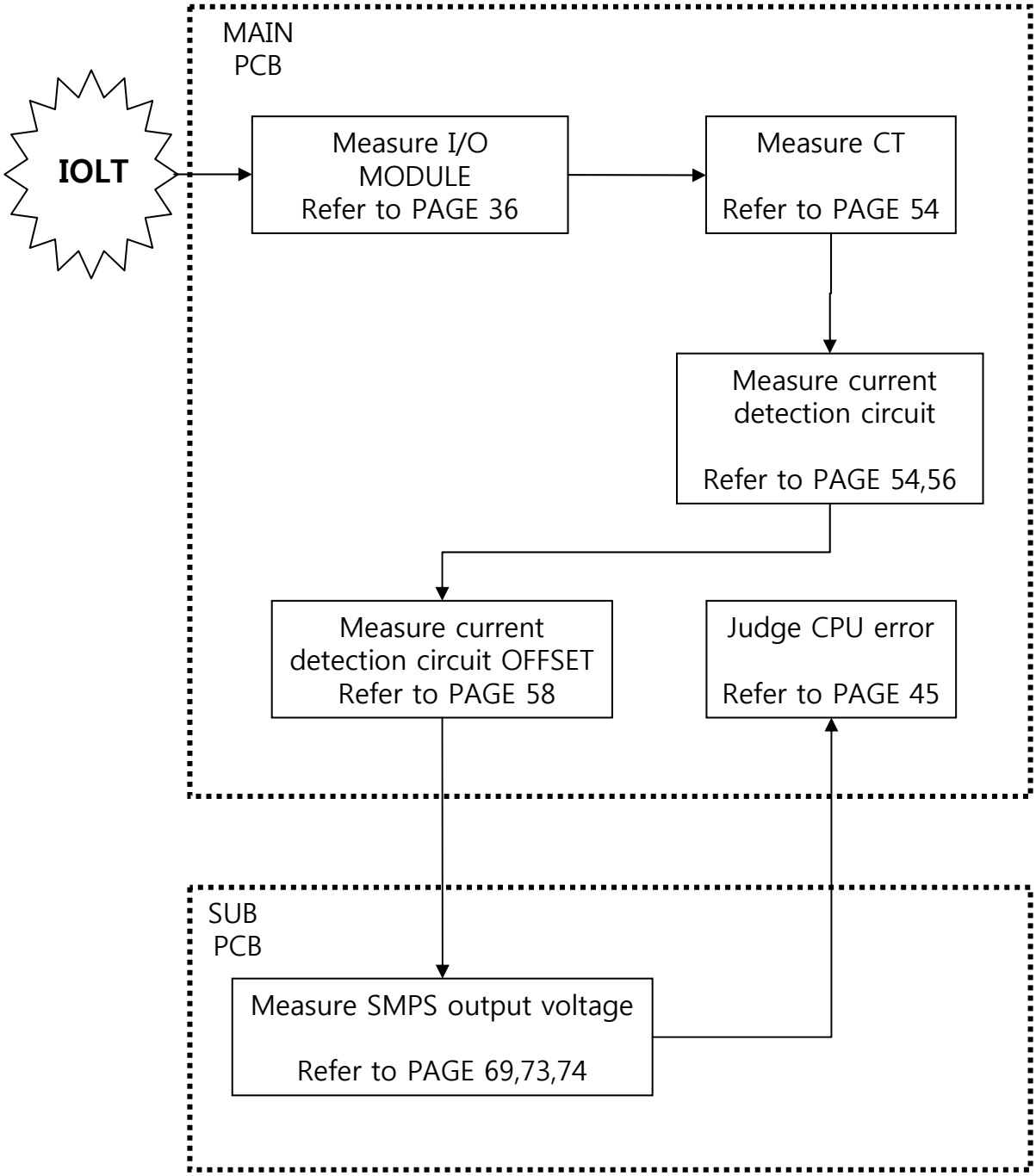
***Product: SV004~008IG5A-2/4**



고객지원팀

- INVERTER OVER LOAD TRIP (2/4)

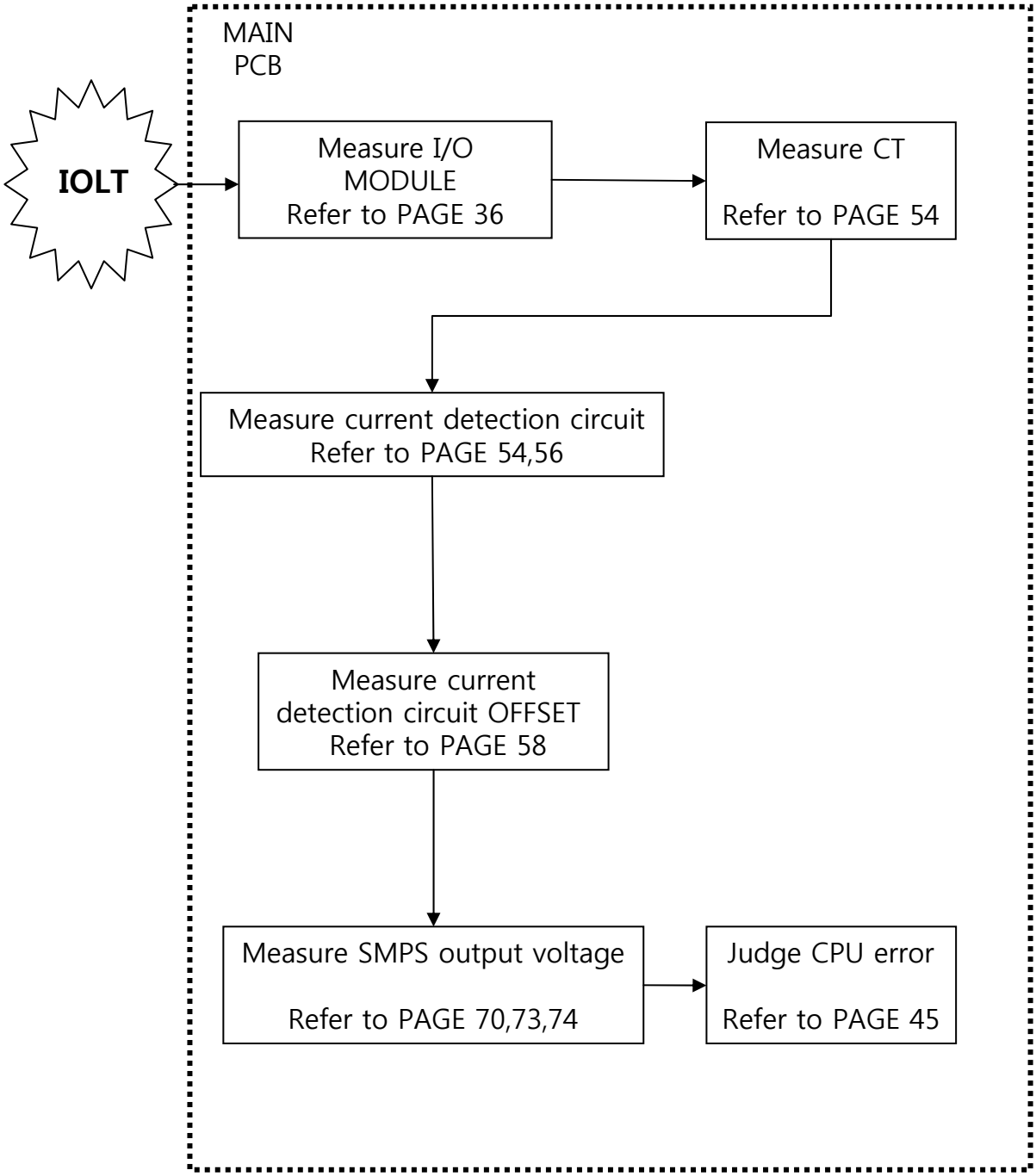
***Product: SV015~040IG5A-2/4**



고객지원팀

- INVERTER OVER LOAD TRIP (3/4)

*Product: SV055~075IG5A-2/4



고객지원팀

- INVERTER OVER LOAD TRIP (4/4)

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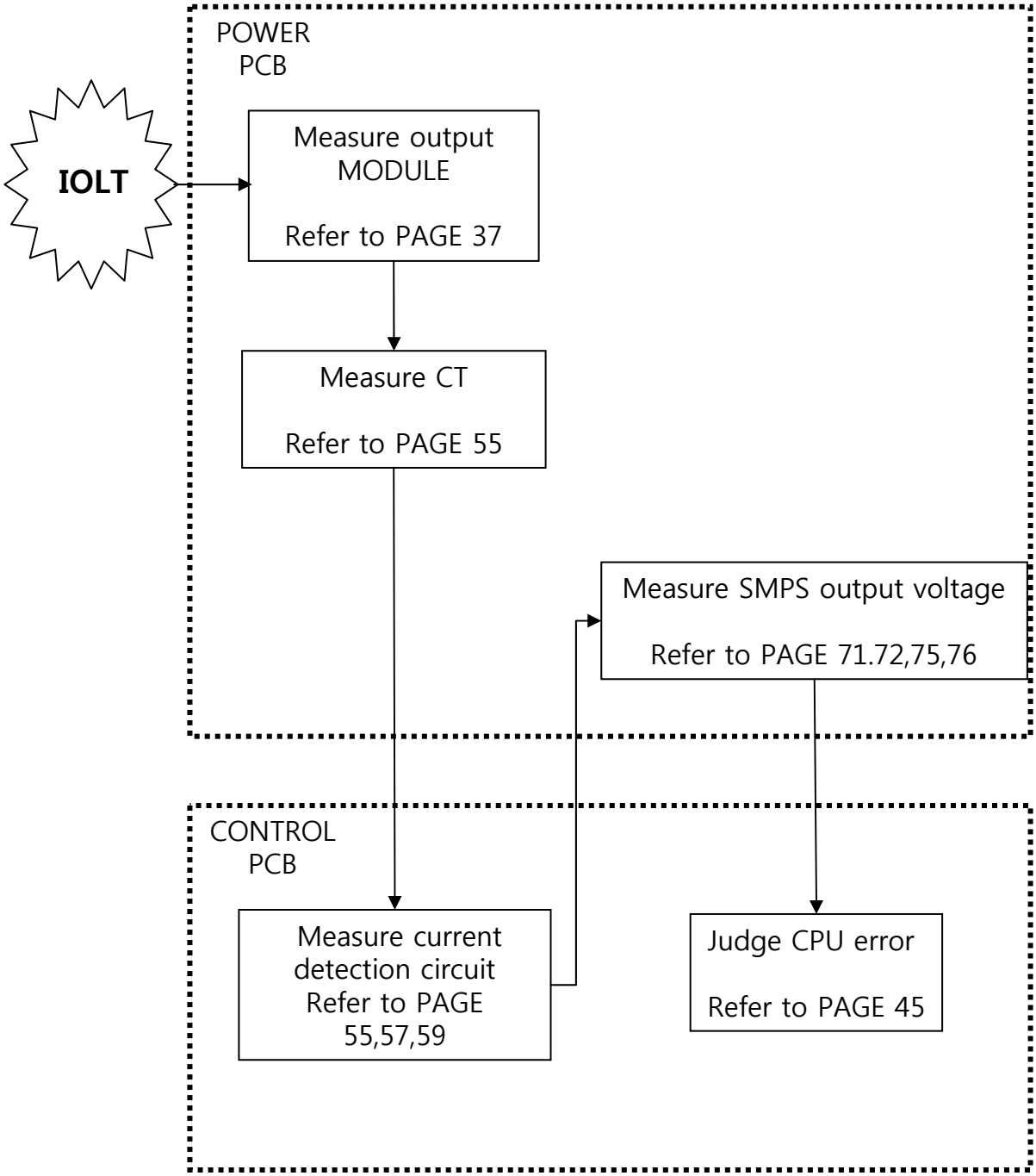
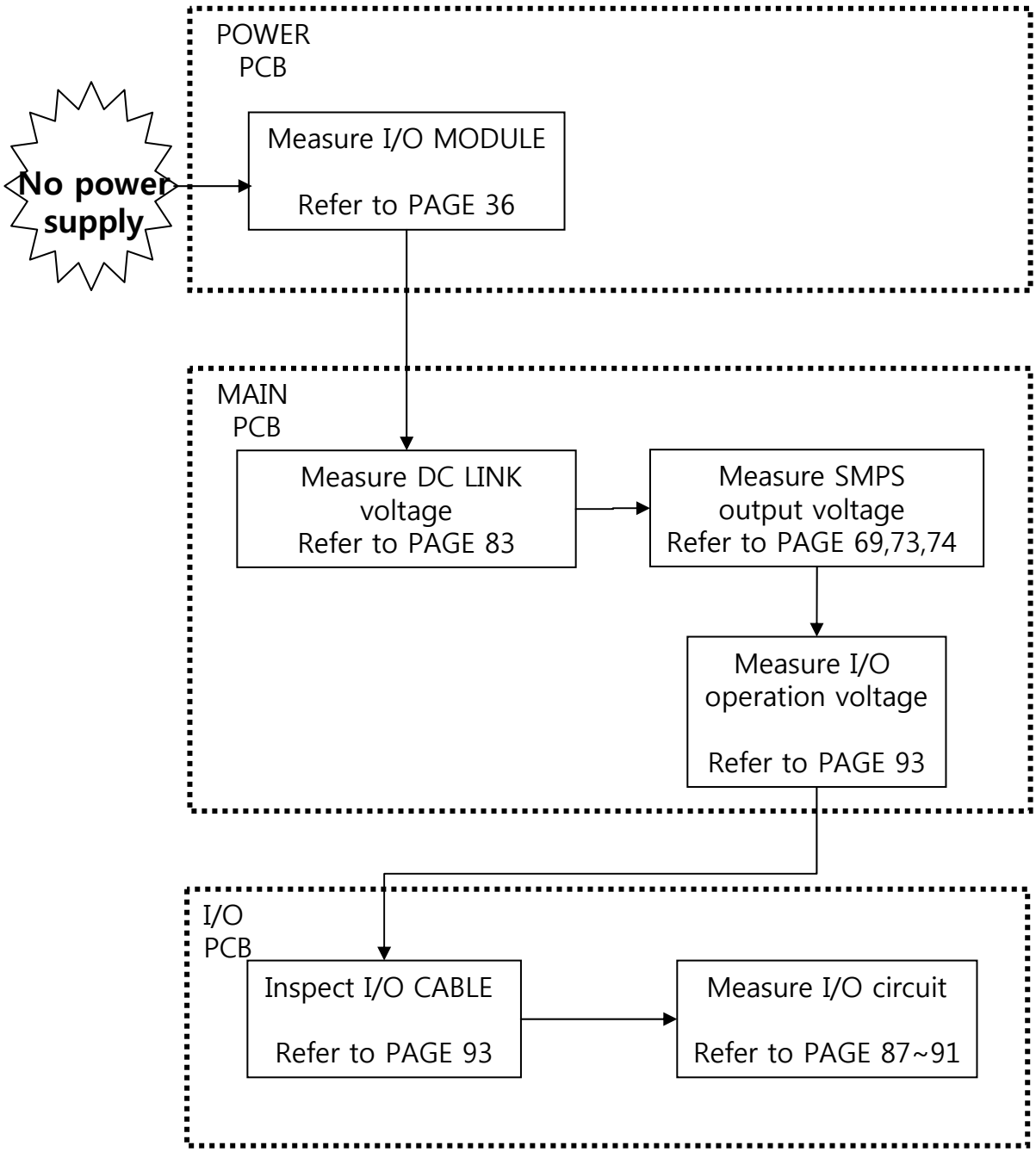


고객지원팀

- No power supply (1/4)

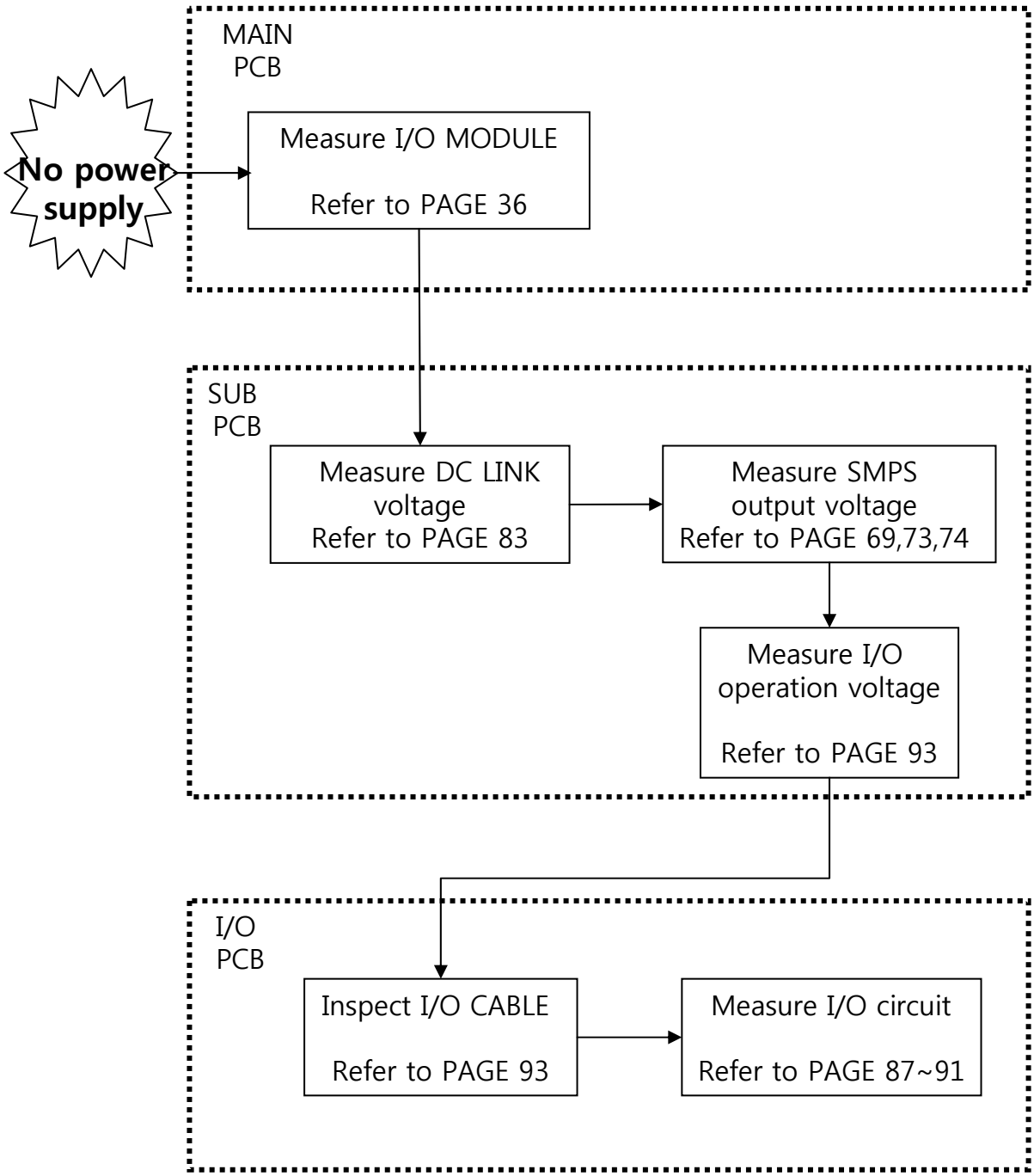
*Product: SV004~015IG5A-2/4



고객지원팀

- No power supply (2/4)

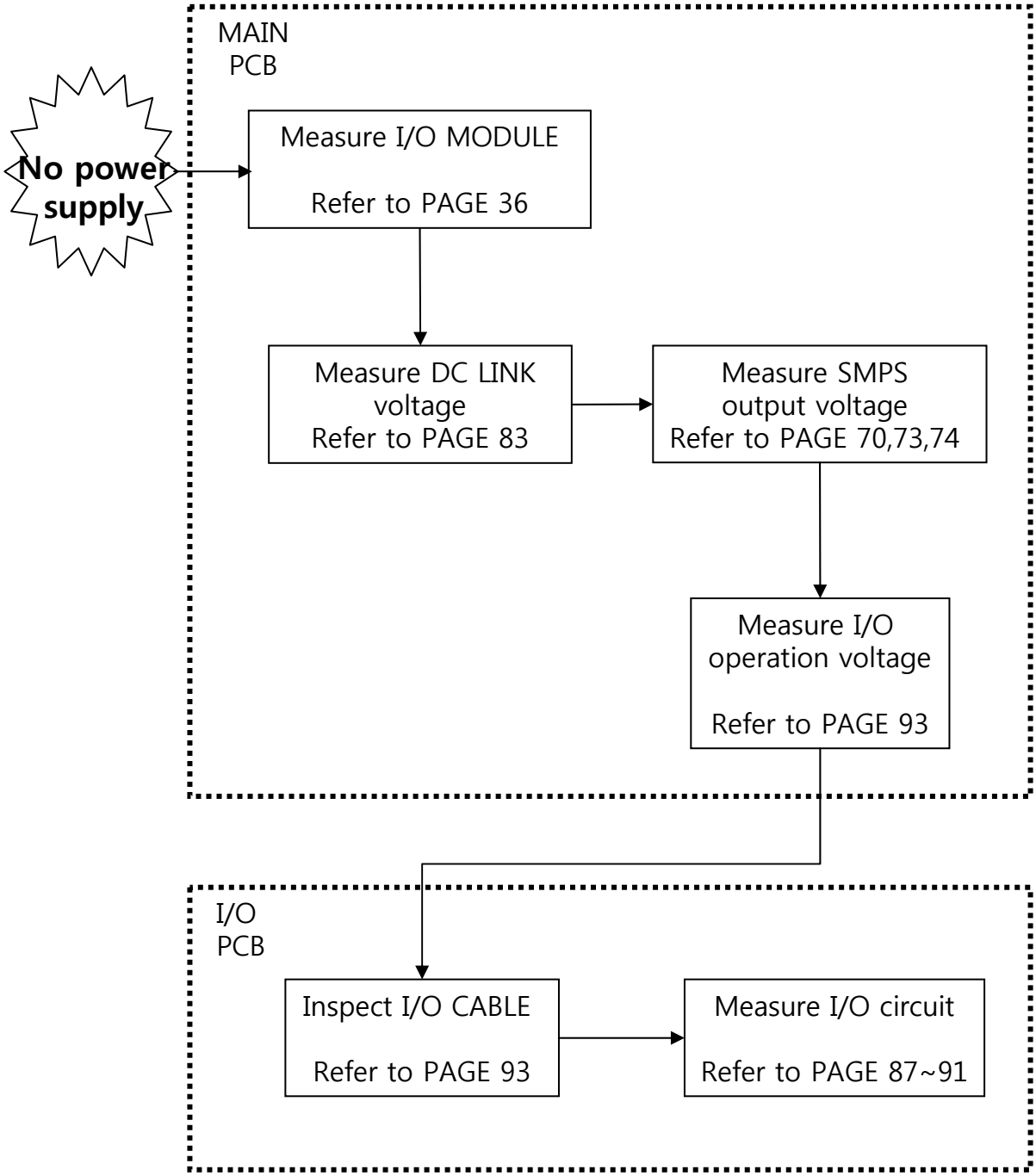
*** Product: SV020~040IG5A-2/4**



고객지원팀

- No power supply (3/4)

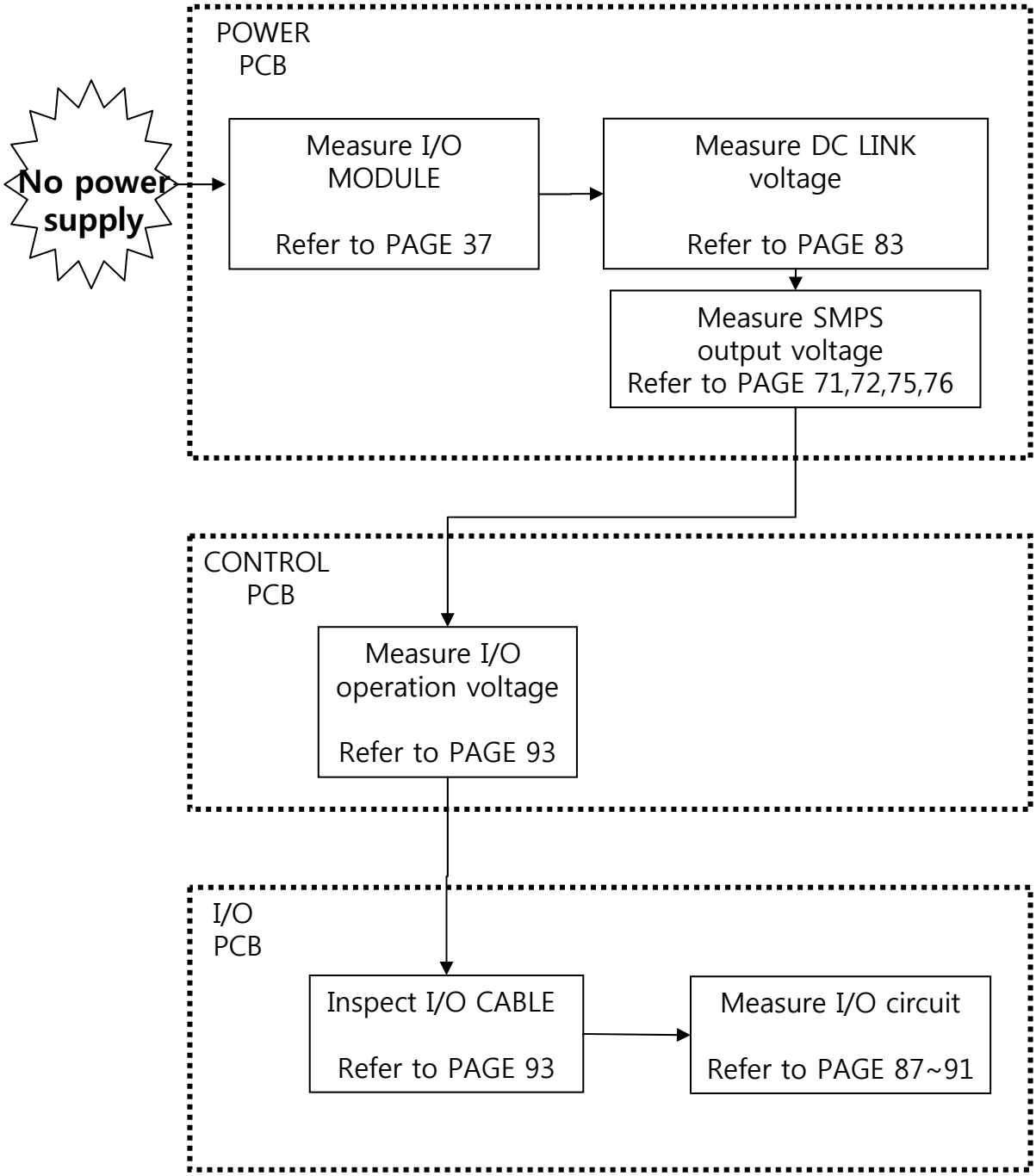
*** Product: SV055~075IG5A-2/4**



고객지원팀

- No power supply (4/4)

*** Product: SV110~220IG5A-2/4**



고객지원팀

Chap. 3 Inspection standard and Method

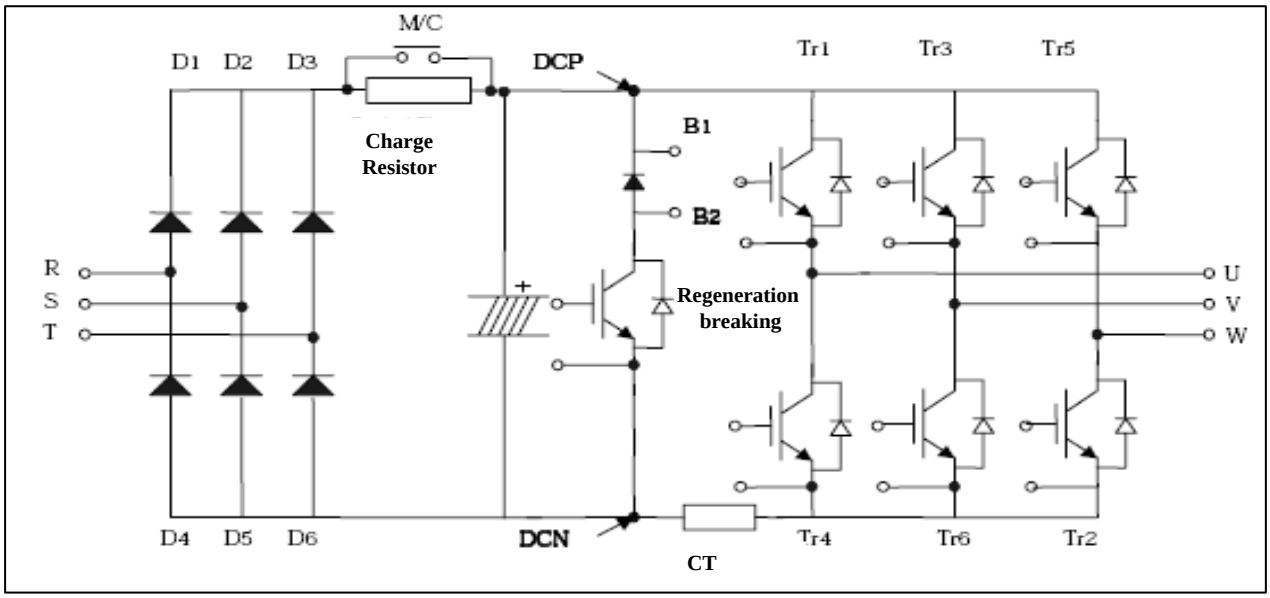
Contents

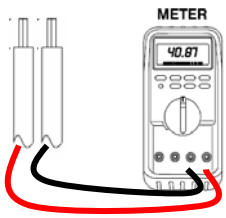
고객지원팀

Contents

1. POWER

1) POWER section inspection (SV004~075IG5A-2/4)





	Component	Test polarity +	Test polarity -	Measured value	Component	Test polarity +	Test polarity -	Measured value
Diode Module	D1	R	B1	(+)	D4	R	DCN	(-)
		B1	R	(-)		DCN	R	(+)
	D2	S	B1	(+)	D5	S	DCN	(-)
		B1	S	(-)		DCN	S	(+)
	D3	T	B1	(+)	D6	T	DCN	(-)
		B1	T	(-)		DCN	T	(+)
iGBT Module	TR1	U	B1	(+)	TR4	U	DCN	(-)
		B1	U	(-)		DCN	U	(+)
	TR3	V	B1	(+)	TR6	V	DCN	(-)
		B1	V	(-)		DCN	V	(+)
	TR5	W	B1	(+)	TR2	W	DCN	(-)
		B1	W	(-)		DCN	W	(+)

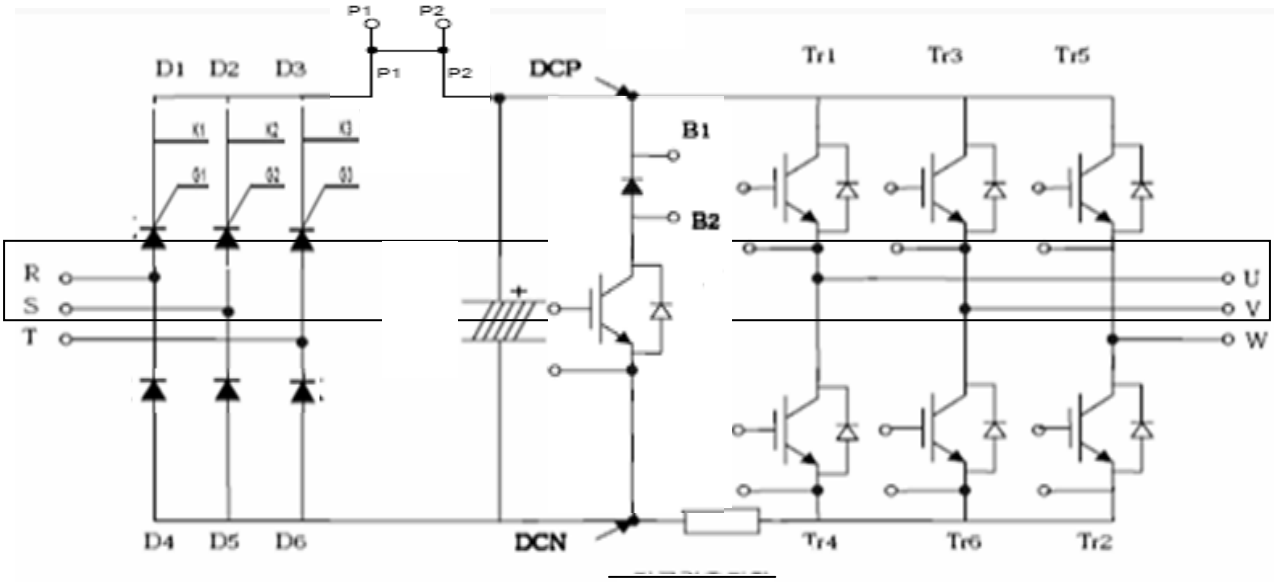
(+):Connected, (-):Nonconnected

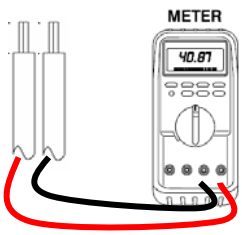
※ Measuring method

1) Remove R,S,T output power lines and U,V,W motor output lines.
2) Do the test after checking the discharge of electrolytic condenser.
3) Without current flowing, one-digit value of mega impedance is displayed or in some cases, after current flowing for a moment by the effect of electrolytic condenser, one-digit value of mega impedance is displayed. With current flowing, one or two digits of Ω value is displayed.
4) According to module and tester device type, displayed value can be different, but if measured values between phases are same within the error range of ±10%, it is judged correct.

1.POWER

2) POWER section inspection (SV110~220IG5A-2/4)





	Component	Test polarity +	Test polarity -	Measured value	Component	Test polarity +	Test polarity -	Measured value
Diode Module	D1	R	DCP	(+)	D4	R	DCN	(+)
		DCP	R	(-)		DCN	R	(+)
	D2	S	DCP	(-)	D5	S	DCN	(-)
		DCP	S	(-)		DCN	S	(+)
	D3	T	DCP	(-)	D6	T	DCN	(-)
		DCP	T	(-)		DCN	T	(+)
iGBT Module	TR1	U	DCP	(+)	TR4	U	DCN	(-)
		DCP	U	(-)		DCN	U	(+)
	TR3	V	DCP	(+)	TR6	V	DCN	(-)
		DCP	V	(-)		DCN	V	(+)
	TR5	W	DCP	(+)	TR2	W	DCN	(-)
		DCP	W	(-)		DCN	W	(+)

(+):Connected, (-):Nonconnected

※ Measuring method

1) Remove R,S,T output power lines and U,V,W motor output lines.

2) Do the test after checking the discharge of electrolytic condenser.
(Check the voltage between DCP-DCN)

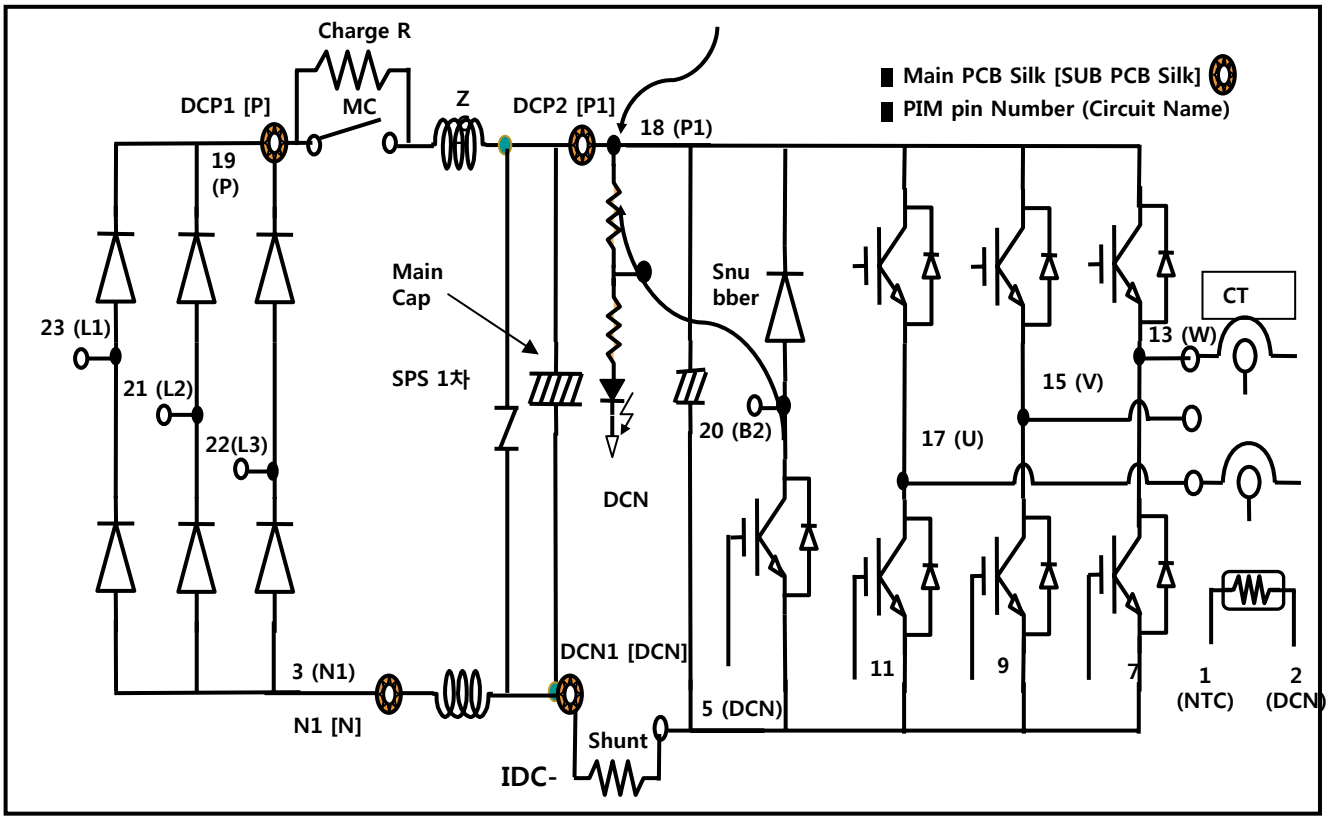
3) Without current flowing, one-digit value of mega impedance is displayed or in some cases, after current flowing for a moment by the effect of electrolytic condenser, one- digit value of mega impedance is displayed. With current flowing, one or two digits of Ω value is displayed.

4) According to module and tester device type, displayed value can be different, but if measured values between phases are same within the error range of ±10%, it is judged correct.

고객지원팀

1.POWER

3)Power Configuration SV004/008iG5A-2/4

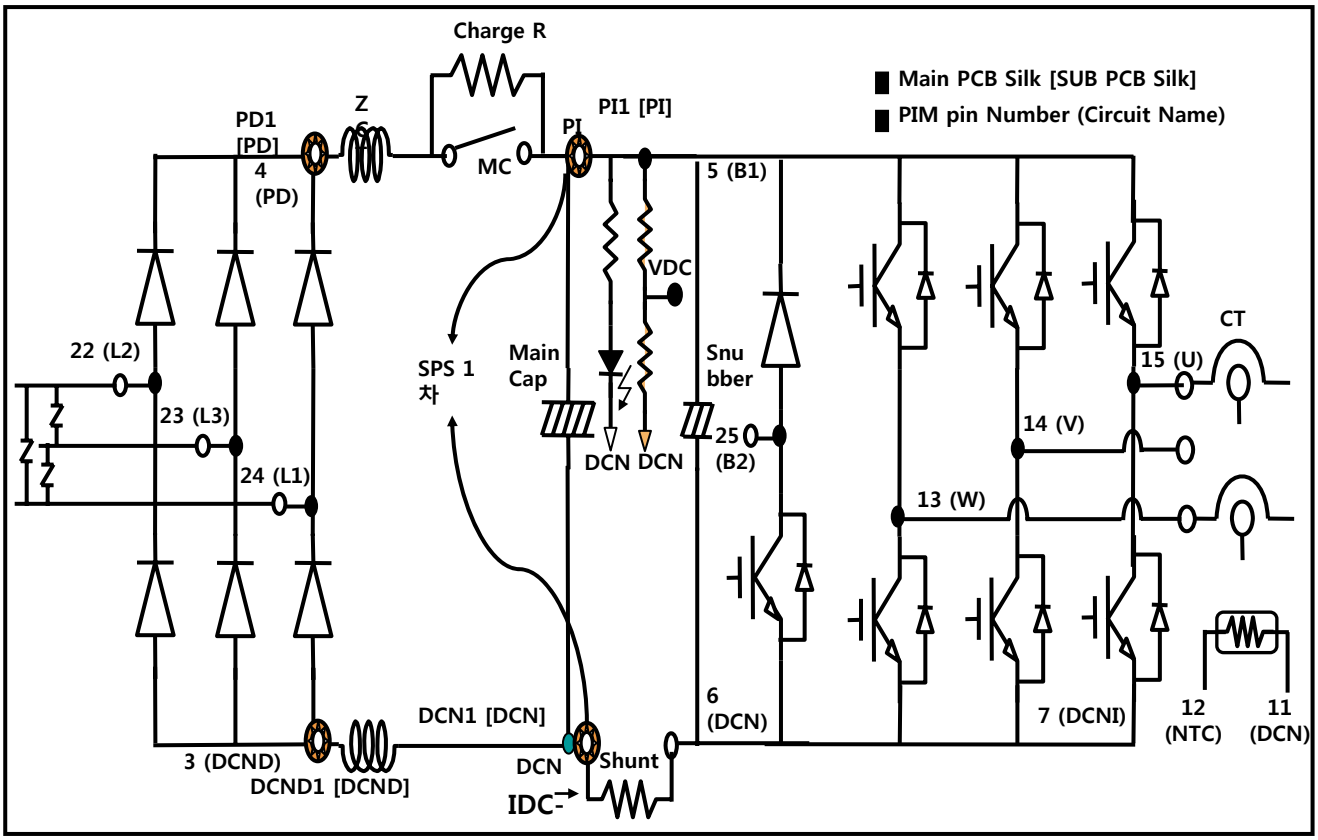


	Module Rating	INV Rating	CT Rating	H/W OCS Rating	S/W OCS Rating	OCT Rating	Rgain2	Rdiff	Rgain2
004-2	7 [A]	2.5 [A]	3 [A]	7.2[A] 103%	6.3[A] 90%	15.0[A] 214%	1.40kΩ	2.80kΩ	120Ω
008-2	15 [A]	5 [A]	10 [A]	15.7[A] 105%	13.5[A] 90%	30.0[A] 200%	2.15kΩ	4.30kΩ	62Ω
004-4	5 [A]	1.25 [A]	3 [A]	5.3[A] 106%	4.9[A] 90%	75.0[A] 214%	1.91kΩ	3.83kΩ	62Ω
008-4	10 [A]	2.5 [A]	5 [A]	10.5[A] 105%	9.0[A] 90%	100.0[A] 200%	1.60kΩ	3.24kΩ	62Ω

	PIM	MAIN CAPACITOR	HALL - CT	SHUNT R	CHARGE R	Common
004-2	V23990-P542-A	HL22G151MCY [2]	L07P003D15	MPS-2 21mm[1]	5W 200Ω [1]	Snubber : PM3A104K (400) 6PC2JRB103 (200) NTC : 22.0KΩ
008-2	V23990-P544-A	HL22G221MCZ [2]	L07P010D15	MPS-2 10mm[1]	5W 200Ω [1]	
004-4	V23990-P548-A	HL22G151MCY [2]	L07P003D15	MPS-2 30mm[2]	5W 200Ω [1]	
008-4	V23990-P549-A	HL22G221MCZ [2]	L07P005D15	MPS-2 20mm[2]	5W 200Ω [1]	

1.POWER

4)Power Configuration SV015iG5A-2



Rating	Module Rating	INV Rating	CT Rating	H/W OCS Rating	S/W OCS Rating	OCT Rating	Rgain2	Rdiff	Rgain2
015-2	20 [A]	8 [A]	10 [A]	36.2[A] 121%	20.0[A] 100%	40.0[A] 200%	1.40kΩ	2.80kΩ	62Ω

POWER	PIM	MAIN CAPACITOR	HALL – CT	SHUNT R	CHARGE R	Common
015-2	V23998-P85-A20	HL22G221MCZ [4]	L07P010D15	MPS-2 15mm [1]	5W 200Ω	Snubber : 6PC2JRB103AF NTC : 4.7KΩ

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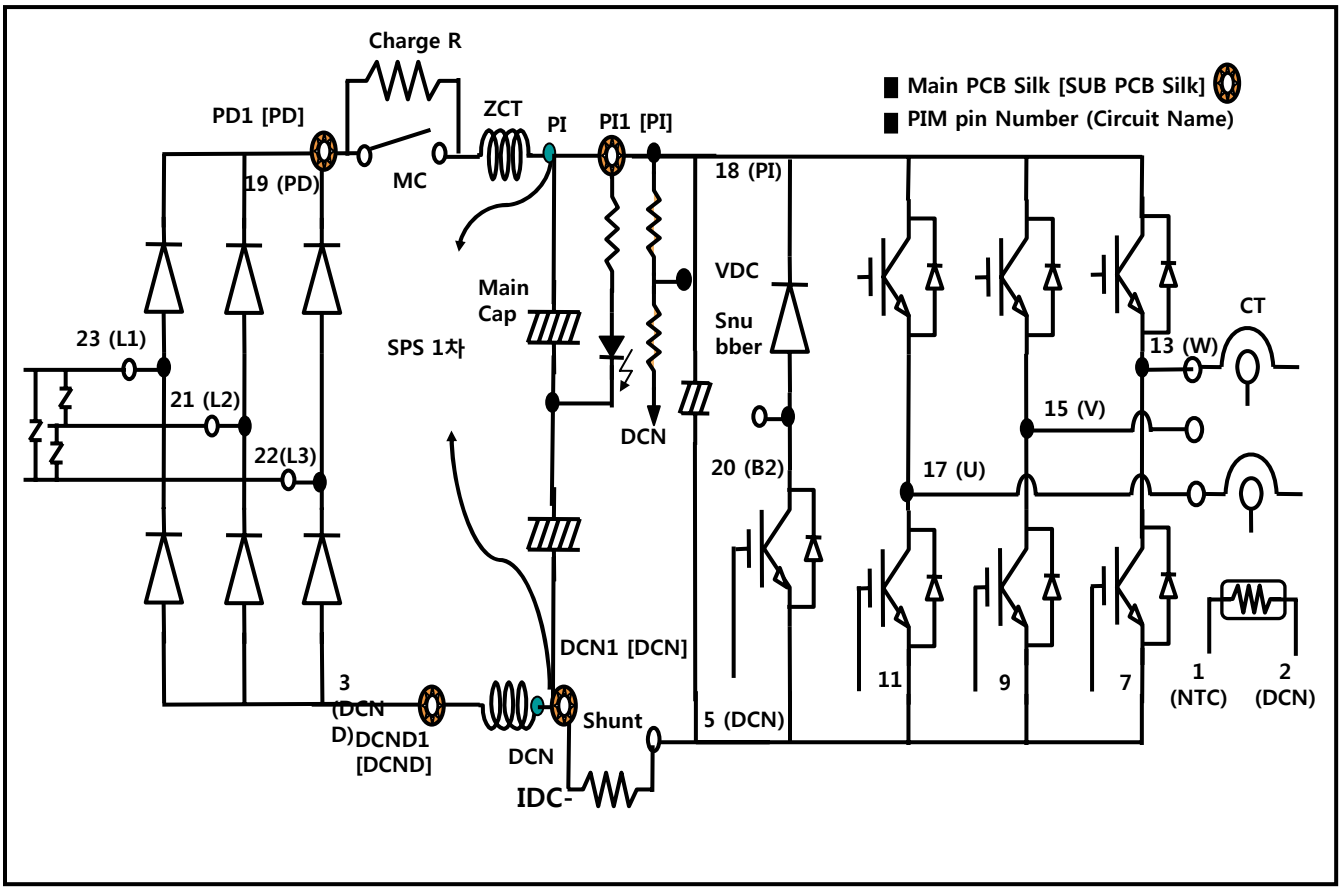
1.POWER

5)Power Configuration SV015iG5A-4

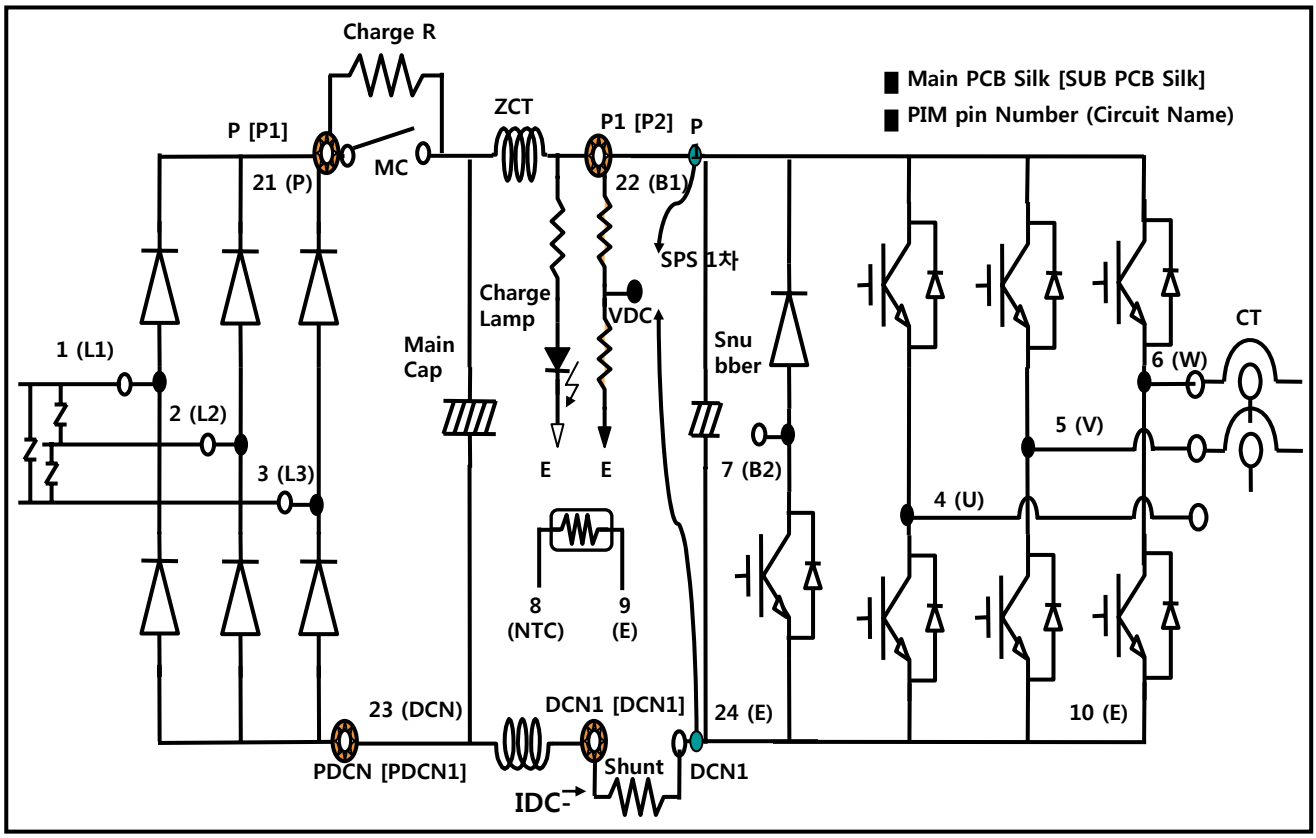


Rating	Module Rating	INV Rating	CT Rating	H/W OCS Rating	S/W OCS Rating	OCT Rating	Rgain2	Rdiff	Rgain2
015-4	10 [A]	4 [A]	5 [A]	12.1[A] 121%	10.0[A] 100%	15.0[A] 150%	1.40kΩ	2.80kΩ	62Ω

POWER	PIM	MAIN CAPACITOR	HALL - CT	SHUNT R	CHARGE R	Common
015-4	V23998-P549-A	HL22G221MCZ [4]	L07P005D15	MPS-2 20mm [1]	5W 200Ω	Snubber : PM3A103 NTC : 22.0KΩ

