



QUICK CHARGER

FOR ELECTRIC VEHICLE

SERVICE MANUAL

SERVICE

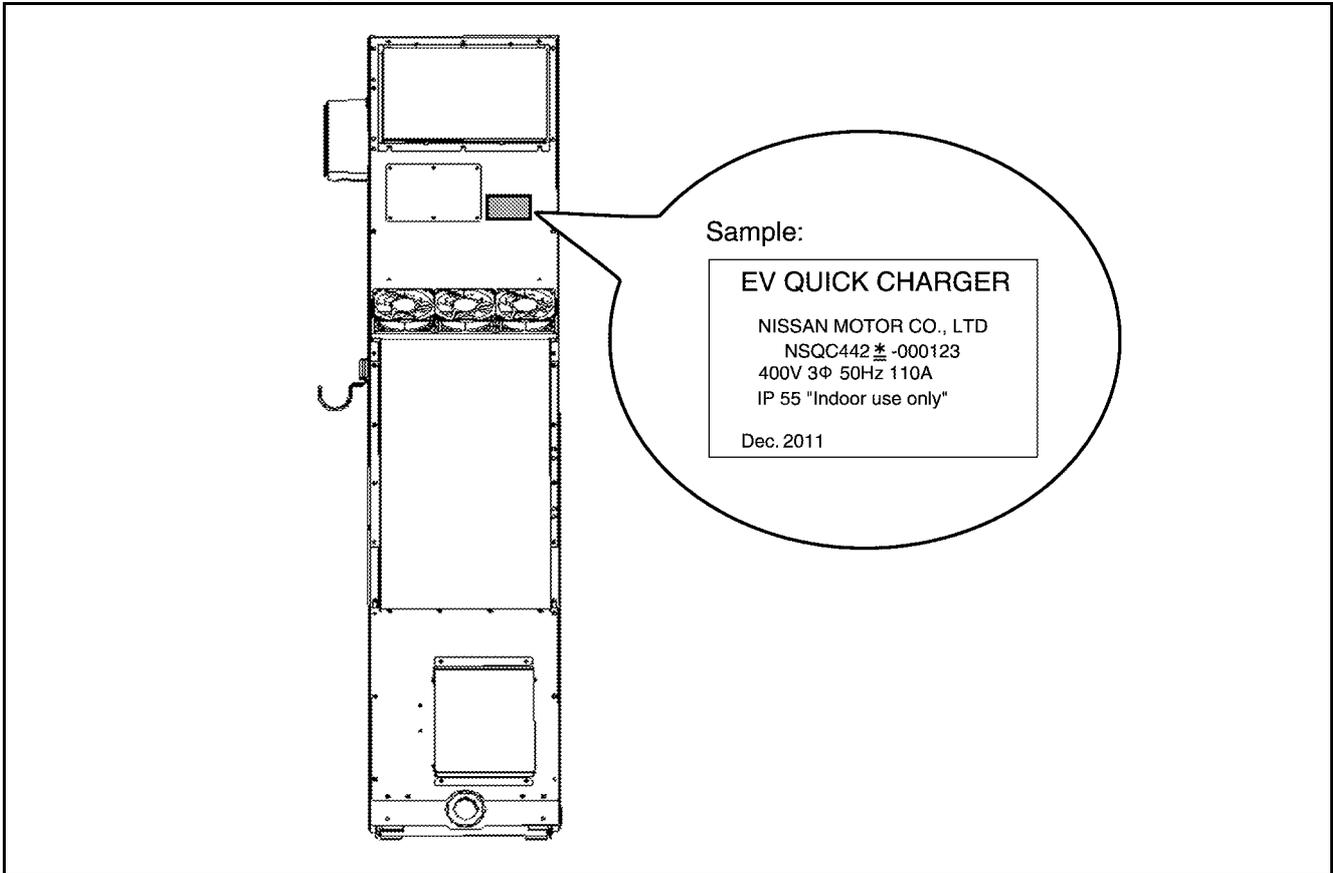


Zero Emission

HOW TO USE THIS MANUAL

APPLICATION NOTICE

Check the quick charger type to use the service information in this manual.

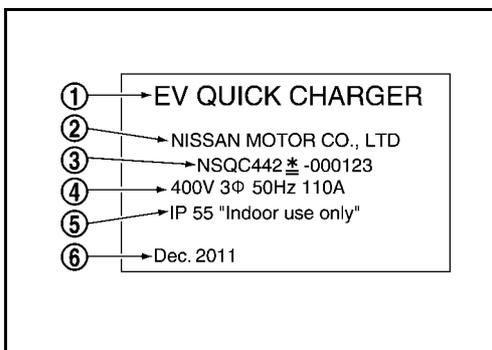


Quick charger is categorized into several types according to the serial number model (*) marked on the label.

TYPE1: NSQC442D / NSQC442E (For North America)

TYPE2: NSQC442F / NSQC442G (For Europe)

How to read the label



1) Equipment reference

2) Manufacturer

3) Serial number

4) Rated voltage, frequency current, phases

5) IP class

-When it is base specifications: indicated as IP33 "Indoor use only".

-When it is standard specification or cold specification: just indicated as IP55

6) Date of manufacture

FOREWORD

TYPE1

This Service Manual describes service procedures for NSQC442D/NSQC442E quick charger for electric vehicles. NSQC442D/NSQC442E quick charger has mechanisms unique to NISSAN. NISSAN, therefore, specifies that operations are to be consigned to an after-service company that is capable of performing inspection and service operations safely and effectively, including periodical inspection. For NSQC442D/NSQC442E quick charger, always consign inspection and service operations to a technician of a contracted after-service company specified by NISSAN.

Never allow any unlicensed technician to perform the operation.

TYPE2

This Service Manual describes service procedures for NSQC442F/NSQC442G quick charger for electric vehicles. NSQC442F / NSQC442G quick charger has mechanisms unique to NISSAN. NISSAN, therefore, specifies that operations are to be consigned to an after-service company that is capable of performing inspection and service operations safely and effectively, including periodical inspection. For NSQC442F/NSQC442G quick charger, always consign inspection and service operations to a technician of a contracted after-service company specified by NISSAN.

Never allow any unlicensed technician to perform the operation.

NOTATION RELATED TO SAFETY

Safety precautions in this Service Manual are classified into ranks as shown below.

		Indicates a hazard which will result in death or serious injury if instructions are not followed.
		Indicates a potential hazard which could result in death or serious injury if instructions are not followed.
		Indicates a potential hazard which may result in minor or moderate injury or damage to a component if instructions are not followed.

PRECAUTION FOR TECHNICIANS USING MEDICAL ELECTRIC DEVICES



Technician using an implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD) must not perform the operation as the device must keep distance of 800 mm (31.5 in) from the quick charger.

If a technician uses medical electric devices other than an implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of the quick charger might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before using the quick charger.

HIGH VOLTAGE PRECAUTION



Because the quick charger contains a high voltage system, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage components are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.

Be sure to wear personal protective equipment (PPE) consisting of gloves, shoes, and a face shield before beginning work on the high voltage system.

Symbol	Description
 Electric shock symbol	It may cause an electric shock if instructions are not followed. To be used to describe the removal of component, connector, etc. where high voltage is/might be present.
 Insulated gloves	Always wear when inspecting or performing service operation of high voltage components.
 Insulated safety shoes/ Insulated rubber sheet	Always wear when inspecting or performing service operation of high voltage components.
 Safety glasses	Always wear when performing the following operations: <ul style="list-style-type: none"> • Removal, installation, or inspection of high voltage terminal and harness. (Sparking may occur due to a short circuit.) • Work inside the quick charger.
 Face shield	
 Insulated hand tools	Always use these when performing live line work.

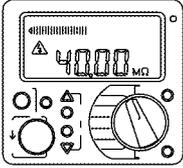
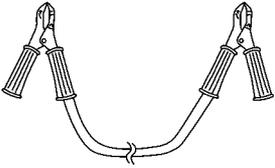
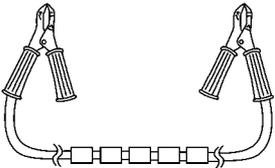
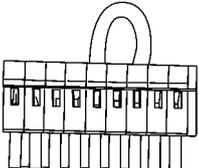
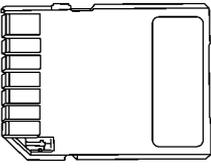
PRECAUTION FOR THE PARTS

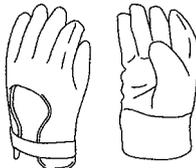
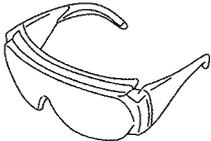
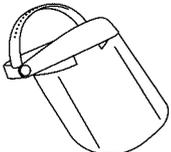
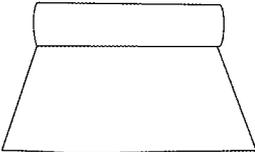


The inside of quick charger includes a precision component. Handle with care because any external shock or contact with water causes a malfunction.

If service work is necessary in the rain, protect the parts from contacting with water.

PREPARETION

Tool	Purpose	Spec
Insulation resistance tester 	Insulation Resistance Test	Enable to: -Measure resistance of more than 400 mega ohm by applying 500 V and 1000 V -Measure resistance of 0.01ohm by over 200 mA -Measure over 500 V DC Safety switch / function should be available for misselect prevention. (ex. require two steps to select high voltage resistance check)
Cable with crocodile clip connector 	Ground fault protection test	Clip -Rated current 20 A or more -Opening width 20 mm (0.79 in) Cable -Rated voltage 600 V or more -Wire diameter more than 1.3 sq -Cable length: 600 mm (23.62 in) (Necessary cables: 8) -Cable length: 2.1 m (6.9 ft) (Necessary cables: 2)
Resistance unit 	Ground fault protection test	Clip -Rated current 20 A or more -Opening width 20 mm (0.79 in) Cable -Rated voltage 600 V or more -Wire diameter more than 1.3 sq -Cable length: 2.1 m (6.9 ft) (Necessary cable: 1) Resistive part -50 k ohm, 5 W
Test connector 	Ground fault protection test	Supplier -WAGO Part No. -734-109 Cable -Wire diameter: 0.75 mm (0.03 in) -Cable length:50 mm (1.97 in) (Necessary cable: 1)
SD card 	Read out error code history for Base specifications	Size: 2 - 4GB Format: FAT16 / FAT32

Tool	Image	Purpose	Spec
Insulated gloves		Protect technicians from electric shock	[TYPE1] ASTM D 120-95 -Class 0: Test voltage: 5000 V -Maximum Use Voltage: 1000 V [TYPE2] EN60903 -D/C Class: 00 Test voltage: 4000 V -Maximum Use voltage: 750 V
Leather gloves (Use leather gloves that can fasten the wrist tight)		Protect insulated gloves	-
Insulated safety shoes		Protect technicians from electric shock	[TYPE1] ASTM F2412 (Safety for toe protection & Electrical insulation) [TYPE2] EN 346 (Safety for toe protection) -Test voltage: 14000
Safety glasses		Protect eyes	[TYPE1] ANSI Z87.3 [TYPE2] EN 166:2001 Personal eye protection
Face shield		Protect Face	-
Rubber sheet		Damage protection of front cover	-
Digital tester	-	Continuity test	-
Screwdriver	-	Removal / Install back panel	Plus, Minus, stubby plus
Hexagon wrench and socket	-	Removal / Install cable	Socket: 6 mm (0.24 in)
Waste cloth	-	Cleaning	-
Torque wrench	-	Tighten bolt / nut	-
Grease	-	Anti- corrosion of screws	-

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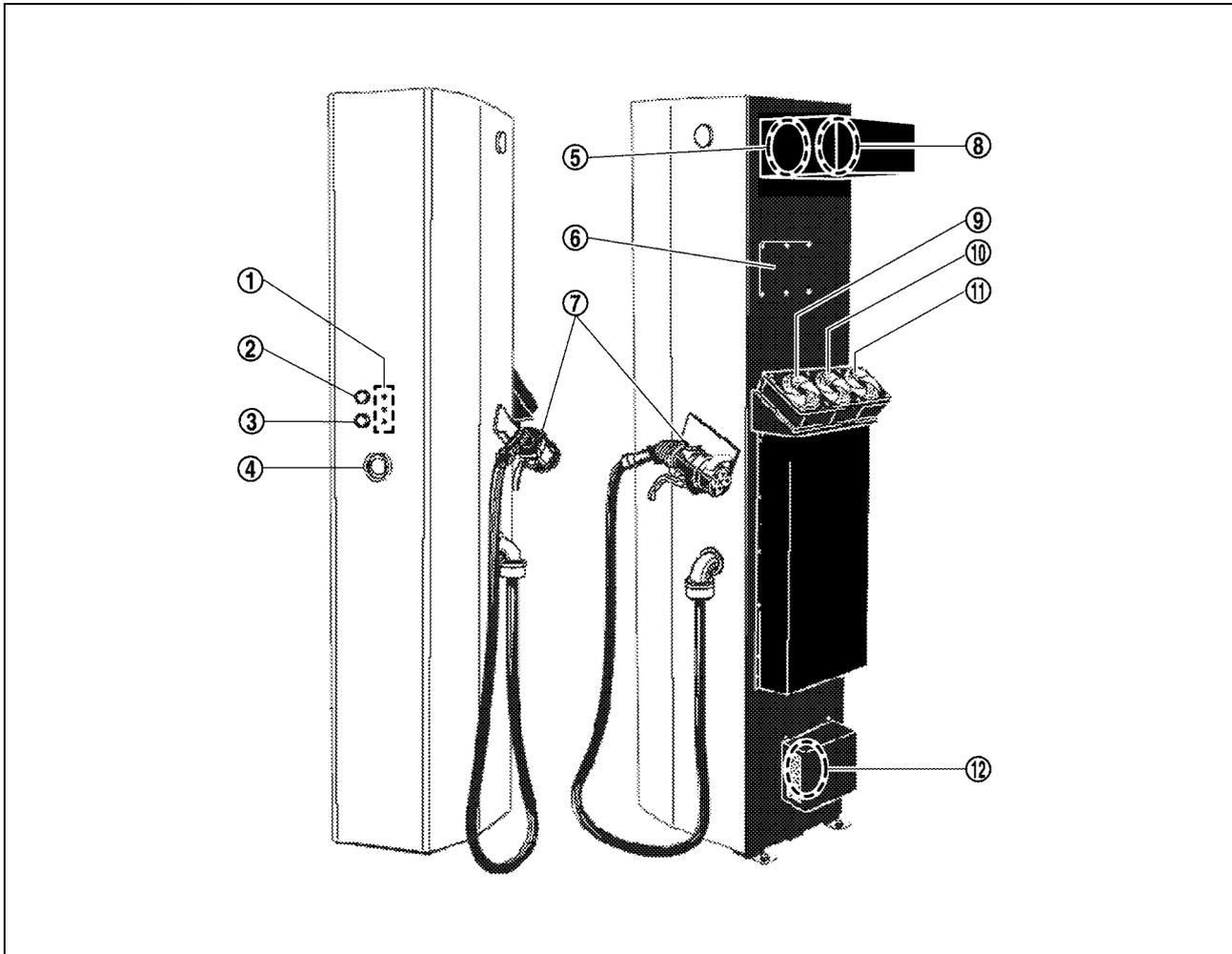
10. ASSEMBLY DIAGRAM

11. LOCATION OF LABEL APPLICATION

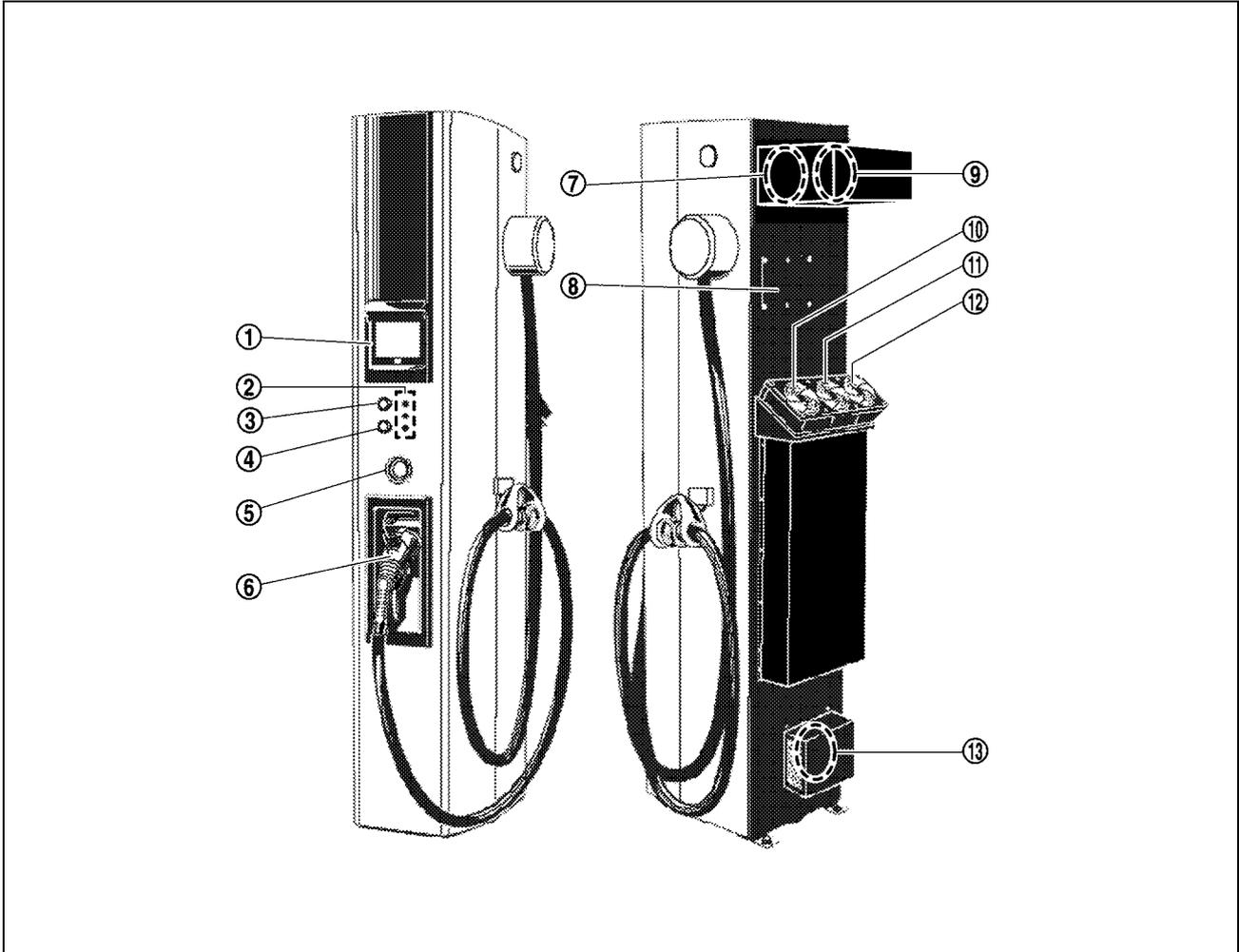
1. OVERVIEW OF THE QUICK CHARGER

1 - 1 : Names

1 - 1 - 1 : Base Specifications

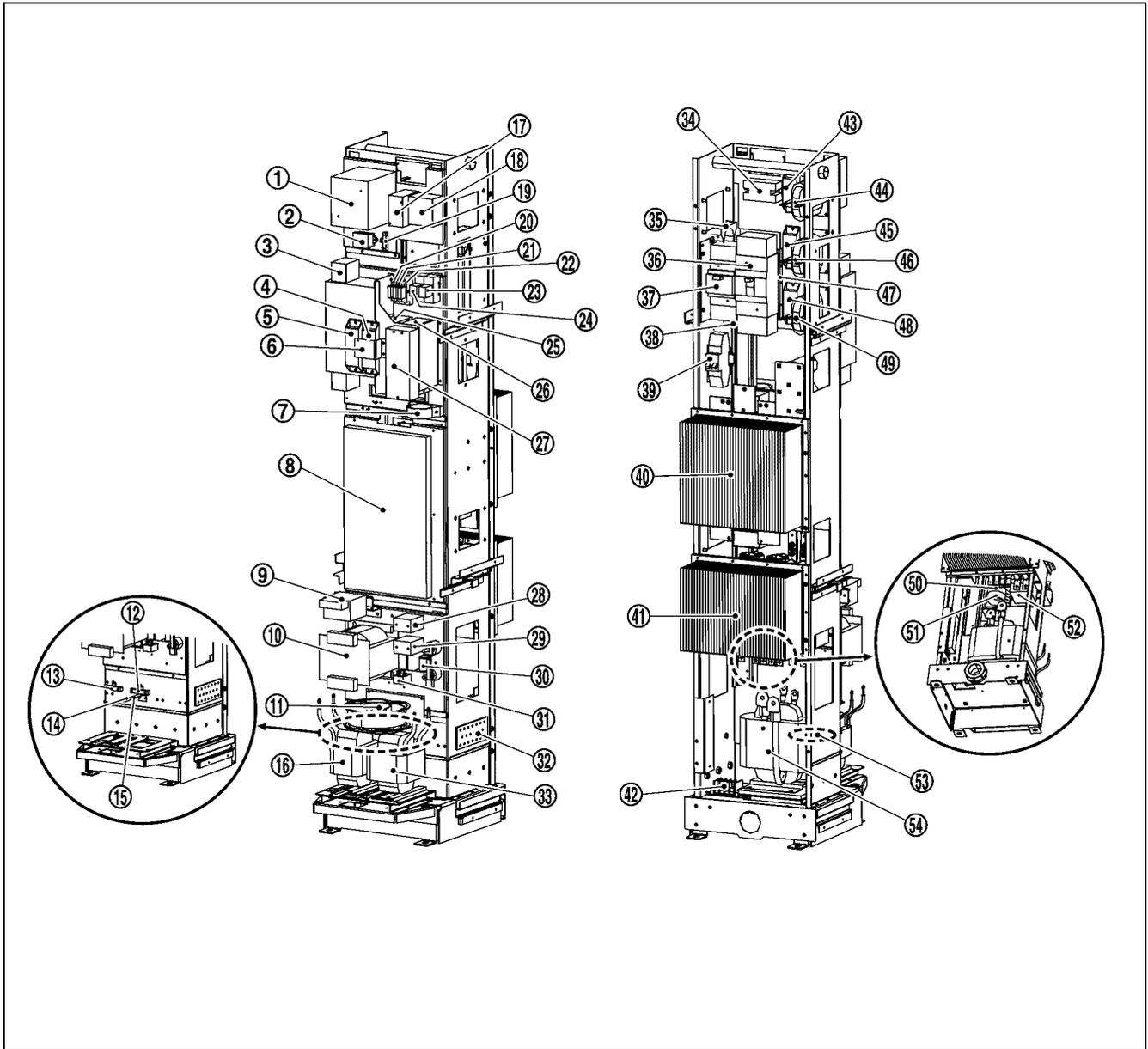


1. Indicator lamps (LED lamps)	2. Start button	3. Stop button
4. Emergency stop button	5. Fan assy- ventilation (FAN1-1)	6. Circuit breaker assy
7. Charge Connector	8. Fan assy- ventilation (FAN1-2)	9. Fan assy- cooling (FAN4)
10. Fan assy- cooling (FAN5)	11. Fan assy- cooling (FAN6)	12. Fan Assy- cooling, boost (FAN7)



1. Display assy (LCD)	2. Indicator lamps (LED lamps)	3. Start button
4. Stop button	5. Emergency stop button	6. Charge Connector
7. Fan assy- ventilation (FAN1-1)	8. Circuit breaker assy	9. Fan assy- ventilation (FAN1-2)
10. Fan assy- cooling (FAN4)	11. Fan assy- cooling (FAN5)	12. Fan assy- cooling (FAN6)
13. Fan Assy- cooling, boost (FAN7)		

1 - 1 - 3 : COMPORNENT PART LOCATION



1. Contactor assy- magnet,1st (MC1)	2. Relay assy-earth leak test (CR30) ^{*1}	3. Filter assy-noise (NF1)
4. Resistor assy-pre charge (R26)	5. Resistor assy-pre charge (R24)	6. Thermometer assy-system, D (TSTR5)
7. Filter assy-noise (ZACL5)	8. Controller assy-main (PWB1)	9. Heater assy-control (FH1) ^{*2}
10. Transformer assy-input power circuit (TR2)	11. Fan assy-cooling (FAN3)	12. Resistor assy (R23-2)
13. Resistor assy (R23-1)	14. Thermometer assy-system, C (TSTR3)	15. Thermometer assy-system, F (TSTR7)
16. Coil assy-dc filter, 2nd (L5)	17. Contactor assy-magnet, 2nd (MC4)	18. Contactor assy-magnet (TB1)
19. Resistor assy-earth leak test (R30) ^{*1}	20. Fuse assy (F5)	21. Fuse assy (F6)
22. Fuse assy (F7)	23. Heater assy-control (CR2) ^{*2}	24. Heater assy-control (CR1) ^{*2}
25. Power supplier assy-1st (PS1)	26. Power supplier assy-2nd (PS2)	27. Power supplier assy-3rd (PS3)
28. Contactor assy-magnet (MC3 -1)	29. Contactor assy-magnet (MC3 -2)	30. Fuse assy (F4)
31. Sensor assy-current (CT2)	32. Plate assy-earth bar	33. Coil assy-dc filter,1st (L4)
34. Filter assy-noise,1st (NF2)	35. Filter assy-noise (ZACL6)	36. Circuit breaker assy-1st (ELCB1)

37. Circuit breaker assy-2nd (ELCB2)	38. SPD assy-input	39. Heater assy-control (CP1) ^{*2}
40. Converter assy-matrix	41. Diode assy-rectifier	42. Terminal block assy-ac (TB2) ^{*3}
43. Resistor assy-damping (R1)	44. Coil assy- AC filter (L1)	45. Resistor assy-damping (R2)
46. Coil assy-ac filter (L2)	47. Thermometer assy-system, E (TSTR6)	48. Resistor assy-damping (R3)
49. Coil assy-ac filter (L3)	50. Filter assy-noise (ZACL1)	51. Filter assy-noise (ZACL2)
52. Heater assy-control (FH2) ^{*2}	53. Thermometer assy-system, C (TSTR4)	54. Transformer assy(TR1)

*1: Type1

*2: Cold Specifications

*3: Type2

1 - 2 : Specifications

1 - 2 - 1 : TYPE1

	Base Specifications	Standard Specifications	Cold Specifications
Type	NSQC442D	NSQC442E	
Rated input	50 kVA, 3-phase AC 480 V, 60 Hz		
Output voltage	DC 50 - 500 V		
Output current	DC 0 - 120 A		
Power supply connector	Conforms to JEVS G 105-1993.		
Dimensions (case only)	Height: 1840 mm Width: 380 mm Depth: 600 mm	Height: 1840 mm Width: 380 mm Depth: 665 mm	
Service temperature range	-10 - +40 deg C (+14 - +104 deg F)		-30 - +40 deg C (-22 - +104 deg F)
Required measures	-	-	Installation of heater
Humidity range	30 - 90%		
Weight	161 kg (355.01 lb)	203.4kg (448.5 lb)	
Rated efficiency	90% or more		
Waterproofing and dust proofing	Equivalent to IP33 (IEC standard)	Equivalent to IP55 (IEC standard)	
Cable length	2 m (6.6 ft)	4 m (13.1 ft)	

1 - 2 - 2 : TYPE2

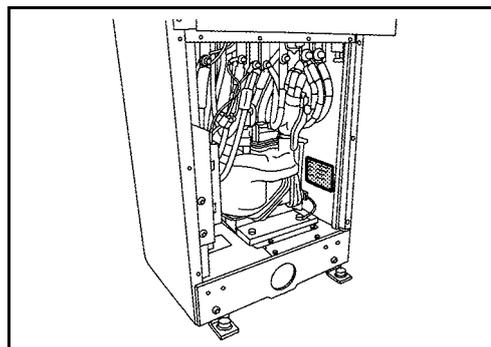
	Base Specifications	Standard Specifications	Cold Specifications
Type	NSQC442F	NSQC442G	
Rated input	50 kVA, 3-phase AC 400 V, 50 Hz		
Output voltage	DC 50 - 500 V		
Output current	DC 0 - 120 A		
Power supply connector	Conforms to JEVS G 105-1993.		
Dimensions (case only)	Height: 1840 mm Width: 380 mm Depth: 600 mm	Height: 1840 mm Width: 380 mm Depth: 665 mm	
Service temperature range	-10 - +40 deg C (+14 - +104 deg F)		-30 - +40 deg C (-22 - +104 deg F)
Required measures	-	-	Installation of heater
Humidity range	30 - 90%		
Weight	161 kg (355.01 lb)	203.4kg (448.5 lb)	
Rated efficiency	90% or more		
Waterproofing and dust proofing	Equivalent to IP33 (IEC standard)	Equivalent to IP55 (IEC standard)	
Cable length	2 m (6.6 ft)	4 m (13.1 ft)	



- The quick charger is intended to be connected to a dedicated power supply transformer or power supply generator. Never directly connect to low voltage overhead power distribution lines.
- The quick charger is intended to be used at locations where the distance is 30 m (98.4ft) or more from any radio sensitive objects. Never use the quick charger at locations where the distance is less than 30m (98.4ft) from any radio sensitive objects.
- The quick charger may cause radio interference. Supplementary mitigation measures may be required.

1 - 3 : Where are a label of serial No., model No., and part No. located

The label is on the rear side of quick charger and on the right side of plate assy-back (lower).



1 - 4 : Precautions related to prevention of electric shock



Never touch the primary side (Type1: AC 480 V, Type2: AC 400 V), damaged portion of charge cable and charge connector, or exposed portion of the inside board. Always wear insulated personal protective equipment (PPE) when any of the portions are to be touched.

Even after the primary power supply (Type1: AC 480 V, Type2: AC 400 V) is turned OFF, high voltage may be retained until the capacitor discharge is complete. Never touch any terminal or device with bare hands to any terminals or devices. Always wear personal protective equipment (PPE).

Indicates a hazard which will result in death or serious injury if instructions are not followed.



When performing inspection or service, always turn OFF the primary power supply (Type1: AC 480 V, Type2: AC 400 V) and the breakers.

When performing inspection or service, always post the following directions in the working area to prevent a third party from turning ON the primary power supply (Type1: AC 480 V, Type2: AC 400 V) switch.

Indicates a potential hazard which could result in death or serious injury if instructions are not followed.



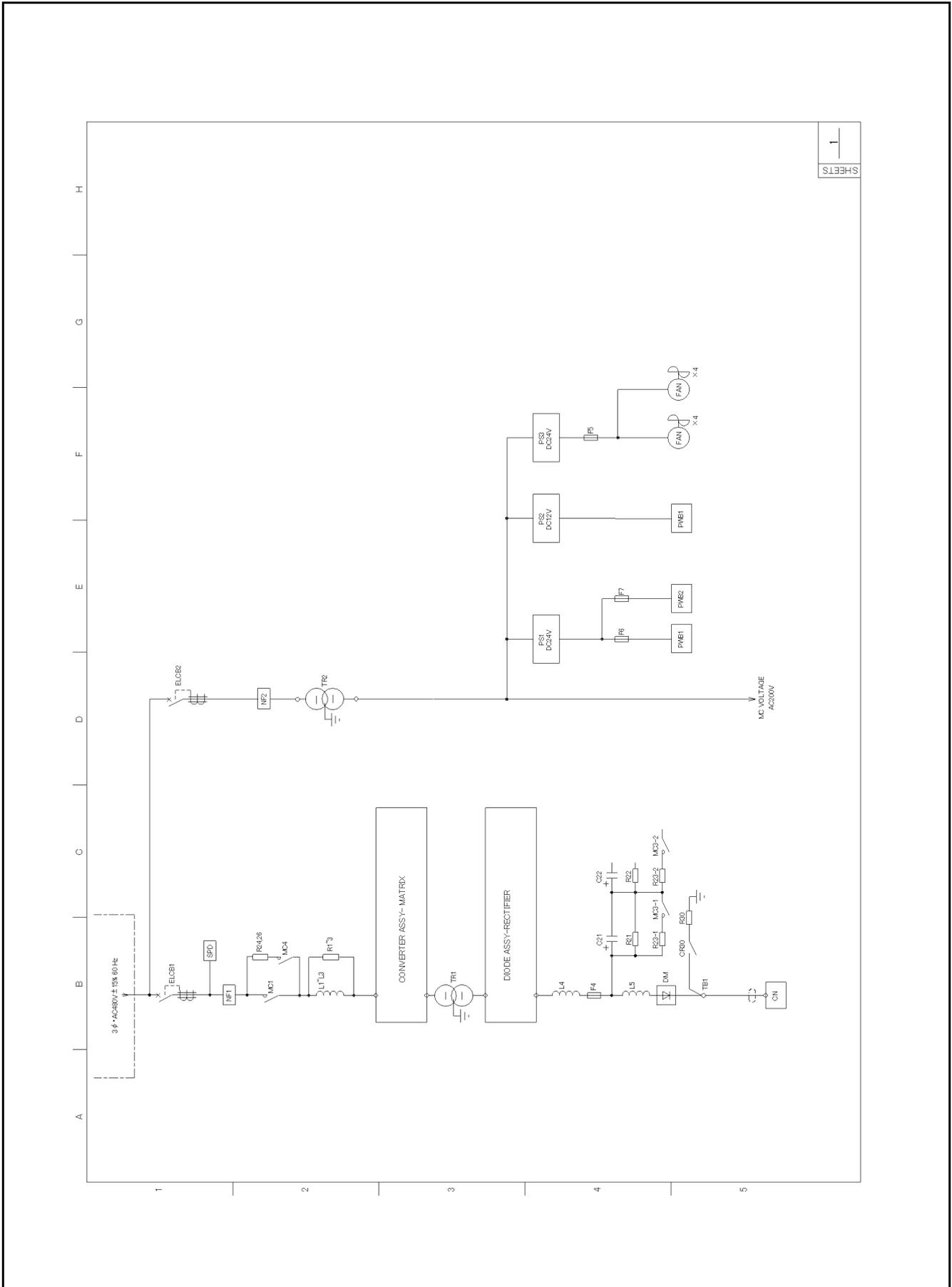
To call the attention of other workers, indicate "Danger: High voltage work in progress. Do not touch!".

Person in charge: _____
DO NOT TOUCH!
IN PROGRESS.
HIGH VOLTAGE REPAIR
DANGER:

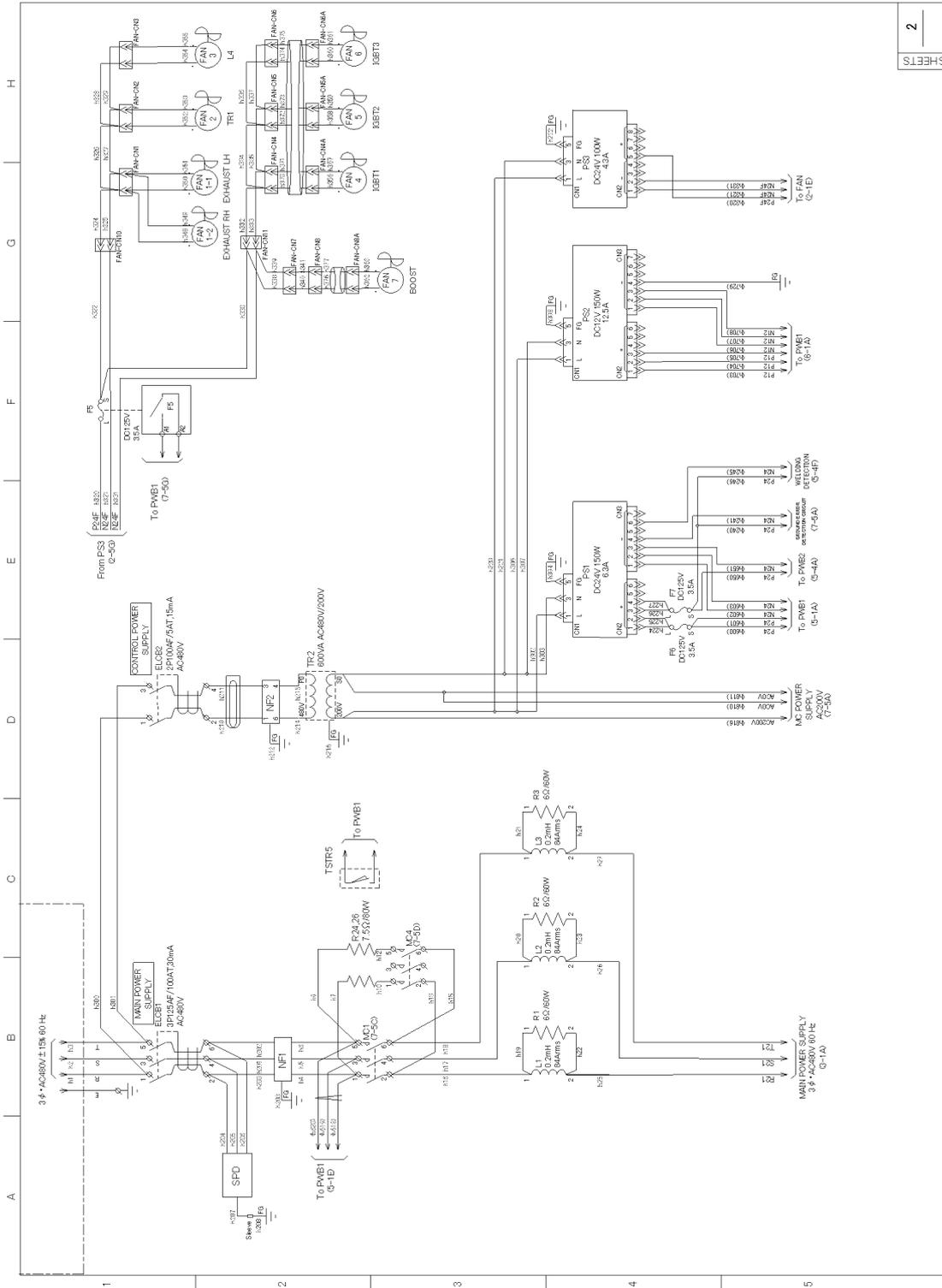
DANGER:
HIGH VOLTAGE REPAIR
IN PROGRESS.
DO NOT TOUCH!
Person in charge: _____

1 - 5 : Wiring Diagram (Type1: Base Specifications)

1 - 5 - 1 : SINGLE LINE WIRE CONNECTION DIAGRAM

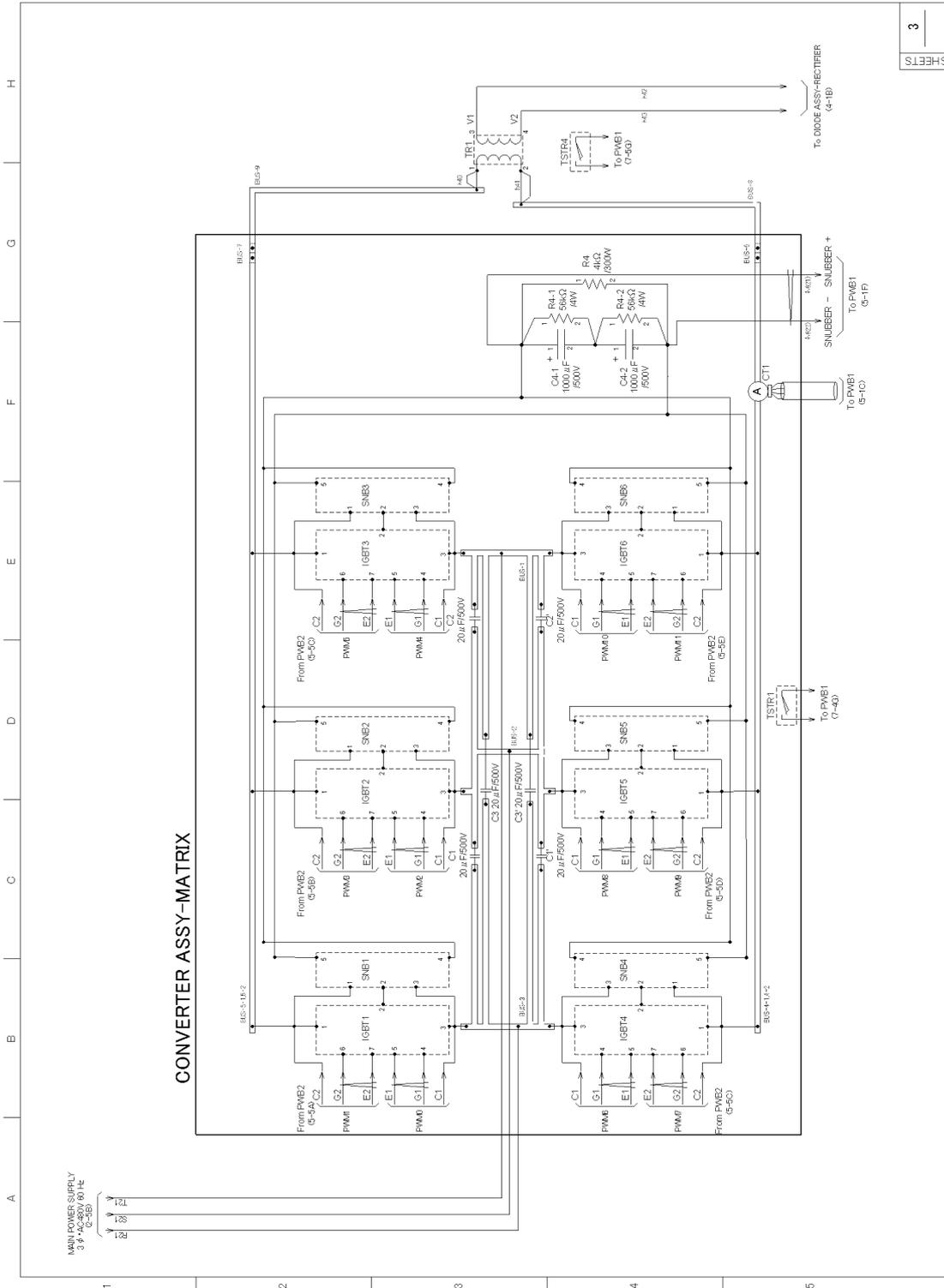


1 - 5 - 2 : MAIN CIRCUIT - POWER SUPPLY



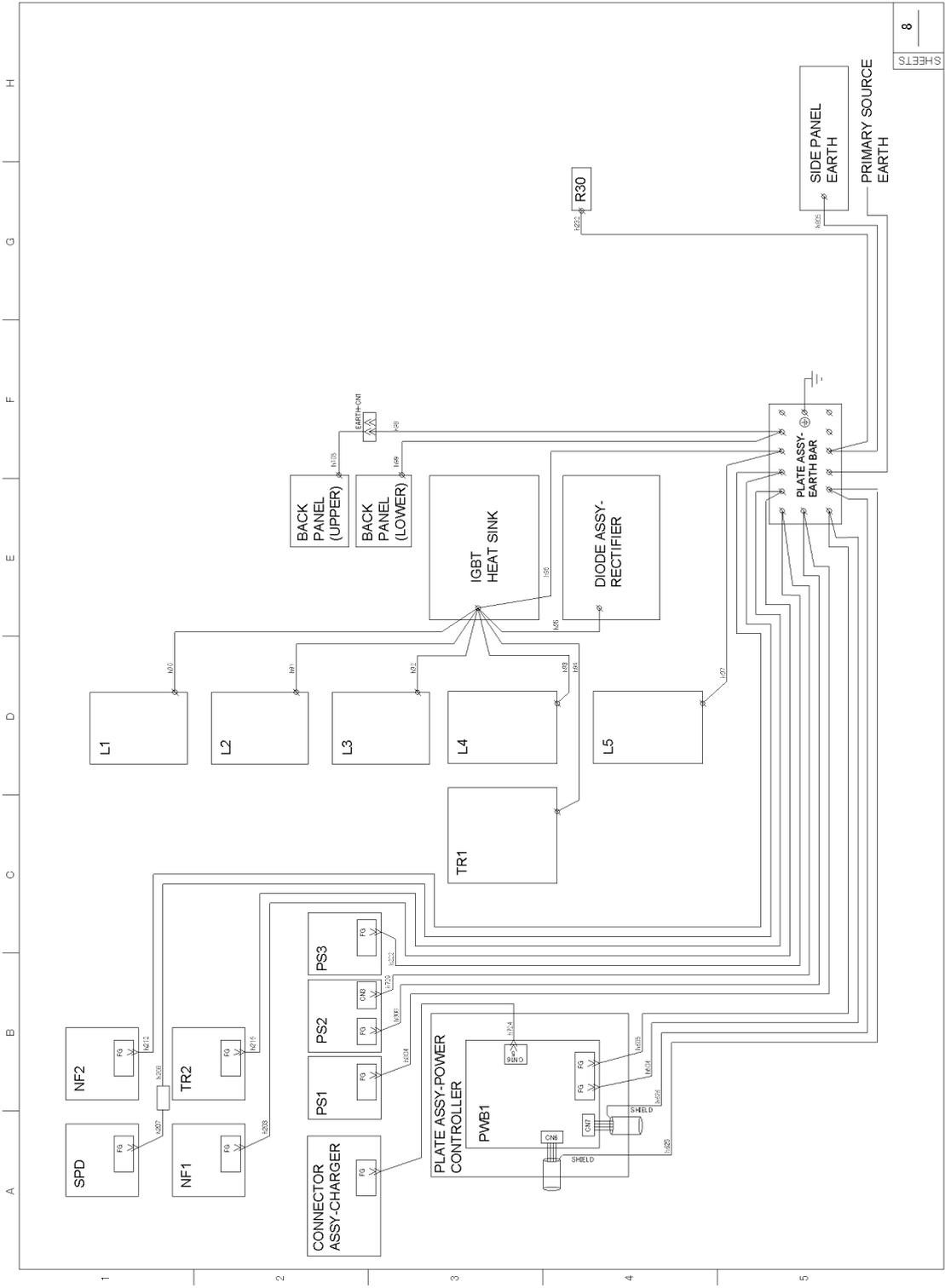
2
SHEETS

1 - 5 - 3 : MAIN CIRCUIT - CONVERTER ASSY, MATRIX



3
SHEETS

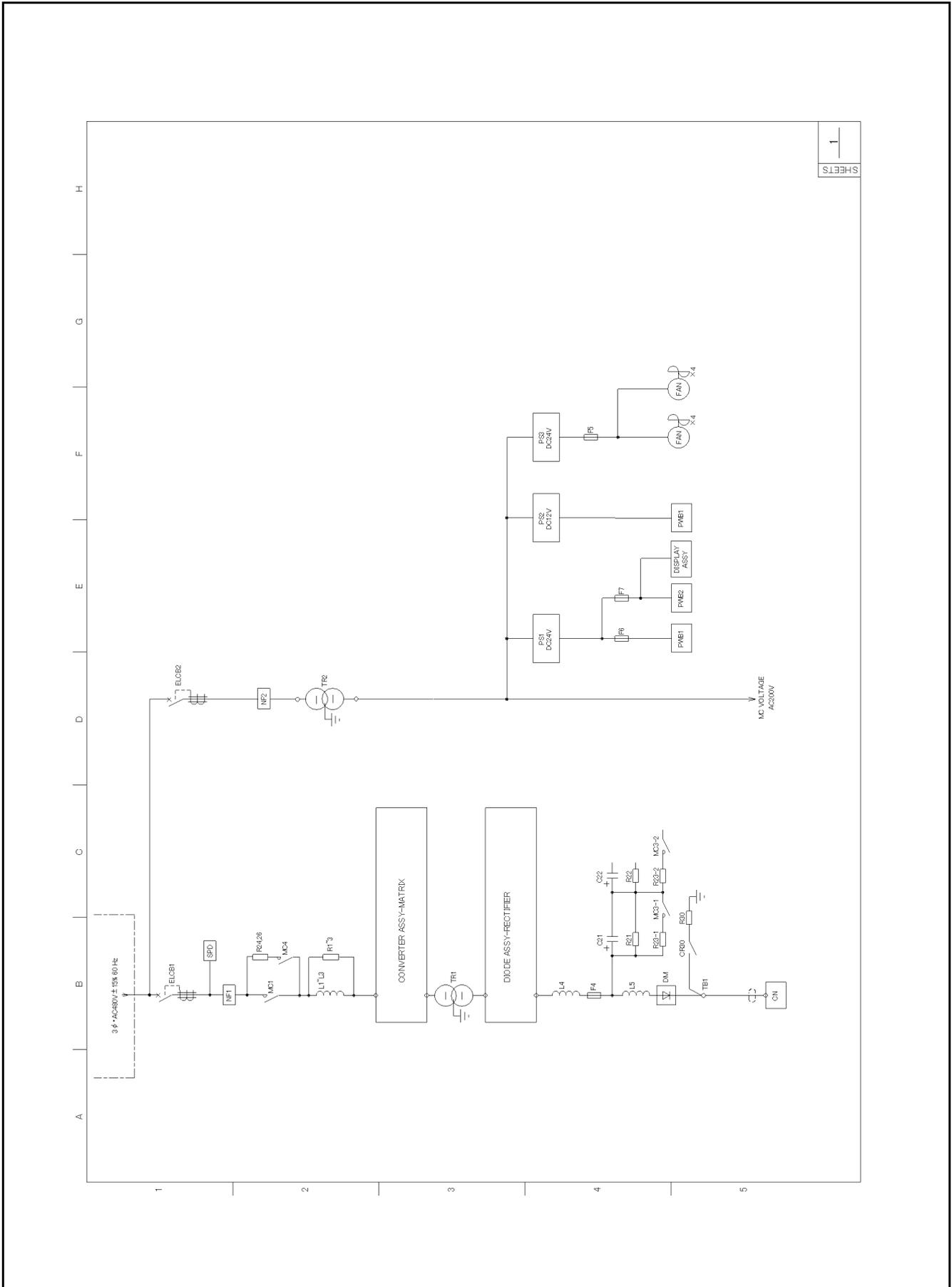
1 - 5 - 8 : EARTH CONNECTION DIAGRAM



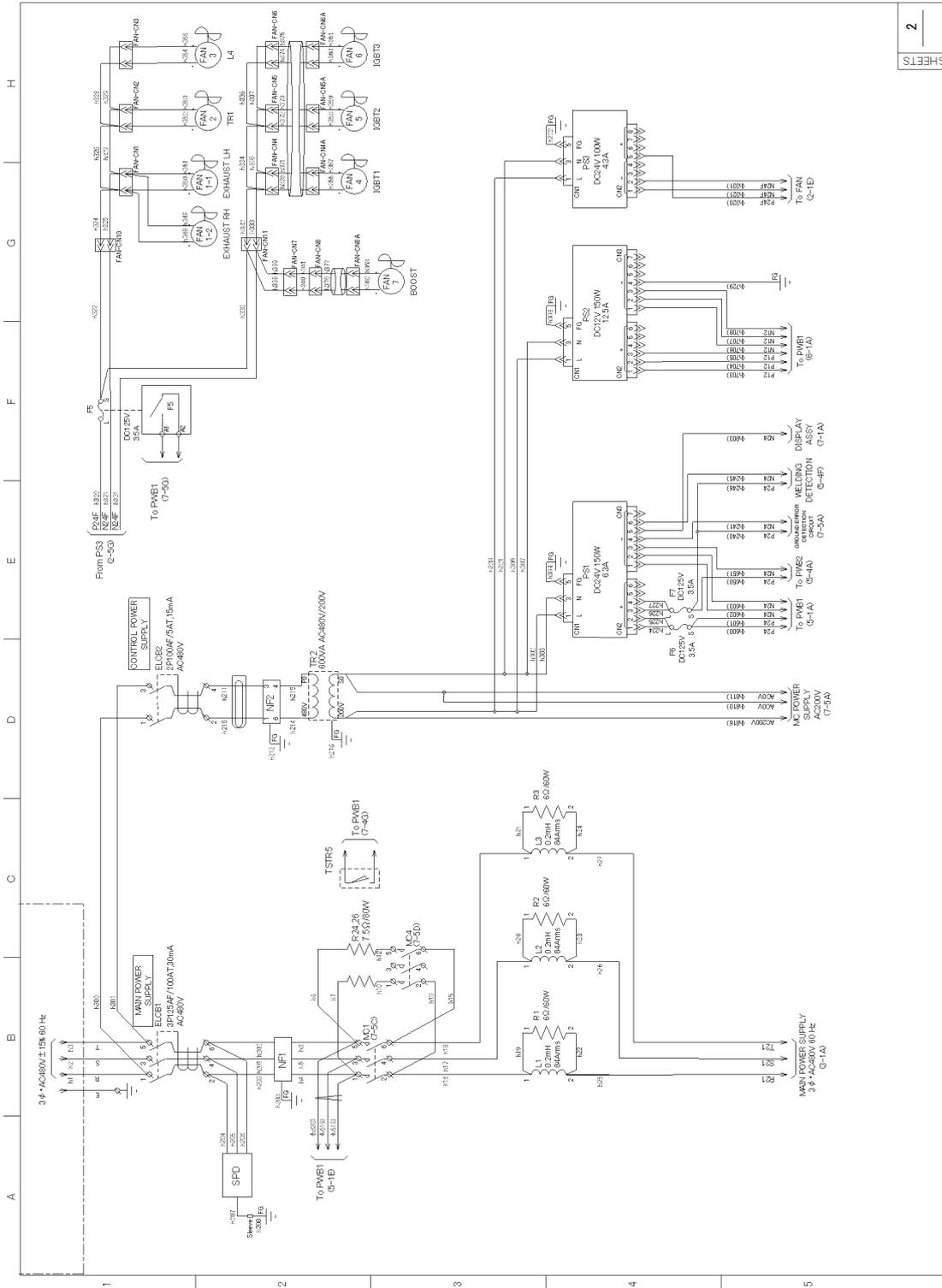
8
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1 - 6 : Wiring Diagram (Type1: Standard Specifications)

1 - 6 - 1 : SINGLE LINE WIRE CONNECTION DIAGRAM

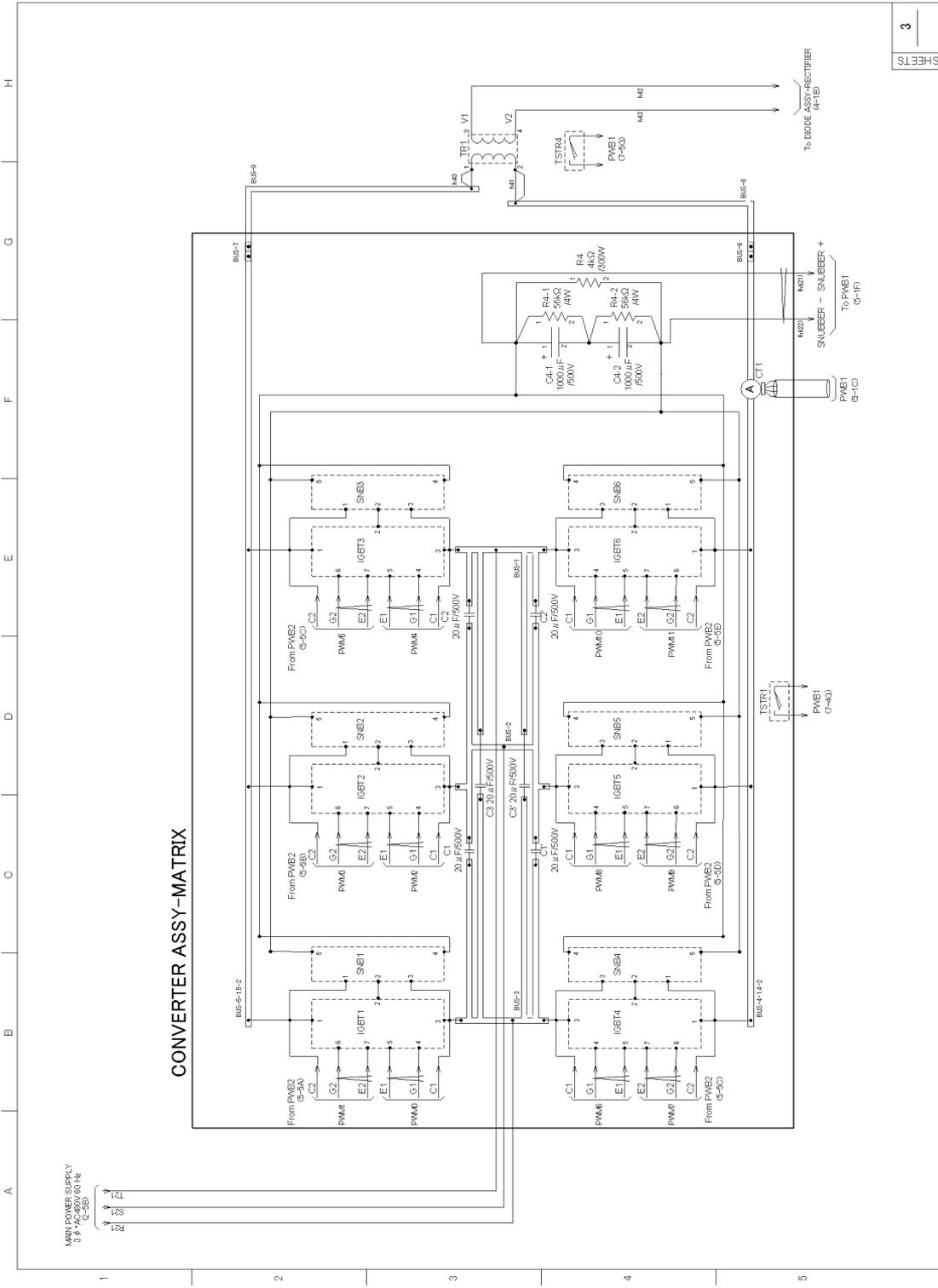


1 - 6 - 2 : MAIN CIRCUIT - POWER SUPPLY

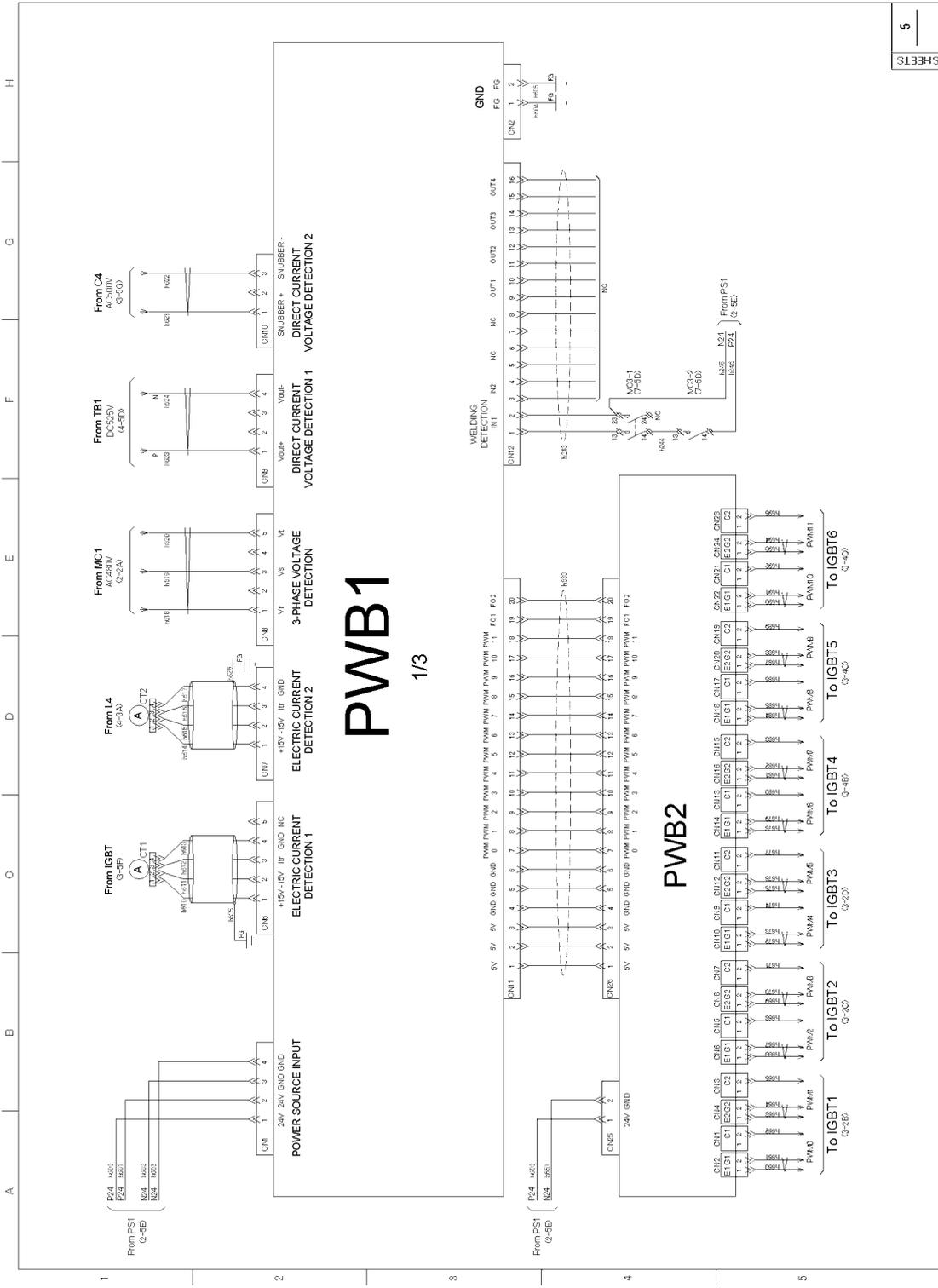


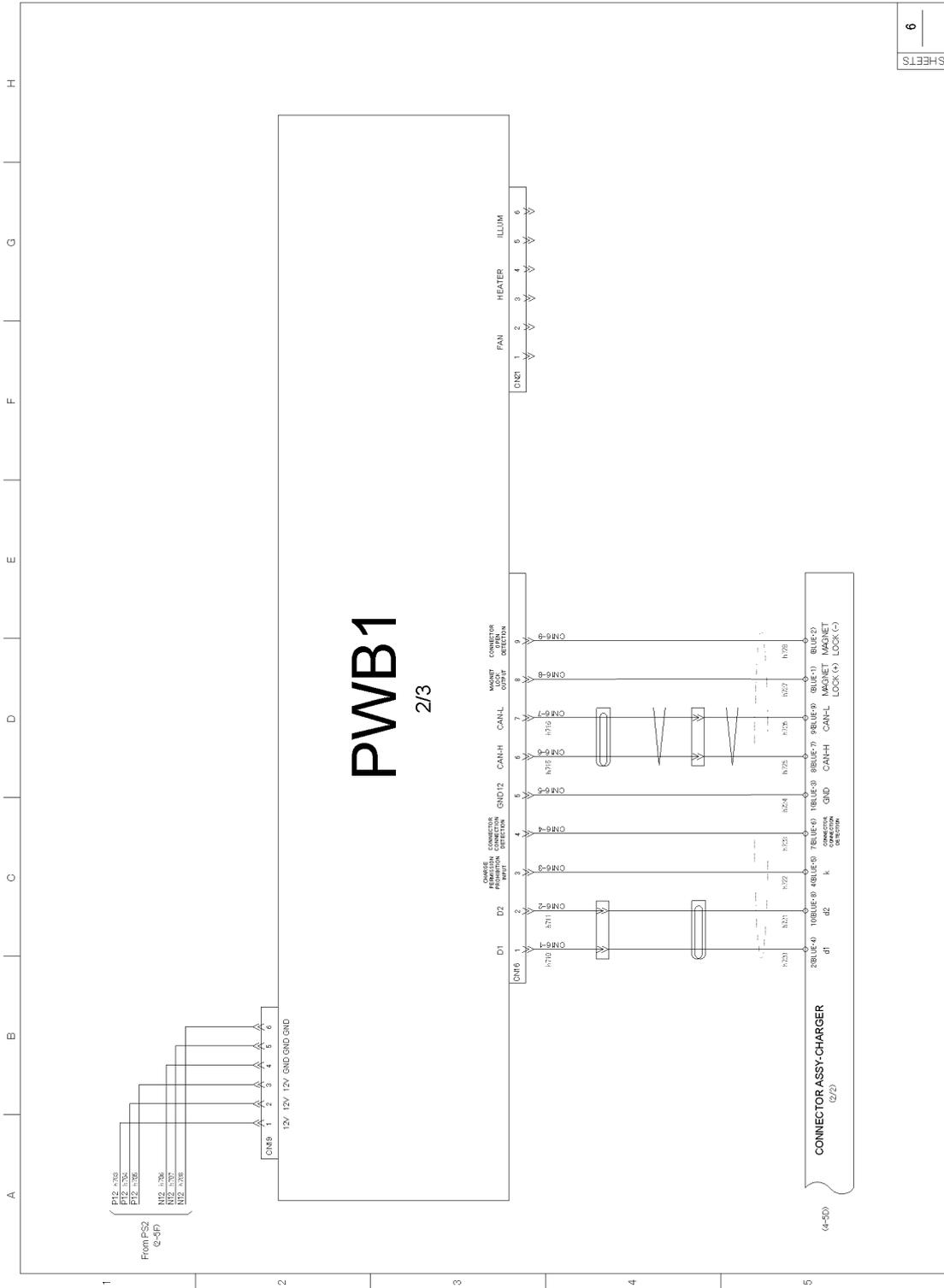
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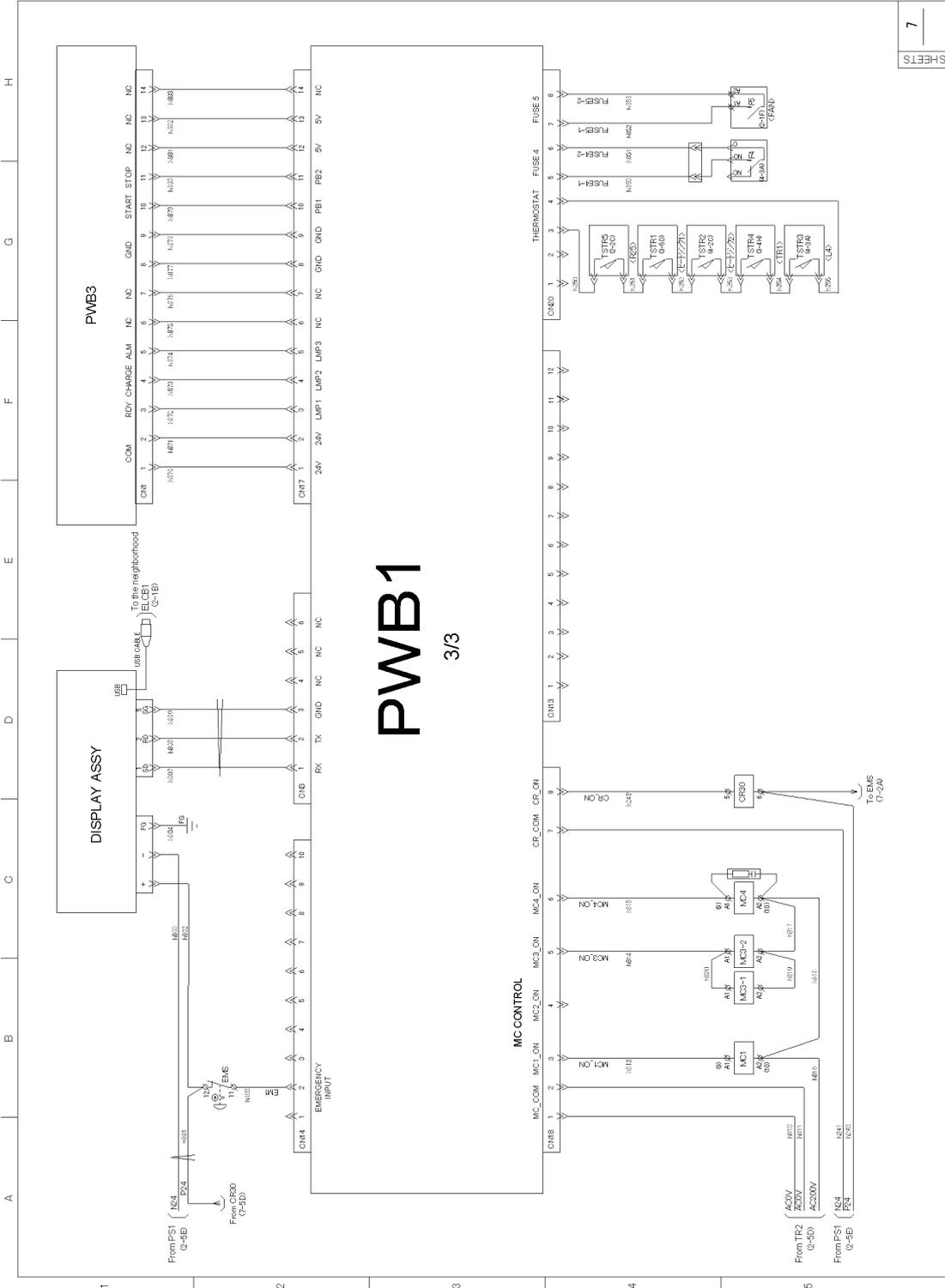
1 - 6 - 3 : MAIN CIRCUIT - CONVERTER ASSY, MATRIX



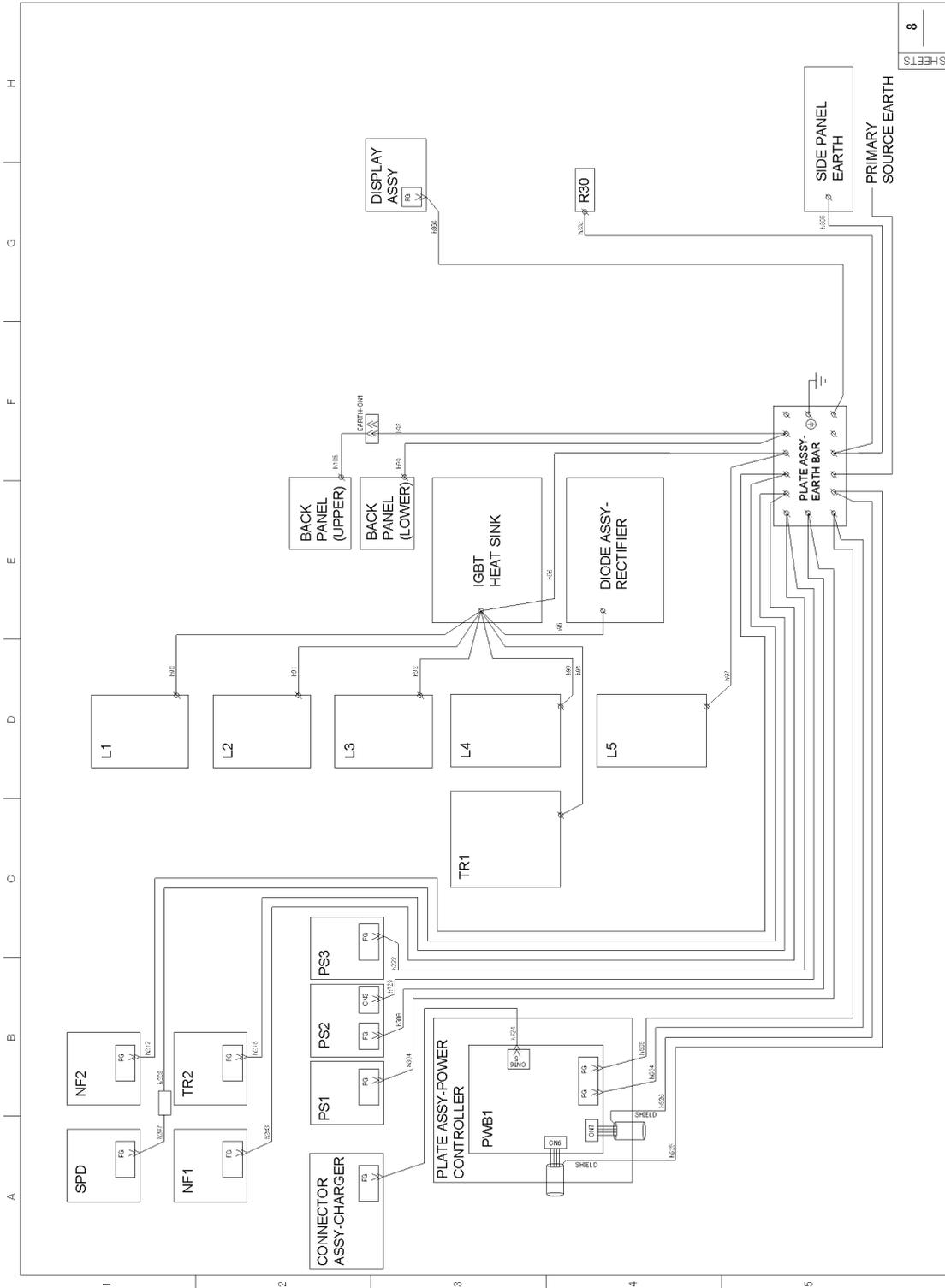
SHEETS
3







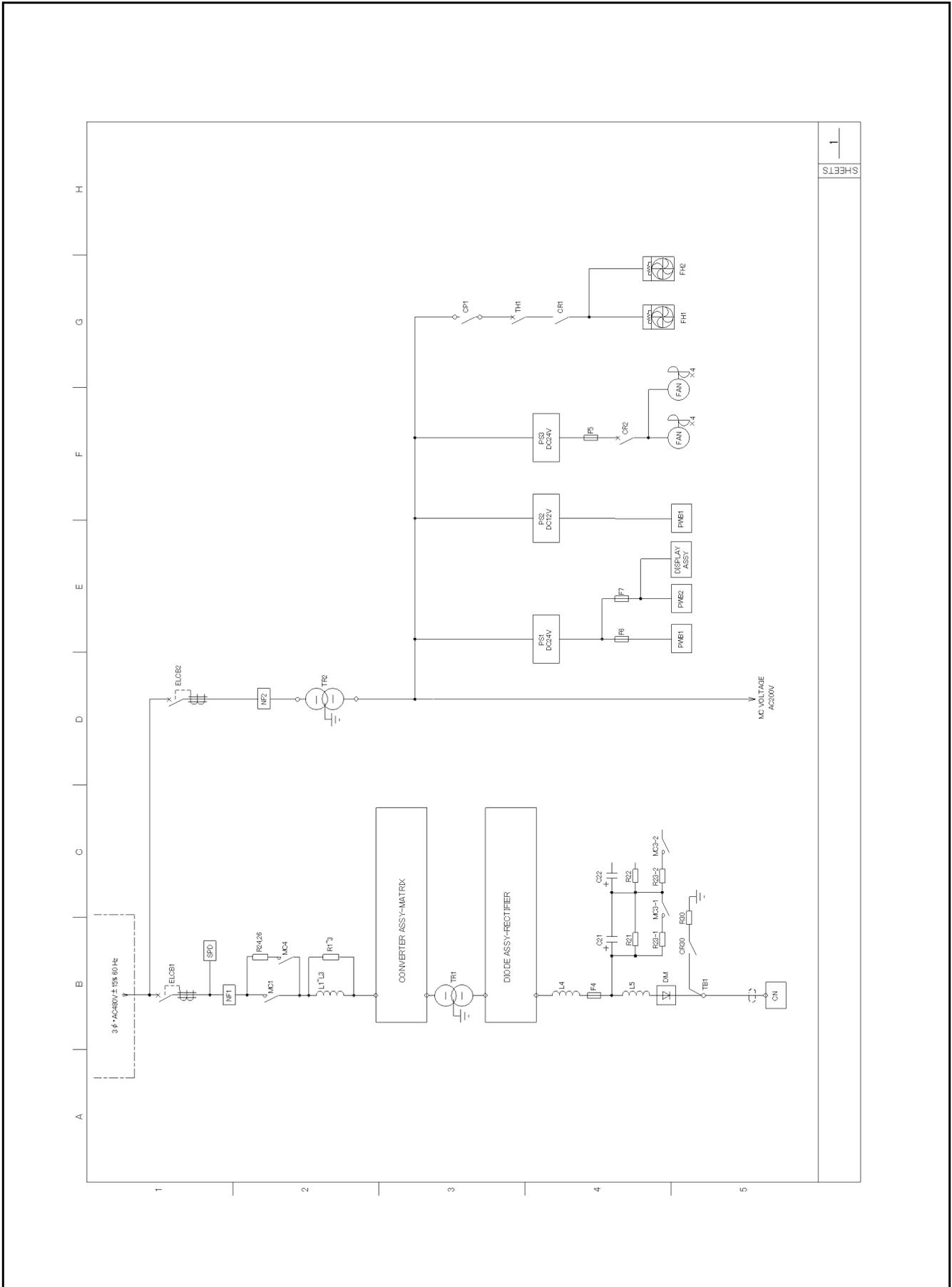
1 - 6 - 8 : EARTH CONNECTION DIAGRAM



8
SHEETS

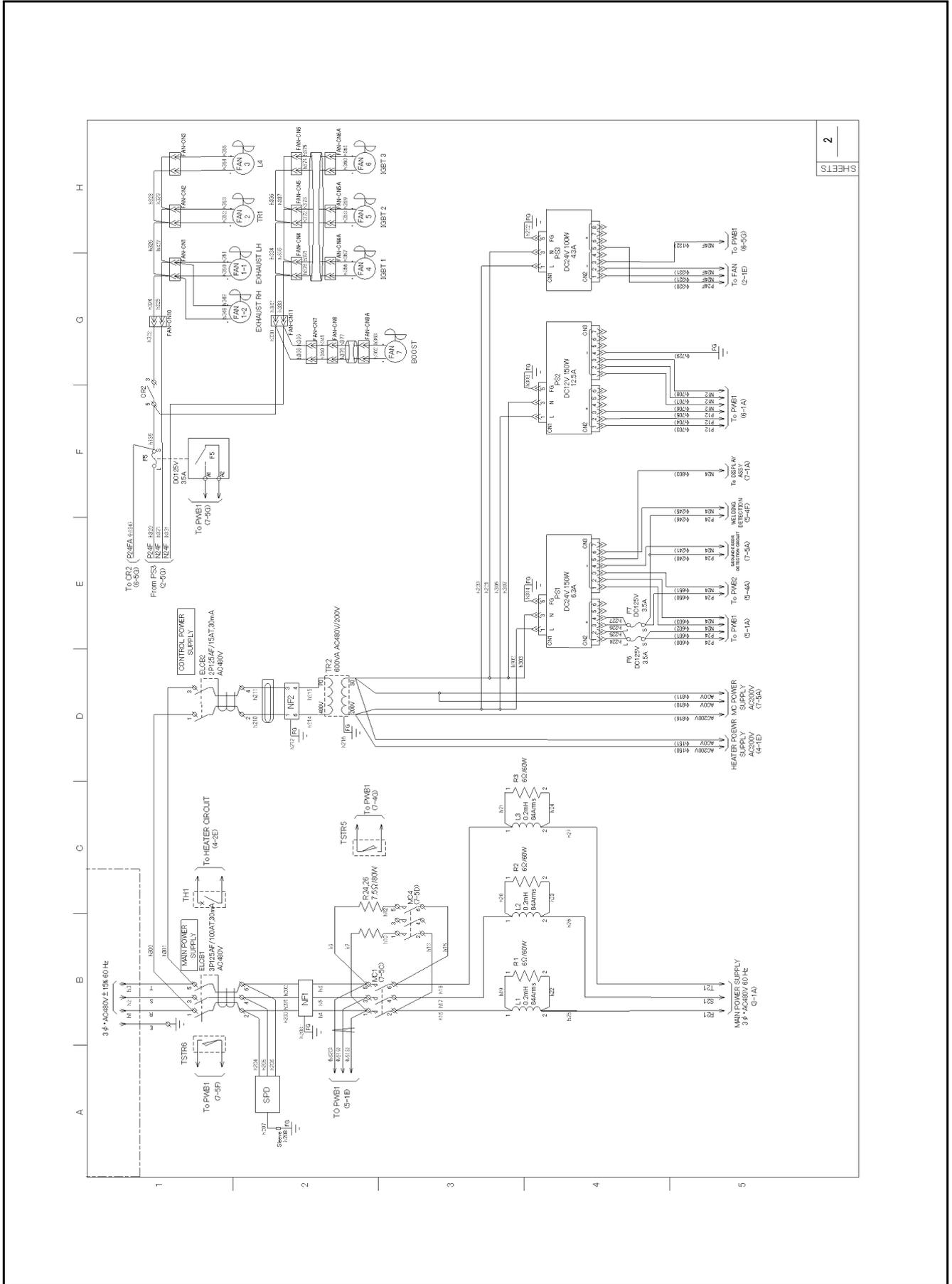
1 - 7 : Wiring Diagram (Type1: Cold Specifications)

1 - 7 - 1 : SINGLE LINE WIRE CONNECTION DIAGRAM

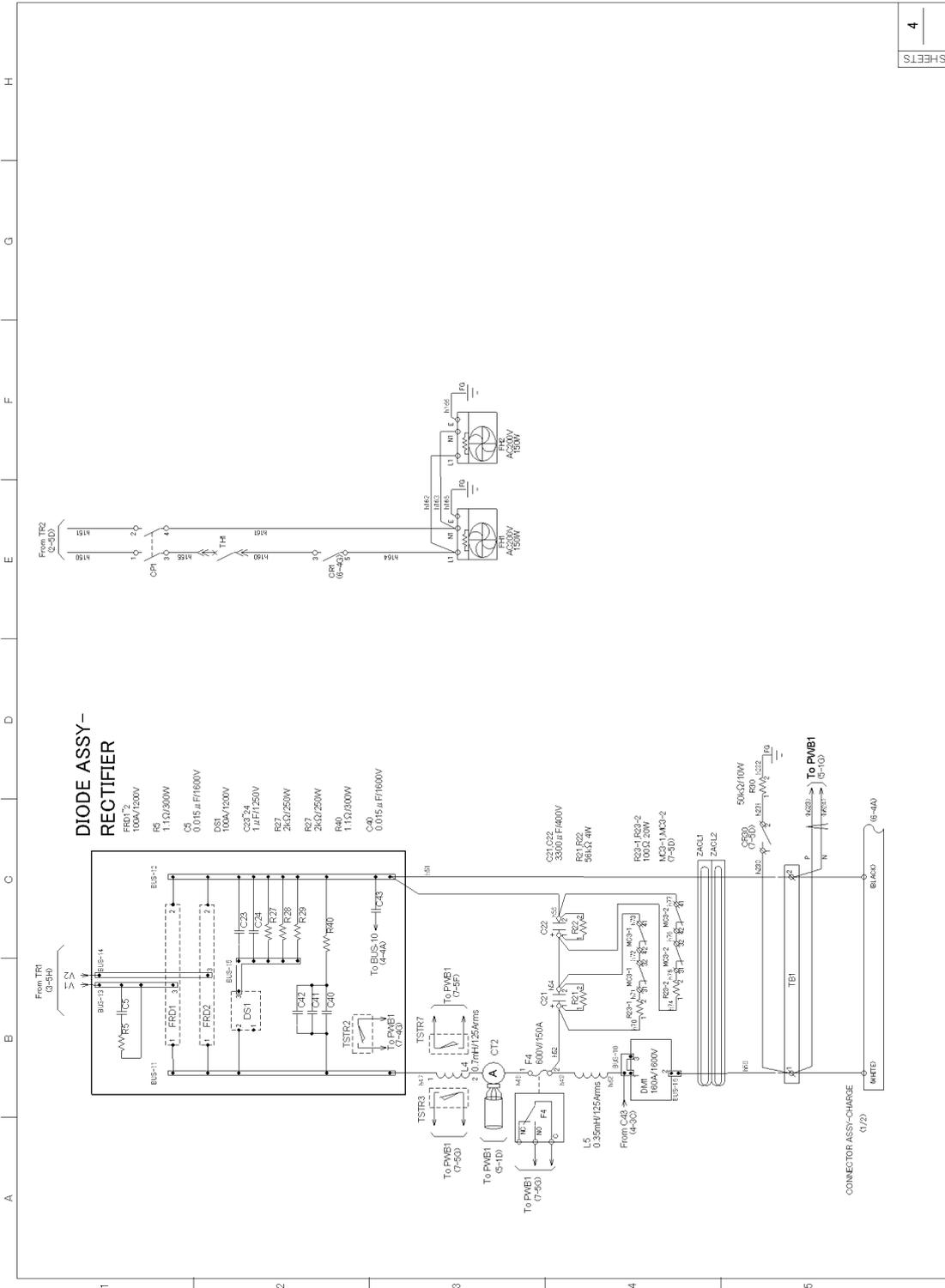


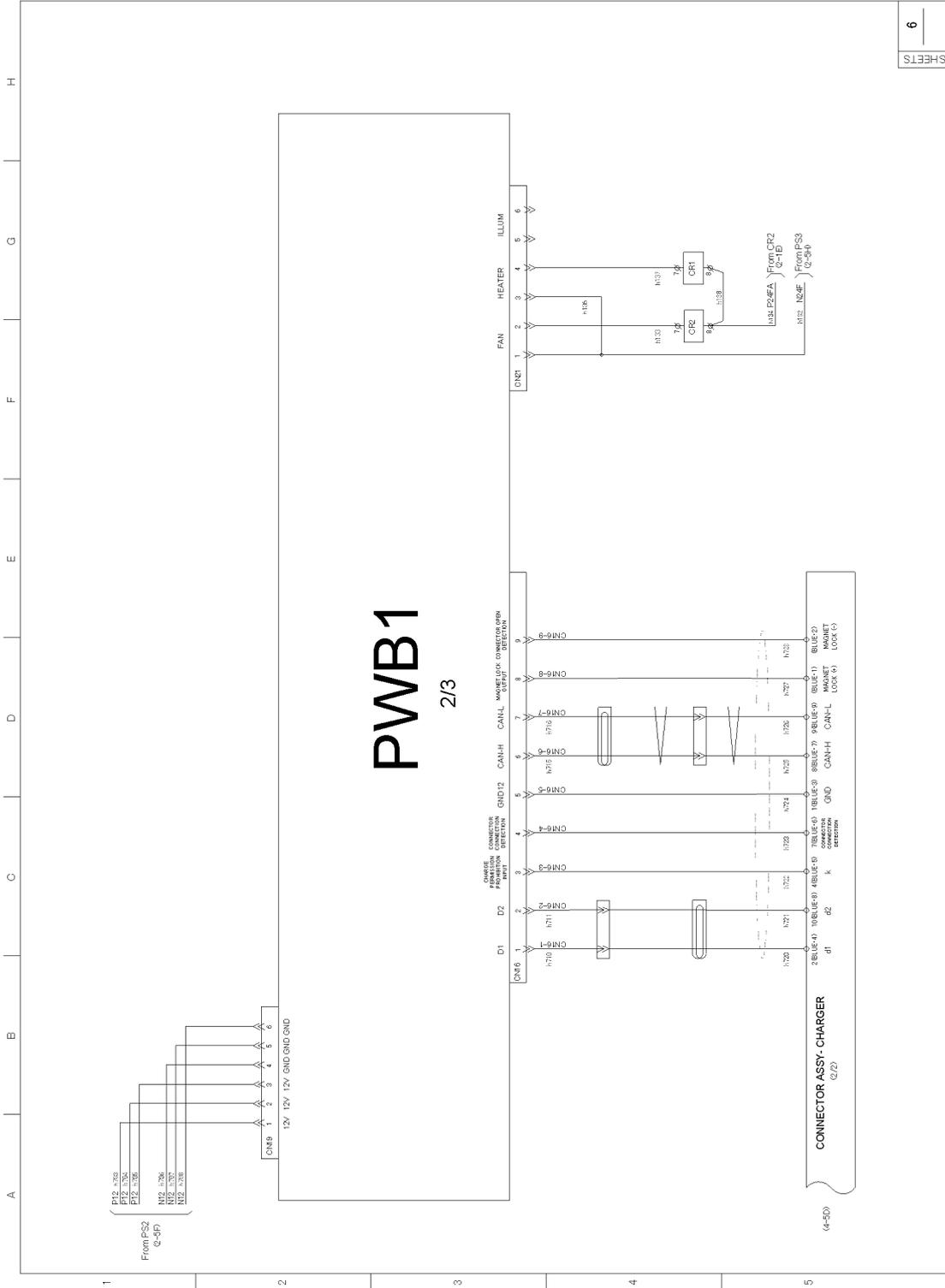
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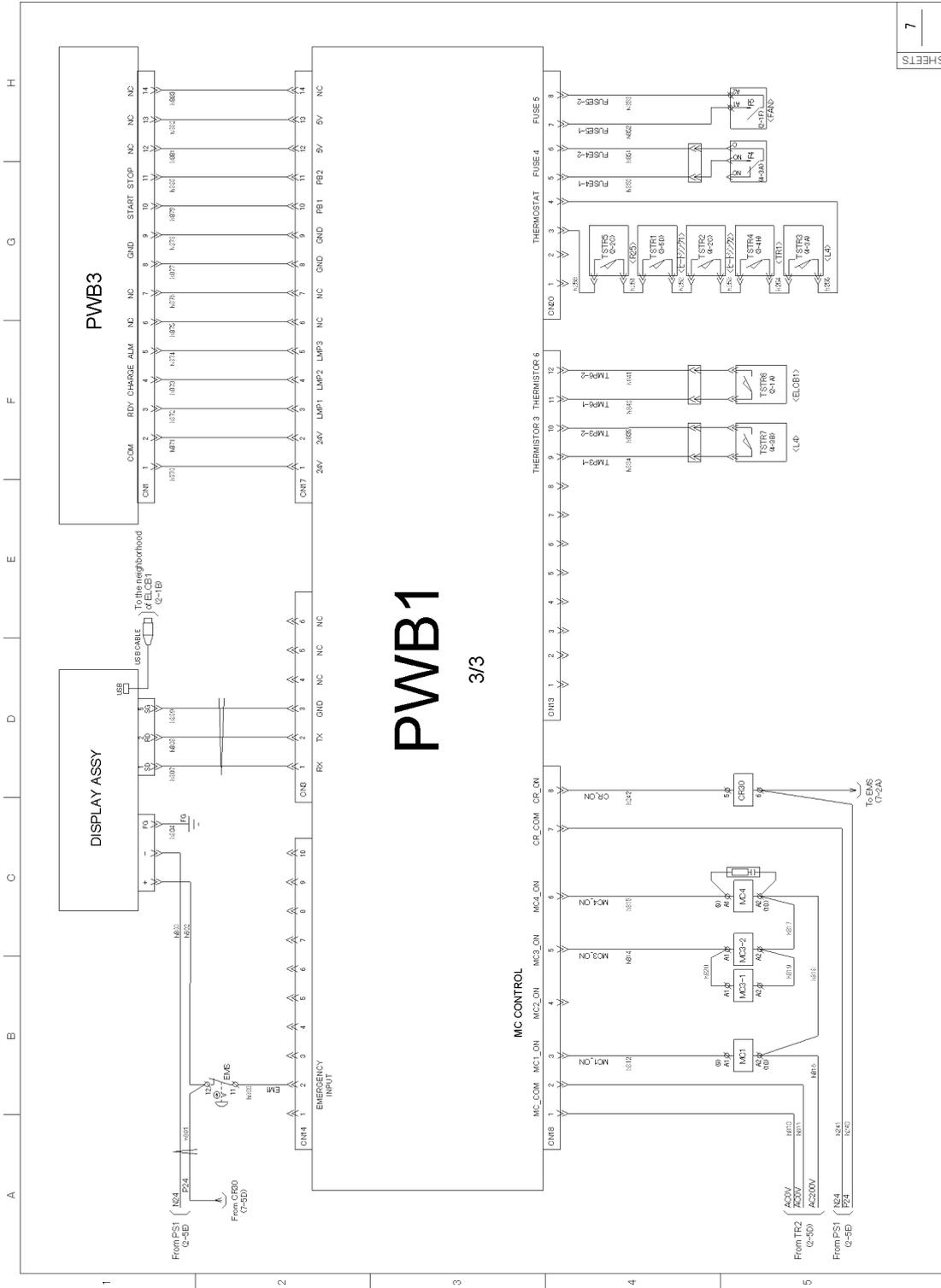
1 - 7 - 2 : MAIN CIRCUIT - POWER SUPPLY



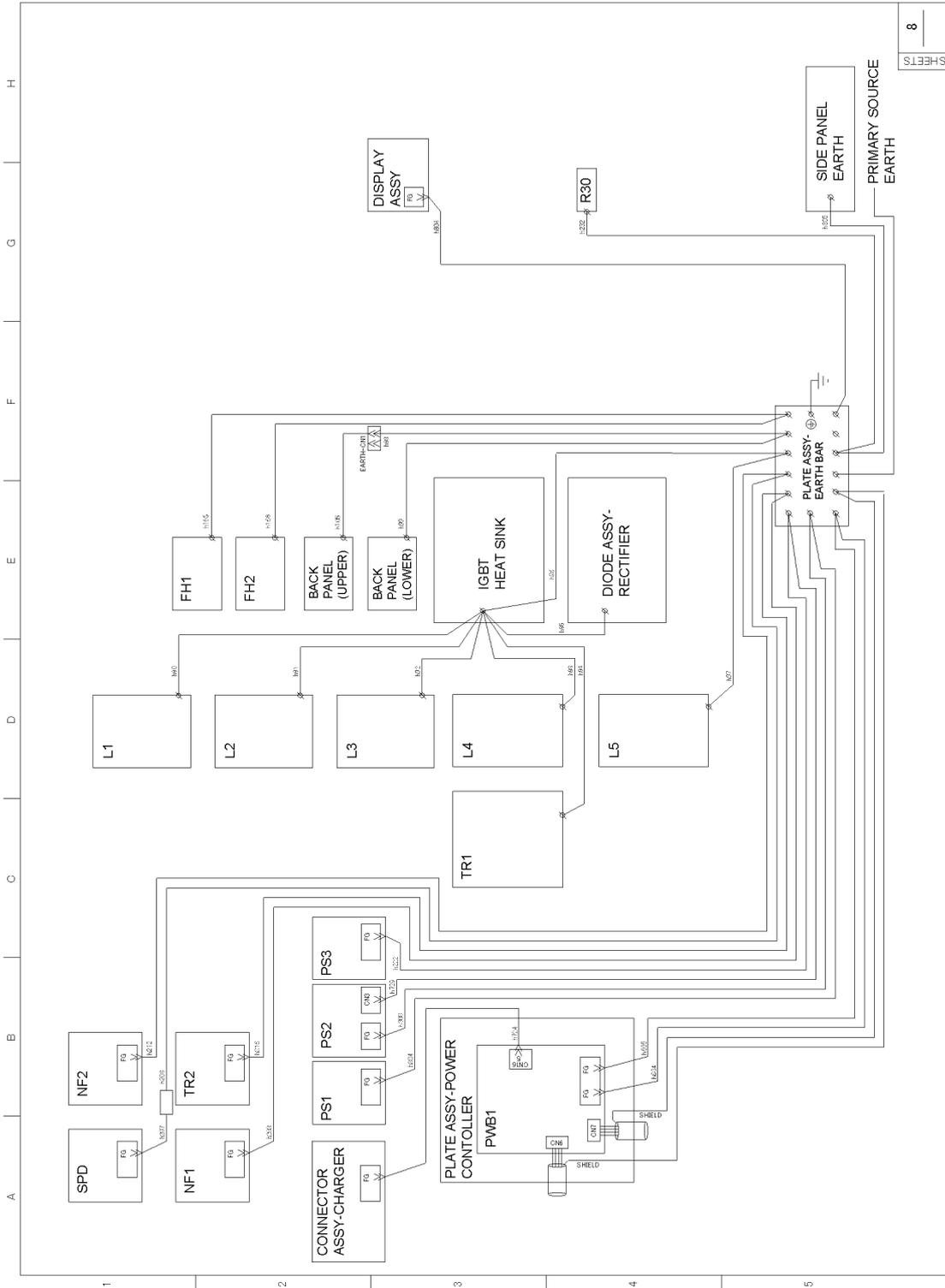
1 - 7 - 4 : MAIN CIRCUIT - DIODE ASSY - RECTIFIER



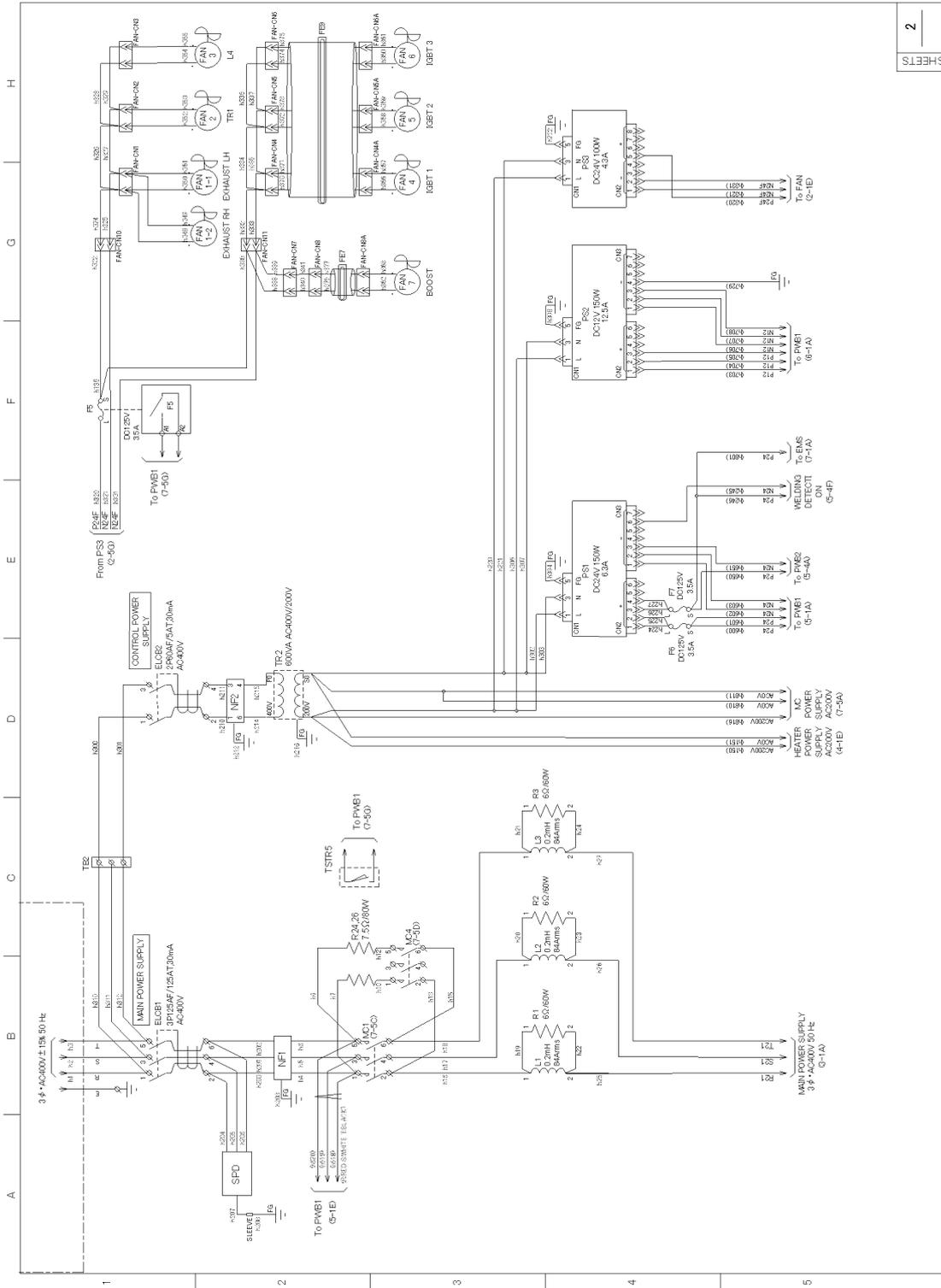




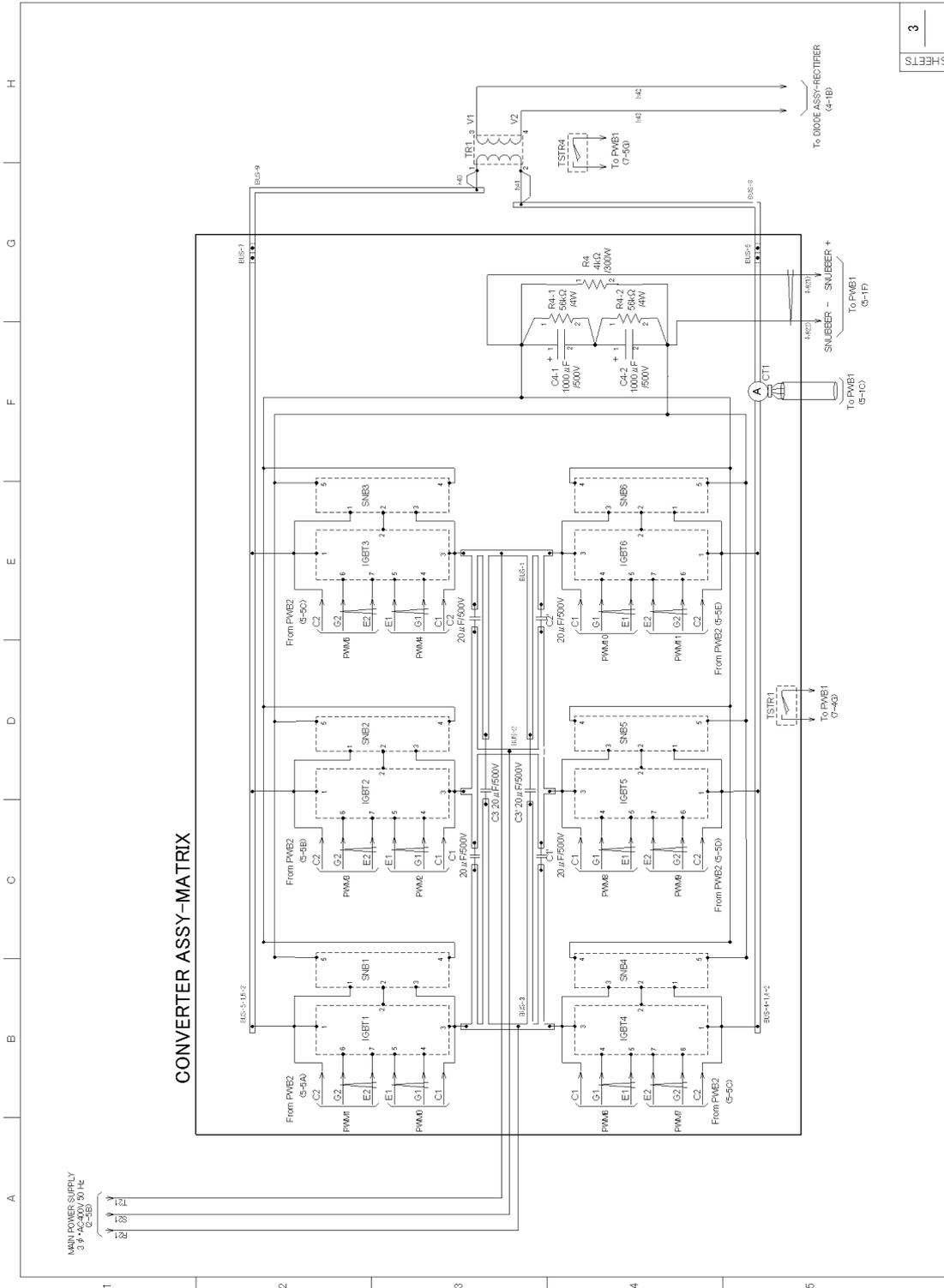
1 - 7 - 8 : EARTH CONNECTION DIAGRAM



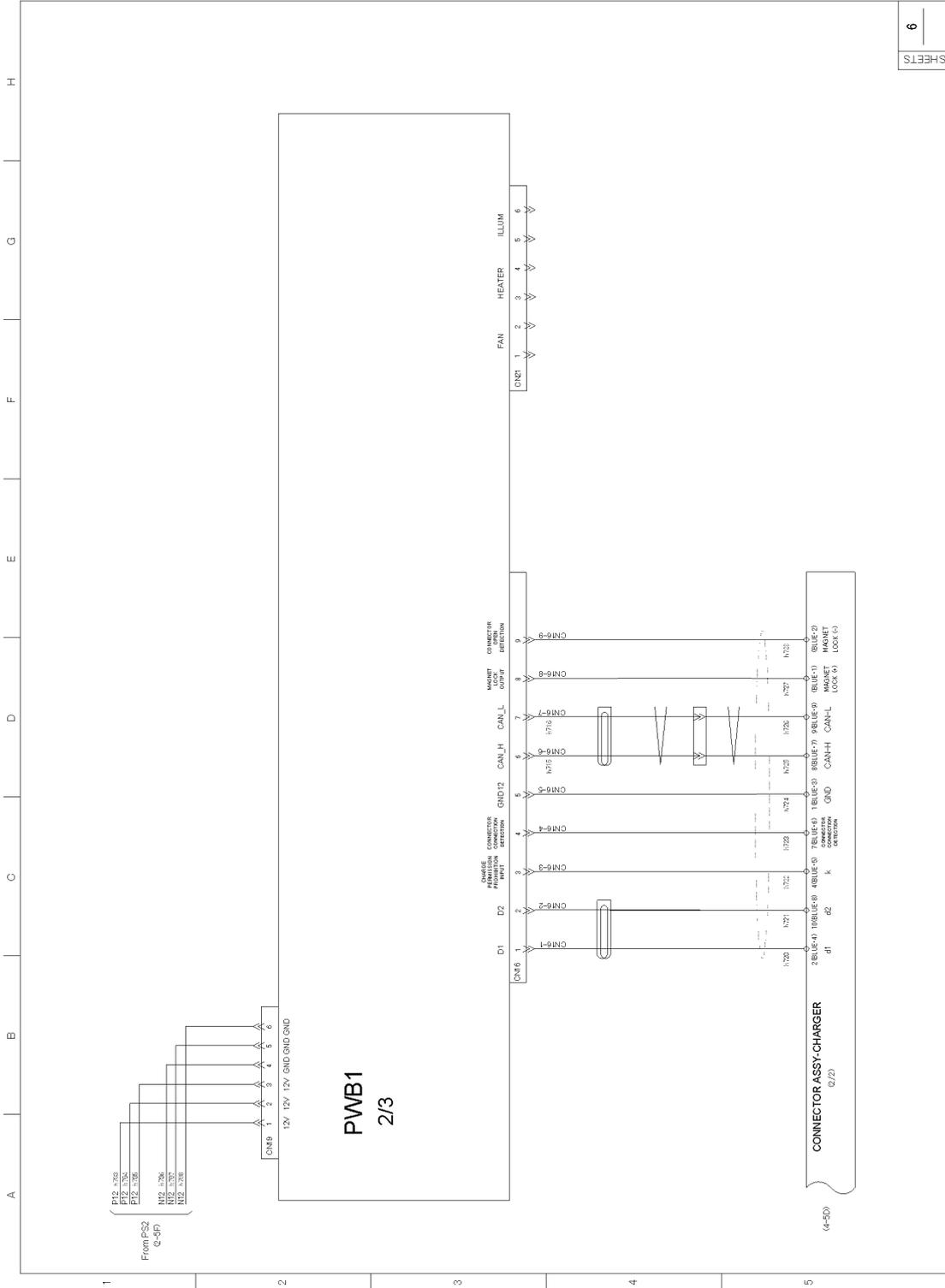
1 - 8 - 2 : MAIN CIRCUIT - POWER SUPPLY



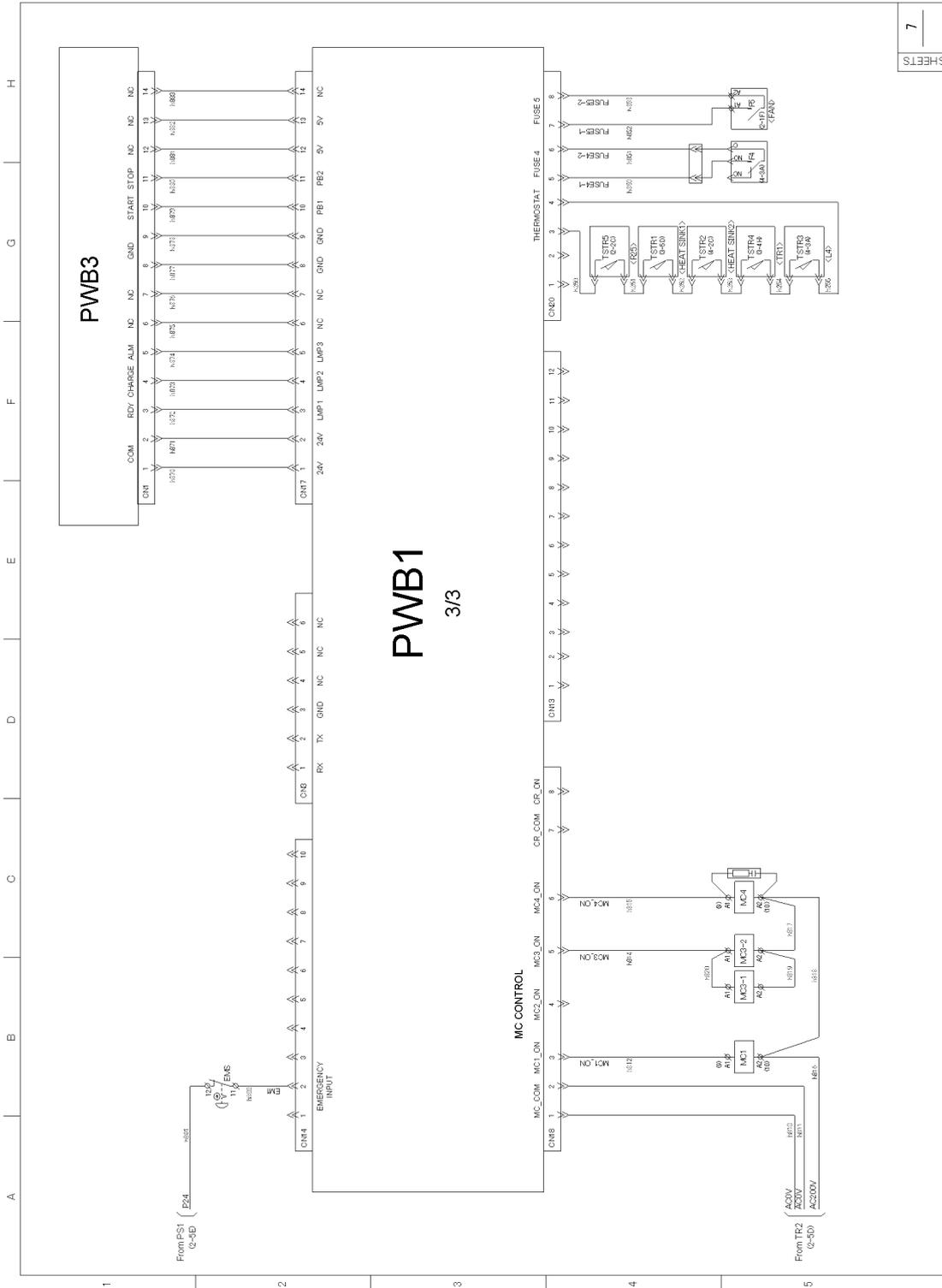
1 - 8 - 3 : MAIN CIRCUIT - CONVERTER ASSY, MATRIX