1.POWER

6)Power Configuration SV022~040iG5A-2/4

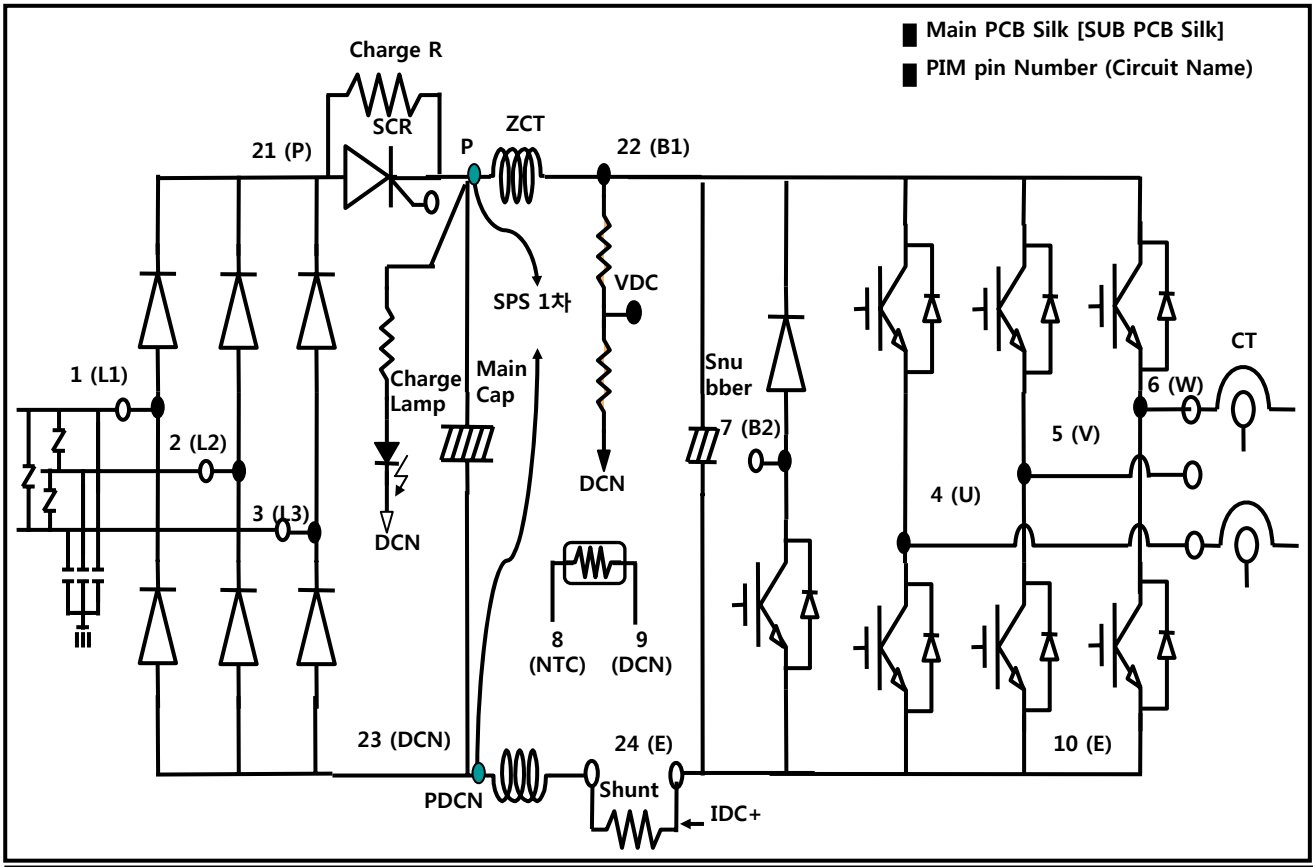


Rating	Module Rating	INV Rating	CT Rating	H/W OCS Rating	S/W OCS Rating	OCT Rating	Rgain2	Rdiff	Rgain2
022-2	30 [A]	12 [A]	15 [A]	24.1[A] 121%	30.0[A] 100%	60.0[A] 200%	1.40kΩ	2.80kΩ	75Ω
037-2	50 [A]	16 [A]	25 [A]	52.7[A] 105%	45.0[A] 90%	100.0[A] 200%	1.60kΩ	3.24kΩ	75Ω
022-4	15 [A]	6 [A]	10 [A]	18.0[A] 120%	15.0[A] 100%	30.0[A] 200%	1.87kΩ	3.74kΩ	75Ω
037-4	15 [A]	8 [A]	15 [A]	26.5[A] 106%	22.5[A] 90%	50.0[A] 200%	1.91kΩ	3.83kΩ	75Ω

POWER	PIM	MAIN CAPACITOR	HALL - CT	SHUNT R	CHARGE R	Common
022-2	BSM30GP60	HU42G331MCZ [4]	L07P015D15	MPS-2 10mm [2]	5W 200Ω [2]	
037-2	BSM50GP60	HU42G561MCZS7 [4]	L07P025D15	MPS-2 6mm [3]	5W 200Ω [2]	Snubber : PM3A103K NTC : 5.0KΩ
022-4	BSM15GP120	HU42G331MCZ [4]	L07P010D15	MPS-2 10mm [1]	5W 200Ω [2]	
037-4	BSM25GP120	HU42G561MCZS7 [4]	L07P015D15	MPS-2 6mm [1]	5W 200Ω [2]	

1.POWER

7)Power Configuration SV055/075iG5A-2/4

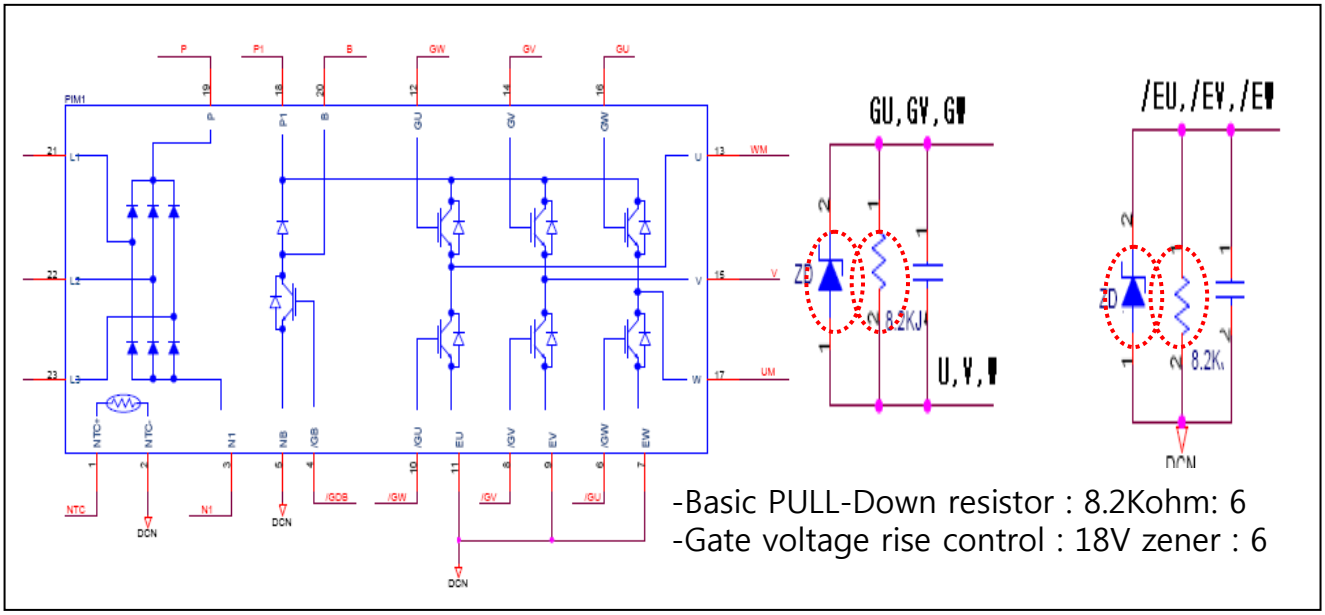


Rating	Module Rating	INV Rating	CT Rating	H/W OCS Rating	S/W OCS Rating	OCT Rating	Rgain2	Rdiff	Rgain2
055-2	75 [A]	24 [A]	50 [A]	76.4[A] 102%	67.5[A] 90%	142.9[A] 190%	2.21kΩ	4.42kΩ	62Ω
075-2	100 [A]	32 [A]	50 [A]	102.3[A] 102%	90.0[A] 90%	225.1[A] 225%	1.65kΩ	3.3kΩ	47Ω
055-4	35 [A]	12 [A]	25 [A]	35.6[A] 102%	31.5[A] 90%	75.0[A] 214%	2.37kΩ	4.75kΩ	62Ω
075-4	50 [A]	16 [A]	25 [A]	51.1[A] 102%	45.0[A] 90%	100.0[A] 200%	1.65kΩ	3.3kΩ	47Ω

POWER	PIM	MAIN CAPACITOR	HALL - CT	SHUNT R	CHARGE R	Common
055-2	7MBR75SD060	HU52G681MRY [4]	HC-PDA50V4	MPS-2 4mm [2]	10W 40Ω [2]	
075-2	7MBR100SD060	HU52G681MRY [6]	HC-PDA50V4	MPS-2 4mm [3]	10W 40Ω [2]	Snubber : PM3A104K NTC : 5.0KΩ
055-4	7MBR35SD120	HU52G681MRY [4]	HC-PDA50V4	MPS-2 8mm [2]	10W 100Ω [2]	
075-4	7MBR50SD120	HU52G681MRY [6]	HC-PDA50V4	MPS-2 6mm [2]	10W 100Ω [2]	

2.PIM

1) PIM (SV004~075IG5A-2/4)



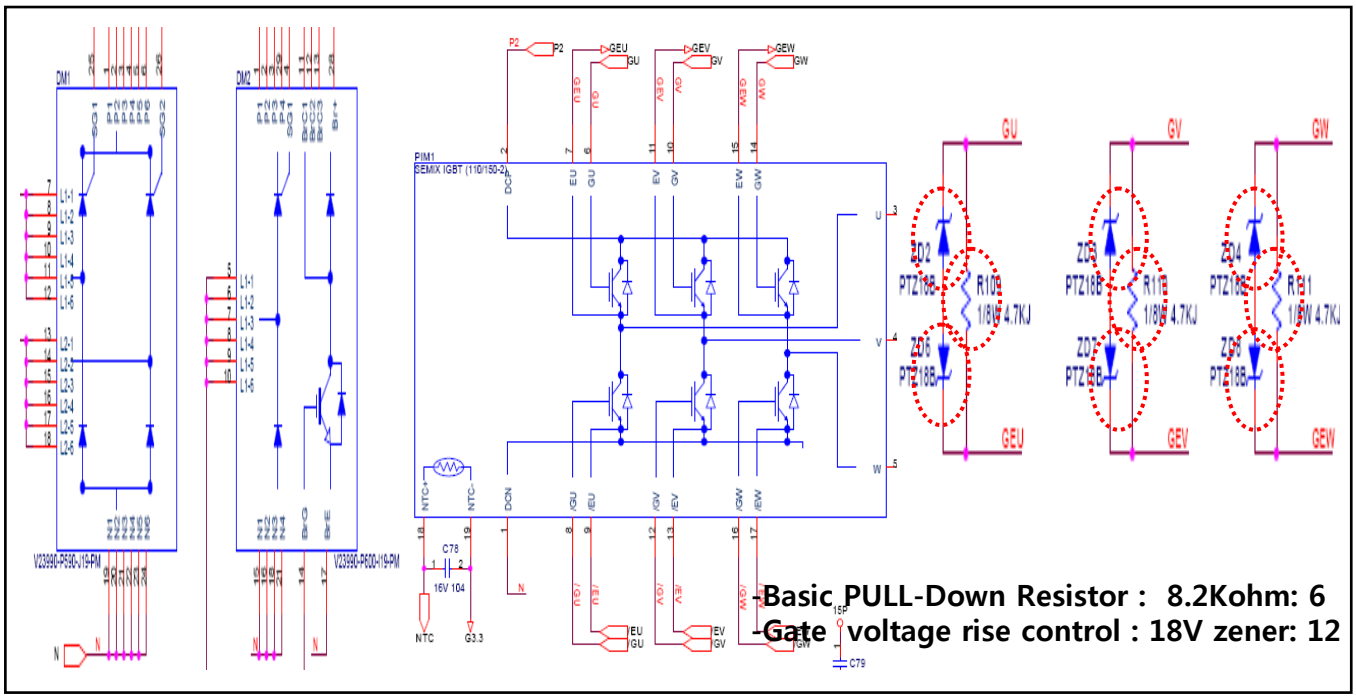
***Basic PULL-Down resistor : Before securing operating power, DC voltage of inverter rises up. When DC voltage rises up, this voltage is also fed to both ends of the output IGBT as the form of partial pressure and the voltage between IGBT G-E rises. If this voltage increases over IGBT threshold voltage, short accident can happen with the current flowing. So, the Resistor prevents this.**

***Gate voltage rise control : 18V zener is used in IGBT gate for controlling Gate voltage rise and keeping IGBT current when output short occurs.**

Type	Spec.	Maker	Type	Spec.	Maker	Type	Spec.	Maker
004-2	P542	TYCO	040-2	BSM50GP60 7MBR50SA060	EUPEC FUJI	022-4	BSM15GP120 7MBR15SA120	EUPEC FUJI
008-2	P544	TYCO	055-2	7MBR75SD60	FUJI	037-4	BSM25GP120 7MBR25SA120	EUPEC FUJI
015-2	P85	TYCO	075-2	7MBR100SD60	FUJI	040-4	BSM25GP120 7MBR25SA120	EUPEC FUJI
022-2	BSM30GP60 7MBR30SA060	EUPEC FUJI	004-4	P548	TYCO	055-4	7MBR35SD120	FUJI
037-2	BSM50GP60 7MBR50SA060	EUPEC FUJI	008/0 15-4	P549	TYCO	075-4	7MBR50SD120	FUJI

2.PIM

2) PIM / IGBT (SV110 ~ 220IG5A-2/4)



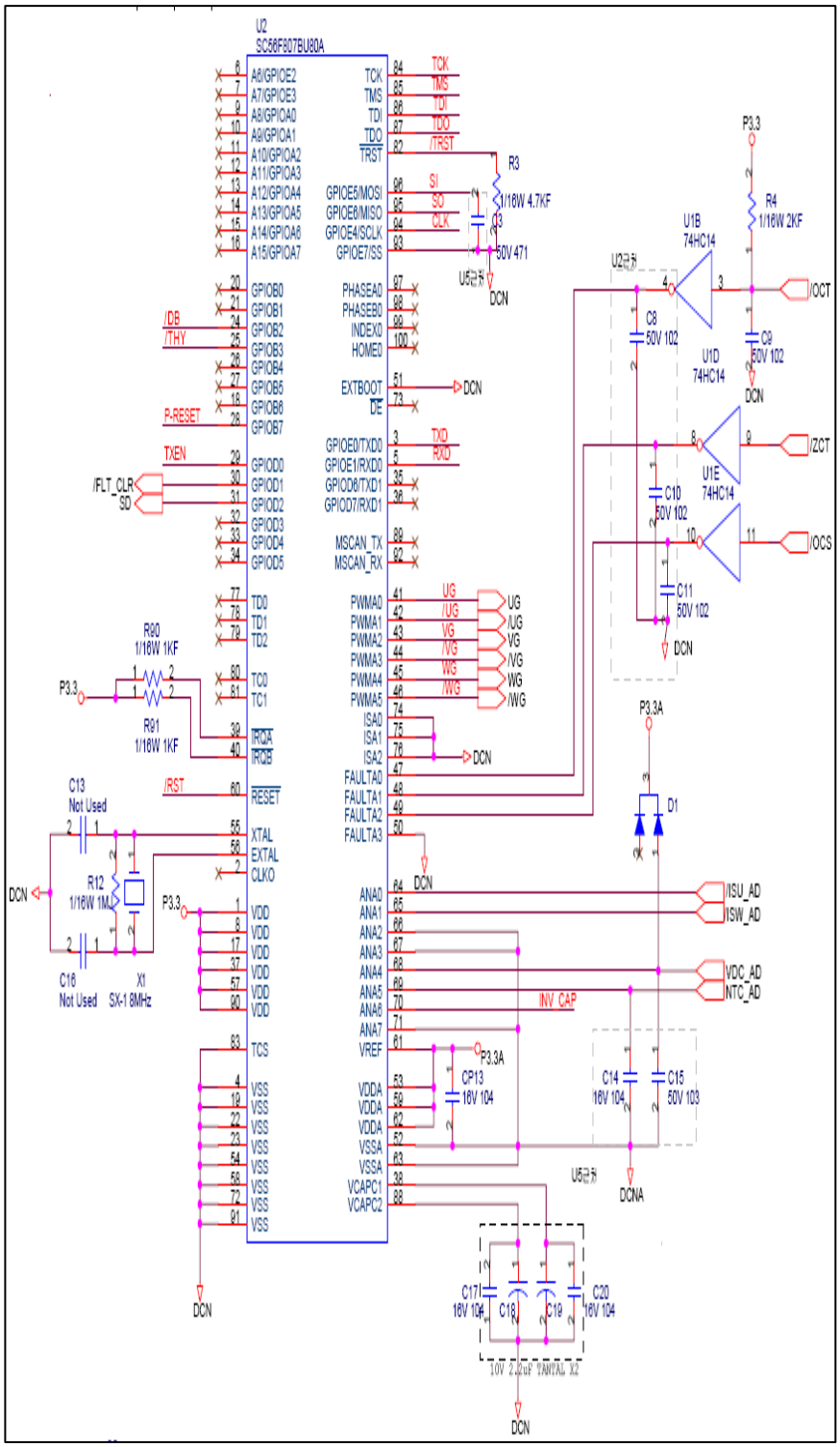
*Basic PULL-Down resistor : Before securing operating power, DC voltage of inverter rises up. When DC voltage rises up, this voltage is also fed to both ends of the output IGBT as the form of partial pressure and the voltage between IGBT G-E rises. If this voltage increases over IGBT threshold voltage, short accident can happen with the current flowing. So, the Resistor prevents this.

*Gate voltage rise control : 18V zener is used in IGBT gate for controlling Gate voltage rise and keeping IGBT current when output short occurs.

Type	Input Spec.	Maker	Output Spec.	Maker	Type	Input Spec.	Maker	Output Spec.	Maker
110-2	P590 P600	TYCO TYCO	101GD066H DS	SEMIKR-ON	110-4	P590 P600	TYCO TYCO	101GD128D S	SEMIKR-ON
150-2	P590 P600	TYCO TYCO	151GD066H DS	SEMIKR-ON	150-4	P590 P600	TYCO TYCO	101GD128D S	SEMIKR-ON
185-2	P590 P600	TYCO TYCO	201GD066H DS	SEMIKR-ON	185-4	P590 P600	TYCO TYCO	101GD126H DS	SEMIKR-ON
220-2	P590 P600	TYCO TYCO	201GD066H DS	SEMIKR-ON	220-4	P590 P600	TYCO TYCO	151GD128D S	SEMIKR-ON

3.CPU

CPU: SC56F807BU80A (Motorola社) , 100Pin, iG5A dedicated Main CPU



SD : Gate Drive Shut Down
FLT_CLR : Gate Drive Clear
/DB : Braking signal
/THY : 5.5/7.5kW (SCR signal)
0.4~4.0kW (MC signal)
P-RESET : IO CPU Reset
/RST : Main CPU Reset at D/L
TCK,TMS,TDI,TDO,/TRST : D/L
SI,SO,CLK : communication between IO and SPI
TXD,RXD : 485 comm.
UG~/WG : PWM output
FAULTA0 : OCT detection
FAULTA1 : GFT detection
FAULTA2 : OCS detection
ISU_AD : Current detection AD
VDC_AD : Voltage detection AD
NTC_AD : Temperature detection AD
INV_CAP : Automatic capacity recognition AD

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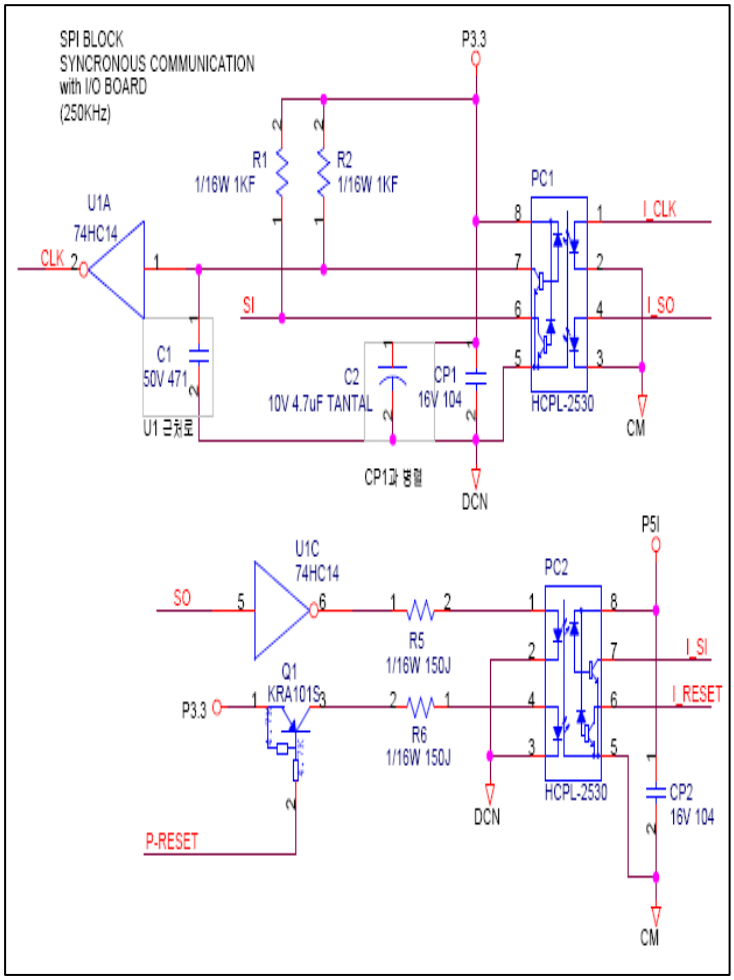
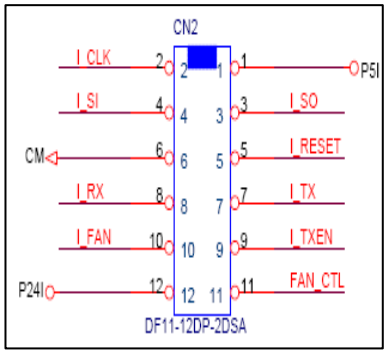
4.SPI

SPI : HCPL-2530 (IR社) , Optocoupler for communication

☞ Charged in comm. between Main CPU and IO CPU.
Synchronization comm., Master is IO CPU





P5I	5V power
I_CLK	SPI communication
I_SO	
I_SI	
I_RESET	IO CPU Reset
CM	Common terminal (Ground)
I_TX	485 Communication
I_RX	
I_TXEN	
I_FAN	FAN Control
FAN_CTL	
P24I	24V power

- I_CLK : IO, as Master, provides Clock for synchronization communication.
- I_SO : Transmit Data from IO to Main
- I_SI : Transmit Data from Main to IO
- I_Reset : Signal for IO CPU Reset

※ I_SI signal get Open : after few seconds, “Err” occurs
※ I_SO signal get Open : communication blocked , if I_SO signal is restored as normal, “COM” occurs.
※ EEP occurs when parameter can’t be saved during LV period.

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5. Capacity recognition

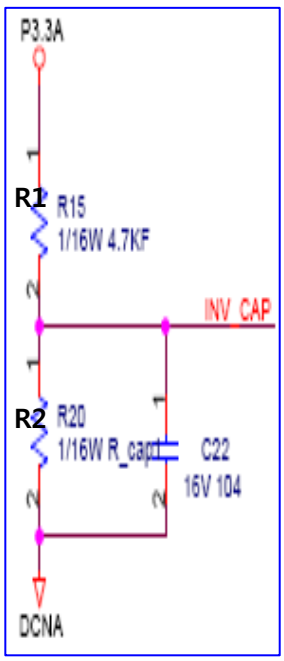
Capacity recognition : CPU recognizes the capacity automatically by feeding power(3.3V) with conversion of voltage detected as resistance partial pressure to AD value of CPU.

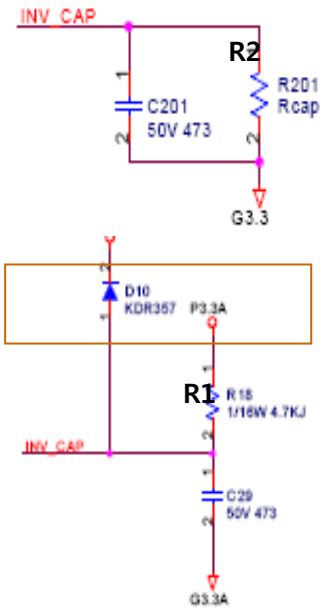
※ Test Standard

Point : After feeding power, measure the voltage between INV_CAP and DCNA with DMM and check if it's proper for the inverter capacity.

(ex: For 2.2KW-2type, the voltage would be about 0.914V.)

SV004~075IG5A-2/4 SV110~220IG5A-2/4





※Inverter capacity checking method
=> MAK Group (In FU2-95, input "807" and save then check MAK Group 1)

※ When error occurs
① Measure the impedance of R1, R2
② Measure the voltage of P3.3V .
③ Consider the possibility of CPU error.

INV CAP	200V 3 phases AD VAL / [V]	200V 3 phases R1 / R2	Para. Maker 1	400V 3 phases AD VAL / [V]	400V 3 phases R1 / R2	Para. Maker 1
0.2kW	153 / 0.123	4.7kΩ / 182Ω		-	-	
0.4kW	314 / 0.253	4.7kΩ / 390Ω		-	-	
0.4kW-NC	477 / 0.385	4.7kΩ / 620Ω	0	2517 / 2.029	4.7kΩ / 7.5kΩ	13
0.75kW	637 / 0.513	4.7kΩ / 866Ω	1	2677 / 2.157	4.7kΩ / 8.87kΩ	14
0.75kW-NC	777 / 0.626	4.7kΩ / 1.1kΩ		2786 / 2.245	4.7kΩ / 10kΩ	
1.5kW	955 / 0.770	4.7kΩ / 1.43kΩ	3	2969 / 2.393	4.7kΩ / 12.4kΩ	16
2.2kW	1134 / 0.914	4.7kΩ / 1.8kΩ	4	3103 / 2.501	4.7kΩ / 14.7kΩ	17
3.7kW	1265 / 1.019	4.7kΩ / 2.1kΩ	5	3316 / 2.672	4.7kΩ / 20kΩ	18
4.0kW	1418 / 1.143	4.7kΩ / 2.49kΩ	6	3445 / 2.776	4.7kΩ / 24.9kΩ	19
5.5kW	1542 / 1.243	4.7kΩ / 2.84kΩ	7	3628 / 2.924	4.7kΩ / 36.5kΩ	20
7.5kW	1689 / 1.361	4.7kΩ / 3.3kΩ	8	3778 / 3.044	4.7kΩ / 56kΩ	21
11.0kW	1857 / 1.497	4.7kΩ / 3.9kΩ	9	3869 / 3.118	4.7kΩ / 80.6kΩ	22
15.0kW	2048 / 1.650	4.7kΩ / 4.7kΩ	10	3949 / 3.182	4.7kΩ / 121kΩ	23
18.5kW	2226 / 1.794	4.7kΩ / 5.6kΩ	11	4001 / 3.224	4.7kΩ / 200kΩ	24
22.0kW	2375 / 1.914	4.7kΩ / 6.49kΩ	12	4095 / 3.3	4.7kΩ / 1MkΩ	25

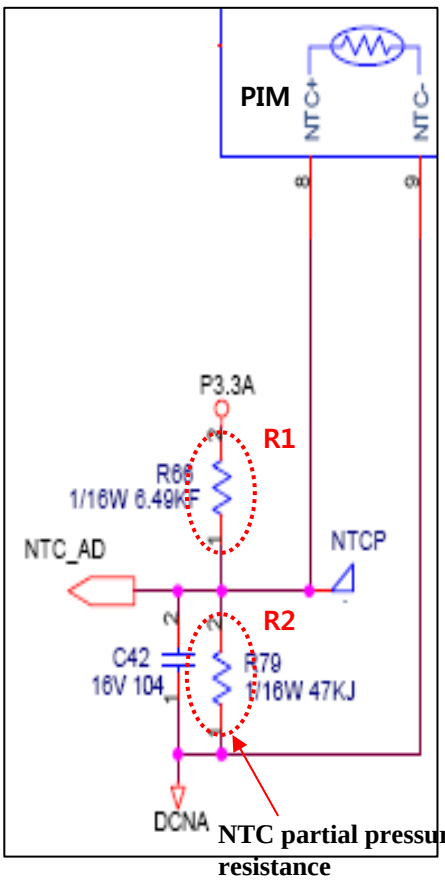
6.NTC Detection

NTC : Using NTC built-in PIM, CPU recognizes the temperature with conversion of the resistance partial pressure voltage according to NTC Spec.

※Test standard

Point : After feeding power to inverter , measure the voltage between NTC_AD and DCNA using DMM. (Keep in mind that the measured voltage can be different according to the interior impedance value of PIM MODULE.)

SV004~075IG5A-2/4



	NTC. Partial pressure Resistor
004-2/4, 008-2/4	R3 [1/16W 100KJ] (M)
015-4	R4 [1/16W 100KJ] (M)
015-2	R4 [1/16W 47KJ] (M)
022-2/4, 037-2/4, 040-2/4	R75 [1/16W 47KJ] (M)
055-2/4, 075-2/4	R79 [1/16W 47KJ] (M)

※Inverter temperature checking method

	Group	Code	Display	
Setting	MAK	3	NTC	NTC temparature display

※ NTC interior impedance value of PIM according to capacity

- **0.4/0.75-200V, 0.4/0.75/1.5-400V : TYCO, at room temp. (22kΩ)**
- **1.5kW-200V : TYCO, at room temp. (4.7kΩ)**
- **2.2/3.7/4/4.0kW : EUPEC, at room temp.(5.0kΩ)**
- **5.5/7.5kW : FUJI, at room temp.(5.0kΩ)**

※ When error occurs
① Check the impedance value of R1, R2.
② Check the P3.3V power.
③ Consider the possibility of PIM MODULE NTC or CPU error.
※ If there's cold solder part or NTC Pin is Open : NTC TRIP occurs
※ If temp. is over 102 degrees : OH TRIP occurs

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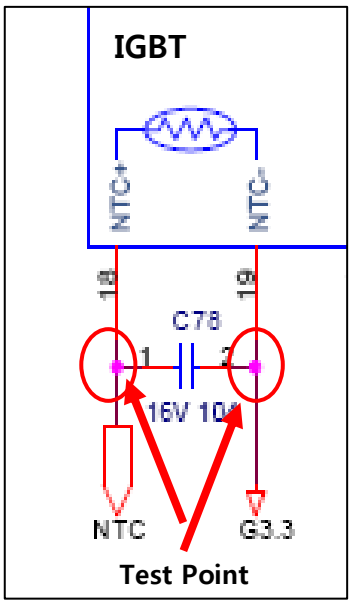
6.NTC Detection

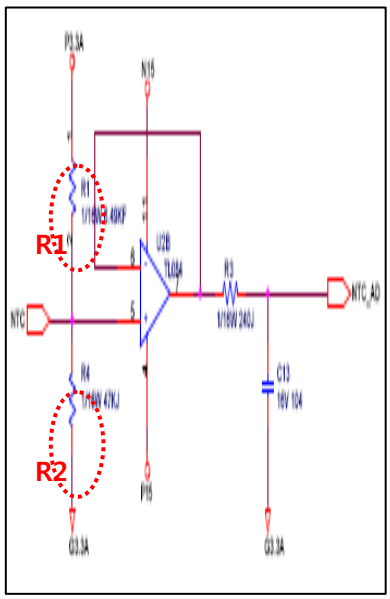
NTC detection : Using NTC built-in IGBT, CPU recognizes the temperature with conversion of the resistance partial pressure voltage according to NTC Spec.

※Test Standard

Point : Feed DC 300V to the terminal P1~N of power module/PIM1 separated power board using DC power unit. Connect the 10KΩ variable resistance to PIM1:18~ PIM1:19 of power board and measure the temperature displayed in KPD adjusting variable resistance as below table.

SV110~220IG5A-2/4





Variable Resistor	Measured position		Temp. Range [°C]
	Circuit	TEST POINT	
5KΩ	PIM1:18 ~ PIM1:19	NTCP ~ NTCN	22.5~ 27.5
2KΩ			45~55
840Ω			67.5~ 82.5
560Ω			90~ 100 (OH)

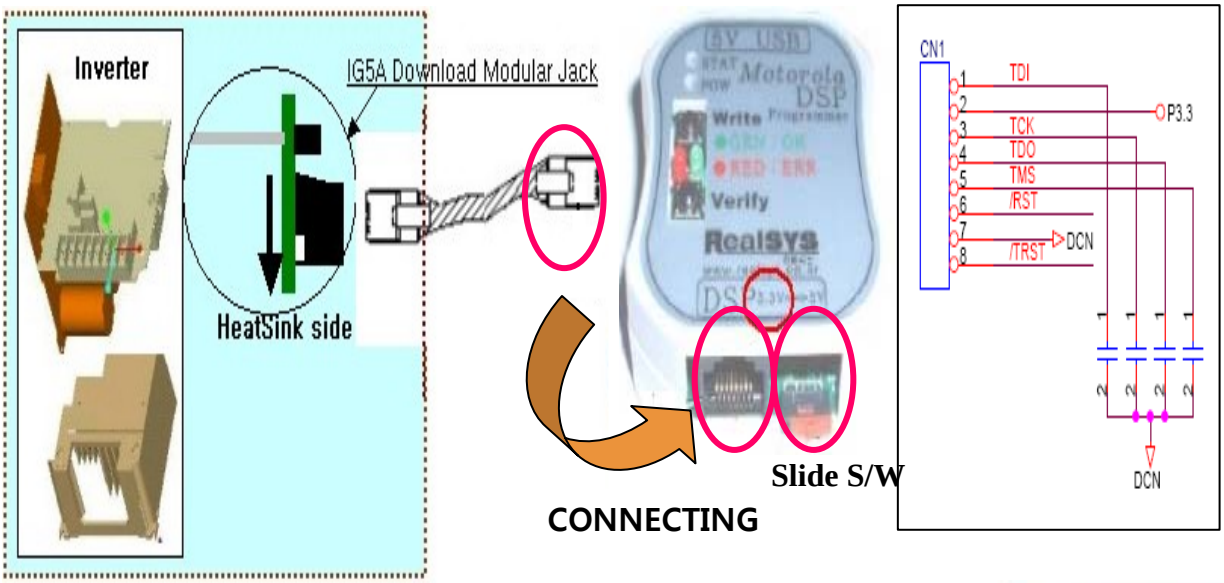
※ Inverter temperature checking method

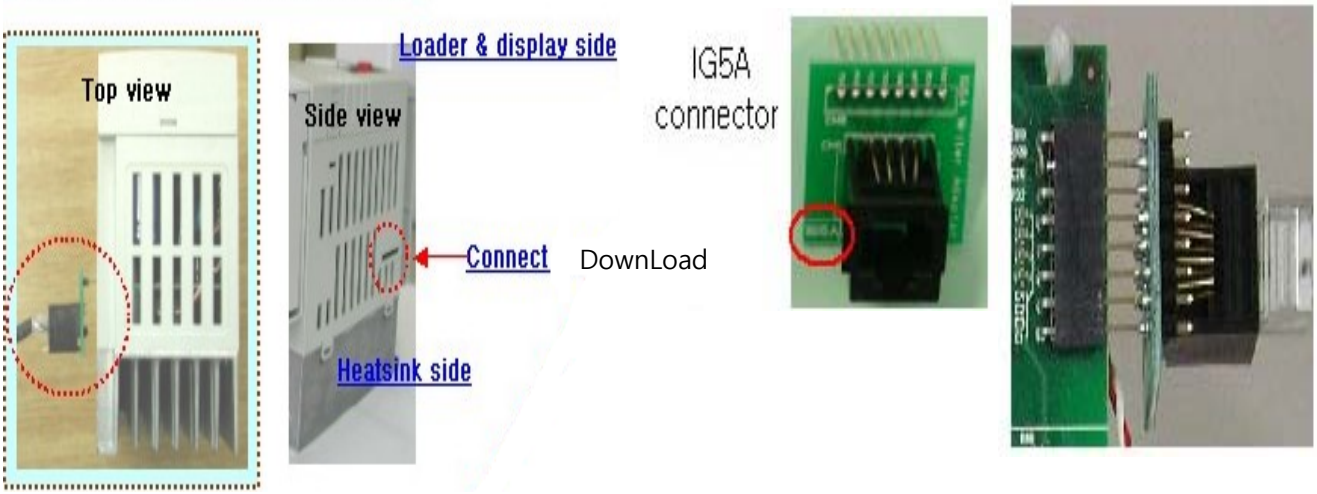
	Group	Code	Display	
Setting	MAK	3	NTC	NTC temparature display

※ When error occurs
① Check the impedance value of R1, R2.
② Check the P3.3V power.
③ Consider the possibility of PIM MODULE NTC or CPU error.
※ If there's cold solder part or NTC Pin is Open : NTC TRIP occurs
※ If temp. is over 102 degrees : OH TRIP occurs

7. O/S Download

O/S Download : COPY O/S using Download Kit offered by Realsys. (extra operation program is needed)





※ Using method

Make sure to be OFF the inverter power before Program download.
For IG5A Series, select 3.3V for Slide S/W of Download Kit.
For, IG5A Series, select CPU DSP56F807.
Connect correctly not to change direction of Download Jack.

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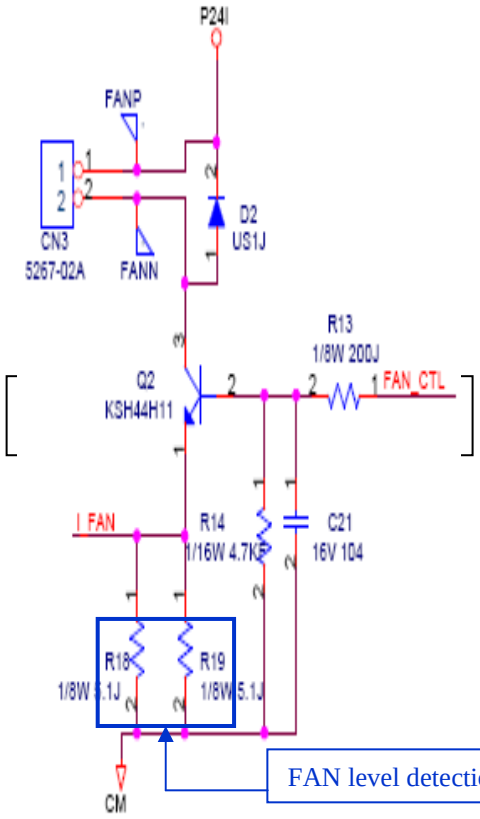
8.FAN Control

iG5A series have Cooling FAN control function. It is possible to replace the Fan when the FAN is out of order.
Run when powering, Run when run command, Trip occurrence when Fan is fault Or warning by multi-function relay/output.

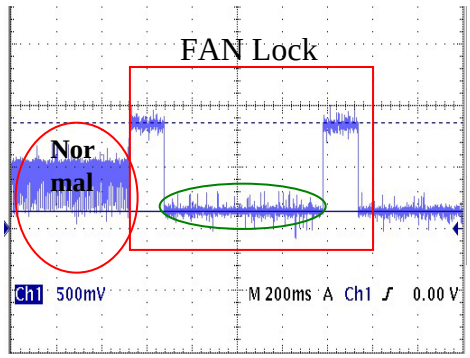
※ Test Reference

Point : after powering, measure the voltage of I_FAN-CM by using DMM.
(The reference values are below)
if the measured value is larger or smaller than the level range of below table, FAN TRIP will be occurred. (TRIP would happen when H78 is set to 1.)

SV004~075IG5A-2/4



C. Range	Spec.	Level	
0.4~1.5k W	40x40x20, 24V, 110mA NMB (1ea)	High : 0.6V Low : 0.2V	
2.2~4.0k W	60x60x25, 24V, 130mA NMB (1ea)	High : 0.8V Low : 0.2V	
5.5~7.5k W	60x60x25, 24V, 130mA DY (2ea)	High : 0.75V Low : 0.3V	



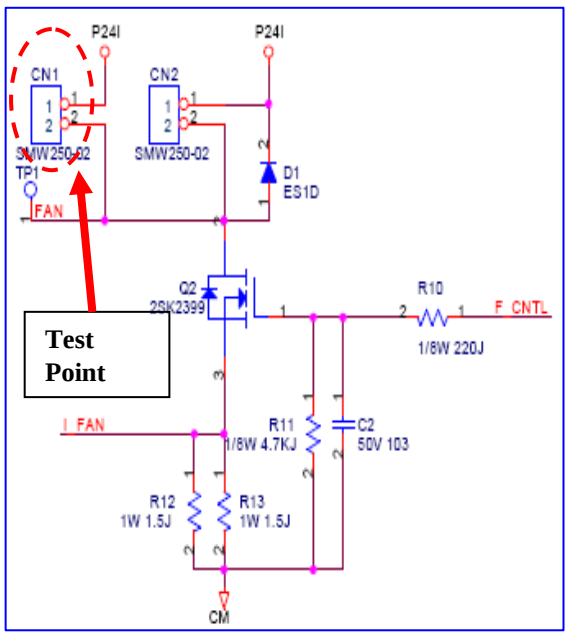
※ After 7-10sec under FAN Lock condition, FAN TRIP is happened

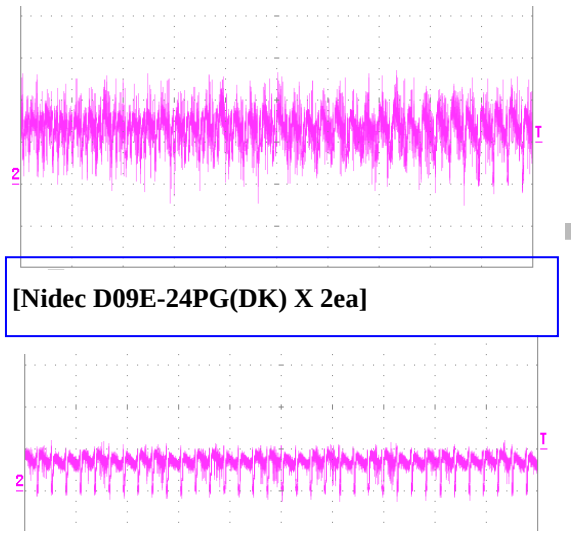
I_FAN : The detected voltage is transferred to the I/O CPU through FAN level detection resistor. detect normal or abnormal of FAN
FAN_CTL : ON-OFF signal of FAN

8.FAN Control

iG5A series have Cooling FAN control function. It is possible to replace the Fan when the FAN is out of order.
Run when powering, Run when run command, Trip occurrence when Fan is fault Or warning by multi-function relay/output.

SV110~220IG5A-2/4





[Nidec D09E-24PG(DK) X 2ea]

[Nidec D09E-24PG(DK) X 1ea]

FAN Control test

※ Test reference Point :
- Chec' if there is connected FA' with CN1.
- Feedi g power, set optimal frec ency and check worki ig when RUN and stop wi en Stop command.
- Measure the voltage of the both end of the FAN.

FAN Locking test

※ Test reference (Fan Trip)
Point : In case that Fan Lock test, set as 1 the H77 and H78 and RUN.
Test by that One of the FAN is locking, both of them is locking, one is Open, both are Open.

Subject	FAN	Measuring point		Reference voltage [V]
		Circuit	Test Point	
At Run (High)	Run	CN1:1~CN1:2	FAN~CM	Over 21
At Stop (Low)	Stop			Below 0.5

Fan	KPD display(Trip Massage)
Normal condition	NON
Fan 1EA Locking	FAn
Fan 2EA Locking	FAn
Fan 1EA Open	FAn
Fan 2EA Open	FAn

9. Current detection

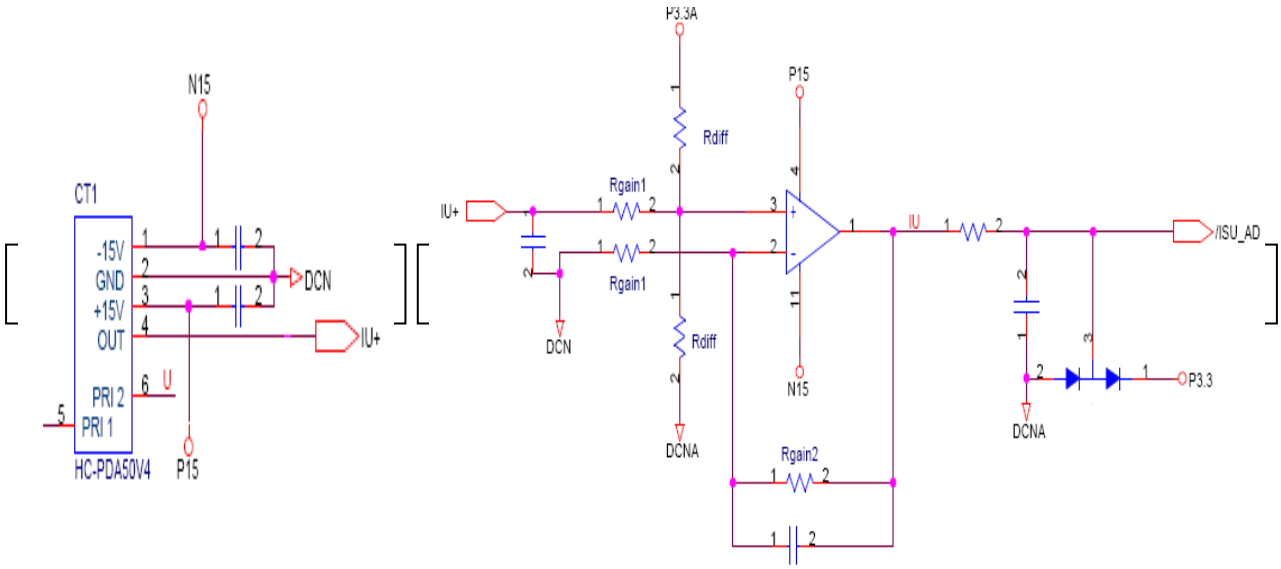
: Detecting output terminal current using current detection element.

(After detecting 2 phases, the other phase is calculated through total current sum)

CPU AD current recognition level: 0 ~ 3.3V

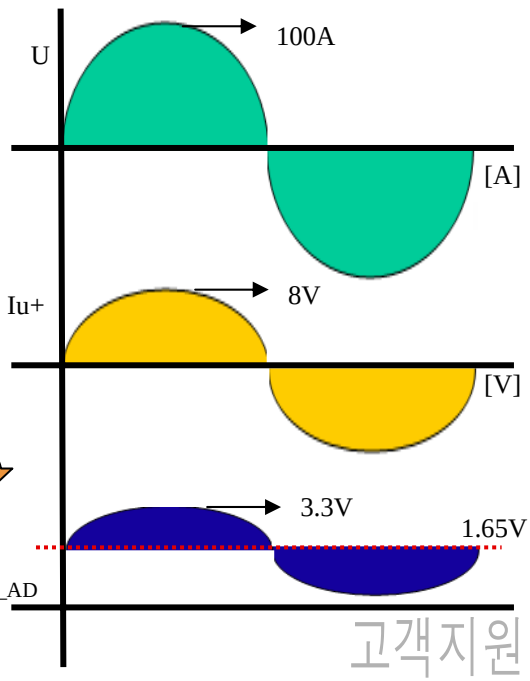
For Hall-CT output, the current is converted into voltage according to Spec.

(Ex) HC-PDA50V4 : 4V per 50A)



Current level modification : after actual current detection, it converts into the voltage value which CPU can recognize.

/ISU_AD = (Rgain2 / Rgain1)*Vin + (Rdiff / 2*Rdiff)*P3.3A



IF) HC-PDA50V4 is used, current is 100A, being recognized at CPU as the most,

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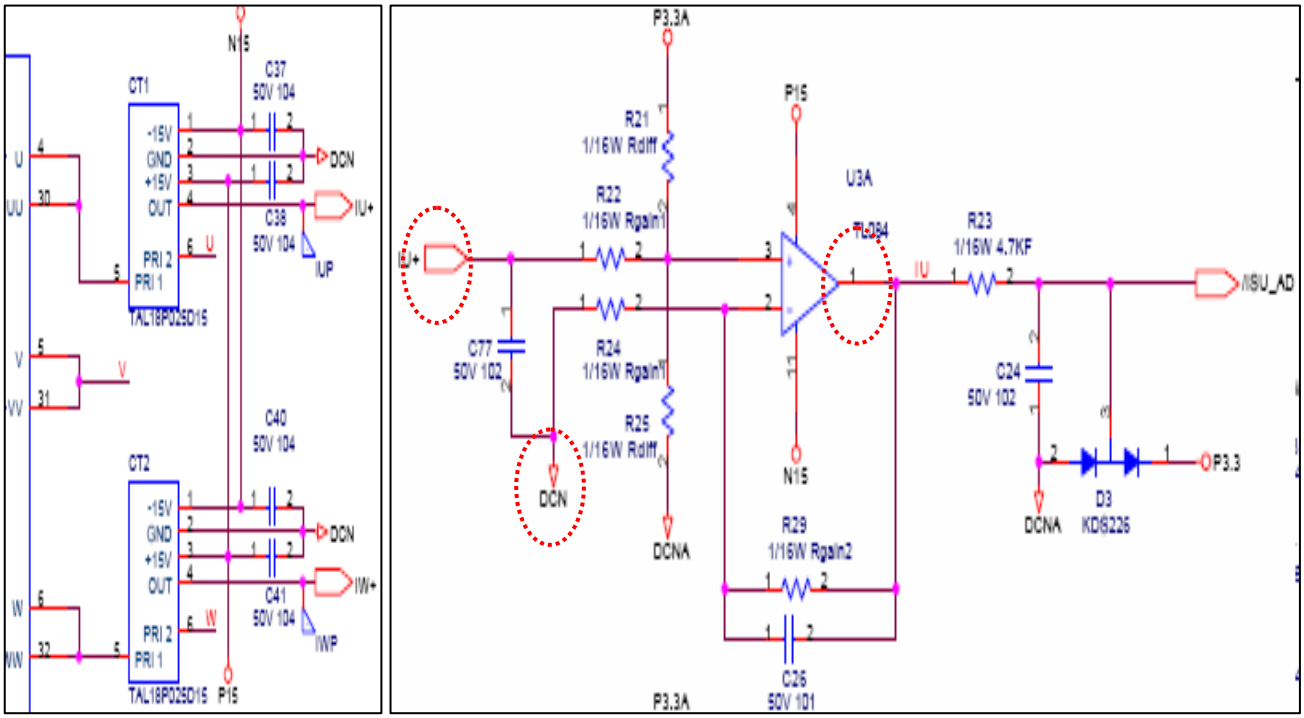
9. Current detection

(1) Current detection error inspection

①SV004~075IG5A-2/4



CT- Spec.	INV	Current detection phase
L07P003D15	004-2/4	0.4/0.8/1.5/5.5/7.5KW : phase U, W
L07P005D15	008/015-4	
L07P010D15	008/015-2,022-4	2.2/3.7/4.0kW : phase V, W
L07P015D15	022-2,037/040-4	
L07P025D15	037/040-2	5.5/7.5kW : phase U,W
HC-PDA25V4	055/075-4	
HC-PDA50V4	055/075-2	

	IU+ ~DCN	U3 1~DCN
Measured value (V)	0 V	1.60~1.70V

When an error occurs

① Measure if 0V can be output between IU+ and DCN at the non-load operation status without motor.
② Measure if 1.60 ~ 1.70V can be output between the pin 1. of U3 IC and DCN.
③ Measure with the same way for the IW+.

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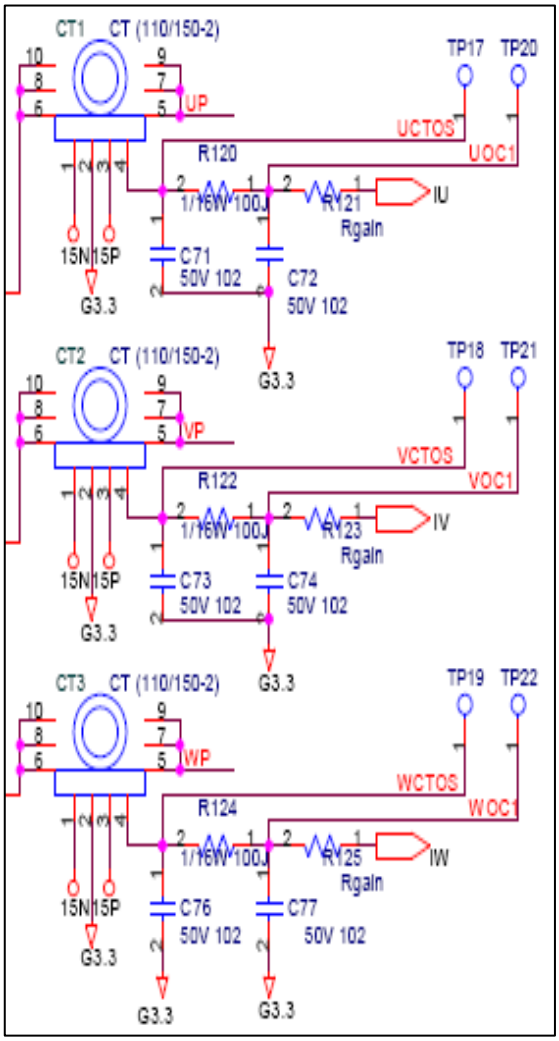
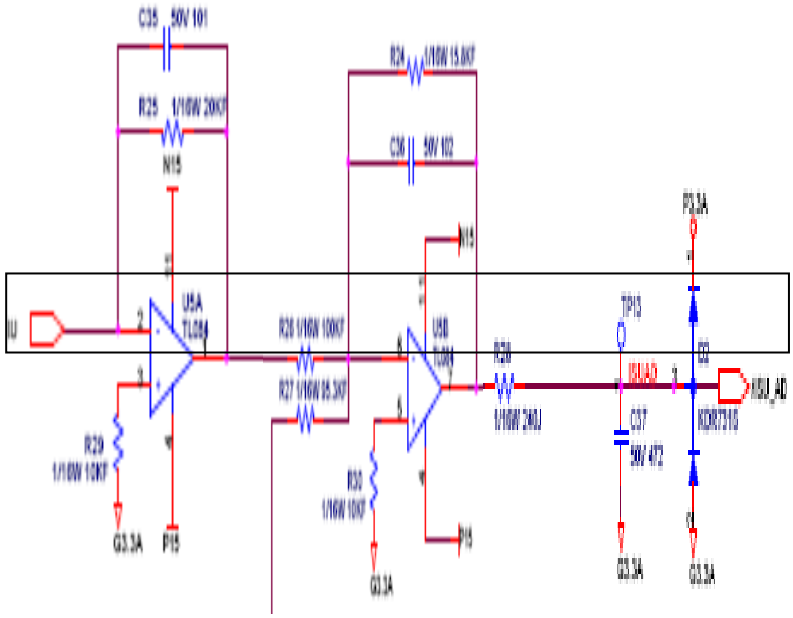
9. Current detection

(1) Current detection error inspection

② SV110~220IG5A-2/4





	IU ~DCN	U5 7~DCN
Measured value (V)	0 V	1.60~1.70V

CT- Spec	INV	Current detect
L18P050D15	110-2,110/150/185-4	U,V,W phase
AP03D100D15	150/185/220-2	
L18P060D15	220-4	

When an error occurs

① Measure if 0V can be output between IU+ and DCN at the non-load operation status without motor.
② Measure if 1.60 ~ 1.70V can be output between the pin 1. of U5 IC and DCN.
③ Measure with the same way for the IW+.