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SHEETS

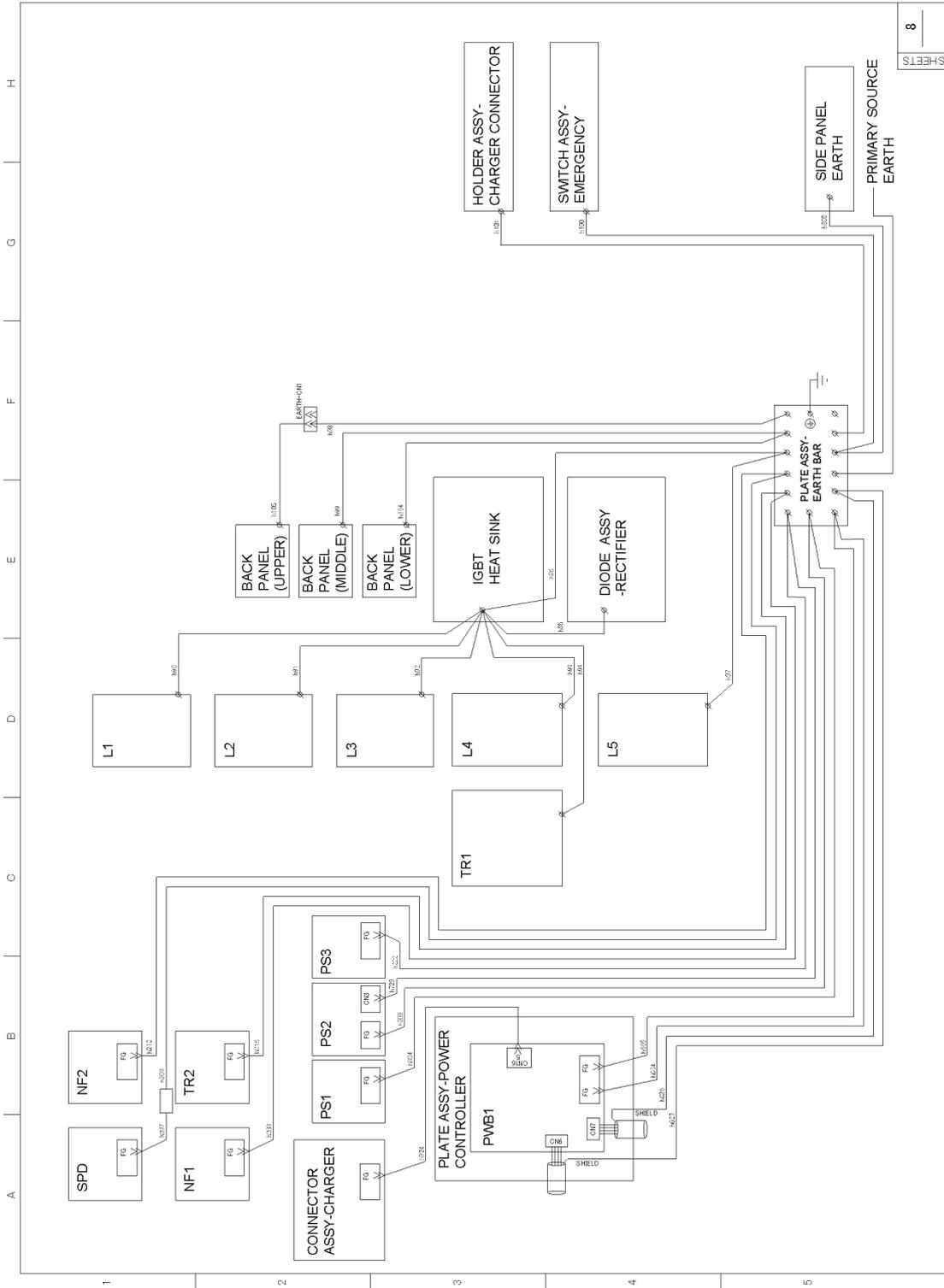


6 SHEETS



PWB1
3/3

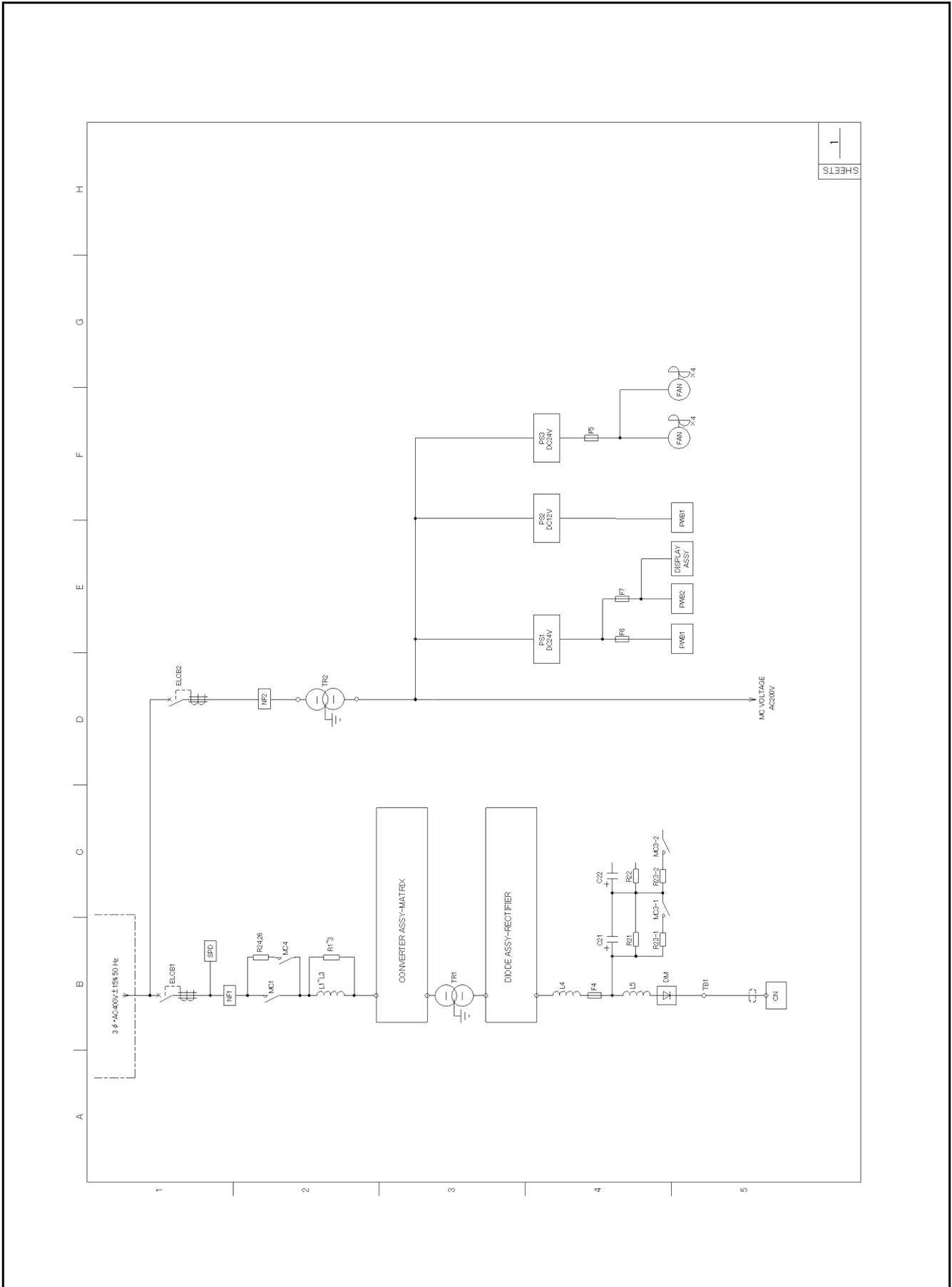
1 - 8 - 8 : EARTH CONNECTION DIAGRAM

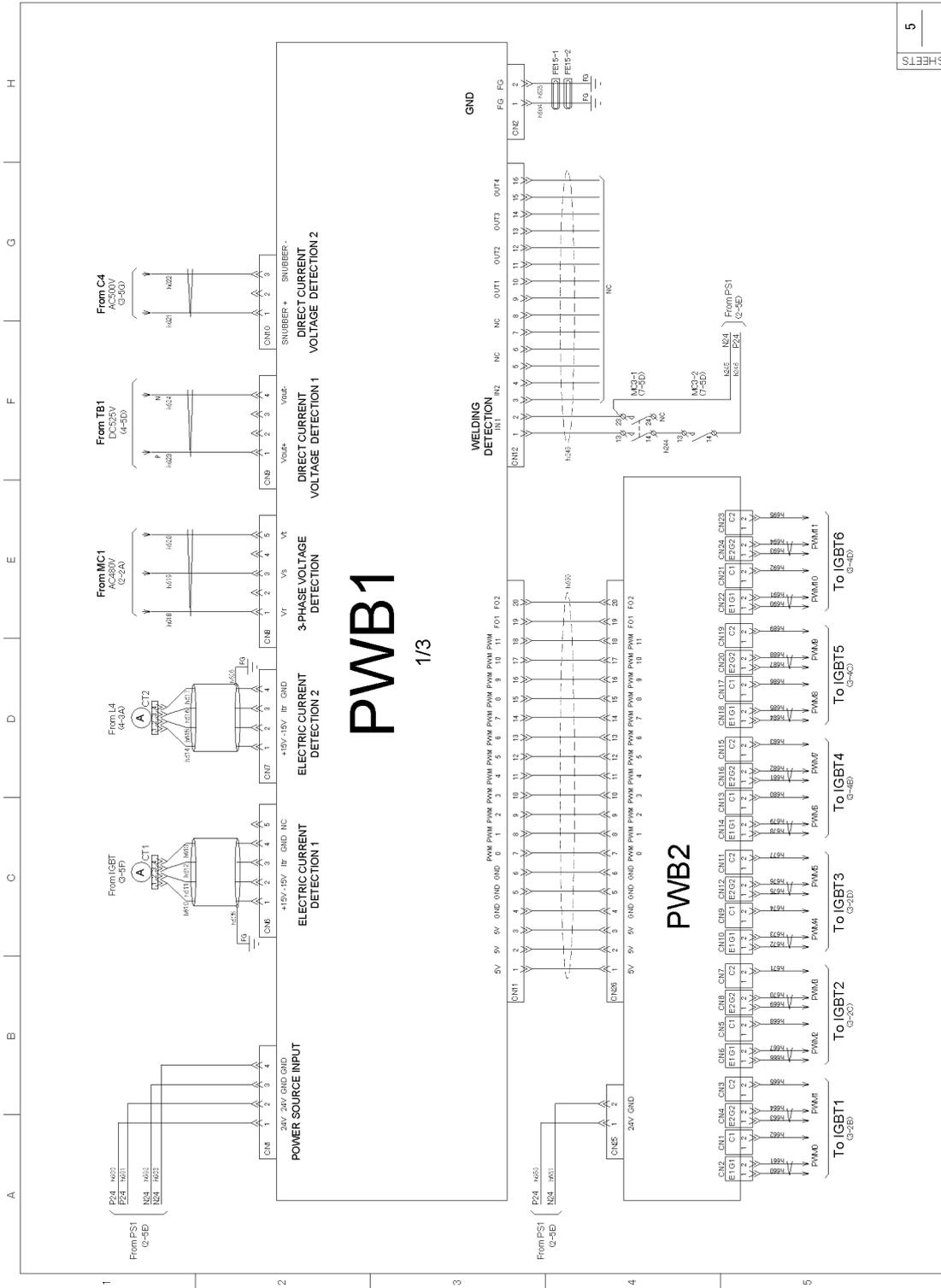


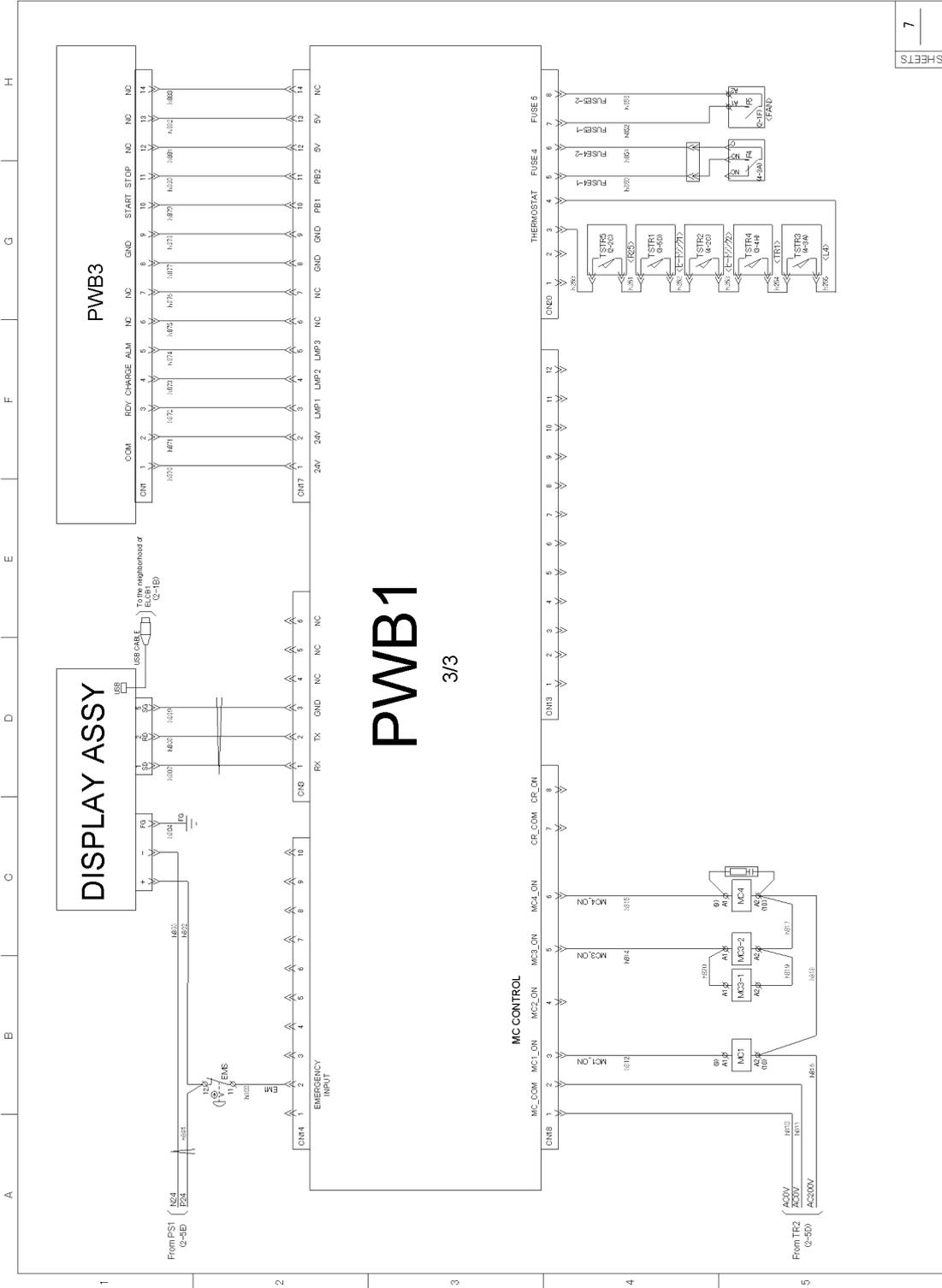
8
SHEETS

1 - 9 : Wiring Diagram (Type2: Standard Specifications)

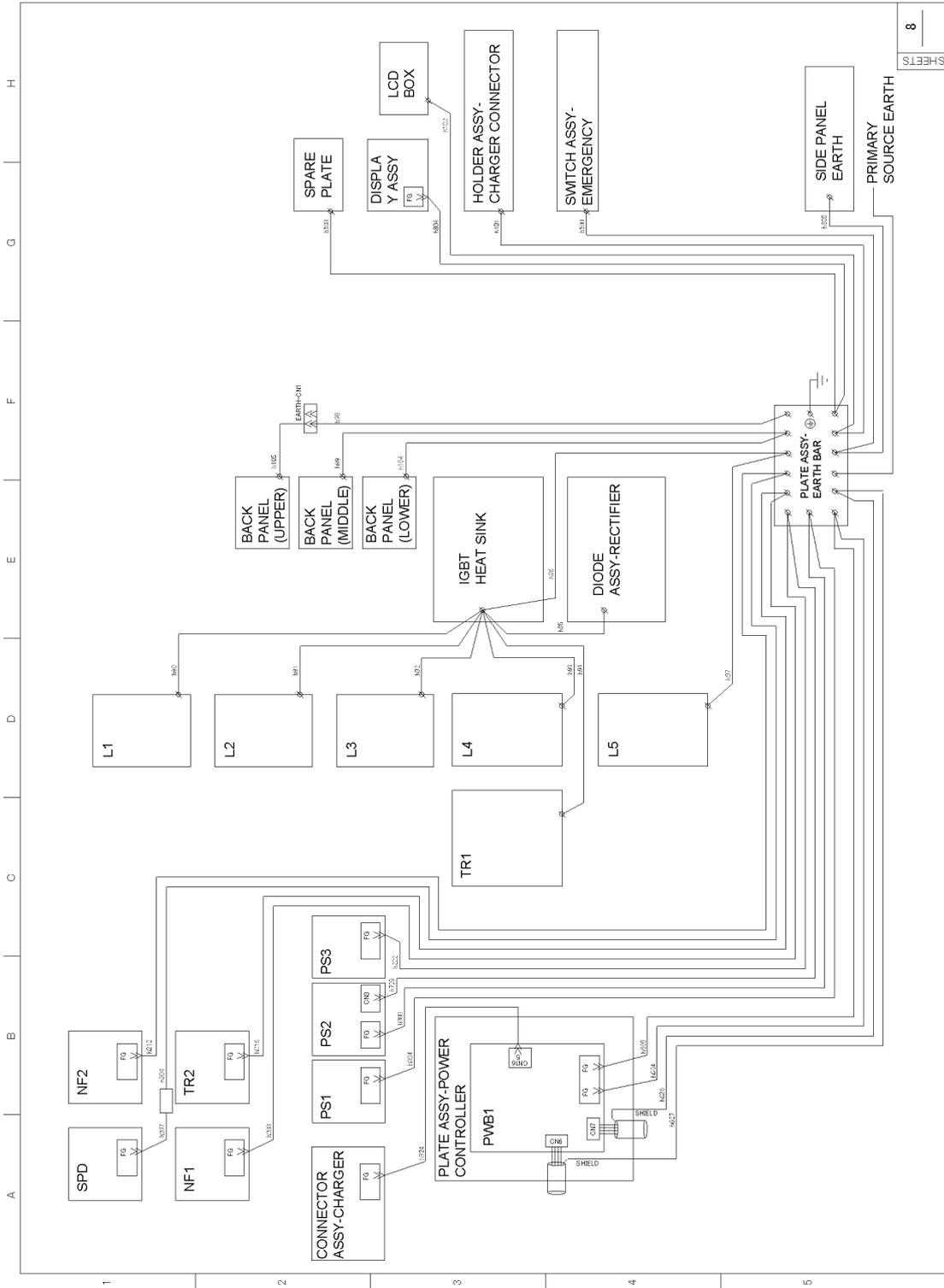
1 - 9 - 1 : SINGLE LINE WIRE CONNECTION DIAGRAM







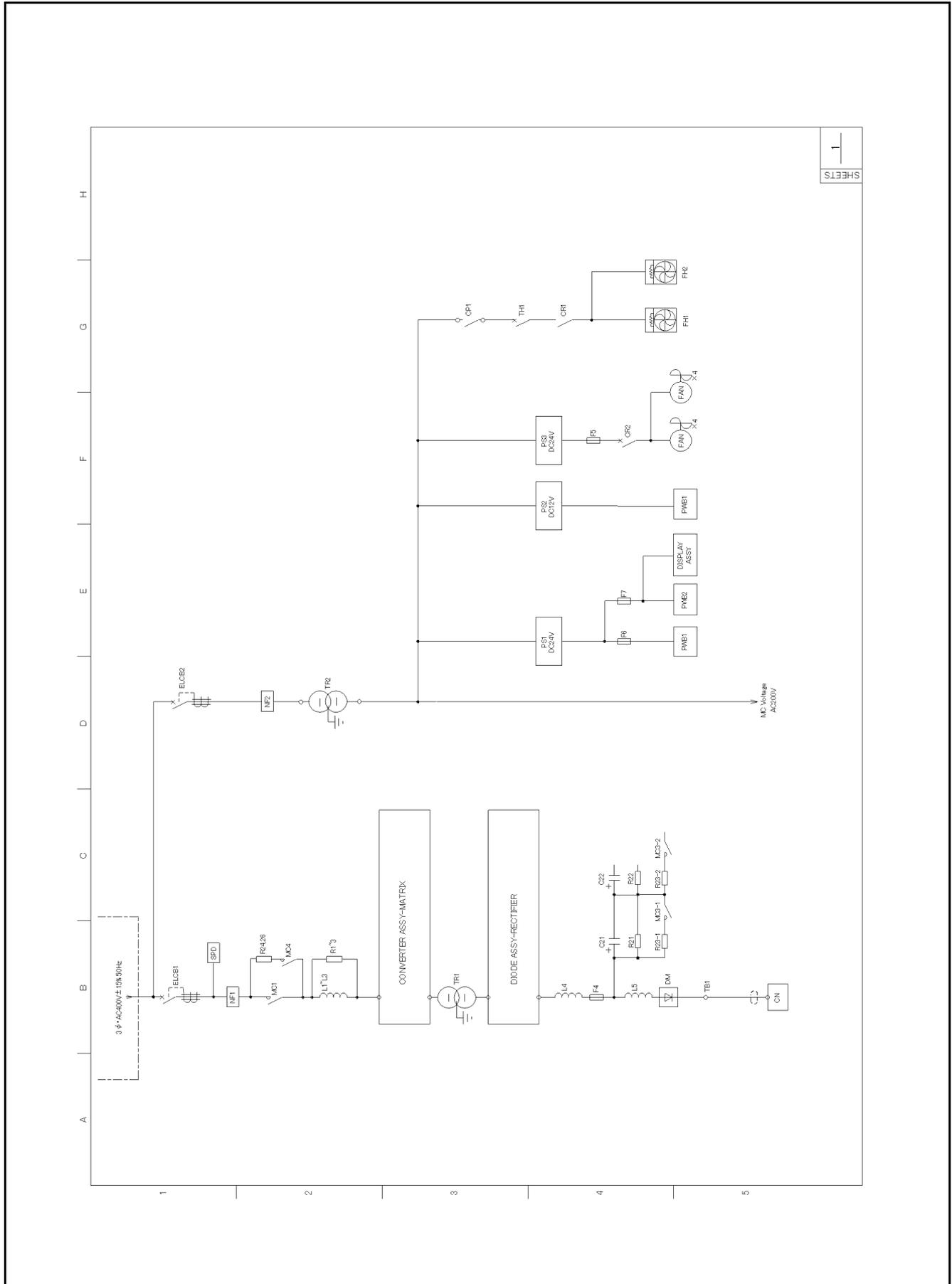
1 - 9 - 8 : EARTH CONNECTION DIAGRAM

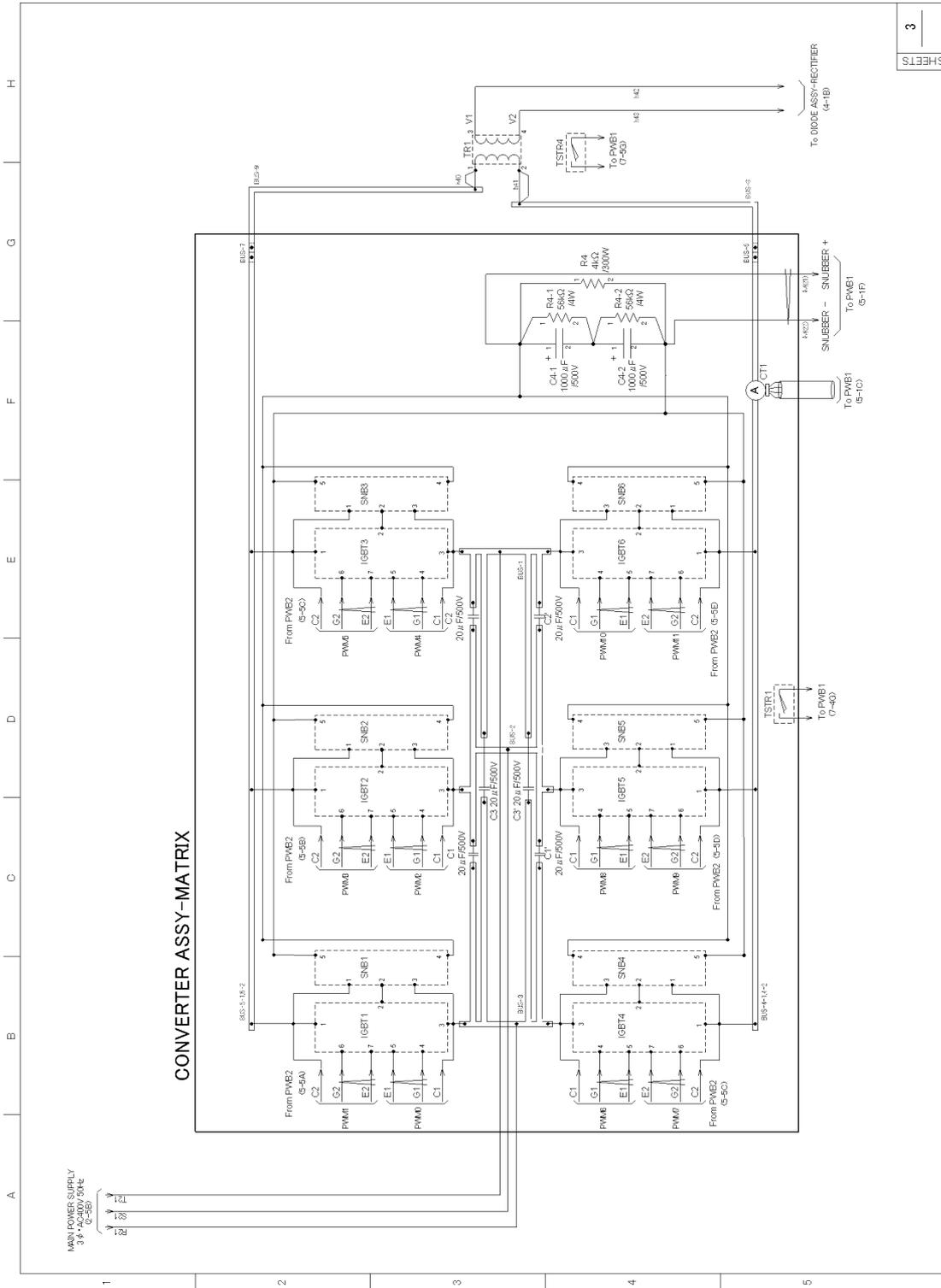


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SHEETS

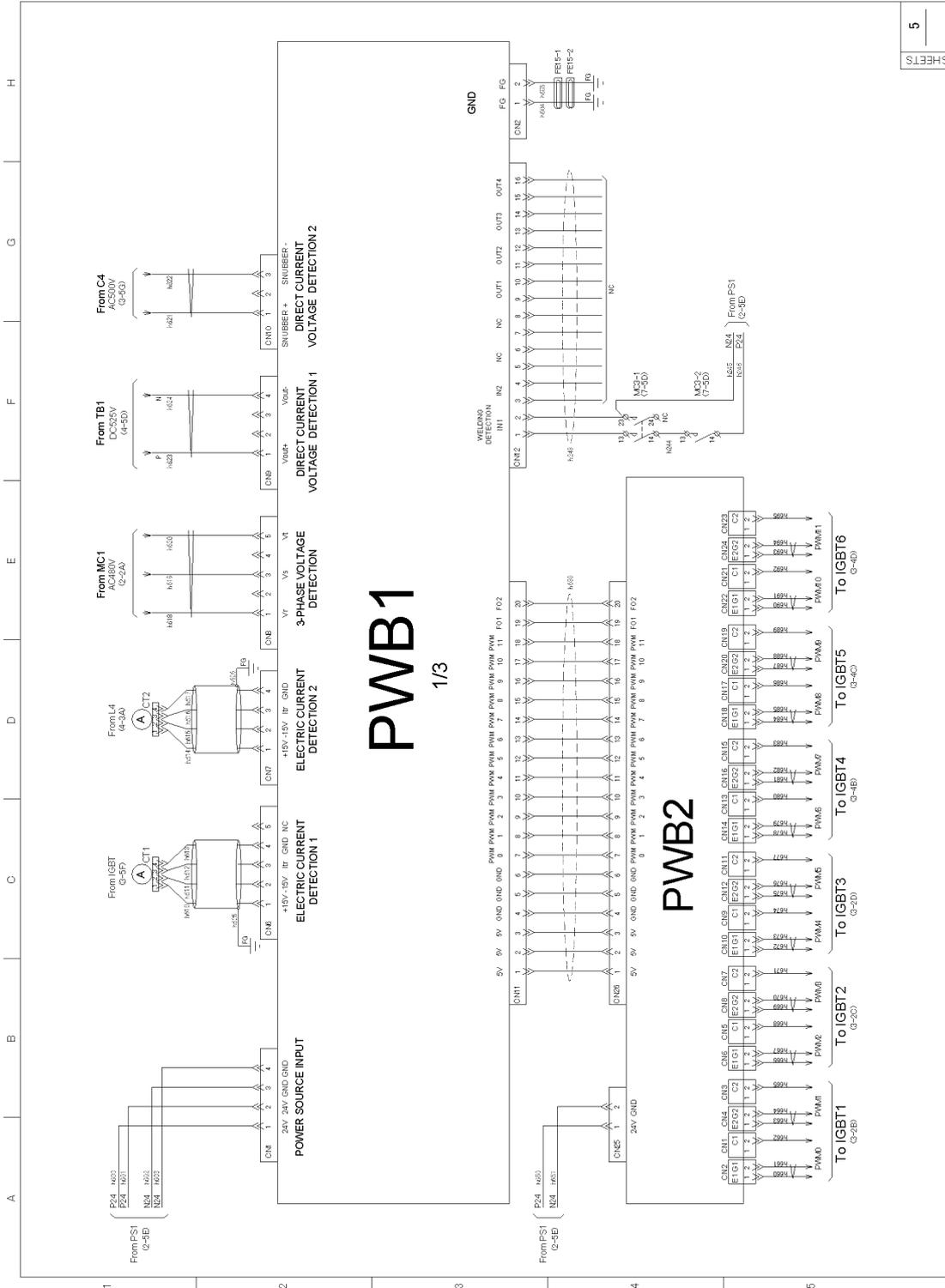
1 - 10 : Wiring Diagram (Type2: Cold Specifications)

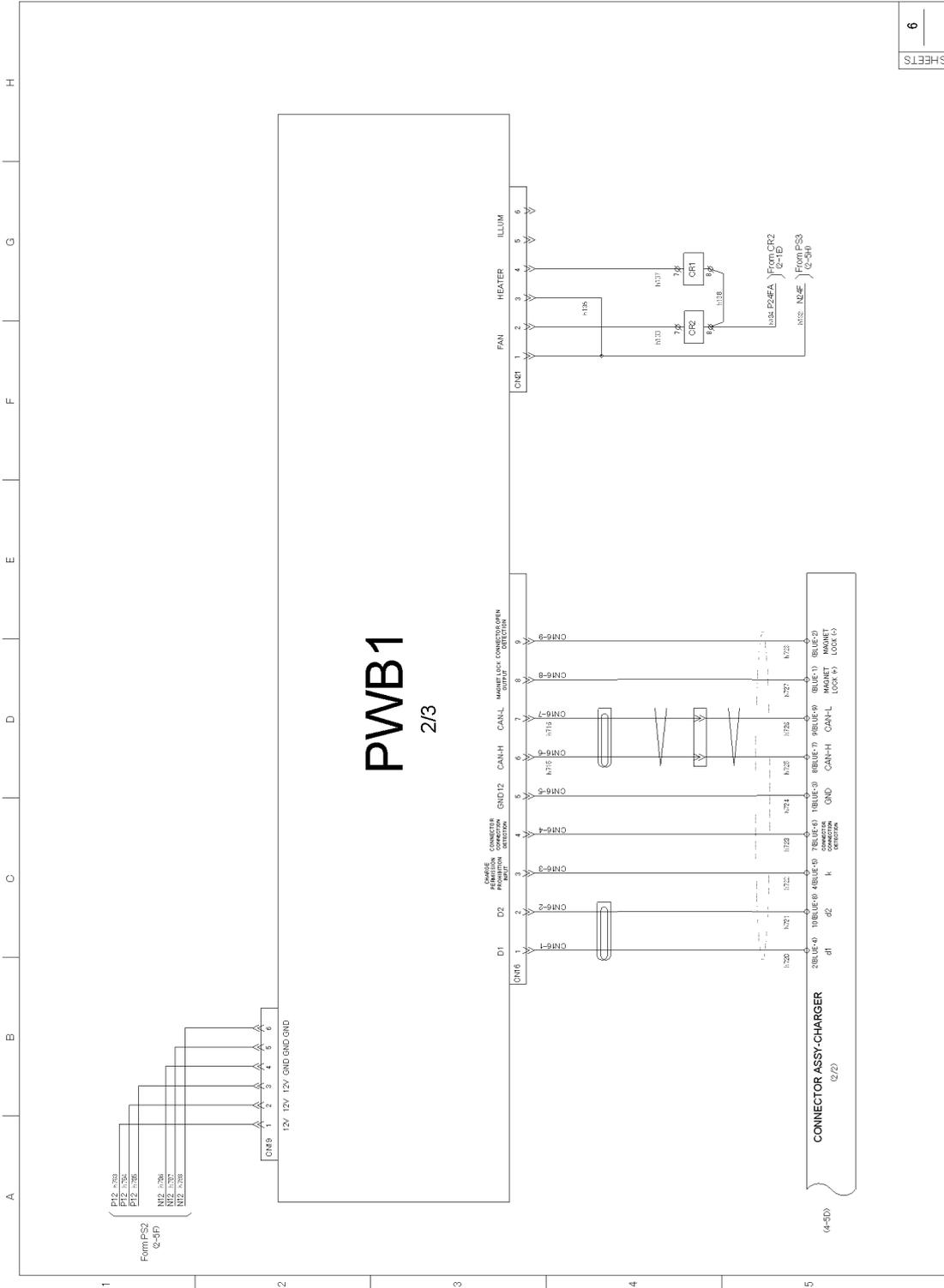
1 - 10 - 1 : SINGLE LINE WIRE CONNECTION DIAGRAM



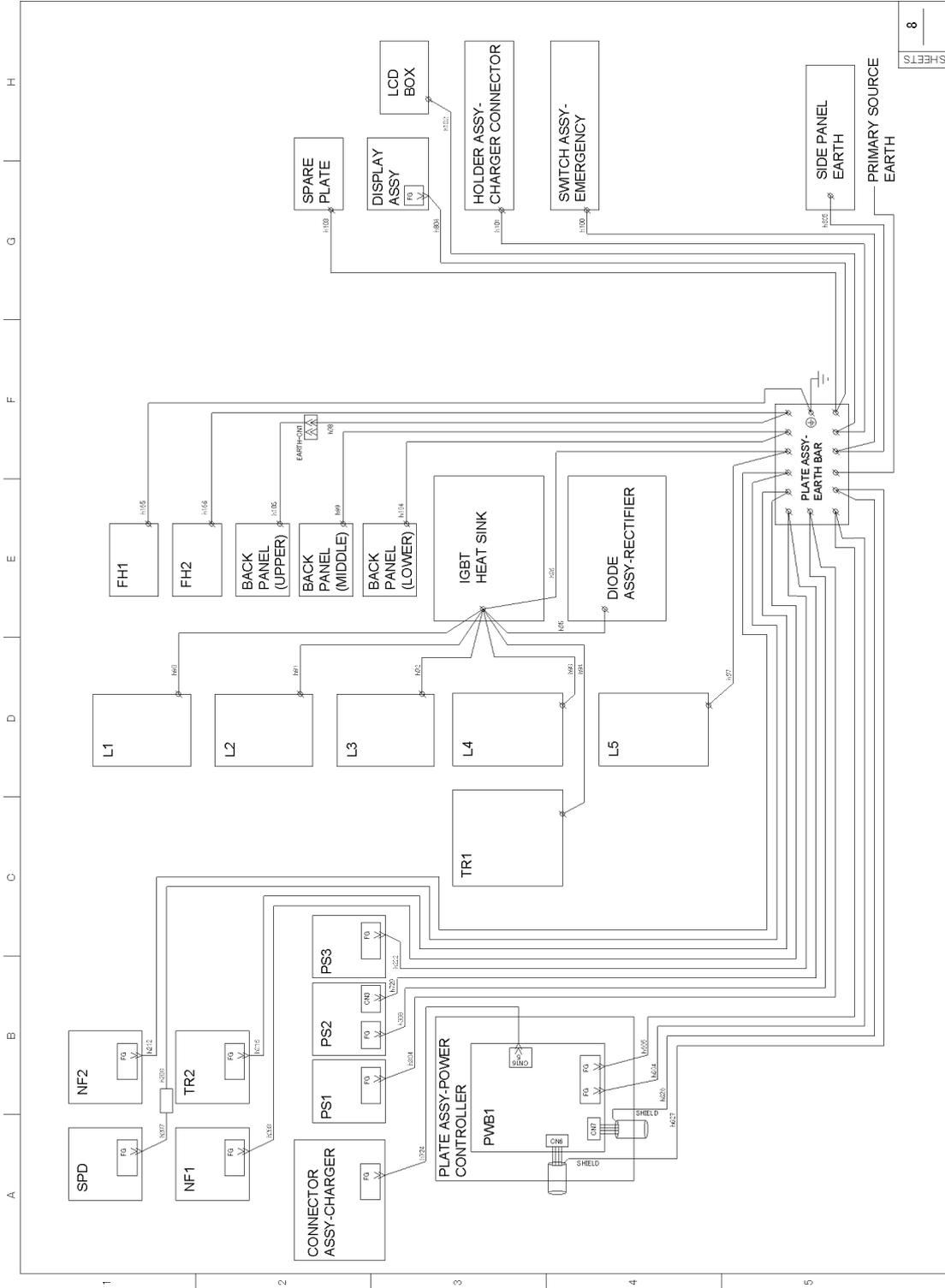


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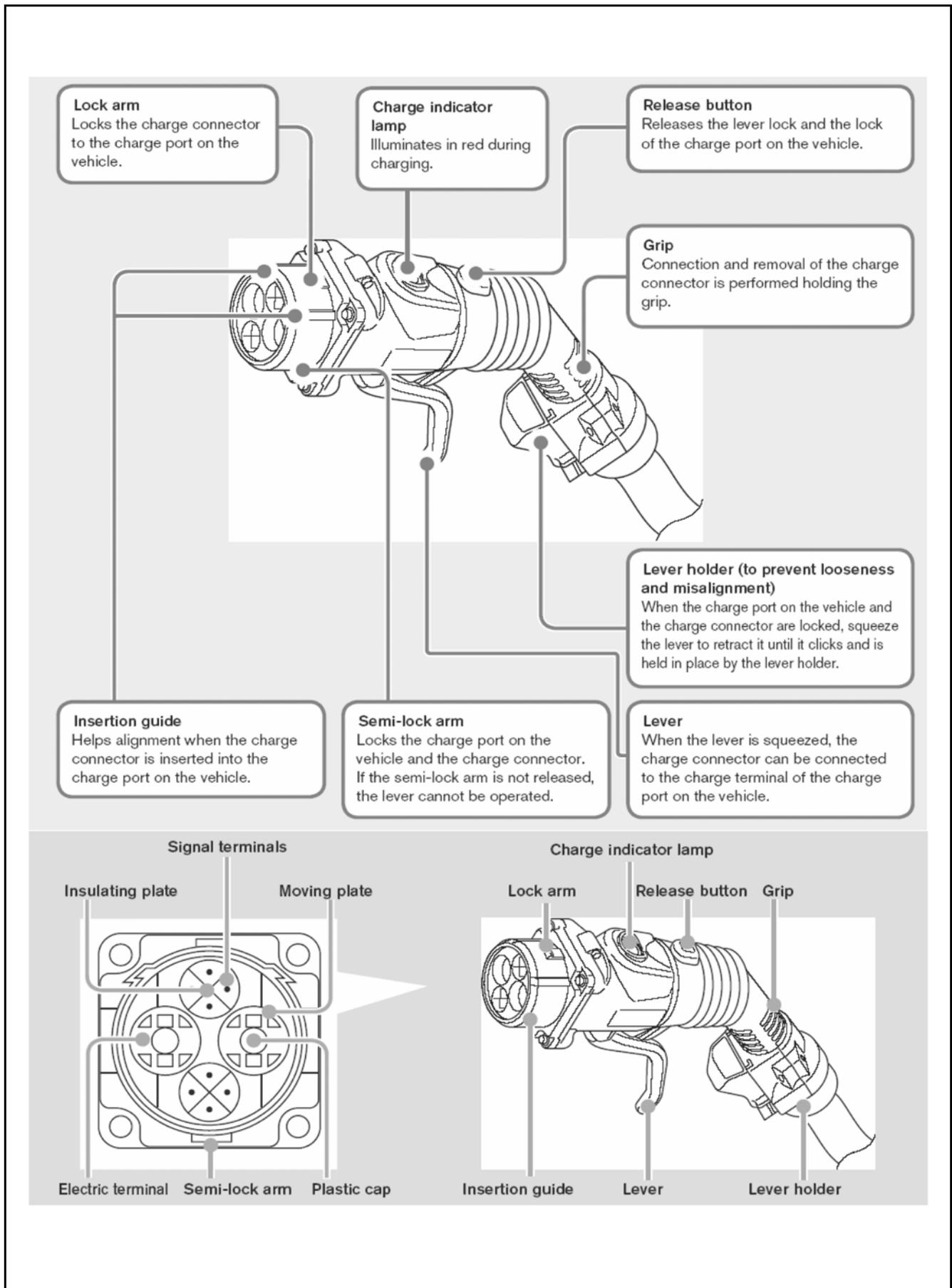


1 - 10 - 8 : EARTH CONNECTION DIAGRAM



8
SHEETS

1 - 11 : Connector Assy- Charger Names



2. INSPECTION PROCEDURES

2 - 1 : Inspection Items, Procedures, and Judgment Standards

2 - 1 - 1: ITEMS TO PREPARE BEFORE BEGINING WORK

Checking the tools that are used	
1.	Digital tester
2.	Insulation resistance meter (500 V meter)
3.	Temperature gauge
4.	Humidity gauge
5.	Final inspection unit (dummy load device for testing)
6.	Phillips screwdriver
7.	Resistance unit (Type2)
8.	Cable with crocodile clip connector (Type2)
9.	Shop cloth for cleaning
10.	Resistor (50 k ohm / 5 W)
11.	Torque wrench
12.	personal protective equipment (PPE)
13.	Rubber sheet (for protecting against scratches when installing the case)
14.	Test connector (Type2)

2 - 1 - 2: DAILY INSPECTION

Item	Inspection method	Judgment standard	
Ambient environment	Are the ambient environment, humidity, vibration, and atmosphere (presence of dust, gas, oil, mist, water droplets, etc.) in accordance with the specifications?	Visual	Check that the environment is in accordance with the specifications.
Fault lamp	Is the lamp blinking?	Visual	Check that it is not blinking.
Is there any abnormal noise, abnormal vibration, or abnormal odor?		Listening, visual, and smell	Check that there are no abnormalities.
Charge connector Note: The lever cannot be operated unless the semi-lock arm is released.	Is there any damage to the connector?	Visual	Check that the LED is not damaged.
			Check that the grip is not bent.
			Check that the lever is not bent.
			Check that the release button is not damaged.
			Check that the incomplete insertion prevention holder is not damaged.
			Check that there are no dents in the connector.
			Check that there are no large scratches on the connector.
			Check that there is no corrosion on the connector.
	Check that the connector screws are installed.		
	Check that the grip rubber is not torn.		
Is there any damage to the front end of the connector (plastic)?	Visual	Check that the front end (cavity) is not cracked.	
		Check that the front end (cavity) is not deformed.	
Is there any foreign material in the front end of the connector?	Visual	Check that no stones, dirt, rubber, or other foreign material is in the front end (inside the cavity).	

Item		Inspection method	Judgment standard
Charge connector Note: The lever cannot be operated unless the semi-lock arm is released.	Is there any deformation or damage of the lock arm?	Visual	Check that the lock arm is attached.
			Check that the lock arm is not engaged.
			Check that the lock arm is not bent.
	Is there any deformation or damage of the semi-lock arm?	Visual	Check that the semi-lock arm is attached.
			Check that the semi-lock arm is not engaged.
			Check that the semi-lock arm is not bent.
	Is the plastic cap attached to the end of the power terminal?	Visual	Check that the plastic cap is not detached.
	Is the moving plate attached?	Visual	Check that the moving plate is not detached.
	Are the signal terminals (7 terminals) deformed? (1 is empty.)	Visual	Check that the signal terminals are not bent, broken, or otherwise damaged. [Guideline for bending: Max. 0.8 mm (0.03 in) from center. Guideline for length from the top of the cross on the insulation plate to the end of the pin: 10 - 11 mm (0.39 - 0.43 in)].
	When the lock is operated, the lever must fit into the incomplete insertion prevention holder.	Operation	Release the semi-lock arm and check that the lever can be operated.
Check that it is engaged in the incomplete insertion prevention holder when the lever is operated.			
It must be possible to disengage the lock.	Operation	Check that the sliding part of the incomplete insertion prevention holder moves smoothly without sticking.	
		Press the release button and check that the lever moves smoothly without sticking.	
Charge cable	Is there any tearing or damage of the insulation?	Visual	Check that the charge cable filler is not visible.
	Is there any twisting?	Visual, operation	Check that the charge cable is not twisted.
	Is there any discoloration caused by overheating?	Visual	Check that there is no discoloration of the charge cable insulation caused by overheating.
Is there any cracking, damage, or other abnormality of the charge start button or charge stop button cover?	Visual	Check that there are no abnormalities.	
Is there any clogging of the intake port or exhaust port, or foreign material adhering to them?	Visual	Check that there are no abnormalities.	