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9. Current detection

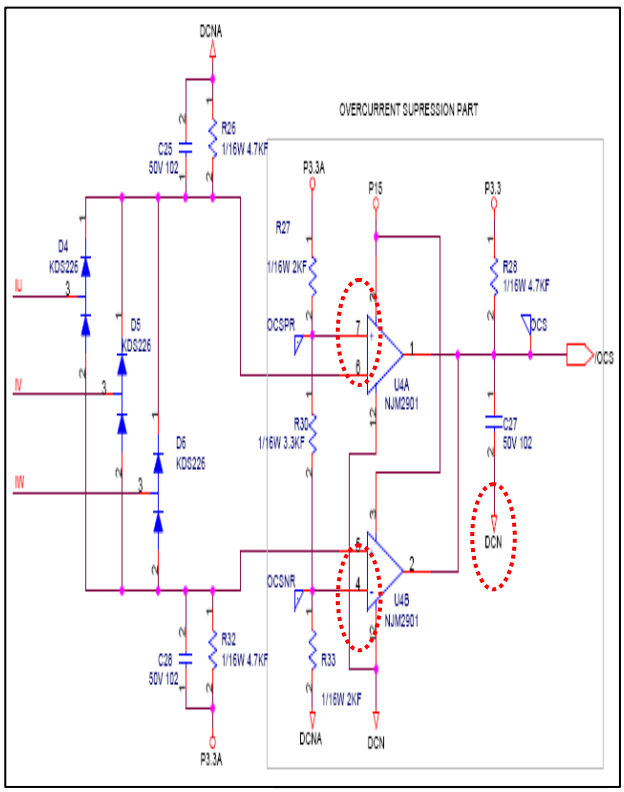
(2) OCS detection

① SV004~075IG5A-2/4

: iG5A is structured with H/W OCS (about 100% of module rating) or S/W OCS (about 95% of module rating) function.
S/W OCS is judged by the current detected through Hall_CT and can be disabled at M25.

※ Testing Reference

Point : When an error occurs, first of all, measure the standard voltage of OCS+ and OCS-, and check if High voltage(3.3V) can be output between Pin 1 of U4 IC and DCN.



	Reference	Measuring Point	
		004/008-2/4	015-2/4
OCS+	2.36 ~ 2.48V	U4 : 7 ~ DCN (M)	U4 : 7 ~ DCN (M)
OCS-	0.83 ~ 0.88V	U4 : 4 ~ DCN (M)	U4 : 4 ~ DCN (M)
OCT	0.665 ~ 0.696	U2 : 5 ~ DCN (P)	U6 : 3 ~ DCN (M)
IDC-	0.889 ~ 0.931	U2 : 6 ~ DCN (P)	U6 : 2 ~ DCN (M)

	Reference	Measuring Point	
		022~040-2/4	055/075-2/4
OCS+	2.36 ~ 2.48V	U4 : 7 ~ DCN (M)	-
	2.35 ~ 2.44V	-	U4 : 7 ~ DCN (M)
OCS-	0.83 ~ 0.88V	U4 : 4 ~ DCN (M)	-
	0.87 ~ 0.92V	-	U4 : 4 ~ DCN (M)
OCT	0.620 ~ 0.664	U2 : 5 ~ DCN (P)	-
	0.27 ~ 0.33V	-	U7:6 ~ DCN (M)
IDC-	0.955 ~ 1.022	U2 : 6 ~ DCN (P)	-

(M) : Main Board, (S) : Sub Board, (P) : Power Board

1) OCS level is determined with the partial pressure rate of R27(2K),R30(3.3K),R3(2K).
2) At IU,IV,IW input, there exists Diode Drop (D4,D5,D6) components.

When an error occurs
① Measure the impedance value of R27,R30,R33.
② Measure the power voltage of P3.3V.
③ If is isn't measured voltage normally at Pin 1 of U4 IC, it is necessary to check the former circuit from C/T output end.

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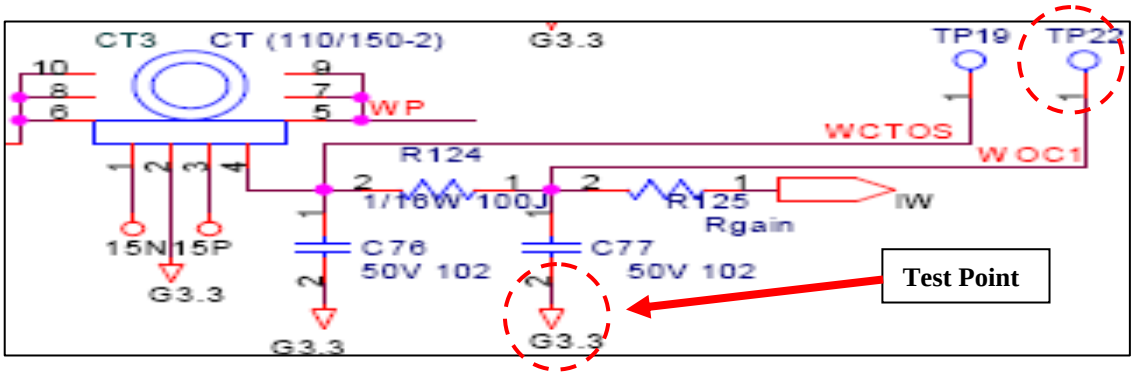
9. Current detection

(2) OCS detection

② SV110~220IG5A-2/4

: iG5A is structured with H/W OCS (about 100% of module rating) or S/W OCS (about 95% of module rating) function.
S/W OCS is judged by the current detected through Hall_CT and can be disabled at M25.



※ Testing Reference

Point :

① By using the Voltage Standard that can adjust output voltage, feed DC voltage signal to CT output. at this, the rest phases connect with GND.

② After Power ON, Make PWM signal by Keypad and measure the PWM signal by Oscilloscope

③ Measure the Voltage standard(OCS voltage) at the moment that the PWM signal is blocked.

④ During the test, test with setting M20(GFT, IOLT)=00, M25(S/W OCS)=0

*** Voltage Standard connection : [Power board - CT]**

	U	V	W
Circuit	**C72 : 1 ~ C72 : 2**	**C74 : 1 ~ C74 : 2**	**C77 : 1 ~ C77 : 2**
TEST POINT	**UOC1 ~ G3.3**	**VOC1 ~ G3.3**	**WOC1 ~ G3.3**

OCS Test Result

Subject	Reference	Measured value[V]							
		110-2	150-2	185-2	220-2	110-4	150-4	185-4	220-4
	PWM output	9.06 ~10.06 V	6.71~	9.06 ~10.06 V	9.06 ~10.06 V	6.18~	6.18~	7.60~	8.22~
	Blocking reference		7.71V			7.18V	7.18V	8.60V	9.22V

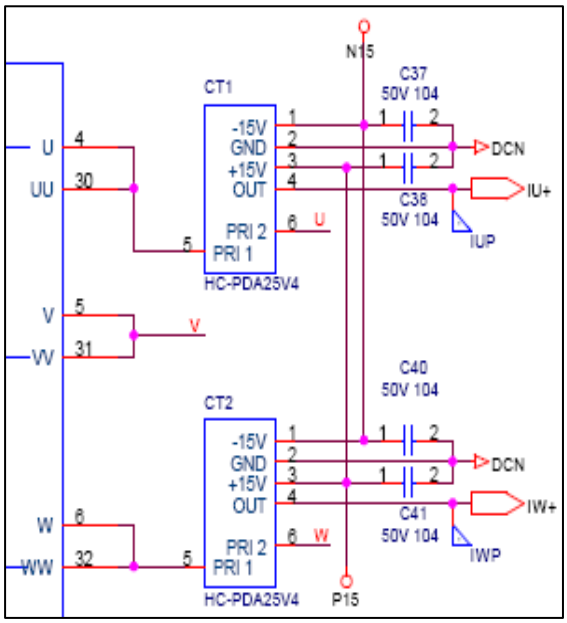
9. Current detection

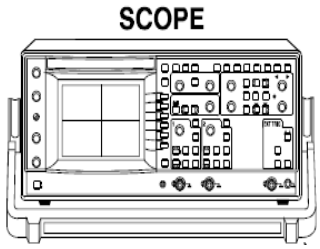
(3) Offset voltage measurement of current detection circuit

①SV004~075IG5A-2/4

※measuring method

After feeding power voltage to inverter, measuring Mother board PCB CT output end (Test Pad)~ DCN voltage, Check if it falls under the standard value of the below table.





Subject	Reference value	Measuring points for each capacity		
		004/008-2/4	015-2	015-2
CT1 offset	Below 100mV	R34 : 2 ~ DCN (P)	R63 : 1 ~ DCN (M)	R61 : 2 ~ DCN (M)
CT1 offset	Below 100mV	R36 : 2 ~ DCN (P)	R68 : 1 ~ DCN (M)	R92 : 2 ~ DCN (M)

Measuring points	Subject	Reference value	Measuring points
022~040-2/4			055/075-2/4
R92 : 1 ~ DCN (M)	CT1 offset	Below 50mV	CT1:4 ~ DCN
R94 : 1 ~ DCN (M)	CT1 offset	Below 50mV	CT2:4 ~ DCN

(M) : Main Board, (P) : Power Board

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9. Current detection

(3) Offset voltage measurement of current detection circuit

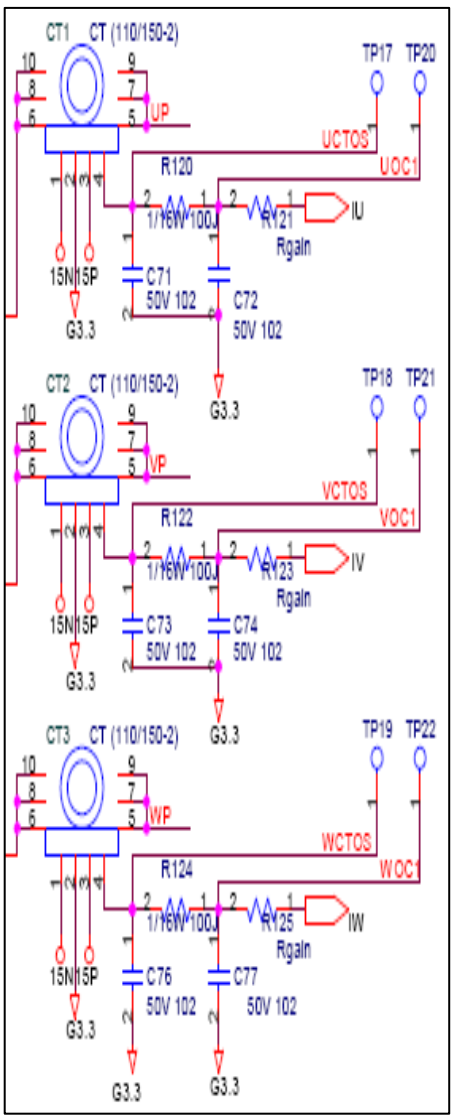
②SV110~220IG5A-2/4

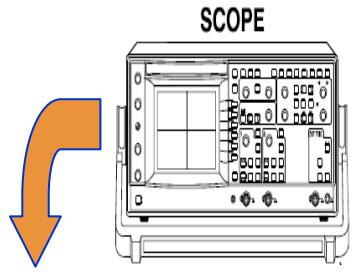
※Measuring Method

Point :

① Feed 300/600V between P2~N of power terminal.

② Check whether the measured value of CT output end voltage is within the reference table below.





200V class

Subject	Measuring place			Reference value
	11kW	15/18.5/22kW	TEST POINT	
CT Offset	CT1:4~ CT1:2	CT1:3~ CT1:4	UCTOS ~ G3.3	Below 50mV
CT Offset	CT2:4~ CT2:2	CT2:3~ CT2:4	VCTOS ~ G3.3	Below 50mV
CT Offset	CT3:4~ CT3:2	CT3:3~ CT3:4	WCTOS ~ G3.3	Below 50mV

400V Class

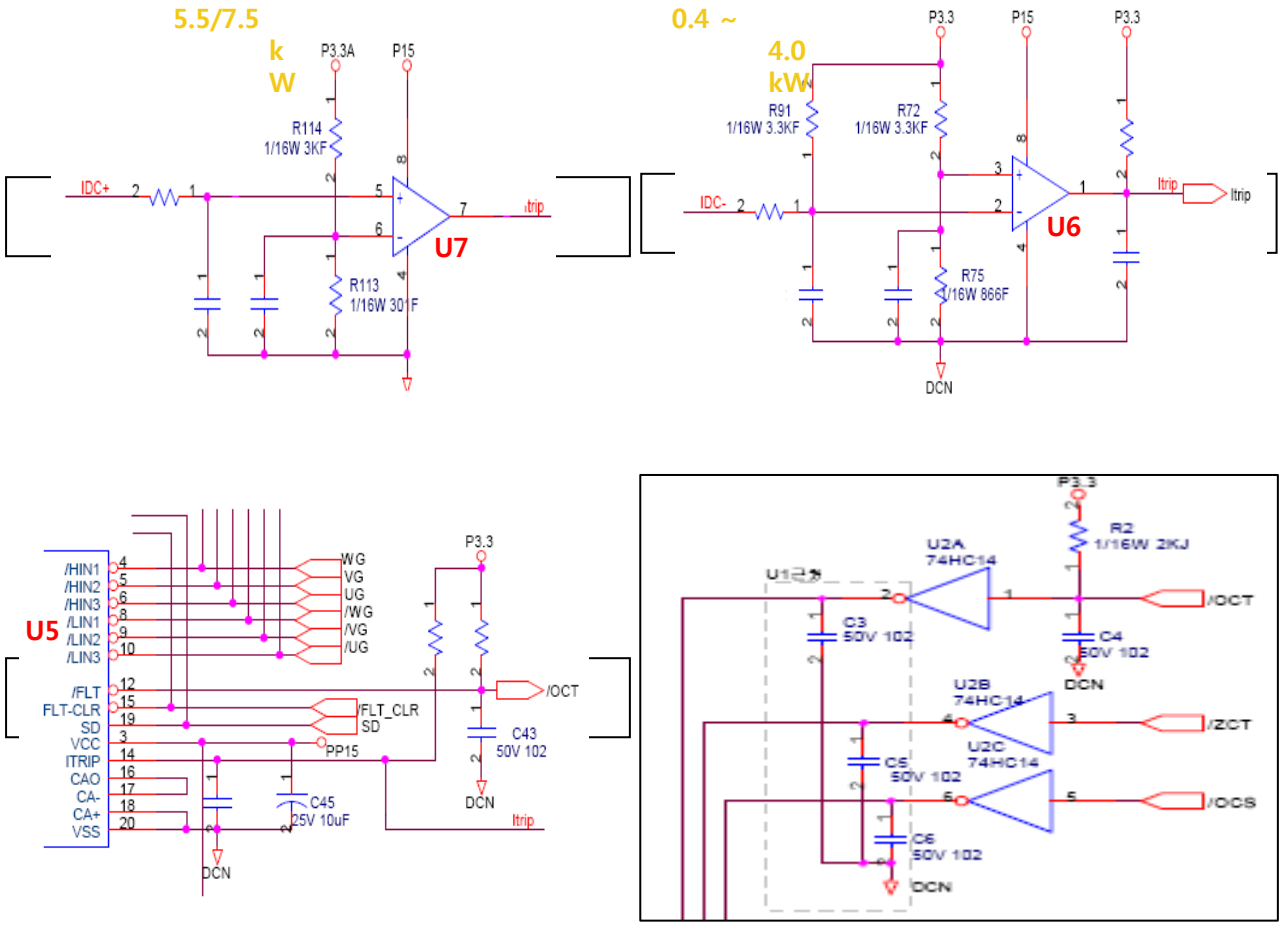
Subject	Measuring place		Reference value
	11/15/18.5/22kW	TEST POINT	
CT offset	CT1:4~ CT1:2	UCTOS ~ G3.3	Below 50mV
CT offset	CT2:4~ CT2:2	VCTOS ~ G3.3	Below 50mV
CT offset	CT3:4~ CT3:2	WCTOS ~ G3.3	Below 50mV

9. Current Detection

(4) OCT Detection

① SV004~075IG5A-2/4

: Detect OC trip through the Shunt resistor connected to DCN terminal.
OC Trip can be judged through the comparison equipment and this signal (I_{trip}) is used for input of Gate Drive, when OC occurs, block the output of Gate Drive first and transmit this signal to CPU for displaying OCT. OCT is generally about 200% level by the module rating standard.



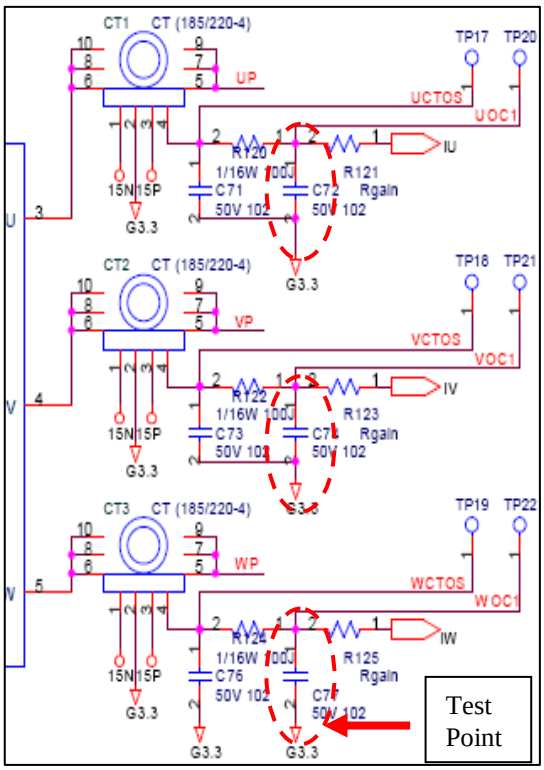
When an error occurs

① Measure Pin 7 (Low output : 0V) of U7 IC by the standard of 5.5~7.5KW.
② Measure the Pin 12(High output:3.3V) of U5 IC.
③ Measure the Pin 2 of U2 IC (Low output :0V).
④ Consider also the CPU error.

9. Current Detection

(4) OCT Detection

②SV110~220IG5A-2/4



***Circuit Explanation :**

OC Trip is detected by shunt resistor which is connected with DCN terminal. Through comparator, OC trip is decided and Itrip is used with input of Gate Drive.

When OC is happened, The output of gate drive is firstly blocked and this signal is transferred to CPU and display "OCT". OCT is 200% of module rating.

* Voltage Standard connection : [Power board – CT]

	Circuit	TEST POINT
U	C72 : 1 ~ C72 : 2	UOC1 ~ G3.3
V	C74 : 1 ~ C74 : 2	VOC1 ~ G3.3
W	C77 : 1 ~ C77 : 2	WOC1 ~ G3.3

※ How to test

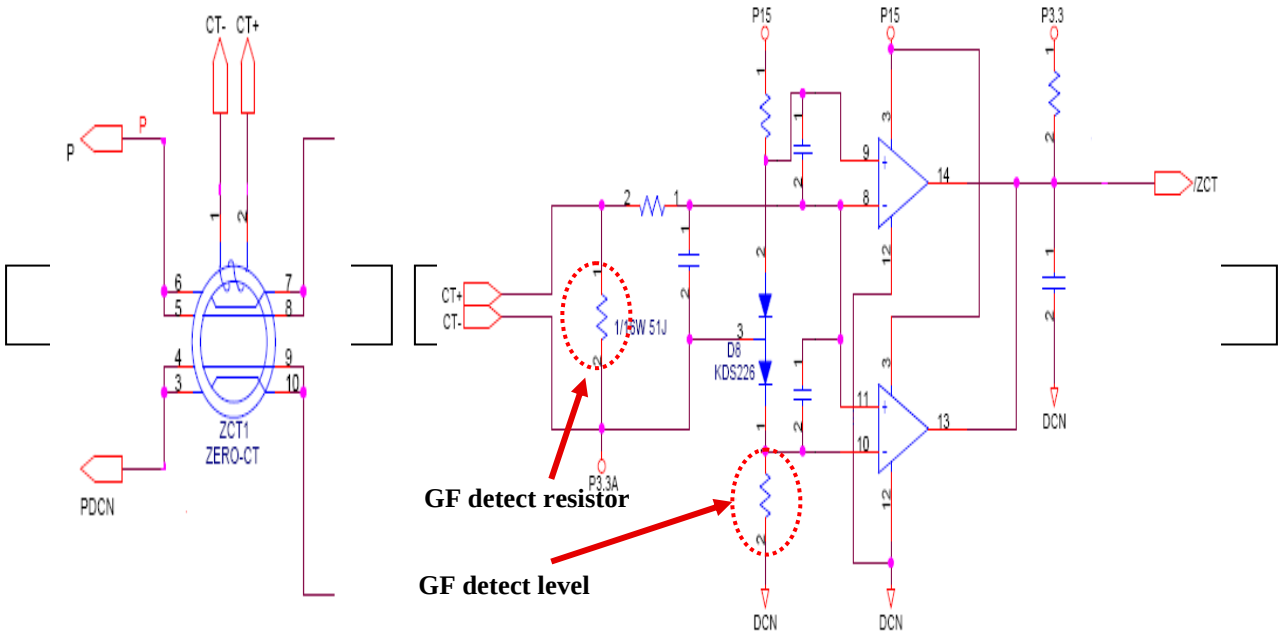
Point : ① powering DC voltage at the CT output of power board by Voltage Standard.
②at here, The CT output of rest phases is connected with GND.
③After powering, Make the PWM signal by KPD and measure by Oscilloscope.
④When OC1 trip is displayed in KPD, measure the OCT voltage.
⑤ While testing, test setting by M20(GFT, IOLT)=00,M25(S/W OCS)=0.

OCT Test result

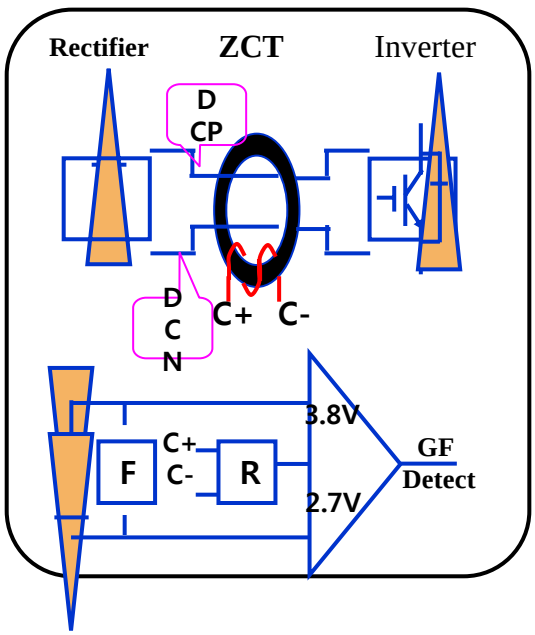
Sub	Reference	Measured value [V]							
		110-2	150-2	185-2	220-2	110-4	150-4	185-4	220-4
	OCT	10.6~	7.9~	10.6~	10.6~	7.3~	7.3~	8.9~	9.6~
	Peak reference	11.6V	8.9V	11.6V	11.6V	8.3V	8.3V	9.9V	10.6V

10. GFT Detection

iG5A detects GF trip by H/W method.(It can't not be set level with S/W method.)
If you set 1 at M76 about GF trip, you can Disable the function itself but you can't detect actual GF situation. (Over V1.6)



GF Detection Method



GF Detection level

DCP & DCN current Unbalance

ZCT 2nd wiring : 150 Turns.
GF detect level : 0.5 [V]
Load resistor : in case that 50[ohm]

$$I_S = \frac{V}{R} = \frac{0.5}{50} = 0.01[A]$$

$$I_P = T \times I_S = 150 \times 0.01 = 1.5[A]$$

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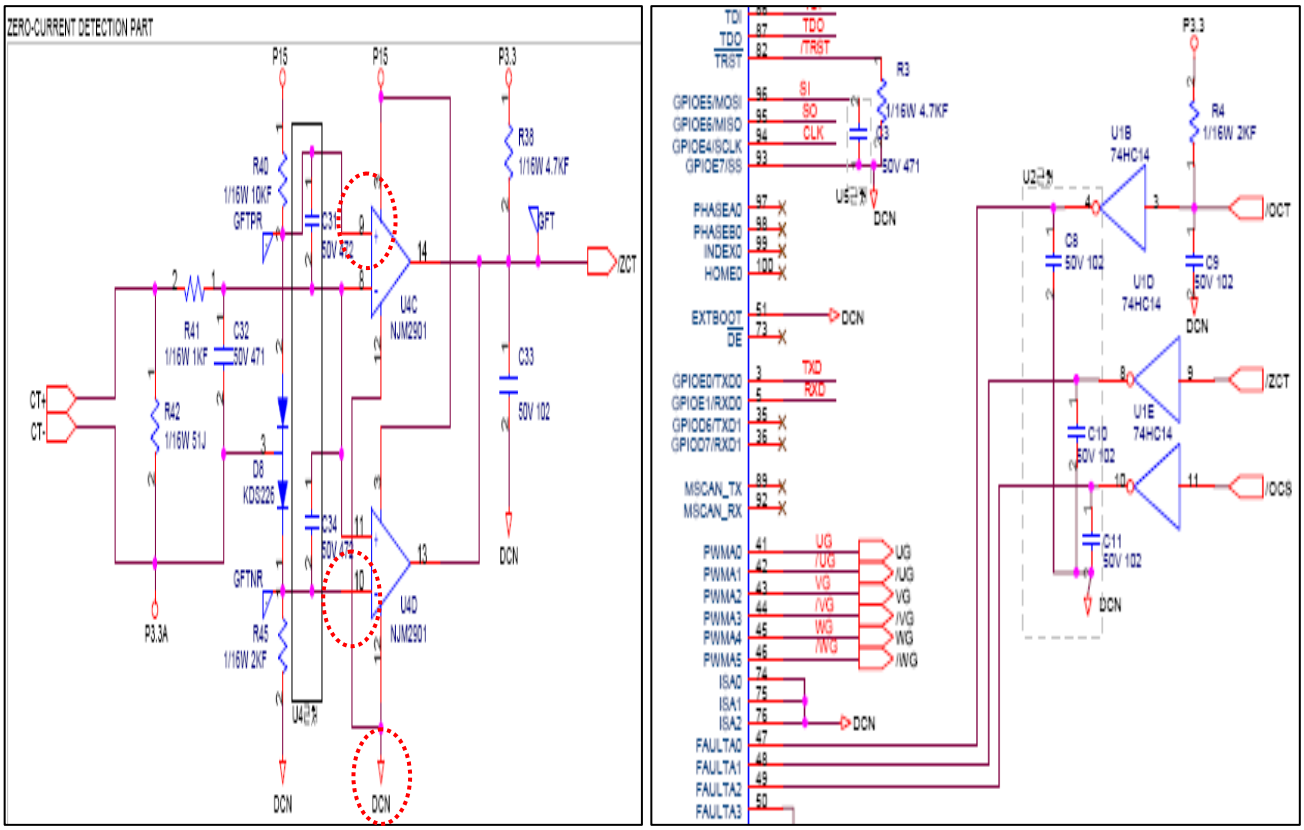
10. GFT Detection

(1) GFT Level measurement

① SV004~075IG5A-2/4

※ Test method

Point : When operating with actual load, measure at measuring POINT as below table using DMM.



	Measuring Point	Reference voltage
GFT+	U4 : 9 ~ DCN	3.80 ~ 3.95V
GFT-	U4 : 10 ~ DCN	2.55 ~ 2.70V

☞ Measuring point and reference voltage are same at all series

When an error occurs

① Measure if Off set voltage between CT+ and CT- can be output under the value of 0.5V.
② Measure if between –DCN (High : 3.3V) of Pin 13 and Pin 14 of U4 IC can be output.
③ Measure if Pin 8 of U1 IC (Low : 0V)) can be output.
④ Consider also the possibility of CPU error.

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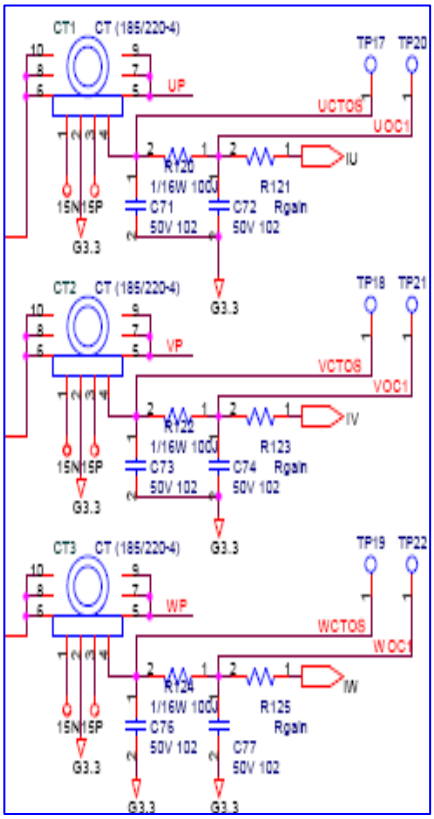
10. GFT Detection

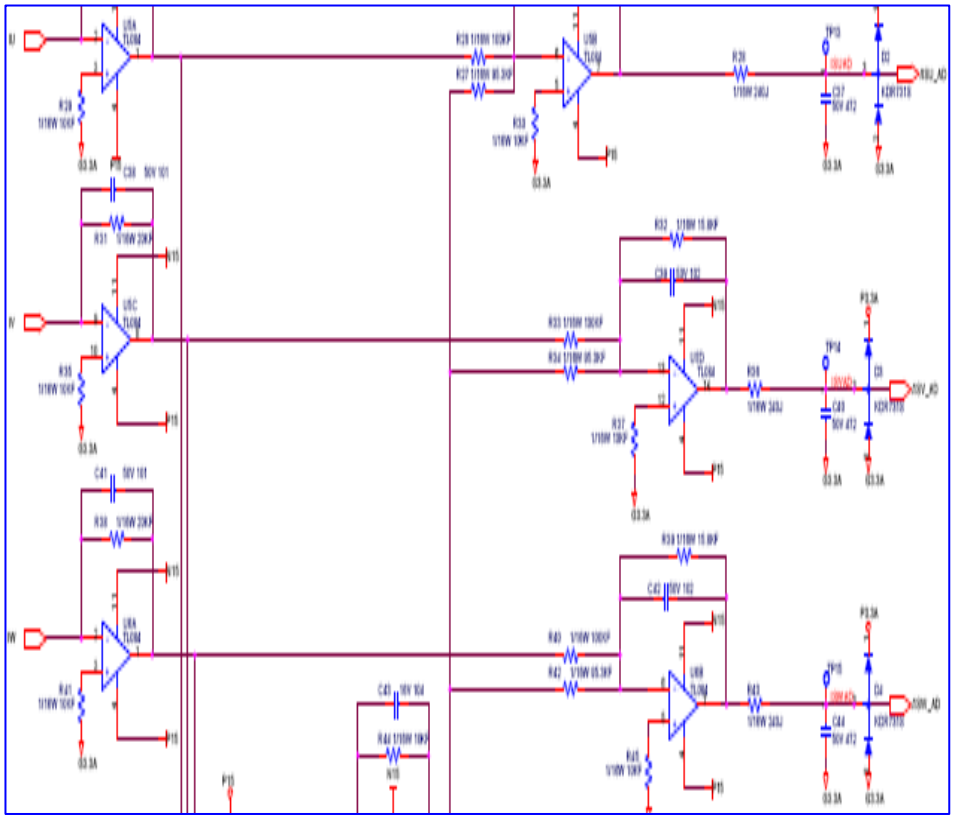
(1) GFT Level measurement

②SV110~220iG5A-2/4

※ Test Method

Point : When operating with actual load, measure at measuring POINT as below table using DMM.(11~22KW products have no ZCT, Trip is decided by U,V,W phase unbalance)





Measuring point	IU ~DCN	U5 7th~DCN
Measuring value (V)	0 V	1.60~1.70V

※ When an Error occurs

① Check if the 0V is measured between IU and DCN without motor and No load condition.
② Check if 1.60~1.70V is measured between 7th of U5 IC and DCN.
③ Measure IV,IW also by the same way

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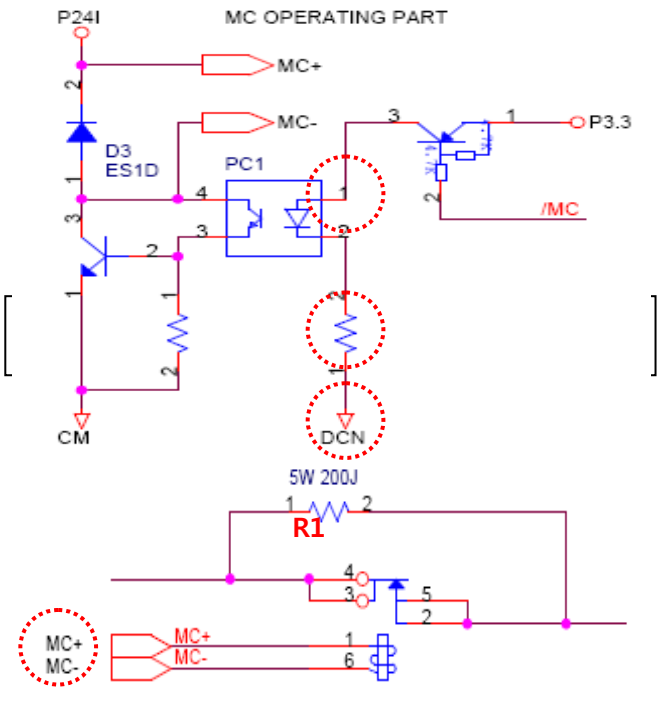
11. MC

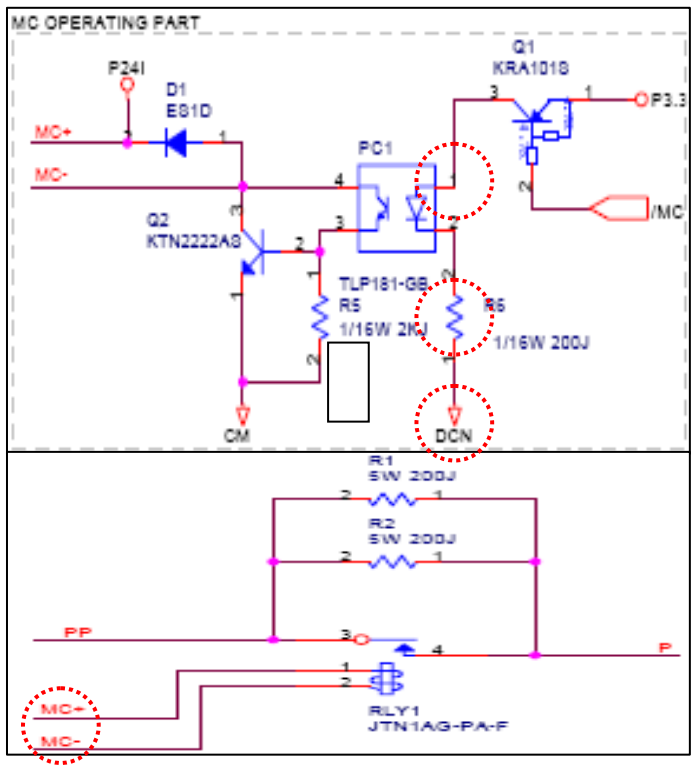
(1)SV004~040IG5A-2/4

Use the charging resistor or MC for decreasing the effect caused by inrush current. MC operation can be ON with the condition of more than LV removal level and more than 450ms in time.

1.5KW-2/4



2.2~4.0KW-2/4



When an error occurs

① Measure the value of R1 impedance value.
② Measure the 24V between the MC+ and MC-
③ Measure if 3.3V is output between Pin 1 of PC1 and DCN.
④ Measure if /MC (Low : 0V) can be output.
⑤ Consider also the possibility of CPU error.

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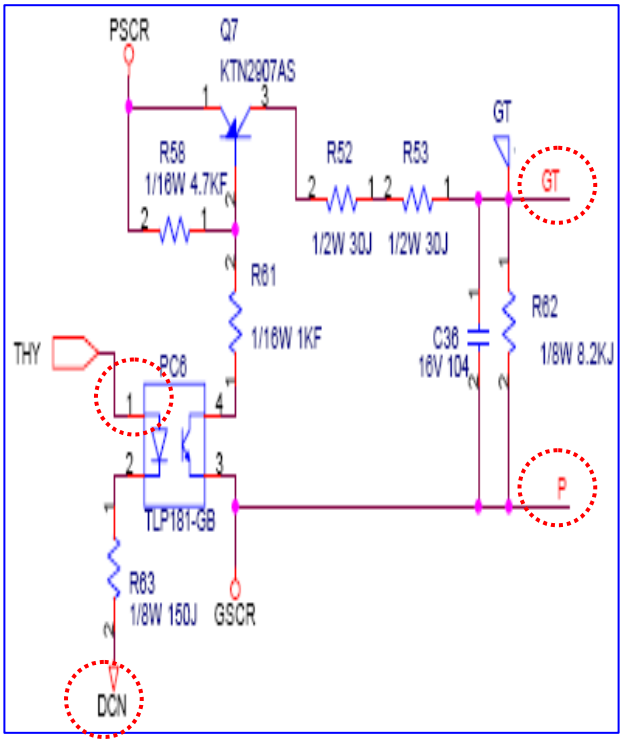
11. MC

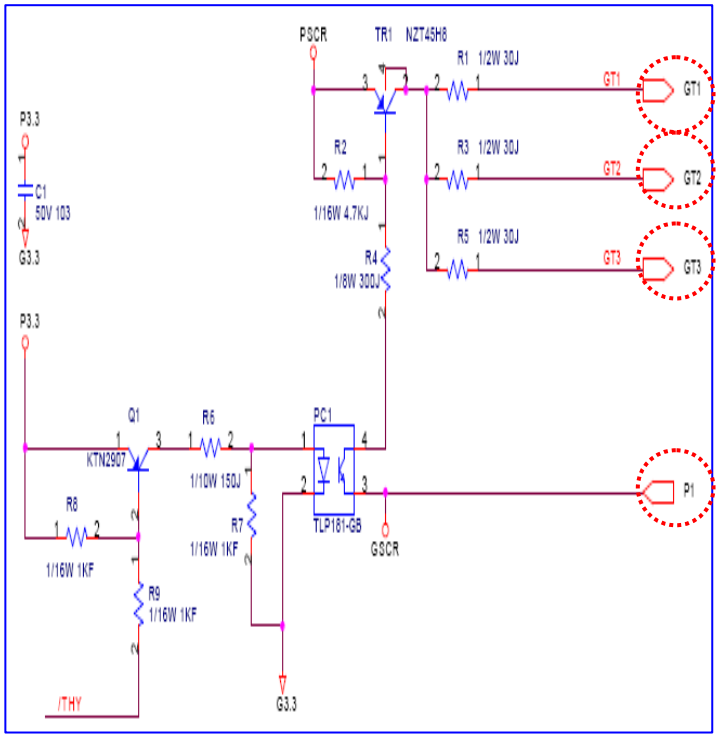
(2)SV055~220IG5A-2/4

Use charge resistor and SCR to reduce the effect of inrush current. SCR is turn on while the condition that over LV releasing level and over 450ms.

SV055~075IG5A-2/4



SV110~220IG5A-2/4



SCR driving circuit checking(200V/400V)

Subject		Measuring place		Reference
		Circuit	Test Point	
Charge	OFF	R112 : 1 ~	GT1 ~ P1	**Within 0.5V**
	ON	R112 : 2		5.0~5.8V
	OFF	R113 : 1 ~	GT2 ~ P1	**Within 0.5V**
	ON	R113 : 2		5.0~5.8V
	OFF	R114 : 1 ~	GT3 ~ P1	**Within 0.5V**
	ON	R114 : 2		5.0~5.8V

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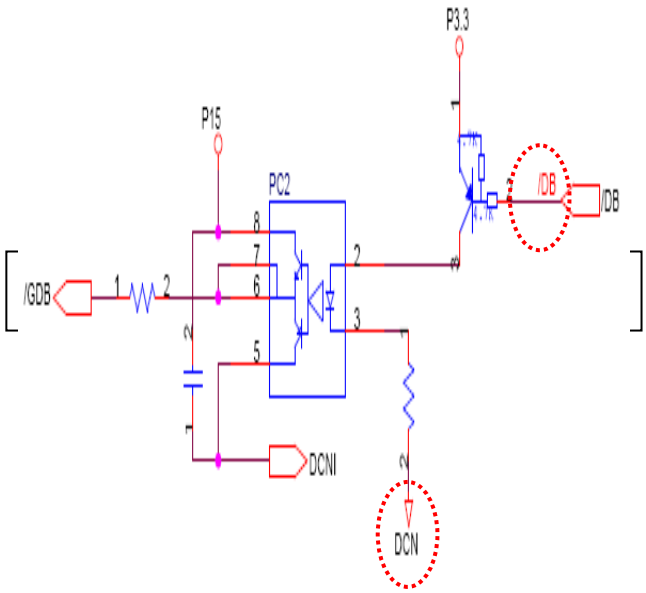
12. DB

①SV004~075IG5A-2/4

DB : can be ON only during the Inverter operation.

※ Measuring Method

Point : After setting up with the existence of PIM1 module set as below.
After feeding DC 310V(in the case of 220V TYPE) to P1 ~ DCN, command RUN.
Adjusting DC power device, measure DC voltage for operating DB.



200V

Subject	Measuring place	Gate working	DCP-DCN voltage	Measuring voltage
Breaking start	DCN~/DB Gate	0V(-3V)->15V	377~383V	
Breaking stop	DCN~/DB Gate	15V -->0V(-3V)	367~373V	

400V

Subject	Measuring place	Gate working	DCP-DCN voltage	Measuring voltage
Breaking start	DCN~/DB Gate	0V(-3V)->15V	795~801V	
Breaking stop	DCN~/DB Gate	15V -->0V(-3V)	778~784V	

In case that 5.5/7,5kW: -3V is applied and the rest are 0V is applied.
In case that 5.5/7,5kW: E ground to voltage but the rest are DCN to Ground

	Group	Code	Display	Setting value
Setting	**FU2**	**75**	**Limit %ED for DB**	**Don't limit %ED (0)**

%ED : Using rate (Enable Duty)

※ When an error occurs*

① Measure if GDB (Low) can be output at the DB Trun on operation section.
② Measure 3.3V can be output between PC2 Pin 2 and DCN.
③ Measure if output (Low) between DB and DCN is possible.
④ Consider also the possibility of CPU error.

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12. DB

②SV110~220IG5A-2/4

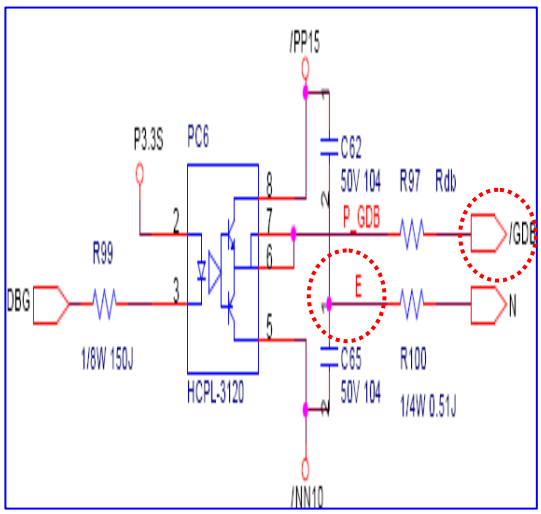
※ Measuring Method

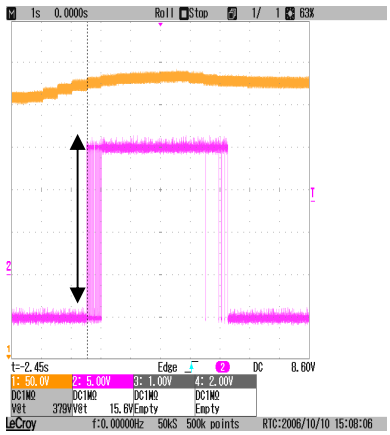
Point : ① Connect DC power source between P2~N of Power board T/B.

② Drive with 60Hz with powering DC 300/600V.

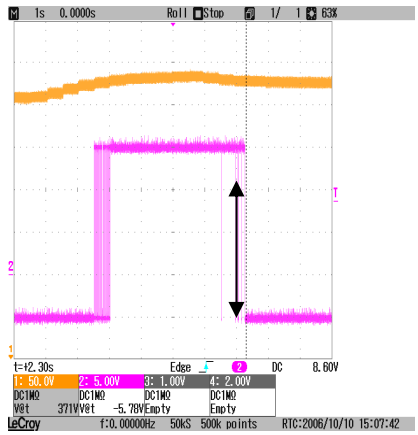
③ Raise the DC power source up to DB TURN ON level.

④ Check the ON/OFF working of power module[PIM1] DB Gate signal.





DB Turn ON (379V , 15.6V)



DB Turn OFF (371V , -5.78V)

	Mode	Group	Code	title	Setting value
Setting	FU2	H	76	%ED	0%

%ED : Using rate (Enable Duty)

200V

* DB ON voltage is ±5% under the reference S/W detection voltage

Subject	Measuring Place		Gate working	P2 - N voltage
	Circuit	TESP POINT		
DB start	ZD1:2~ ZD5:2	/GDB ~ E	-5~6V → 14~16V	361~ 399V
DB Stop			14~16V → -5~6V	351 ~ 388V

400V

Subject	Measuring Place		Gate working	P2 - N voltage
	Circuit	TESP POINT		
DB start	ZD1:2~ ZD5:2	/GDB ~ E	-5~6V → 14~16V	775~815V
DB Stop			14~17V → -5~6V	775 ~815V

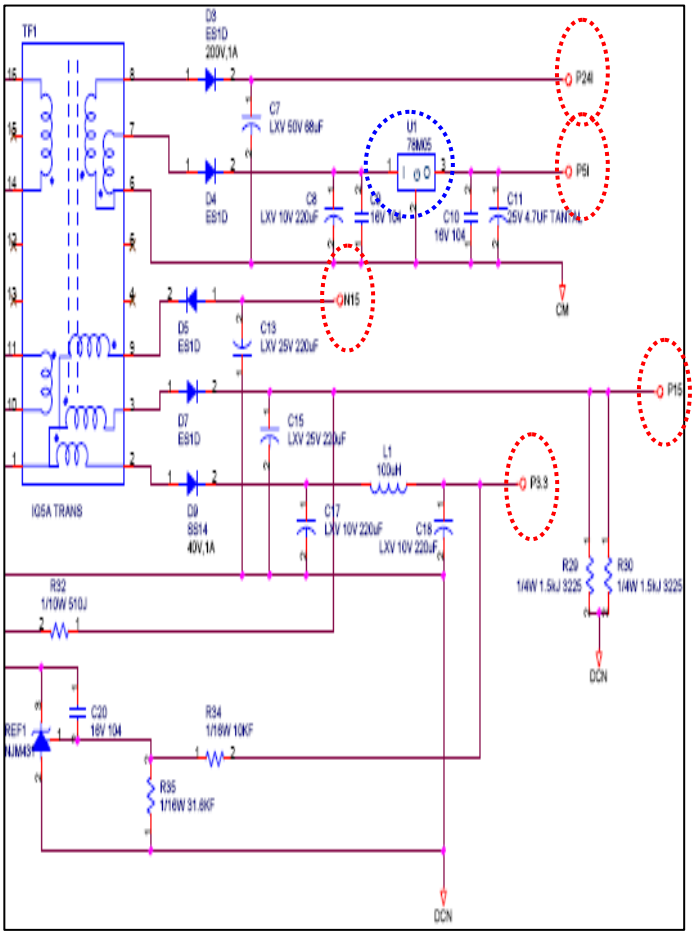
13. SPS

(1) SPS Power voltage

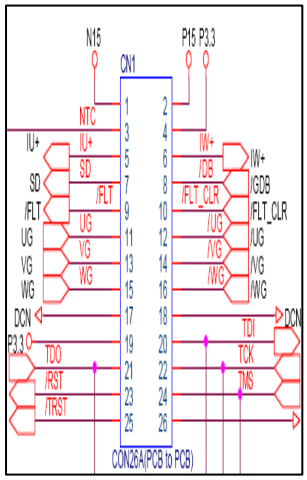
①SV004~040IG5A-2/4

※ **Measuring method**

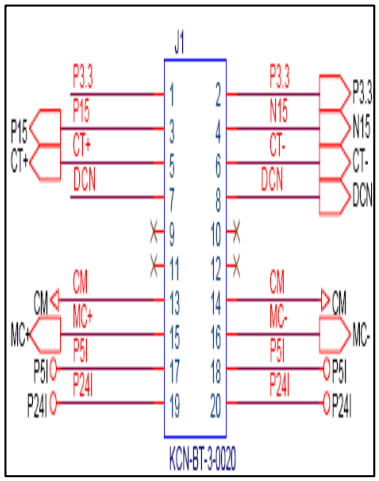
After feeding power to inverter, check the measuring value at each measuring point using DMM referring to below table.



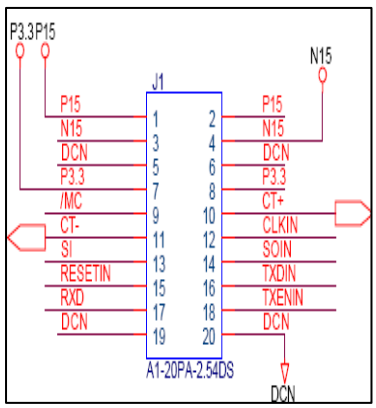
0.4~0.8KW-2/4



1.5KW-2/4



2.2~4.0KW-2/4



P.S	Allowable range	Measuring point		
		004/008-2/4	015-2/4	022~040-2/4
P3.3	3.23 ~ 3.37	CN1 : 4 ~ CN1 : 17 (M)	J1 : 2 ~ J1 : 7 (S)	J1 : 8 ~ J1 : 6 (S)
P15	15.7 ~ 16.8	CN1 : 2 ~ CN1 : 17 (M)	J1 : 3 ~ J1 : 7 (S)	J1 : 2 ~ J1 : 6 (S)
N15	-14.5 ~ -15.5	CN1 : 1 ~ CN1 : 17 (M)	J1 : 4 ~ J1 : 7 (S)	J1 : 4 ~ J1 : 6 (S)
P24I	23.0 ~ 25.0	D1 : 2 ~ U5 : 2 (M)	J1 : 19 ~ J1 : 13 (S)	D2 : 2 ~ U1 : 2 (S)
P5I	4.9 ~ 5.2	U5 : 3 ~ U5 : 2 (M)	J1 : 17 ~ J1 : 13 (S)	U1 : 3 ~ U1 : 2 (S)

- In case that SMPS output has some abnormal. : Trans &, Switching part problem
- In case SMPS output certain part has some abnormal: the corresponding circuit problem

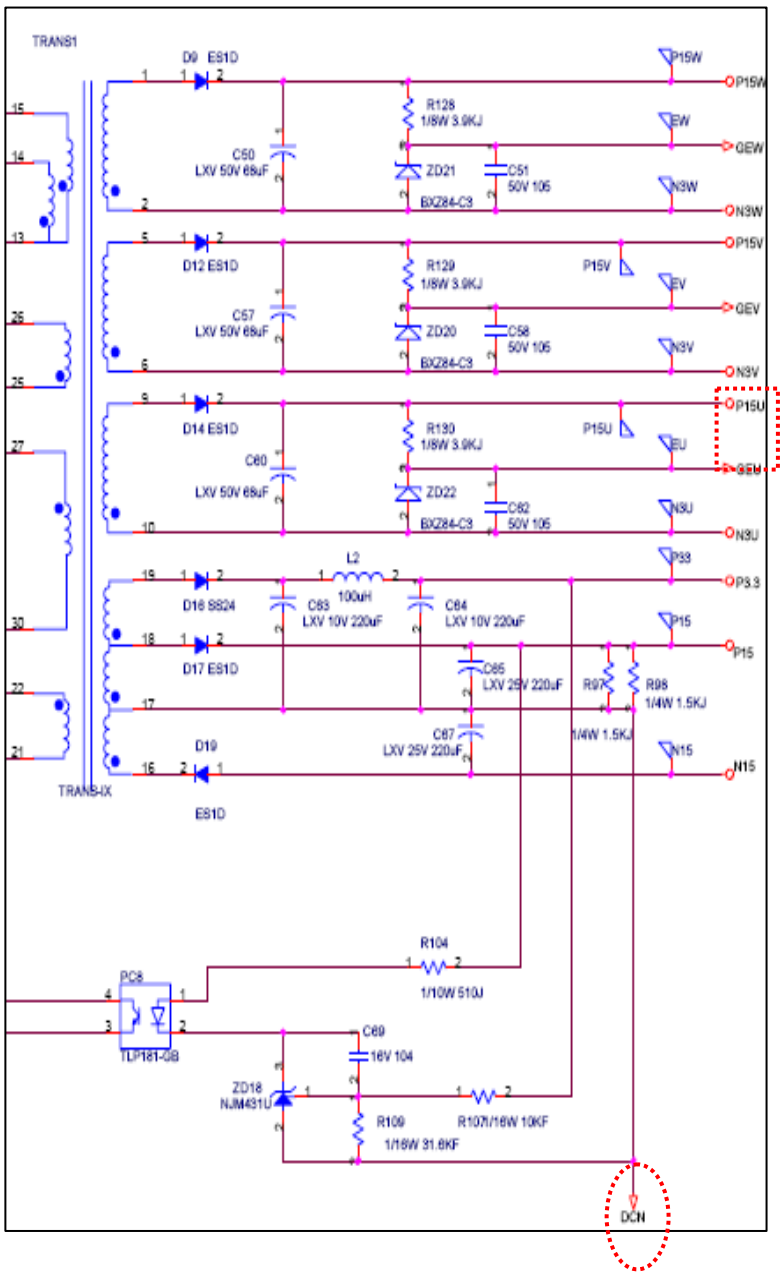
13. SPS

(1) SPS Power voltage

①SV055~075IG5A-2/4

※**Measuring method**

After feeding power to inverter, check the measuring value at each measuring point using DMM referring to below table.