2 - 1 - 3: RECOMMENDED PERIODIC INSPECTION (ONCE / YEAR)

Item	Inspection contents	Inspection method	Judgment standard
Inside the equipment panel	Clean	Clean	-
Filter	Check for cleanliness and condition.	Cleaning (washing with water) and visual	Replace if necessary.
SPD assy-input	Check the lifetime lamp.	Visual	If the lamp is lit, replace the part.
Ambient environment	Are the ambient environment, humidity, vibration, and atmosphere (presence of dust, gas, oil, mist, water droplets, etc.) in accordance with the specifications?	Visual and measurement instrument (Temperature, humidity)	Check that the environment is in accordance with the specifications.
Check the airtightness.	Malfunction of the waterproofing rubber	Visual	Check that there are no tears, scratches, or other abnormalities.
Fault lamp	Is the lamp blinking?	Visual	Check that it is not blinking.

Item	Inspection contents	Inspection method	Judgment standard
Screw-fastened parts of plate assy-back	Apply grease.	Apply grease. (Apply to threads.)	-
Charge connector Note: The lever cannot be operated unless the semi-lock arm is released.	Is there any damage to the connector?	Visual	Check that the LED is not damaged.
			Check that the grip is not bent.
			Check that the lever is not bent.
			Check that the release button is not damaged.
			Check that the incomplete insertion prevention holder is not damaged.
			Check that there are no dents in the connector.
			Check that there are no large scratches on the connector.
			Check that there is no corrosion on the connector.
			Check that the connector screws are installed.
			Check that the grip rubber is not torn.
	Is there any damage to the front end of the connector (plastic)?	Visual	Check that the front end (cavity) is not cracked. Check that the front end (cavity) is not deformed.
	Is there any foreign material in the front end of the connector?	Visual	Check that no stones, dirt, rubber, or other foreign material is in the front end (inside the cavity).
Is there any deformation or damage of the lock arm?	Visual	Check that the lock arm is attached.	
		Check that the lock arm is not engaged.	
		Check that the lock arm is not bent.	
Is there any deformation or damage of the semi-lock arm?	Visual	Check that the semi-lock arm is attached.	
		Check that the semi-lock arm is not engaged.	
		Check that the semi-lock arm is not bent.	
Charge connector Note: The lever cannot be operated unless the semi-lock arm is released.	Is the plastic cap attached to the end of the power terminal?	Visual	Check that the plastic cap is not detached.
	Is the moving plate attached?	Visual	Check that the moving plate is not detached.
	Does the moving plate move smoothly?	Visual	Press the moving plate and check that it moves smoothly without sticking.
	Are the signal terminals (7 terminals) deformed? (1 is empty.)	Visual, measurement	-Check that the signal terminals are not bent [Guideline for bending: Max 0.8 mm (0.03 in) from center]. -Check that the signal terminals are not broken. -Guideline for length from the top of the cross on the insulation plate to the end of the pin: 10 - 11mm (0.39 - 0.43 in).
	Is the terminal surface base metal exposed?	Visual	Check that the terminal plating is not peeled off.
	When the lock is operated, the lever must fit into the incomplete insertion prevention holder.	Operation	Release the semi-lock arm and check that the lever can be operated.
			Check that it is engaged in the incomplete insertion prevention holder when the lever is operated.
	It must be possible to disengage the lock.	Operation	Check that the sliding part of the incomplete insertion prevention holder moves smoothly without sticking.
Press the release button and check that the lever moves smoothly without sticking.			

Item	Inspection contents	Inspection method	Judgment standard
Charge cable	Is there any tearing or damage of the insulation?	Visual	The charge cable filler must not be visible.
	Is there any twisting?	Visual, operation	Check that the charge cable is not twisted.
	Is there any discoloration caused by overheating?	Visual	Check that there is no discoloration of the charge cable insulation caused by overheating.
Charge connector and Charge cable	Check the continuity of the conductor. There must be continuity.	Measurement	There must be continuity at the terminals of the charge connector and the terminals inside the charger.
	Measure the insulation resistance between the power terminals.	Measurement	Use an insulation resistance meter. Apply DC 500 V and check that the displayed measurement value is OL.
Appearance inspection	Corrosion, scratches, or dents on the front panel	Visual	Check that there are no abnormalities.
	Corrosion, scratches, or dents on the side panel	Visual	Check that there are no abnormalities.
	Corrosion, scratches, or dents on the rear panel	Visual	Check that there are no abnormalities.
	Corrosion of the control devices	Visual (transformer, reactor)	Check that there are no abnormalities.
	Looseness of the base anchor	Perform a hammer check and check for looseness.	Check that there is no looseness.
	Entry of dust, dirt, or foreign material	Visual	Check that there are no abnormalities.
	Case damage or disconnection	Visual	Check that there are no abnormalities.
	Tearing or damage of the cable insulation	Visual	Check that there are no abnormalities.
	Improper connection of the ground wire	Visual	Check that there are no abnormalities.
	Improper processing of the shield wire	Visual	Check that there are no abnormalities.
Inspection for additional tightening	Looseness of terminals at high-voltage connection points	Torque check	- Contactor assy-magnet,1st (MC1) terminal: 15 - 20 N-m (1.6 - 2.0 kg-m, 11 - 14 ft-lb) - Contactor assy-magnet,2nd (MC4) terminal: 0.8 - 1 N-m (0.09 - 0.10 kg-m, 7 -8 in-lb) -Fuse assy (F4) terminal: 27 N-m (2.8 kg-m, 20 ft-lb) -Transformer assy (TR1) terminal: 24 - 32 N-m (2.5 - 3.2 kg-m, 18 -23 ft-lb) -Circuit breaker assy-1st (ELCB1) terminal: 8 - 13 N-m (0.82 - 1.3 kg-m, 71- 115 in-lb) - Circuit breaker assy-2nd (ELCB2 terminal: 2 - 3 N-m (0.21 - 0.30 kg-m, 18 - 26 in-lb) - Coil assy-ac filter (L1, L2, L3) terminals: 11 - 16 N-m (1.2 - 1.6 kg-m, 9 - 11 ft-lb)
	Looseness of points where wiring of the charge connector (including cable) is connected	Torque check	Contacto assy-magnet (TB1) terminal: 9 N-m (0.92 kg-m, 80 in-lb)
Checking the function of the ELCB (Earth Leakage Circuit Breaker)	Function check button	Check that there are no abnormalities.	

Item	Inspection contents	Inspection method	Judgment standard
Checking the power voltage	AC voltage / DC voltage	Instrument measurement	1) Measuring the main circuit power voltage TYPE1: Use a digital voltmeter and measure between R-S, S-T, and R-T. The voltage between each pair of phases must satisfy the standard of AC 480 ± 15% (AC 408 V - AC 552 V). TYPE2: Use a digital voltmeter and measure between R-S, S-T, and R-T. The voltage between each pair of phases must satisfy the standard of AC 400 ± 15% (AC 340 V - AC 460 V).
			2) Measuring the DC power voltage Use a digital voltmeter and measure the DC power. -PS1 output between P24-N24 must satisfy the standard of DC 24 ± 1.0 V. -PS2 output between P12-N12 must satisfy the standard of DC 12 ± 0.5 V. -PS3 output between P24-N24 must satisfy the standard of DC 24 ± 1.0 V.
			3) Measuring the control circuit power supply voltage Secondary side voltage of transformer assy-input power circuit (TR2): AC 200V
Checking the safety protection functions	Emergency stop	With the case removed, press the emergency stop switch.	The fault lamp illuminates. With Standard Specifications, a screen message is also displayed.
Operation confirmation	Ground short protection test*	Refer to "2-4: Ground Short Protection Test".	

*: Type2

2 - 1 - 4: RECOMMENDED PERIODIC REPLACEMENT

Time	Item
Once every 3 years	Charge connector and charge cable
	Cooling fan
	Filter assy- air
Once every 1 year	Display assy (LCD) Settings Backup Battery *

*: Replace the battery while the power is ON.

2 - 2 :Inspection Reports

Customer's name		Location of installation	
Work date		Work performed by	
Handling No.		Device name	
Serial No.		Part code	

Item	Inspection contents	Judgment standard	Measured value	Judgment
Inside the equipment panel	Clean	-		OK / NG
Filter	Check for cleanliness and condition.	Replace if necessary.		OK / NG
Lightning arrestor	Check the lifetime lamp.	If the lamp is lit, replace the part.		OK / NG

Item	Inspection contents	Judgment standard	Measured value	Judgment
Ambient environment	Are the ambient environment, humidity, vibration, and atmosphere (presence of dust, gas, oil, mist, water droplets, etc.) in accordance with the specifications?	Check that the environment is in accordance with the specifications.		OK / NG
Check the airtightness.	Malfunction of the waterproofing rubber	Check that there are no tears, scratches, or other abnormalities.		OK / NG
Fault lamp	Is the lamp blinking?	Check that it is not blinking.		OK / NG
Screw-fastened parts of rear panel	Apply grease.	-		OK / NG
Charge connector Note: The lever cannot be operated unless the semi-lock arm is released.	Is there any damage to the connector?	Check that the LED is not damaged.		OK / NG
		Check that the grip is not bent.		OK / NG
		Check that the lever is not bent.		OK / NG
		Check that the release button is not damaged.		OK / NG
		Check that the incomplete insertion prevention holder is not damaged.		OK / NG
		Check that there are no dents in the connector.		OK / NG
		Check that there are no large scratches on the connector.		OK / NG
		Check that there is no corrosion on the connector.		OK / NG
		Check that the connector screws are installed.		OK / NG
Check that the grip rubber is not torn.		OK / NG		
Charge connector Note: The lever cannot be operated unless the semi-lock arm is released.	Is there any damage to the front end of the connector (plastic)?	Check that the front end (cavity) is not cracked.		OK / NG
		Check that the front end (cavity) is not deformed.		OK / NG
	Is there any foreign material in the front end of the connector?	Check that no stones, dirt, rubber, or other foreign material is in the front end (inside the cavity).		OK / NG
	Is there any deformation or damage of the lock arm?	Check that the lock arm is attached.		OK / NG
		Check that the lock arm is not engaged.		OK / NG
		Check that the lock arm is not bent.		OK / NG
	Is there any deformation or damage of the semi-lock arm?	Check that the semi-lock arm is attached.		OK / NG
		Check that the semi-lock arm is not engaged.		OK / NG
		Check that the semi-lock arm is not bent.		OK / NG
	Is the plastic cap attached to the end of the power terminal?	Check that the plastic cap is not detached.		OK / NG
	Is the moving plate attached?	Check that the moving plate is not detached.		OK / NG

Item	Inspection contents	Judgment standard	Measured value	Judgment
Charge connector Note: The lever cannot be operated unless the semi-lock arm is released.	Does the moving plate move smoothly?	Press the moving plate and check that it moves smoothly without sticking.		OK / NG
	Are the signal terminals (7 terminals) deformed? (1 is empty.)	- Check that the signal terminals are not bent. [Guideline for bending: Max. 0.8 mm (0.03 in) from center.] - Check that the signal terminals are not broken. - Guideline for length from the top of the cross on the insulation plate to the end of the pin: 10 - 11mm (0.39 - 0.43 in).		OK / NG
Charge connector Note: The lever cannot be operated unless the semi-lock arm is released.	Is the terminal surface base metal exposed?	Check that the terminal plating is not peeled off.		OK / NG
	When the lock is operated, the lever must fit into the incomplete insertion prevention holder.	Release the semi-lock arm and check that the lever can be operated.		OK / NG
		Check that it is engaged in the incomplete insertion prevention holder when the lever is operated.		OK / NG
Charge connector Note: The lever cannot be operated unless the semi-lock arm is released.	It must be possible to disengage the lock.	Check that the sliding part of the incomplete insertion prevention holder moves smoothly without sticking.		OK / NG
		Press the release button and check that the lever moves smoothly without sticking.		OK / NG
Charge cable	Is there any tearing or damage of the insulation?	The charge cable filler must not be visible.		OK / NG
	Is there any twisting?	Check that the charge cable is not twisted.		OK / NG
	Is there any discoloration caused by overheating?	Check that there is no discoloration of the charge cable insulation caused by overheating.		OK / NG
Charge connector and Charge cable	Check the continuity of the conductor. There must be continuity.	There must be continuity at the terminals of the charge connector and the terminals inside the charger.		OK / NG
	Measure the insulation resistance between the power terminals.	Use an insulation resistance meter. Apply DC 500 V and check that the displayed measurement value is OL.		OK / NG

Item	Inspection contents	Judgment standard	Measured value	Judgment
Appearance inspection	Corrosion, scratches, or dents on the front panel	Check that there are no abnormalities.		OK / NG
	Corrosion, scratches, or dents on the side panel	Check that there are no abnormalities.		OK / NG
	Corrosion, scratches, or dents on the rear panel	Check that there are no abnormalities.		OK / NG
	Corrosion of the control devices	Check that there are no abnormalities.		OK / NG
	Looseness of the base anchor	Check that there is no looseness.		OK / NG
	Entry of dust, dirt, or foreign material	Check that there are no abnormalities.		OK / NG
	Case damage or disconnection	Check that there are no abnormalities.		OK / NG
	Tearing or damage of the cable insulation	Check that there are no abnormalities.		OK / NG
	Improper connection of the ground wire	Check that there are no abnormalities.		OK / NG
	Improper processing of the shield wire	Check that there are no abnormalities.		OK / NG
Inspection for additional tightening	Looseness of terminals at high-voltage connection points	Check that there is no looseness.		OK / NG
	Looseness of points where wiring of the charge connector (including cable) is connected	Check that there is no looseness.		OK / NG
Checking the function of the ELCB (Earth Leakage Circuit Breaker)		Check that there are no abnormalities.		OK / NG
Checking the power voltage	AC voltage / DC voltage	1) Measuring the main circuit power voltage Use a digital voltmeter and measure between R-S, S-T, and R-T. The voltage between each pair of phases must satisfy the standard of AC 200 V \pm 15% (AC 170 V - AC 230 V).		OK / NG
		2) Measuring the DC power voltage Use a digital voltmeter and measure the DC power. -PS1 output between P24-N24 must satisfy the standard of DC 24 \pm 1.0 V. -PS2 output between P12-N12 must satisfy the standard of DC 12 V \pm 0.5 V. -PS3 output between P24-N24 must satisfy the standard of DC 24 \pm 1.0 V.		OK / NG
		3) Measuring the control circuit power supply voltage -Secondary side voltage of transformer assy-input power circuit (TR2): AC 200V		OK / NG
Checking the safety protection functions	Emergency stop	The fault lamp illuminates. With Standard Specifications, a screen message is also displayed.		OK / NG
Operation confirmation	Ground short protection test*	Refer to "2-4: Ground Short Protection Test".		OK / NG

*: Type2

2 - 3 : Insulation Resistance Measurement

CAUTION 1: Never drop or lose the washers, and be sure to reinstall them.

CAUTION 2: Panel assy-side (front cabinet) and unit are connected by a harness. Be careful not to cut the harness.

CAUTION 3: Always handle insulation resistance meter with care.

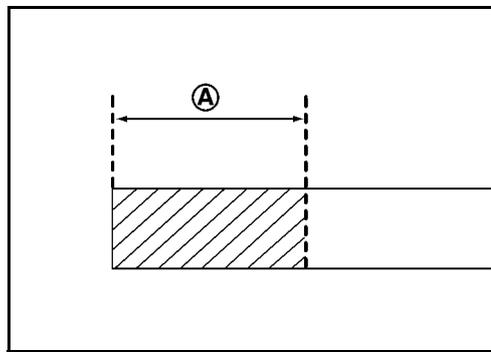
CAUTION 4: Observe the procedure correctly. Never measure the resistance using an insulated resistance meter, otherwise the devices may be damaged.

2 - 3 - 1 : CABLE WITH CROCODILE CLIP CONNECTOR CREATION PROCEDURE

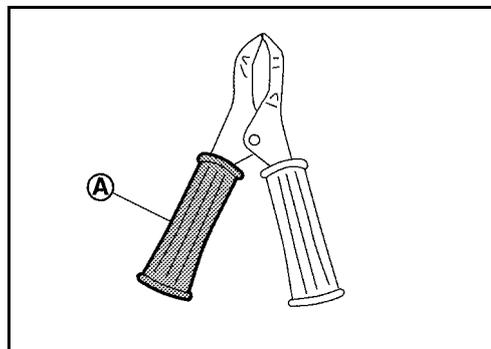
1) Prepare crocodile clips and wires.

Crocodile clip	<ul style="list-style-type: none"> - Rated current 20A or more - Opening width 20mm (0.79 in) - Necessary clips: 20
Wire	<ul style="list-style-type: none"> - Rated voltage 600V or more - Wire diameter more than 1.3 mm (0.05 in) - Cable length: 600 mm (23.62 in) (Necessary cables: 8) - Cable length: 2.1 m (6.9 ft) (Necessary cables: 2)

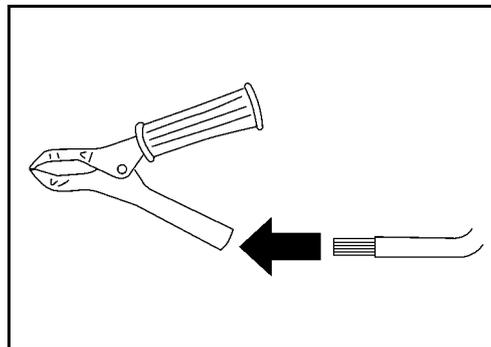
2) Peel the cover off about 5mm (0.2 in) at both ends of the wire (A).



3) Remove grip (A) from crocodile clip.



4) Crimp wires onto the grip of crocodile clip and solder them.



5) Proceed the similar work for the other side.

6) Return the grip to the original position.

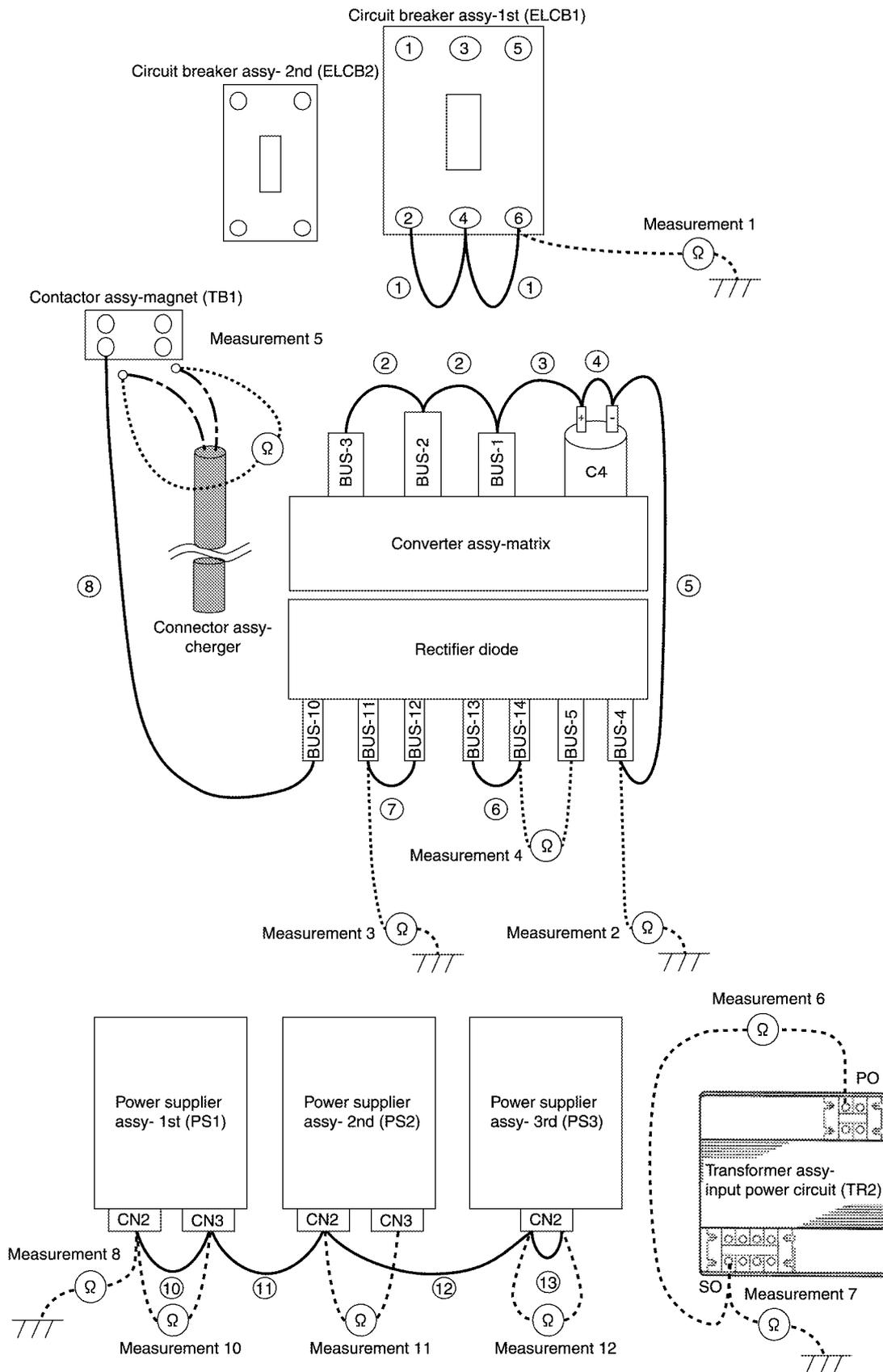
2 - 3 - 2 : REMOVE

- 1) Remove heat sink cover. Refer to "5-2: Heat sink cover".
- 2) Remove plate assy-back (upper). Refer to "5-3: Plate Assy- Back (Upper)".
- 3) Remove plate assy-back (lower). Refer to "5-4: Plate Assy- Back (lower)".
- 4) Remove plate assy-back (side RH and LH). Refer to "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove cover-supt clamp, charger connector cable. Refer to "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove side panel assy. Refer to "5-8: Side Panel Assy".
- 7) Disconnect controller assy-main (PWB1) harness connector CN2, CN8, CN9 and CN10.
- 8) Disconnect power supplier assy- 1st (PS1) harness connector CN1.
- 9) Disconnect power supplier assy- 2nd (PS2) harness connector CN1.
- 10) Disconnect power supplier assy- 3rd (PS3) harness connector CN1.

2 - 3 - 3 : INSULATION RESISTANCE TEST PREPARATION

- 1) Short circuit between circuit breaker assy-1st (ELCB1) and secondary side terminals 2, 4, and 6.
- 2) Short circuit between BUS-1, BUS-2, and BUS-3.
- 3) Short circuit between BUS-1 and condenser C4 (+).
- 4) Short circuit between condenser C4 (+) and condenser C4 (-).
- 5) Short circuit between condenser C4 (-) and BUS-4.
- 6) Short circuit between BUS-13 and BUS-14.
- 7) Short circuit between BUS-11 and BUS-12.
- 8) Short circuit between BUS-10 and contactor assy-magnet (TB1) (terminal left lower).
- 9) Turn ON the circuit breaker assy-1st (ELCB1) and circuit breaker assy-2nd (ELCB2).
- 10) Short circuit between power supplier assy- 1st (PS1) connector CN2 terminal 1 and power supplier assy- 1st (PS1) harness connector CN3 terminal 1.
- 11) Short circuit between power supplier assy- 1st (PS1) connector CN3 terminal 1 and power supplier assy- 2nd (PS2) harness connector CN2 terminal 1.
- 12) Short circuit between power supplier assy- 2nd (PS2) connector CN2 terminal 1 and power supplier assy- 3rd (PS3) harness connector CN2 terminal 1.

13) Short circuit between power supplier assy- 3rd (PS3) harness connector CN2 terminals 1 and 8.



2 - 3 - 4 : MEASUREMENT

- 1) Check the continuity between the circuit breaker assy- 1st (ELCB1) and plate assy- earth bar.
 - 2) Check the continuity between the BUS-4 and plate assy- earth bar.
 - 3) Check the continuity between the BUS-11 and plate assy- earth bar.
 - 4) Check the continuity between the BUS-14 and BUS-5.
 - 5) During measuring operation only, remove TB1 lower side terminal and 2 cables. Measure the value between white and black of the charge cable.
 - * Measure each at DC 500 V range. Measured value must be 5 M ohm or more.
 - 6) Check the continuity between the transformer assy-input power circuit (TR2) terminal PO and SO.
 - * Measure each at DC 500 V range. Measured value must be 5 M ohm or more.
 - 7) Check the continuity between the transformer assy-input power circuit (TR2) terminal SO and plate assy- earth bar.
 - * Measure each at DC 500 V range. Measured value must be 5 M ohm or more.
- CAUTION: From step 8) to step 12), measure the values using a normal circuit tester.
- 8) Check the continuity between the power supplier assy- 1st (PS1) connector CN2 terminal 1 and plate assy- earth bar.
 - *Measure the a resistance range. Measured value must be 1 M ohm or more.
 - 9) Remove the harness that is installed in "2-3-2: INSULATION RESISTANCE TEST PREPARATION" at steps 10) to 13).
 - 10) Check the continuity between the power supplier assy- 1st (PS1) harness connector CN2 terminal 1 and power supplier assy- 1st (PS1) harness connector CN3 terminal 1.
 - *Measure the a resistance range. Measured value must be 1 M ohm or more.
 - 11) Check the continuity between the power supplier assy- 2nd (PS2) harness connector CN2 terminal 1 and power supplier assy- 2nd (PS2) harness connector CN3 terminal 1.
 - *Measure the a resistance range. Measured value must be 1 M ohm or more.
 - 12) Check the continuity between the power supplier assy- 3rd (PS3) harness connector terminals 1 and 8.
 - *Measure the a resistance range. Measured value must be 1 M ohm or more.

2 - 3 - 5 : POST TREATMENT

- 1) Remove all the harnesses that are installed in "2-3-2:INSULATAION RESISTANCE TEST PREPARATION".
- 2) Install all the connectors that are removed in "2-3-1: REMOVE".

2 - 4 : Ground Short Protection Test (Type2)



Be sure to personal protective equipment (PPE) before beginning work. Indicates a hazard which will result in death or serious injury if instructions are not followed.

CAUTION 1: Never drop or lose the washers, and be sure to reinstall them.

CAUTION 2: Panel assy-side (front cabinet) and unit are connected by a harness. Always prevent a break in the harness.

CAUTION 3: This procedure requires a power-on operation. Always prevent an electric shock.

CAUTION 4: Record the setting status of controller assy-main (PWB1) SW1 in a notebook.

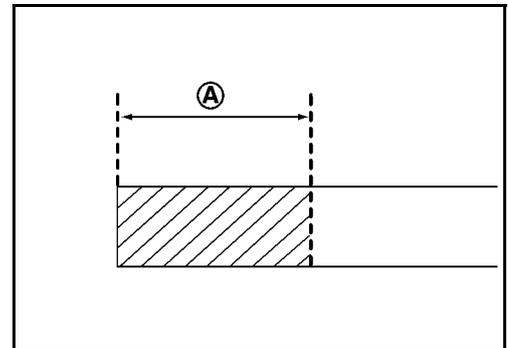
2 - 4 - 1 : TEST TOOLS CREATION PROCEDURE

1) Test connector

a) Prepare connector and wire.

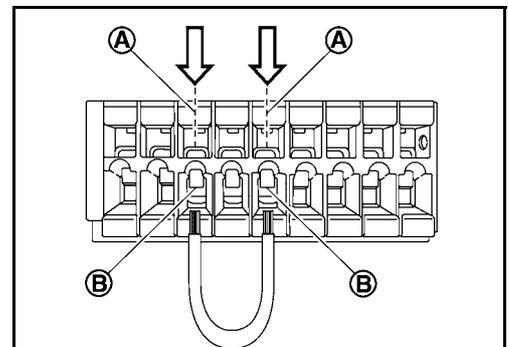
Part No.	734-109
Wire size	0.75 mm (0.03 in)

b) Peel the cover off about 5mm (0.2 in) at both ends of the wire (A).



c) Insert a thin flat blade screwdriver into the opening of (A) and press it.

d) Insert the harness into the opening (B) (Terminal No. 3 and 5) that is generated by the previous step.

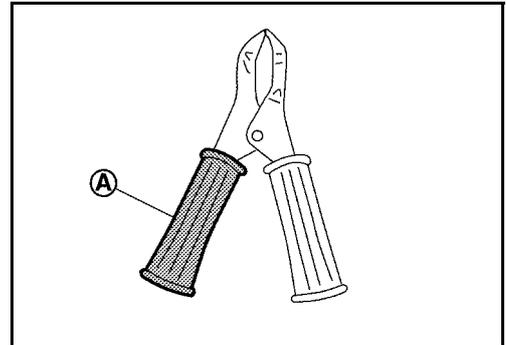


2) Resistance unit

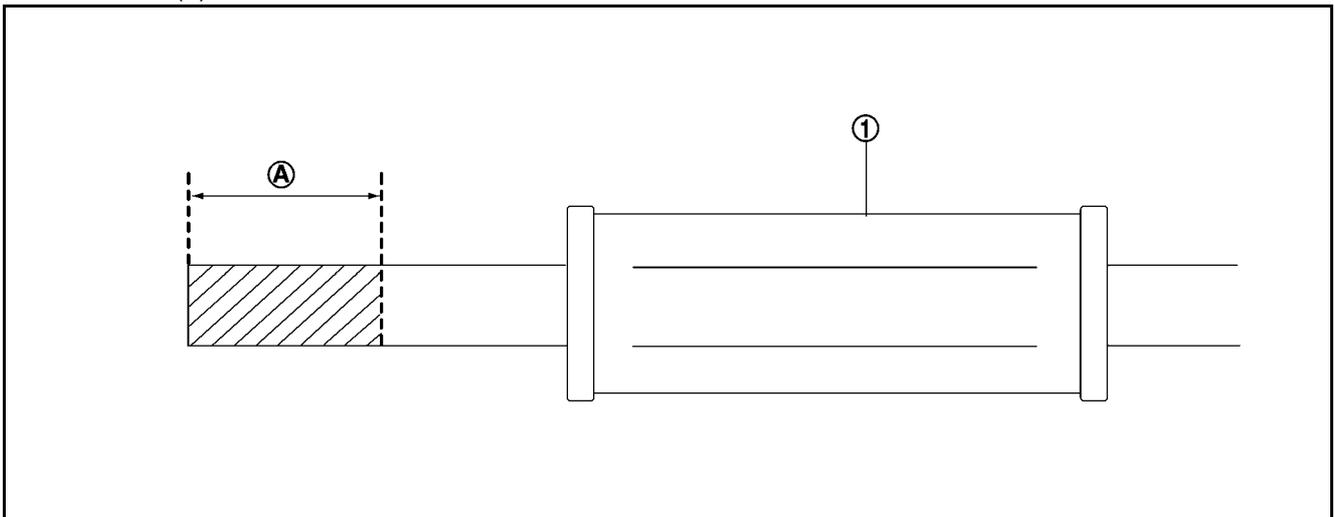
a) Prepare crocodile clip, wire, and resistance.

Crocodile clip	- Rated current 20A or more - Opening width 20mm (0.79 in) - Necessary clips: 2
Wire size	- Rated voltage 600V or more - Wire diameter more than 1.3 mm (0.05 in)
Resistance	-50 k ohm / 5W

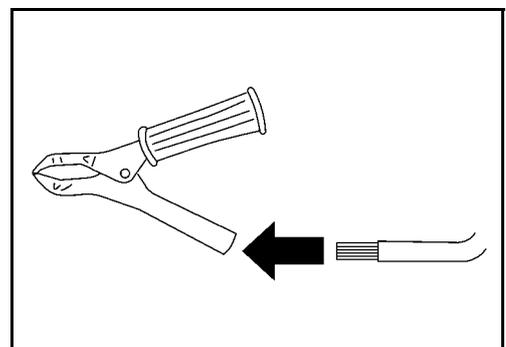
b) Remove grip (A) from crocodile clip.



c) Thread the grip (1) through the wire side, and peel the cover off approximately 5mm (0.2 in) at both ends of the wire (A).



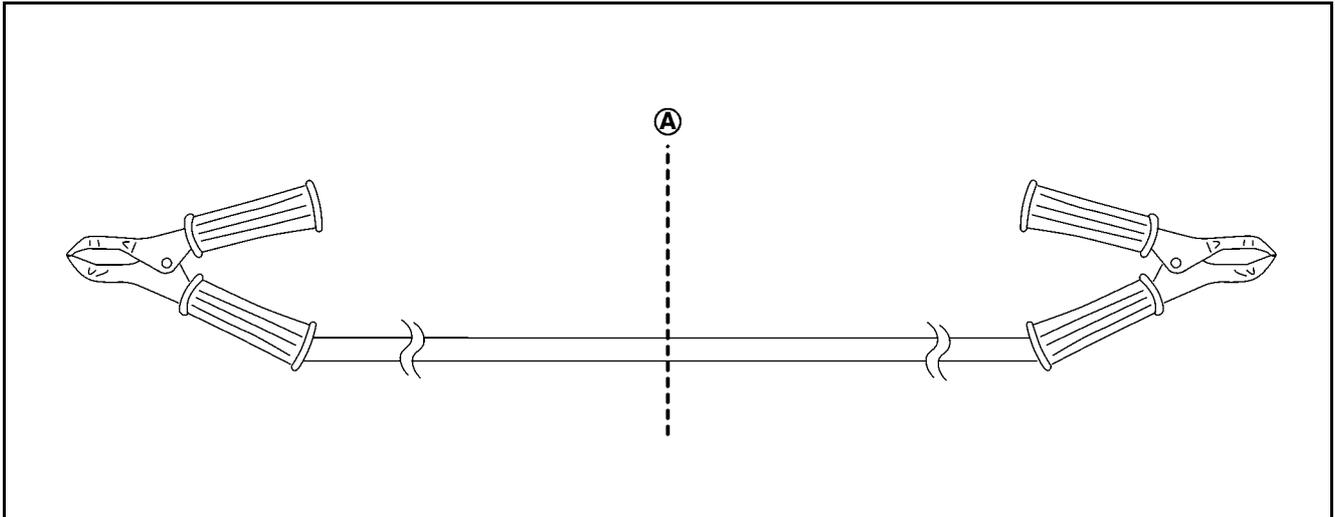
d) Crimp wires onto the grip of crocodile clip and solder them.



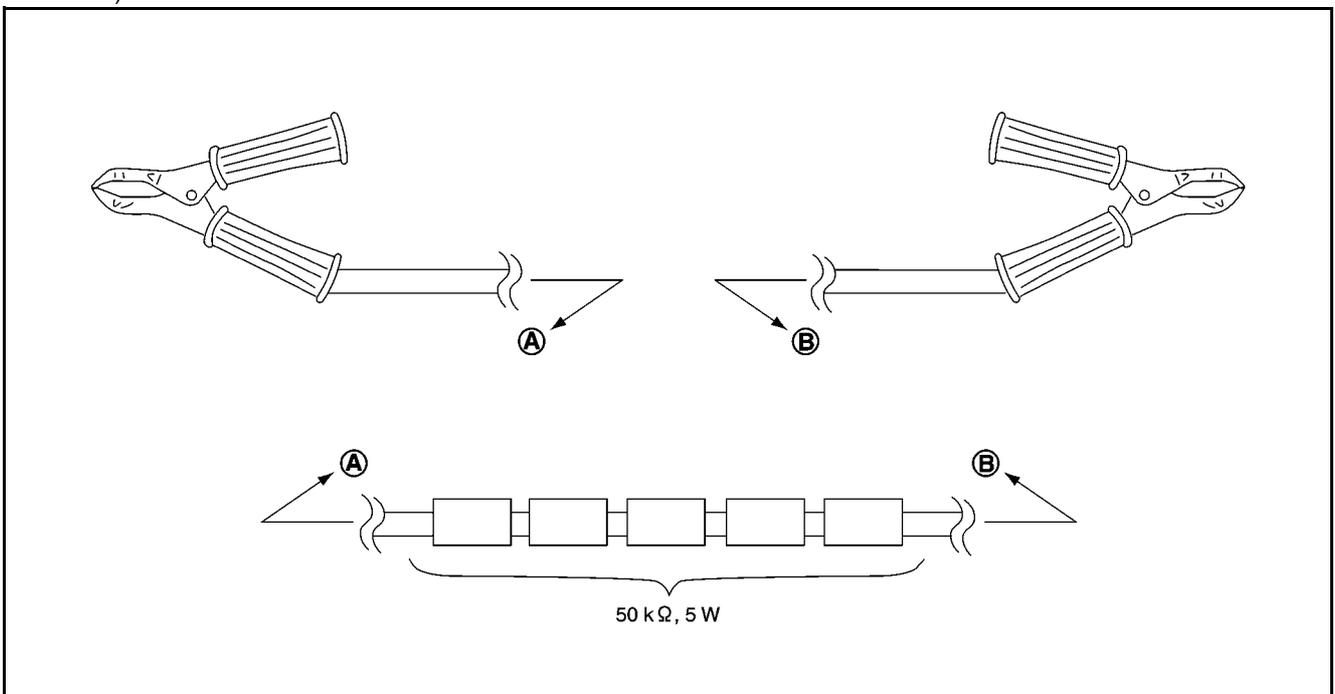
e) Proceed the similar work for the other side.

f) Return the grip to the original position.

g) Cut the wire (A).



h) Connect a resistance of 50 K ohm / 5 W between the wires cut.

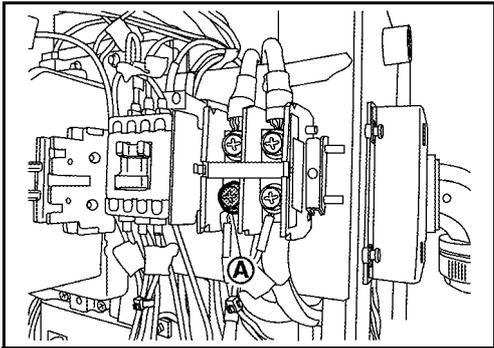


2 - 4 - 2 : REMOVE

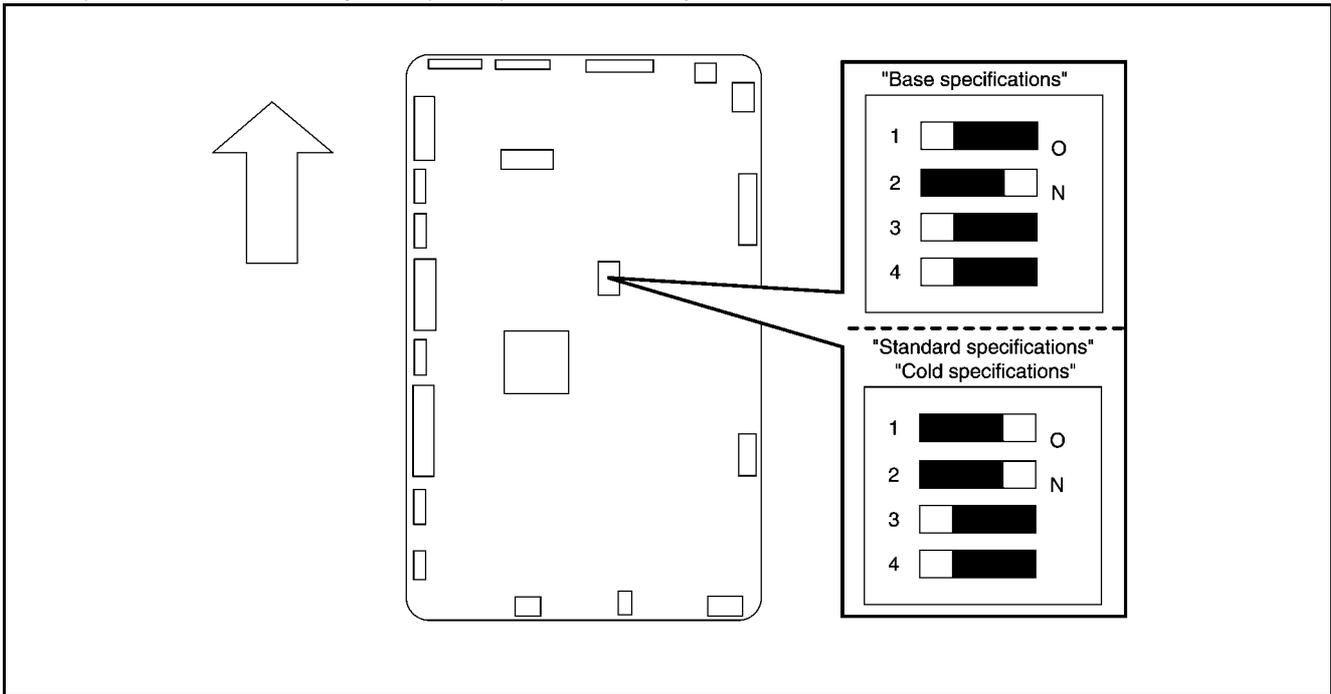
- 1) Remove heat sink cover. Refer to "5-2: Heat sink cover".
- 2) Remove plate assy-back (upper). Refer to "5-3: Plate Assy- Back (Upper)".
- 3) Remove plate assy-back (lower). Refer to "5-4: Plate Assy- Back (lower)".
- 4) Remove plate assy-back (side RH and LH). Refer to "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove cover-supt clamp, charger connector cable. Refer to "5-6: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove panel assy-side (front cabinet). Refer to "5-7: Panel Assy- Side (Front Cabinet)".

2 - 4 - 3 : GROUND SHORT PROTECTION TEST METHOD

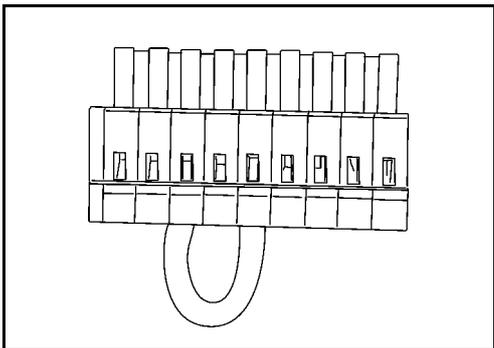
1) Connect P (A) of contactor assy-magnet (TB1) and plate assy earth bar using a resistance unit. (50 k ohm / 5 W)



2) Turn 2 of controller assy-main (PWB1) SW1 to the ON position.

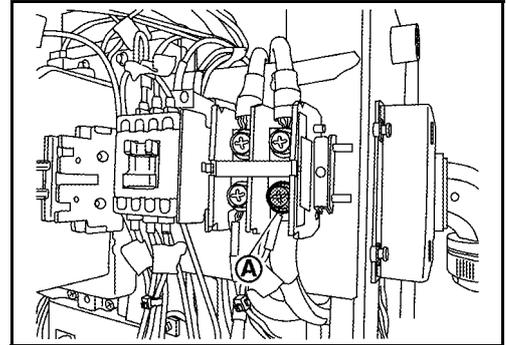


3) Remove CN16 of controller assy-main (PWB1) and alternatively install a connector for the ground short protection test.



- 4) Turn ON the quick charger main power supply.
- 5) Turn ON the circuit breaker assy- 1st (ELCB1) and circuit breaker assy-2nd (ELCB2).
- 6) Check that READY lamp blinks.
- 7) Press START button. (For STD model, touch LCD anywhere once and then press START button.)
- 8) During ground short protection test, CHARGE lamp blinks.

-
- 9) When the CHARGE lamp turns OFF, the ground short protection test is complete. Ground short is detected according to the status of the ALARM lamp.
- a) ALARM lamp turns OFF: Not normal (Ground short is not detected.)
 - b) ALARM lamp turns ON: Normal (Ground short is detected.)
- 10) Turn OFF the circuit breaker assy-1st (ELCB1) and circuit breaker assy-2nd (ELCB2).
- 11) Connect P (A) of contactor assy-magnet (TB1) and plate assy earth bar using a resistance unit (50 k ohm / 5 W).
- 12) Return SW1 of controller assy-main (PWB1) to the original status.



3. INSPECTION PROCEDURES OF PERIODICAL REPLACEMENT PARTS

3 - 1 : Inspection Items, Procedures, and Judgment Standards

Item	Inspection item	Inspection procedure	Judgment standard
1	Perform preparation	1-1: Checking the tools that are used	-
		(1) Digital tester	
		(2) Insulation resistance meter (500V meter)	
		(3) Temperature gauge	
		(4) Humidity gauge	
		(5) Final inspection unit (dummy load device for testing)	
		(6) Phillips screwdriver	
		(7) Cable with crocodile clip connector	
		(8) Resistance unit	
		(9) Shop cloth for cleaning	
		(10) Resistor (50 k ohm / 5 W)	
		(11) personal protective equipment (PPE)	
		(12) Rubber sheet (for protecting against scratches when installing the case)	
(13) Test connector			
2	Equipment power OFF	1-2: Checking parts that require replacement	Once every 3 years
		(1) Cooling fans	
		(2) Filter	
		(3) Charge cable and connector	
		(4) Touch panel battery	
2	Equipment power OFF	Shut off the input to the quick charger.	Visually check that there are no abnormalities.
		(1) Turn OFF the breaker.	
		(2) Place a sign on the breaker that is turned OFF to indicate that work is in progress.	
3	Replacing the cooling fans	(3) Check that the quick charger input voltage is 0 V.	Check using a digital voltmeter.
		Replace the quick charger cooling fans.	After replacing, check visually that there are no abnormalities.
		Follow the replacement procedure and replace each of the cooling fans.	
4	Replacing the filters	Replace the filter in each cooling fan.	After replacing, check visually that there are no abnormalities.
		Follow the replacement procedure and replace each of the filters.	
5	Replacing the charge cable and connector	Replace the charge cable and connector inside the quick charger.	After replacing, check visually that there are no abnormalities.
		Follow the replacement procedure and replace the charge cable and connector.	
6	Replacing the touch panel battery	Replace the touch panel battery.	After replacing, check visually that there are no abnormalities.
		Follow the replacement procedure and replace the touch panel battery.	
7	Checking after work is completed	After replacing a part, check the operation of the quick charger based on the inspection procedure and confirm that it operates normally.	

8	Checking after work is completed	8-1: Check that all breakers are ON.	Must be the same as before work.
		8-2: Check that all fuses are inserted.	Check by touch that there are no abnormalities.
		8-3: Check that the equipment operates normally.	Visually check that there are no abnormalities.
		8-4: Check the quantity of the tools that were used.	All tools must be accounted for.
		8-5: Submit the daily work report.	All required fields must be completed.
9	Report	Create the daily work report and have it signed.	All required fields must be completed.

4. REPLACEMENT PROCEDURES OF PERIODICAL REPLACEMENT PARTS

	<p>Take the following steps to prevent electric shock while working.</p> <p>(1) Wear personal protective equipment (PPE) while working.</p> <p>(2) Turn OFF the corresponding breaker on the primary-side distribution panel.</p> <p>(3) Place a sign on the breaker indicating that work is in progress.</p> <p>(4) Also turn OFF circuit breaker assy- 1st (ELCB1) and circuit breaker assy- 2nd (ELCB2) on the device side before beginning work.</p> <p>Indicates a hazard which will result in death or serious injury if instructions are not followed.</p>
	<p>After replacing parts or removing and installing parts of the quick charger, always perform the operation check of the quick charger according to the inspection procedures using the final inspection unit or vehicle. Check that the quick charger operates normally. Never allow the quick charger to be used without completing the operation check.</p> <p>Quick charger may not operate if this is not performed.</p>

4 - 1 : Display Assy (LCD) Settings Backup Battery

Replacement of battery is recommended In order to maintain quality if 1 year or more is passed since the last replacement.

REMOVAL AND INSTALLATION

Refer to the removal procedure in "5-47: Display assy (LCD) Settings Backup Battery".

4 - 2 : Charge Cable and Connector

Replacement of battery is recommended In order to maintain quality if 3 year or more is passed since the last replacement.

REMOVAL AND INSTALLATION

Refer to the disconnection procedure in "5-26: Charge Cable and Connector".

4 - 3 : Fan Assy- Ventilation (FAN1-1, FAN1-2) / Filter Assy- Air

Replacement of battery is recommended In order to maintain quality if 3 year or more is passed since the last replacement.

REMOVAL AND INSTALLATION

Refer to the removal procedure in "5-37: Fan assy-ventilation (FAN1-1, FAN1-2) / Filter assy-air and replace.

4 - 4 : Cooling Fan (FAN2) and Filter

Replacement of the battery is recommended In order to maintain quality if 3 years or more are passed since the last replacement.

REMOVAL AND INSTALLATION

Refer to the removal procedure in "5-39: Fan Assy-Cooling (FAN2) and Filter" and replace.

4 - 5 : Fan Assy- Cooling (FAN3)

Replacement of battery is recommended in order to maintain quality if 3 years or more are passed since the last replacement.

REMOVAL AND INSTALLATION

Refer to the removal procedure in "5-23: Fan Assy- Cooling (FAN3)" and replace.

4 - 6 :Fan Assy- Cooling (FAN4, FAN5, FAN6)

Replacement of battery is recommended in order to maintain quality if 3 years or more are passed since the last replacement.

REMOVAL AND INSTALLATION

Refer to the removal procedure in "5-41: Fan assy-cooling (FAN4, FAN5, FAN6)" and replace.

4 - 7 :Fan Assy- Cooling, Boost (FAN7)

Replacement of battery is recommended in order to maintain quality if 3 years or more are passed since the last replacement.

REMOVAL AND INSTALLATION

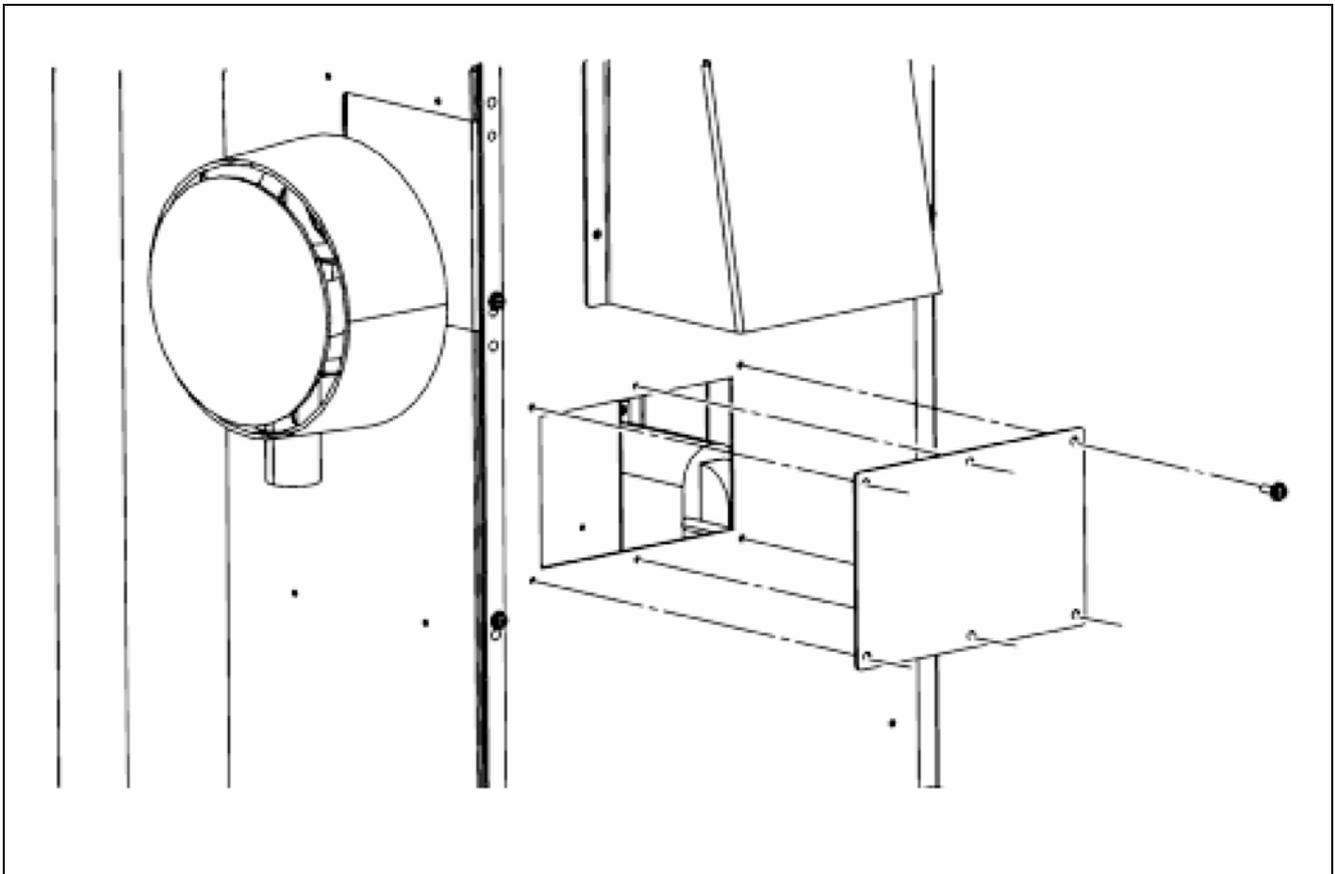
Refer to the removal procedure in "5-6: Plate Assy- Back (middle) / Fan Assy- Cooling, Boost (FAN7)" and replace.

5. REMOVAL AND INSTALLATION

	<p>Take the following steps to prevent electric shock while working.</p> <ol style="list-style-type: none">(1) Wear personal protective equipment (PPE) while working.(2) Turn OFF the corresponding breaker on the primary-side distribution panel.(3) Place a sign on the breaker indicating that work is in progress.(4) Also turn OFF circuit breaker assy-1st (ELCB1) and circuit breaker assy-2nd (ELCB2) on the device side before beginning work. <p>Indicates a hazard which will result in death or serious injury if instructions are not followed.</p>
	<p>After replacing parts or removing and installing parts of the quick charger, always perform the operation check of the quick charger according to the inspection procedures using the final inspection unit or vehicle. Check that the quick charger operates normally. Never allow the quick charger to be used without completing the operation check.</p> <p>Quick charger may not operate if this is not performed.</p>

5 - 1 : Circuit Breaker Assy Cover

5 - 1 - 1 : COMPONENT PARTS LOCATION



5 - 1 - 2 : REMOVAL

Remove the circuit breaker assy cover mounting screws.

5 - 1 - 3 : INSTALLATION

Install in the reverse order of removal.

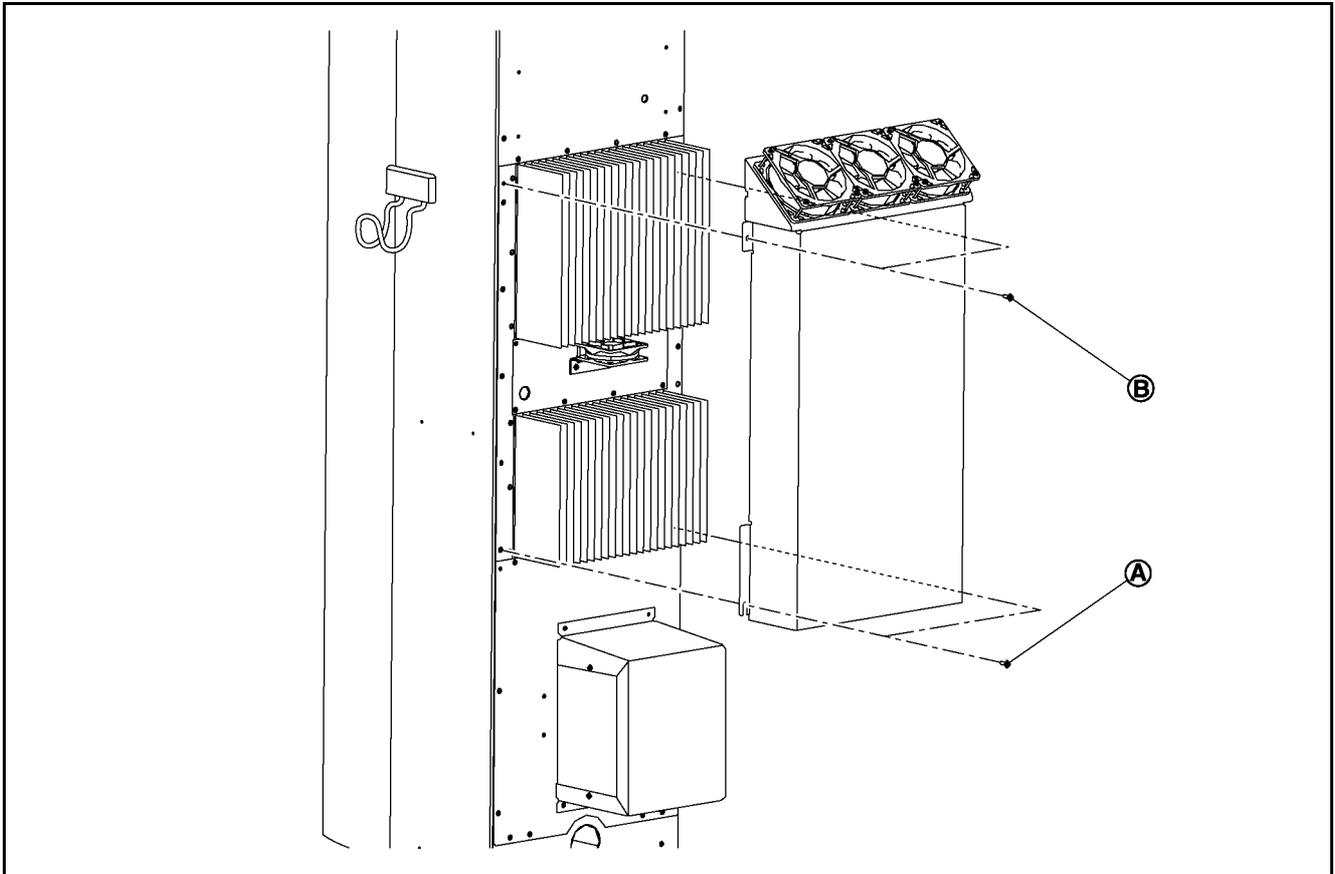
5 - 2 : Heat Sink Cover

CAUTION 1 : Perform this work only when the heat sink is cool.

CAUTION 2 : Work for removal of the heat sink fan connector must be performed by 2 persons.

CAUTION 3 : The corners of the heat sink fins are sharp. Use caution to avoid injury.

5 - 2 - 1 : COMPONENT PARTS LOCATION



5 - 2 - 2 : REMOVAL

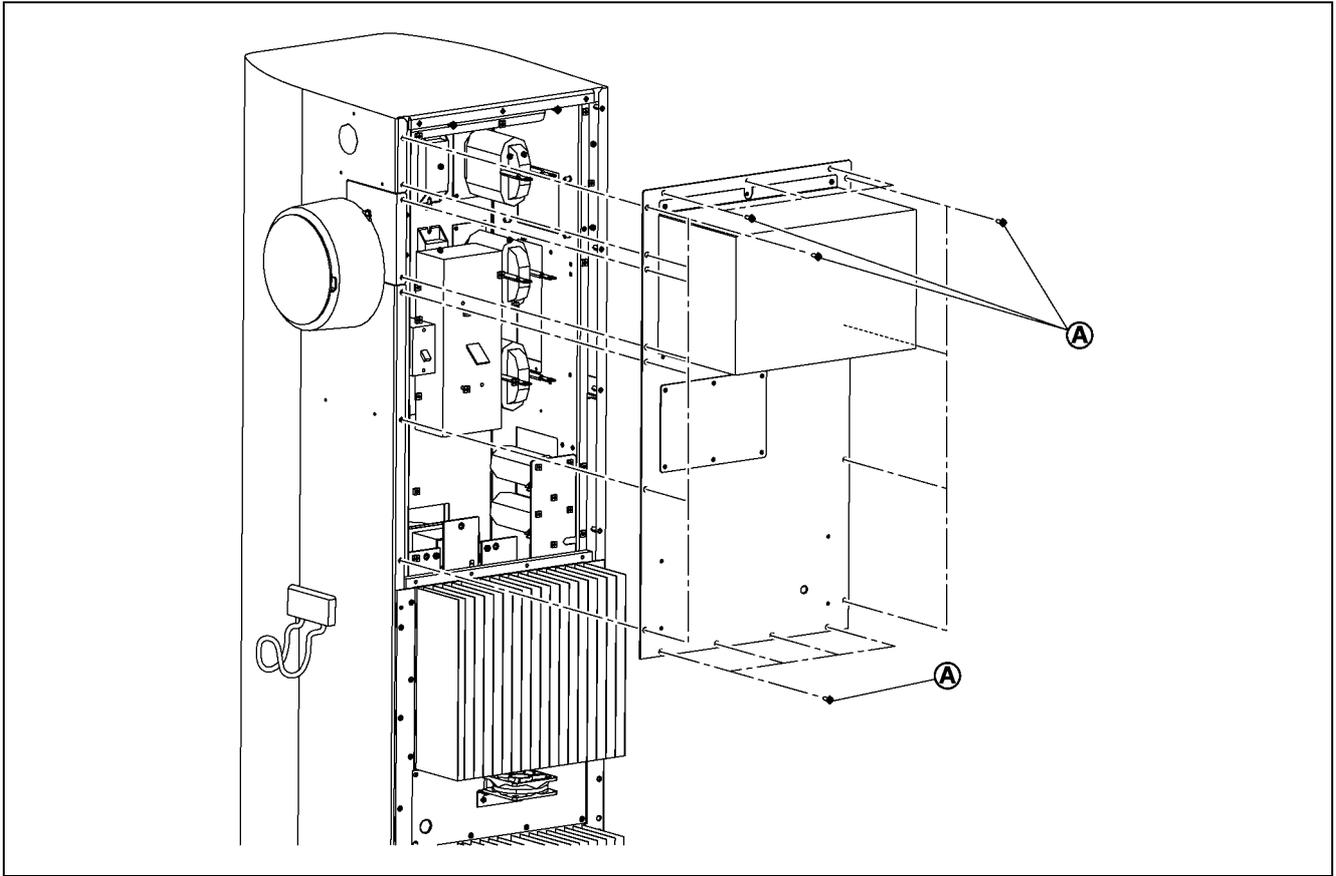
- 1) Loosen the heat sink cover mounting screws (A) that fasten the heat sink cover.
- 2) Remove the heat sink cover mounting screws (B).
- 3) Lift up the heat sink cover.
- 4) Disconnect the cooling fan harness connectors.
- 5) Remove the heat sink cover.

5 - 2 - 3 : INSTALLATION

Install in the reverse order of removal.

5 - 3 : Plate Assy- Back (Upper)

5 - 3 - 1 : COMPONENT PARTS LOCATION



5 - 3 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy- back (upper) mounting screws (A).
- 3) Disconnect the earth harness connector.
- 4) Disconnect the fan assy- ventilation (FAN1-1 and FAN1-2) harness connectors.
- 5) Remove the plate assy- back (upper).

5 - 3 - 3 : INSTALLATION

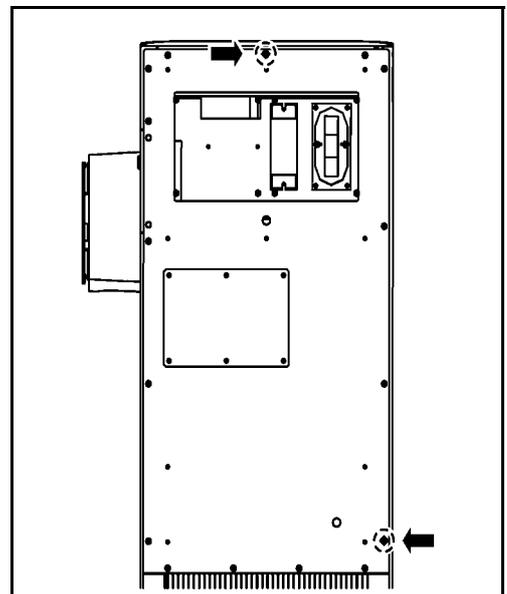
Note the following, and install in the reverse order of removal.

CAUTION 1: Install the small screws (two screws shown with black arrow) with small screw holes first, which are used to identify the location.

CAUTION 2: When multiple back plates are removed, reinstall them in the order of back plate (lower), back plate (middle), back plate side (RH and LH), and back plate (upper).

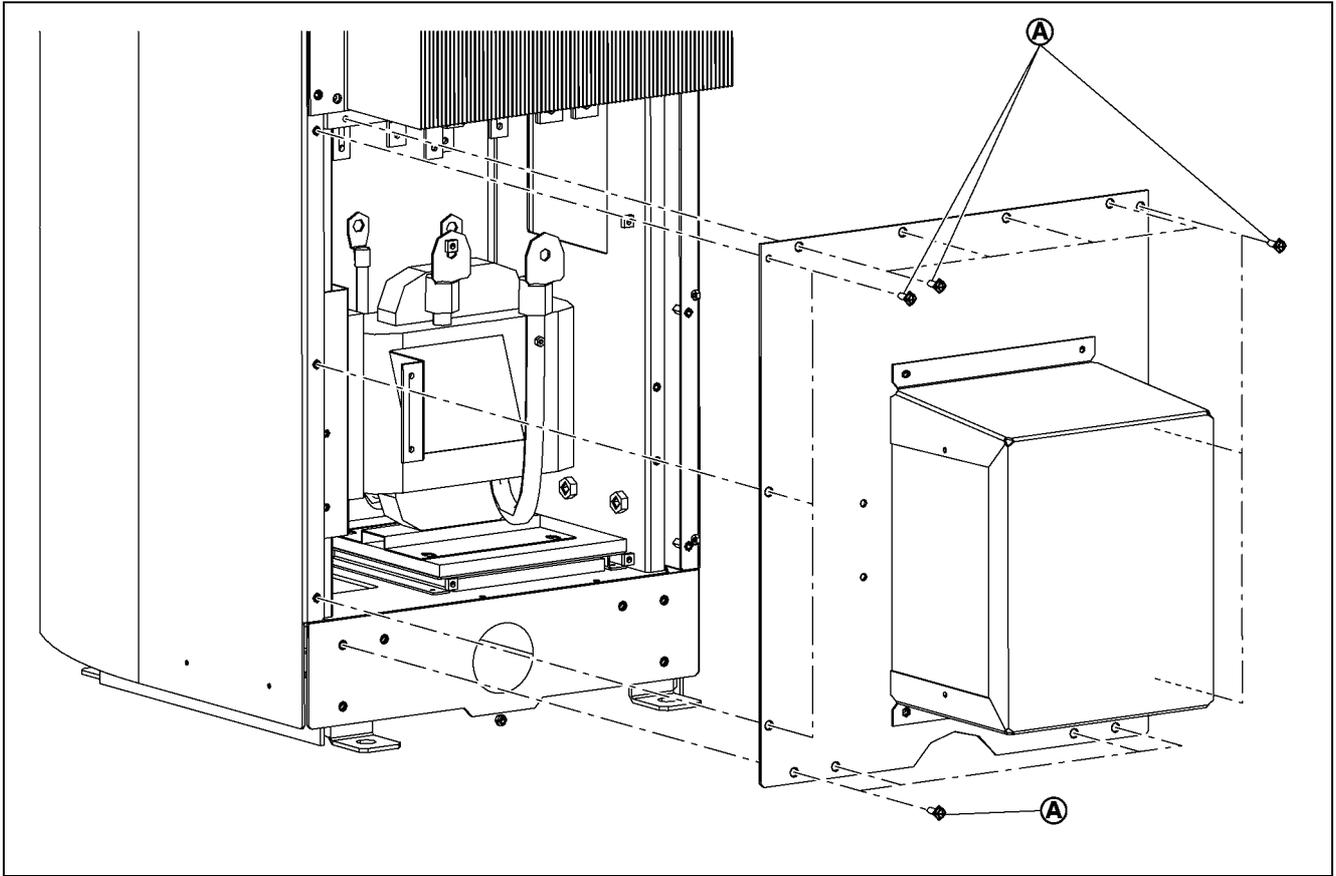
CAUTION 3: When installing each back plate (upper, middle, side RH, side LH, and lower), inject grease to each screw hole to prevent corrosion.

CAUTION 4: If any abnormal condition is observed on waterproof seal, replace back plate assy.



5 - 4 : Plate Assy- Back (Lower)

5 - 4 - 1 : COMPONENT PARTS LOCATION



5 - 4 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy- back (lower) mounting screws (A).
- 3) Remove the earth harness.
- 4) Disconnect the fan assy-cooling (FAN2) harness connector.
- 5) Remove the plate assy- back (lower).

5 - 4 - 3 : INSTALLATION

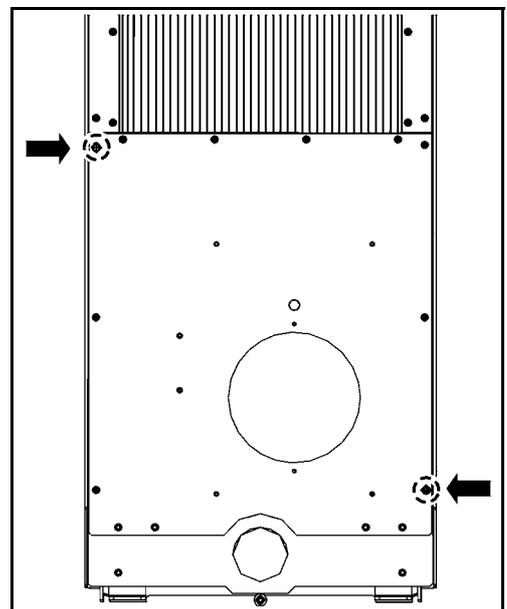
Note the following, and install in the reverse order of removal.

CAUTION 1: Install the small screws (two screws shown with black arrow) with small screw holes first, which are used to identify the location.

CAUTION 2: When multiple back plates are removed, reinstall them in the order of back plate (lower), back plate (middle), back plate side (RH and LH), and back plate (upper).

CAUTION 3: When installing each back plate (upper, middle, side RH, side LH, and lower), inject grease to each screw hole to prevent corrosion.

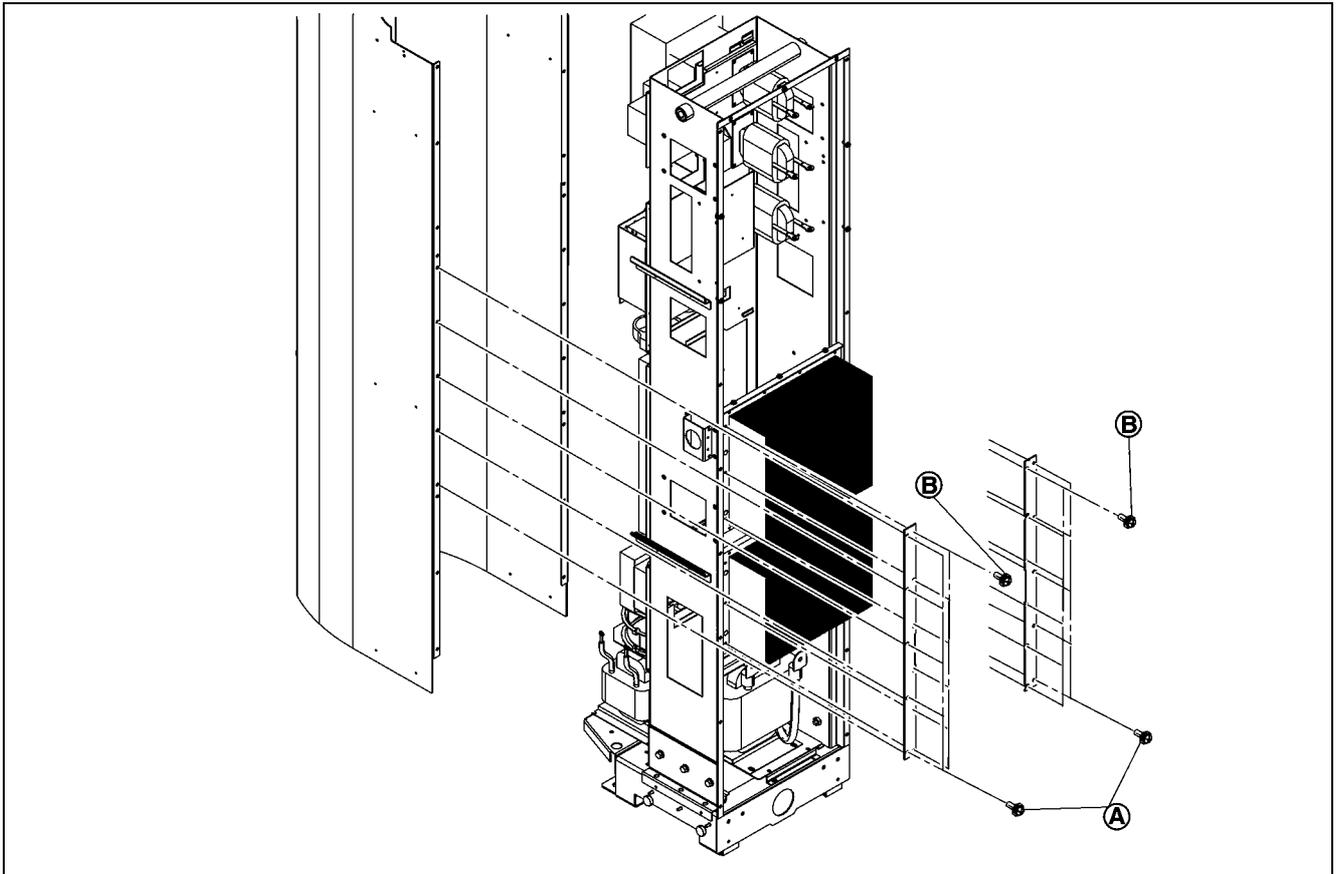
CAUTION 4: If any abnormal condition is observed on waterproof seal, replace back plate assy.



5 - 5 : Plate Assy- Back (Side RH and LH)

NOTE: To remove only the side panel assy, remove the fastening screws (A).

5 - 5 - 1 : COMPONENT PARTS LOCATION



5 - 5 - 2 : REMOVAL

- 1) Remove the plate assy- back (side RH and LH) mounting screws (A).
- 2) Remove the plate assy- back (side RH and LH) mounting screws (B).
- 3) Remove the plate assy- back (side RH and LH).

5 - 5 - 3 : INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION 1: Install the small screws (two screws shown with black arrow) with small screw holes first, which are used to identify the location.

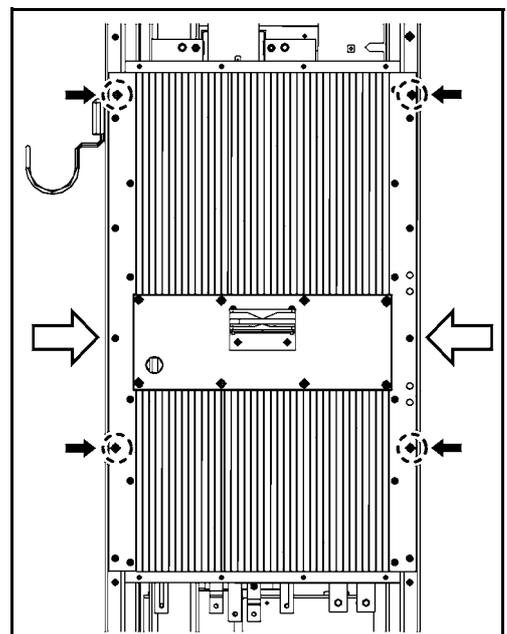
CAUTION 2: Tighten the screws pressing the back plate (side RH and LH) against back plate (middle) (as shown with white arrow).

CAUTION 3: When installing, inject grease into each of the screw holes in order to prevent corrosion.

CAUTION 4: When multiple back plates are removed, reinstall them in the order of back plate (lower), back plate (middle), back plate side (RH and LH), and back plate (upper).

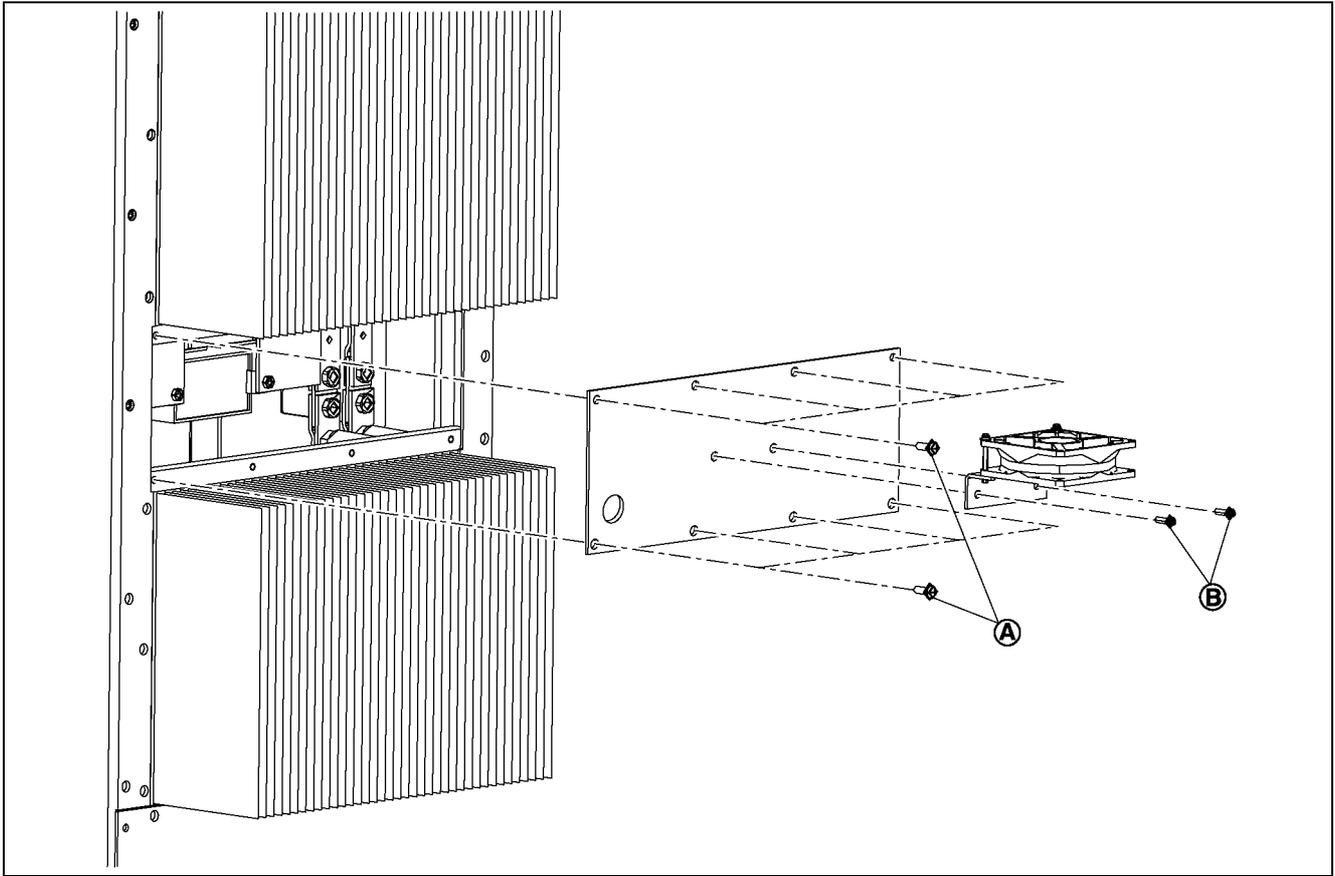
CAUTION 5: When installing each back plate (upper, middle, side RH, side LH, and lower), inject grease to each screw hole to prevent corrosion.

CAUTION 6: If any abnormal condition is observed on waterproof seal, replace back plate assy.



5 - 6 : Plate Assy- Back (Middle) / Fan Assy- Cooling, Boost (FAN7)

5 - 6 - 1 : COMPONENT PARTS LOCATION



5 - 6 - 2 : REMOVAL

- 1) Remove the plate assy- back (middle) mounting screws (A).
- 1) Disconnect the earth harness.
- 2) Disconnect the fan assy- cooling, boost (FAN7) harness connector.
- 3) Remove the plate assy- back (middle) from unit.
- 4) Remove the fan assy- cooling, boost (FAN7) mounting screws (B).
- 5) Remove the fan assy- cooling, boost (FAN7) from plate assy- back (middle).

5 - 6 - 3 : INSTALLATION

Note the following, and install in the reverse order of removal.

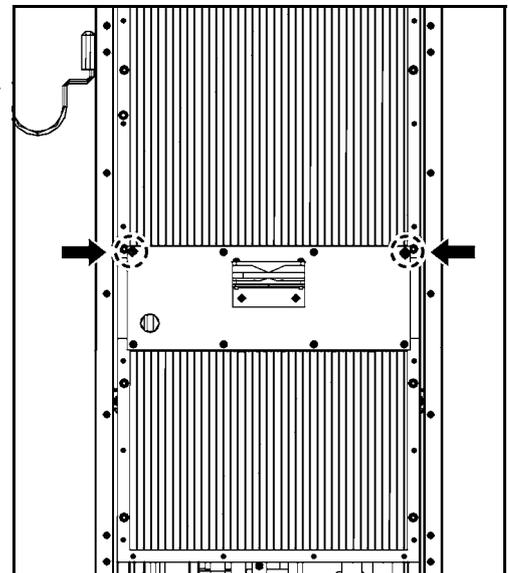
CAUTION 1: Install the small screws (two screws shown with black arrow) with small screw holes first, which are used to identify the location.

CAUTION 2: Install FAN placing the label surface upward.

CAUTION 3: When multiple back plates are removed, reinstall them in the order of back plate (lower), back plate (middle), back plate side (RH and LH), and back plate (upper).

CAUTION 4: When installing each back plate (upper, middle, side RH, side LH, and lower), inject grease to each screw hole to prevent corrosion.

CAUTION 5: If any abnormal condition is observed on waterproof seal, replace back plate assy.



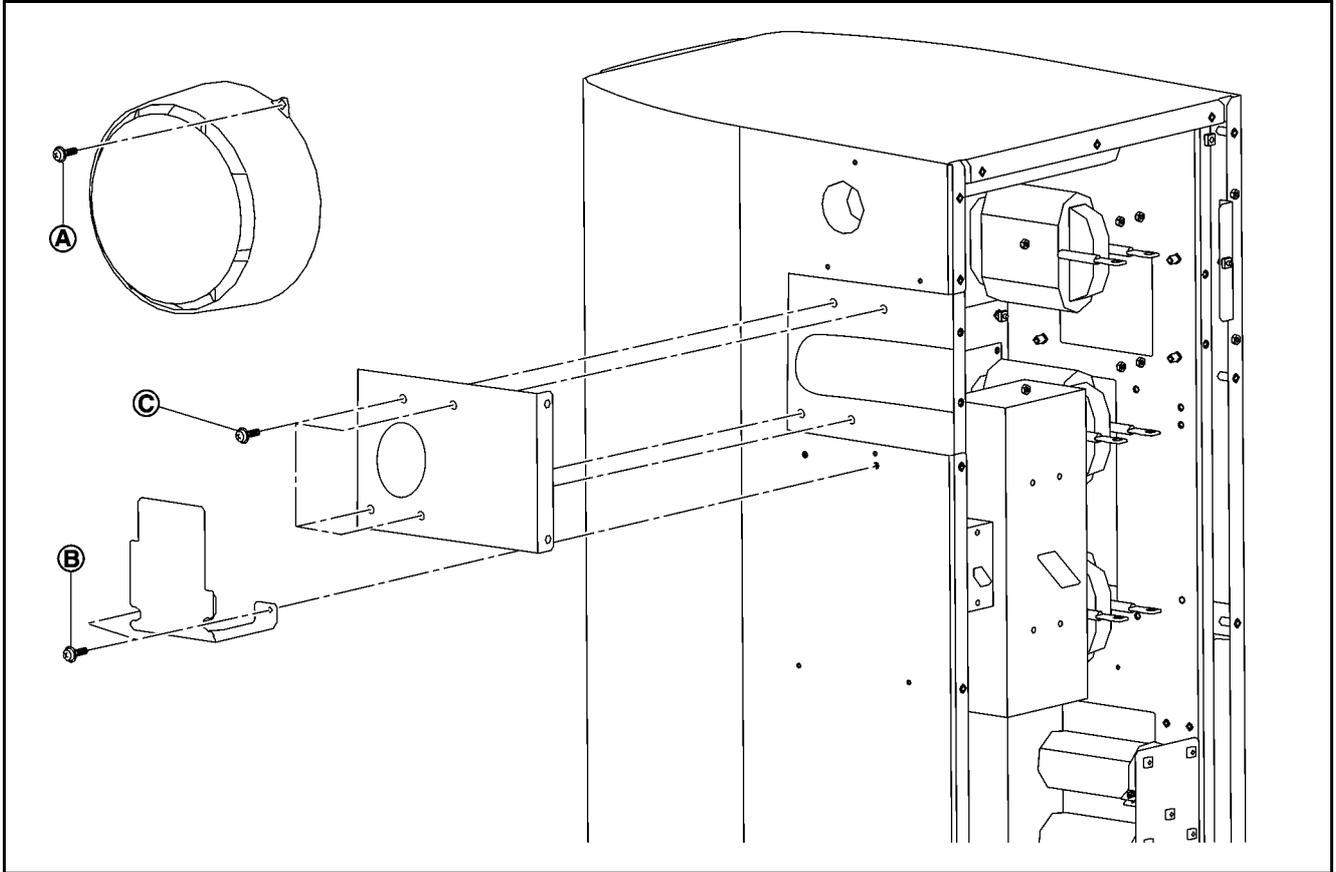
5 - 7 :Cover- Supt Clamp / Charge cable and connector

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

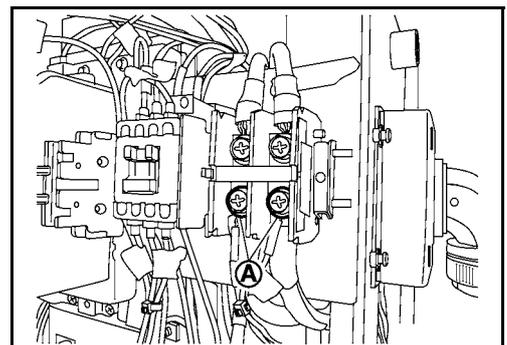
CAUTION 3: Be sure to note the directions of the coupling, bushing, and positioning spacers.

5 - 7 - 1 : COMPONENT PARTS LOCATION



5 - 7 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the cover-supt clamp, charger connector cable mounting screws (A), and remove the cover to upward direction.
- 4) Remove the cover-supt clamp, charger connector cable bracket mounting screws (B).
- 5) Remove the finisher mounting screws (C).
- 6) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 7) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 8) Pull the side panel assy forward while lifting them up and place them approximately 500 mm (19.69 in) in front of the unit.
- 9) Remove the contactor assy- magnet (TB1) clear protective cover.
- 10) Remove the contactor assy- magnet (TB1) lower side terminal bolts (A) and disconnect the harness.



- 11) Disconnect charge cable and connector harness connector.
- 12) Loosen the charging cable and connector coupling and remove the base, bushing, positioning spacers, and coupling from the cable.
- 13) Remove the connector assy-charger mounting nut from the finisher.

5 - 7 - 3 : INSTALLATION

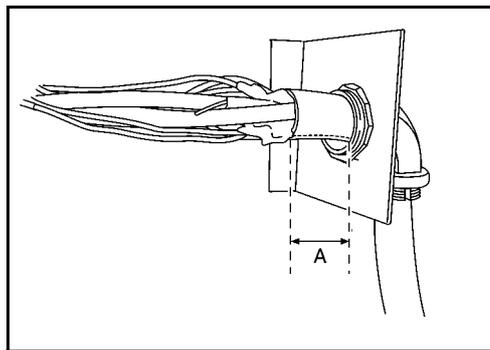
Note the following, and install in the reverse order of removal.

CAUTION 1: When installing each back plate (upper, middle, side RH, side LH, and lower), inject grease to each screw hole to prevent corrosion.

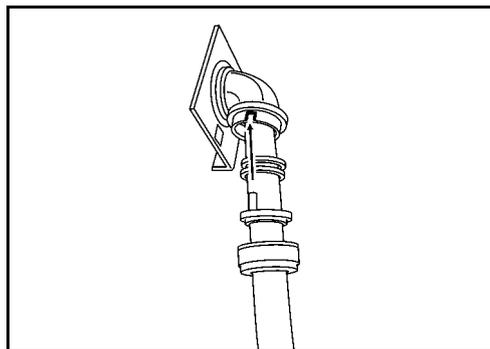
CAUTION 2: If any abnormal condition is observed on waterproof seal, replace back plate assy.

CAUTION 3: When multiple back plates are removed, reinstall them in the order of back plate (lower), back plate (middle), back plate side (RH and LH), and back plate (upper).

CAUTION 4: Install so that the covered part of the charge cable extends by 50 mm (1.97 in) (A) from the cable outlet base.



CAUTION 5: When installing the positioning spacers, install with the projections aligned.

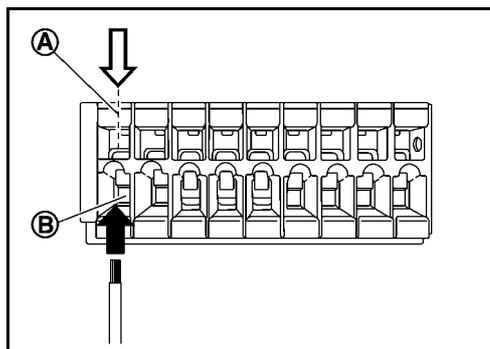


CAUTION 6: When replacement to new charge cable and connector is performed, replacement of CN16 connector is required.

CAUTION 7: Make sure to connect the wire to the original location.

CAUTION 8: Refer to the below procedure for wire replacement.

- 1) Insert a thin minus screwdriver into the opening of (A) and press it, and then remove the wire.
- 2) Insert the harness into the opening (B) that is generated by the previous step.



5 - 8 : Side Panel Assy

CAUTION 1: The side panel (front cabinet) and unit are connected by a harness. Be careful not to cut the harness.

CAUTION 2: Because the side panel (front cabinet) is heavy, this work must be performed by 2 persons.

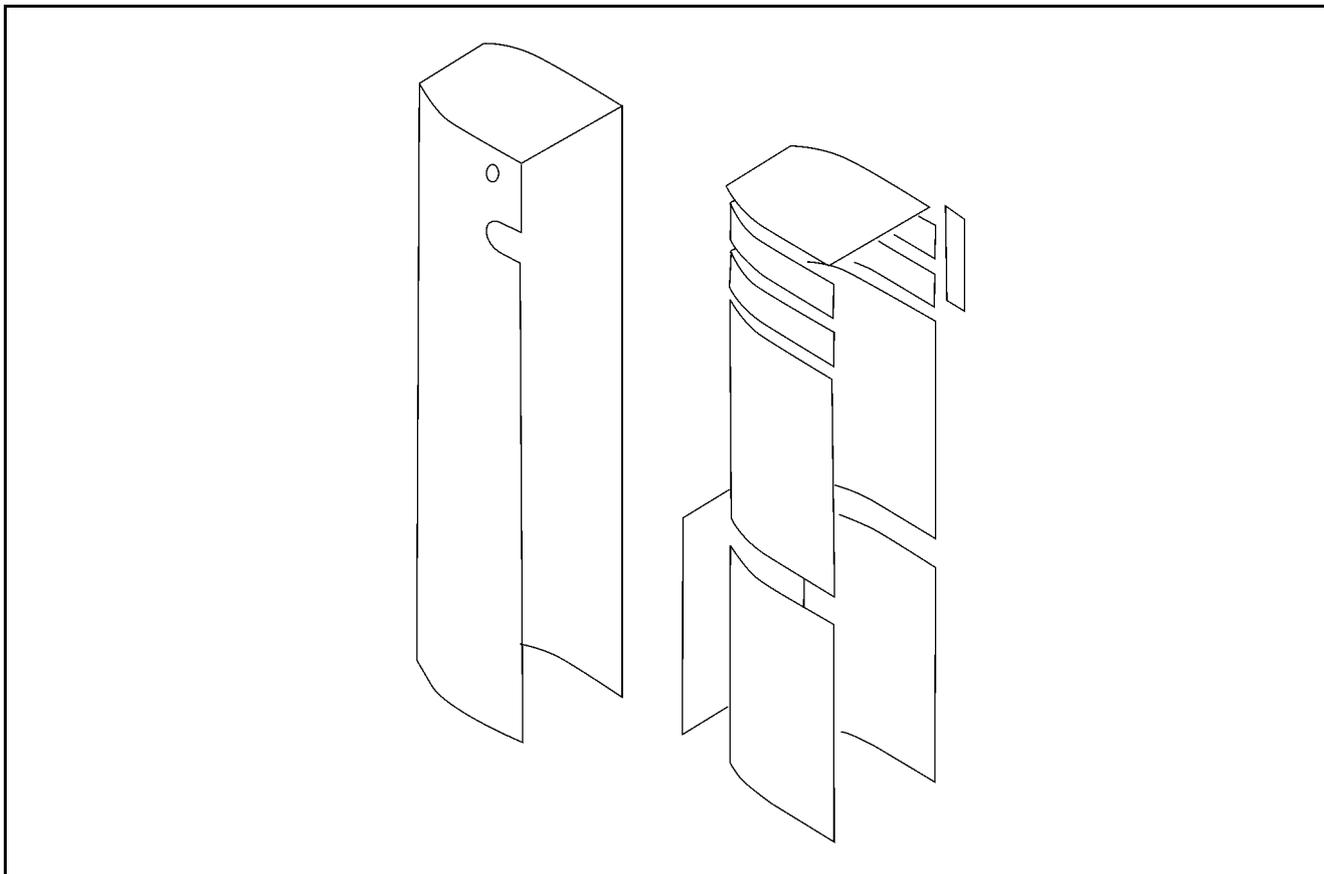
CAUTION 3: Be sure to lay the removed side panel (front cabinet) on its side so that it is not knocked over by strong wind or another cause.

CAUTION 4: When placing the side panel (front cabinet) on the ground, place it on a rubber sheet or similar item so that the paint is not peeled off.

CAUTION 5: Before disconnecting the wiring, record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

NOTE: The LCD is installed only with the Standard Specifications.

5 - 8 - 1 : COMPONENT PARTS LOCATION



5 - 8 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Pull the side panel forward while lifting them up and place them approximately 500 mm (19.69 in) in front of the unit.
- 7) Disconnect the harness connectors and wiring for the display assy (LCD), operation panel, buttons, and ground.
- 8) Remove the side panel assy.

5 - 8 - 3 : INSTALLATION

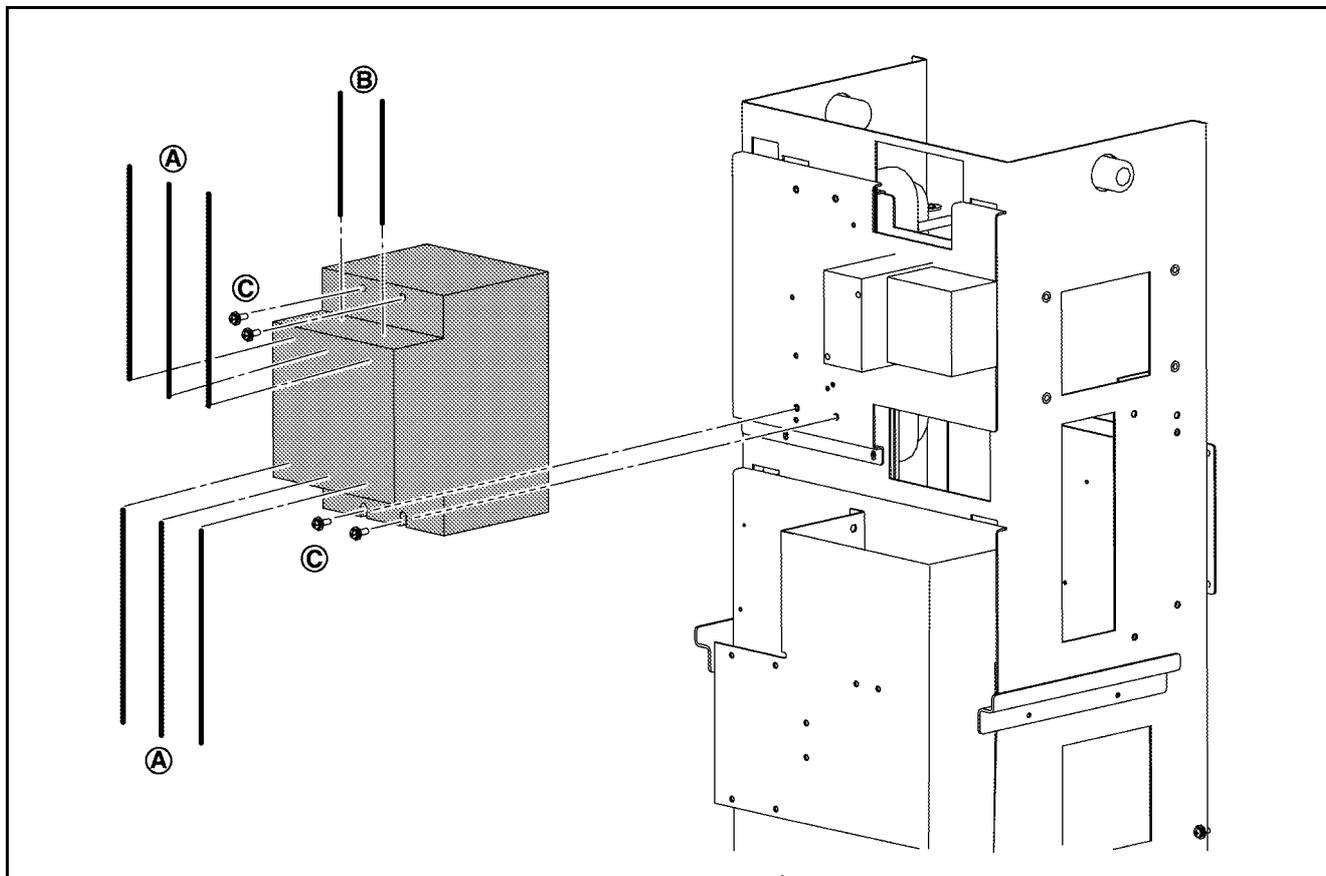
Install in the reverse order of removal.

5 - 9 : Contactor Assy- Magnet, 1st (MC1)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

5 - 9 - 1 : COMPONENT PARTS LOCATION



5 - 9 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the contactor assy- magnet, 1st (MC1) upper and lower terminal nuts and disconnect harness (A).
- 8) Remove the contactor assy- magnet, 1st (MC1) upper terminal screws and disconnect harness (B).
- 9) Remove the contactor assy- magnet, 1st (MC1) mounting screws (C), and then remove the contactor assy- magnet, 1st (MC1).

5 - 9 - 3 : INSTALLATION

Note the following, and install in the reverse order of removal.

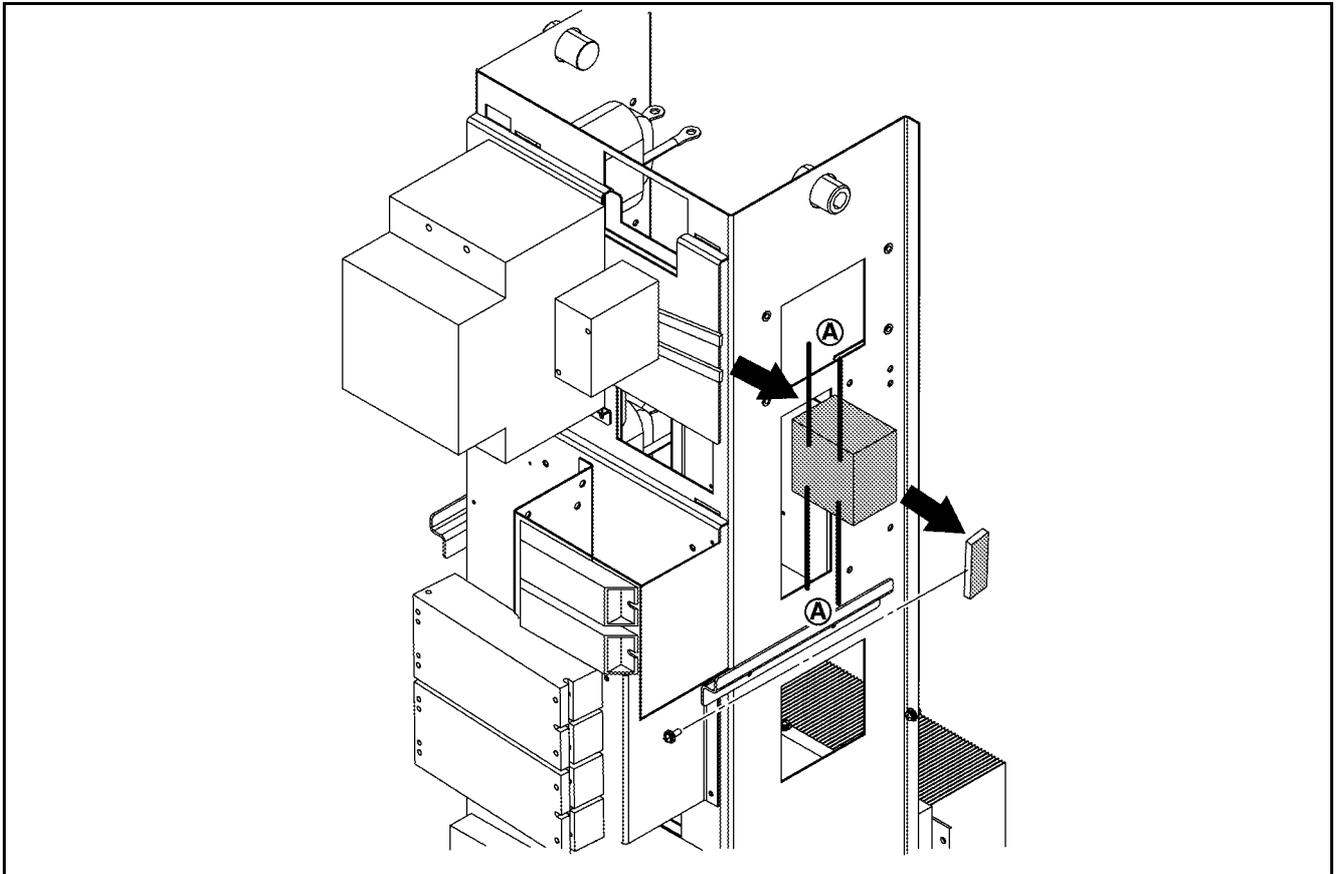
NOTE: MC1 terminal tightening torque: 15 - 20 N-m

5 - 10 : Contactor Assy- Magnet (TB1)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

5 - 10 - 1 : COMPONENT PARTS LOCATION



- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the contactor assy-magnet (TB1) clear cover.
- 8) Remove the contactor assy-magnet (TB1) terminal bolts and disconnect harness (A).
- 9) Remove the screw which fastens the guide on the installation rail.
- 10) Slide the rail guide to the right to remove it.
- 11) Slide contactor assy-magnet (TB1) to the right to remove it.

5 - 10 - 3 : INSTALLATION

Note the following, and install in the reverse order of removal.