PS	Allowable range	Measuring place	
		055/075-2/4	Test point
P3.3	3.23~3.37	C221 ~ DCN (M)	P3.3 ~ DCN
P15	14.7~15.8	R971 ~ R972 (M)	P15 ~ DCN
N15	-14.7~-15.8	D191 ~ DCN (M)	N15 ~ DCN
P15U	14.5~16.0	R1301 ~ R1302 (M)	P15U ~ DCN
N3U	-2.7~-3.3	ZD222 ~ ZD223 (M)	N3U ~ DCN
P15V	14.5~16.0	R1291 ~ R1292 (M)	P15V ~ DCN
N3V	-2.7~-3.3	ZD202 ~ ZD203 (M)	N3V ~ DCN
P15W	14.5~16.0	R1281 ~ R1282 (M)	P15W ~ DCN
N3W	-2.7~-3.3	ZD212 ~ ZD213 (M)	N3W ~ DCN
PP15	14.7~15.7	R1102 ~ DCN (M)	PP15 ~ DCN
NN5	-3.0~-3.5	ZD192 ~ ZD193 (M)	NN5 ~ DCN
PSCR	5.7~7.0	Q71 ~ PC63 (M)	PSCR ~ GSCR
P5I	4.9~5.2	U63 ~ CM (M)	P5I ~ CM
P24I	23.0~25.0	D22 ~ CM (M)	P24I ~ CM

(M) : Main Board, (S) : Sub Board, (P) : Power Board

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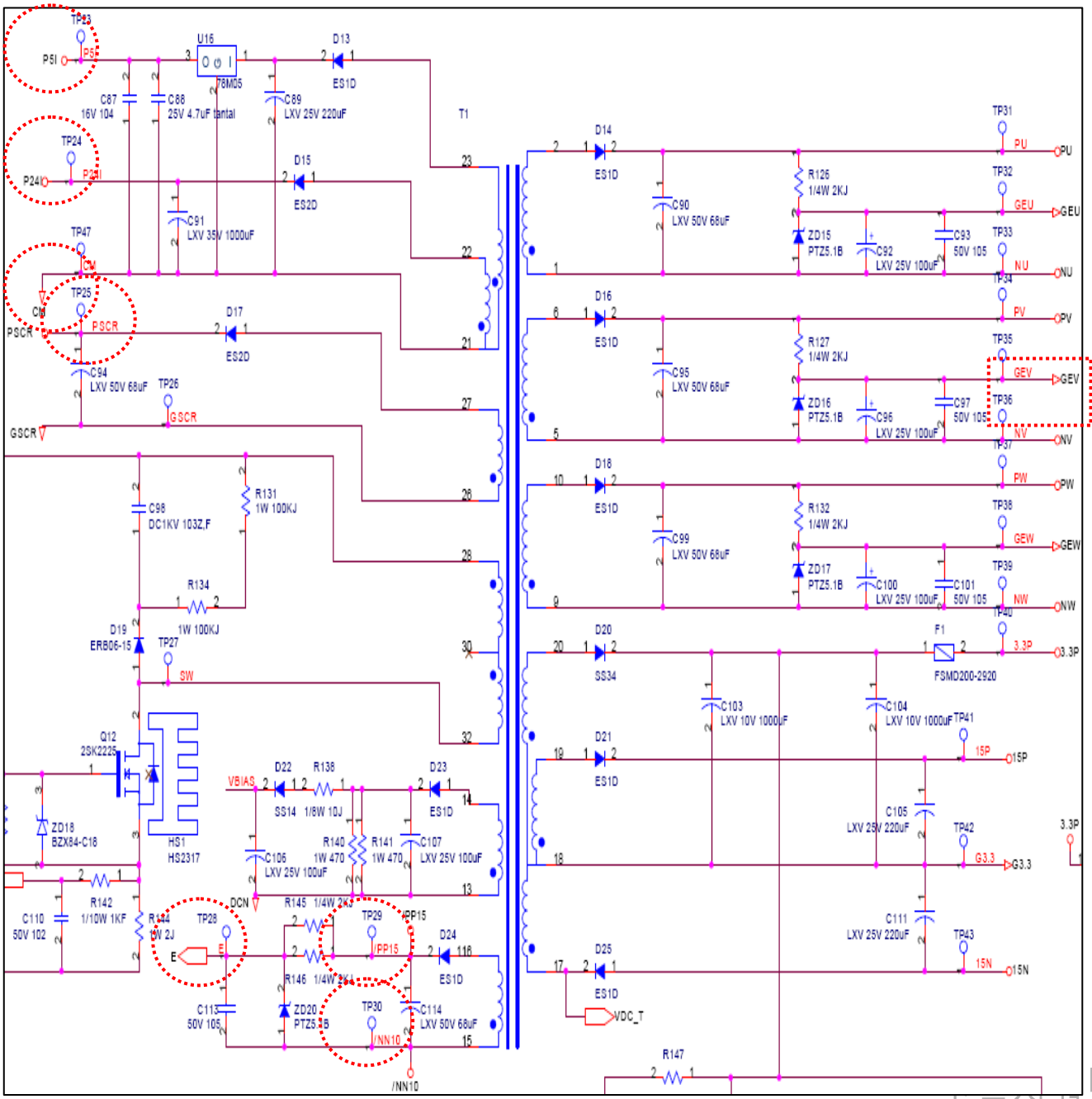
13. SPS

(1) SPS power source

②SV110~220IG5A-2/4

※Measuring method

After feeding power to inverter, check the measuring value at each measuring point using DMM referring to below table.



13. SPS

(1) SPS power source

②SV110~220IG5A-2/4

※Measuring method

After feeding power to inverter, check the measuring value at each measuring POINT using DMM referring to below table.

P.S	Allowable range	Measuring point	
	[V]	Circuit	TEST POINT
P3.3	3.2V ~ 3.4V	L1:2 – C112:2	3.3P ~ 5G
15P	15.0V ~ 17.0V	C105:1 – C105:2	15P ~ 5G
15N	-15.0V ~ -17.0V	C111:2 – C111:1	15N ~ 5G
PSCR	5.1~7.0V	C94:1 – C94:2	PSCR ~ P1
/PP15	16.0V ~ 18.5V	C114:1 – ZD20:2	/PP15 ~ E
/NN10	-4.8V ~ -6.0V	C114:2 – ZD20:2	/NN10 ~ E
PU	15.5V ~ 17.0V	U6:8 – ZD15:2	PU ~ GEU
NU	-4.8V ~ -6.0V	U6:5 – ZD15:2	NU ~ GEU
PV	15.5V ~ 17.0V	U8:8 – ZD16:2	PV ~ GEV
NV	-4.8V ~ -6.0V	U8:5 – ZD16:2	NV ~ GEV
PW	15.5V ~ 17.0V	U10:8 – ZD17:2	PW ~ GEW
NW	-4.8V ~ -6.0V	U10:5 – ZD17:2	NW ~ GEW
P24I	24.0V ~ 28.0V	C6:1 – C6:2	P24I ~ CM
P5I	4.5 ~ 5.5V	U16:2 – U16:3	P5I ~ CM

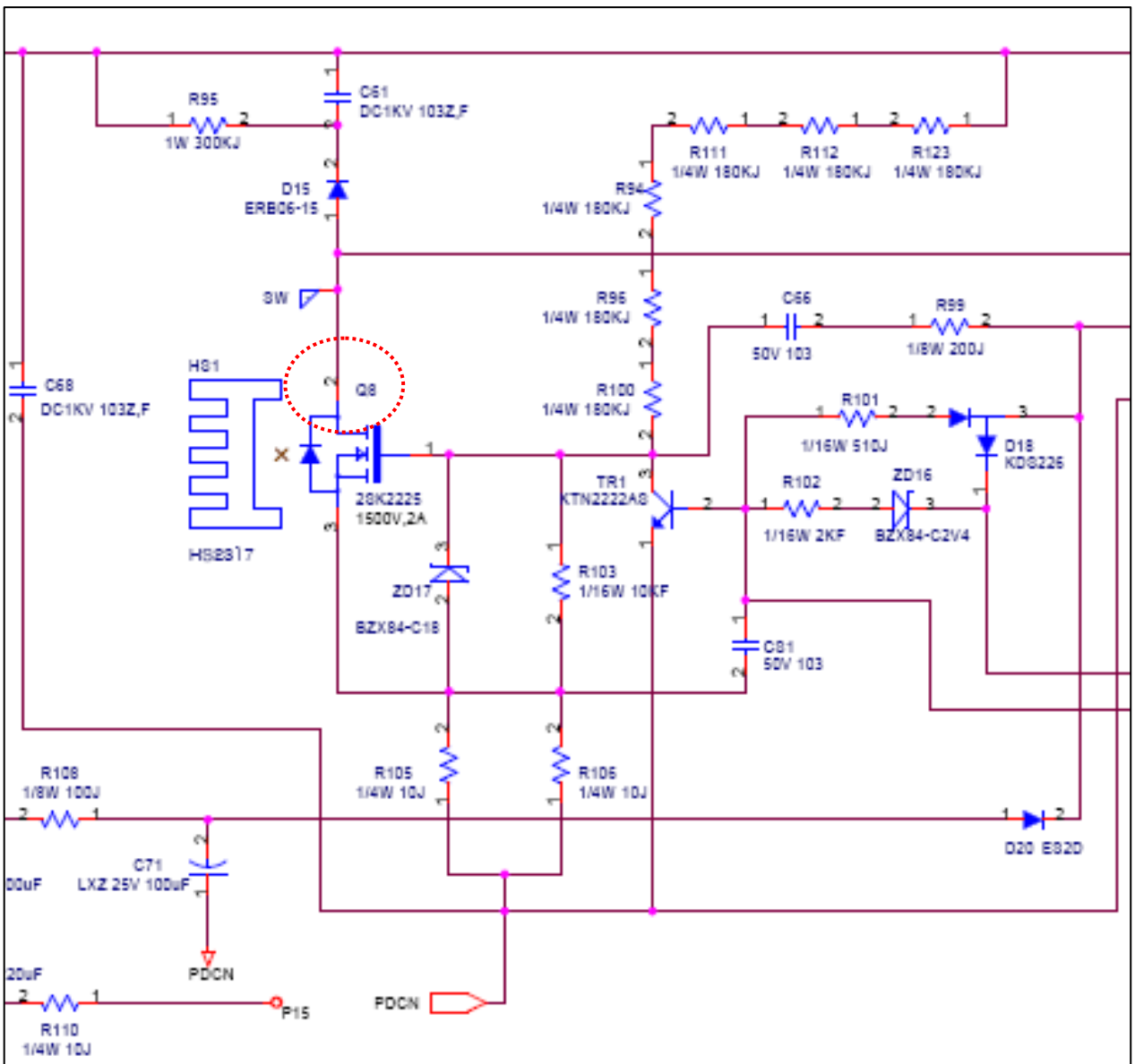
13. SPS

(2) SPS Switching Frequency

①SV004~075IG5A-2/4

※ **Measuring method**

Point : Connecting voltage of DC power device to P1 –N terminal of Mother Board and feed DC 620V(when 400V TYPE
Measure the frequency of Q8-2번~ DCN of Mother Board using oscilloscope.
Slydacs, DMM, Oscilloscope (200Mhz)- use 100 : 1 for PROBE



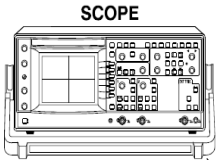
13. SPS

(2) SPS Switching Frequency

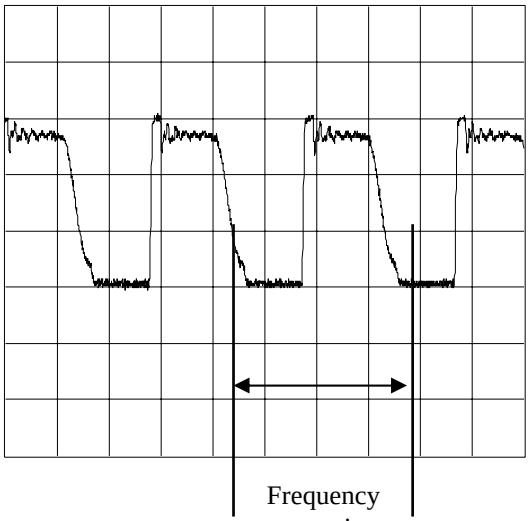
①SV004~075IG5A-2/4

※ **Measuring method**

Point : Connecting voltage of DC power device to P1 –N terminal of Mother Board and feed DC 620V(when 400V TYP
Measure the frequency of Q8-2번~ DCN of Mother Board using oscilloscope.
Slydacs, DMM, Oscilloscope (200Mhz)- use 100 : 1 for PROBE



200V/DIV
5uS/DIV



Product type	Input voltage	Measuring point	Working frequency range
004-2	DC 310V	Q8-2번 ~ DCN	80 ~ 150 kHz
004-4	DC 620V	Q8-2번 ~ DCN	80 ~ 150 kHz
008-2, 015-2 022-2, 037-2, 040-2	DC 310V	Q8-2번 ~ DCN	60 ~ 130 kHz
008-4, 015-4 022-4, 037-4, 040-4	DC 620V	Q8-2번 ~ DCN	60 ~ 130 kHz
055-2, 075-2	DC 310V	Q8-2번 ~ DCN	40 ~ 80 kHz
055-4, 075-4	DC 620V	Q8-2번 ~ DCN	40 ~ 80 kHz

13. SPS

(2) SPS Switching product

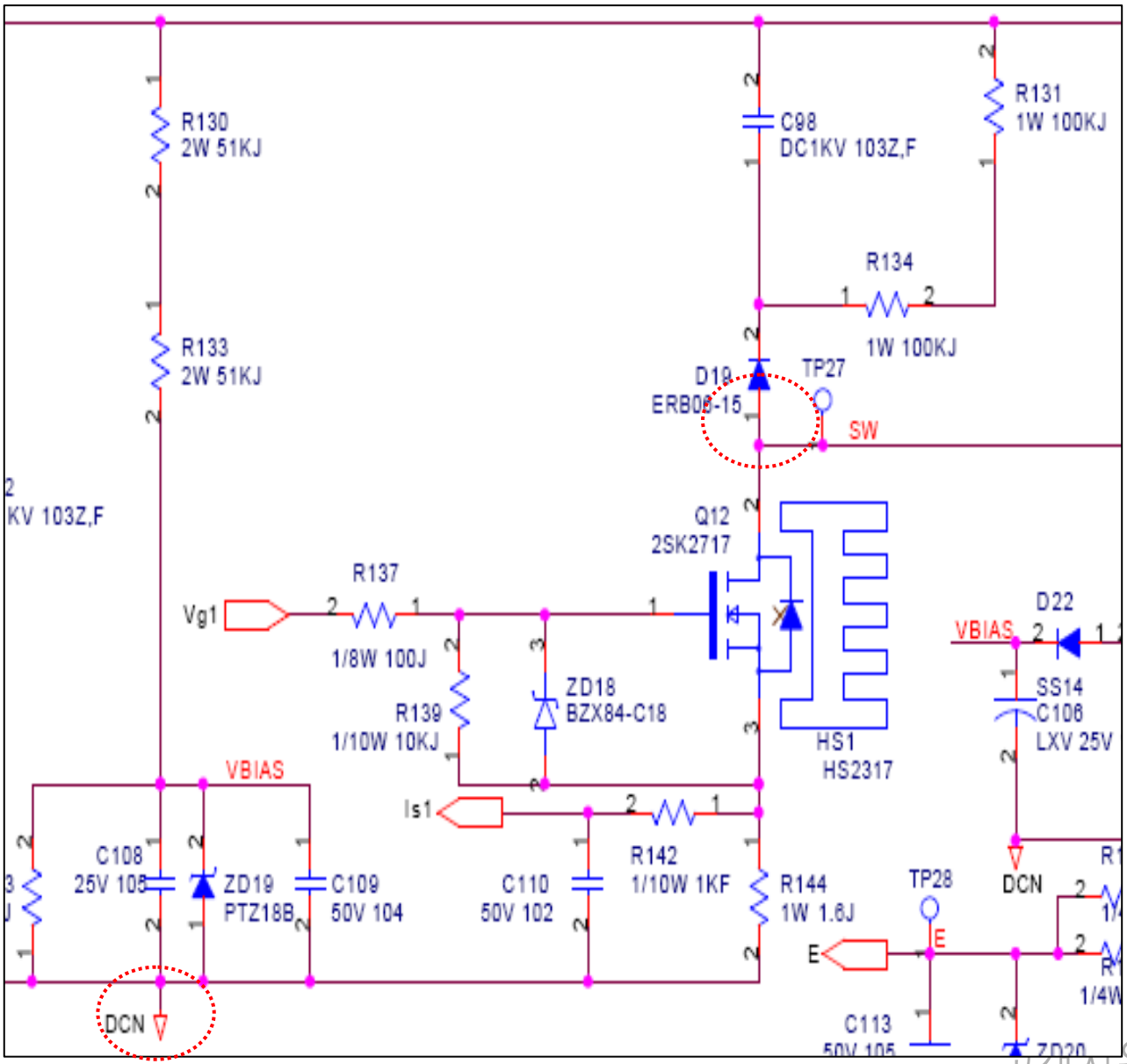
②SV110~220IG5A-2/4

※ Measuring method

Point : ① connect DCP(DCP), DCN(DCN) of DC power source at input terminal(P2, N) of power board.

② power up until 300/600V(200/400V type)

③ Measure the voltage using differential probe that between Drain and DCN of Power board Mosfet



13. SPS

(2) SPS Switching frequency

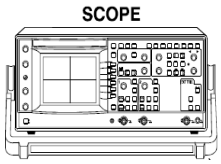
②SV110~220IG5A-2/4

※ Measuring method

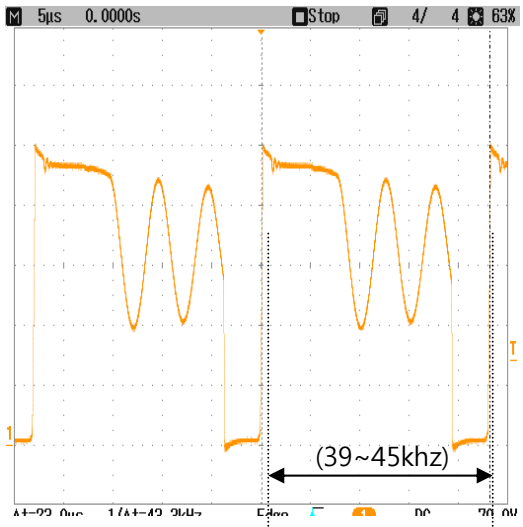
Point : ① connect DCP(DCP), DCN(DCN) of DC power source at input terminal(P2, N) of power board.

② power up until 300/600V(200/400V type)

③ Measure the voltage using differential probe that between Drain and DCN of Power board Mosfet.



Frequency Measuring



100V/DIV 5uS/DIV

Products	Input Voltage [V]	Measuring point	TEST POINT	SMPS working frequency [kHz]
200V Type	DC 300V	D19:1 ~ DCN	SW ~ DCN	38 ~ 44
400V Type	DC 600V	D19:1 ~ DCN	SW ~ DCN	38 ~ 44

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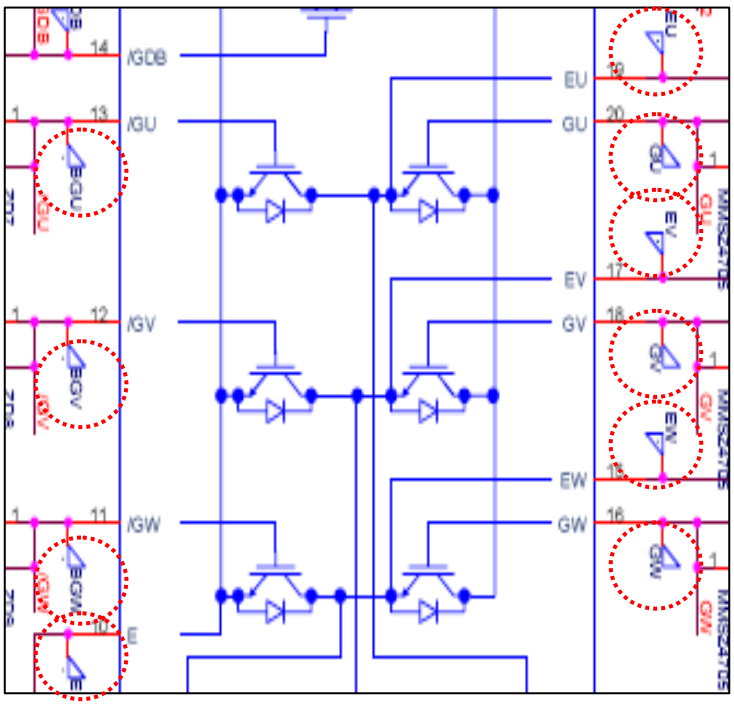
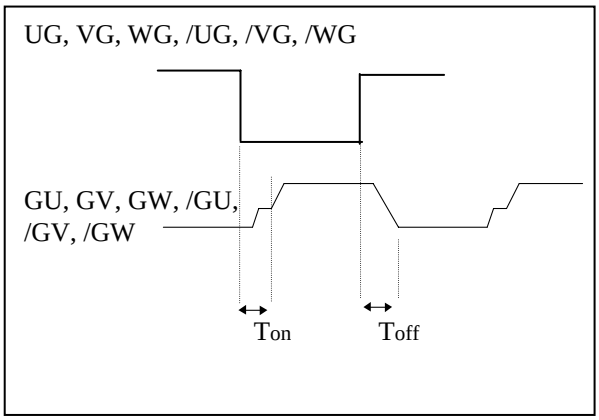
14. PWM Output

(1) SV004~075IG5A-2/4

※ **Measuring method :**

Feeding power to inverter, inputting, operating at 0.5Hz, check the output wave of each part using oscilloscope. Make sure to use oscilloscope insulated each channel. (Measure Gate Drive I/O voltage)





Measuring place		Ton(us)	Toff(us)	ON voltage Reference
UG ~ DCN	GU ~ GEU	1~2.5	1.5~3.0	13~16
VG ~ DCN	GV ~ GEV	1~2.5	1.5~3.0	13~16
WG ~ DCN	GW ~ GEW	1~2.5	1.5~3.0	13~16
/UG ~ DCN	/GU ~ E	1~2.5	1.5~3.0	13~16
/VG ~ DCN	/GV ~ E	1~2.5	1.5~3.0	13~16
/WG ~ DCN	/GW ~ E	1~2.5	1.5~3.0	13~16

14. PWM Output

(1) SV004~075IG5A-2/4

※ **Measuring method :**

Feeding power to inverter, inputting, operating at 0.5Hz, check the output wave of each part using Oscilloscope. Make sure to use oscilloscope insulated each channel. (Measure Gate Drive I/O voltage)

product	CPU Gate Signal (input)	IGBT G-E Voltage (output)
004-2/4	U1-04번(UG) ~ DCN	PIM1 핀 16(GU) - 17(UM)
008-2/4	U1-08번(/UG) ~DCN	PIM1 핀 6(/GU) - 7(DCN)
	U1-05번(VG) ~ DCN	PIM1 핀 14(GV) - 15(V)
	U1-09번(/VG) ~DCN	PIM1 핀 8(/GV) - 7(DCN)
	U1-06번(WG) ~ DCN	PIM1 핀 12(GW) - 13(WM)
	U1-10번(/WG)~DCN	PIM1 핀 10(/GW) - 7(DCN)
015-4	U5-04번(UG) ~ DCN	PIM1 핀 16(GU) - 17(UM)
	U5-08번(/UG) ~DCN	PIM1 핀 6(/GU) - 7(DCN)
	U5-05번(VG) ~ DCN	PIM1 핀 14(GV) - 15(V)
	U5-09번(/VG) ~DCN	PIM1 핀 8(/GV) - 7(DCN)
	U5-06번(WG) ~ DCN	PIM1 핀 12(GW) - 13(WM)
	U5-10번(/WG)~DCN	PIM1 핀 10(/GW) - 7(DCN)
015-2	U5-04번(UG) ~ DCN	PIM1 핀 17(GU) - 16(UM)
	U5-08번(/UG) ~DCN	PIM1 핀 10(/GU) - 7(DCN)
	U5-05번(VG) ~ DCN	PIM1 핀 19(GV) - 18(V)
	U5-09번(/VG) ~DCN	PIM1 핀 9(/GV) - 7(DCN)
	U5-06번(WG) ~ DCN	PIM1 핀 21(GW) - 20(WM)
	U5-10번(/WG)~DCN	PIM1 핀 8(/GW) - 7(DCN)
022-2/4	U5-04번(UG) ~ DCN	PIM1 핀 20(GU) - 19(EU)
037-2/4	U5-08번(/UG) ~DCN	PIM1 핀 13(/GU) - 10(COM)
040-2/4	U5-05번(VG) ~ DCN	PIM1 핀 18(GV) - 17(EV)
	U5-09번(/VG) ~DCN	PIM1 핀 12(/GV) - 10(COM)
	U5-06번(WG) ~ DCN	PIM1 핀 16(GW) - 15(EW)
	U5-10번(/WG)~DCN	PIM1 핀 11(/GW) - 10(COM)
055-2/4	U5-06번(U) ~ DCN	PIM1 핀 20(GU) - 19(EU)
075-2/4	U5-10번(/U) ~DCN	PIM1 핀 13(/GU) - 10(E)
	U5-05번(V) ~ DCN	PIM1 핀 18(GV) - 17(EV)
	U5-09번(/V) ~DCN	PIM1 핀 12(/GV) - 10(E)
	U5-04번(W) ~ DCN	PIM1 핀 16(GW) - 15(EW)
	U5-08번(/W)~DCN	PIM1 핀 11(/GW) - 10(E)

14. PWM Output

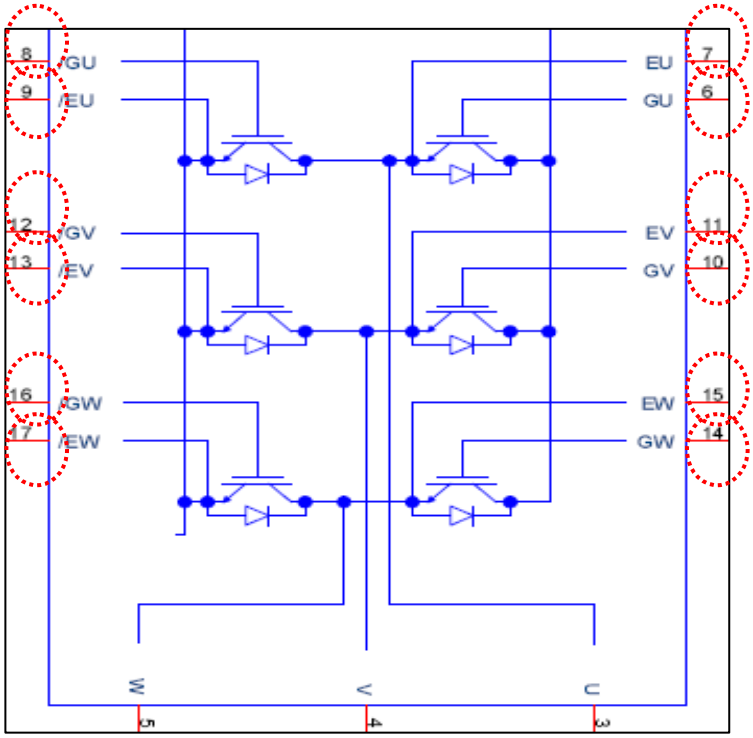
(2) SV110~220IG5A-2/4

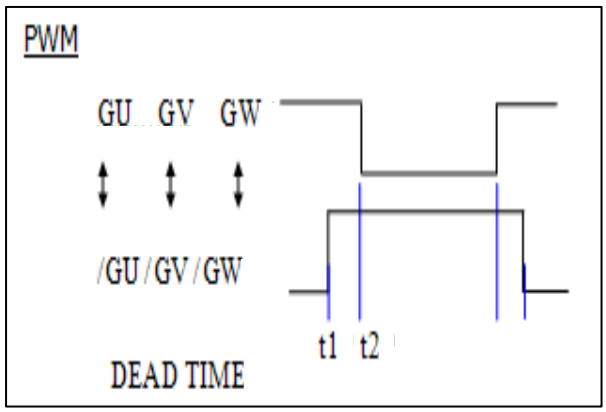
※ Measuring Method

Point : ①After running by 0.5Hz, check the Dead Time of PWM gate signal that is gathering in power module of each phase using Oscilloscope without power elements.

② Measure the maximum voltage of powering at the gate pin of Power module.

③ Measure with /GU& GU, /GV& GV, /GW& GW





110~220 Dead Time

PWM	Measuring Point				Dead time
	Circuit		TEST POINT		Reference [usec]
U	ZD2:2~ ZD6:2	ZD9:2~ ZD12:2	GU ~ GEU	/GU ~ /EU	2.2 – 2.8
V	ZD3:2~ ZD7:2	ZD10:2~ ZD13:2	GV ~ GEV	/GV ~ /EV	2.2 – 2.8
W	ZD4:2~ ZD8:2	ZD11:2~ ZD14:2	GW ~ GEW	/GW ~ /EW	2.2 – 2.8

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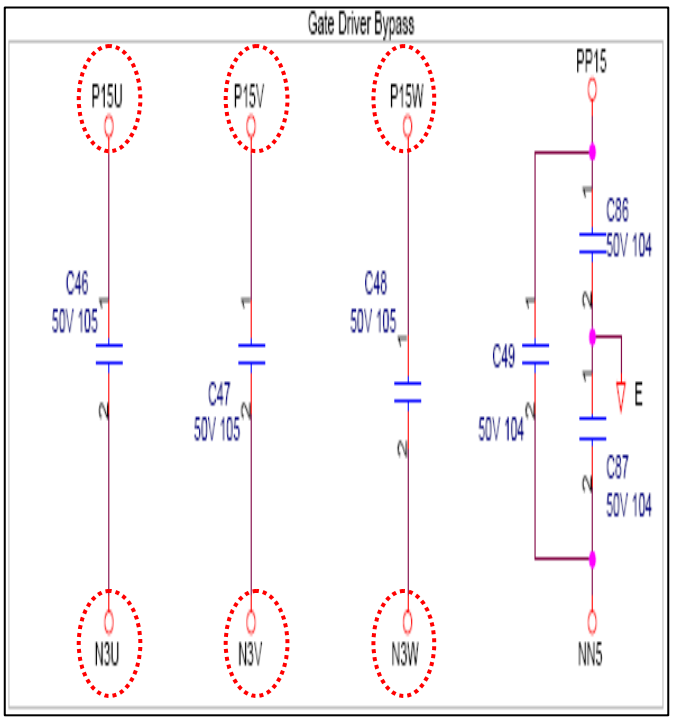
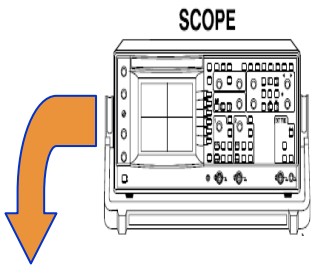
15. Gate Drive Power Source

(1) SV004~075IG5A-2/4

※ **Measuring method:**

When operating with 0.5 Hz and 60Hz, Measure the power voltage of drive circuit of IGBT + at the below measuring point using oscilloscope and check the minimum value.





	Measuring place		Allowable Range
		Test Point	
PU	C46:1 ~ C46:2	P15U ~ N3U	17.3 ~ 18.5 VDC
PV	C47:1 ~ C47:2	P15V ~ N3V	17.3 ~ 18.5 VDC
PW	C48:1 ~ C48:2	P15W ~ N3W	17.3 ~ 18.5 VDC

(Product Measuring POINT)

	Measuring place	Allowable Range	004/008-2/4	015-2/4	022~040-2/4
PU	U+ DRIVE	12 ~ 15.8 VDC	C10 (P)	C35 (M)	C47 (M)
PV	V+ DRIVE	12 ~ 15.8 VDC	C9 (P)	C36 (M)	C46 (M)
PW	W+ DRIVE	12 ~ 15.8 VDC	C11 (P)	C37 (M)	C45 (M)

(M) : Main Board, (P) : Power Board

Above table follows the 5.5~7.5KW standard, Refer to the table for permitted VDC range by capacity.

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15. Gate Drive Power source

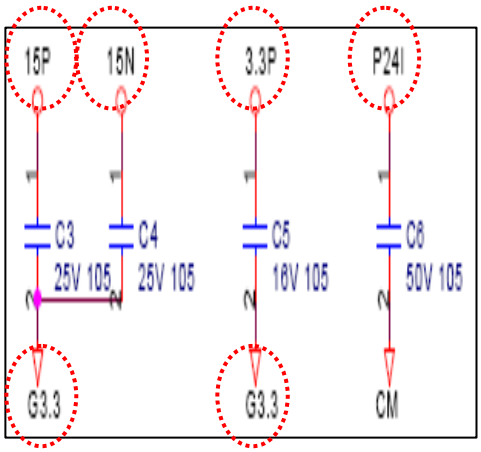
(2) SV110~220IG5A-2/4

※ Measuring Point

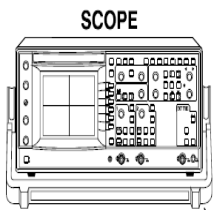
Point : ①Power up DC 300/600V into P2-N of power board which is assembled PIM1 module.

② Measure the output wave by Oscilloscope by running with 0.5Hz.

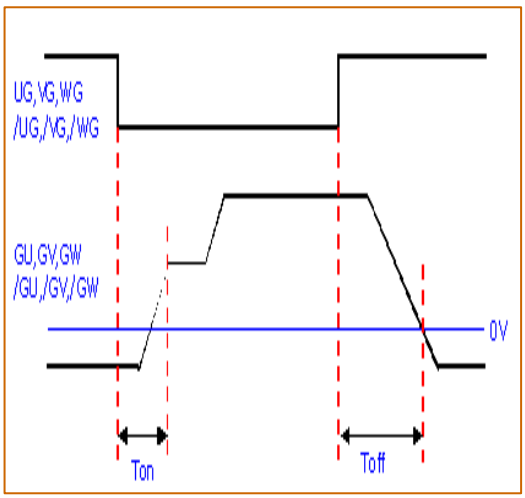
(Note that the each channel of the oscilloscope should be insulated.)



CPU Gate signal		IGBT G-E voltage
	Test Point	
GU	C3:1~G3.3	ZD2:2~ ZD6:2
GV	C4:1~G3.3	ZD3:2~ ZD7:2
GW	C5:1~G3.3	ZD4:2~ ZD8:2
/GU	C6:1~G3.3	ZD9:2~ ZD12:2
/GV	C7:1~G3.3	ZD10:2~ ZD13:2
/GW	C8:1~G3.3	ZD11:2~ ZD14:2



PWM wave



고객지원팀

15. Gate Drive Power source

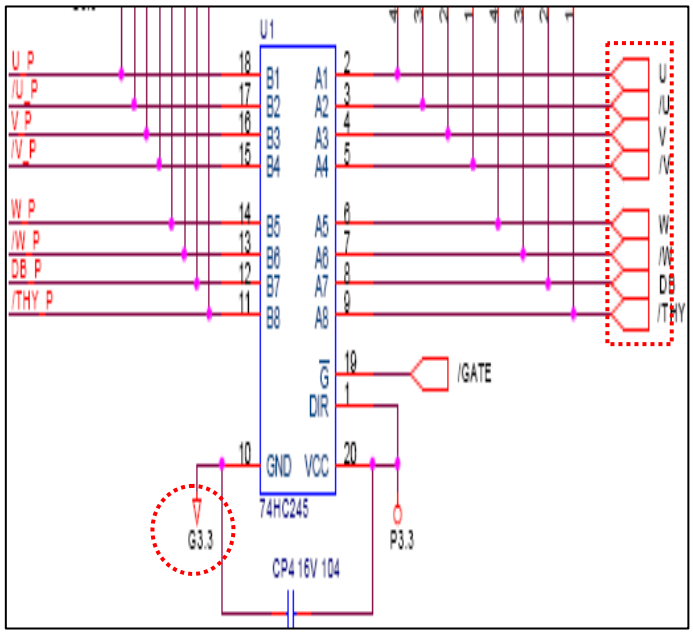
(2) SV110~220IG5A-2/4

※ Measuring Point

Point : ①Power up DC 300/600V into P2-N of power board which is assembled PIM1 module.

② Measure the output wave by Oscilloscope by running with 0.5Hz.

(Note that the each channel of the oscilloscope should be insulated.)



Measuring point		Ton	Toff	ON voltage
		Allowable	Allowable	Reference[V]
Gate signal	Vg_e	Range(uS)	Range(uS)	
U1:2~G3.3	GU ~ EU	0.5~2.0	0.8~2.3	13~17
U1:3~G3.3	GV ~ EV	0.5~2.0	0.8~2.3	13~17
U1:4~G3.3	GW ~ EW	0.5~2.0	0.8~2.3	13~17
U1:5~G3.3	/GU ~ E	0.5~2.0	0.8~2.3	13~17
U1:6~G3.3	/GV ~ E	0.5~2.0	0.8~2.3	13~17
U1:7~G3.3	/GW ~ E	0.5~2.0	0.8~2.3	13~17

16. LV / OV Protecting test

※ Test reference

Point : After Powering DC 300/600V between P2 and DCN,
Read the voltage that is displaying at the moment changed as table below with varying the input from 100V to 400V using DMM.

200V

Subject	KPD Display	Input voltage Range[V]
LV recover	Command frequency	230 ± 10
LV	LV	180 ± 10
OVT	OV	400 ± 10

400V

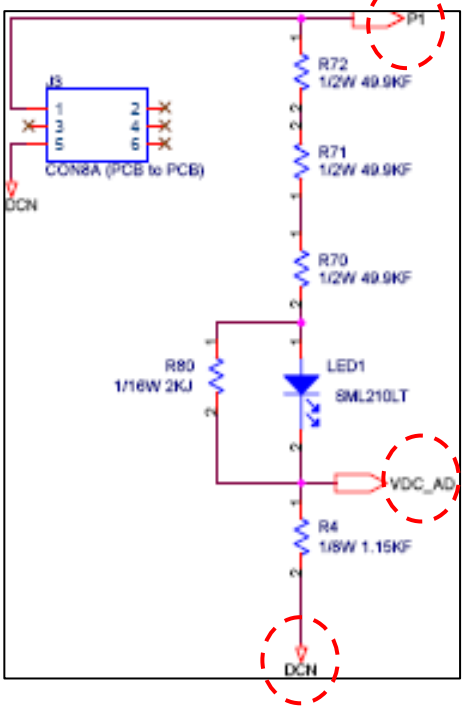
Subject	KPD Display	Input voltage Range[V]
LV recover	Command frequency	460 ± 20
LV	LV	360 ± 20
OVT	OV	820 ± 20

※ LV trip is released automatically if the voltage is over LV recover,
OV trip is released with RESET after lowering the voltage below OV trip level.

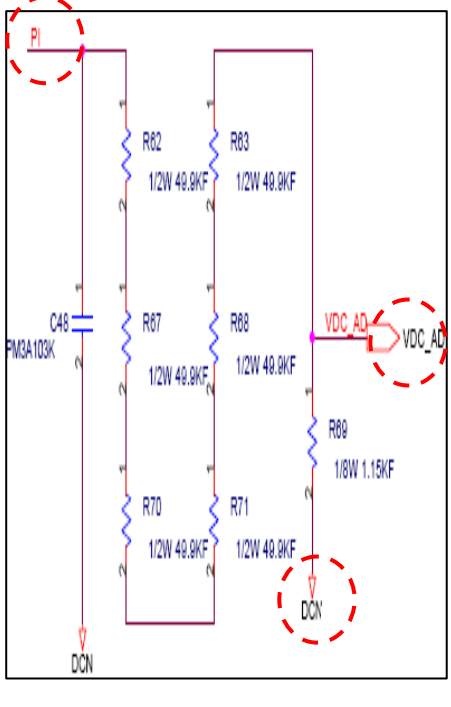
17. VDC Circuit

(1) SV004~040IG5A-2/4

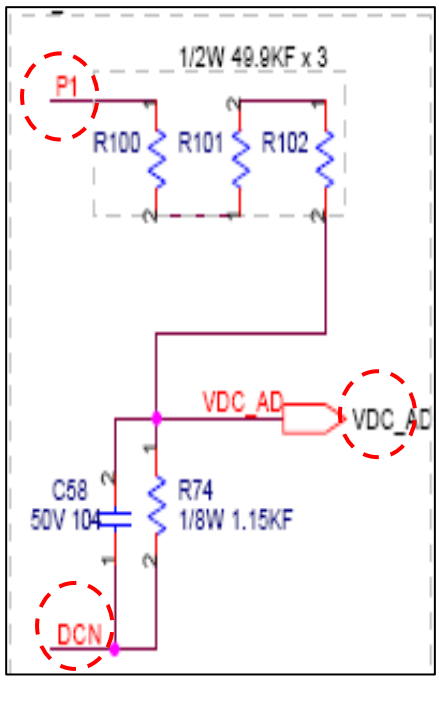
SV004~008IG5A-2/4



SV015KW-2/4



SV022~040KW-2/4



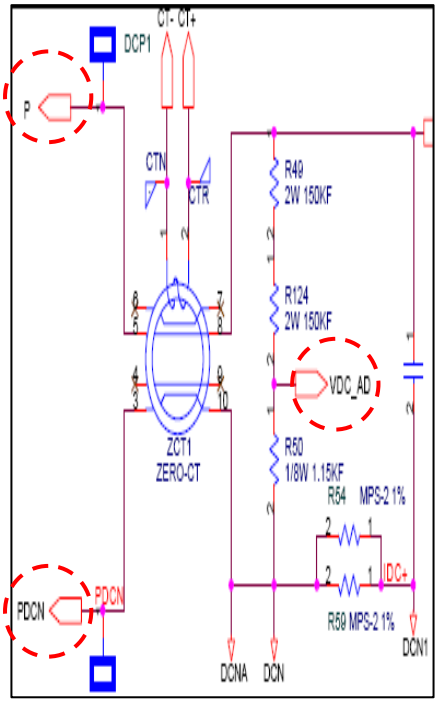
*How to Measure:
According to the input, After checking the DC LINK voltage of P1(DCP)-DCN terminal, check the corresponding VDC_AD at the VDC_AD-DCN terminal.
(AC220V/AC440V => VDC_AD 2.37V)

DC LINK (220V TYPE)	DC LINK (440V TYPE)	VDC_AD(V)
65.7V	131.4V	0.5V
131.4V	262.8V	1.0V
197.2V	394.4V	1.5V
262.9V	525.8V	2.0V
328.6V	657.2V	2.5V
394.3V	788.6V	3.0V
433.7V	867.4V	3.3V

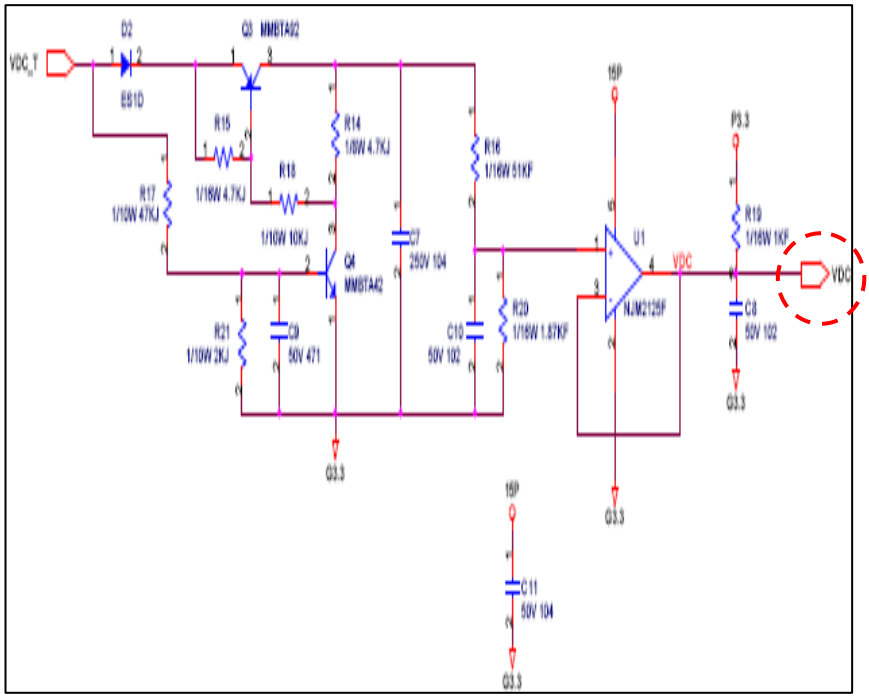
17. VDC Circuit

(2) SV055~220IG5A-2/4

5.5~7.5KW-2/4



11~22KW-2/4



* How to Measure:

According to the input, After checking the DC LINK voltage of P(DCP)-DCN terminal, check the corresponding VDC_AD at the VDC_AD-DCN terminal.

(AC220V/AC440V => VDC_AD 2.37V)

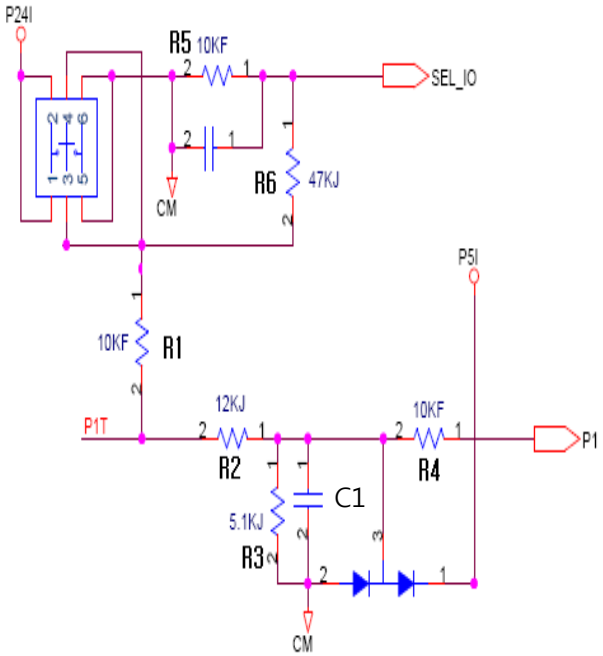
DC LINK (220V TYPE)	DC LINK (440V TYPE)	VDC_AD(V)
65.7V	131.4V	0.5V
131.4V	262.8V	1.0V
197.2V	394.4V	1.5V
262.9V	525.8V	2.0V
328.6V	657.2V	2.5V
394.3V	788.6V	3.0V
433.7V	867.4V	3.3V

18. I/O

(1) PNP/NPN Selection

※ According to Slide SW position, it can be divided as PNP/NPN mode.

ⅰ) NPN Mode : Slide SW is connected to 24V inside, and SEL_IO is recognized as High and transmitted to IO CPU.
ⅱ) PNP Mode : connected to 0V inside and SEL_IO is recognized as Low.
ⅲ) R4 is set as a value for CPU protection.

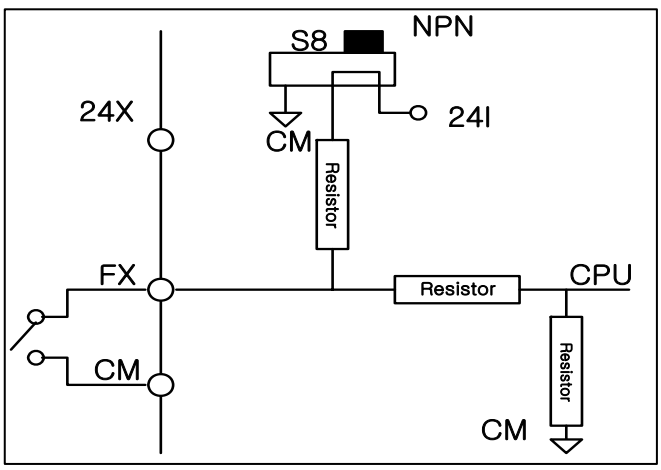


※ Measuring method

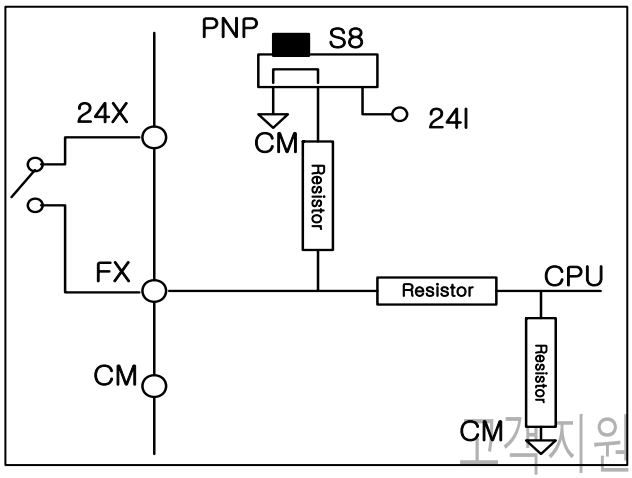
NPN Mode
contact point OFF : C1 voltage is (R1+R2) // R3 ≒ 4.5V (Logi
contact point ON : C1 voltage is 0V (Logic “0”)
C1 has filter function for the contact point input.

PNP Mode
contact point OFF : C1 voltage is 0V (Logic “0”)
contact point ON : R2 // R3 partial pressure is 7.16V but by the Diode
effect, is limited to about 5.6V actually. (Logic “1”)

NPN Wiring



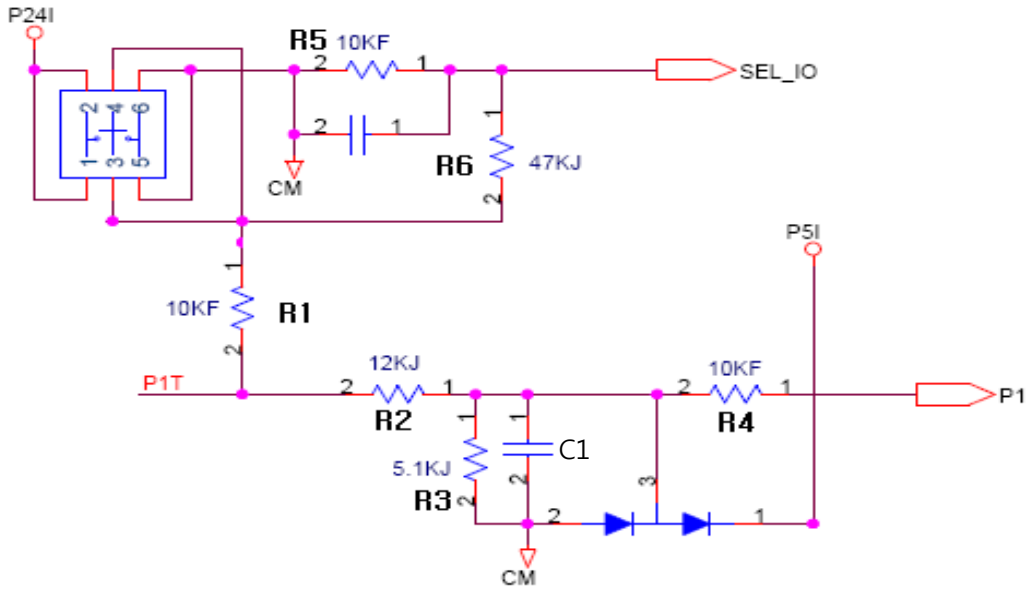
PNP Wiring



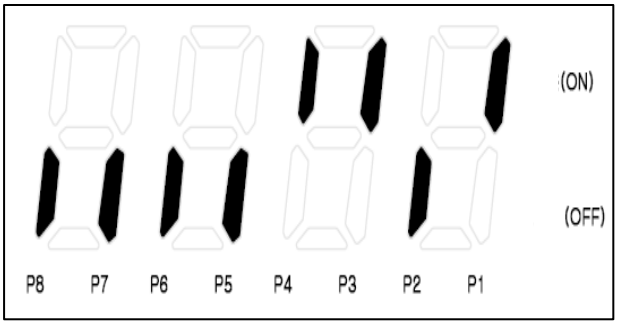
18. I/O

(2) Terminal Digital input

After selecting NPN/PNP terminal and move parameter as below, According to sequence, when each terminal (P1 ~ P 8) turns on, check the ON display of each.