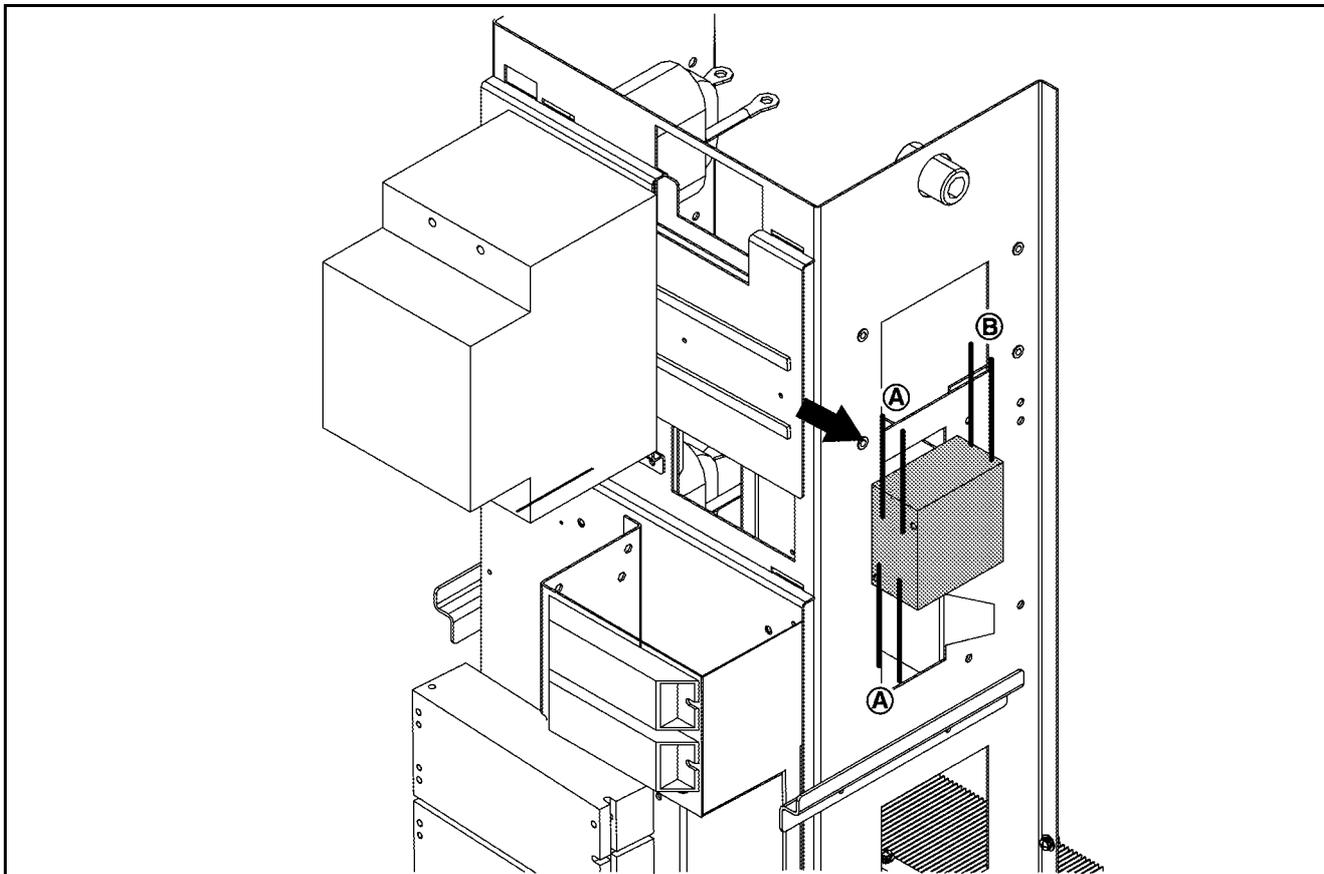
NOTE: TB1 terminal tightening torque: 9 N-m

5 - 11 : Contactor Assy- Magnet, 2nd (MC4)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

5 - 11 - 1 : COMPONENT PARTS LOCATION



5 - 11 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove contactor assy-magnet (TB1). Refer to the removal procedure in "5-10: Contactor Assy-magnet (TB1)".
- 8) Remove the contactor assy-magnet, 2nd (MC4) terminal cover.
- 9) Remove the contactor assy-magnet, 2nd (MC4) terminal screws and disconnect harness (A).
- 10) Remove the contactor assy-magnet, 2nd (MC4) terminal screws and disconnect harness (B).
- 11) Slide contactor assy-magnet, 2nd (MC4) to the right to remove it.

5 - 11 - 3 : INSTALLATION

Note the following, and install in the reverse order of removal.

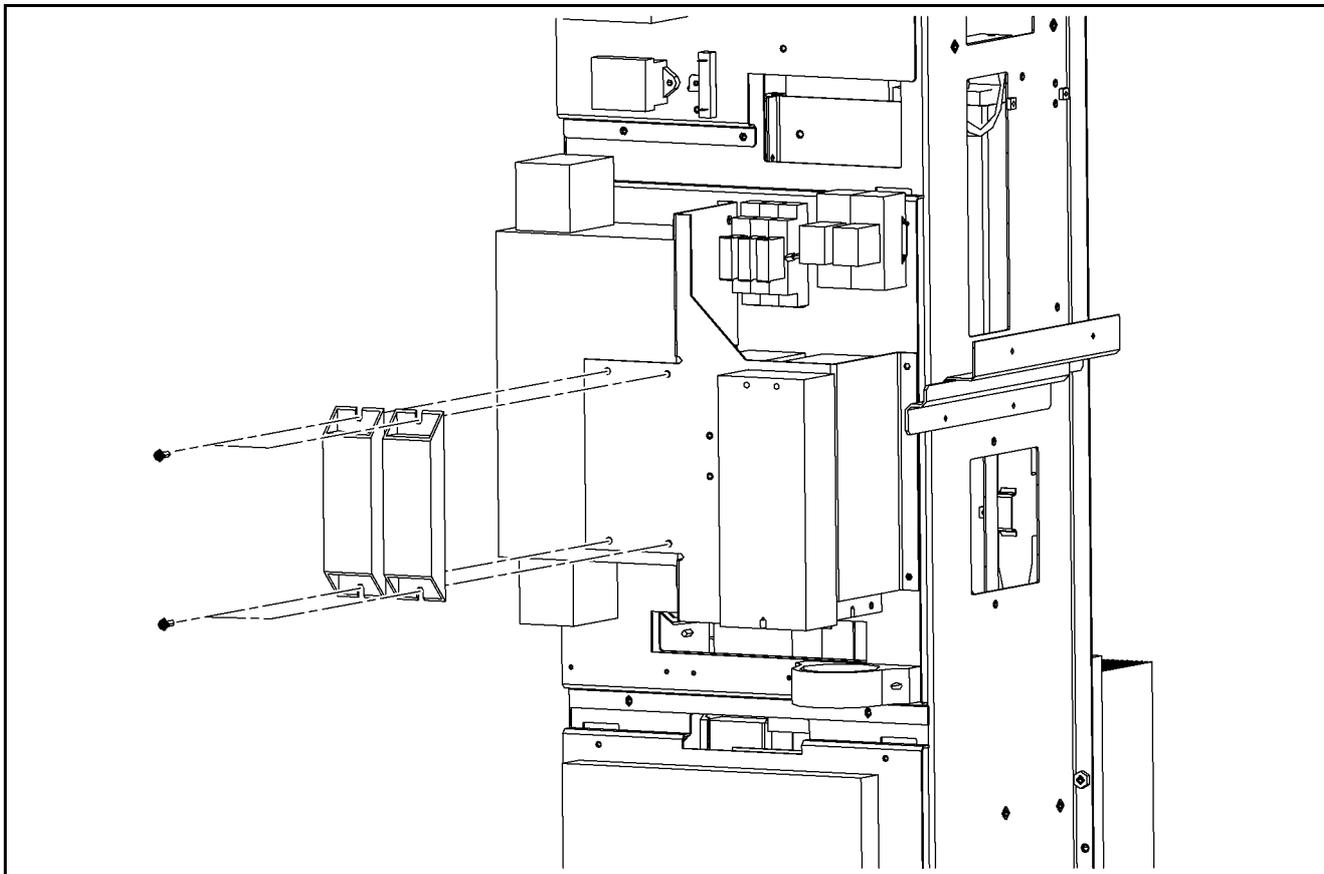
NOTE: MC4 terminal tightening torque: 0.8 - 1 N-m

5 - 12 : Resistor Assy- Pre Charge (R24, R26)

CAUTION 1: Record the cable connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

5 - 12 - 1 : COMPONENT PARTS LOCATION



5 - 12 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the thermometer assy-system, D (TSTR5).
- 8) Remove the contactor assy- magnet, 1st (MC1) terminal nuts and disconnect harness.
- 9) Remove the contactor assy- magnet, 2nd (MC4) terminal screws and disconnect harness.
- 10) Remove the resistor assy- pre charge (R24 and R26) mounting screws, and then remove the resistor assy- pre charge (R24 and R26)

5 - 12 - 3 : INSTALLATION

Install in the reverse order of removal.

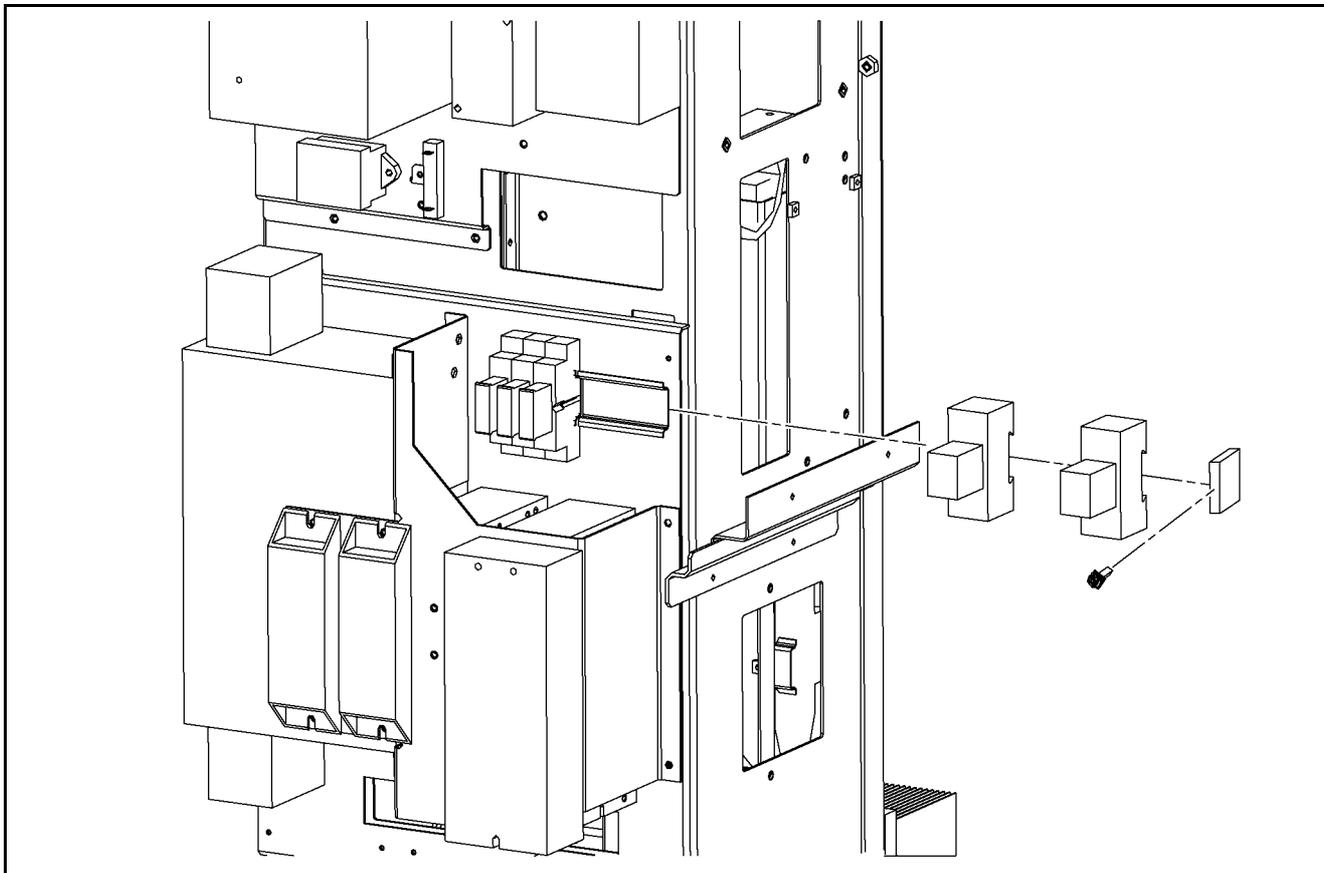
5 - 13 :Heater Assy- Control (CR1, CR2)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

NOTE: This procedure describes the steps for when the assembly is replaced. Ordinarily only the fuses are replaced.

5 - 13 - 1 : COMPONENT PARTS LOCATION



5 - 13 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Disconnect the heater assy- control (CR1, CR2) harness.
- 8) Remove the screw that fastens the guide on the installation rail.
- 9) Slide the rail guide to the right to remove it.
- 10) Slide heater assy- control (CR1, CR2) to the right to remove it.

5 - 13 - 3 : INSTALLATION

Install in the reverse order of removal.

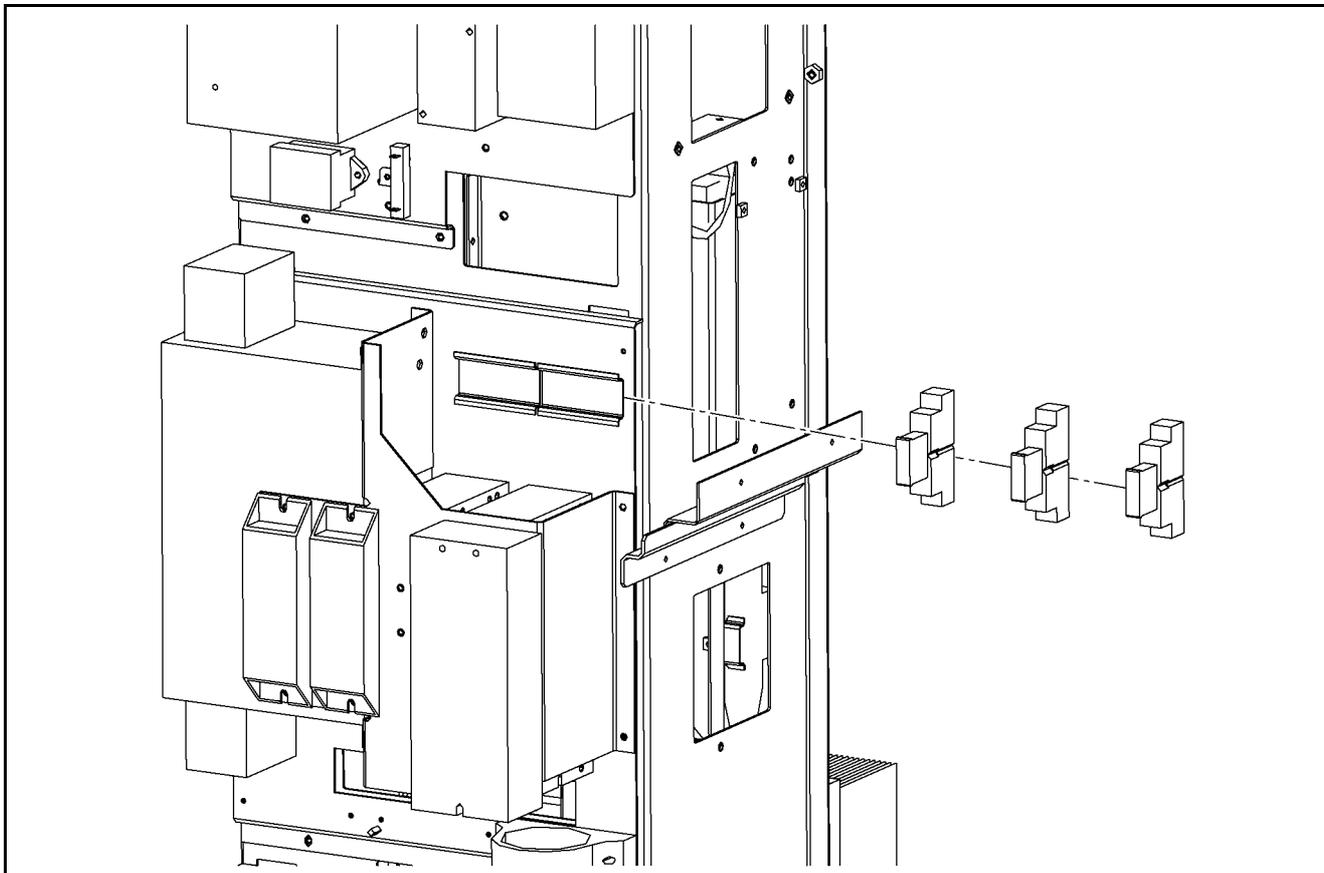
5 - 14 : Fuse Assy (F5, F6, F7)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

NOTE: This procedure describes the steps for when the assembly is replaced. Ordinarily only the fuses are replaced.

5 - 14 - 1 : COMPONENT PARTS LOCATION



5 - 14 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Disconnect the fuse assy (F5, F6, F7) harness.
- 8) Remove the heater assy- control (CR1, CR2).
- 9) Slide fuse assy (F5, F6, F7) to the right to remove it.

5 - 14 - 3 : INSTALLATION

Install in the reverse order of removal.

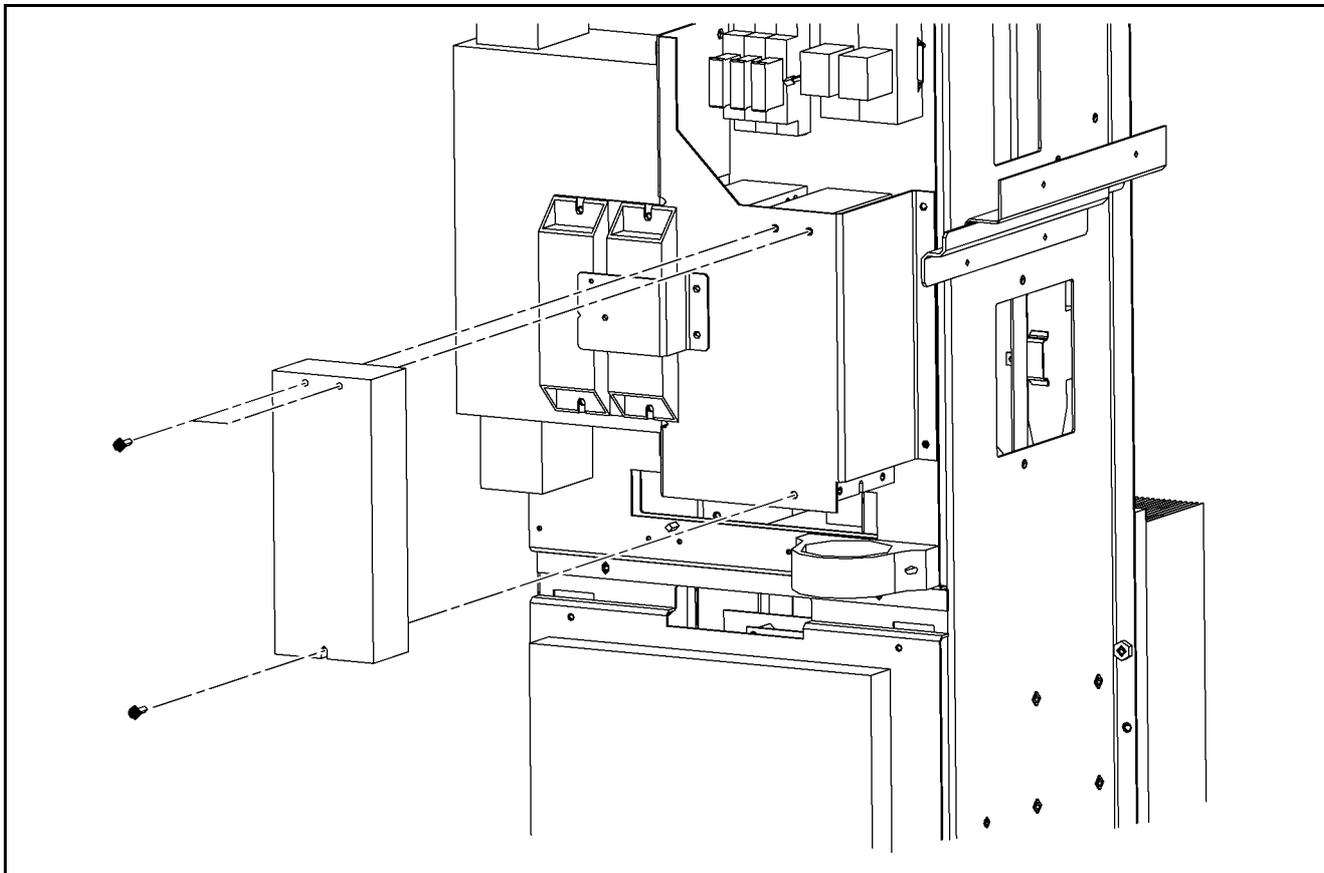
5 - 15 :Power Supply Assy- 3rd (PS3)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

NOTE: This procedure describes the steps for when the assembly is replaced. Ordinarily only the fuses are replaced.

5 - 15 - 1 : COMPONENT PARTS LOCATION



5 - 15 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Disconnect power supply assy- 3rd (PS3) harness connector.
- 8) Remove power supply assy- 3rd (PS3) mounting screws, and then remove the power supply assy- 3rd (PS3).

5 - 15 - 3 : INSTALLATION

Install in the reverse order of removal.

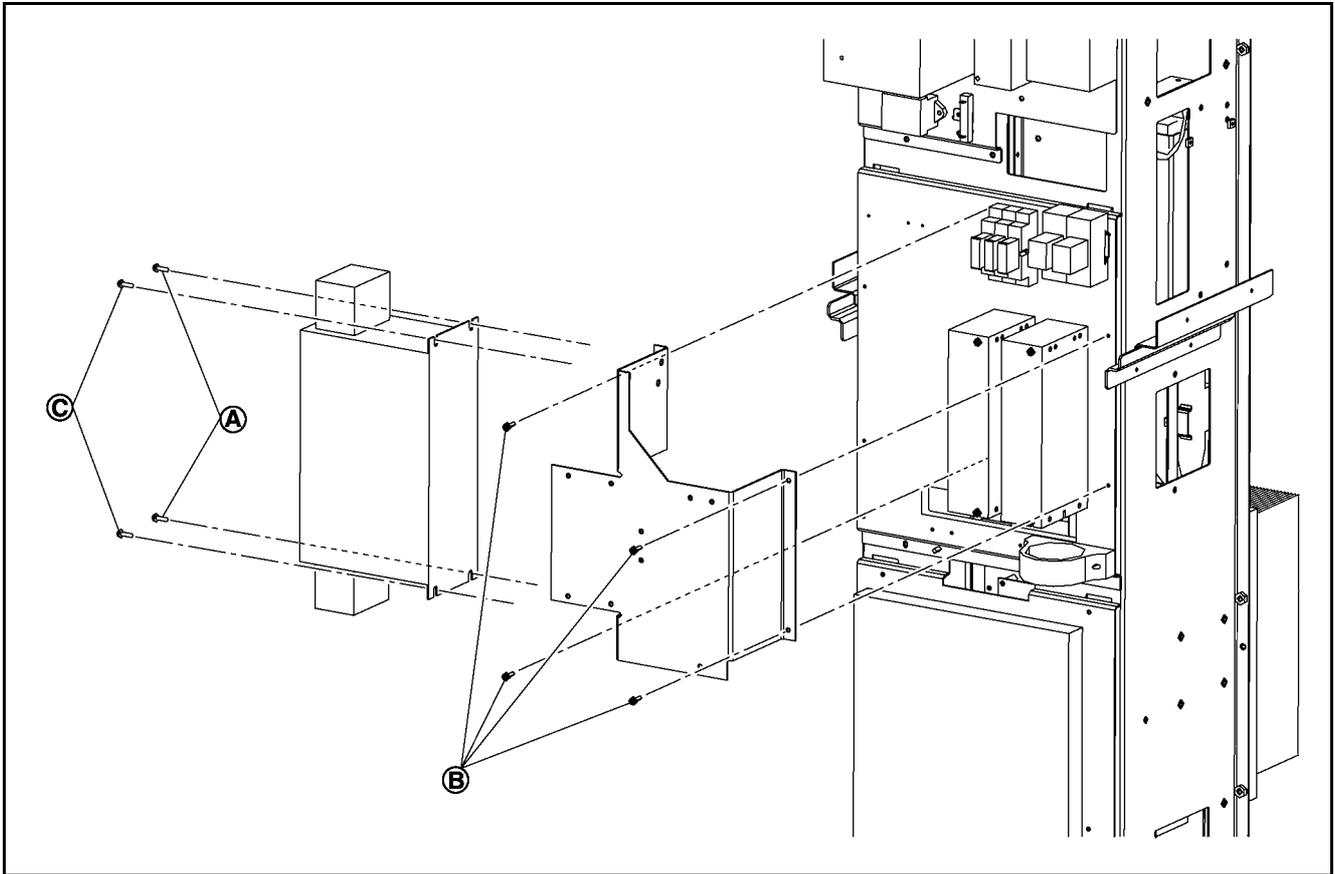
5 - 16 :Filter Assy- Noise (NF1)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

NOTE: This procedure describes the steps for when the assembly is replaced. Ordinarily only the fuses are replaced.

5 - 16 - 1 : COMPONENT PARTS LOCATION



5 - 16 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the filter assy- noise (NF1) mounting screws (A).
- 8) Remove the filter assy- noise (NF1) bracket mounting screws (B), and then remove the filter assy- noise (NF1) assy from base.
- 9) Remove the filter assy- noise (NF1) mounting screws (C), and then remove the filter assy- noise (NF1) assy from bracket.

5 - 16 - 3 : INSTALLATION

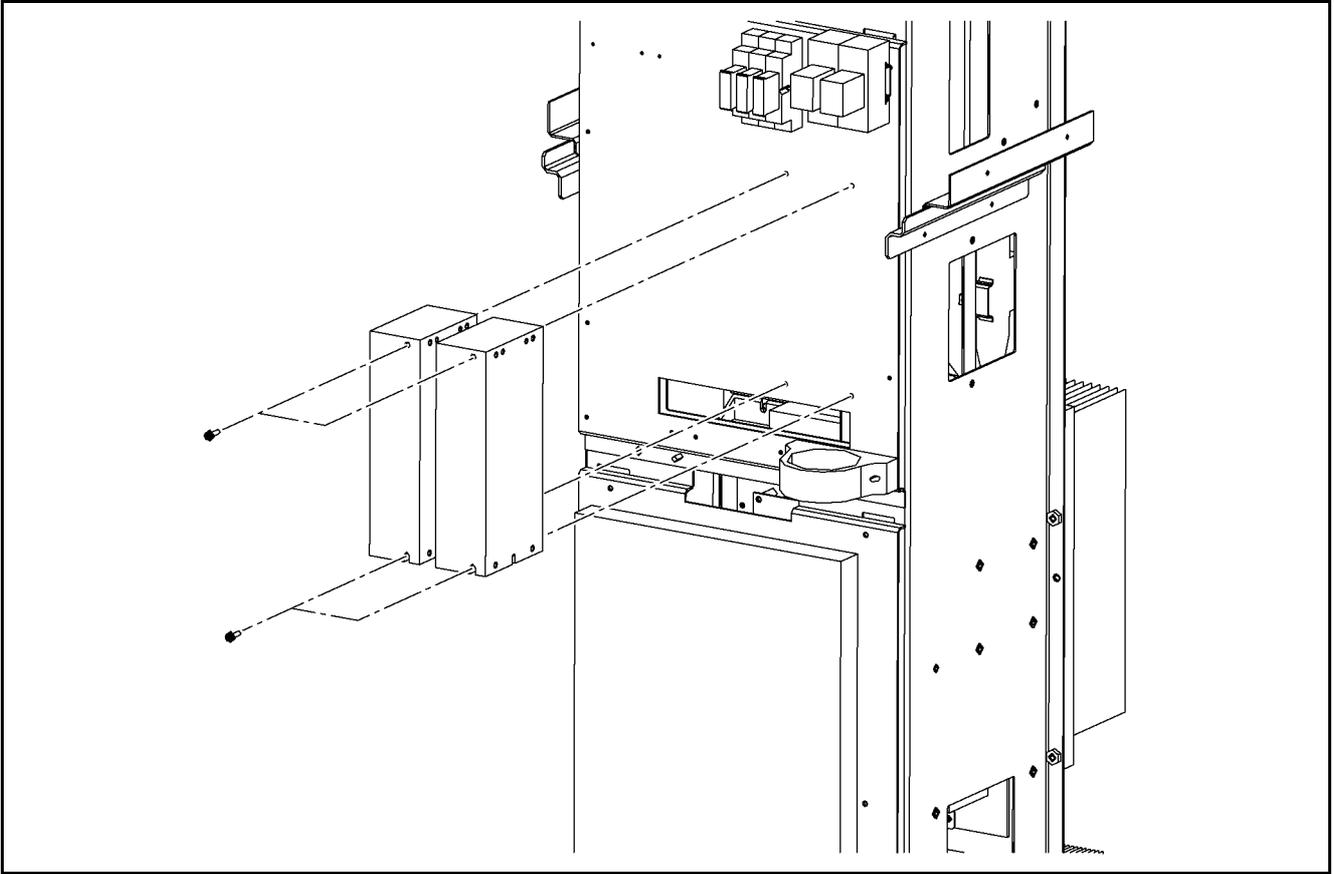
Install in the reverse order of removal.

5 - 17 : Power Supplier Assy-1st (PS1), Power Supplier Assy-2nd (PS2)

CAUTION 1: Before disconnecting the connectors, record the connector connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Because both power supplier assy-1st (PS1) and power supplier assy-2nd (PS2) use the same type and number of connectors, be sure to record each in a notebook or other place when disconnecting them.

5 - 17 - 1 : COMPONENT PARTS LOCATION



5 - 17 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the filter assy- noise (NF1).
- 8) Disconnect the power supplier assy-1st (PS1) and power supplier assy- 2nd (PS2) harness connectors.
- 9) Remove power supplier assy-1st (PS1) and power supplier assy- 2nd (PS2) mounting screws, and then remove the supplier assy-1st (PS1) and power supplier assy- 2nd (PS2).

5 - 17 - 3 : INSTALLATION

Install in the reverse order of removal.

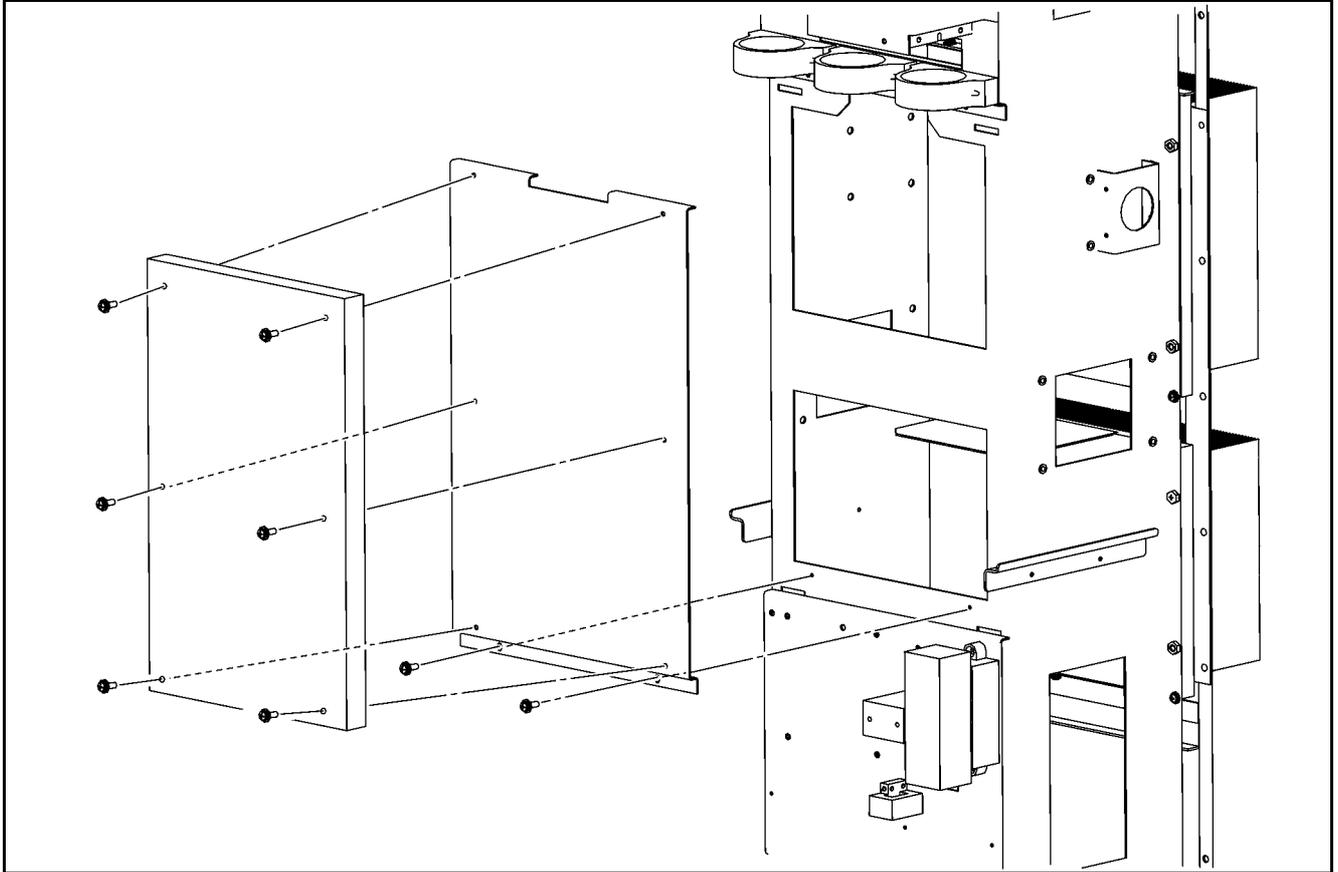
5 - 18 : Controller Assy- Main (PWB1)

CAUTION 1: Before disconnecting the connectors, record the connector connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Because the CN11 (flat cable) connector can be installed facing in either direction, check the position of the mark when connecting.

NOTE: The connector numbers and types may change depending on the options.

5 - 18 - 1 : COMPONENT PARTS LOCATION



5 - 18 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Disconnect the controller assy- main (PWB1) harness connectors.
- 8) Disengage the clips on the bottom of the base.
- 9) Lift up all of controller assy- main (PWB1) and disconnect the hooks from the case.
- 10) Remove the controller assy- main (PWB1) mounting screws, and then remove the controller assy- main (PWB1) from the base.

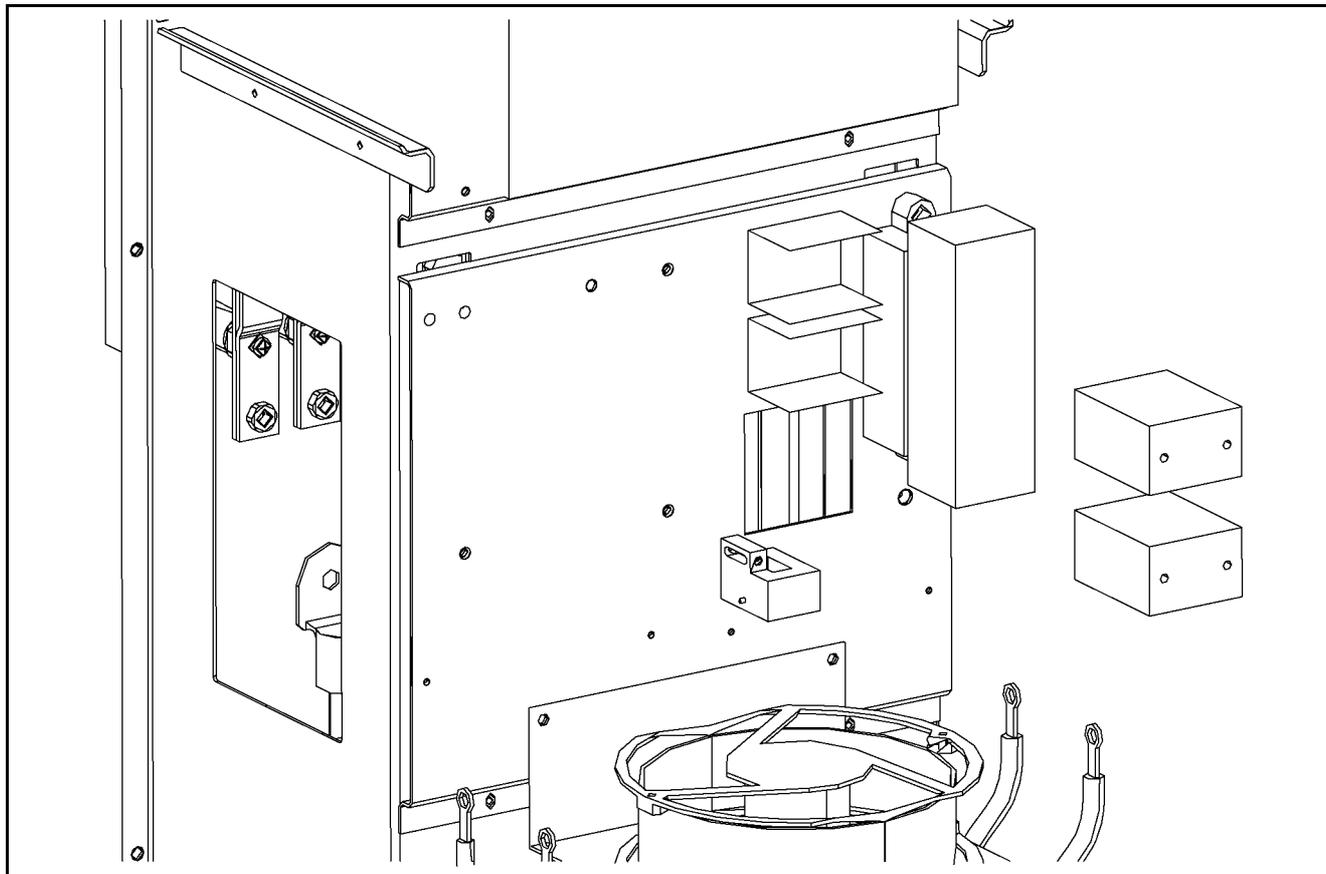
5 - 18 - 3 : INSTALLATION

Install in the reverse order of removal.

5 - 19 : Contactor Assy- Magnet (MC3-1, MC3-2)

Caution: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

5 - 19 - 1 : COMPONENT PARTS LOCATION



5 - 19 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the contactor assy- magnet (MC3-1, MC3-2) terminal cover.
- 8) Disconnect the contactor assy- magnet (MC3-1, MC3-2) harness.
- 9) Remove the contactor assy- magnet (MC3-1, MC3-2) from the bracket.

5 - 19 - 3 : INSTALLATION

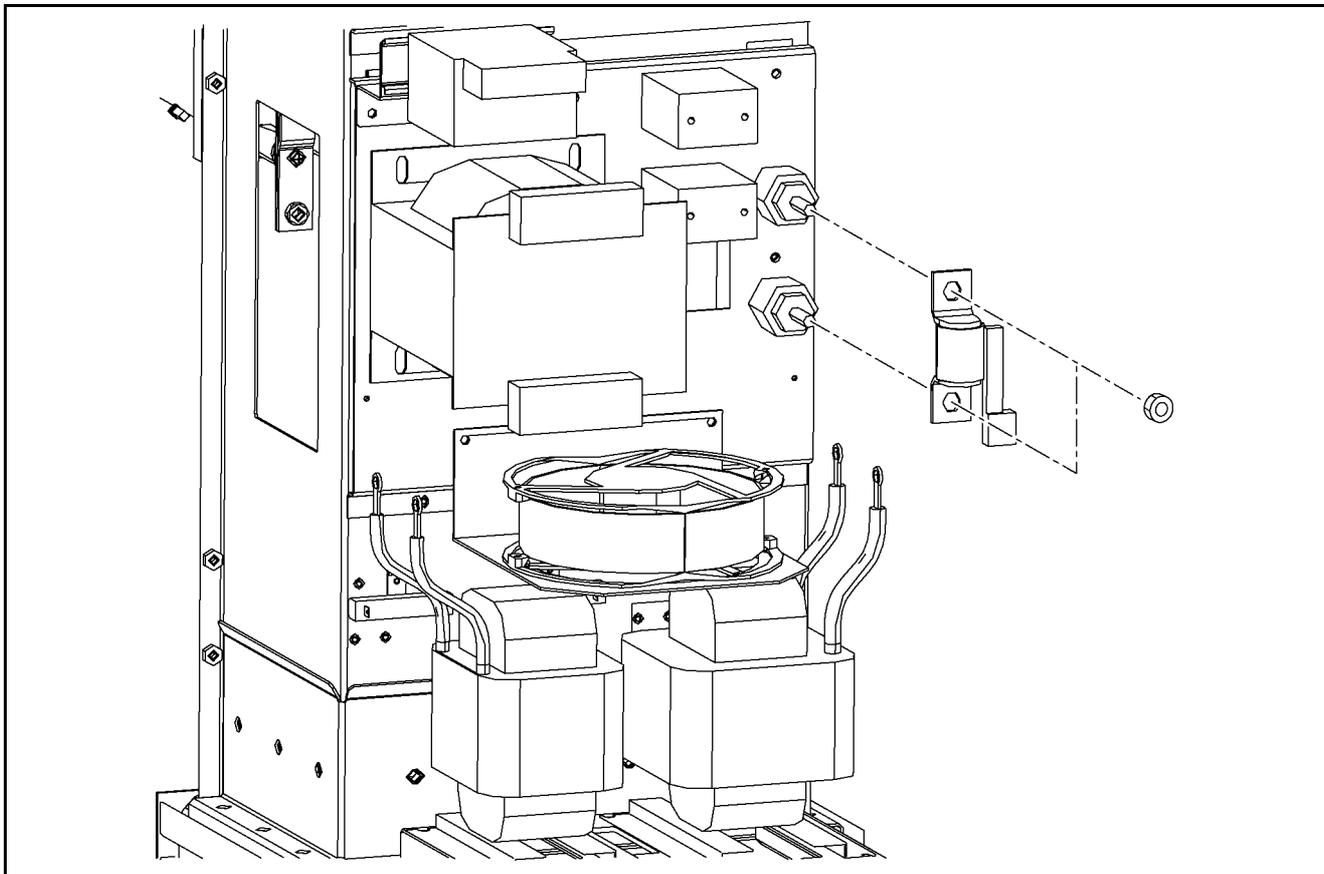
Install in the reverse order of removal.

5 - 20 : Fuse Assy (F4)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

5 - 18 - 1 : COMPONENT PARTS LOCATION



5 - 20 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the fuse assy (F4) open-circuit detector switch connectors.
- 8) Remove the fuse assy (F4) terminal nuts and disconnect harness.
- 9) Remove the fuse assy (F4) mounting screws and remove F4 from the base.

5 - 20 - 3 : INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION: F4 terminal tightening torque: 27 N-m

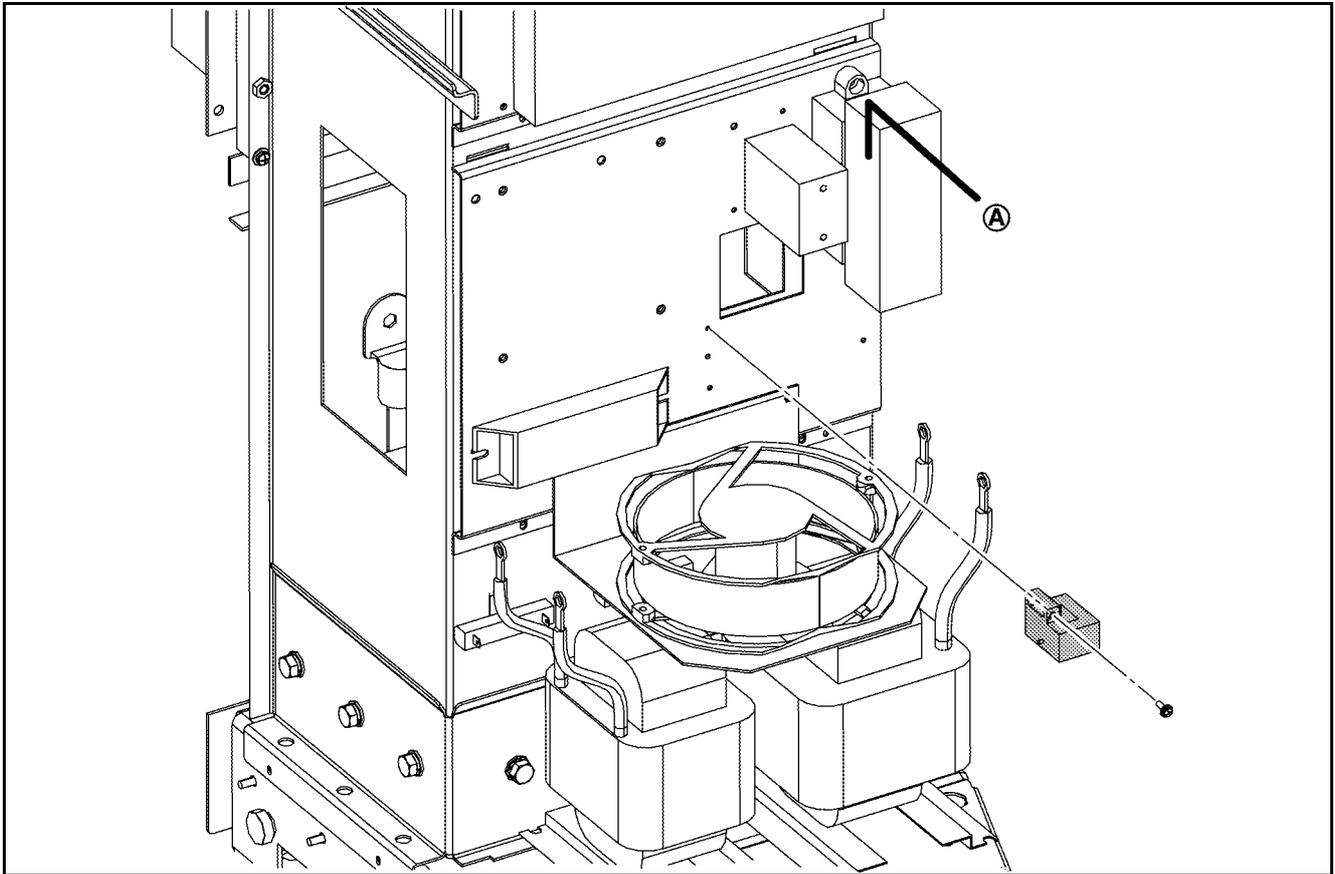
5 - 21 : Sensor Assy- Current (CT2)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

CAUTION 3: Install so that the sensor assy- current (CT2) connector faces downwards.

5 - 21 - 1 : COMPONENT PARTS LOCATION



5 - 21 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the fuse assy (F4) upper side terminal nuts and disconnect harness (A).
- 8) Disconnect sensor assy- current (CT2) harness.
- 9) Remove the sensor assy- current (CT2) mounting screw, and then remove the sensor assy- current (CT2) from base.

5 - 21 - 3 : INSTALLATION

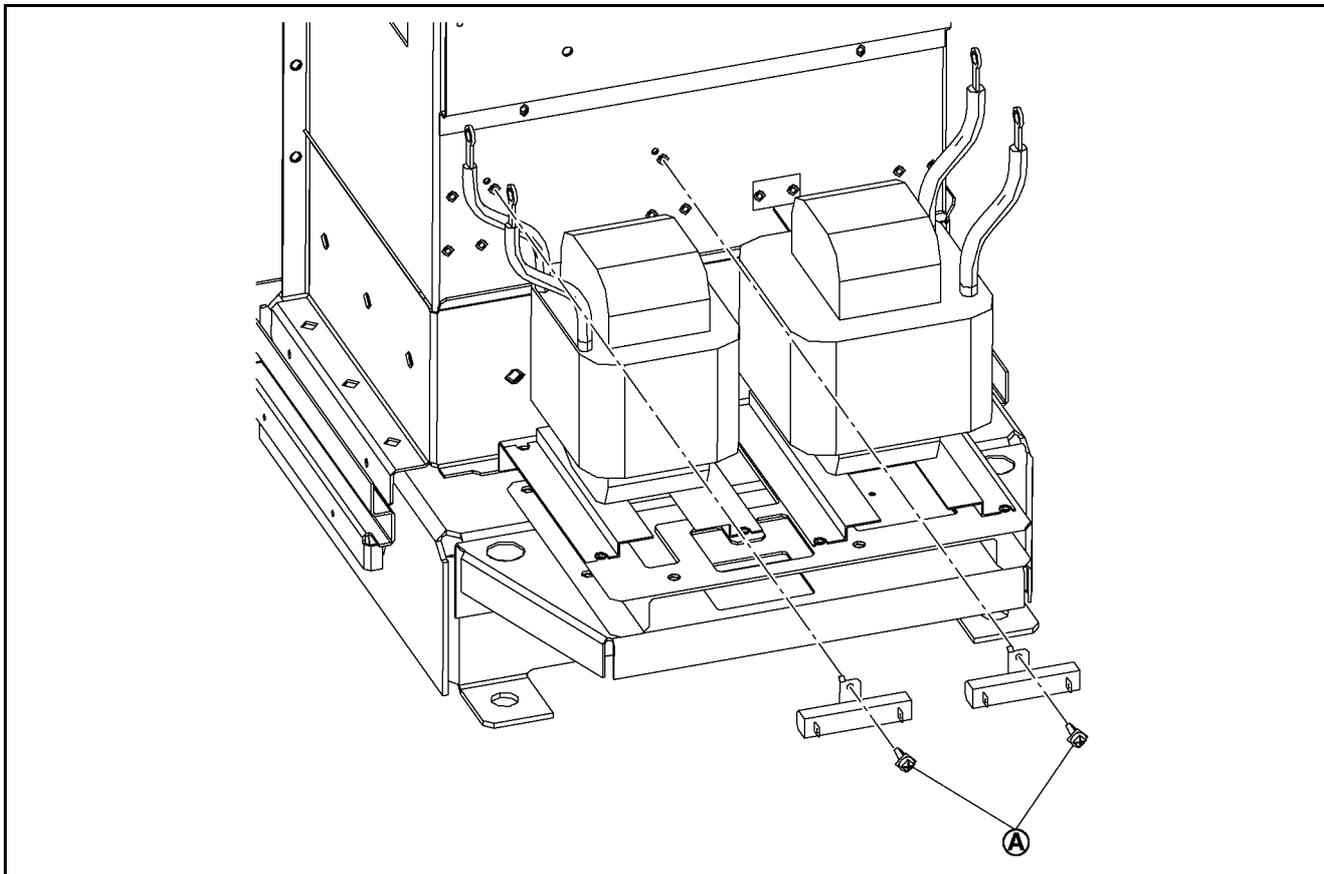
Install in the reverse order of removal.

5 - 22 : Resistor Assy (R23-1, R23-2)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

5 - 22 - 1 : COMPONENT PARTS LOCATION



5 - 22 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the resistor assy (R23-1, R23-2) harness.
- 8) Remove the resistor assy (R23-1, R23-2) mounting screws (A), and then remove the resistor assy (R23-1, R23-2) from the base.

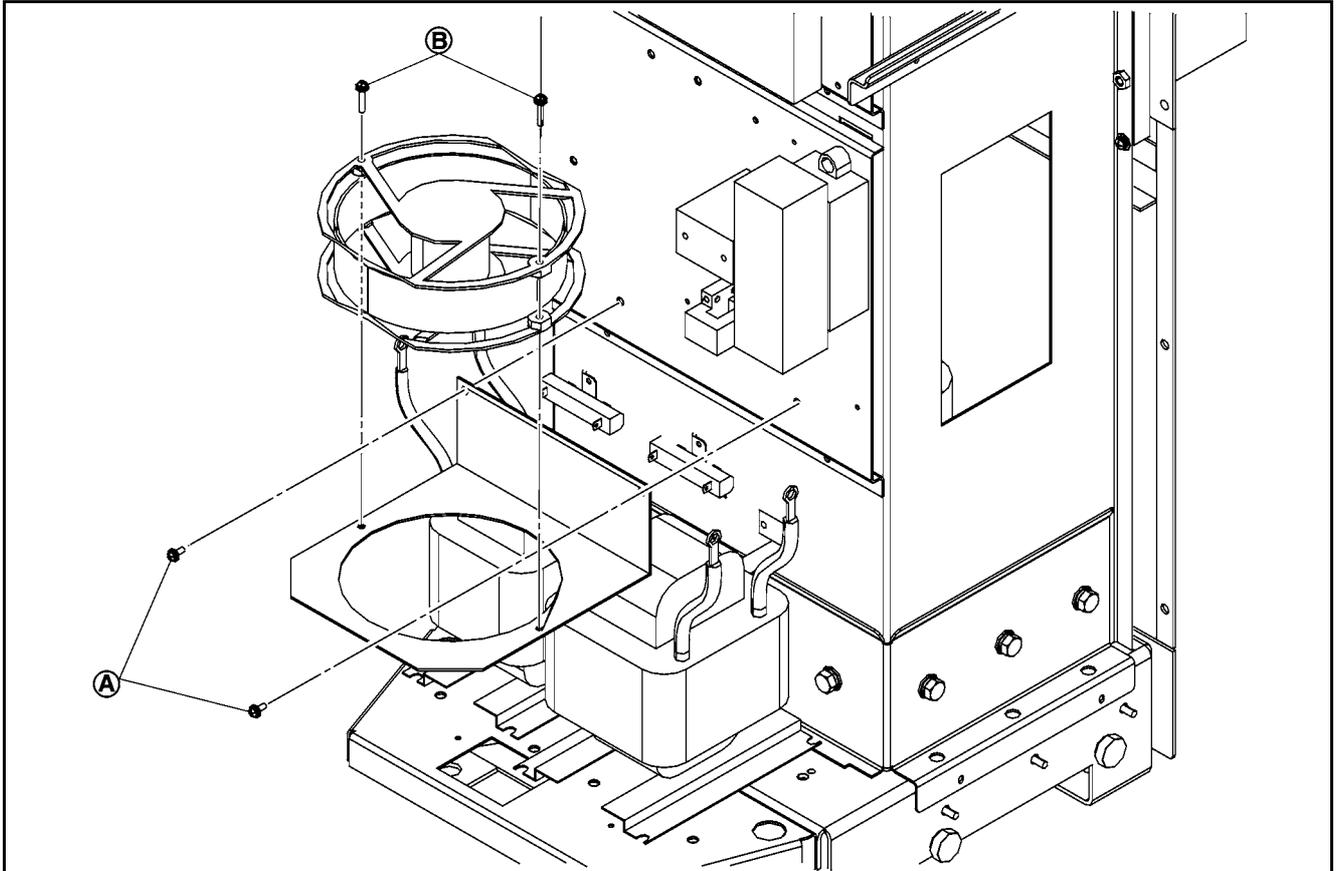
5 - 22 - 3 : INSTALLATION

Install in the reverse order of removal.

5 - 23 : Fan Assy- Cooling (FAN3)

CAUTION: Be sure to note the fan installation direction, and check the direction of the label before beginning work.

5 - 23 - 1 : COMPONENT PARTS LOCATION



5 - 23 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Disconnect the fan assy- cooling (FAN3) harness connector.
- 8) Remove the fan assy- cooling (FAN3) bracket mounting screw (A), and then remove the fan assy- cooling (FAN3) and bracket.
- 9) Remove the fan assy- cooling (FAN3) mounting screws (B), and then remove the bracket.

5 - 23 - 3 : INSTALLATION

Note the following, and install in the reverse order of removal.

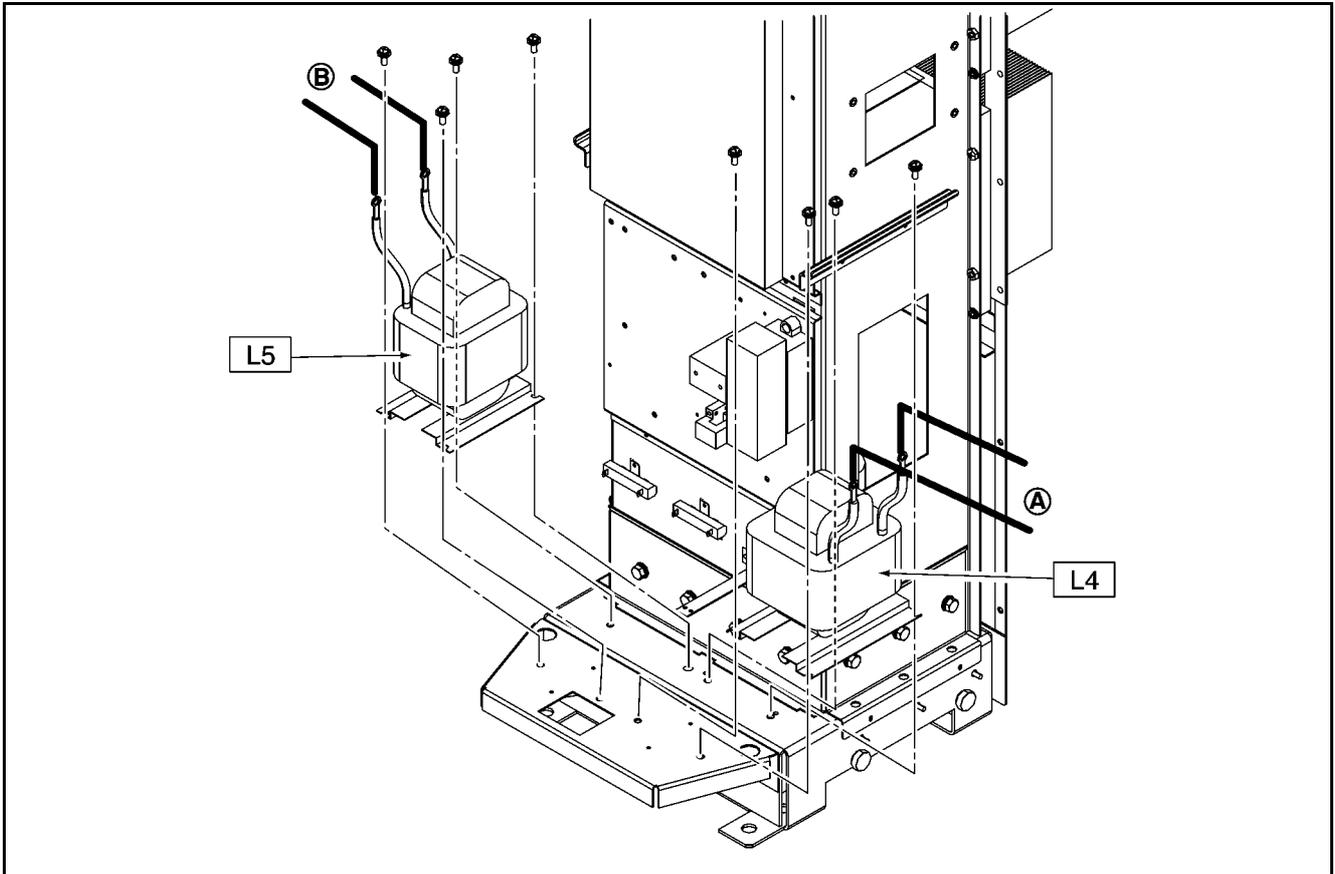
CAUTION: The fan label faces downwards.

5 - 24 : Coil Assy- DC Filter,1ST (L4), Coil Assy- DC Filter,2ND (L5)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

5 - 24 - 1 : COMPONENT PARTS LOCATION



5 - 24 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove fan assy- cooling (FAN3). Refer to the removal procedure in "5-18: fan assy- cooling (FAN3)".
- 8) Remove the clear protective covers from the coil assy- DC filter, 1ST (L4) and coil assy- DC filter, 2ND (L5) harness mounting bolts and nuts.
- 9) Remove the coil assy- DC filter, 1ST (L4) harness mounting bolts and nuts, and then disconnect harness (A).
- 10) Remove the coil assy- DC filter, 2ND (L5) harness mounting bolts and nuts, and then disconnect harness (B).
- 11) Remove the coil assy- DC filter, 1ST (L4) and coil assy- DC filter, 2ND (L5) mounting bolts and remove coil assy- DC filter, 1ST (L4) and coil assy- DC filter, 2ND (L5) from the base.

5 - 24 - 3 : INSTALLATION

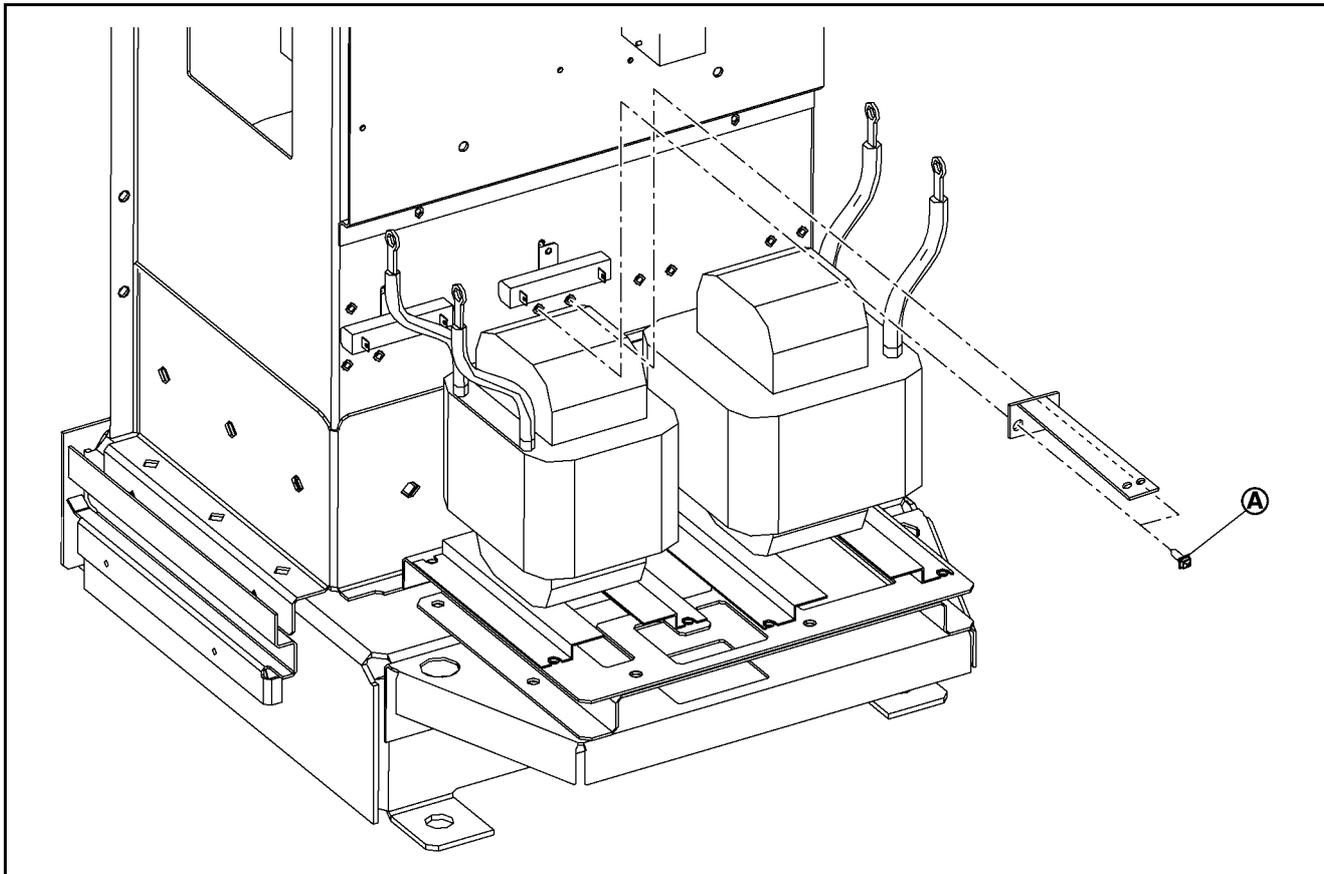
Note the following, and install in the reverse order of removal.

NOTE: L4 and L5 terminal tightening torque: 11 - 16 N-m

5 - 25 : Thermometer Assy- System, C (TSTR3), Thermometer Assy- System, C (TSTR7)

CAUTION: Record the installation direction of the base in a notebook or other place.

5 - 25 - 1 : COMPONENT PARTS LOCATION



5 - 25 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Disconnect the thermometer assy- system, C (TSTR3) and thermometer assy- system, C (TSTR7) harness connectors.
- 8) Remove the thermometer assy- system, C (TSTR3) and thermometer assy- system, C (TSTR7) mounting screws (A).

5 - 25 - 3 : INSTALLATION

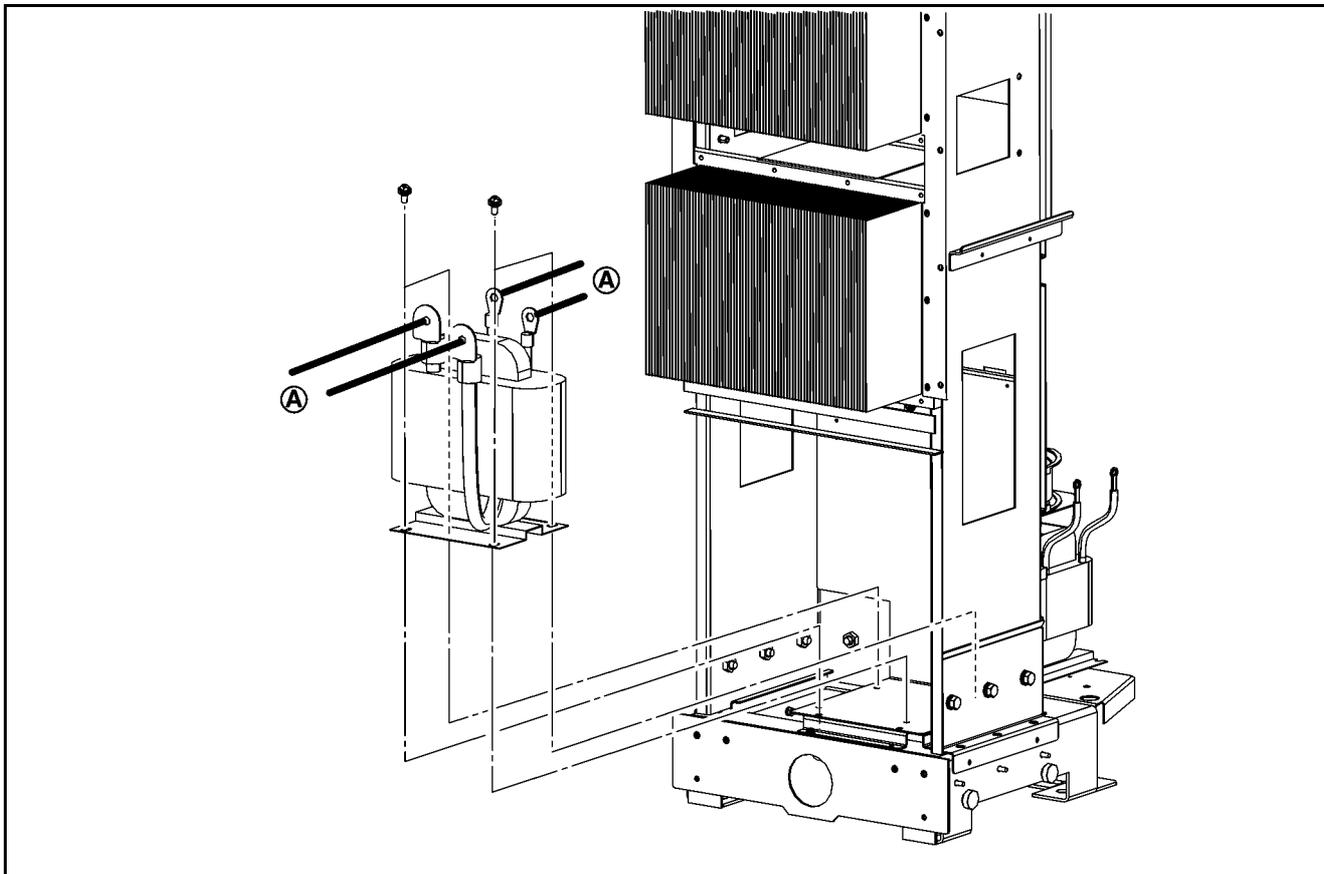
Install in the reverse order of removal.

5 - 26 : Transformer Assy (TR1)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

5 - 26 - 1 : COMPONENT PARTS LOCATION



5 - 26 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the clear protective covers from the transformer assy (TR1) harness mounting bolts and nuts.
- 8) Remove the transformer assy (TR1) harness mounting bolts and nuts, and then disconnect harness (A).
- 9) Remove the transformer assy (TR1) mounting screws, and then remove the transformer assy (TR1) from the base.

5 - 26 - 3 : INSTALLATION

Note the following, and install in the reverse order of removal.

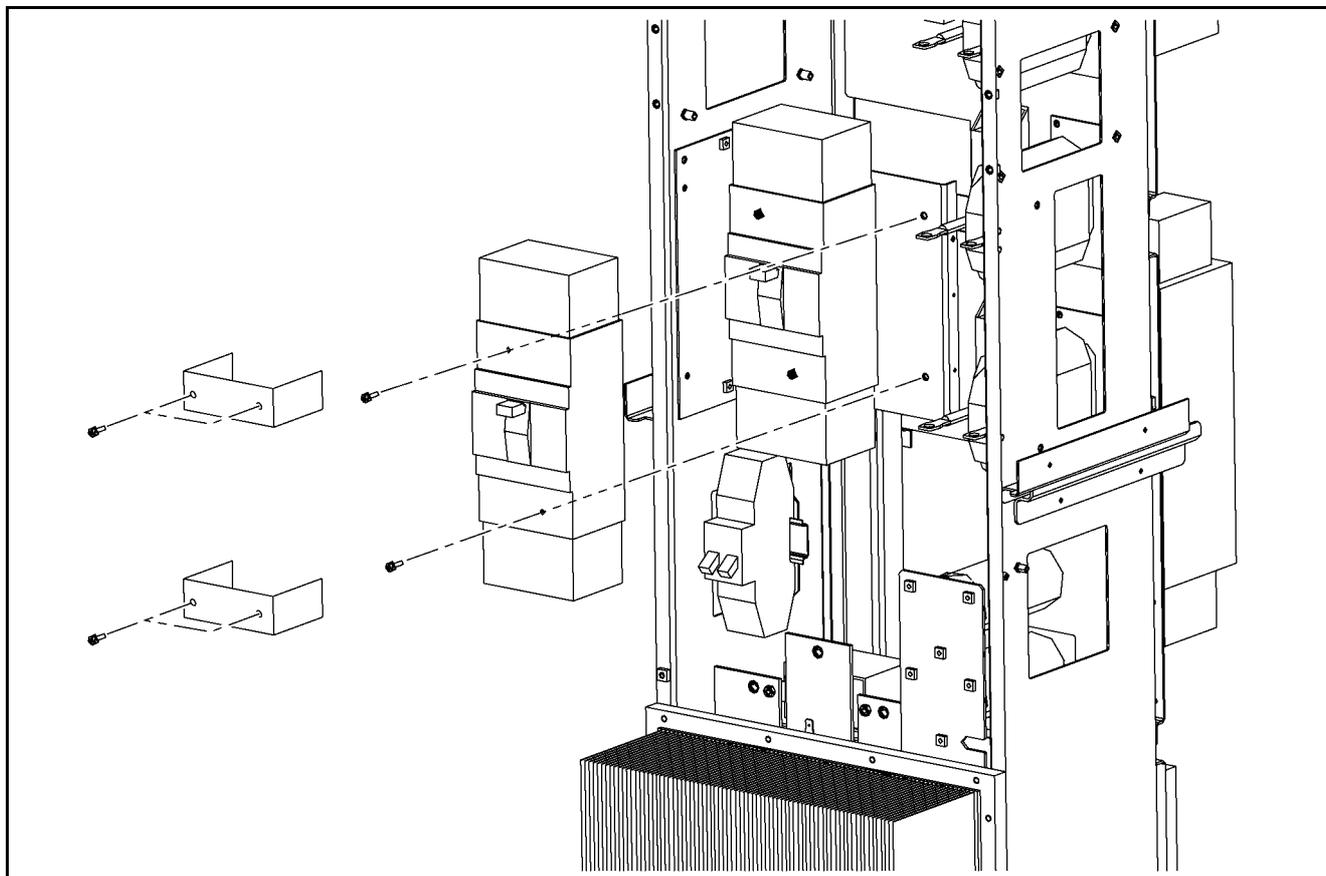
NOTE: TR1 terminal tightening torque: 24 - 32 N-m

5 - 27 :Circuit Breaker Assy-1st (ELCB1) (Type 1)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

5 - 27 - 1 : COMPONENT PARTS LOCATION



5 - 27 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the terminal cover mounting screws from the circuit breaker assy- 1st (ELCB1).
- 8) Disconnect the circuit breaker assy- 1st (ELCB1) harness.
- 9) Remove the circuit breaker assy- 1st (ELCB1) mounting screws.

5 - 27 - 3 : INSTALLATION

Note the following, and install in the reverse order of removal.

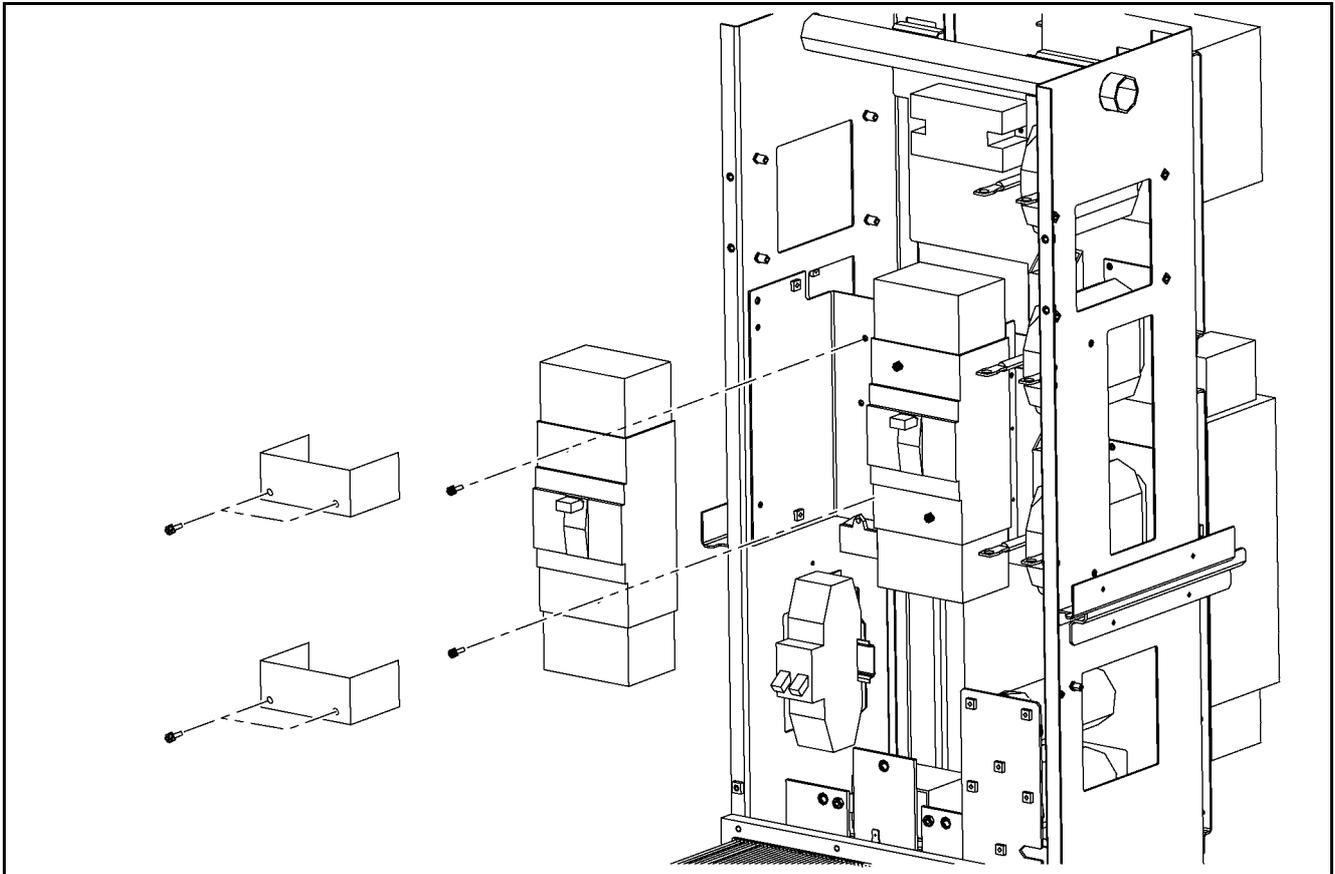
NOTE: Circuit breaker assy- 1st (ELCB1) terminal tightening torque: 8 - 13 N-m

5 - 28 : Circuit Breaker Assy- 2nd (ELCB2)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

5 - 28 - 1 : COMPONENT PARTS LOCATION



5 - 28 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the terminal cover mounting screws from the circuit breaker assy- 2nd (ELCB2).
- 8) Disconnect the circuit breaker assy- 2nd (ELCB2) harness.
- 9) Remove the circuit breaker assy- 2nd (ELCB2) mounting screws.

5 - 28 - 3 : INSTALLATION

Note the following, and install in the reverse order of removal.

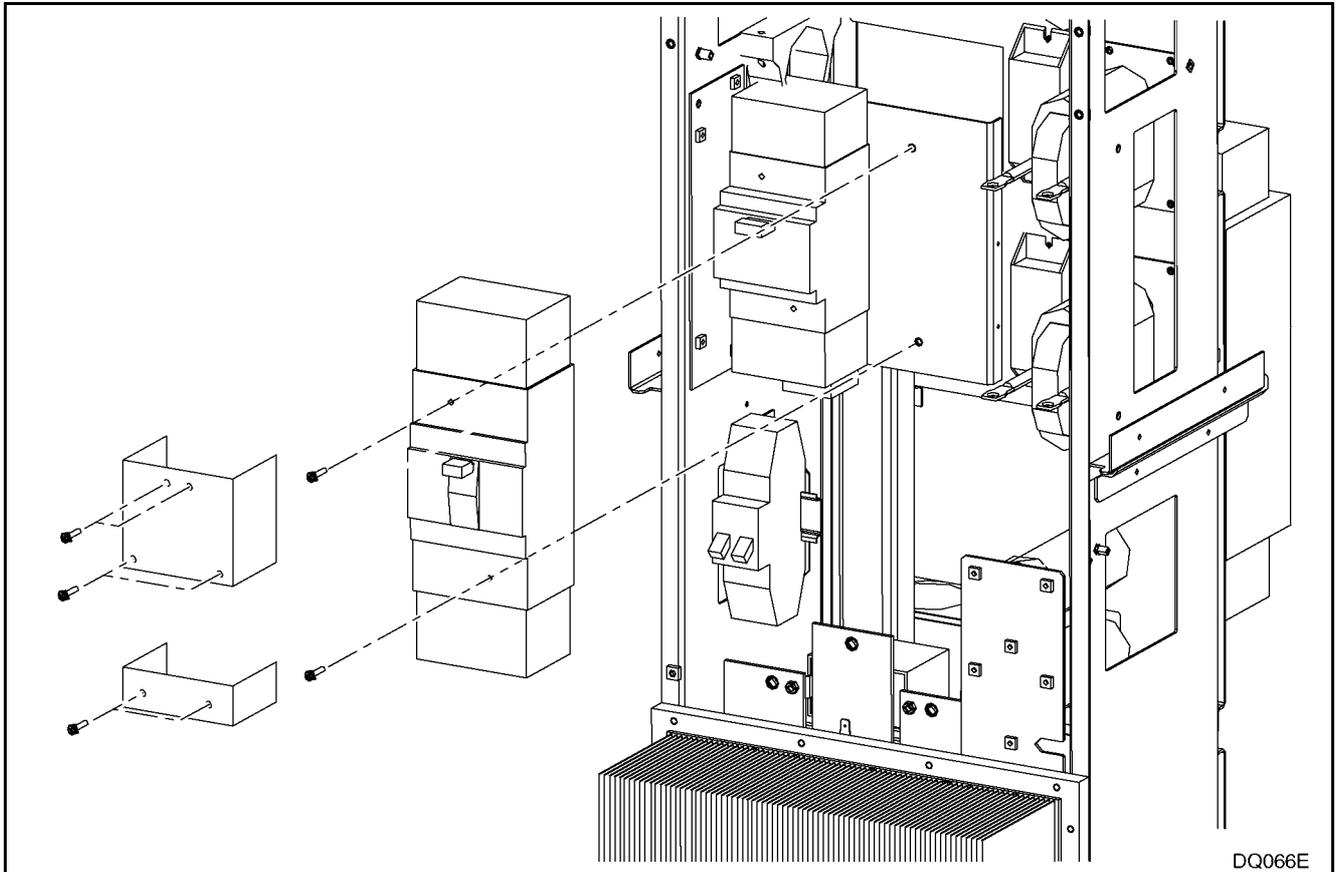
NOTE: Circuit breaker assy- 2nd (ELCB2) terminal tightening torque: 2 - 3 N-m

5 - 29 : Circuit Breaker Assy- 1st (ELCB1) (Type 2)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

5 - 29 - 1 : COMPONENT PARTS LOCATION/REMOVAL



5 - 29 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the terminal cover mounting screws from the circuit breaker assy- 1st (ELCB1).
- 8) Disconnect the circuit breaker assy- 1st (ELCB1) harness.
- 9) Remove the circuit breaker assy- 1st (ELCB1) mounting screws.

5 - 29 - 3 : INSTALLATION

Note the following, and install in the reverse order of removal.

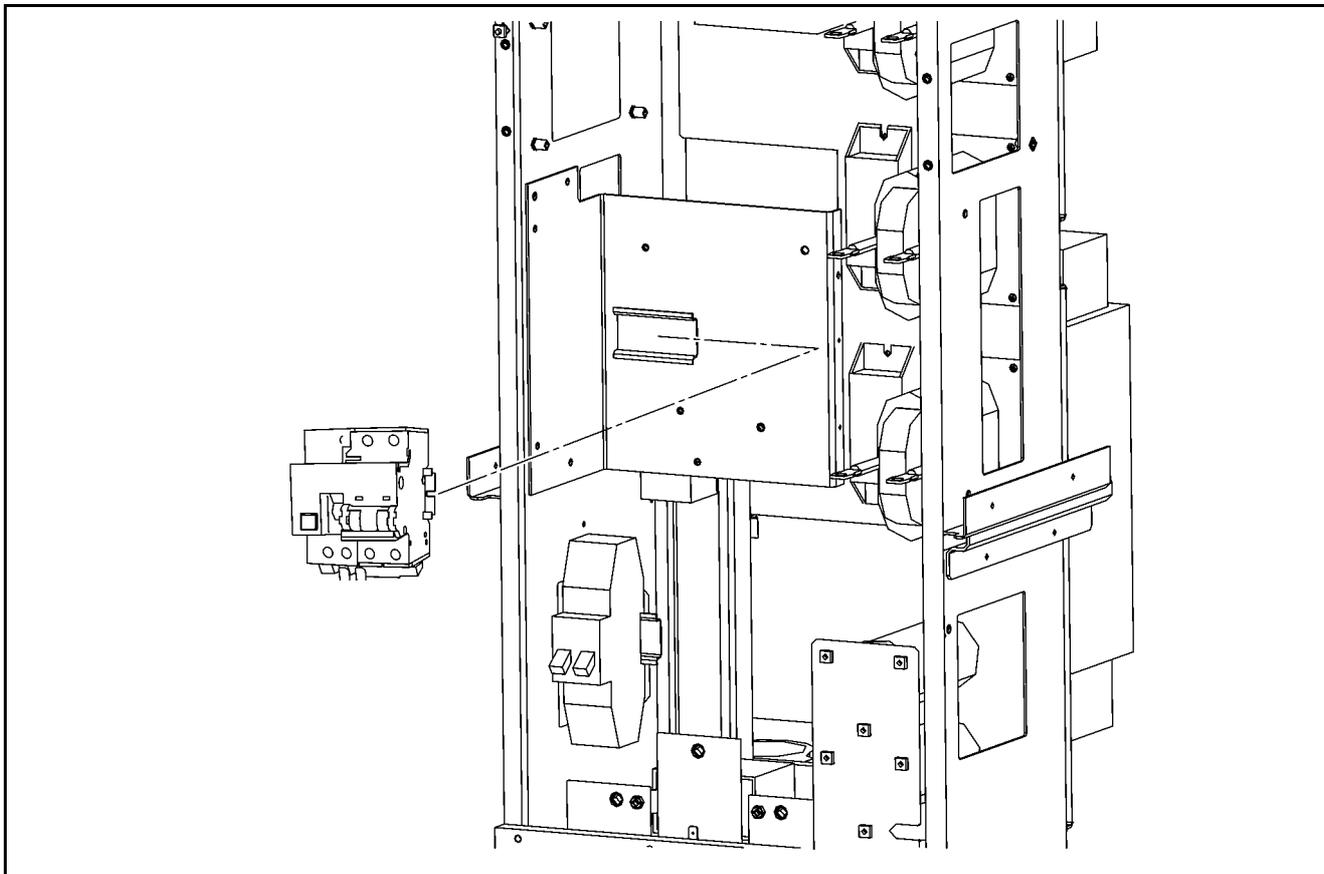
NOTE: Circuit breaker assy- 1st (ELCB1) terminal tightening torque: 8 - 13 N-m

5 - 30 : Circuit Breaker Assy- 2nd (ELCB2) (Cold Specifications)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

5 - 30 - 1 : COMPONENT PARTS LOCATION



- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the circuit breaker assy- 1st (ELCB1).
- 8) Disconnect the circuit breaker assy- 2nd (ELCB2) harness.
- 9) Slide circuit breaker assy- 2nd (ELCB2) to the right to remove it.

5 - 30 - 3 : INSTALLATION

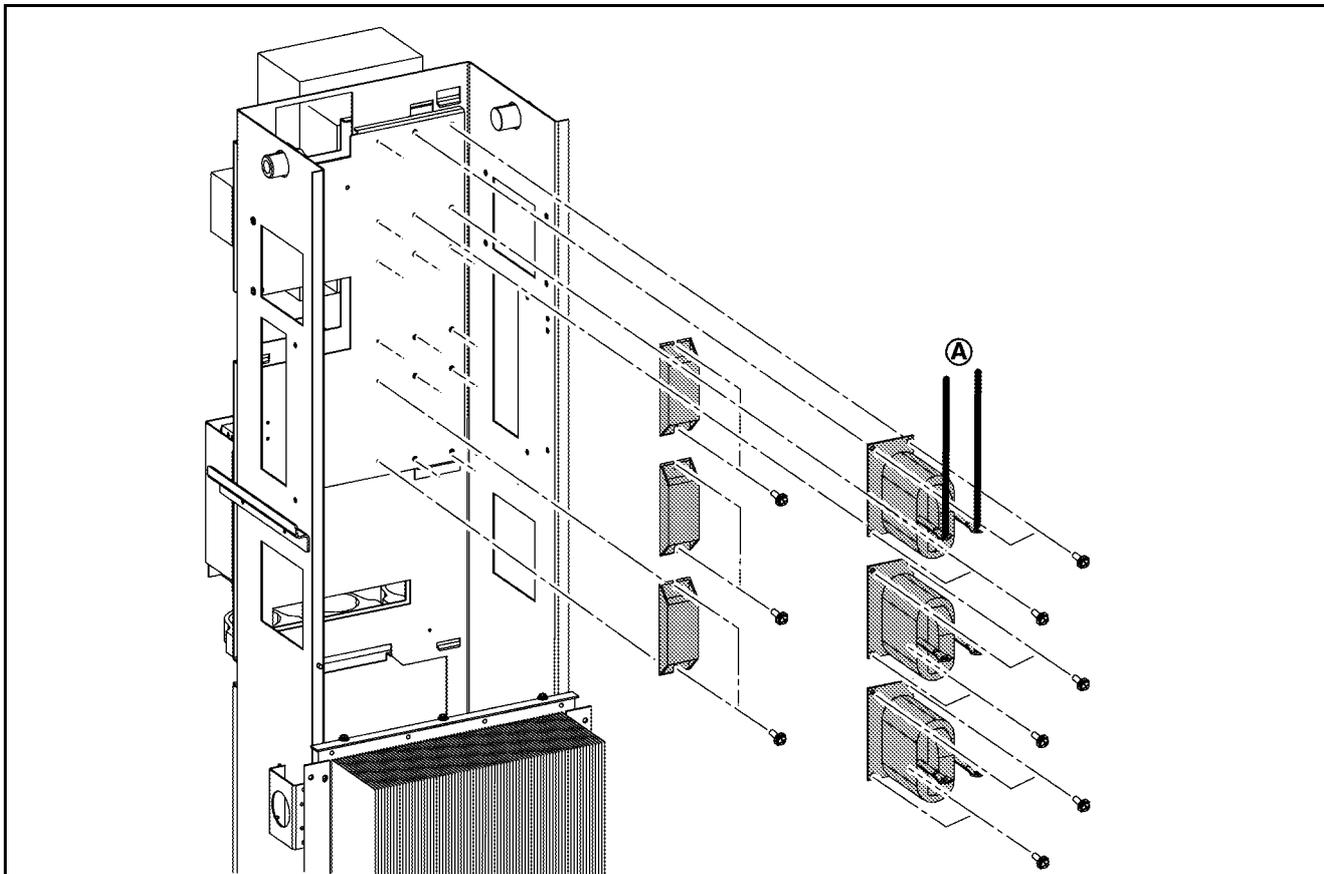
Install in the reverse order of removal.

5 - 31 : Coil Assy- AC Filter (L1, L2, L3) / Resistor Assy- Damping (R1, R2, R3)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

5 - 31 - 1 : COMPONENT PARTS LOCATION



- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the clear protective covers from the coil assy-AC filter (L1, L2, L3) cable installation nuts.
- 8) Remove the coil assy-AC filter (L1, L2, L3) harness mounting bolts and nuts, and then disconnect harness (A).
- 9) Remove the coil assy-AC filter (L1, L2, L3) mounting screws, and then remove the coil assy-AC filter (L1, L2, L3).
- 10) Remove the resistor assy- damping (R1, R2, R3) mounting screws, and then remove the resistor assy- damping (R1, R2, R3).

5 - 31 - 3 : INSTALLATION

Note the following, and install in the reverse order of removal.

NOTE: L1 - L3 terminal tightening torque: 11 - 16 N-m

5 - 32 : Rectifier diode, Thermometer Assy- System, B (TSTR2)

		Wear personal protective equipment (PPE) while working. Indicates a hazard which will result in death or serious injury if instructions are not followed.
		Capacitors may still be charged. Before starting the operation, always check that capacitors are completely discharged to avoid electric shock. Indicates a potential hazard which could result in death or serious injury if instructions are not followed.

CAUTION 1: Because the unit is heavy, this work must be performed by 2 persons.

CAUTION 2: In order to ensure safety and prevent damage to the devices, be sure to understand the entire series of steps before beginning work.

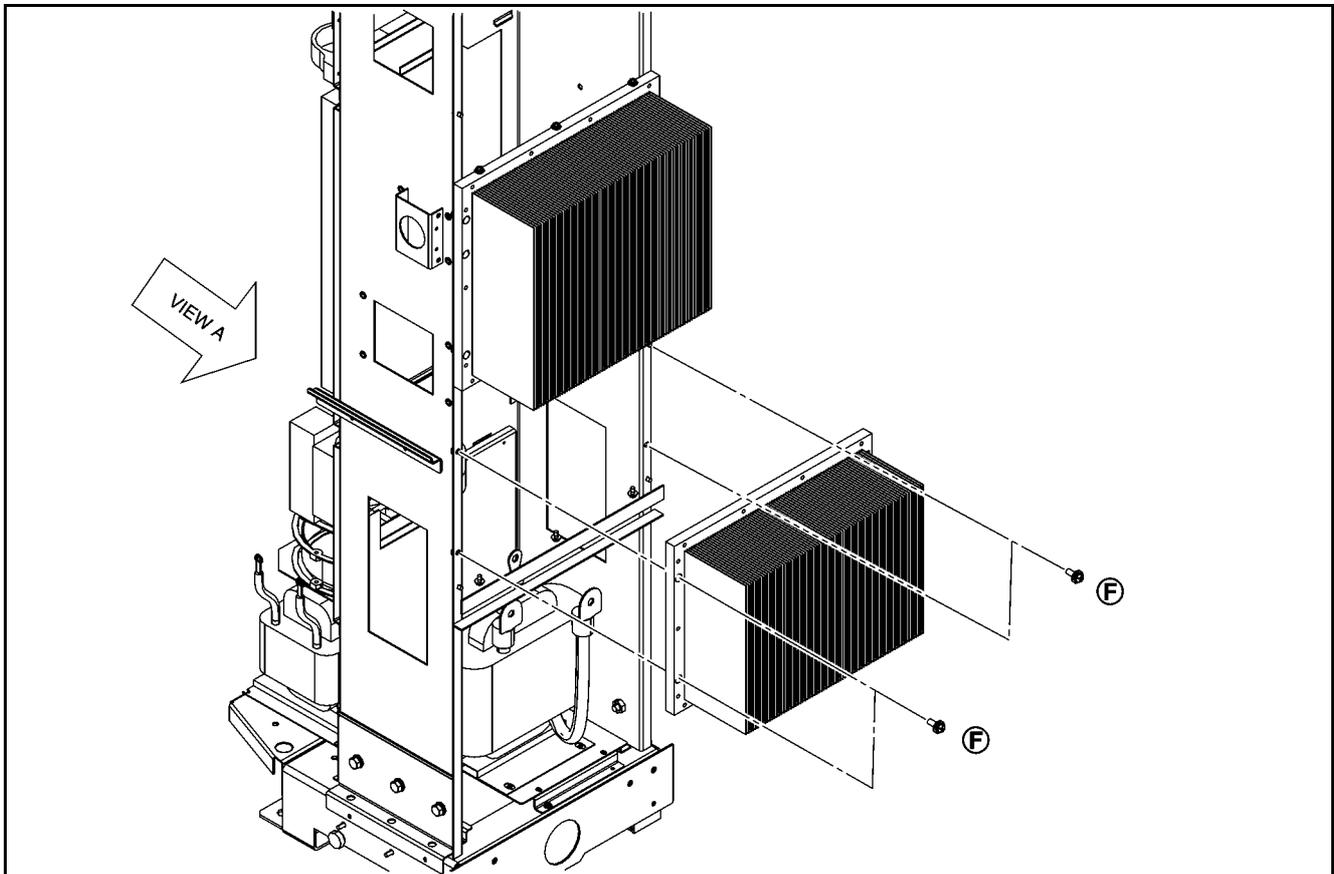
CAUTION 3: Perform this work only when the heat sink is cool.

CAUTION 4: The heat sink fin corners are sharp. Be sure to avoid injury.

CAUTION 5: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 6: Never drop or lose the washers, and be sure to reinstall them.

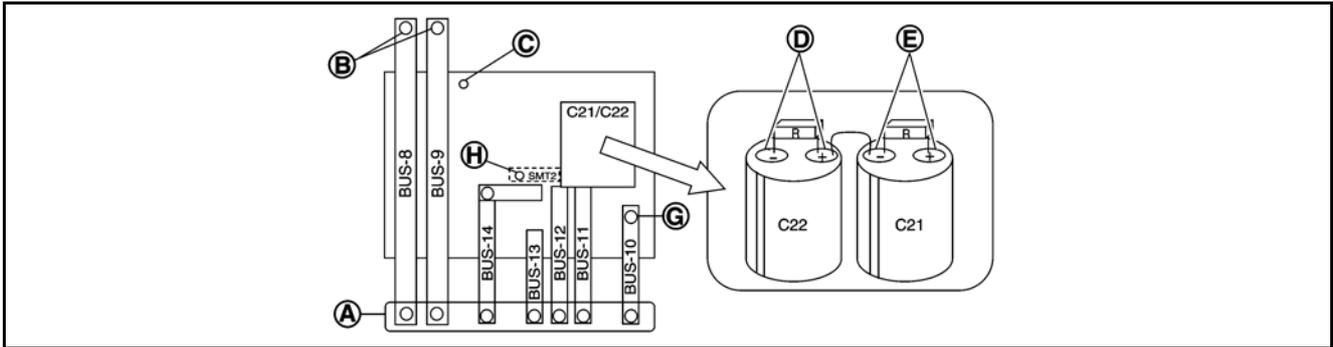
5 - 32 - 1 : COMPONENT PARTS LOCATION



5 - 32 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the plate assy- back (middle). Refer to the removal procedure in "5-6: Plate Assy- Back (middle) / Fan Assy- Cooling, Boost (FAN7)".
- 6) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 7) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".

8) Remove controller assy- main (PWB1). Refer to the removal procedure in "5-15: controller assy- main (PWB1)".



- 9) Remove the contactor assy-magnet (TB1) lower side terminal bolts (A) and disconnect the harness.
- 10) Remove the bus bar bolts (A) and disconnect the harness.
- 11) Remove the bus bar bolts (B).
- 12) Remove the ground mounting screws (C) and disconnect the ground harness.
- 13) Remove terminal screw (D) from the capacitor C22 negative electrode side, then disconnect the harness.
- 14) Remove terminal screw (E) from the capacitor C21 positive electrode side, then disconnect the harness.
- 15) Remove the heat sink mounting screws (F). One person then tilts the rectifier diode assembly towards the front and holds it there.
- 16) Remove the bus bar (BUS-10) bolt (G) and disconnect the harness.
- 17) Remove the thermometer assy- system, B (TSTR2) installation screw (H), then remove SMT2 and remove the rectifier diode assembly.

5 - 32 - 3 : INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION: Be careful when connecting the capacitor (+) electrode and (-) electrode.

5 - 33 : Matrix converter, Sensor Assy- Current (CT1), Thermometer Assy- System, A (TSTR1)

CAUTION 1: Because the unit is heavy, this work must be performed by 2 persons.

CAUTION 2: In order to ensure safety and prevent damage to the devices, be sure to understand the entire series of steps before beginning work.

CAUTION 3: Perform this work only when the heat sink is cool.

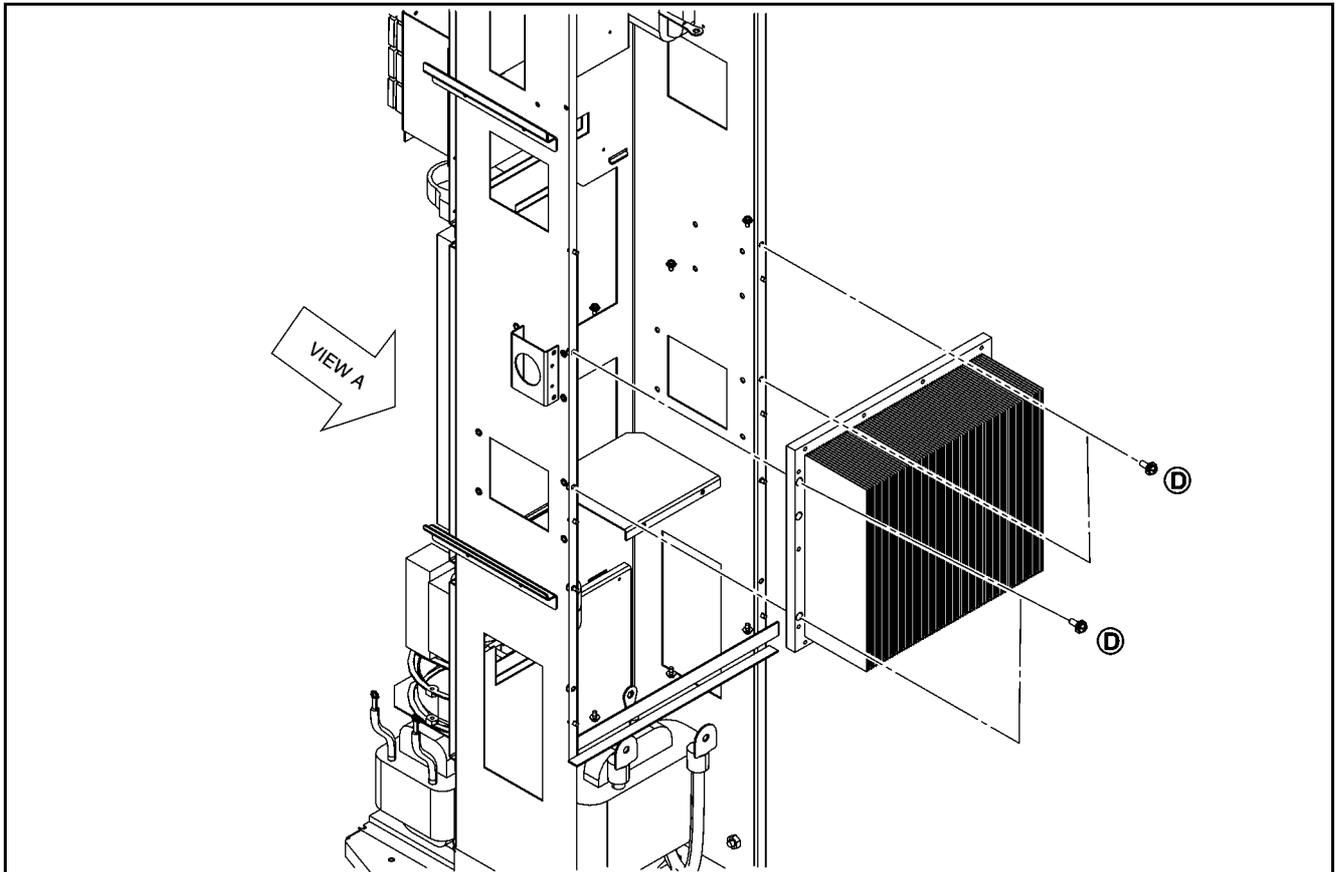
CAUTION 4: The heat sink fin corners are sharp. Be sure to avoid injury.

CAUTION 5: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 6: Never drop or lose the washers, and be sure to reinstall them.

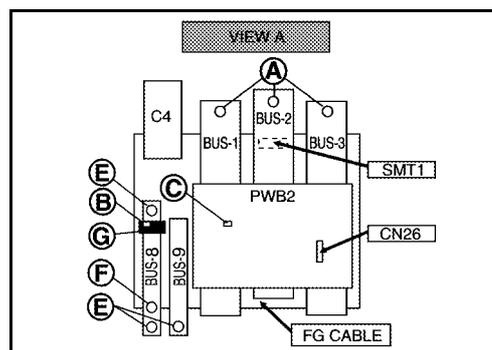
CAUTION 7: Be sure to note the direction of the CH26 connector.

5 - 33 - 1 : COMPONENT PARTS LOCATION



5 - 33 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the plate assy- back (middle). Refer to the removal procedure in "5-6: Plate Assy- Back (middle) / Fan Assy- Cooling, Boost (FAN7)".
- 6) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 7) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 8) Remove controller assy- main (PWB1). Refer to the removal procedure in "5-18: Controller Assy- Main (PWB1)".
- 9) Remove the rectifier diode. Refer to the removal procedure in "5-33: Rectifier Diode, Thermometer Assy- System, B (TSTR2)".
- 10) Remove the bus bar (BUS-1 - BUS-3) bolts (A) and disconnect the harness.
- 11) Follow the thermometer assy- system, A (TSTR1) wiring and disconnect the connectors.
- 12) Disconnect CT1 connector (B).
- 13) Disconnect C25 connector (C).
- 14) Disconnect each earth harness.
- 15) Remove the L4 left inside screw and disconnect the harness.
- 16) Remove the case ground plate screw and disconnect the harness.
- 17) Remove the transformer assy (TR1) front left screw and disconnect the wire.
- 18) Remove each of the L1 - L3 lower left screws and disconnect the harness.
- 19) Remove the matrix converter mounting screws (D) and remove the matrix converter.
- 20) Remove CT1.
- 21) Remove the bus bar (BUS-4) mounting bolts (E).
- 22) Remove the bus bar (BUS-4) mounting screws (F).
- 23) Remove the CT1 mounting screws (G) and remove CT1.

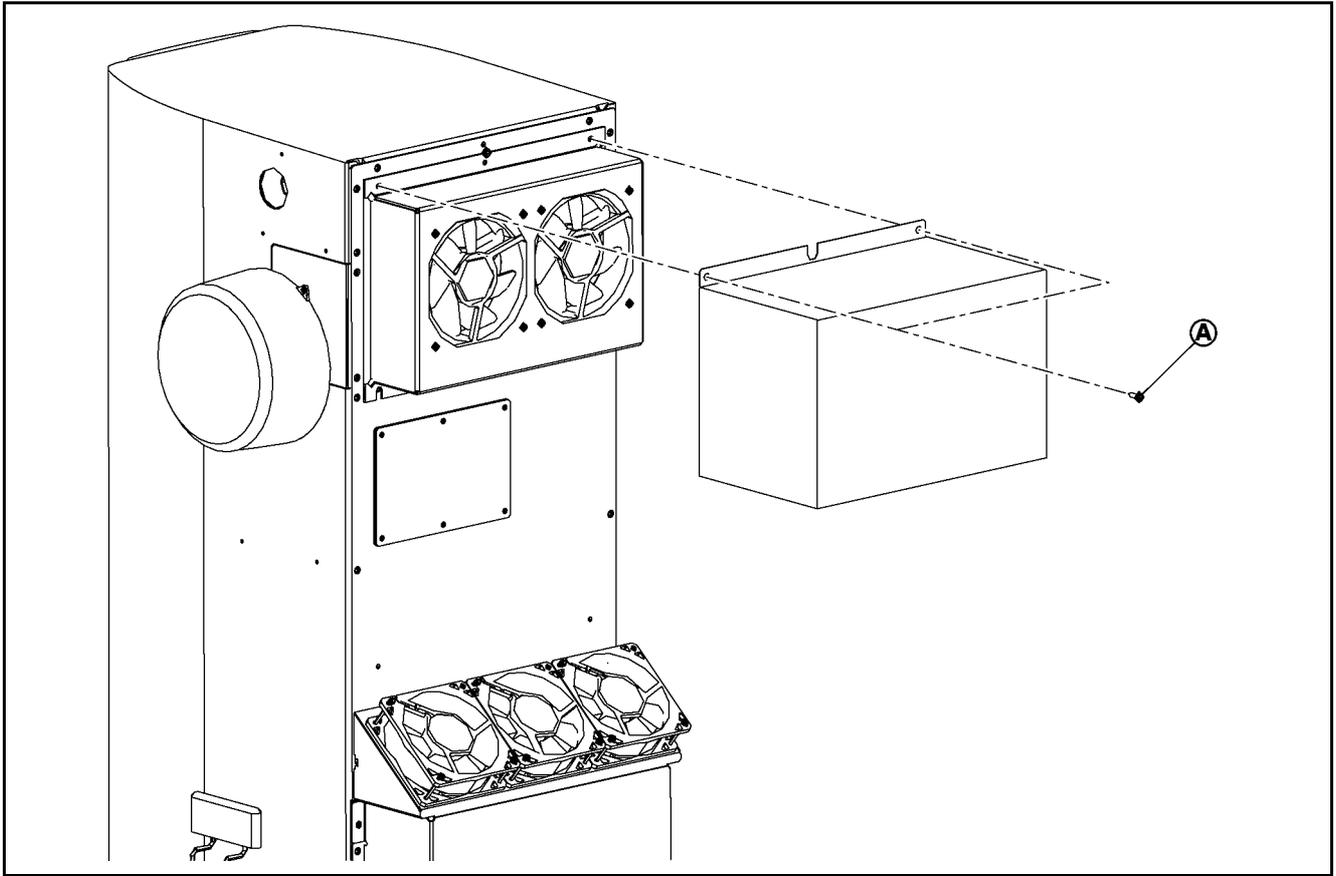


5 - 33 - 3 : INSTALLATION

Install in the reverse order of removal.