	Group	Code	Display Message	Setting value
Move	I/O	19	P3 Function select	FX[0]
Move	I/O	25	In status	00000000



고객지원팀

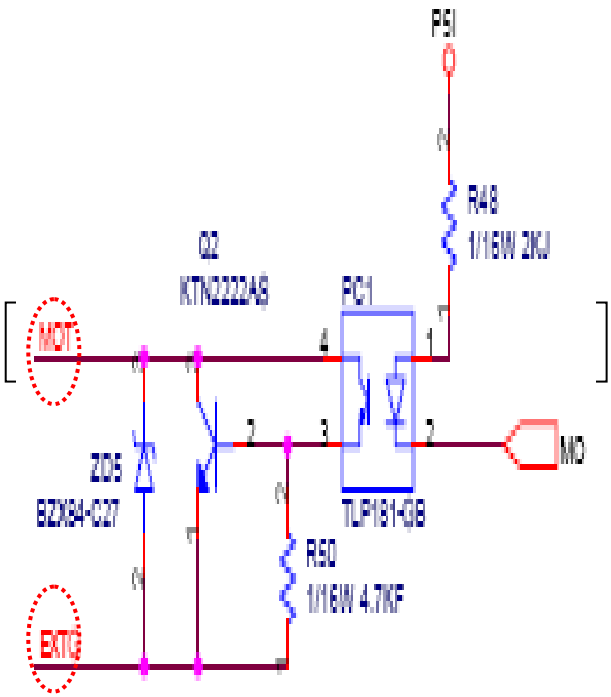
18. I/O

(3) Multi-function output terminal

AS a Transistor type output, use photo-coupler, TLP181considering outside wiring convenience.

※ **Measuring method :**

Setting as below, connect 1/4W,10KΩ resistor between VR-MOT\ at I/O terminals of Control board and connect with WIRE between EXTG-CM.



	Group	Code	Setting Value	Description
setting	**I/O**	**55**	**12**	**Output when RUN**

	Group	Code	Setting Value	Description
setting	**I/O**	**54**	**MO mode**	**Run(12)**

Adjusting RUN/STOP key of Key Switch, measure voltage between MOT-EXTG terminal.

KPD state	MOT and EXTG voltage
Run	Under 1V (contact point ON)
Stop	12±0.5V (contact point OFF)

※ **MO Output:**
-Q2 : For sufficient offer of current capacity.
KTN2222AS (600mA)
-ZD5 : For protecting output from the surge voltage of induction load. 27V zener
-MO : CPU Pin Maximum output current : 3.2 [mA]

※ **When an error occurs***

① Check the ON state of PC1 Pin 3 and Pin 4.
② Check the MO output (High) state.
③ Consider the possibility of CPU error.

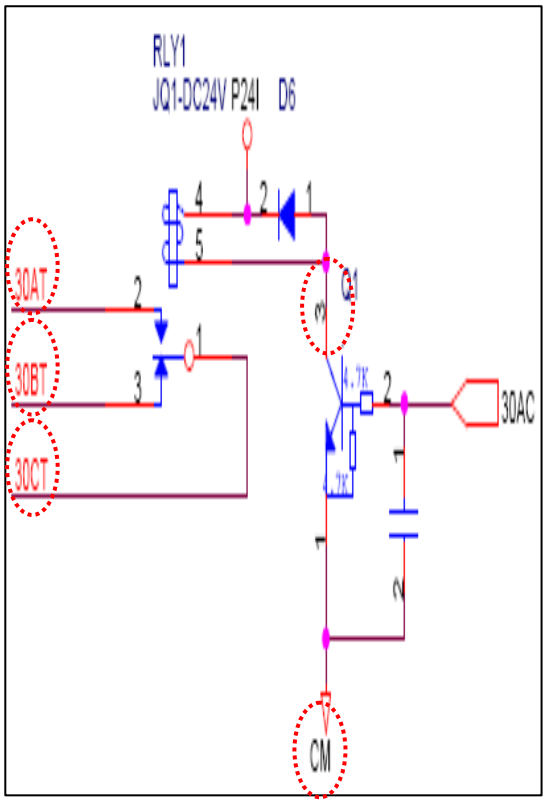
고객지원팀

18. I/O

(4) Multi-function Relay output terminal

Being offered Normal Open or Normal Close type.

※ Measuring method :
Setting as below, if make CM-P8 short with WIRE, EtA is display, Relay operation can be checked. If make CM-P4 short with WIRE, it comes back to former condition.



	Group	Code	Display	Setting Value
Move	I/O	24	P8 function select	Exterior trip signal input, A contact point

	Group	Code	Setting Value	Description
Setting	I/O	55	12	Output when RUN

Performing the operation above,
measure the resistance of 30ABC terminal.

Operation mode	Resistance value of 30A and 30C	Resistance value of 30B and 30C
RUN	0	∞
STOP	∞	0

※ Relay Output:

-Q1 : Relay operating resistor built- in. KRC101S
-30ABC : CPU Pin Maximum output current : 3.2 [mA]

※ When an error occurs*

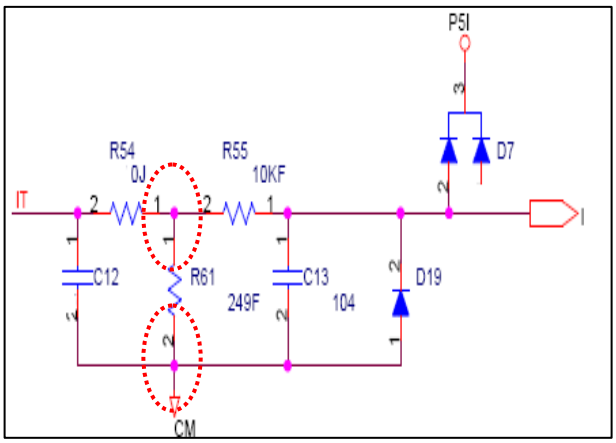
① Measure the 0V between Q1 Pin 3 and CM using DMM.
② Check the 30AC output (High) state.
③ Consider the possibility of CPU error.

고객지원팀

18. I/O

(5) Analog input

As analog input, 4~20 [mA] current input and 0 ~ ±10V voltage input can be used.
VRT(12V) is offered for adjusting voltage signal outside with the simple use of variable resistor.



※ current input measuring method

Point : SetDRV mode as "I (current)" and input current (20mA) between IT-CM terminals, check the relevant frequency.

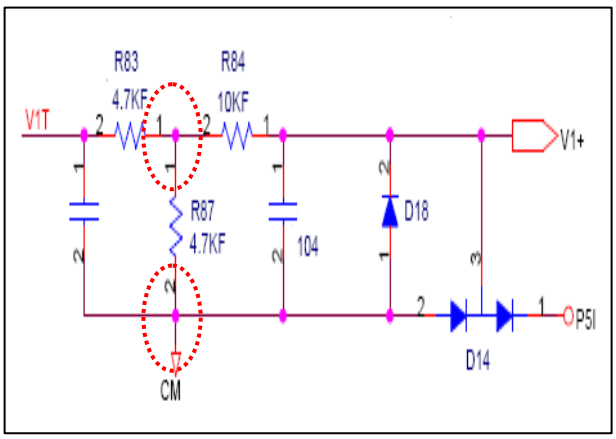
※ When an error occurs*

① Inputting 20mA between IT and CM terminals, check if you can measure 5V at the both end of R61 resistors using DMM.

② Consider also the possibility of CPU error

- Without reference to IT(4~20mA) input, if voltage of both ends of R61 is 5V => Measure D7 Diode.

- Without reference to IT(4~20mA) input, if voltage of both ends of R61 is 0V. =>Measure D9 Diode.



※Voltage input measuring method

Point : Set DRV mode as "V1(Voltage)" and input 10V between V1T-C terminals, check the relevant frequency.

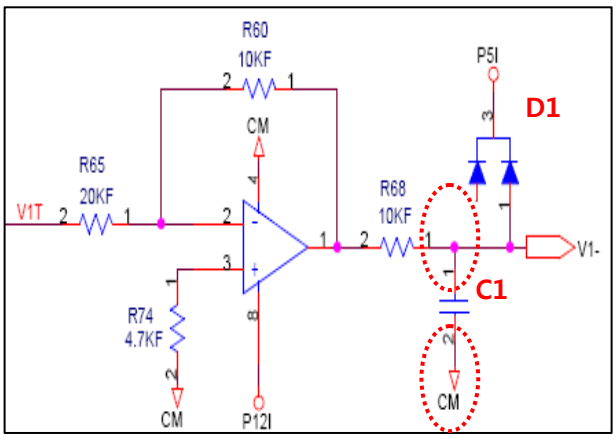
※ When an error occurs*

① Input 10V between V1T and CM, check if you can measure 5V at the both ends of R87 resistors using DMM.

② Consider also the possibility of CPU error

- Without reference to V1T(0~10V) input, if voltage of both ends of R87 is 5V => Measure D14 Diode

- Without reference to V1T(0~10V), if voltage of both ends of R87 is 0V =>Measure D18 Diode



※ Voltage input measuring method (0 ~ ± 10V)

Point : CPU Voltage : ½ of Op-Amp gain

Set DRV mode as "V1(Voltage)", input the voltage (±10V) between V1T and CM terminal, check the relevant frequency.

※ When an error occurs*

① Input ±10V between V1T and CM, check if you can measure 5V at the both ends of C1 using DMM.

② Consider also the possibility of CPU error.

- Without reference to V1T(0~±10V)input, if voltage of both ends of R87 is 5V =>Measure D1 Diode

- Without reference to V1T(0~±10V) input, if voltage of both ends of R87 is 0V =>Measure C1 condenser.

고객지원팀

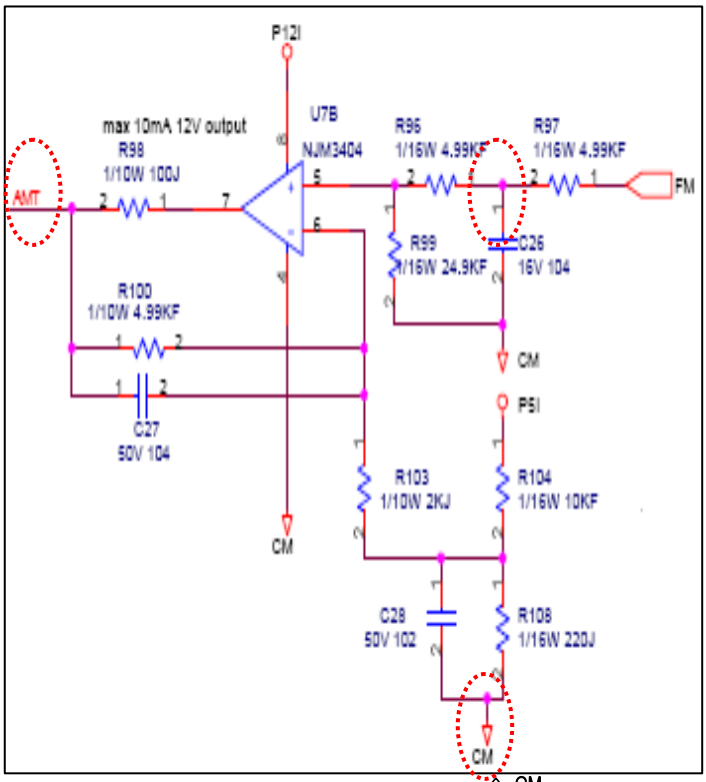
18. I/O

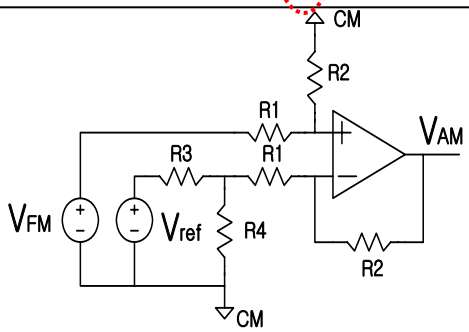
(6) Analog output

Analog output voltage (0 ~ 10V) for monitoring inverter status.

※ Measuring method

Point: Feeding power to inverter, when operating at 60HZ measure voltage between AM and CM terminals using DMM..





Setting parameter as below, measure output voltage between AM and CM terminals using DMM when operating with relevant frequency.

Frequency command [Hz]	Permitted AM output voltage [VDC]
0	0
10	1.47 ~ 1.67 ~ 1.87
20	3.13 ~ 3.33 ~ 3.53
30	4.80 ~ 5.00 ~ 5.20
40	6.47 ~ 6.67 ~ 6.87
50	8.13 ~ 8.33 ~ 8.53
60	9.80 ~ 10.0 ~ 10.2

AM Output voltage

$$V_{AM} = \frac{(R_1+R_2+R_3//R_4)}{(R_1+R_3//R_4)} \frac{R_2}{R_1+R_2} V_{FM} - \frac{R_2}{R_1} \frac{R_1//R_4}{R_3+R_1//R_4} V_{ref}$$

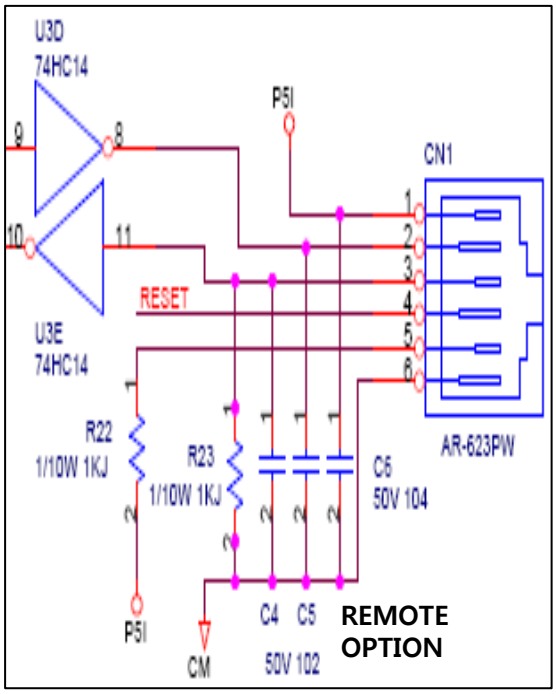
※ When an error occurs*

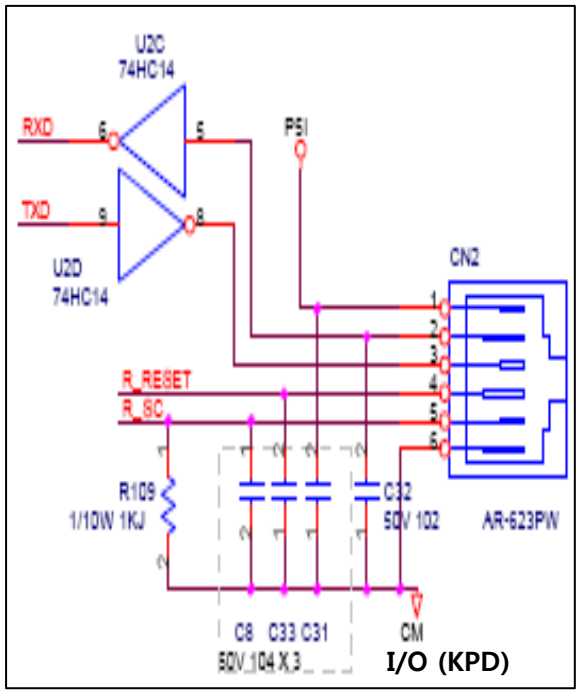
① Measure if 5V can be output between C26 1 and CM terminal when operating at 60Hz.
② Consider also the possibility of CPU error.

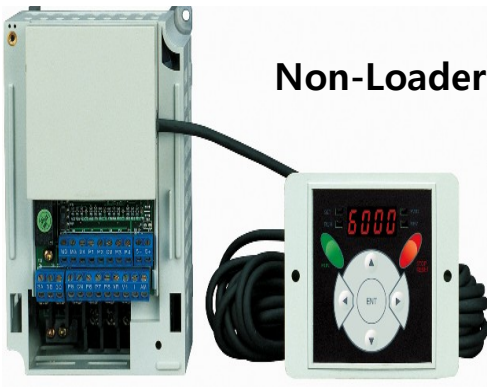
고객지원팀

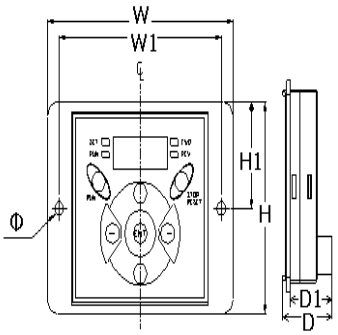
18. I/O

(7) REMOTE OPTION









W	95	D	25.2
W1	83	D1	21.6
H	72.4	Φ	4.5
H1	36.2		

※ Parameter Read/Write function (Option)

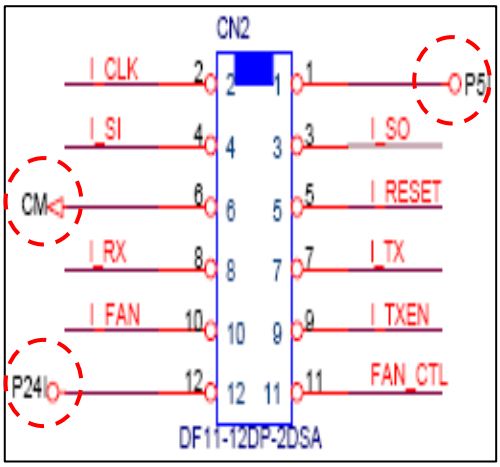
-. 2m, 3m, 5m REMOTE cables are offered

고객지원팀

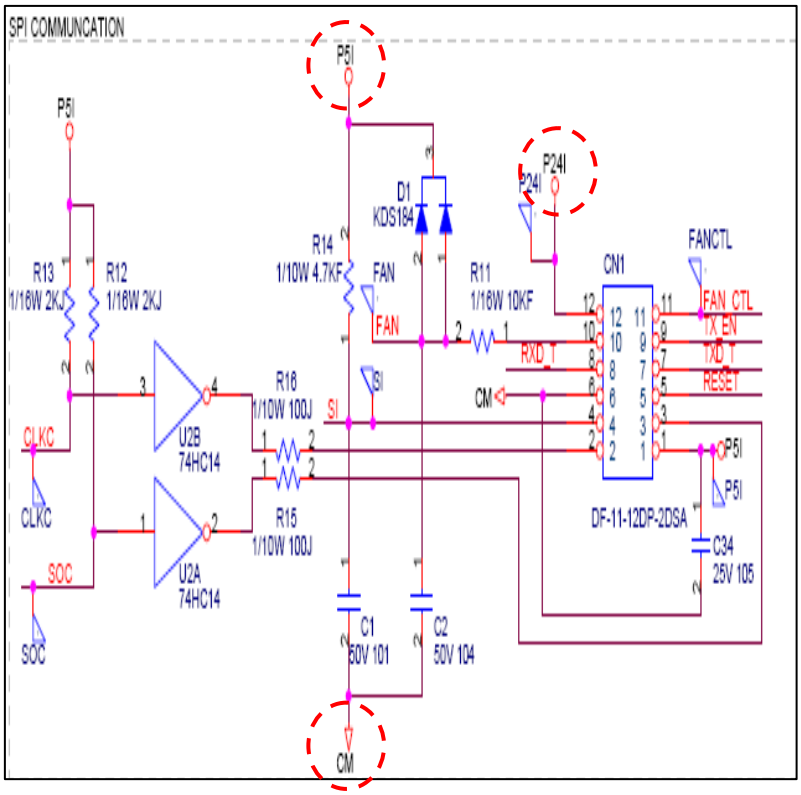
18. I/O

(8) I/O Power

Main body



LOADER



	Measuring point	Measured value
DC 5V	P5I-CM	4.5~5.5V
DC 24V	P24I-CM	23.5~24.5V

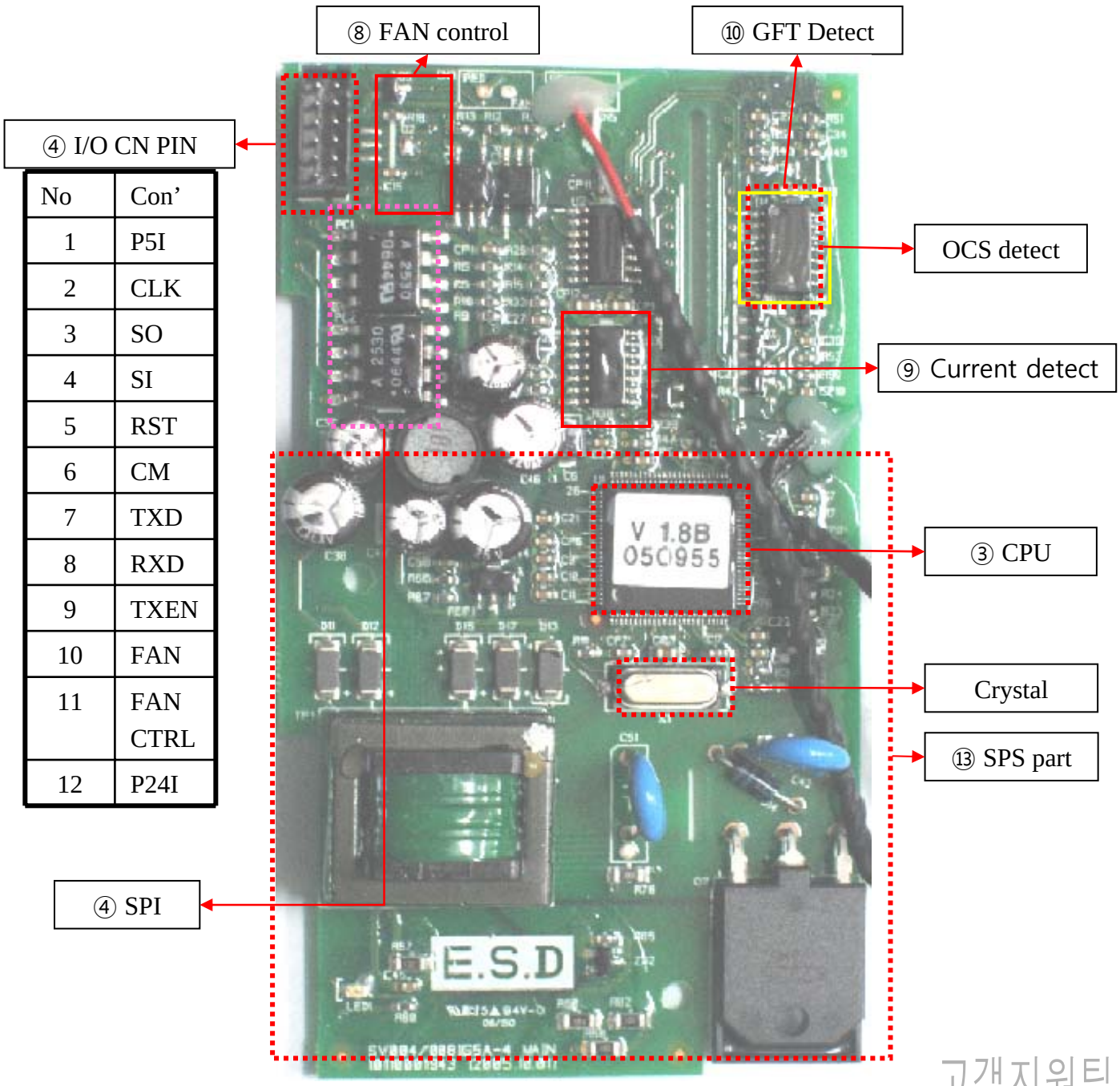
※ When an Error occurs

① After powering, measure DC 5V, DC 24V.
② Check the normal condition of LOADER CABLE.
③ Consider the possibility of CPU error.

고객지원팀

19. BOARD ASS'Y Arrangement

(1) MAIN BOARD SV004~008IG5A-2/4

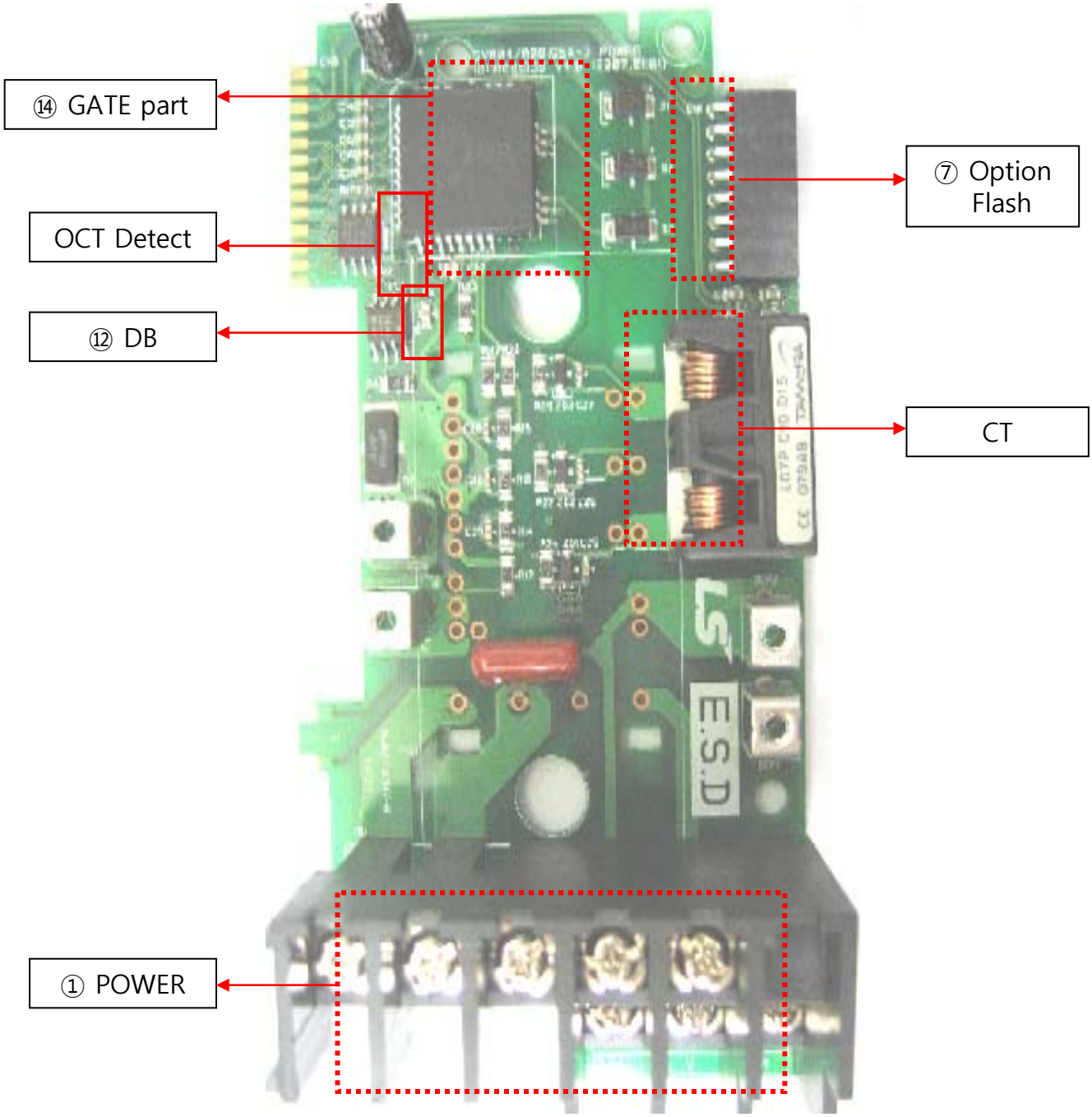


No	Con'
1	P5I
2	CLK
3	SO
4	SI
5	RST
6	CM
7	TXD
8	RXD
9	TXEN
10	FAN
11	FAN CTRL
12	P24I

고객지원팀

19. BOARD ASS'Y Arrangement

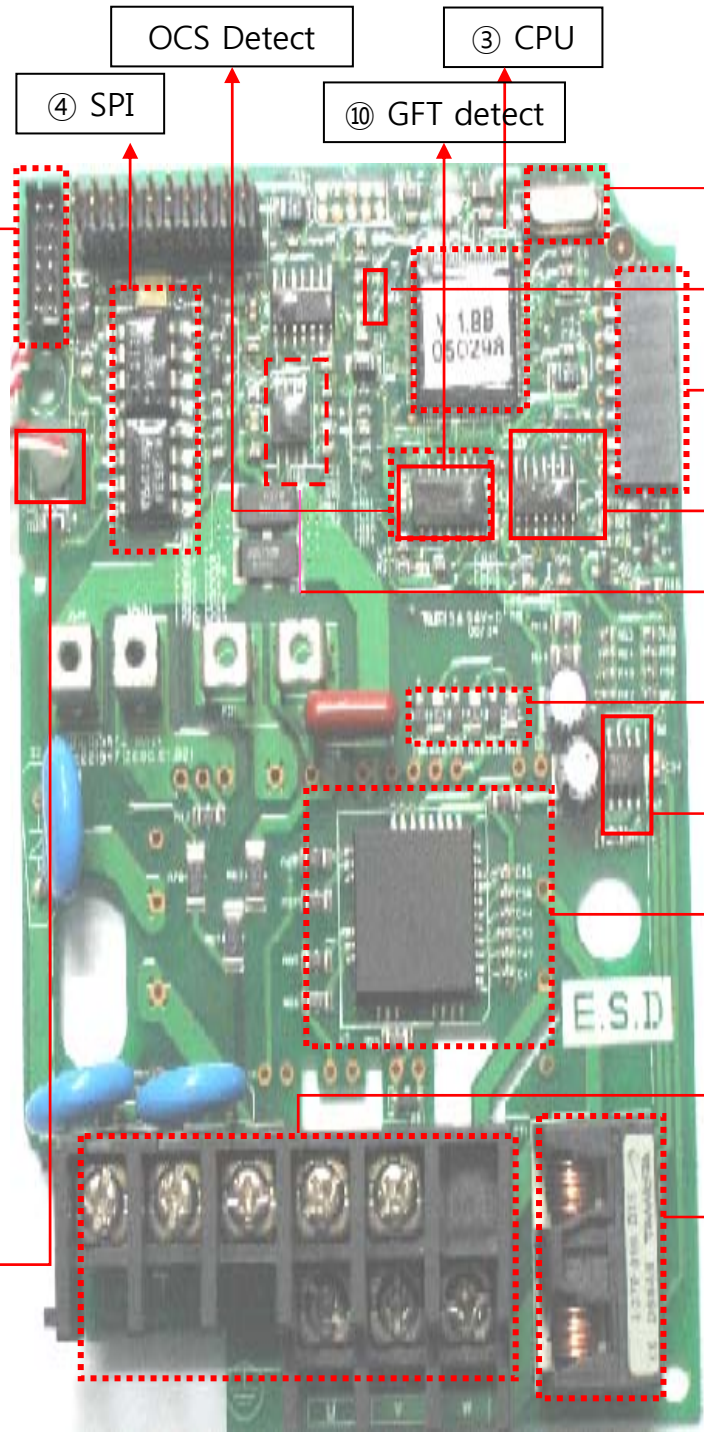
(2) POWER BOARD SV004~008IG5A-2/4



고객지원팀

19. BOARD ASS'Y Arrangement

(3) MAIN BOARD SV015IG5A-2

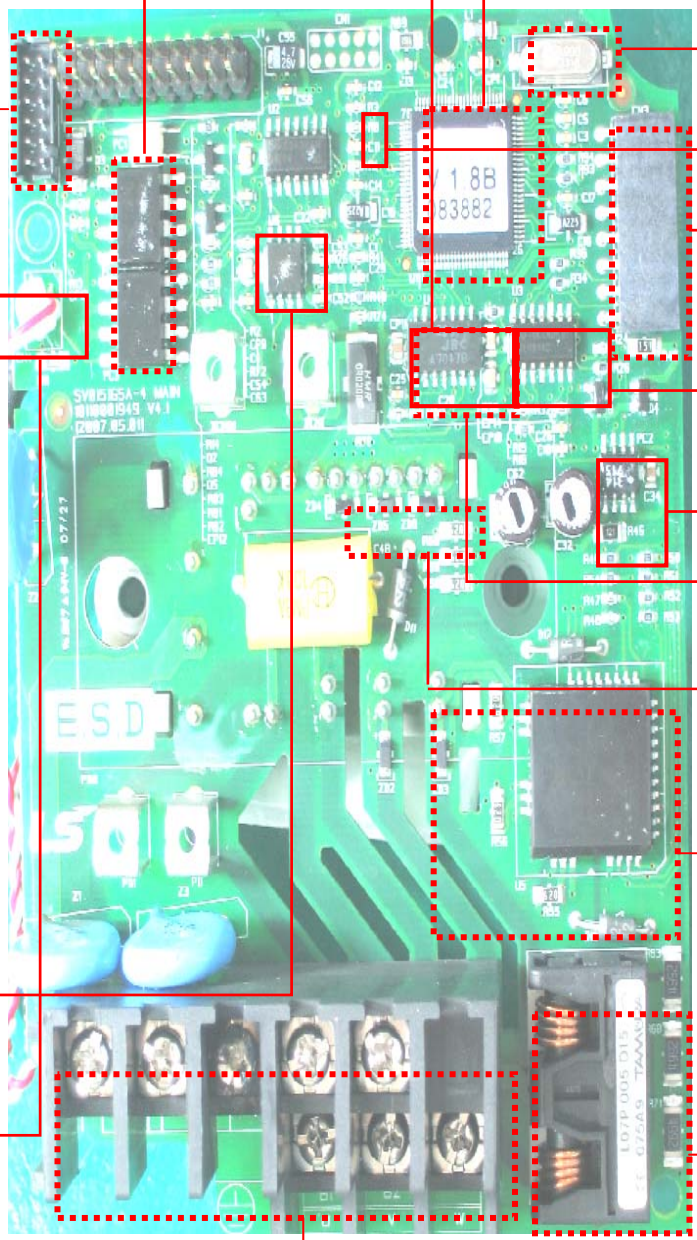


No.	
1	P5I
2	CLK
3	SO
4	SI
5	RST
6	CM
7	TXD
8	RXD
9	TXEN
10	FAN
11	FAN CTRL
12	P24I

고객지원팀

19. BOARD ASS'Y Arrangement

(4) MAIN BOARD SV015~IG5A-4

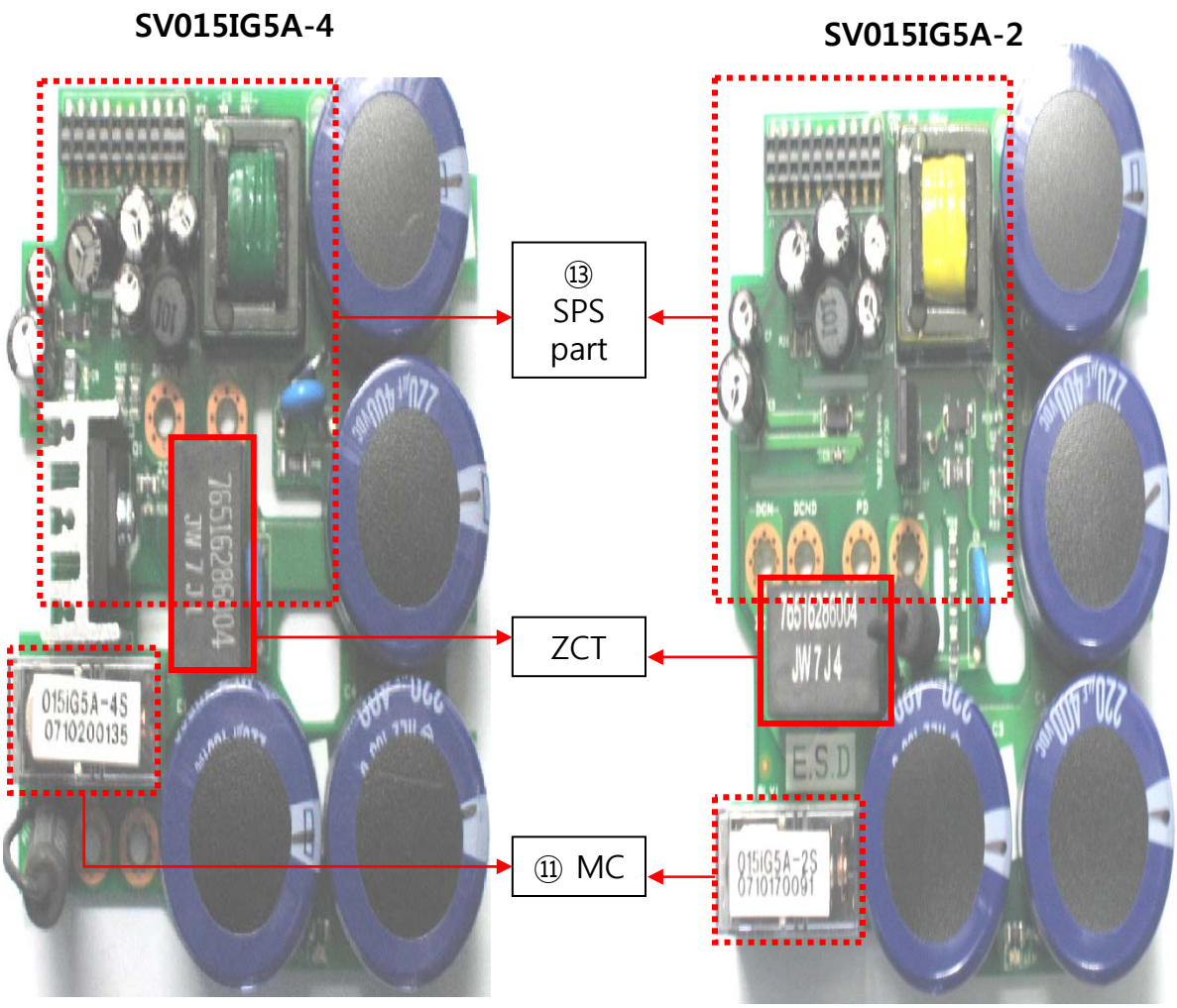


No	
1	P5I
2	CLK
3	SO
4	SI
5	RST
6	CM
7	TXD
8	RXD
9	TXEN
10	FAN
11	FAN CTRL
12	P24I

고객지원팀

19. BOARD ASS'Y Arrangement

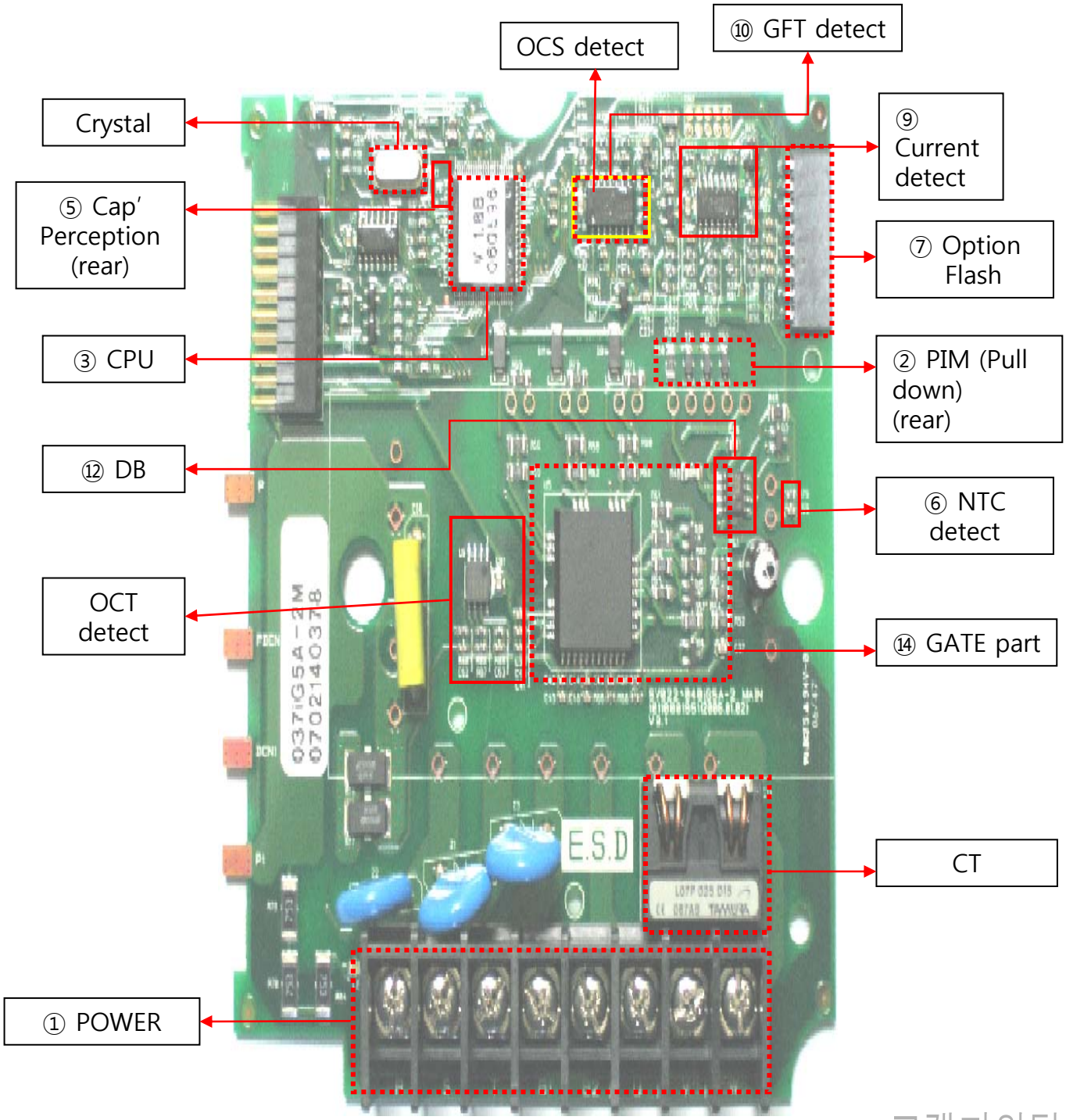
(5) SUB BOARD SV015IG5A-2/4



고객지원팀

19. BOARD ASS'Y Arrangement

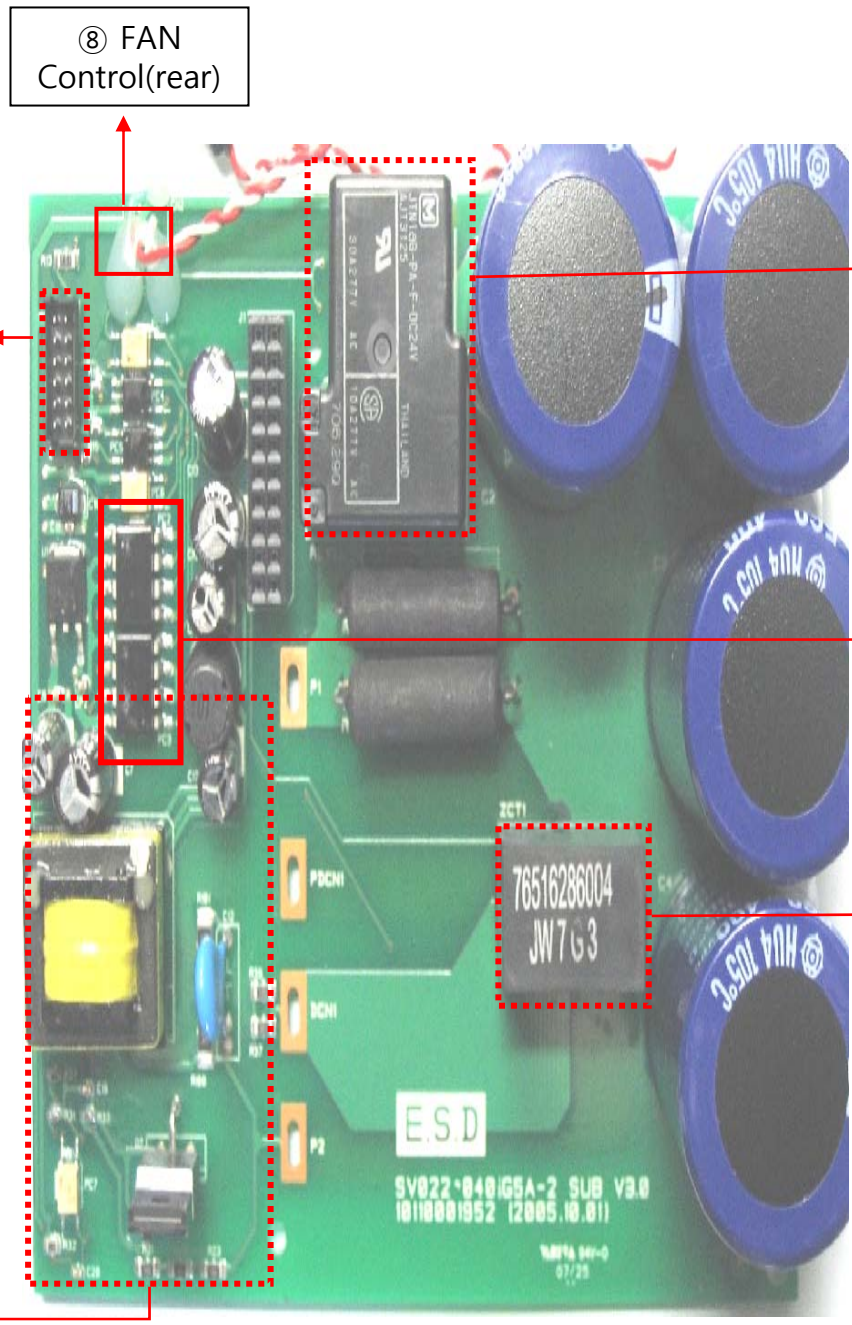
(6) MAIN BOARD SV022~040IG5A-2/4



고객지원팀

19. BOARD ASS'Y Arrangement

(7) SUB BOARD SV022~040IG5A-2/4

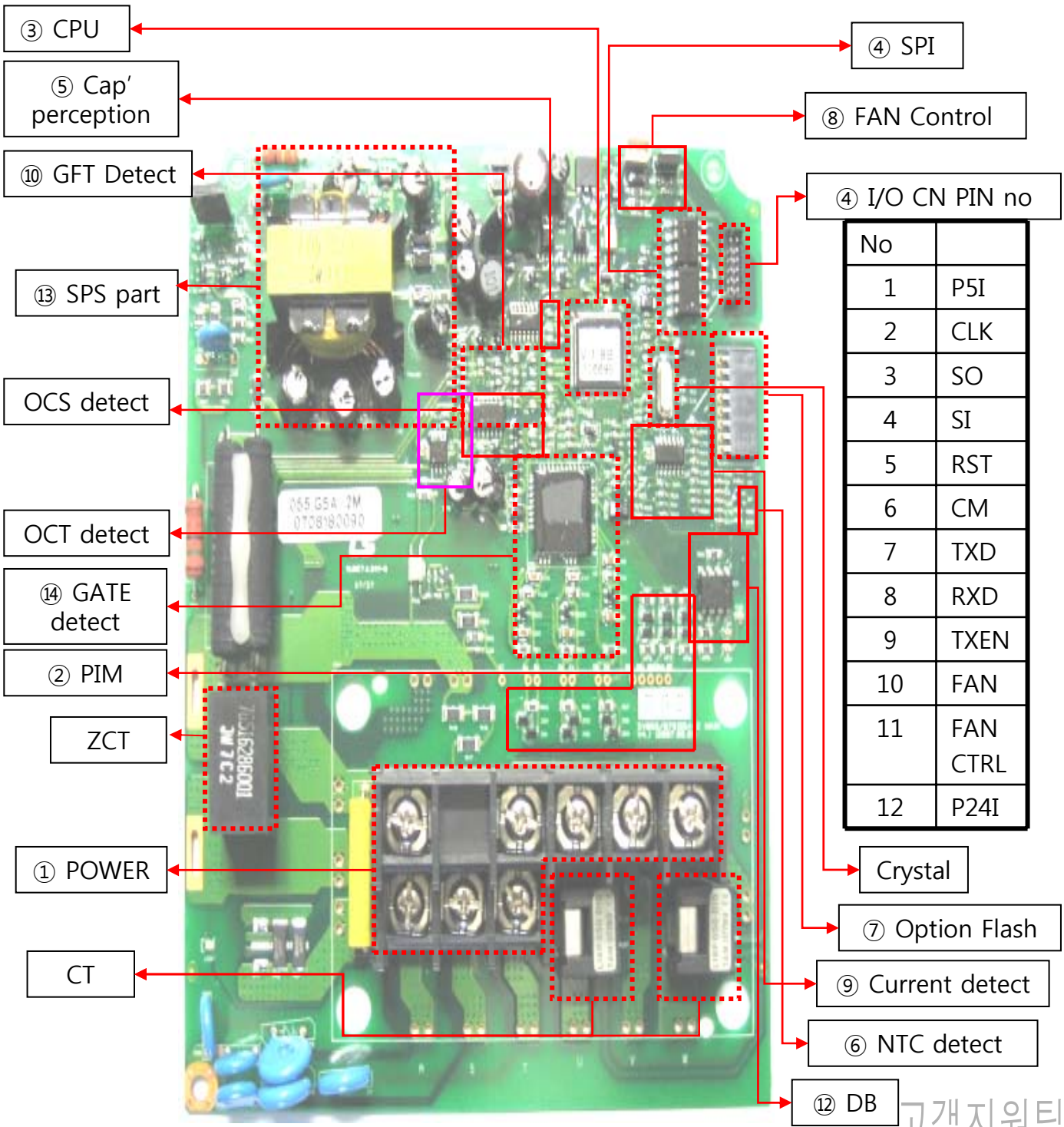


No	
1	P5I
2	CLK
3	SO
4	SI
5	RST
6	CM
7	TXD
8	RXD
9	TXEN
10	FAN
11	FAN CTRL
12	P24I

고객지원팀

19. BOARD ASS'Y Arrangement

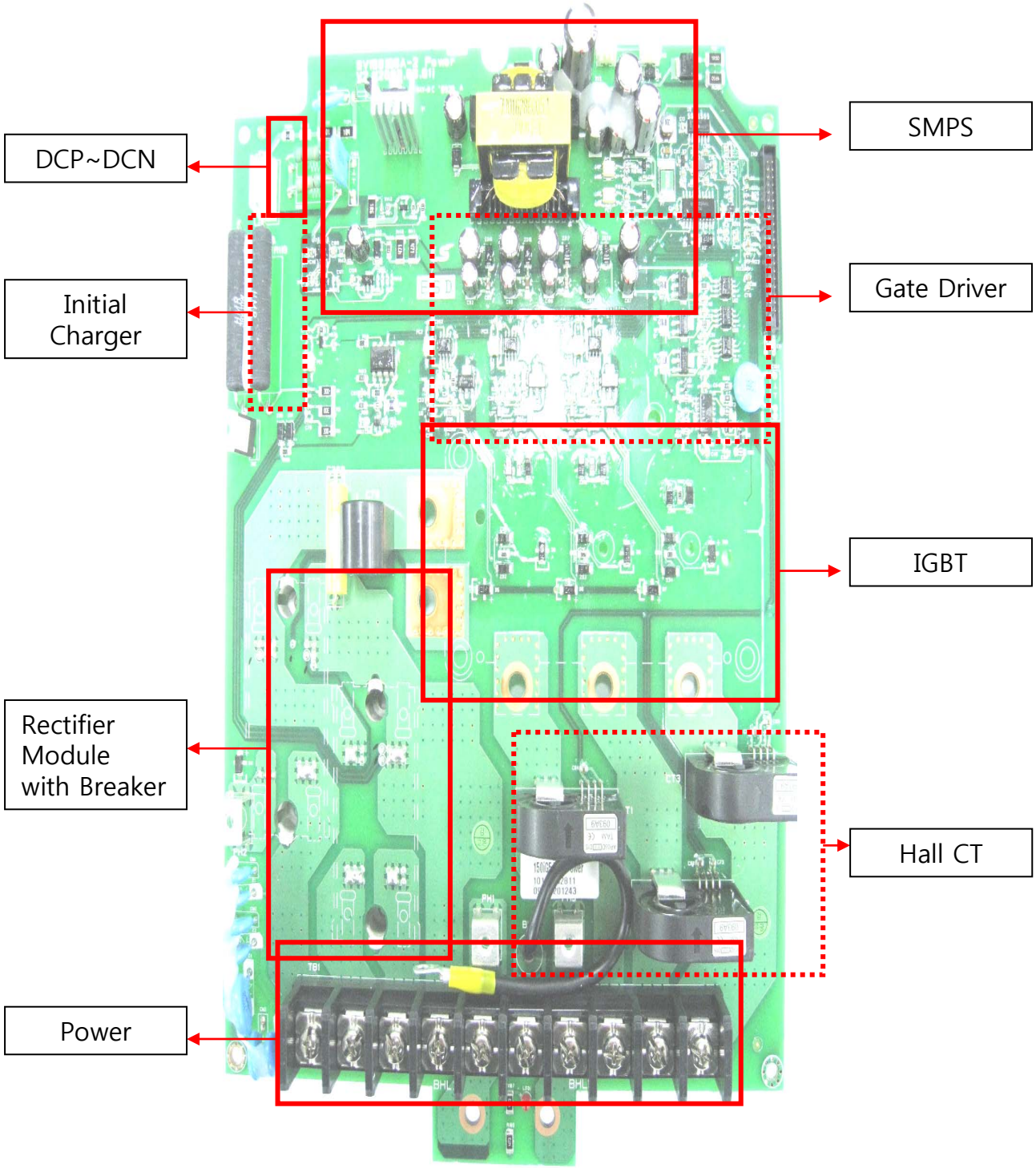
(8) MAIN BOARD SV055~075IG5A-2/4



No	
1	P5I
2	CLK
3	SO
4	SI
5	RST
6	CM
7	TXD
8	RXD
9	TXEN
10	FAN
11	FAN CTRL
12	P24I

19. BOARD ASS'Y Arrangement

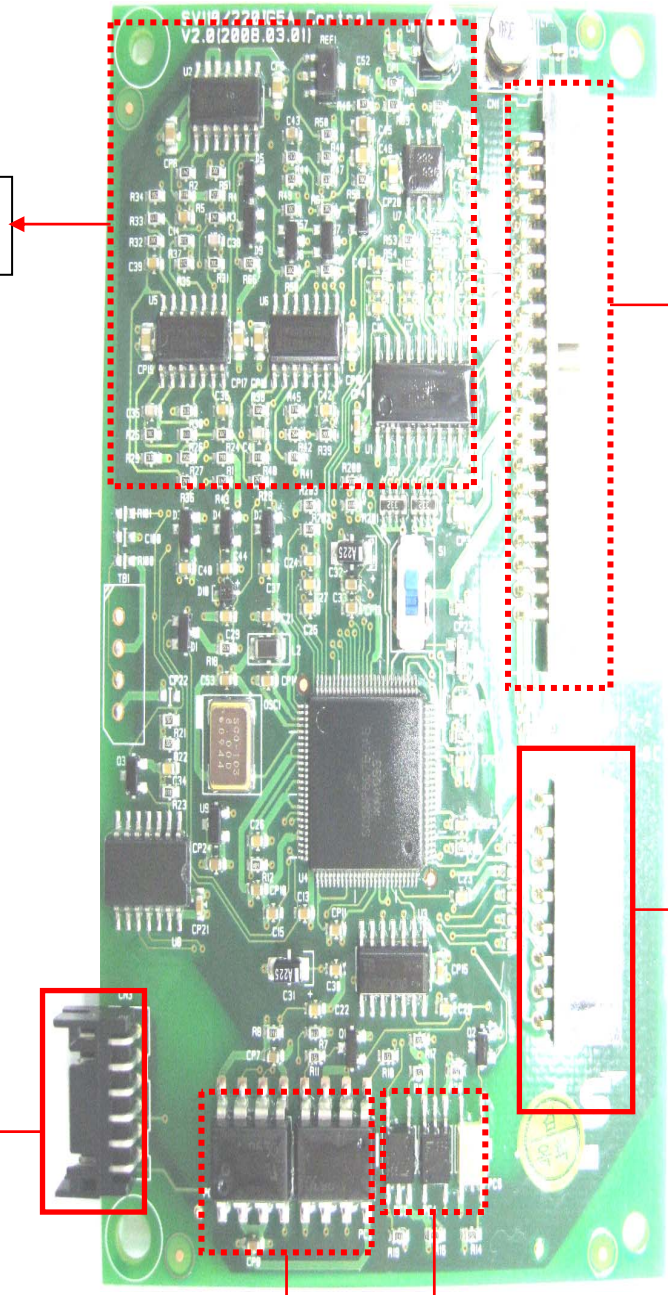
(9) POWER BOARD SV110~220IG5A-2/4



고객지원팀

19. BOARD ASS'Y Arrangement

(10) Control BOARD SV110~220IG5A-2/4



Current Sensing
H/W OCS & OC1

Syn' Comm'

CN1 PIN no

No.	
1	P5I
2	CLK
3	SO
4	SI
5	RST
6	CM
7	TXD
8	RXD
9	TXEN
10	FAN
11	FAN CTRL
12	P24I

SPI

40pin CN.

1.	P3.3.	21.	P3.3.
2.	P3.3.	22.	P3.3.
3.	G3.3.	23.	G3.3.
4.	W.	24.	/W.
5.	V.	25.	/V.
6.	U.	26.	/U.
7.	/THY.	27.	DB.
8.	G3.3.	28.	3.3.
9.	IW.	29.	IU.
10.	VDC.	30.	IV.
11.	P3.3S.	31.	G3.3.
12.	P15.	32.	P15.
13.	N15.	33.	N15.
14.	-.	34.	NTC.
15.	A_RST.	35.	A_SHT.
16.	-.	36.	-.
17.	-.	37.	-.
18.	F_CNTL.	38.	I_FAN.
19.	P5I.	39.	CM.
20.	P24I.	40.	CM.

Download CN

CN1 PIN no.

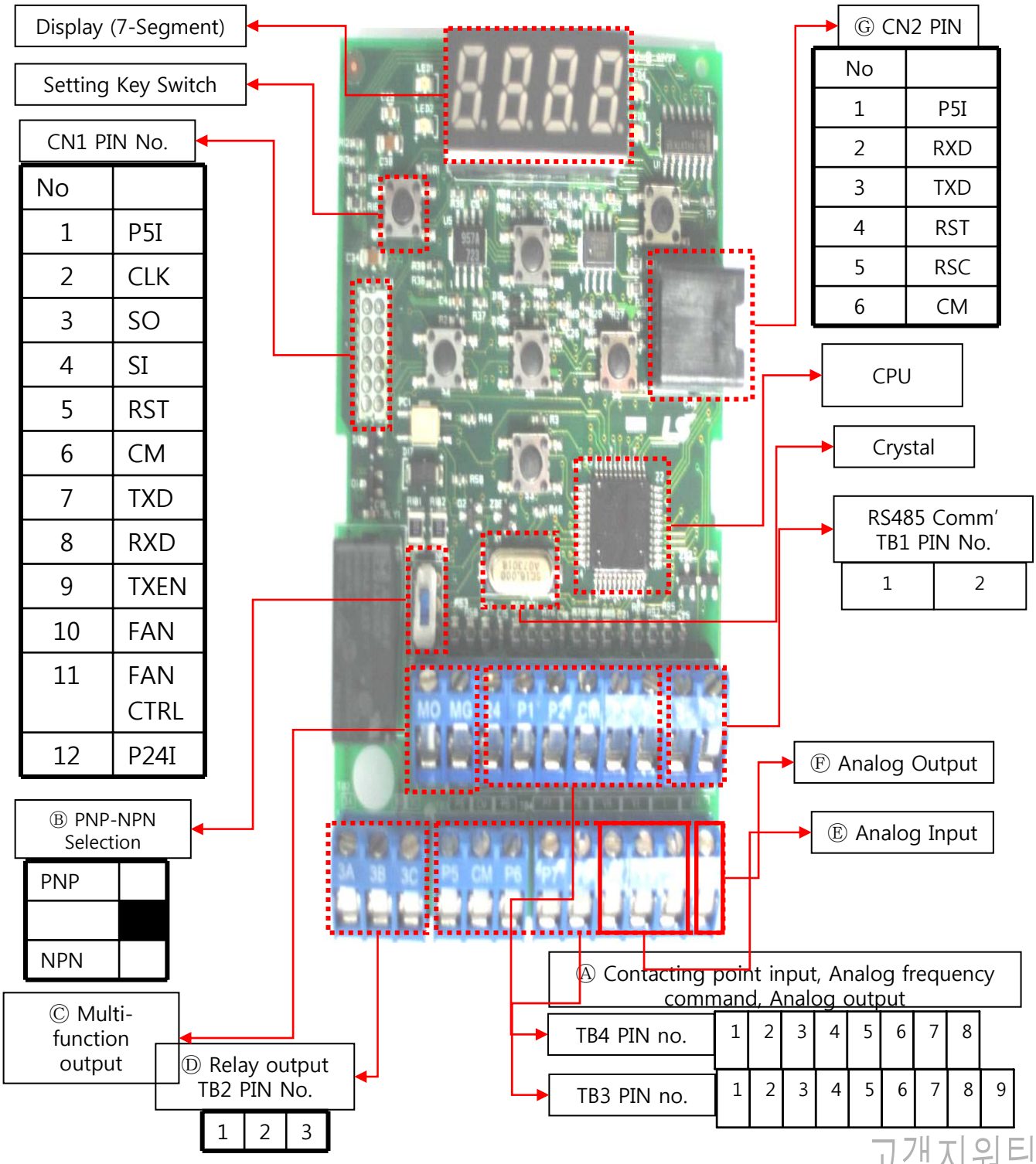
1	TDI
2	P3.3
3	TCK
4	TDO
5	TMS
6	/RST
7	G3.3
8	/TRST

SCI(RS485)

고객지원팀

19. BOARD ASS'Y Arrangement

(11) I/O Board (KPD) (0.4~22kW Common)



고객지원팀

Appendix 1. Parts List

Contents

Photo						
Model Name	PCB ASS'Y,MAIN	PCB ASS'Y,POWER	PCB ASS'Y,SUB	TR,PIM,V23990-P542-A-PM,600V,7A,B,TYCO		
Part Number	10120002404	10120002430	10120002420	08910000586		

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN				
Part Number	11040001386	76676286003				

Photo						
Model Name	HEAT SINK ,DIECASTING3,NO FAN	BODY,CASE2	COVER,SILK PRINT 2			
Part Number	55516285003	64366285003	64616285005			

Photo						
Model Name	PCB ASS'Y,MAIN	PCB ASS'Y,POWER	PCB ASS'Y,SUB	TR,PIM,V23990-P548-A10-PM,1200V,5A,B,TYCO		
Part Number	10120002412	10120002432	10120002425	08910000588		

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN				
Part Number	11040001386	76676286003				

Photo						
Model Name	HEAT SINK ,DIECASTING3,NO FAN	BODY,CASE2	COVER,SILK PRINT 2			
Part Number	55516285003	64366285003	64616285005			

* Repair parts SV008iG5A-2

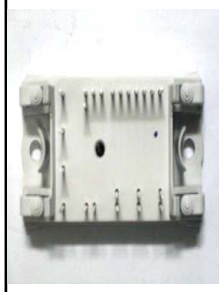
Photo						
Model Name	PCB ASS'Y,MAIN	PCB ASS'Y,POWER	PCB ASS'Y,SUB	TR,PIM,V23990-P544-A-PM,600V,15A,B,TYCO		
Part Number	10120002405	10120002431	10120002421	08910000587		

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN		FAN,DF,1608KL-05W-B50-LQ1,DC24V,0.11A,NMB	BRACKET,FAN2	COVER,FAN
Part Number	11040001386	76676286003		07760000132	50516285012	64616285024

Photo						
Model Name	HEAT SINK ,DIECASTING3	BODY,CASE2	COVER,SILK PRINT 2			
Part Number	55516285002	64366285003	64616285005			

* Repair parts SV008iG5A-4

Photo						
Model Name	PCB ASS'Y,MAIN	PCB ASS'Y,POWER	PCB ASS'Y,SUB	TR,PIM,V23990-P549-A-PM,1200V,10A,B,TYCO		
Part Number	10120002413	10120002433	10120002426	08910000589		

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN		FAN,DF,1608KL-05W-B50-LQ1,DC24V,0.11A,NMB	BRACKET,FAN2	COVER,FAN
Part Number	11040001386	76676286003		07760000132	50516285012	64616285024

Photo						
Model Name	HEAT SINK ,DIECASTING3	BODY,CASE2	COVER,SILK PRINT 2			
Part Number	55516285002	64366285003	64616285005			

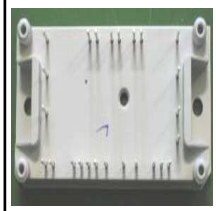
Photo						
Model Name	PCB ASS'Y,MAIN	PCB ASS'Y,SUB		TR,PIM,V23990-P85-A20-PM,600V,20A,B,TYCO		
Part Number	10120002406	10120002426		08910000450		

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN		FAN,DF,1608KL-05W-B50-LQ1,DC24V,0.11A,NMB	BRACKET,FAN3	COVER,FAN
Part Number	11040001386	76676286004		07760000132	50516285013	64616285024

Photo						
Model Name	HEAT SINK,DIECASTING4	BODY,CASE3	COVER,SILK PRINT 3			
Part Number	55516285004	64366285004	64616285006			

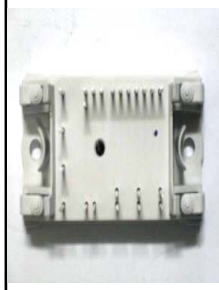
Photo						
Model Name	PCB ASS'Y,MAIN	PCB ASS'Y,SUB		TR,PIM,V23990-P549-A-PM,1200V,10A,B,TYCO		
Part Number	10120002414	10120002427		08910000589		

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN		FAN,DF,1608KL-05W-B50-LQ1,DC24V,0.11A,NMB	BRACKET,FAN3	COVER,FAN
Part Number	11040001386	76676286004		07760000132	50516285013	64616285024

Photo						
Model Name	HEAT SINK,DIECASTING4	BODY,CASE3	COVER,SILK PRINT 3			
Part Number	55516285004	64366285004	64616285006			

Photo						
Model Name	PCB ASS'Y,MAIN	PCB ASS'Y,SUB		TR,PIM,BSM30GP60,600V,30A,B,EUP		
Part Number	10120002407	10120002423		08910000602		

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN		FAN,DF,2410ML-05W-B50-BQ2,DC24V,0.13A,NMB	BRACKET,FAN4	
Part Number	11040001386	76676286004		07760000133	50516285014	

Photo						
Model Name	HEAT SINK,DIECASTING6	BODY,CASE4	COVER,SILK PRINT 4			
Part Number	55516285006	64366285005	64616285007			

Photo						
Model Name	PCB ASS'Y,MAIN	PCB ASS'Y,SUB		TR,PIM,BSM15GP120, 1200V,15A,B,EUP		
Part Number	10120002415	10120002428		08910000604		

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN		FAN,DF,2410ML-05W-B50-BQ2,DC24V,0.13A,NMB	BRACKET,FAN4	
Part Number	11040001386	76676286004		07760000133	50516285014	

Photo						
Model Name	HEAT SINK,DIECASTING6	BODY,CASE4	COVER,SILK PRINT 4			
Part Number	55516285006	64366285005	64616285007			

Photo						
Model Name	PCB ASS'Y,MAIN	PCB ASS'Y,SUB		TR,PIM,7MBR50SA060 ,600V,50A,B,FUJI		
Part Number	10120002408	10120002424		08910000603		

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN		FAN,DF,2410ML-05W-B50-BQ2,DC24V,0.13A,NMB	BRACKET,FAN4	
Part Number	11040001386	76676286004		07760000133	50516285014	

Photo						
Model Name	HEAT SINK,DIECASTING6	BODY,CASE4	COVER,SILK PRINT 4			
Part Number	55516285006	64366285005	64616285007			

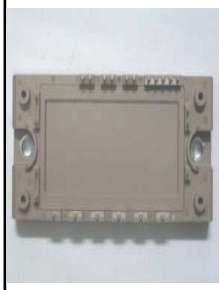
Photo						
Model Name	PCB ASS'Y,MAIN	PCB ASS'Y,SUB		TR,PIM,7MBR50SA060 ,600V,50A,B,FUJI		
Part Number	10120002416	10120002429		08910000605		

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN		FAN,DF,2410ML-05W-B50-BQ2,DC24V,0.13A,NMB	BRACKET,FAN4	
Part Number	11040001386	76676286004		07760000133	50516285014	

Photo						
Model Name	HEAT SINK,DIECASTING6	BODY,CASE4	COVER,SILK PRINT 4			
Part Number	55516285006	64366285005	64616285007			

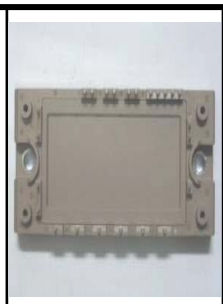
Photo						
Model Name	PCB ASS'Y,MAIN	PCB ASS'Y,SUB		TR,PIM,7MBR50SA060 ,600V,50A,B,FUJI		
Part Number	10120002409	10120002424		08910000714		

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN		FAN,DF,2410ML-05W-B50-BQ2,DC24V,0.13A,NMB	BRACKET,FAN4	
Part Number	11040001386	76676286004		07760000133	50516285014	

Photo						
Model Name	HEAT SINK,DIECASTIN G6	BODY,CASE4	COVER,SILK PRINT 4			
Part Number	55516285006	64366285005	64616285007			

* Repair parts SV040iG5A-4

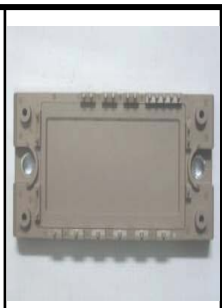
Photo						
Model Name	PCB ASS'Y,MAIN	PCB ASS'Y,SUB		TR,PIM,7MBR25SA120 ,1200V,25A,B,FUJI		
Part Number	10120002417	10120002429		08910000605		

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN		FAN,DF,2410ML-05W-B50-BQ2,DC24V,0.13A,NMB	BRACKET,FAN4	
Part Number	11040001386	76676286004		07760000133	50516285014	

Photo						
Model Name	HEAT SINK,DIECASTIN G6	BODY,CASE4	COVER,SILK PRINT 4			
Part Number	55516285006	64366285005	64616285007			

* Repair parts SV055iG5A-2

Photo						
Model Name	PCB ASS'Y,MAIN	ASS'Y,SUB,C-BANK	WIRE ASS'Y,FAN WIRE 1		TR,PIM,7MBR75SD060,600V,75A,B,FUJI	
Part Number	10120002410	11040001388	76676286002		08910000504	

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN		FAN,COOLING,F6025E24B,DC24V,0.125A,OEC	BRACKET,FAN1	
Part Number	11040001386	76676286001		07760000121	50516285002	

Photo						
Model Name	HEAT SINK,DIECASTING1	BODY,CASE1	COVER,SILK PRINT 1	BRACKET,WIRE1		
Part Number	55516285001	64366285001	64616285001	50516285001		

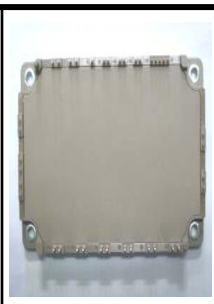
Photo						
Model Name	PCB ASS'Y,MAIN	ASS'Y,SUB,C-BANK	WIRE ASS'Y,FAN WIRE 1		TR,PIM,7MBR35SD120,1200V,35A,B,FUJI	
Part Number	10120002410	11040001390	76676286002		08910000505	

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN		FAN,COOLING,F6025E24B,DC24V,0.125A,OEC	BRACKET,FAN1	
Part Number	11040001386	76676286001		07760000121	50516285002	

Photo						
Model Name	HEAT SINK,DIECASTING1	BODY,CASE1	COVER,SILK PRINT 1	BRACKET,WIRE1		
Part Number	55516285001	64366285001	64616285001	50516285001		

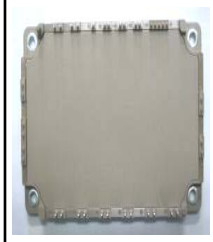
Photo						
Model Name	PCB ASS'Y,MAIN	ASS'Y,SUB,C-BANK	WIRE ASS'Y,FAN WIRE 1		TR,PIM,7MBR100SD060,600V,100A,B,FUJI	
Part Number	10120002411	11040001389	76676286002		08910000503	

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN		FAN,COOLING,F6025E24B,DC24V,0.125A,OEC	BRACKET,FAN1	
Part Number	11040001386	76676286001		07760000121	50516285002	

Photo						
Model Name	HEAT SINK,DIECASTING1	BODY,CASE1	COVER,SILK PRINT 1	BRACKET,WIRE1		
Part Number	55516285001	64366285001	64616285001	50516285001		

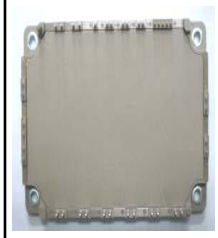
Photo						
Model Name	PCB ASS'Y,MAIN	ASS'Y,SUB,C-BANK	WIRE ASS'Y,FAN WIRE 1		TR,PIM,7MBR50SD120,1200V,50A,B,FUJI	
Part Number	10120002419	11040001391	76676286002		08910000506	

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN		FAN,COOLING,F6025E24B,DC24V,0.125A,OEC	BRACKET,FAN1	
Part Number	11040001386	76676286001		07760000121	50516285002	

Photo						
Model Name	HEAT SINK,DIECASTING1	BODY,CASE1	COVER,SILK PRINT 1	BRACKET,WIRE1		
Part Number	55516285001	64366285001	64616285001	50516285001		

* Repair parts SV110iG5A-2

Photo						
						
Model Name	PCB ASS'Y,CONTROL	PCB ASS'Y,POWER	ASS'Y,FLAT CABLE,IDC 40P L=90m/m,SOLTECH	DIODE,RD,V23990-P590-J19-PM,1600V,100A,TYCO	DIODE,RD,V23990-P600-I19-PM,1600V,100A,TYCO	TR,IGBT,SEMiX101GD066HDS,600V,100A,SEMIKRON
Part Number	10120002808	10120002809	10140000122	08960000888	0896000889	08910000715

Photo						
						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN	FAN,DF,V35131-51LS,DC24V ,92SQ*38MM,NIDEC	BRACKET,FAN	CAP,CE,LNX2G332MSETZH ,DC400V,3300UF,M,NICHICON	BRACKET,VENT
Part Number	11040001386	76676286019	07760000172	50516285015	08810001824	50516285017

Photo						
						
Model Name	BOTTOM ASS'Y,BODY	COVER,SILK	COVER ASS'Y,INNER COVER ASS'Y	BRACKET,WIRING	BRACKET,INSULATE	
Part Number	50426285001	64616285054	64626285007	50516285019	50516285021	

Photo						
Model Name	PCB ASS'Y,CONTROL	PCB ASS'Y,POWER	ASS'Y,FLAT CABLE,IDC 40P L=90m/m,SOLTECH	DIODE,RD,V23990-P590-J19-PM,1600V,100A,TYCO	DIODE,RD,V23990-P600-I19-PM,1600V,100A,TYCO	TR,IGBT,SEMiX101GD128HDS,1200V,75A,SEMIKRON
Part Number	10120002808	10120002810	10140000122	08960000888	0896000889	08910000683

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN	FAN,DF,V35131-51LS,DC24V,92SQ*38MM,NIDEC	BRACKET,FAN	CAP,CE,LNX2G332MSETZH,DC400V,3300UF,M,NICHICON	BRACKET,VENT
Part Number	11040001386	76676286019	07760000172	50516285015	08810001824	50516285017

Photo						
Model Name	BOTTOM ASS'Y,BODY	COVER,SILK	COVER ASS'Y,INNER COVER ASS'Y	BRACKET,WIRING	BRACKET,INSULATE	
Part Number	50426285001	64616285054	64626285007	50516285019	50516285021	

* Repair parts SV150iG5A-2

Photo						
Model Name	PCB ASS'Y,CONTROL	PCB ASS'Y,POWER	ASS'Y,FLAT CABLE,IDC 40P L=90m/m,SOLTECH	DIODE,RD,V23990-P590-J19-PM,1600V,100A,TYCO	DIODE,RD,V23990-P600-I19-PM,1600V,100A,TYCO	TR,IGBT,SEMiX151GD066HDS,600V,130A,SEMIKRON
Part Number	10120002808	10120002811	10140000122	08960000888	0896000889	08910000684

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN	FAN,DF,V35131-51LS,DC24V,92SQ*38MM,NIDEC	BRACKET,FAN	CAP,CE,LNX2G392MSELZH,DC400V,3900UF,M,HICON	BRACKET,VENT
Part Number	11040001386	76676286019	07760000172	50516285015	08810001825	50516285017

Photo						
Model Name	BOTTOM ASS'Y,BODY	COVER,SILK	COVER ASS'Y,INNER COVER ASS'Y	BRACKET,WIRING	BRACKET,INSULATE	
Part Number	50426285001	64616285054	64626285007	50516285019	50516285021	

* Repair parts SV150iG5A-4

Photo						
Model Name	PCB ASS'Y,CONTROL	PCB ASS'Y,POWER	ASS'Y,FLAT CABLE,IDC 40P L=90m/m,SOLTECH	DIODE,RD,V23990-P590-J19-PM,1600V,100A,TYCO	DIODE,RD,V23990-P600-I19-PM,1600V,100A,TYCO	TR,IGBT,SEMiX101GD128HDS,1200V,75A,SEMIKRON
Part Number	10120002808	10120002809	10140000122	08960000888	0896000889	08910000683

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN	FAN,DF,V35131-51LS,DC24V ,92SQ*38MM,NIDEC	BRACKET,FAN	CAP,CE,LNX2G392MSELZH,DC400V,3900UF,M,HICON	BRACKET,VENT
Part Number	11040001386	76676286019	07760000172	50516285015	08810001825	50516285017

Photo						
Model Name	BOTTOM ASS'Y,BODY	COVER,SILK	COVER ASS'Y,INNER COVER ASS'Y	BRACKET,WIRING	BRACKET,INSULATE	
Part Number	50426285001	64616285054	64626285007	50516285019	50516285021	

* Repair parts SV185iG5A-2

Photo						
Model Name	PCB ASS'Y,CONTROL	PCB ASS'Y,POWER	ASS'Y,FLAT CABLE,IDC 40P L=90m/m,SOLTECH	DIODE,RD,V23990-P590-J19-PM,1600V,100A,TYCO	DIODE,RD,V23990-P600-I19-PM,1600V,100A,TYCO	TR,IGBT,SEMiX201GD066HDS,600V,200A,SEMIKRON
Part Number	10120002808	10120002813	10140000122	08960000888	0896000889	08910000716

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN	FAN,DF,V35131-51LS,DC24V ,92SQ*38MM,NIDEC	BRACKET,FAN	CAP,CE,LNX2G472MSESZH,DC400V,4700UF,NICHICON	BRACKET,VENT
Part Number	11040001386	76676286020	07760000172	50516285016	08810001826	50516285018

Photo						
Model Name	BOTTOM ASS'Y,BODY	COVER,SILK	COVER ASS'Y,INNER COVER ASS'Y	BRACKET,WIRING	BRACKET,INSULATE	
Part Number	50426285003	64616285055	64626285008	50516285020	50516285022	

* Repair parts SV185iG5A-4

Photo						
Model Name	PCB ASS'Y,CONTROL	PCB ASS'Y,POWER	ASS'Y,FLAT CABLE,IDC 40P L=90m/m,SOLTECH	DIODE,RD,V23990-P590-J19-PM,1600V,100A,TYCO	DIODE,RD,V23990-P600-I19-PM,1600V,100A,TYCO	TR,IGBT,SEMiX101GD126HDS,1200V,85A,SEMIKRON
Part Number	10120002808	10120002814	10140000122	08960000888	0896000889	08910000682

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN	FAN,DF,V35131-51LS,DC24V ,92SQ*38MM,NIDEC	BRACKET,FAN	CAP,CE,LNX2G472MSESZH,DC400V,4700UF ,NICHICON	BRACKET,VENT
Part Number	11040001386	76676286020	07760000172	50516285016	08810001826	50516285018

Photo						
Model Name	BOTTOM ASS'Y,BODY	COVER,SILK	COVER ASS'Y,INNER COVER ASS'Y	BRACKET,WIRING	BRACKET,INSULATE	
Part Number	50426285003	64616285055	64626285008	50516285020	50516285022	

Photo						
						
Model Name	PCB ASS'Y,CONTROL	PCB ASS'Y,POWER	ASS'Y,FLAT CABLE,IDC 40P L=90m/m,SOLTECH	DIODE,RD,V23990-P590-J19-PM,1600V,100A,TYCO	DIODE,RD,V23990-P600-I19-PM,1600V,100A,TYCO	TR,IGBT,SEMiX201GD066HDS,600V,200A,SEMIKRON
Part Number	10120002808	10120002815	10140000122	08960000888	0896000889	08910000716

Photo						
						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN	FAN,DF,V35131-51LS,DC24V ,92SQ*38MM,NIDEC	BRACKET,FAN	CAP,CE,LNX2G562MSERZH,DC400V,5600UF, NICHICON	BRACKET,VENT
Part Number	11040001386	76676286020	07760000172	50516285016	08810001827	50516285018

Photo						
						
Model Name	BOTTOM ASS'Y,BODY	COVER,SILK	COVER ASS'Y,INNER COVER ASS'Y	BRACKET,WIRING	BRACKET,INSULATE	
Part Number	50426285003	64616285055	64626285008	50516285020	50516285022	

* Repair parts SV220iG5A-4

Photo						
Model Name	PCB ASS'Y,CONTROL	PCB ASS'Y,POWER	ASS'Y,FLAT CABLE,IDC 40P L=90m/m,SOLTECH	DIODE,RD,V23990-P590-J19-PM,1600V,100A,TYCO	DIODE,RD,V23990-P600-I19-PM,1600V,100A,TYCO	TR,IGBT,SEMiX151GD12B HDS,600V,200A,SEMIKRON
Part Number	10120002808	10120002816	10140000122	08960000888	0896000889	08910000717

Photo						
Model Name	ASS'Y,I/O BOARD	WIRE ASS'Y,IO-MAIN	FAN,DF,V35131-51LS,DC24V ,92SQ*38MM,NIDEC	BRACKET,FAN	CAP,CE,LNX2G562MSERZH,DC400V,5600UF, NICHICON	BRACKET,VENT
Part Number	11040001386	76676286020	07760000172	50516285016	08810001827	50516285018

Photo						
Model Name	BOTTOM ASS'Y,BODY	COVER,SILK	COVER ASS'Y,INNER COVER ASS'Y	BRACKET,WIRING	BRACKET,INSULATE	
Part Number	50426285003	64616285055	64626285008	50516285020	50516285022	

* Repair parts SV110~150iG5A-2/4 BUSBAR Commonly used

Photo						
Model Name		BUSBAR ASS'Y,CAP,SV110 /150-2 IG5A,VF7953040	INSULATION PLATE,CAP, SV110/150-2 IG5A,VF7955802			
Part Number		70226285003	67816285002			

* Repair parts SV185~220iG5A-2/4 BUSBAR commonly used

Photo						
Model Name	BUSBAR ASS'Y,PCB,SV185 /220-4 IG5A,VF7953046	BUSBAR ASS'Y,CAP,SV185 /220-4 IG5A,VF7953044	INSULATION PLATE,CAP, SV185/220-4 IG5A,VF7955806			
Part Number	70226285009	70226285006	67816285005			

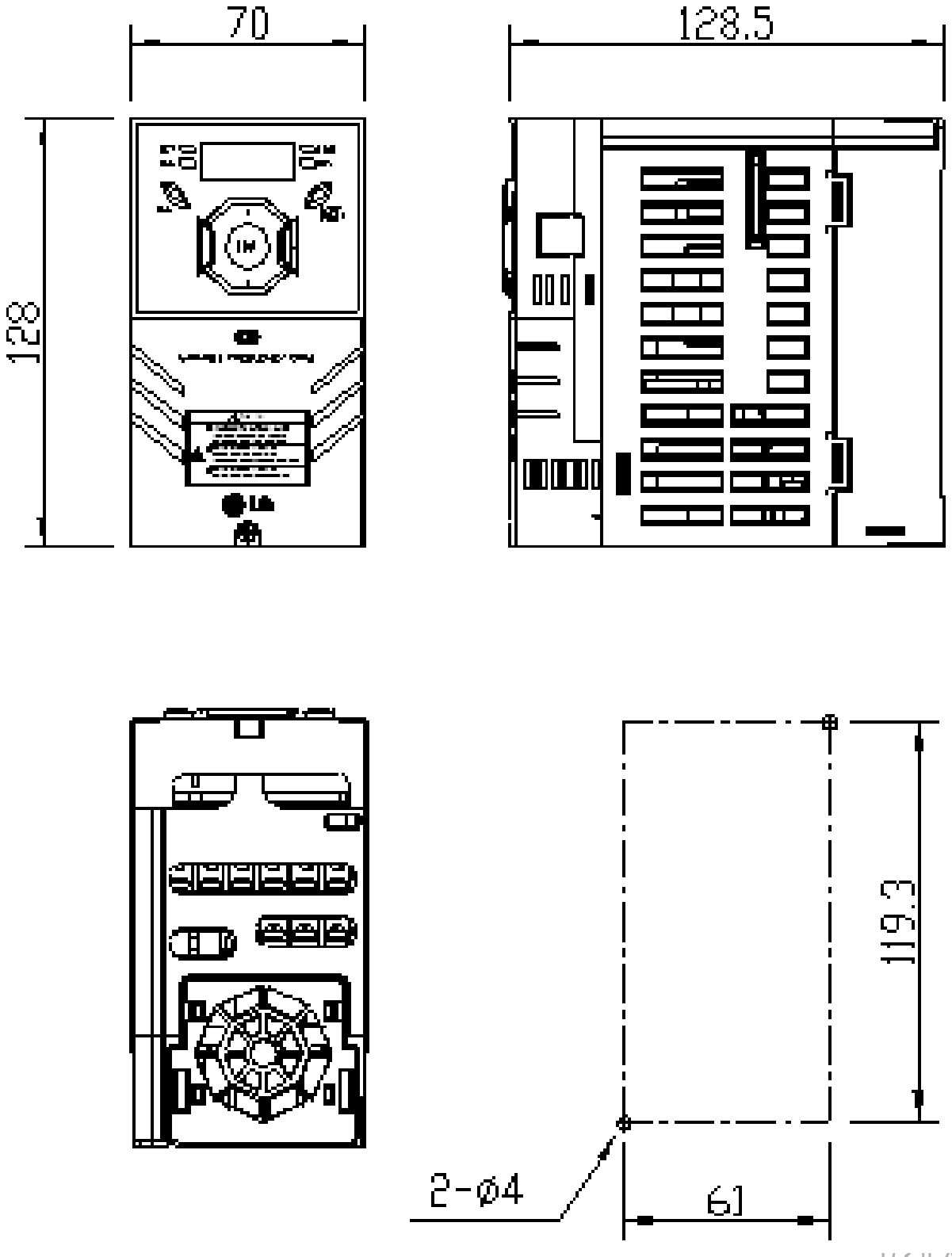
Appendix 2.

Assembly & Disassembly

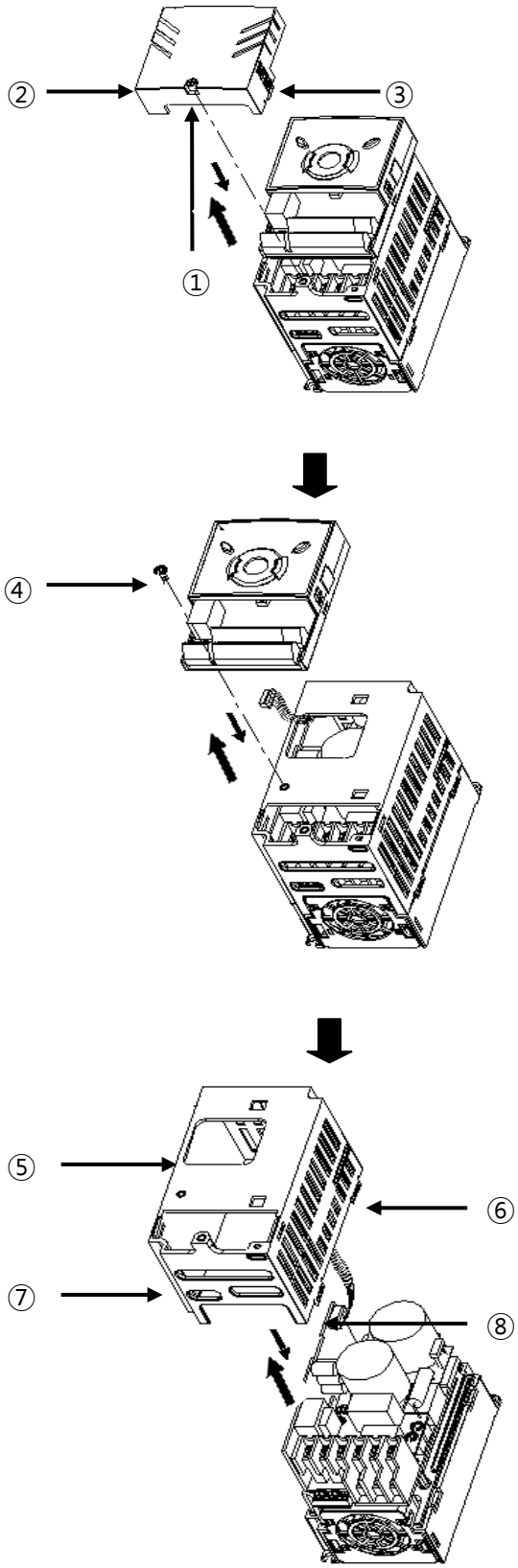
Contents

고객지원팀

*SV004~008iG5A-2/4 Disassembly(A Frame)

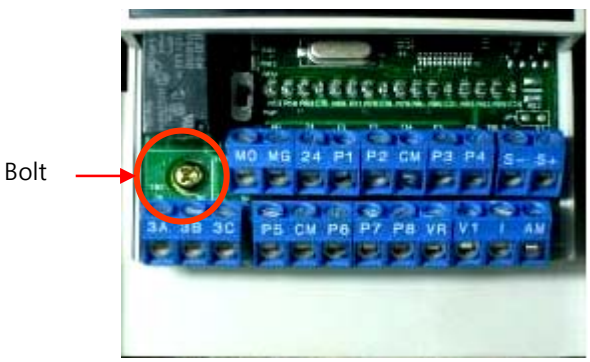


*SV004~008iG5A-2/4 Disassembly

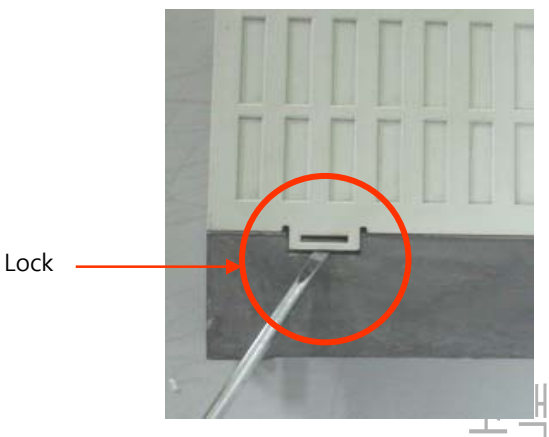


1. Unfasten the Bolt ①, press the top cover as ②③ direction and pull up the cover.

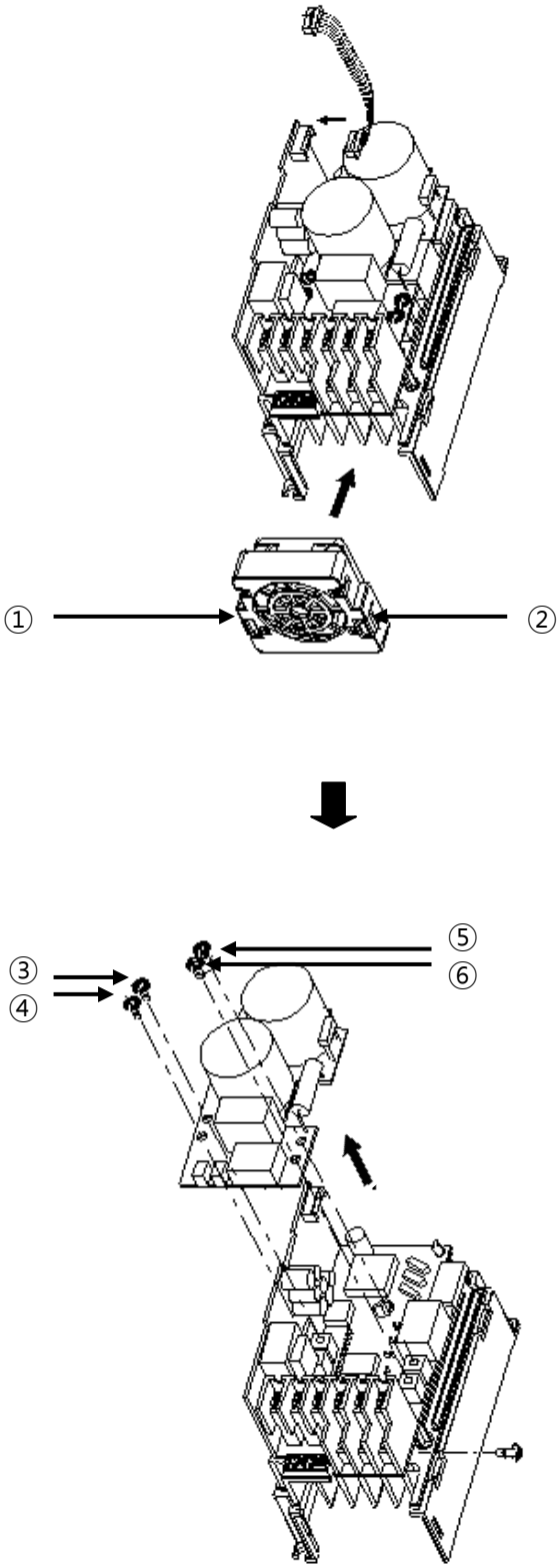
2. Unfasten the Bolt ④, disassembly the I/O Board.



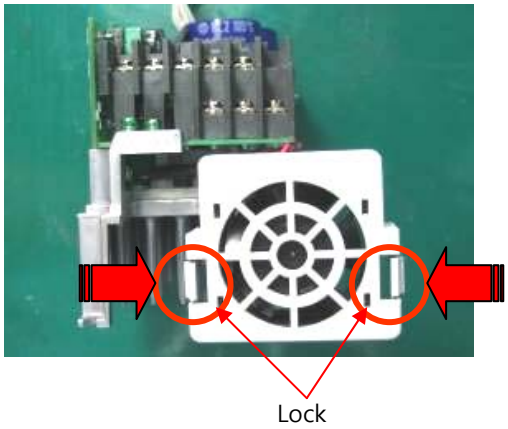
3. Separate the lock ⑤⑥⑦⑧ using Θ screw driver and get off the Body Case.



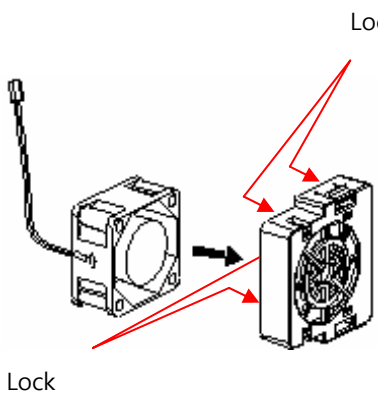
*SV004~008iG5A-2/4 Disassembly



4. press the Lock as ①② direction and get off the FAN Bracket Ass'y.

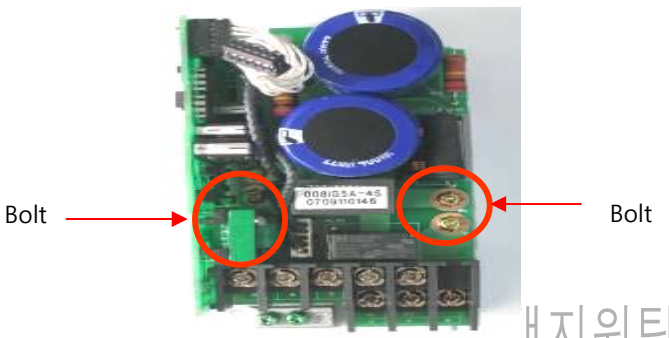


<FAN BRACKET ASS'Y disassembly>

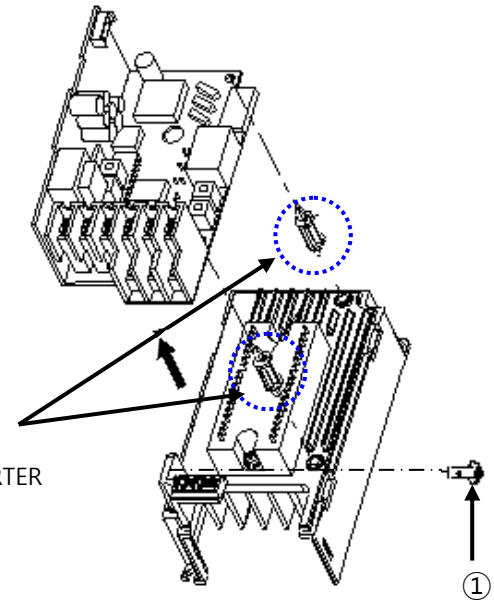


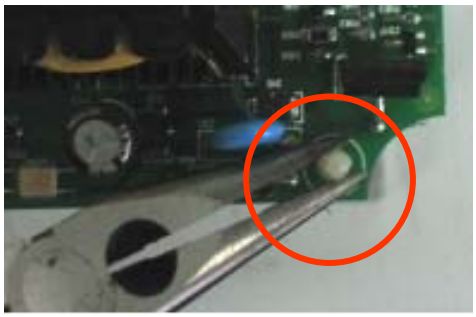
<Unfold the Lock of Fan Bracket inside and disassemble Fan and Bracket>

5. Unfasten the Bolt ③④⑤⑥ and get off SUB PCB.

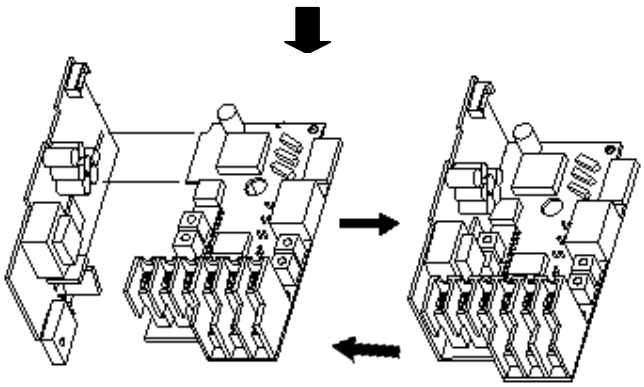


*SV004~008iG5A-2/4 Disassembly

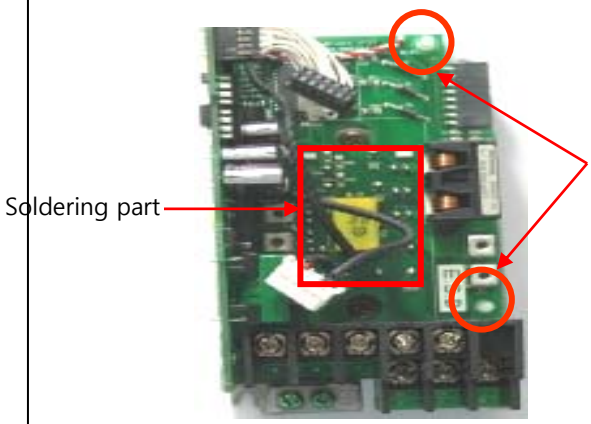




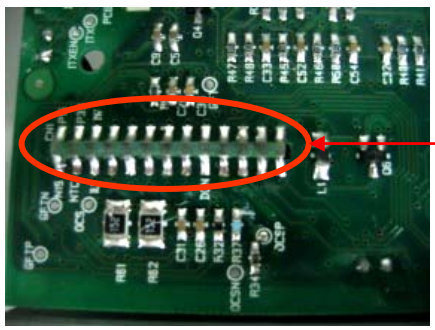
<When get the SUPPORTERs Long-nose is required.>

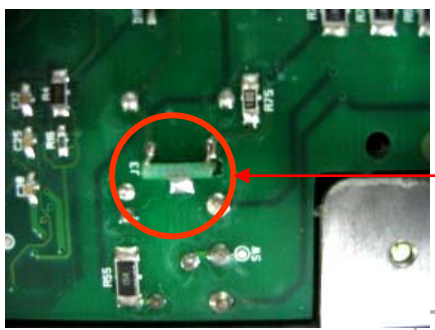


6. Get the power PCB after removing the solderir
unfasten the Bolt ① and press the Supporters.



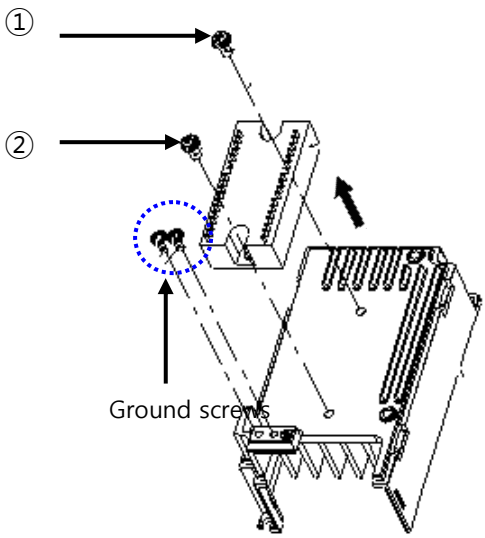
7. After removing the soldering part, get
the Main PCB.



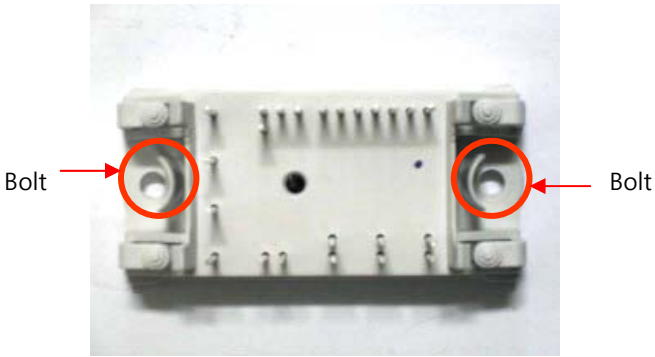


고객지원팀

*SV004~008iG5A-2/4 Disassembly

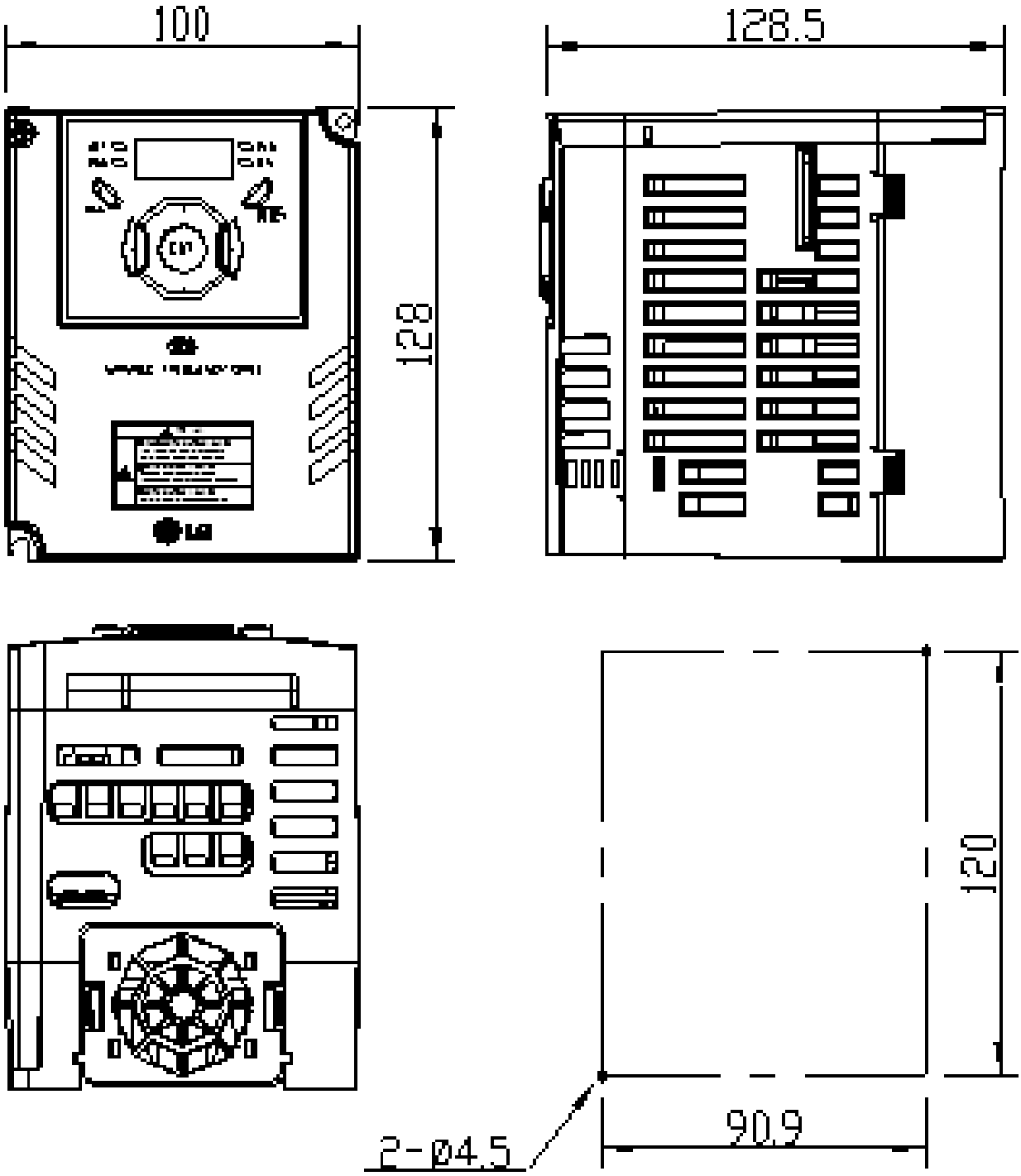


8. Unfasten the Bolt ①② and get the PIM Module.

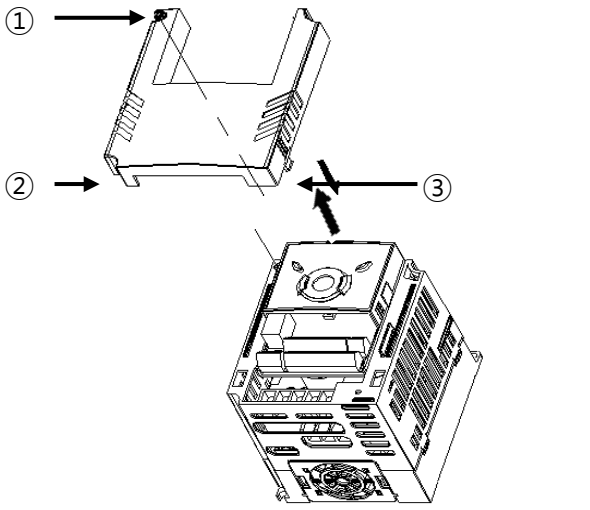


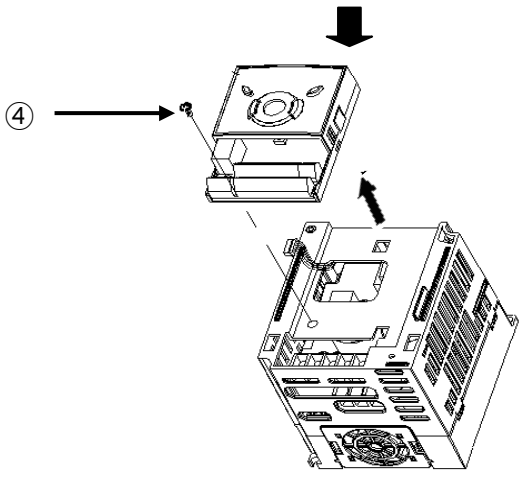
고객지원팀

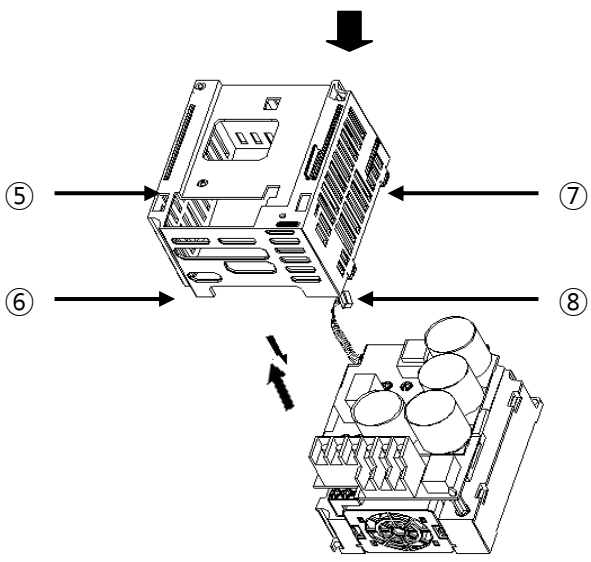
*SV015iG5A-2/4 Disassembly (B Frame)



*SV015iG5A-2/4 Disassembly

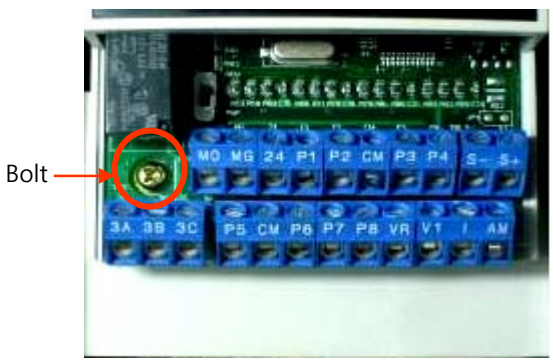




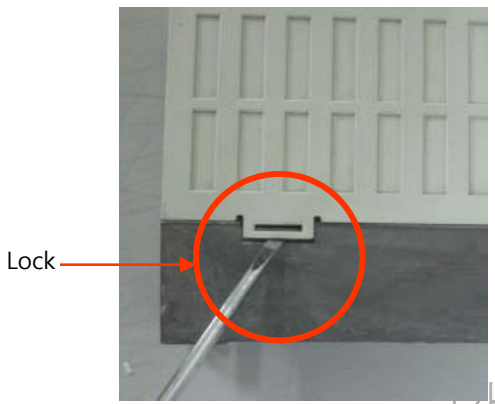


1. Unfasten the Bolt ①, press the top cover as ②③ direction and pull up the cover.

2. Unfasten the Bolt ④, disassembly the I/O Board.

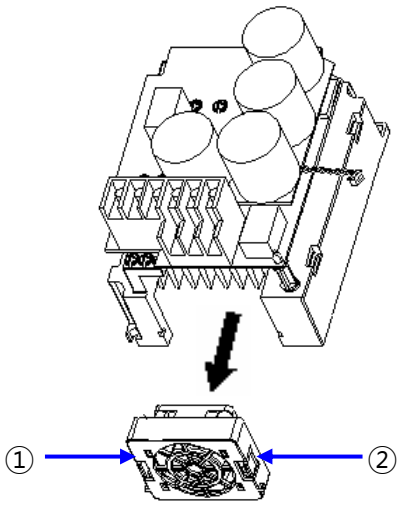


3. Separate the lock ⑤⑥⑦⑧ using Θ screw driver and get off the Body Case.

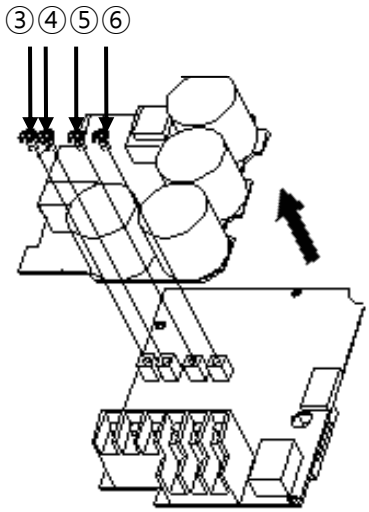


고객지원팀

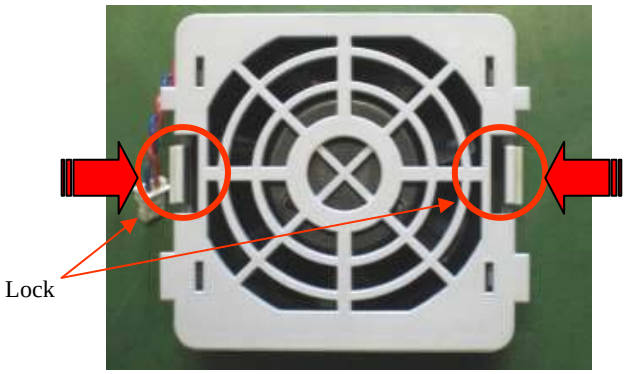
*SV015iG5A-2/4 Disassembly



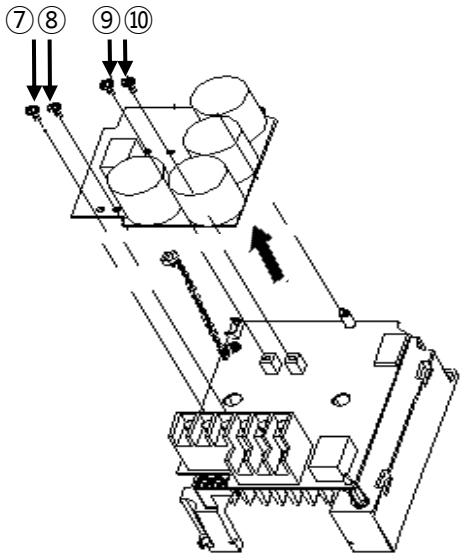
015-2 TYPE

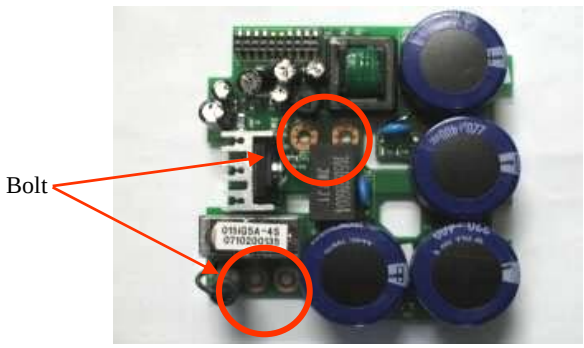


4. press the Lock as ①② direction and get off the FAN Bracket Ass'y.



015-4 TYPE

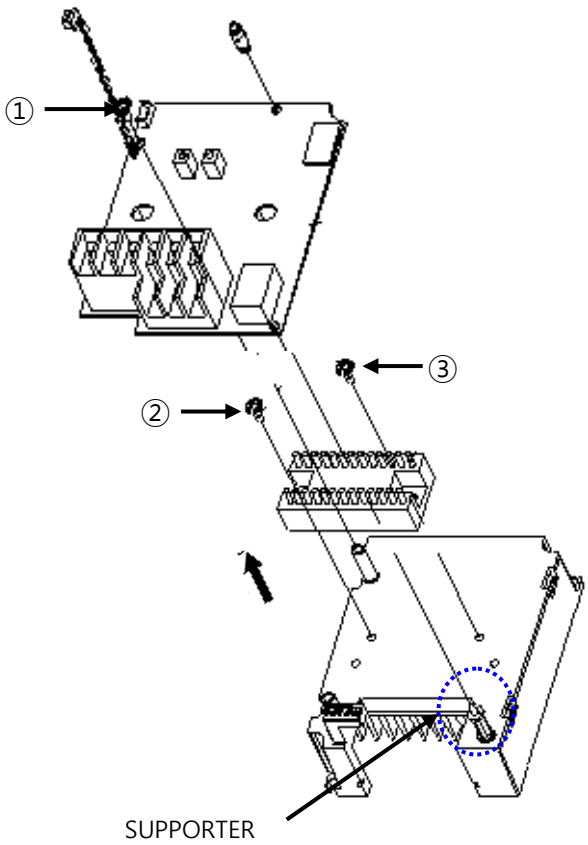




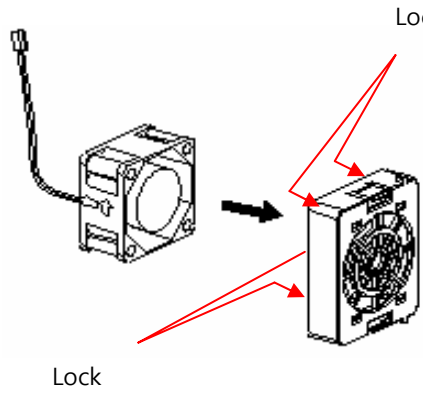
5. In case 2 Type, get the SUB PCB by unfastening Bolt ③④⑤⑥. In case 4 Type, get the SUB PCB by unfastening Bolt ⑦⑧⑨⑩.

고객지원팀

*SV015iG5A-2/4 Disassembly

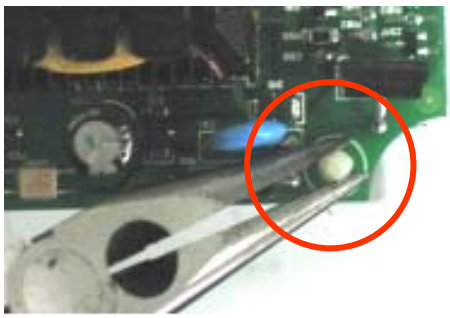


<FAN BRACKET ASS'Y disassembly>

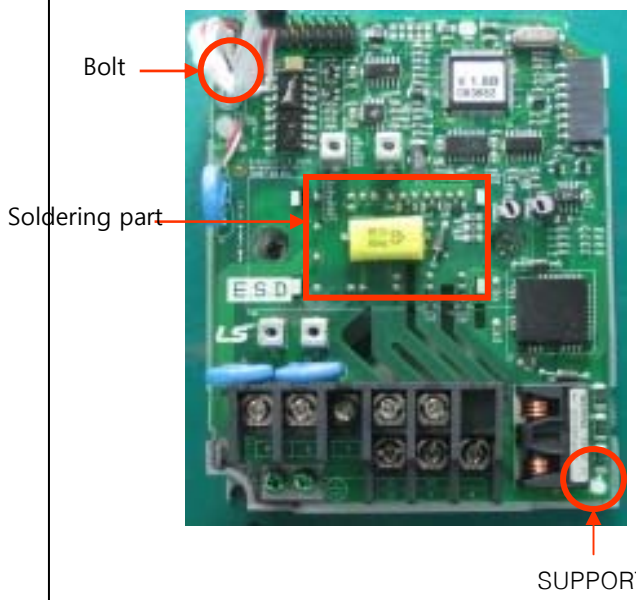


<Unfold the Lock of Fan Bracket inside and disassemble Fan and Bracket>

6. Get the Main PCB after removing the soldering part, unfasten the Bolt ① and press the Supporters. And get the PIM Module by unfastening Bolt ②③.

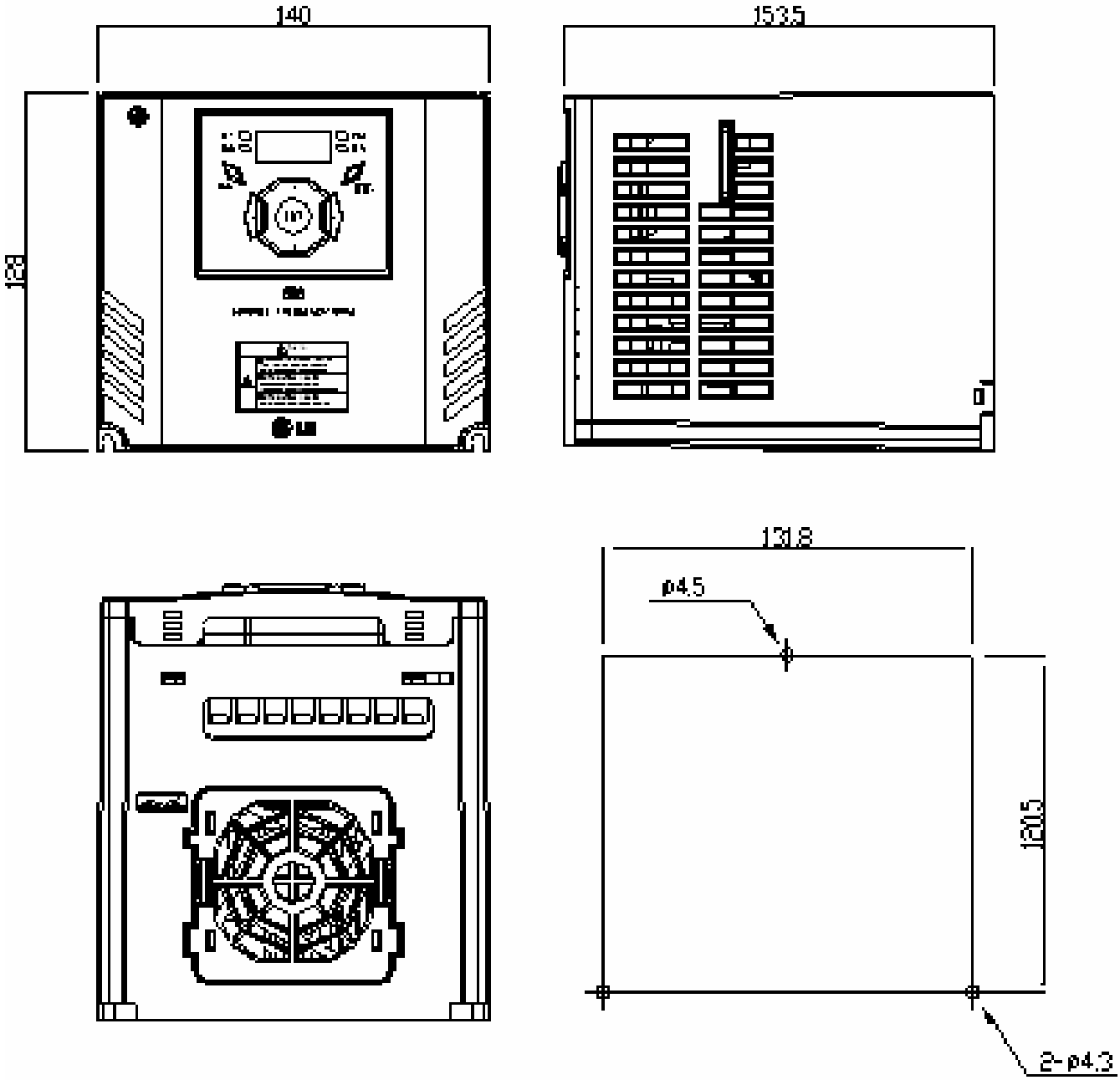


<When get the SUPPORTERs Long-nose is required.>



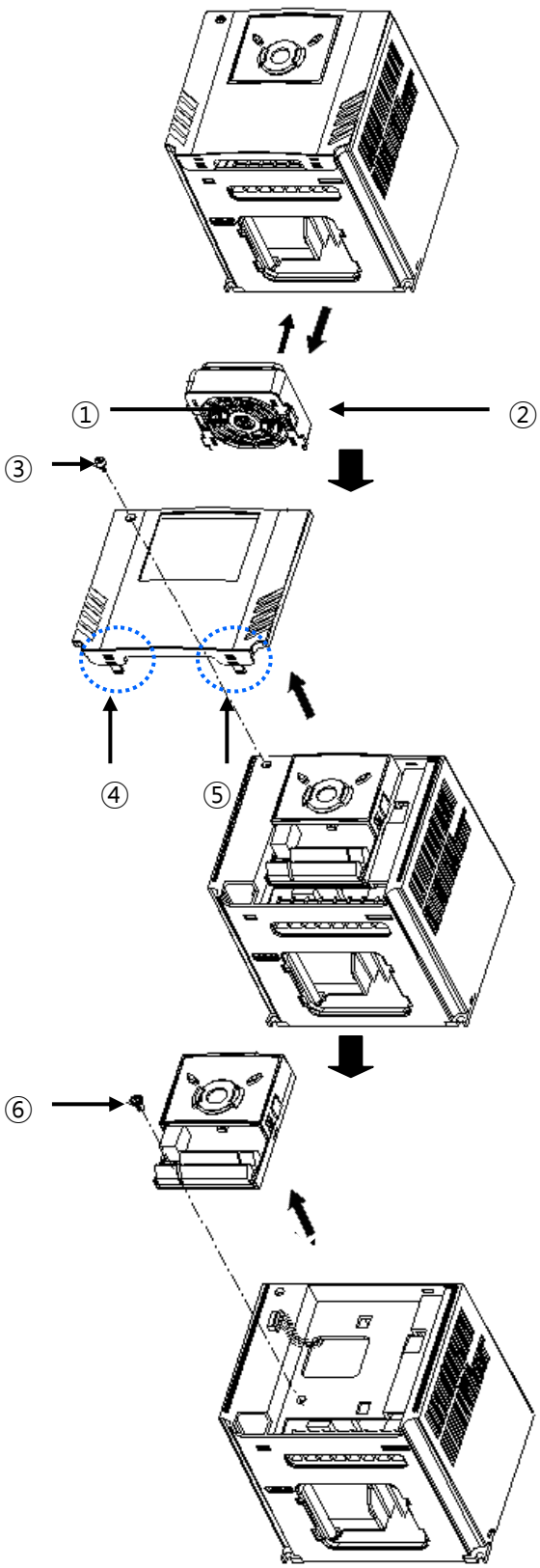
고객지원팀

*SV022~040iG5A-2/4 Disassembly (C Frame)

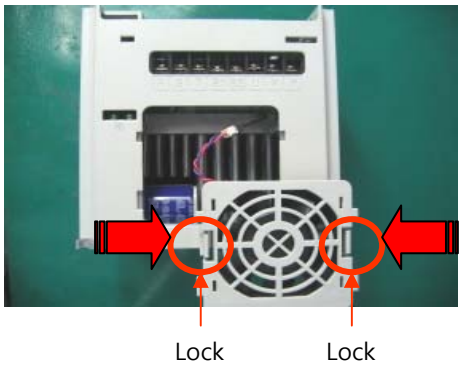


고객지원팀

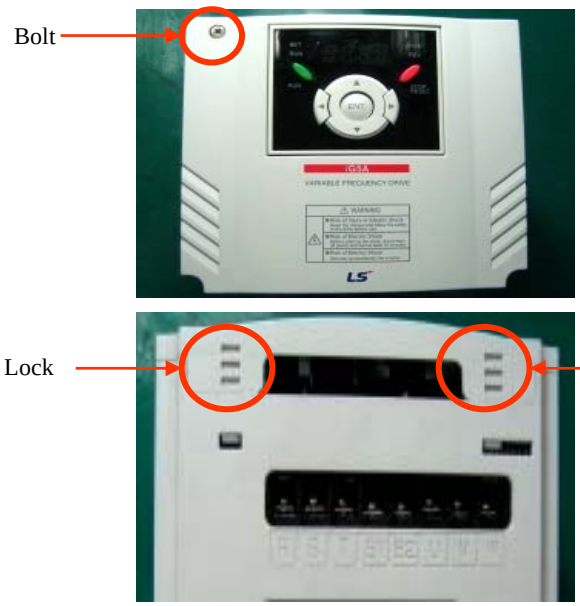
*SV022~040iG5A-2/4 Disassembly



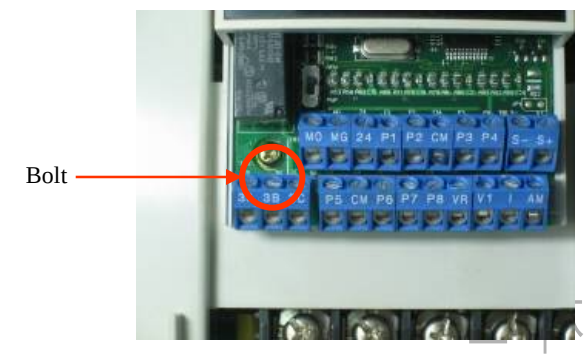
1. press the Lock as ①② direction and get off the FAN.



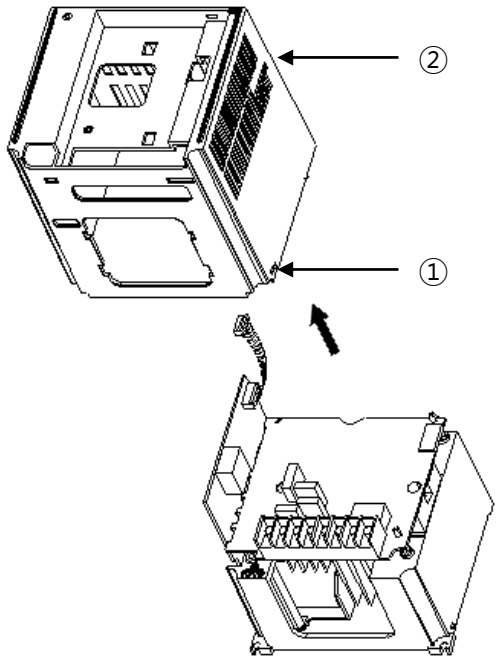
2. Unfasten the Bolt ③, press the top cover as ④⑤ direction and pull up the silk print cover.

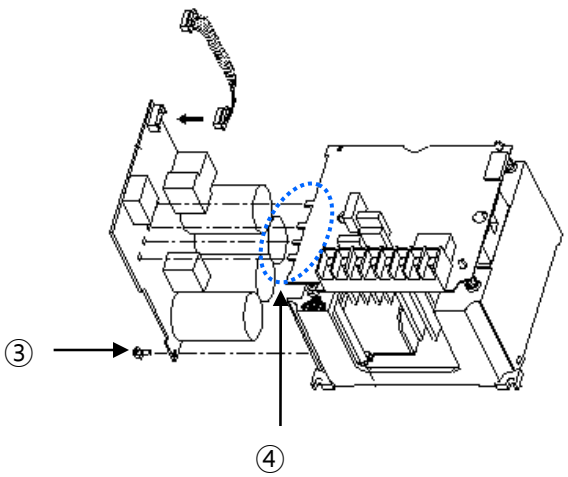


2. Unfasten the Bolt ⑥, disassembly the I/O Board.

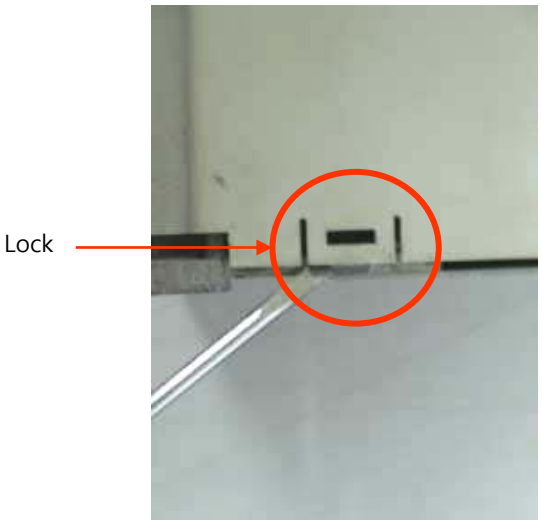


*SV022~040iG5A-2/4 Disassembly

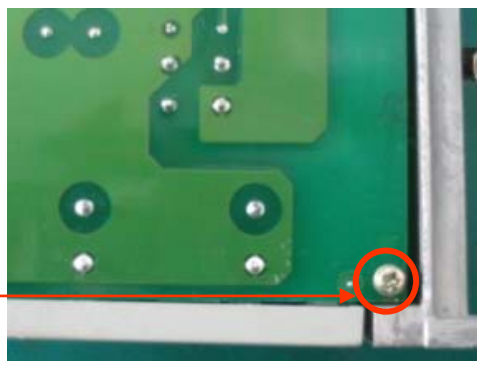


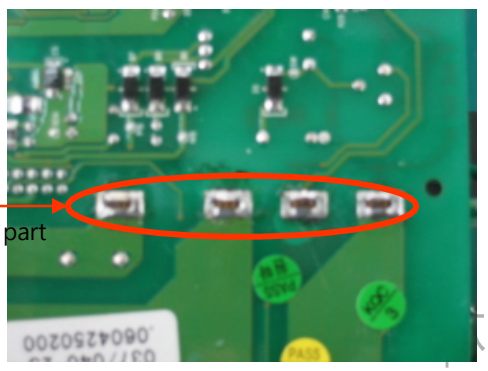


4. Separate the lock ①② using Θ screw driver and get off the Body Case.

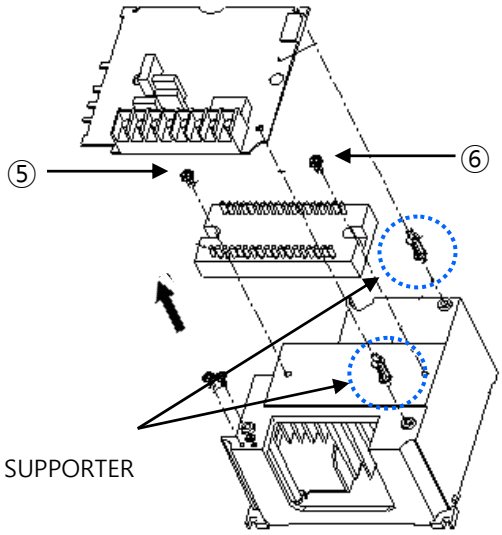


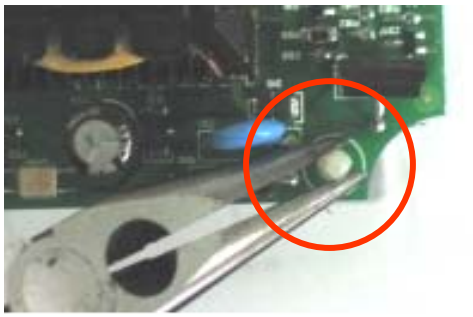
5. Unfasten the Bolt ③ and remove soldering par and get the SUB PCB.





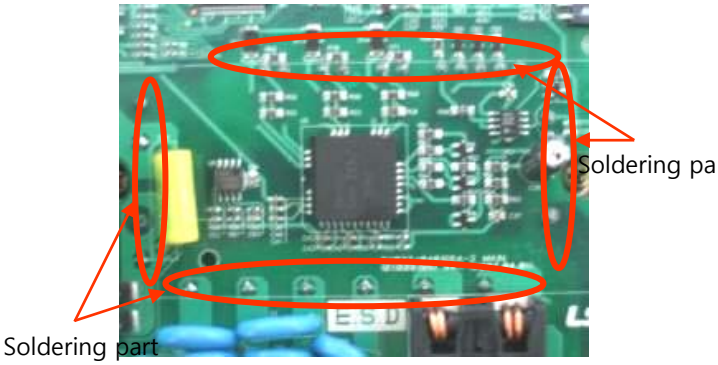
*SV022~040iG5A-2/4 Disassembly

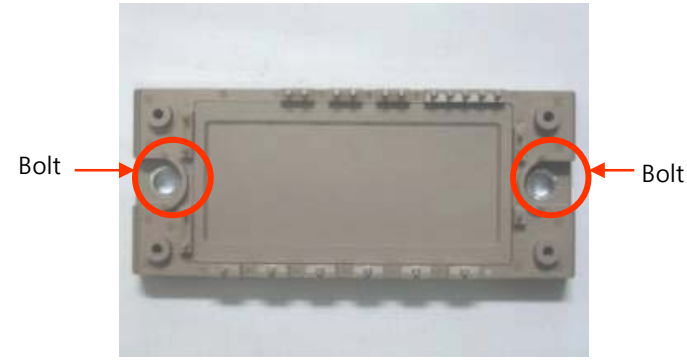




<When get the SUPPORTERs Long-nose is required.>

6. Get the Main PCB after removing the soldering part and press the Supporters. And get the PIM Module by unfastening Bolt ⑤⑥.

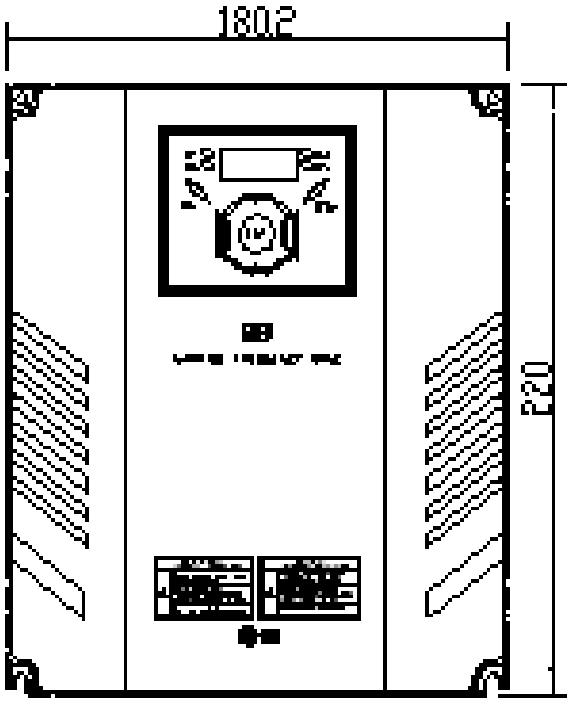


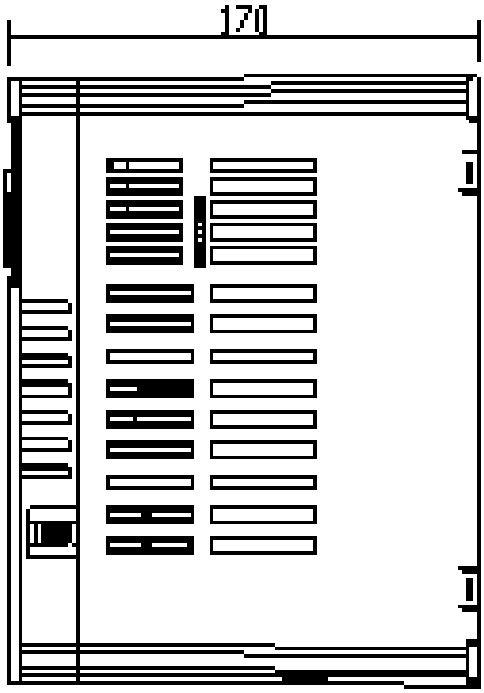


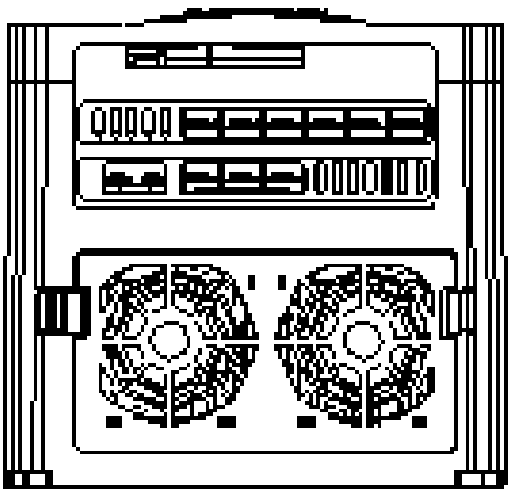
HEAT SINK,DIECASTING6

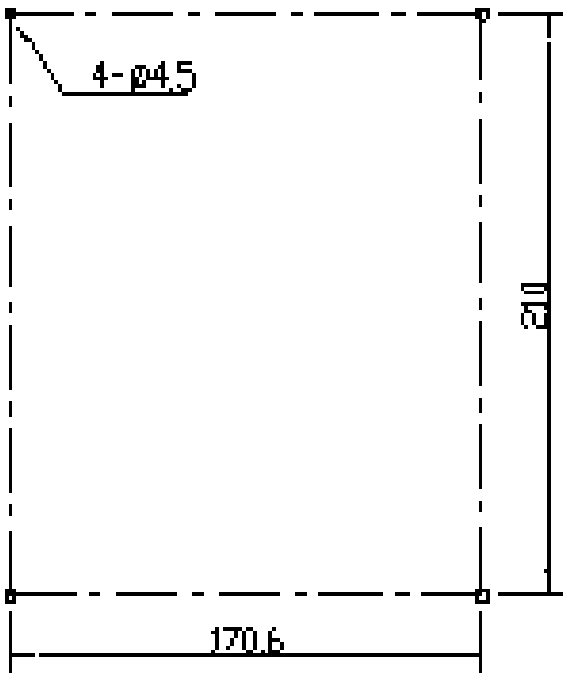
고객지원팀

*SV055~075iG5A-2/4 Disassembly (D Frame)



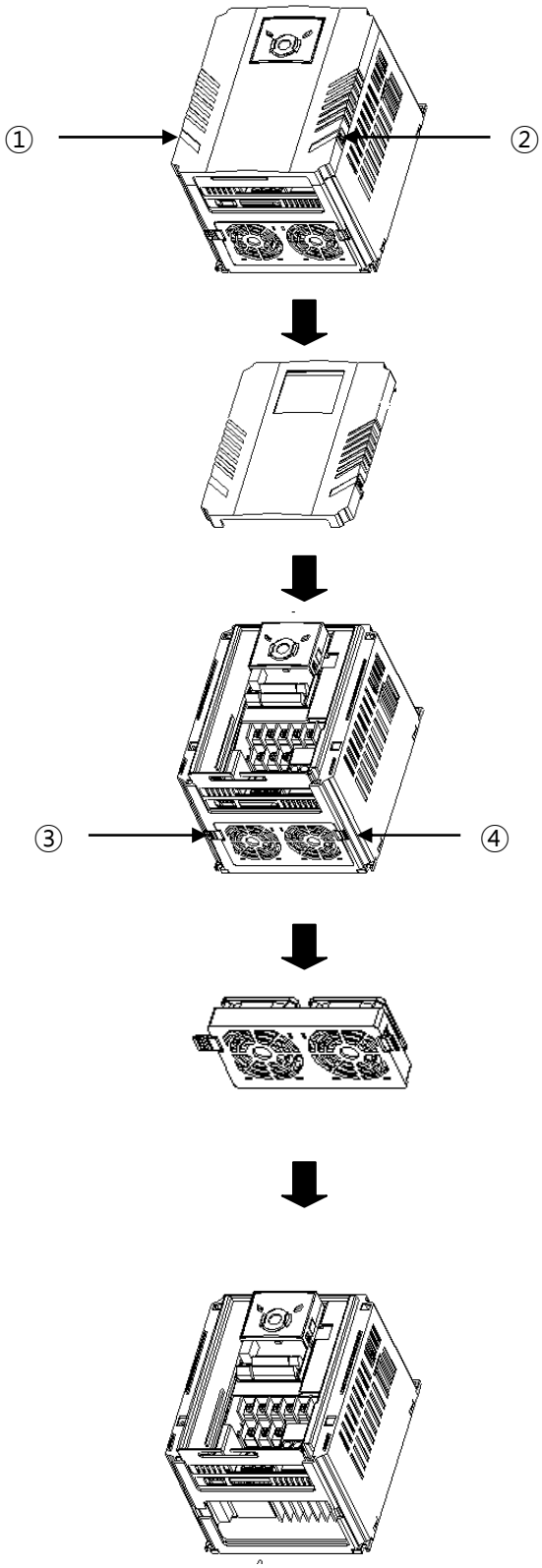




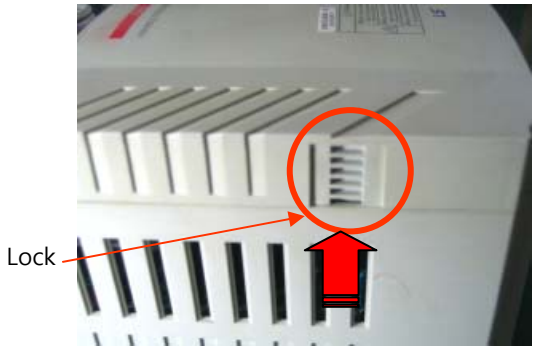


고객지원팀

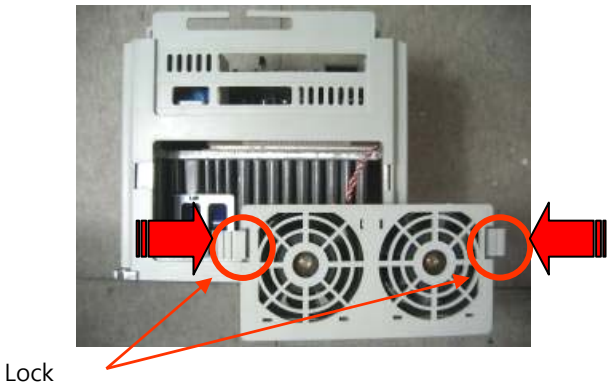
*SV055~075iG5A-2/4 Disassembly



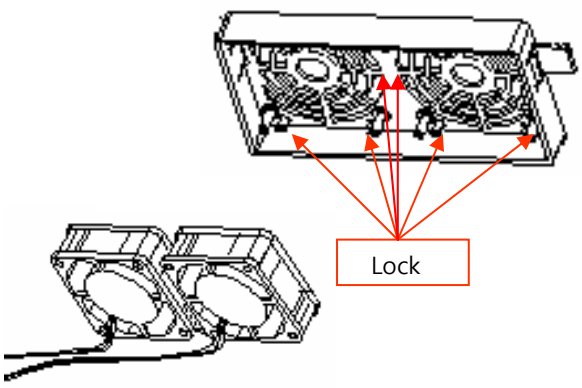
1. press the lock as ①② direction and pull up the cover.



2. press the Lock as ③④ direction and get off the FAN Bracket Ass'y.

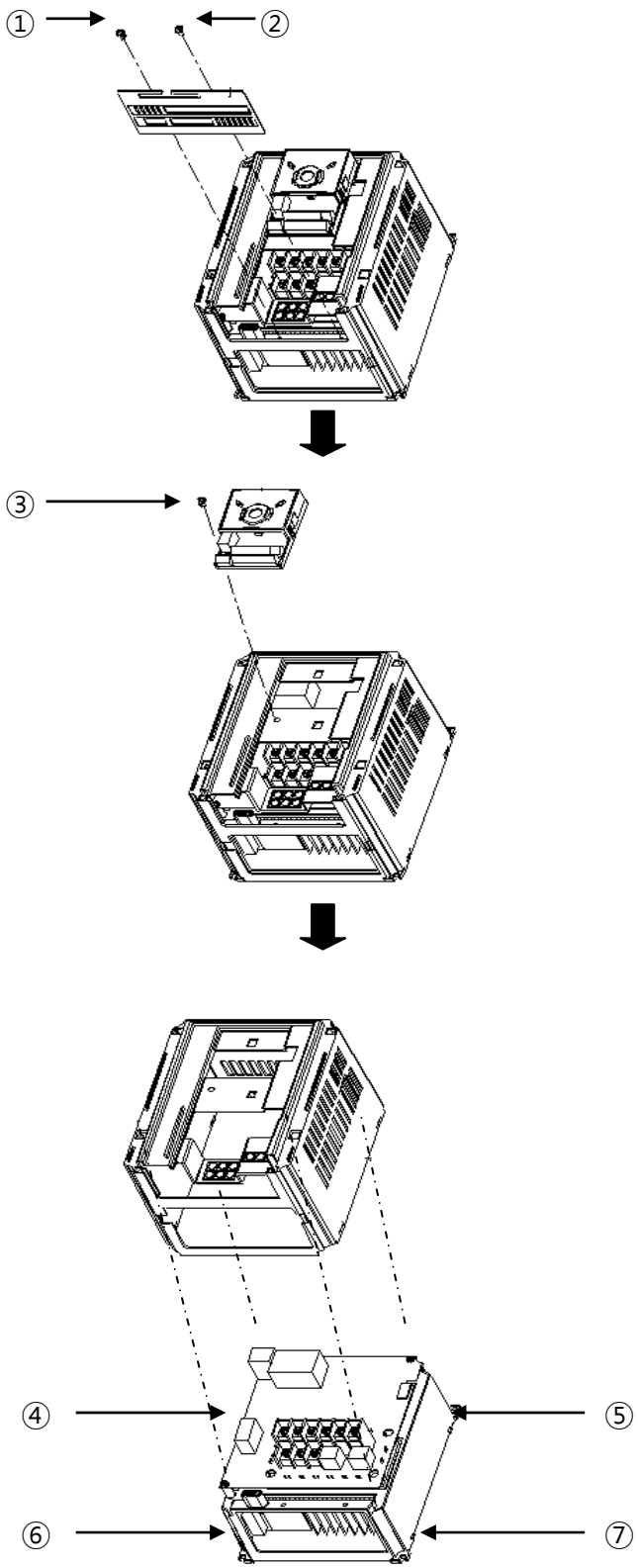


<FAN BRACKET ASS'Y disassembly>

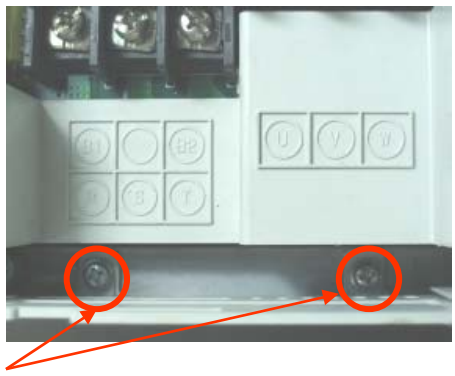


<Unfold the Lock of Fan Bracket inside and disassemble Fan and Bracket>

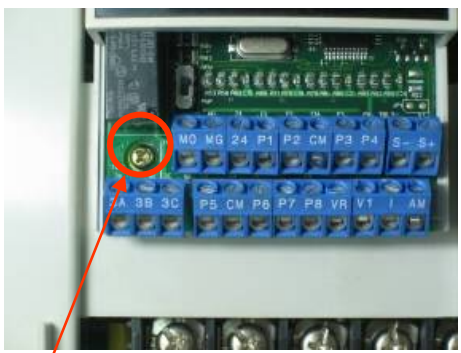
*SV055~075iG5A-2/4 Disassembly



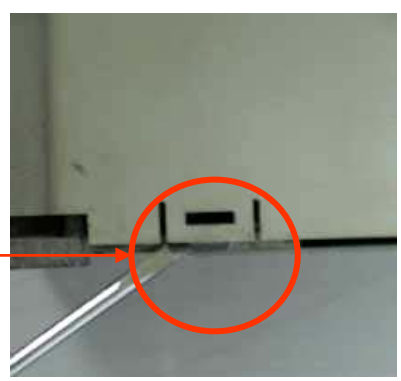
4. Unfasten the Bolt ①② and get the Bracket.



5. Unfasten the Bolt ③, disassembly the I/O Board.

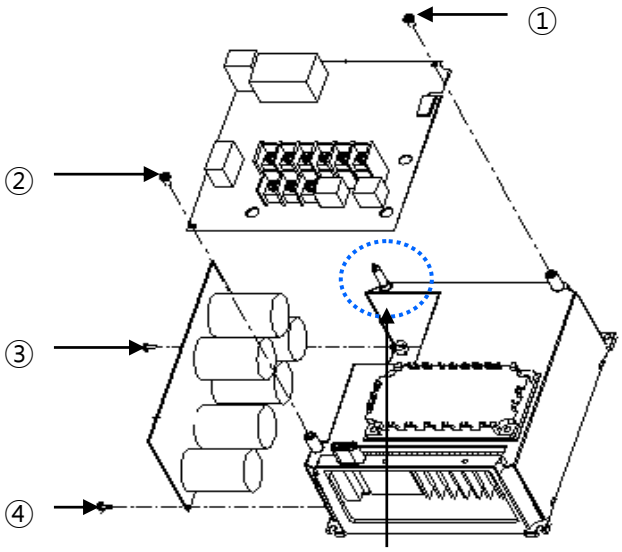


6. Separate the lock ④⑤⑥⑦ using Θ screw driver and get off the Body Case.

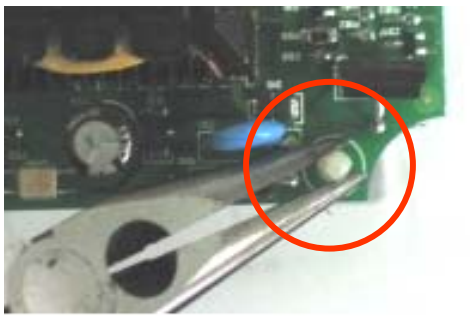


고객지원팀

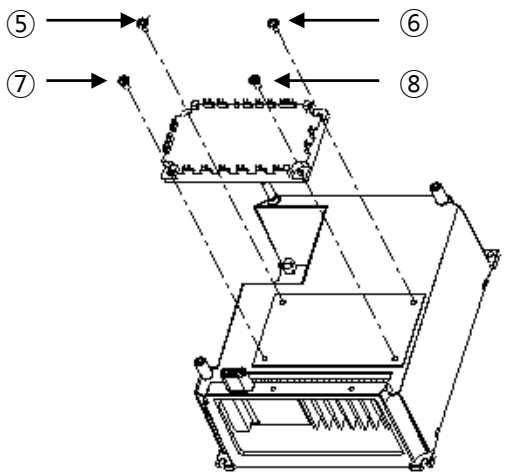
*SV055~075iG5A-2/4 Disassembly



SUPPORTER



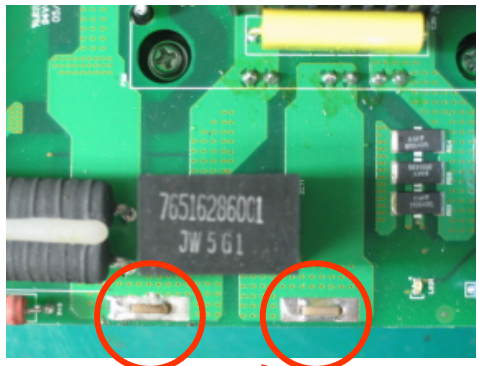
<When get the SUPPORTERs Long-nose is required.>



7. Get the Main PCB & SUB(C-Bank)PCB after removing the soldering part between PIM module and Main PCB, Main PCB and SUB(C-Bank)PCB and unfastening Bolt ①②③④, pressing the Supporters.

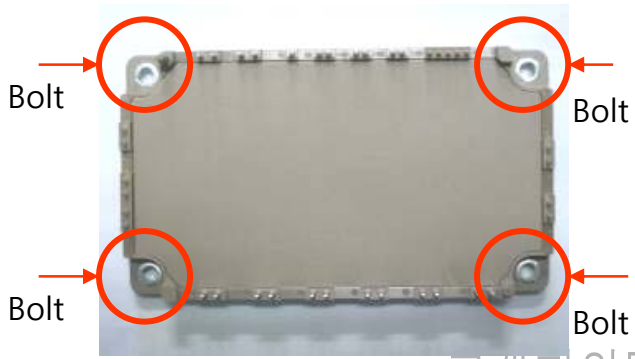
Soldering P

Soldering part



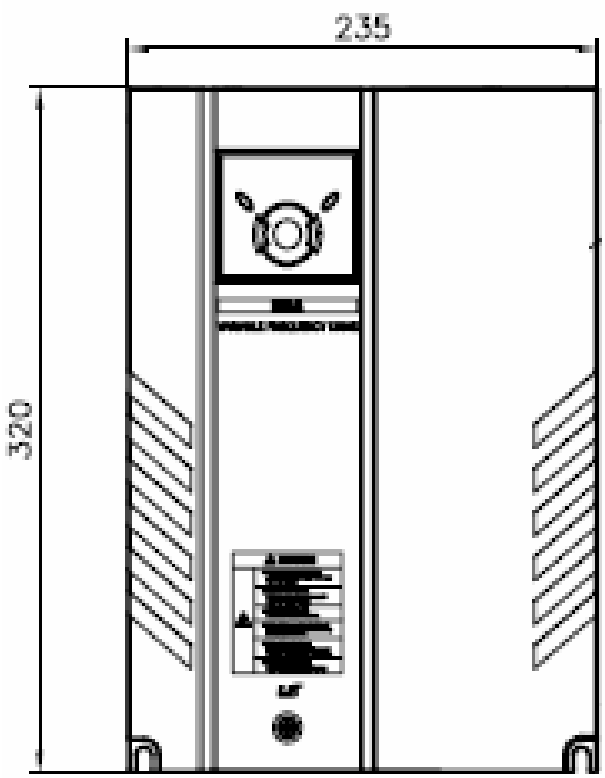
Soldering part

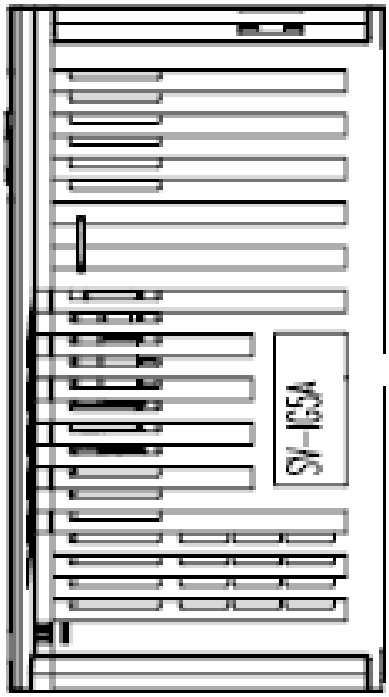
8. Unfastening Bolt ⑤⑥⑦⑧ and get the PIM Module.

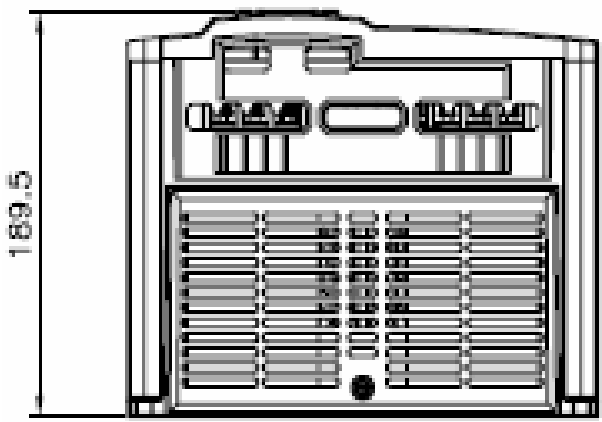


고객지원팀

*SV110~150iG5A-2/4 Disassembly (E Frame)

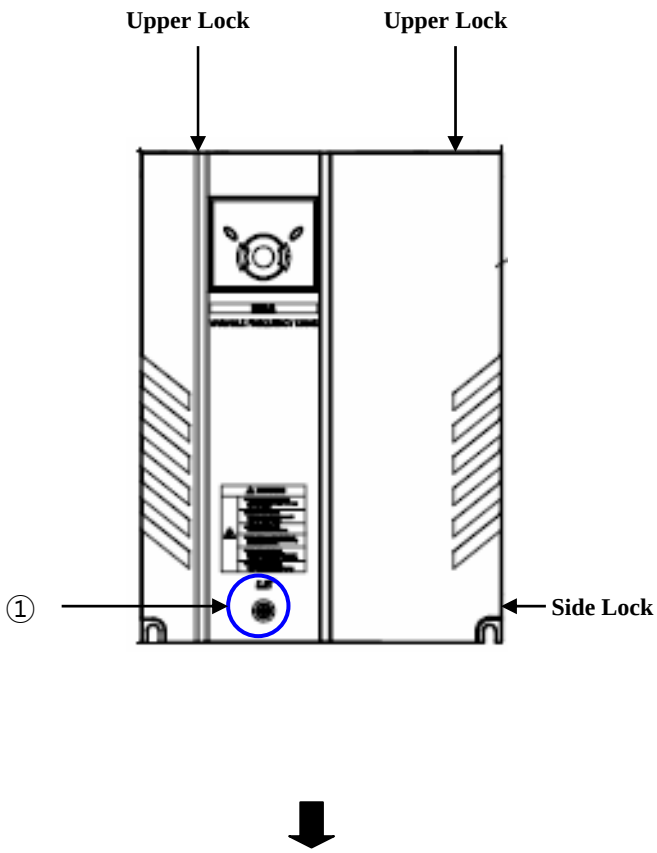




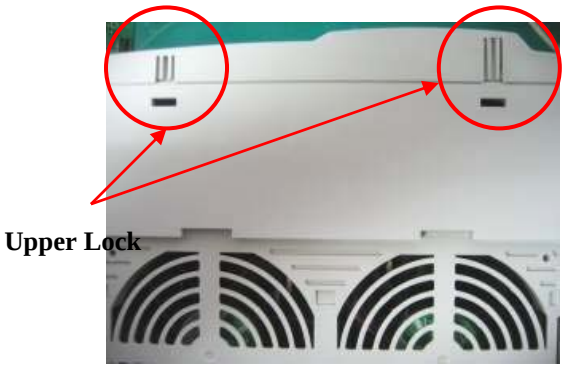


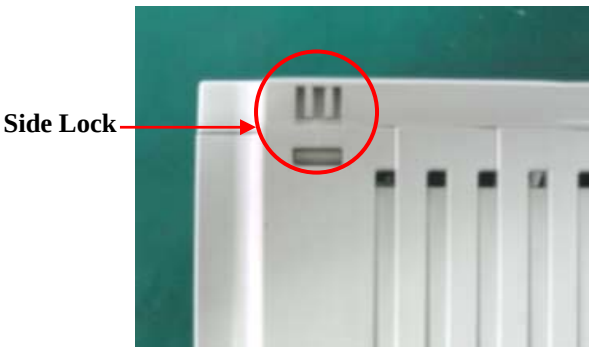
고객지원팀

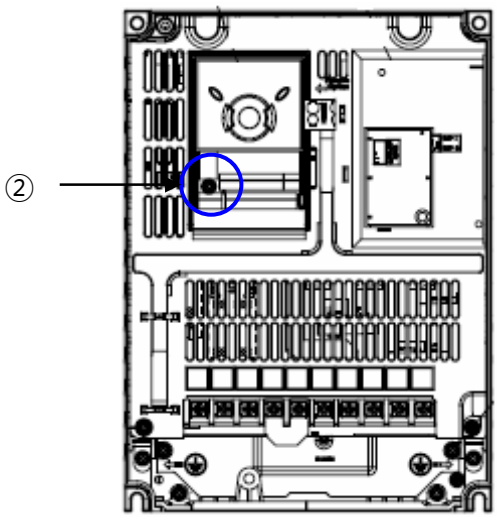
*SV110~150iG5A-2/4 Disassembly



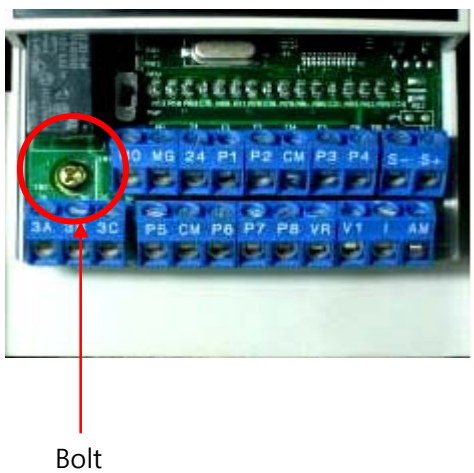
1. Unfasten the Bolt ①, pressing the upper lock and side lock and get cover.





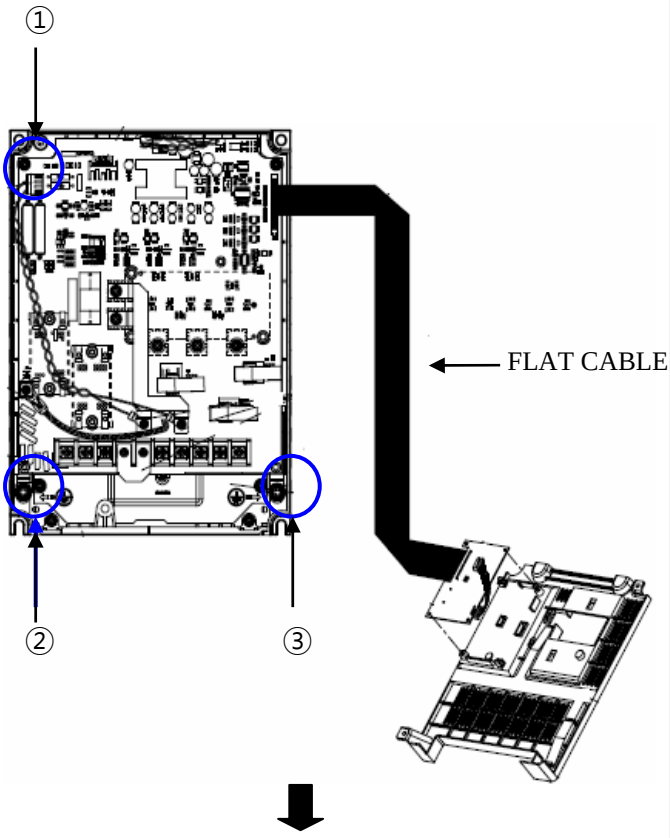


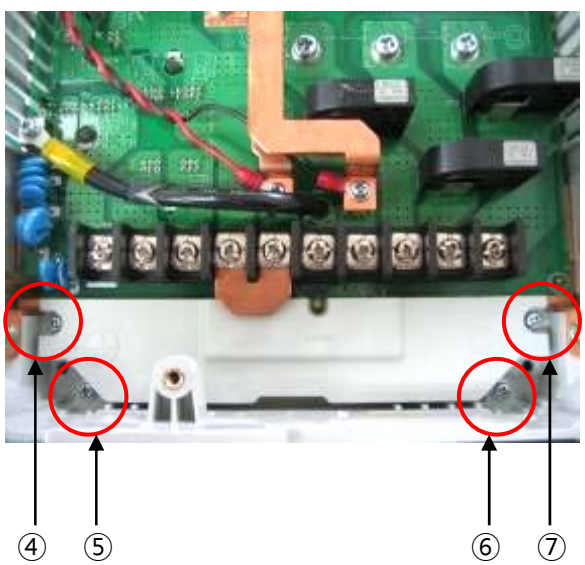
2. Unfasten the Bolt ②, disassembly the I/O Board.



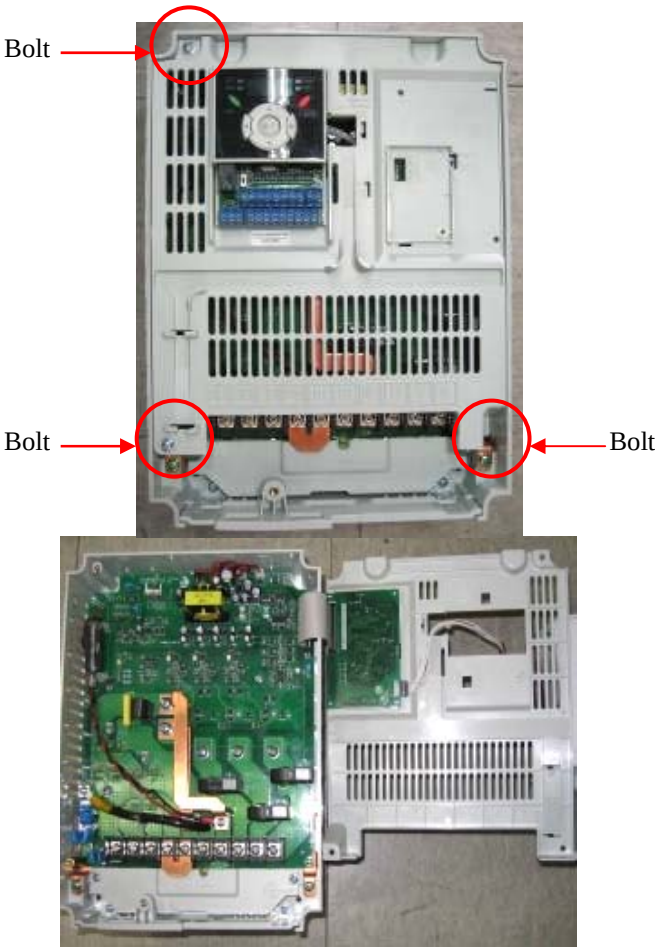
고객지원팀

*SV110~150iG5A-2/4 Disassembly





3. Unfasten Bolt ①②③ and get Inner Cover.

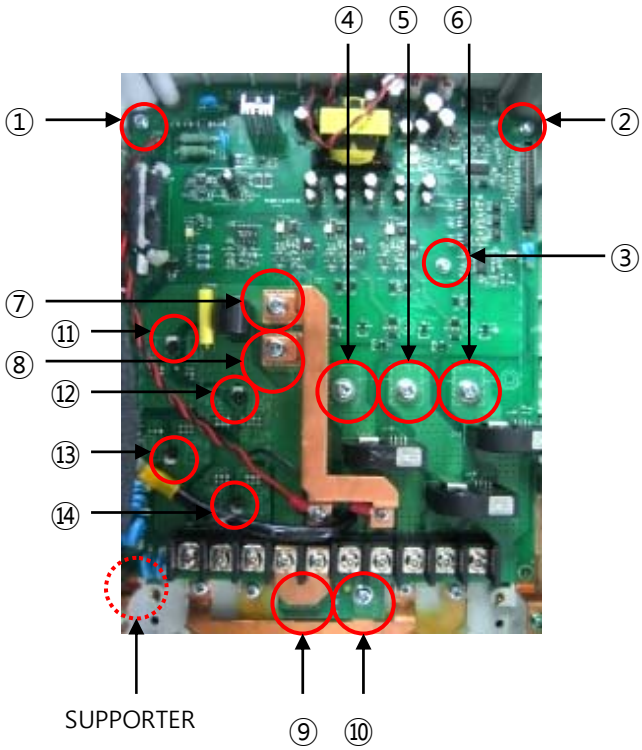


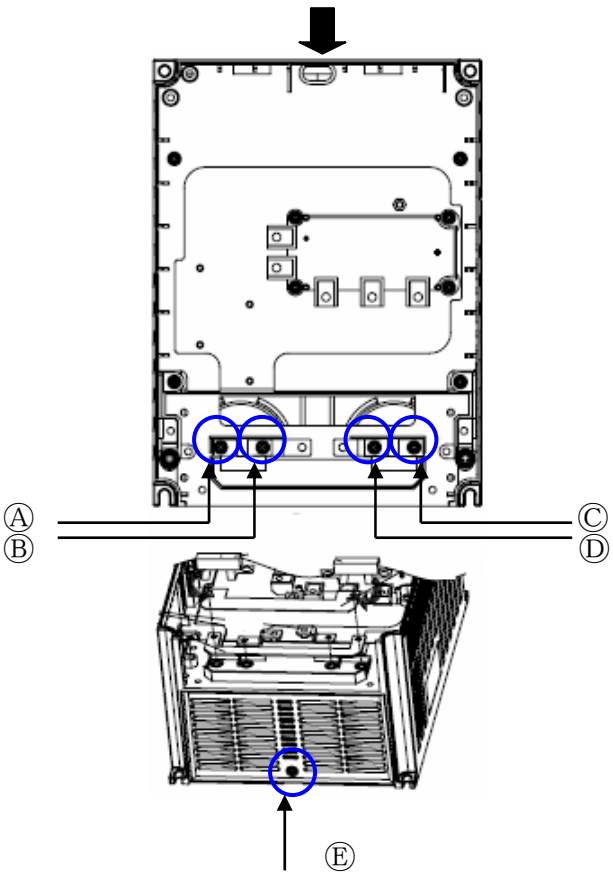
4. Unfastening Bolt ④⑤⑥⑦ and get Bracket Wiring and Bracket Insulate.

BRACKET WIRING

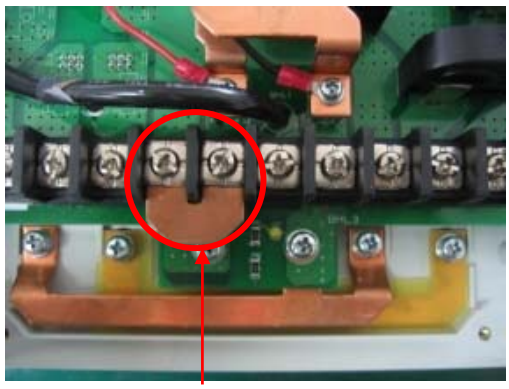
BRACKET INSULATE

*SV110~150iG5A-2/4 Disassembly





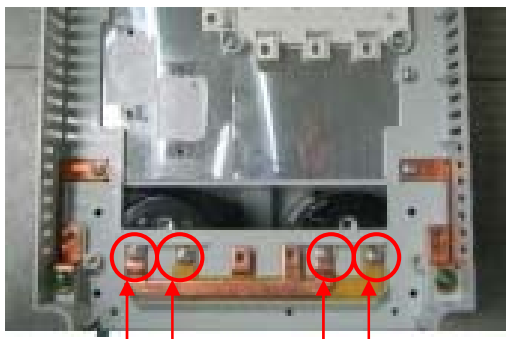
5. Unfasten Bolt and Supporter ①~⑭ and get Power PCB.
(note that remove the BUSBAR BAR for Bolt ⑨ <Fig 1-1 below>)



P1-B1 connection BUSBAR

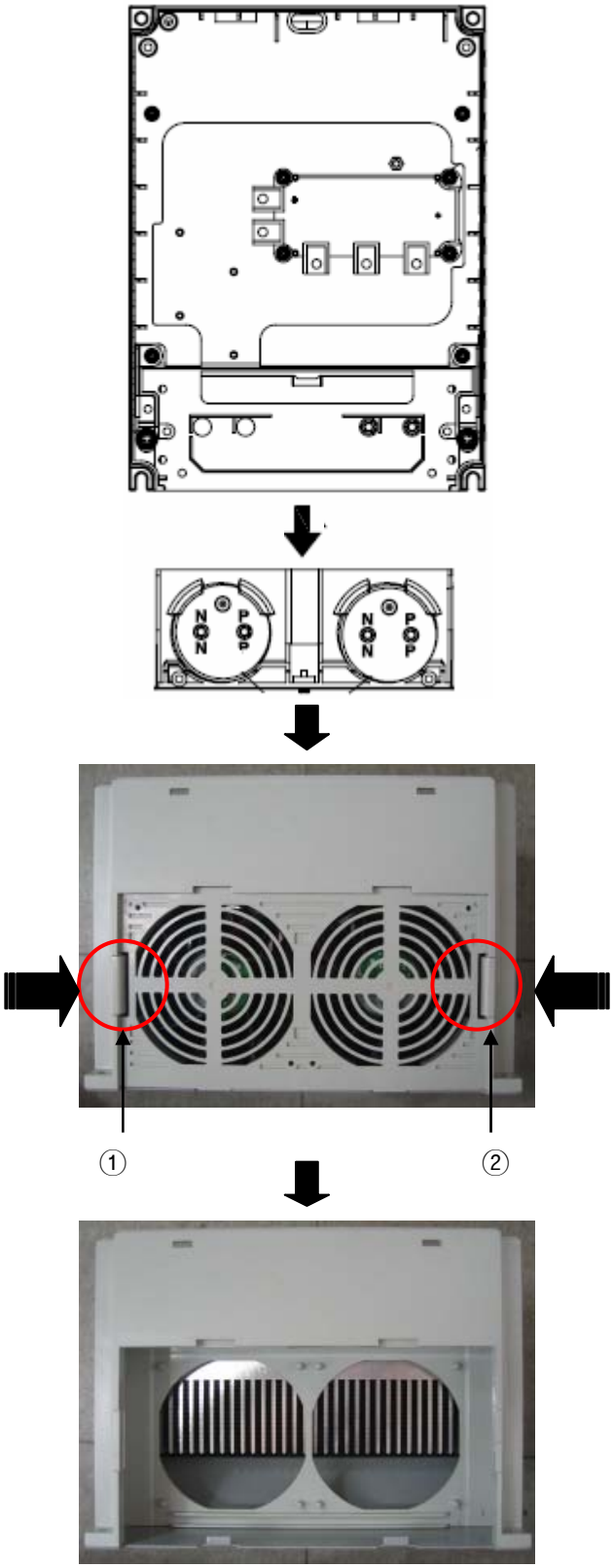
<Fig 1-1>

6. Unfasten Bold ⒶⒷⒸⒹⒺ and pulling the Bracket Vent and get the Main condensors

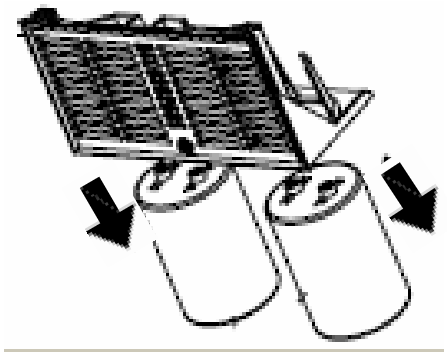


고객지원팀

*SV110~150iG5A-2/4 Disassembly



<BRACKET VENT disassembly>



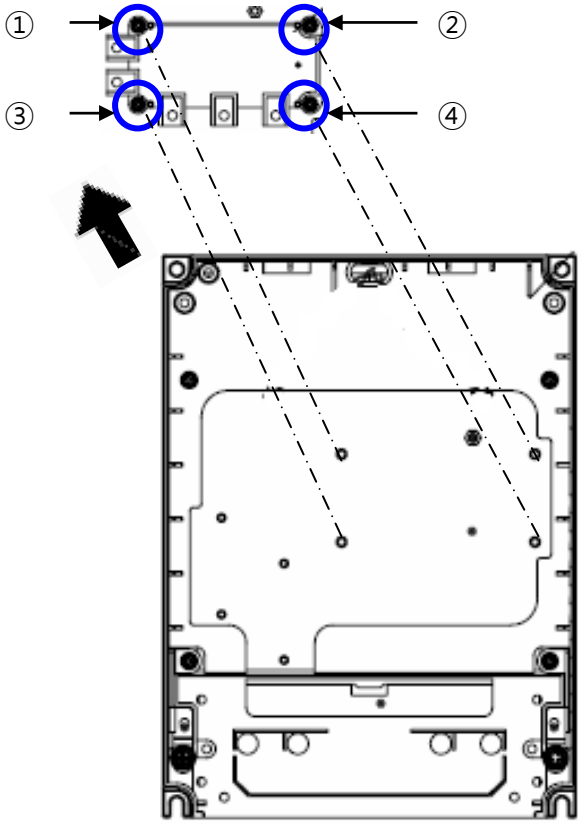
7. Pressing the Lock ①② and pull forward and get the Fan Bracket. (Fan can be get once the Fan Bracket is separated easily)

BRACKET,FAN

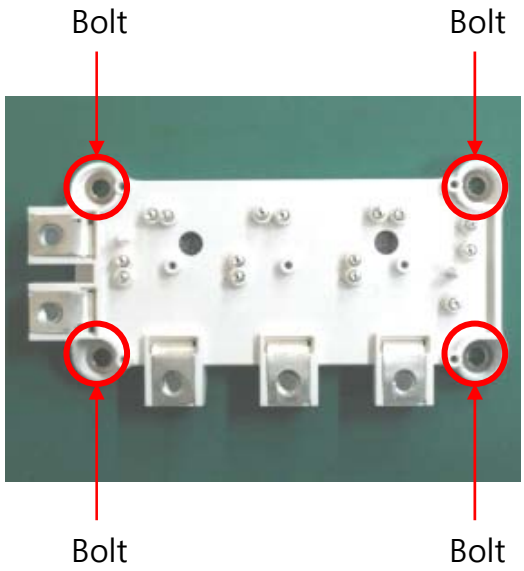
FAN,DF,V35131-51LS,DC24V

고객지원팀

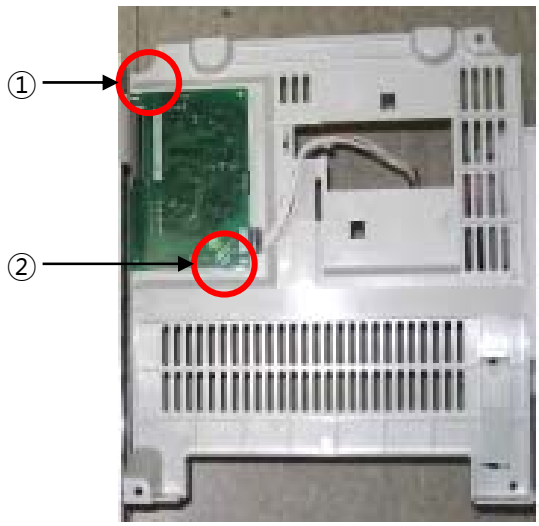
*SV110~150iG5A-2/4 Disassembly

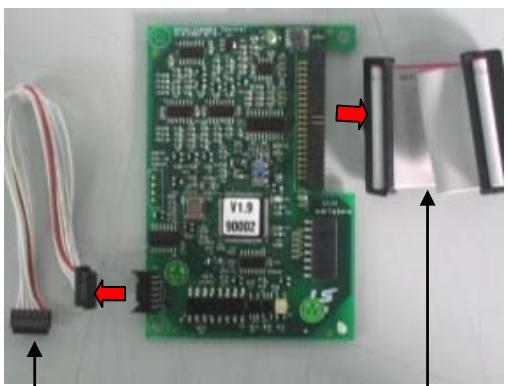


8. Unfasten the Bolt ①②③④ and get IGBT Module.

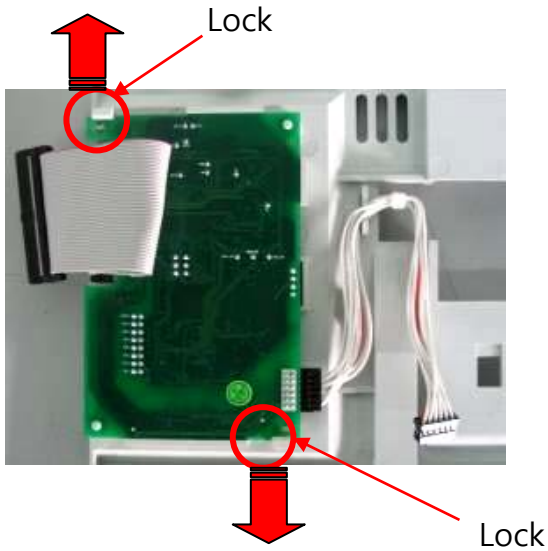


고객지원팀





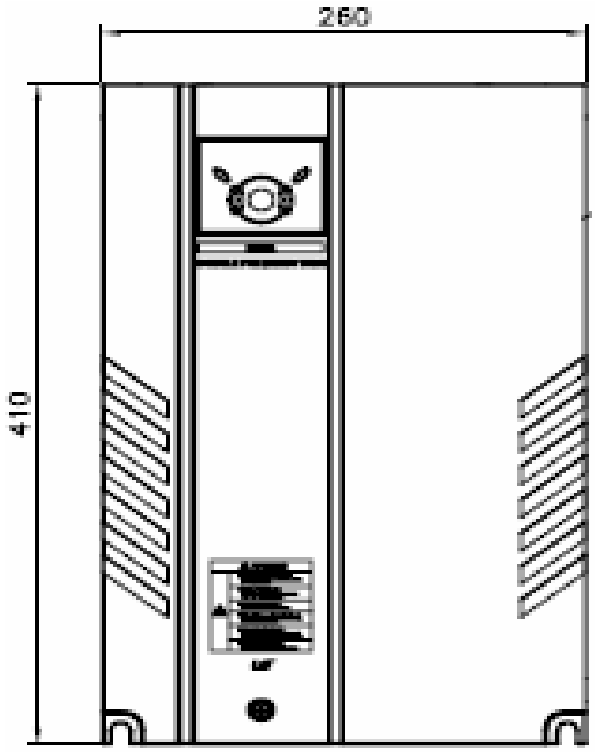
9. Take the Lock ①② outward and get the Control PCB.

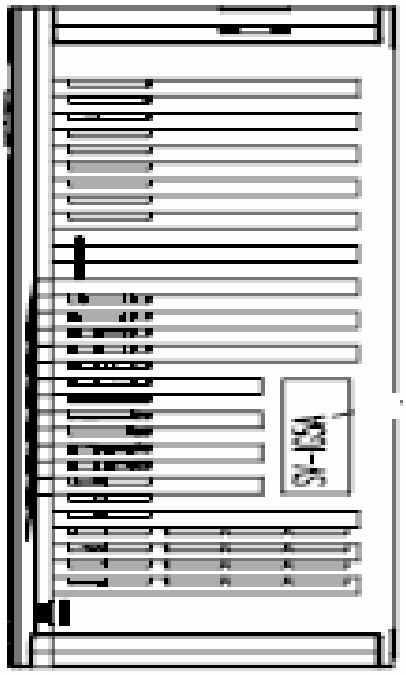


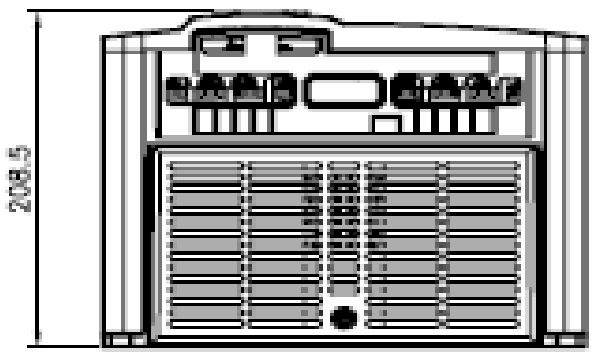
10. At the Control PCB, separate the Wire Ass'y, IO-MAIN and Ass'y, Flat Cable.

고객지원팀

*SV185~220iG5A-2/4 Disassembly (F Frame)

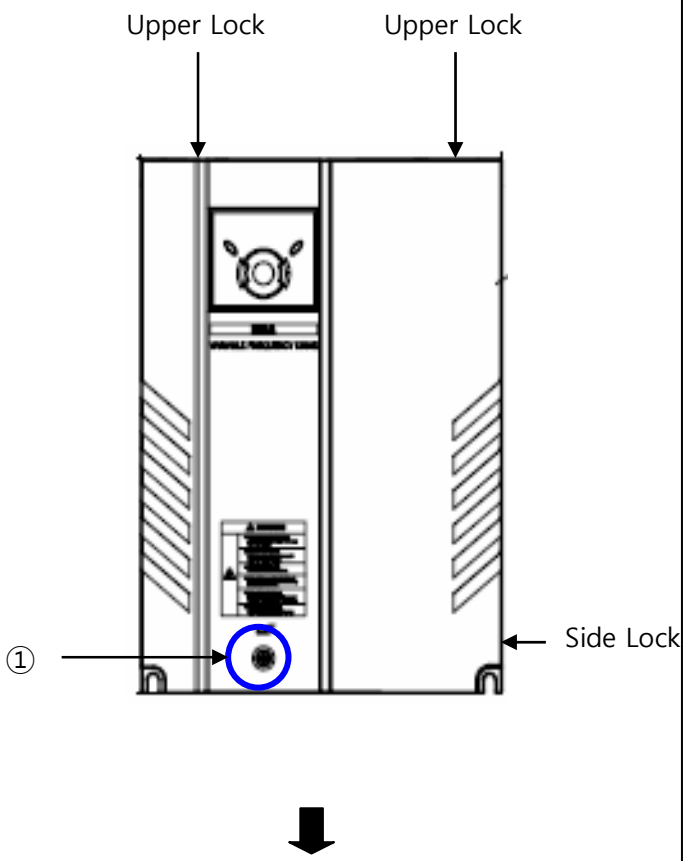




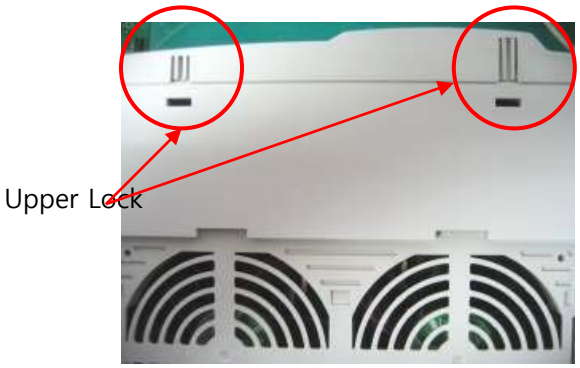


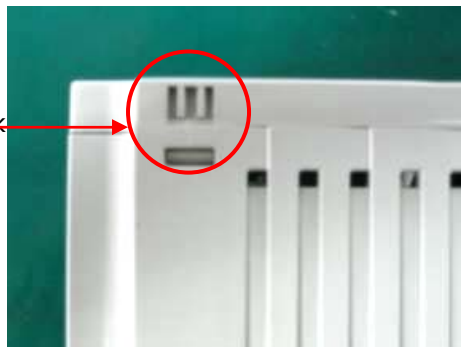
고객지원팀

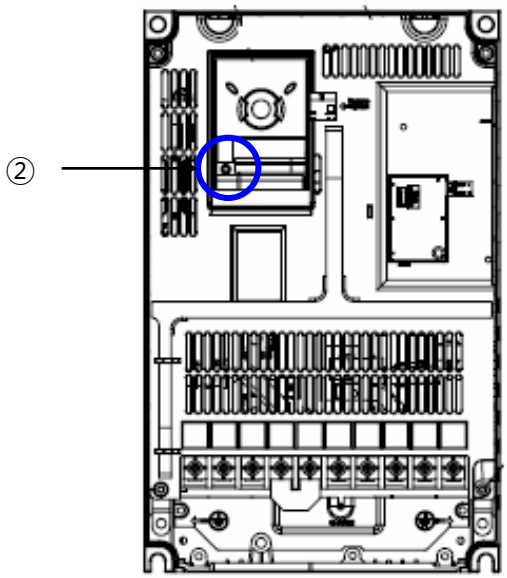
*SV185~220iG5A-2/4 Disassembly



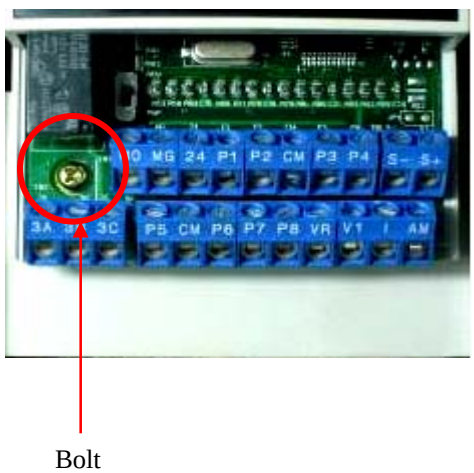
1. Unfasten the Bolt ①, pressing the upper lock and side lock and get cover.





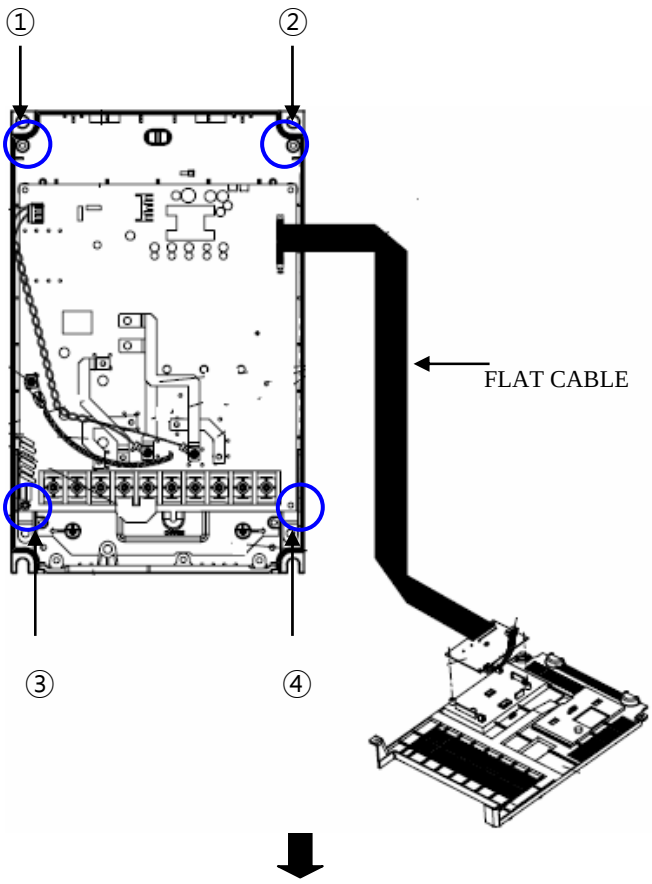


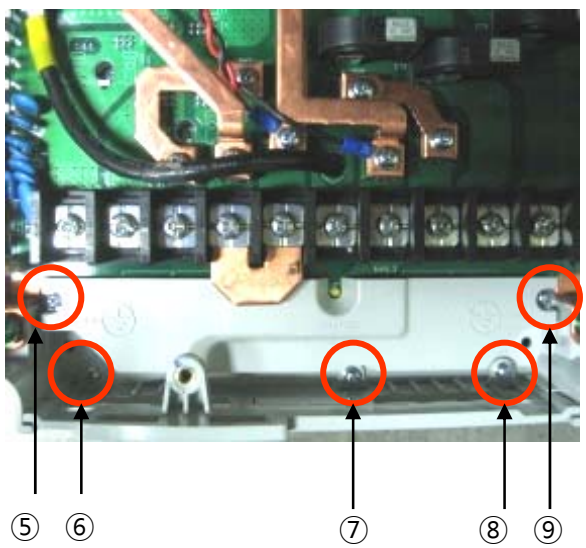
2. Unfasten the Bolt ②, disassembly the I/O Board downward.



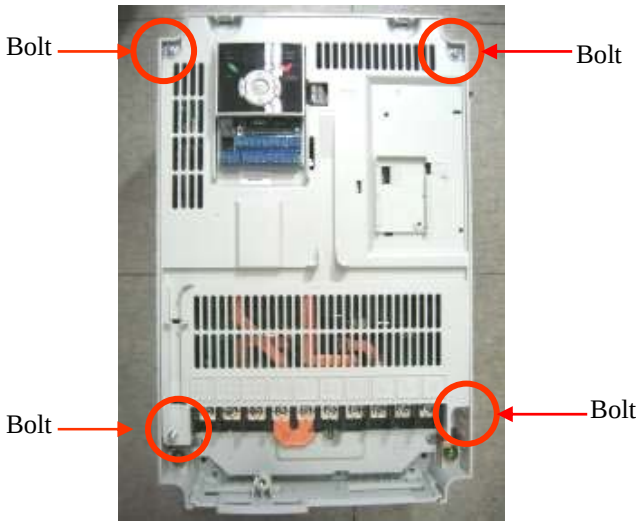
고객지원팀

*SV185~220iG5A-2/4 Disassembly





3. Unfasten Bolt ①②③④ and get the Inner Cover.



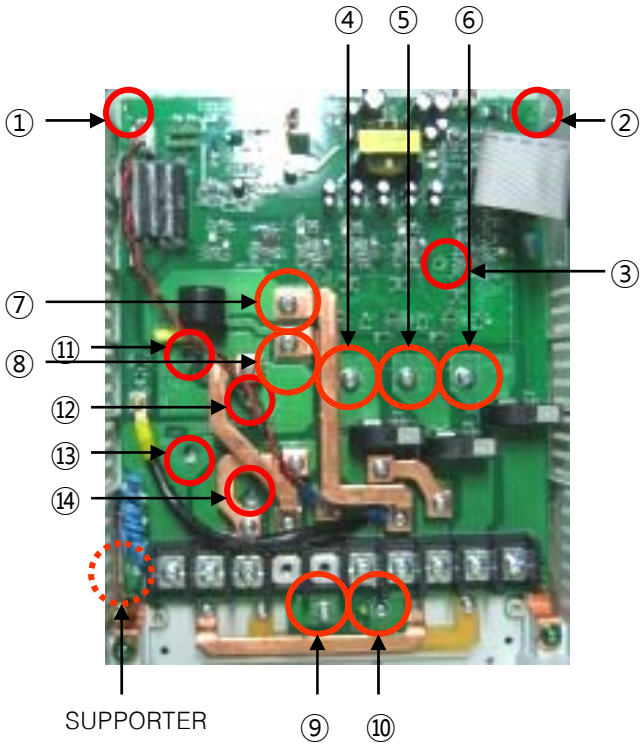
4. Get the Bracket Wiring and Bracket Insulate by unfastening Bolt ⑤⑥⑦⑧⑨.

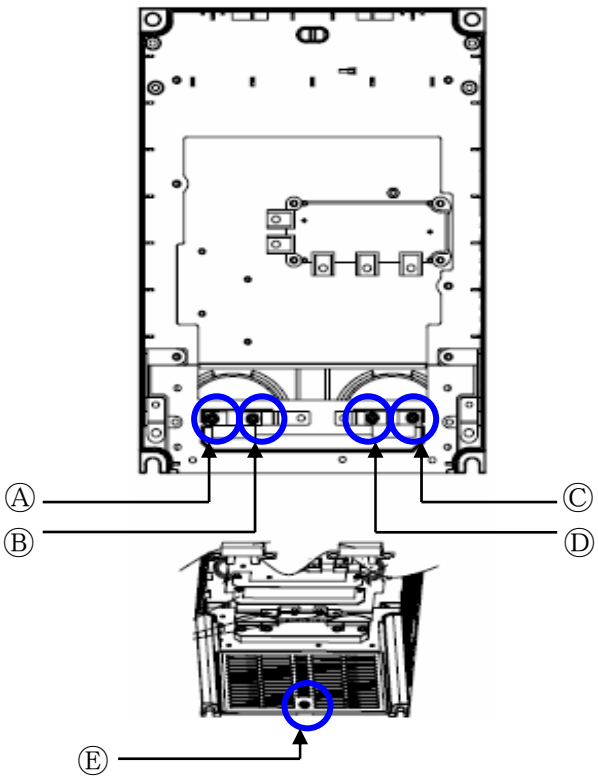
BRACKET WIRING

BRACKET INSULATE

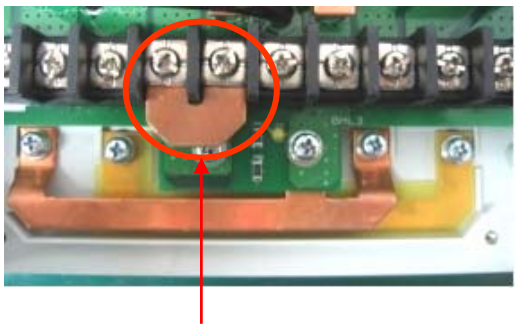
고객지원팀

*SV185~220iG5A-2/4 Disassembly





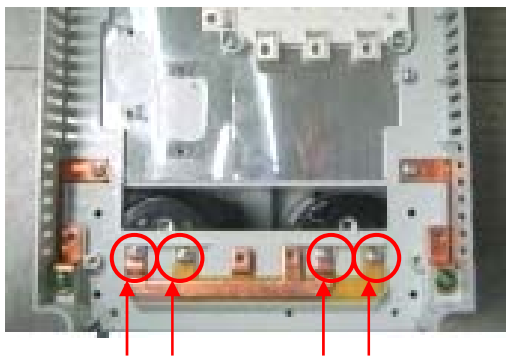
5. Unfasten Bolt and Supporter ①~⑭ and get Power PCB.
(note that remove the BUSBAR BAR for Bolt ⑨ <Fig 1-1 below>)



P1-B1 connection BUSBAR

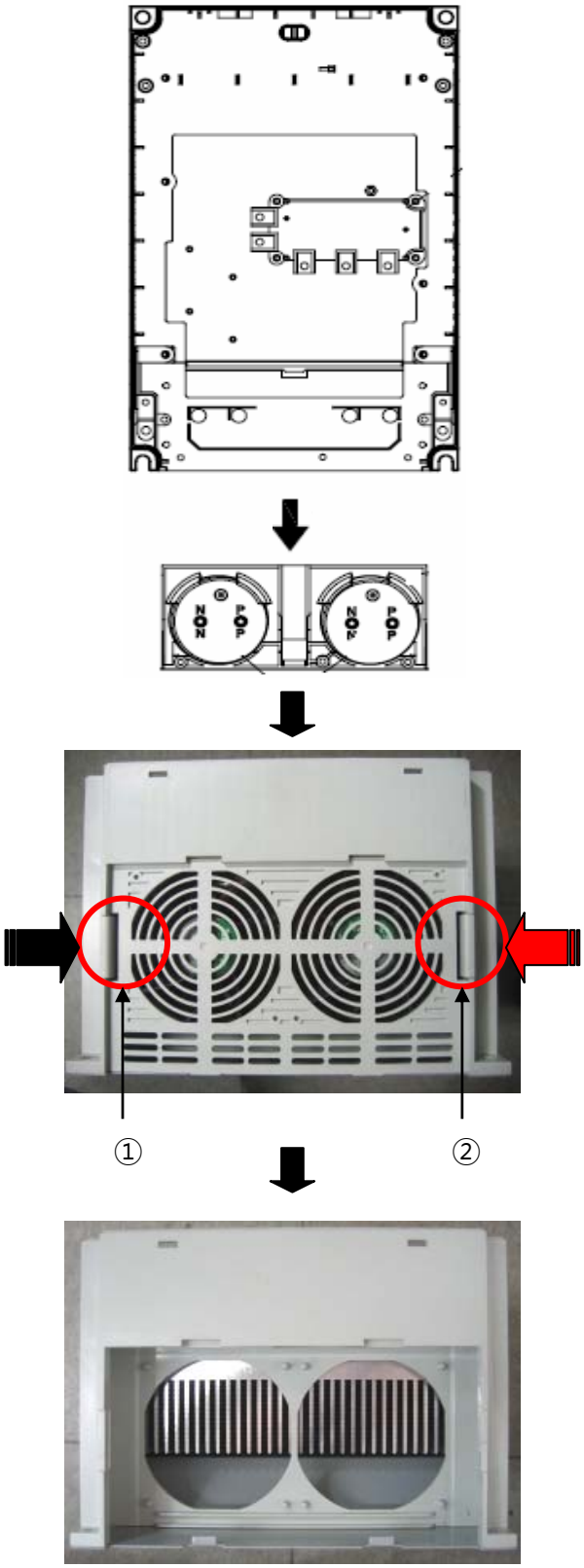
<Fig 1-1>

6. Unfasten Bold ⒶⒷⒸⒹⒺ and pulling the Bracket Vent and get the Main condensors

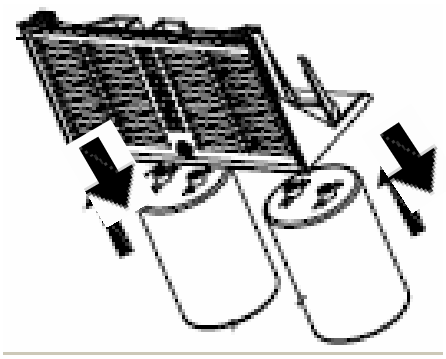


고객지원팀

*SV185~220iG5A-2/4 Disassembly



<BRACKET VENT Disassembly>



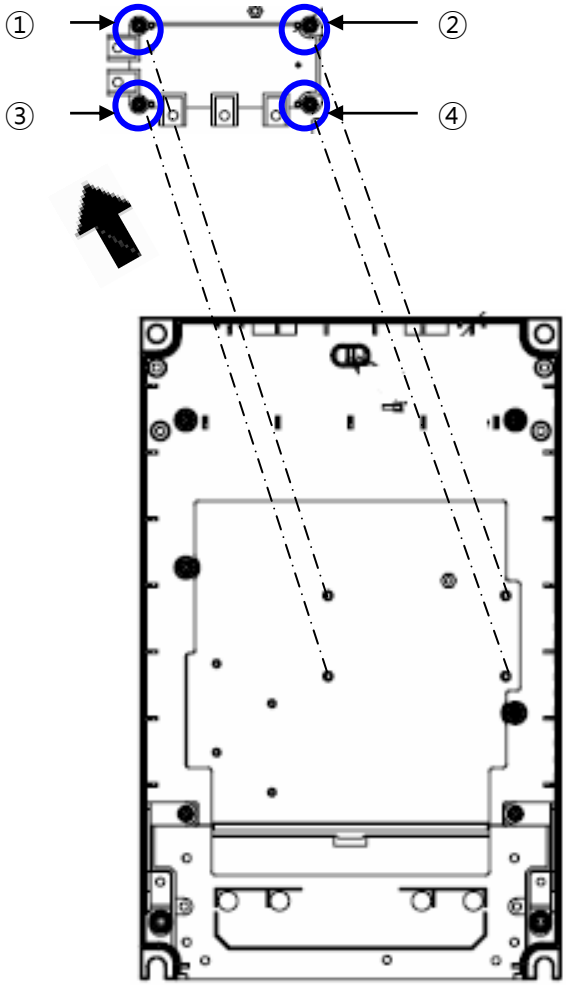
7. Pressing the Lock ①② and pull forward and get the Fan Bracket. (Fan can be get once the Fan Bracket is separated easily)

BRACKET,FAN

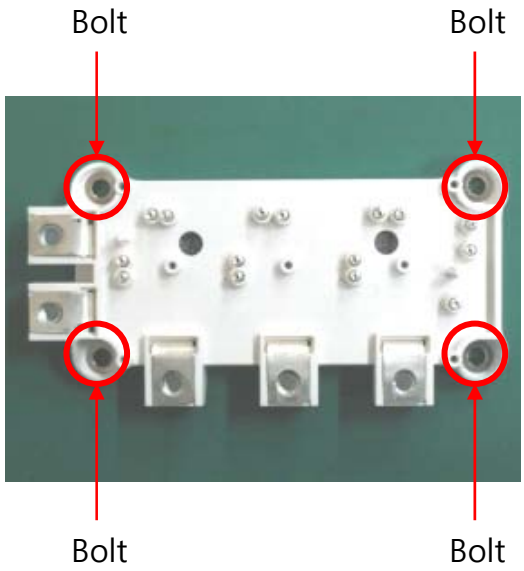
FAN,DF,V35131-51LS,DC24V

고객지원팀

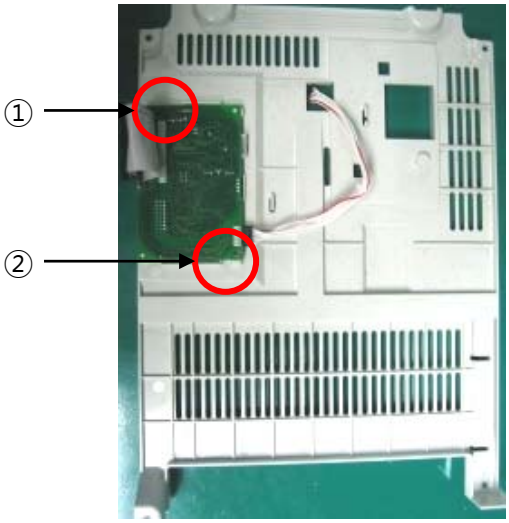
*SV185~220iG5A-2/4 Disassembly

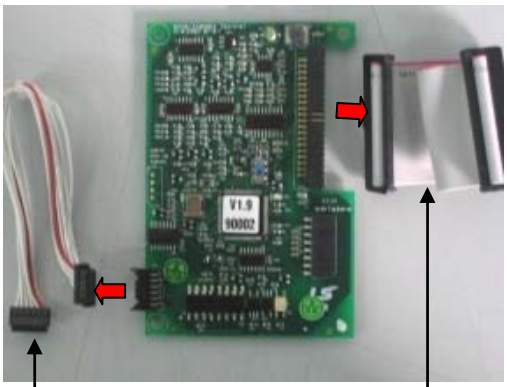


8. Unfasten the Bolt ①②③④ and get IGBT Module.



고객지원팀



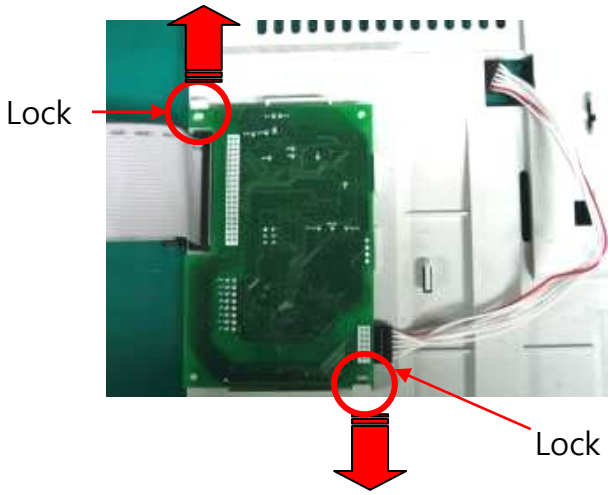


CONTROL PCB

WIRE ASS'Y,IO-MAIN

ASS'Y,FLAT CABLE

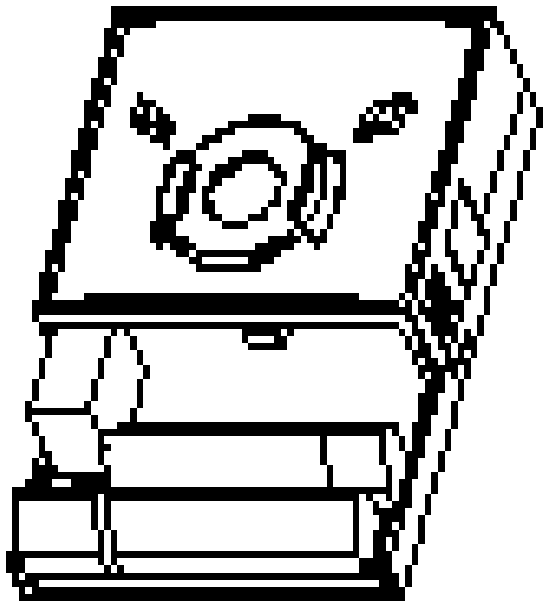
9. Take the Lock ①② outward and get the Control PCB.



10. At the Control PCB, separate the Wire Ass'y, IO-MAIN and Ass'y, Flat Cable.

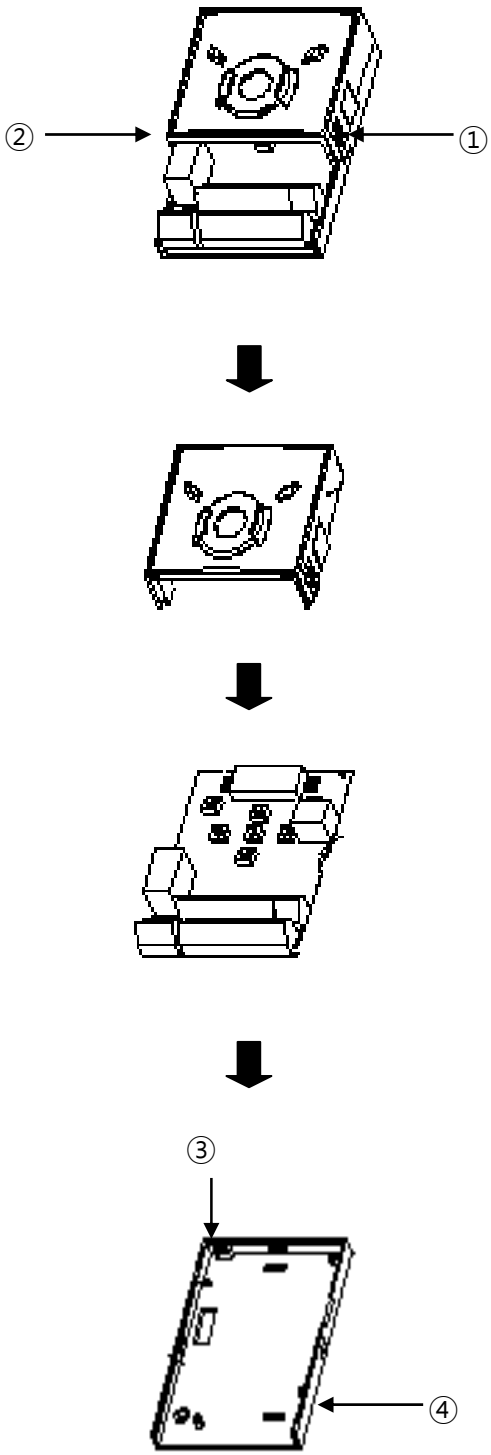
고객지원팀

* I/O BOARD ASS'Y Disassembly (Commonly used)

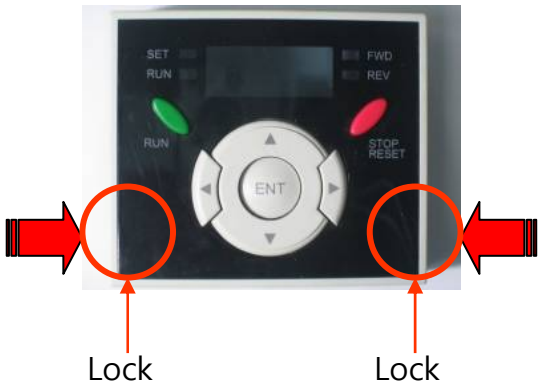


고객지원팀

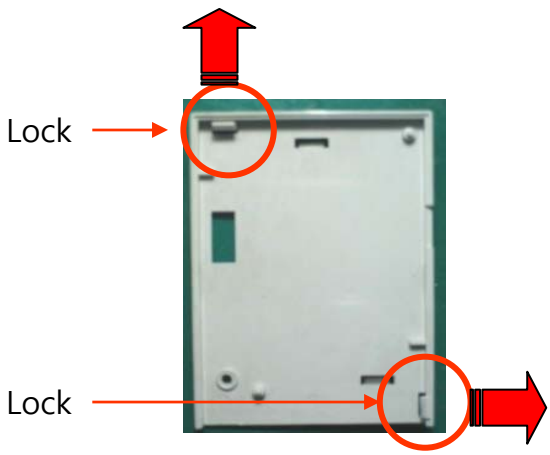
* I/O BOARD ASS'Y Disassembly (Commonly used)



1. Pressing the Lock ①② inward and pull forward the COVER ASS'Y.



2. Take the Lock ③④ as the figure below and separate the I/O PCB and Base I/O.



고객지원팀