5 - 34 : Fan Assy- Ventilation (FAN1-1 and FAN1-2) Cover

5 - 34 - 1 : COMPONENT PARTS LOCATION



5 - 34 - 2 : REMOVAL

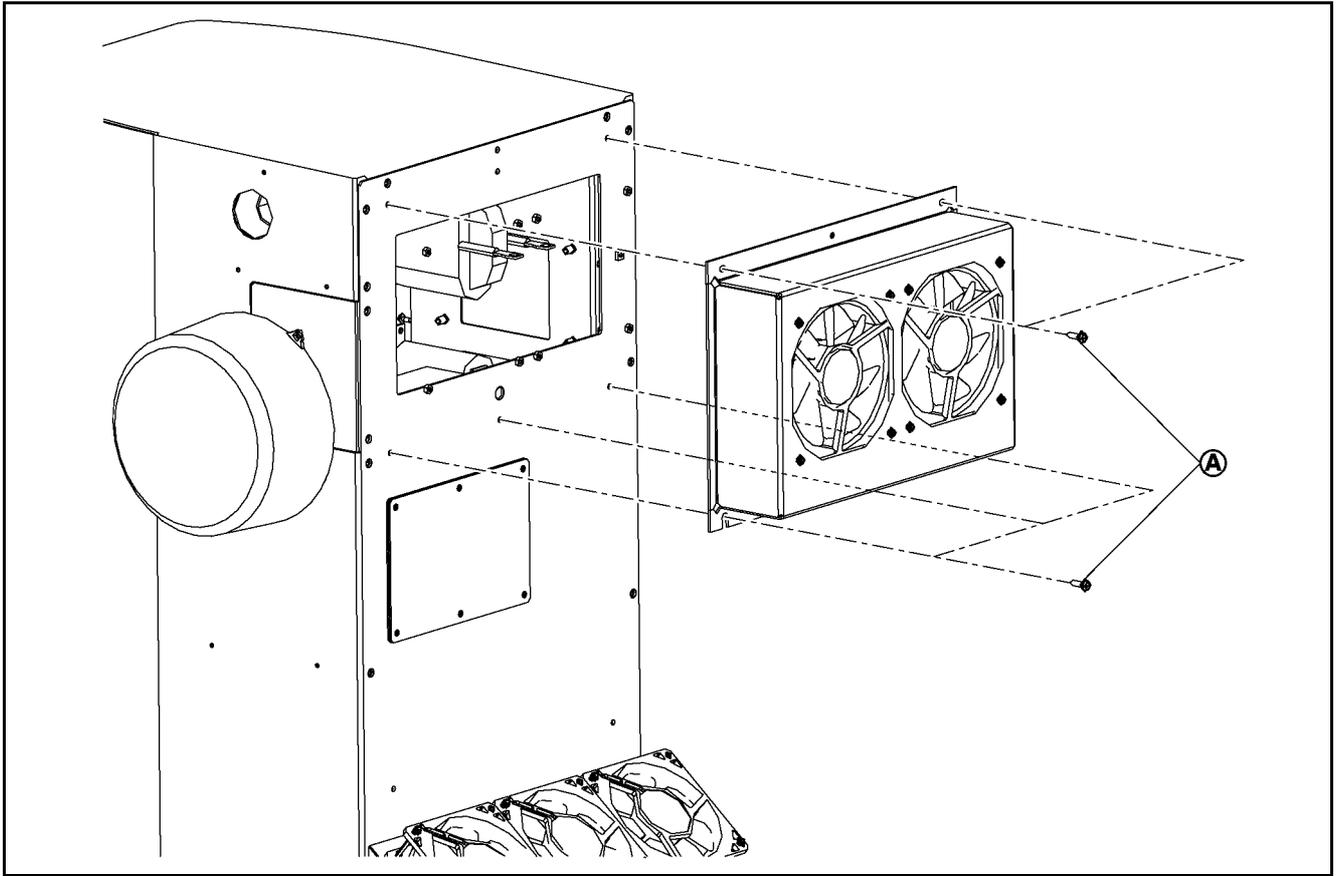
- 1) Remove the fan assy- ventilation (FAN1-1 and FAN1-2) cover mounting screws (A).
- 2) Remove the fan assy- ventilation (FAN1-1 and FAN1-2) cover from plate assy-back (upper).

5 - 34 - 3 : INSTALLATION

Install in the reverse order of removal.

5 - 35 : Fan Assy- Ventilation (FAN1-1 and FAN1-2) Assy

5 - 35 : COMPONENT PARTS LOCATION



5 - 35 - 2 : REMOVAL

- 1) Remove the fan assy- ventilation (FAN1-1 and FAN1-2) cover. Refer to the removal procedure in "5-35: Fan assy- ventilation (FAN1-1 and FAN1-2) Cover".
- 2) Remove the fan assy- ventilation (FAN1-1 and FAN1-2) assembly mounting screws (A).
- 3) Remove the fan assy- ventilation (FAN1-1 and FAN1-2) assembly from plate assy-back (upper).

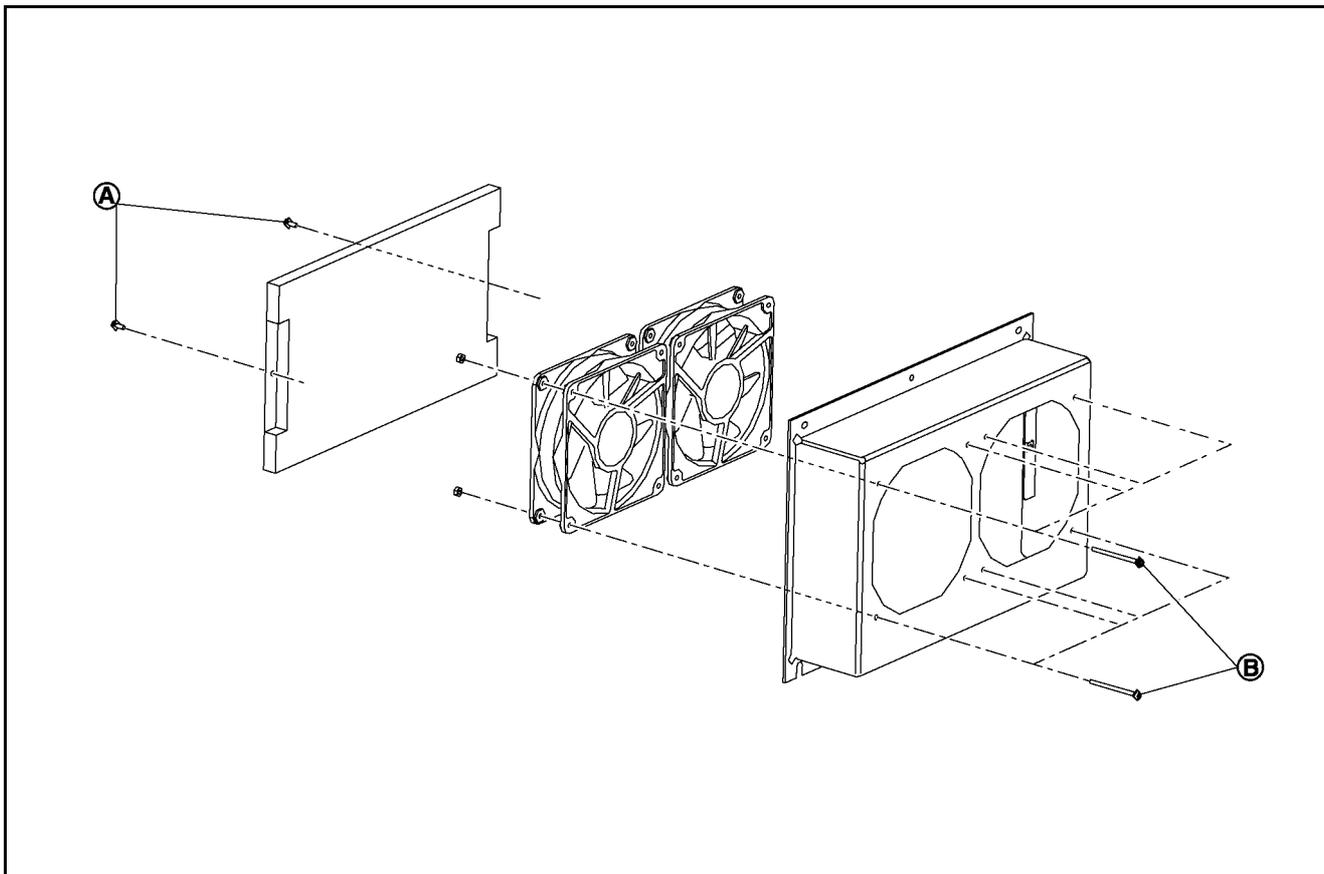
5 - 35 - 3 : INSTALLATION

Install in the reverse order of removal.

5 - 36 : Fan Assy- Ventilation (FAN1-1, FAN1-2), Filter1

CAUTION: Be sure to note the fan installation direction, and check the direction of the label before beginning work.

5 - 36 - 1 : COMPONENT PARTS LOCATION



5 - 36 - 2 : REMOVAL

- 1) Remove the fan assy- ventilation (FAN1-1 and FAN1-2) cover. Refer to the removal procedure in "5-35: Fan assy- ventilation (FAN1-1 and FAN1-2) Cover".
- 2) Remove the fan assy- ventilation (FAN1-1 and FAN1-2) assembly. Refer to the removal procedure in "5-36: Fan assy- ventilation (FAN1-1 and FAN1-2) Assy".
- 3) Remove the filter1 mounting screws (A).
- 4) Remove the fan assy- ventilation (FAN1-1 and FAN1-2) mounting screws (B).

5 - 36 - 3 : INSTALLATION

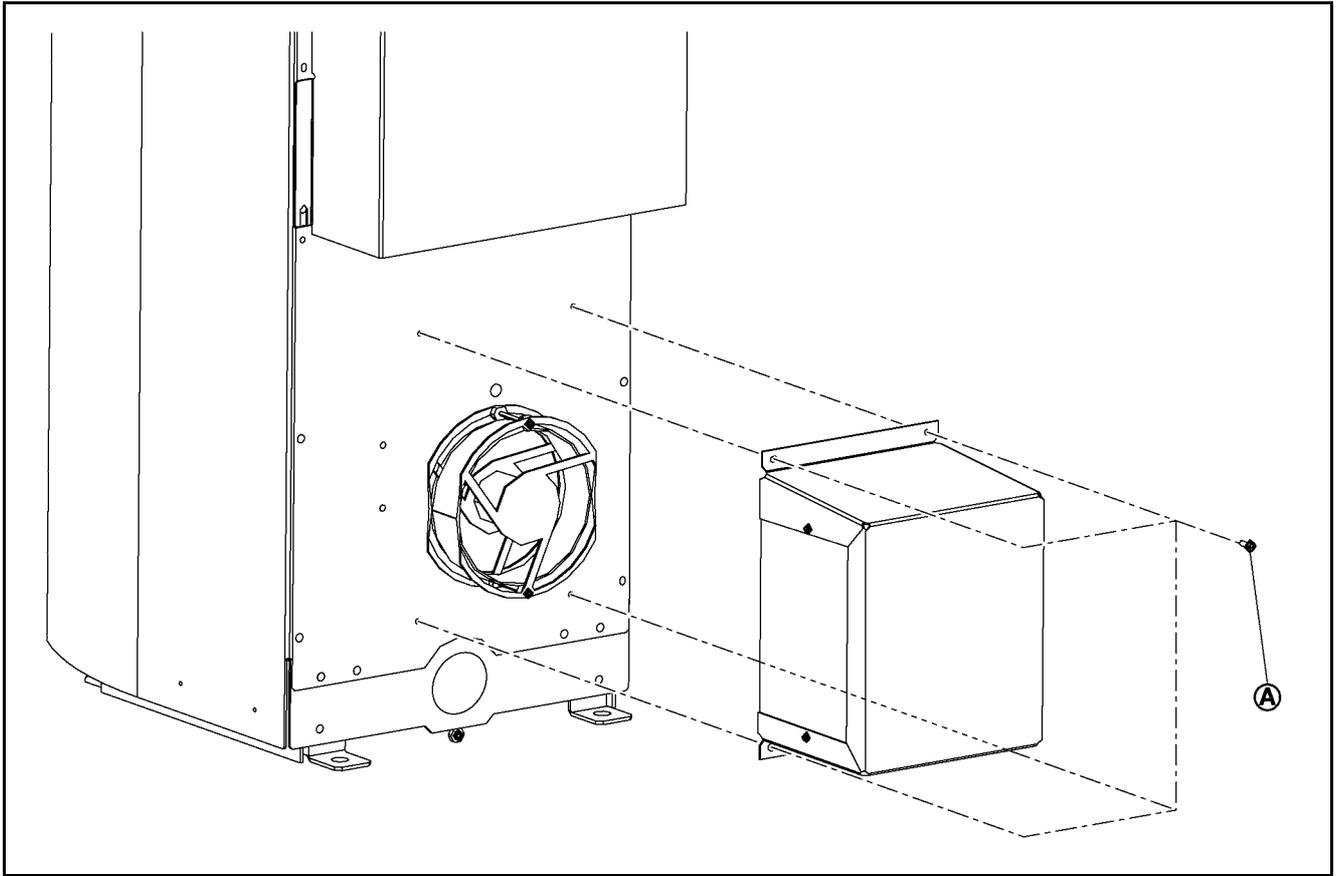
Note the following, and install in the reverse order of removal.

CAUTION 1: Install so that the fan label faces outward.

CAUTION 2: When installing the FAN1 cover, inject grease into each of the screw holes in order to prevent corrosion.

5 - 37 : Fan Assy- Cooling (FAN2) Cover

5 - 37 - 1 : COMPONENT PARTS LOCATION



5 - 37 - 2 : REMOVAL

Remove the fan assy- cooling (FAN2) cover screws (A) and remove the cover.

5 - 37 - 3 : INSTALLATION

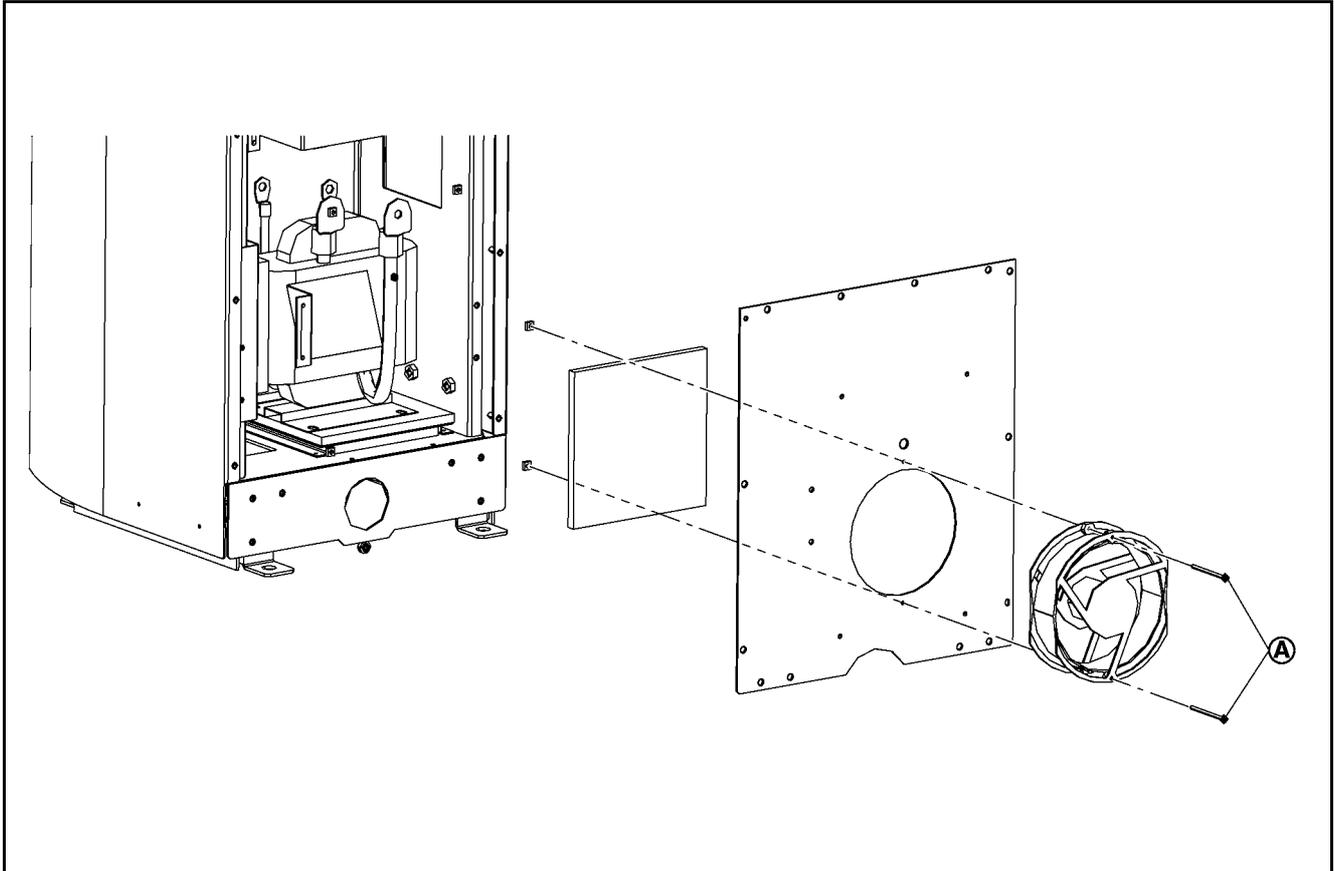
Note the following, and install in the reverse order of removal.

CAUTION: When installing the fan assy- cooling (FAN2) cover, inject grease into each of the screw holes in order to prevent corrosion.

5 - 38 : Fan Assy- Cooling (FAN2) and Filter

CAUTION: Be sure to note the fan installation direction, and check the direction of the label before beginning work.

5 - 38 - 1 : COMPONENT PARTS LOCATION



5 - 38 - 2 : REMOVAL

- 1) Remove heat sink cover. Refer to the removal procedure in "5-2: Heat Sink Cover".
- 2) Remove the fan assy- cooling (FAN2) cover. Refer to the removal procedure in "5-38: Fan Assy- Cooling (FAN2)".
- 3) Remove the fan assy- cooling (FAN2) mounting screws (A).
- 4) Remove the fan assy- cooling (FAN2) and filter.

5 - 38 - 3 : INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION 1: The fan label faces inwards.

CAUTION 2: When installing, inject grease into each of the screw holes in order to prevent corrosion.

CAUTION 3: When plural back plates are removed, re-install them in the order of back plate (lower), back plate (middle), back plate side (RH and LH), and back plate (upper).

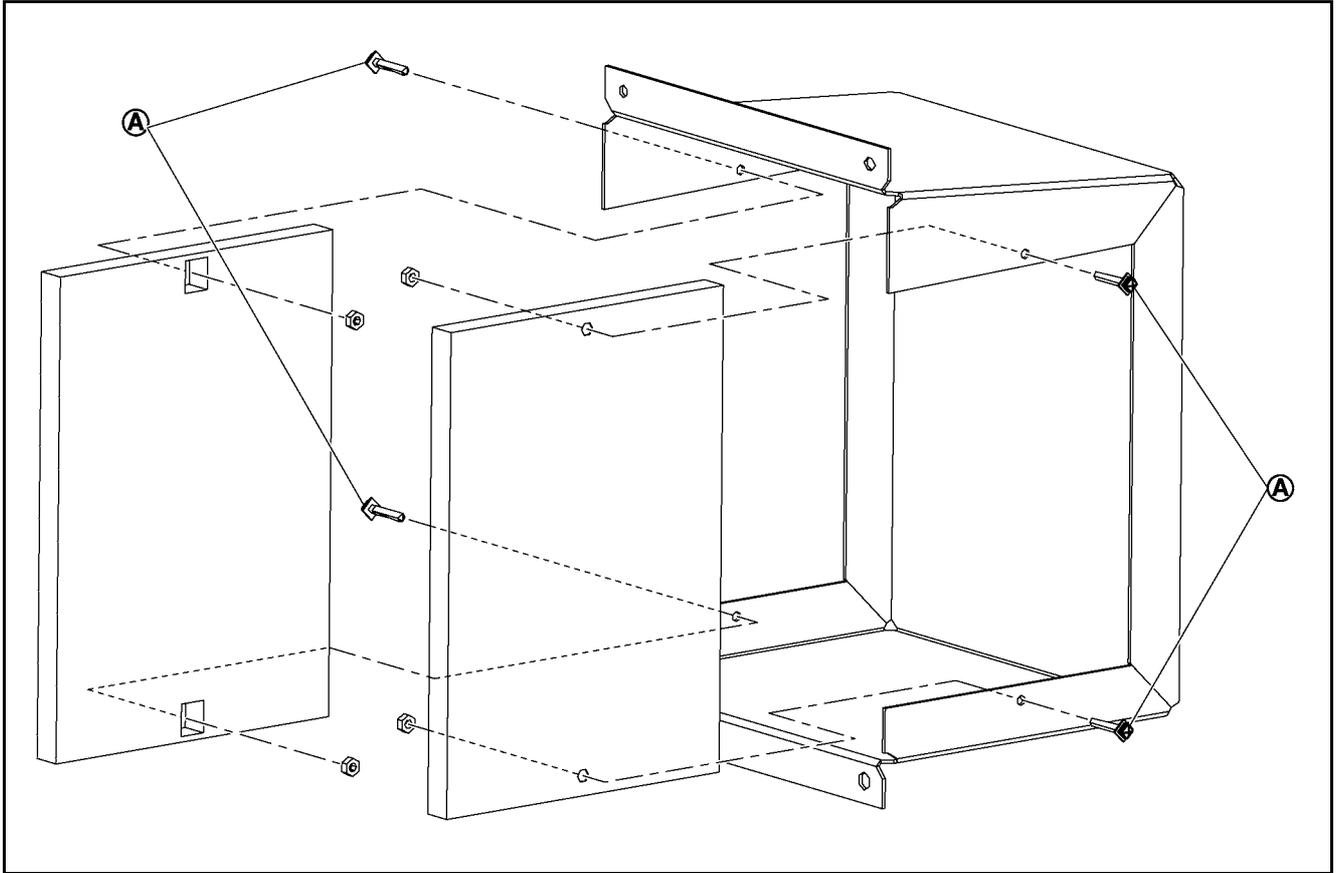
CAUTION 4: When installing each back plate (upper, middle, side RH, side LH, and lower), inject grease to each screw hole to prevent corrosion.

CAUTION 5: If any abnormal condition is observed on waterproof seal, replace back plate assy.

5 - 39 : Fan Assy- Cooling (FAN2) Cover Filter

CAUTION: Be sure to note the fan installation direction, and check the direction of the label before beginning work.

5 - 39 - 1 : COMPONENT PARTS LOCATION



5 - 39 - 2 : REMOVAL

- 1) Remove the fan assy- cooling (FAN2) cover. Refer to the removal procedure in "5-38: fan assy- cooling (FAN2) Cover".
- 2) Remove fan assy- cooling (FAN2) filter mounting screws.

5 - 39 - 3 : INSTALLATION

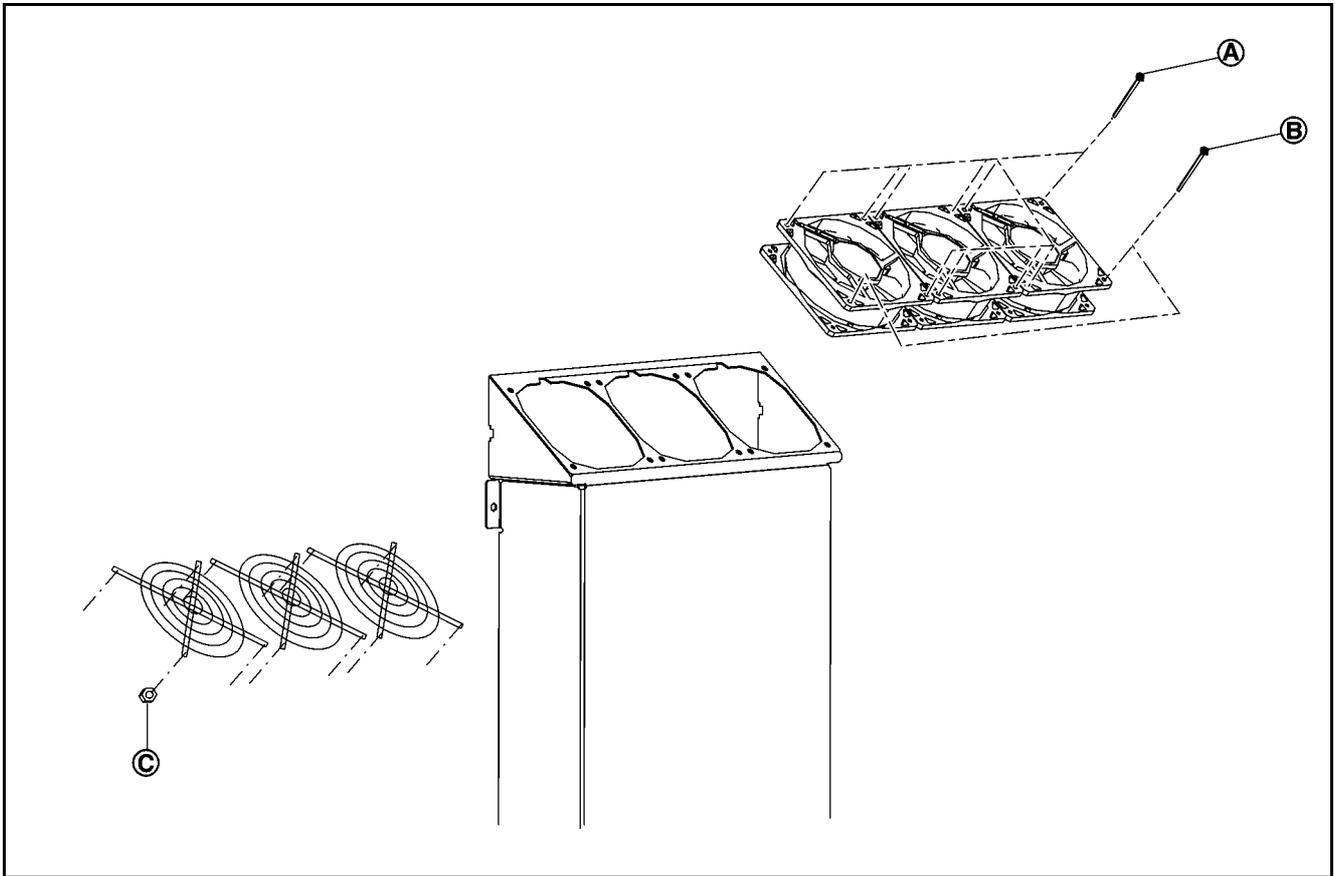
Install in the reverse order of removal.

5 - 40 : Fan Assy- Cooling (FAN4, FAN5, FAN6)

CAUTION 1: Be sure to note the fan installation direction, and check the direction of the label before beginning work.

CAUTION 2: Be careful as the lengths of screws are different between (A) and (B), install the screws paying.

5 - 40 - 1 : COMPONENT PARTS LOCATION



5 - 40 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the fan assy- cooling (FAN4, FAN5, FAN6) mounting screws (A), (B), and nuts (C).

5 - 40 - 3 : INSTALLATION

Note the following, and install in the reverse order of removal.

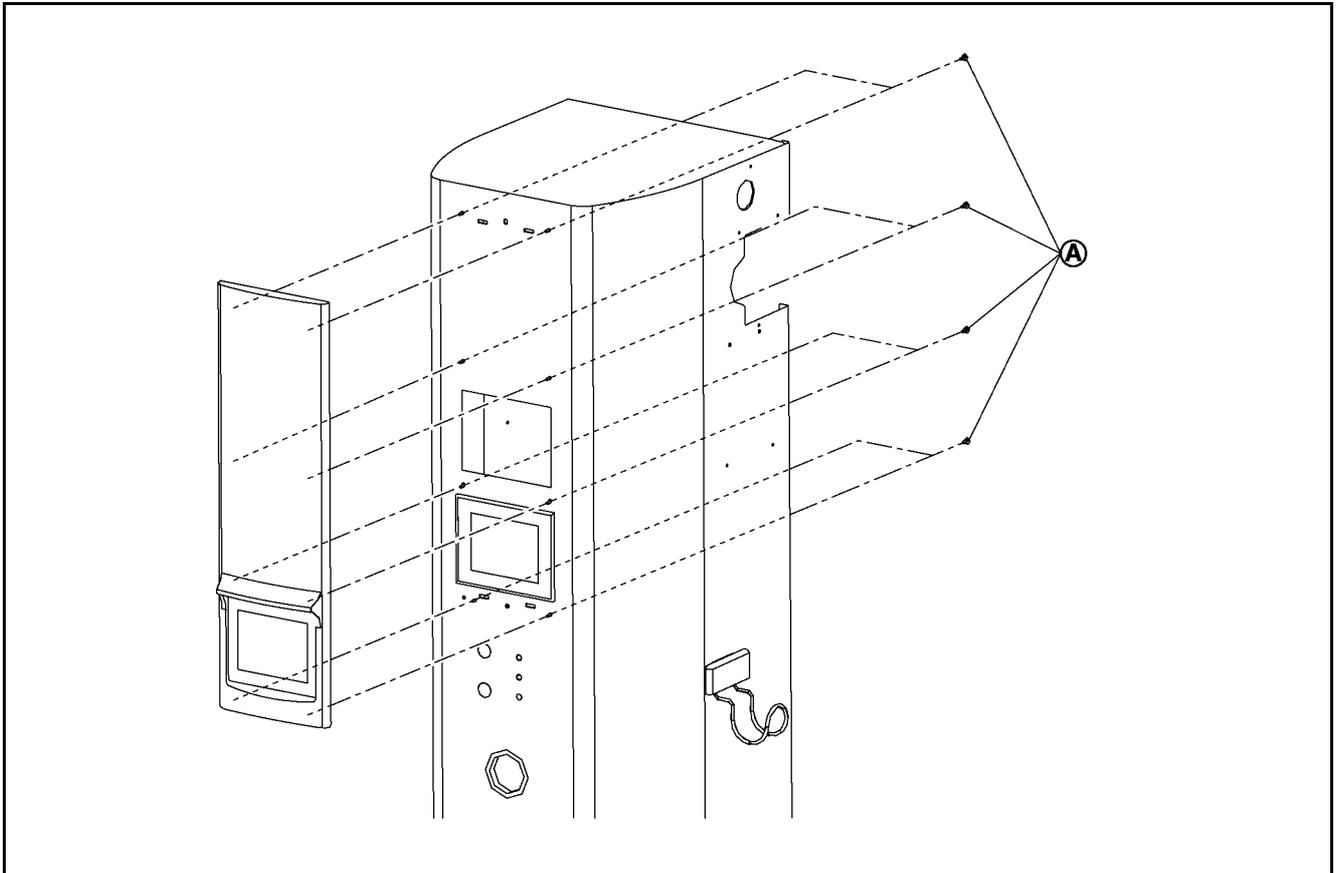
CAUTION 1: The fan label faces outward.

CAUTION 2: Be careful as the lengths of screws are different between (A) and (B), install the screws paying to following.

- 1) Length of screw (A): 600mm (23.62 in)
- 2) Length of screw (B): 550mm (21.65 in)

5 - 41 : Display Assy (LCD) finisher

5 - 41 - 1 : COMPONENT PARTS LOCATION



5 - 41 - 2 : REMOVAL

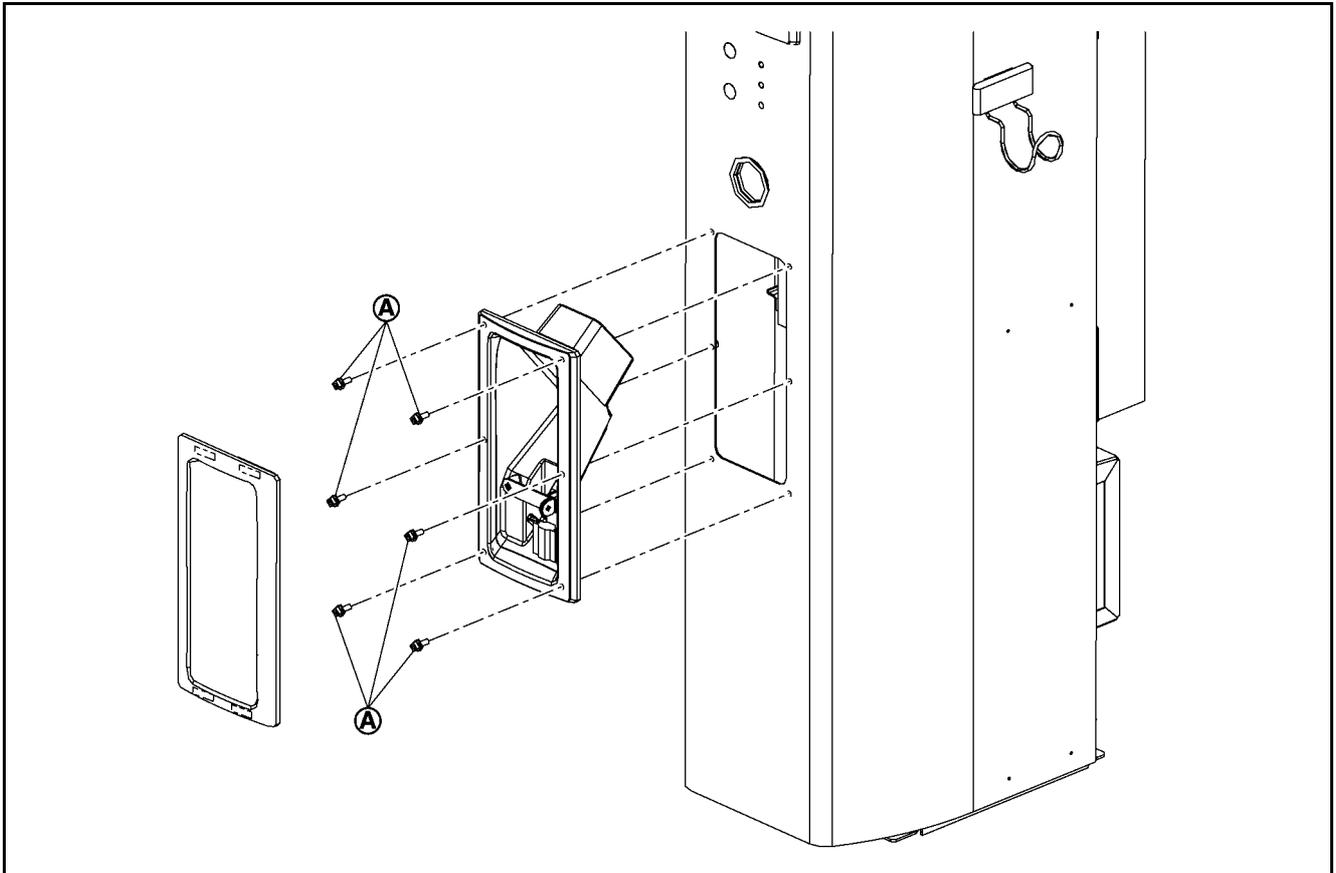
- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the display assy (LCD) finisher mounting screws.

5 - 41 - 3 : INSTALLATION

Install in the reverse order of removal.

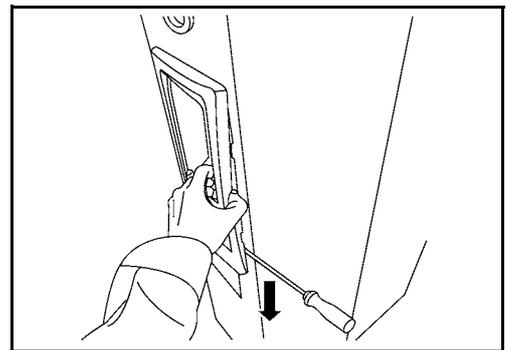
5 - 42 : Charge Connector Pocket

5 - 42 - 1 : COMPONENT PARTS LOCATION



5 - 42 - 2 : REMOVAL

- 1) Pull holder assy-charger connector by the portion slightly right to the center to produce a gap between panel assy-side and holder assy finisher-charger connector.
- 2) Insert a minus screwdriver toward vertical direction against holder assy finisher-charger connector.
- 3) Press down the minus screwdriver in downward direction (as shown with black arrow) and remove holder assy finisher-charger connector.
- 4) Remove holder assy- charger connector mounting screws (A).



5 - 42 - 3 : INSTALLATION

Install in the reverse order of removal.

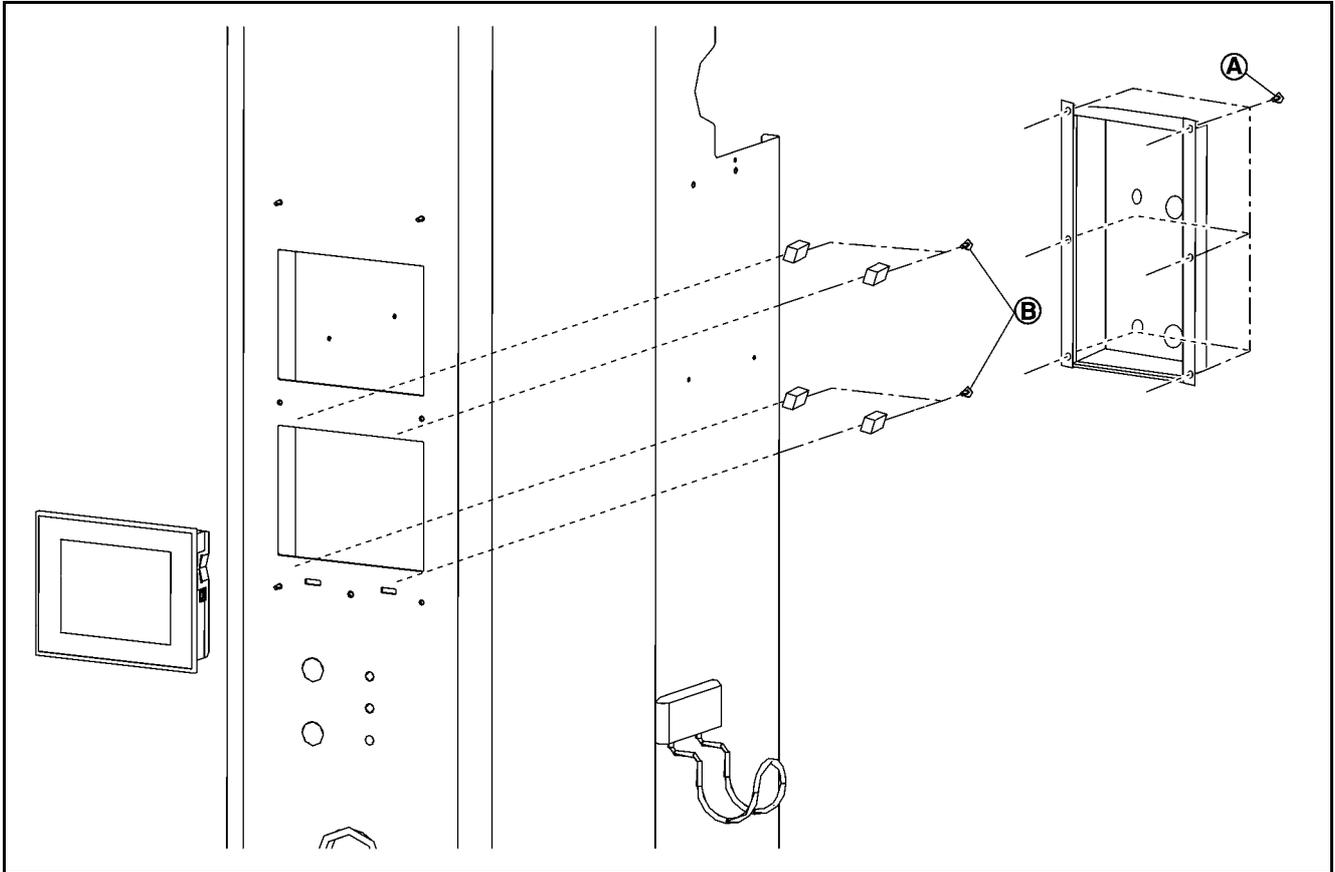
5 - 43 : Display Assy (LCD)

CAUTION 1: The display assy (LCD) is installed only with the Standard Specifications.

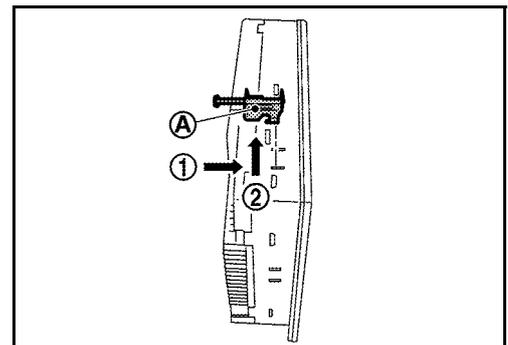
CAUTION 2: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 3: Never drop or lose the washers, and be sure to reinstall them.

5 - 43 - 1 : COMPONENT PARTS LOCATION



- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the display assy (LCD) finisher. Refer to the removal procedure in "5-33: Display Assy (LCD) Finisher".
- 8) Remove the display assy (LCD) cover mounting screws (A).
- 9) Remove the display assy (LCD) mounting screws (B).
- 10) Slide the clamp A toward front (1) then pull it out upward to remove the clamp from display assy (LCD).
- 11) Remove display assy (LCD) from front of side panel assy.



5 - 43 - 3 : INSTALLATION

Install in the reverse order of removal.

5 - 44 : Operation Panel

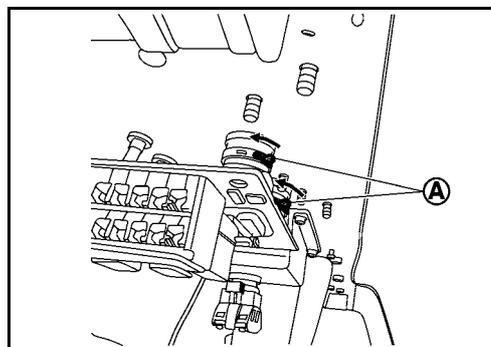
CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

CAUTION 3: When removing the operation panel PCBs, be sure not to damage the LEDs.

5 - 44 - 1 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Disconnect the switch assy-control harness connector.
- 8) Remove the switch assy-control mounting screws.
- 9) Rotate switch assy-emergency fixing pin (A) counterclockwise and remove switch assy-control.
- 10) Remove the switch assy-control from side panels (front cabinet).



5 - 44 - 2 : INSTALLATION

Install in the reverse order of removal.

5 - 45 : Emergency Stop Button

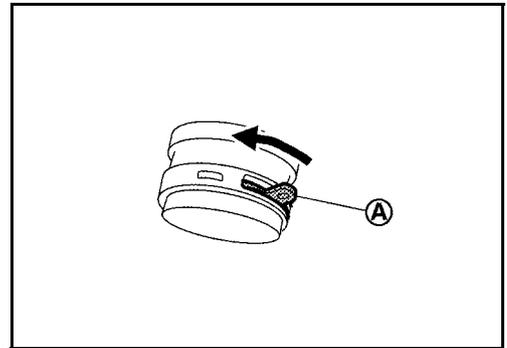
CAUTION 1: Record the wiring connections and the up-down orientation of the emergency stop terminals in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

NOTE: The acrylic panel for preventing incorrect operation is installed only with the Standard Specifications.

5 - 45 - 1 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Disconnect the switch assy- emergency harness.
- 8) Rotate switch assy-emergency fixing pin (A) counterclockwise and remove switch assy -control.



- 9) Remove switch assy- emergency mounting screws.
- 10) Remove the window frame acrylic plate on the side of the side panel (front cabinet) from the window frame rubber (standard Specifications only).

5 - 45 - 2 :INSTALLATION

Install in the reverse order of removal.

5 - 46 : LCD Settings Backup Battery

CAUTION 1: The power supply of the control-side circuit breaker assy- 2nd (ELCB2) turns ON during this work. Be careful for the surrounding devices and the terminal sections.

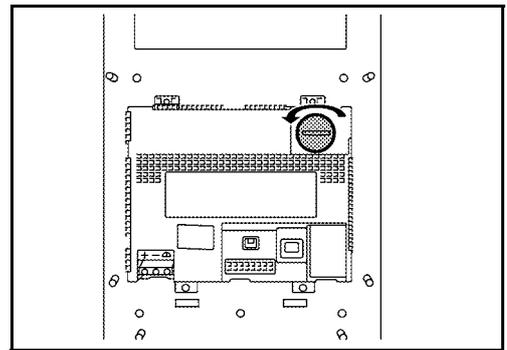
CAUTION 2: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

CAUTION 3: Never drop or lose the washers, and be sure to reinstall them.

NOTE: The LCD is installed only with the Standard Specifications.

5 - 46 - 1 :REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Check that circuit breaker assy- 1st (ELCB1) and circuit breaker assy- 2nd (ELCB2) are OFF.
- 8) Turn ON the charger breaker on the primary side distribution panel.
- 9) Turn ON circuit breaker assy- 2nd (ELCB2) only.
- 10) Check that the LCD display appears, then rotate the battery cap on the rear of the LCD to the left and replace the battery.
- 11) Check that the LCD display is the same as before the battery replacement, then turn OFF circuit breaker assy- 2nd (ELCB2) and the charger breaker on the primary side distribution panel.



5 - 46 - 2 :INSTALLATION

Install in the reverse order of removal.

CAUTION 1: When installing each back plate (upper, middle, side RH, side LH, and lower), apply grease to each screw hole to prevent corrosion.

CAUTION 2: If any abnormal condition is observed on waterproof seal, replace back plate assy.

CAUTION 3: When multiple back plates are removed, reinstall them in the order of back plate (lower), back plate (middle), back plate side (RH and LH), and back plate (upper).

5 - 46 - 3 : IN CASE THE MAIN POWER OR ELCB2 IS TURNED OFF UNDER BATTERY POOR CHARGE CONDITION, PERFORM THE FOLLOWING OPERATION.

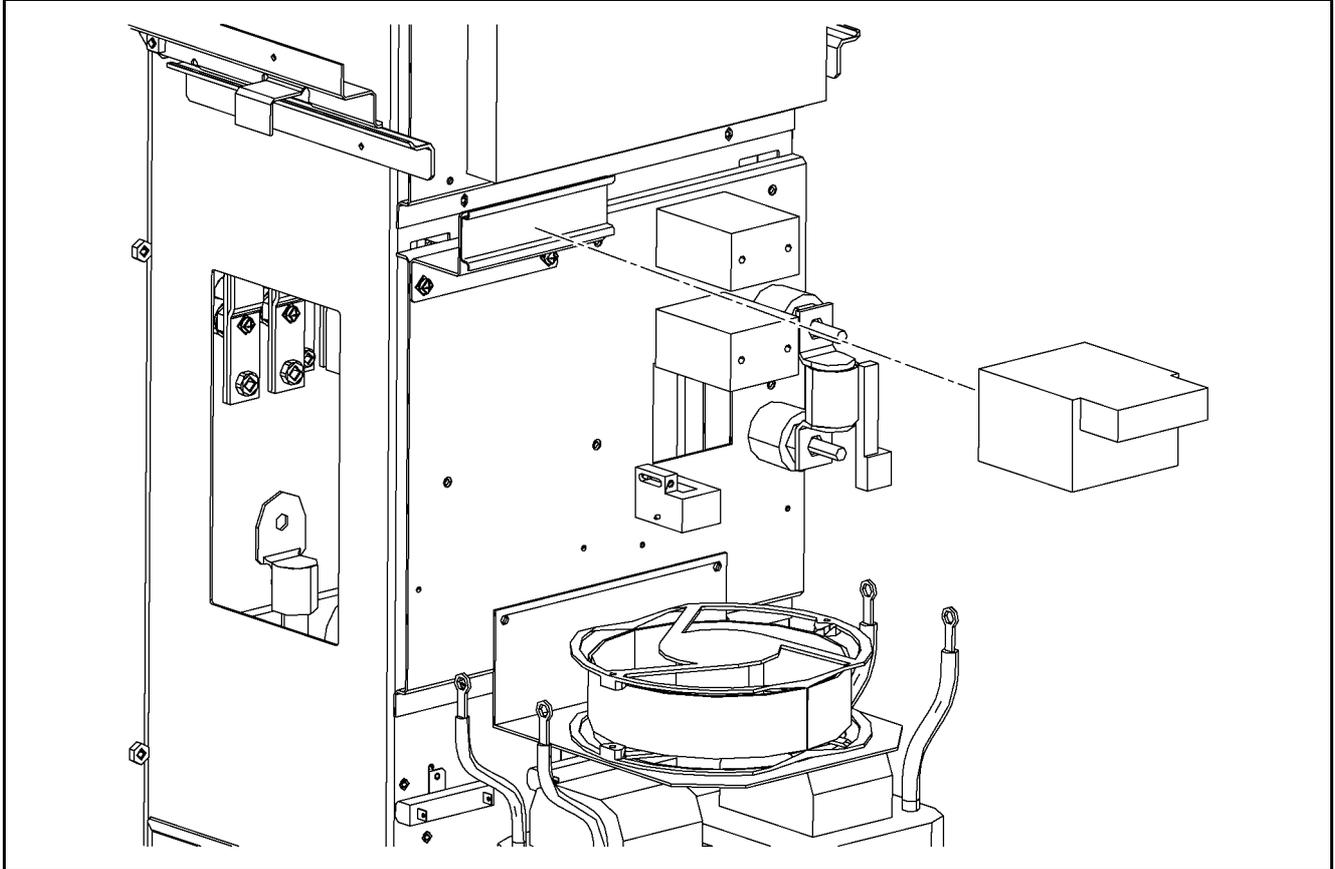
- 1) Perform each registration indicated in "7:Administrator Menu".
- 2) Perform each registration indicated in "8:Maintenance menu" .

5 - 47 : Space Heater (Front) (Cold Specifications)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

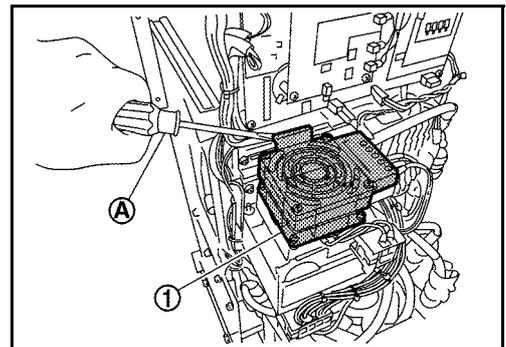
CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

5 - 47 - 1 : COMPONENT PARTS LOCATION



5 - 47 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Disconnect space heater (front) harness.
- 8) Insert minus screwdriver (A) between the rail and space heater front side to remove the joint with rail, and remove space heater (Front) (1).



5 - 47 - 3 : INSTALLATION

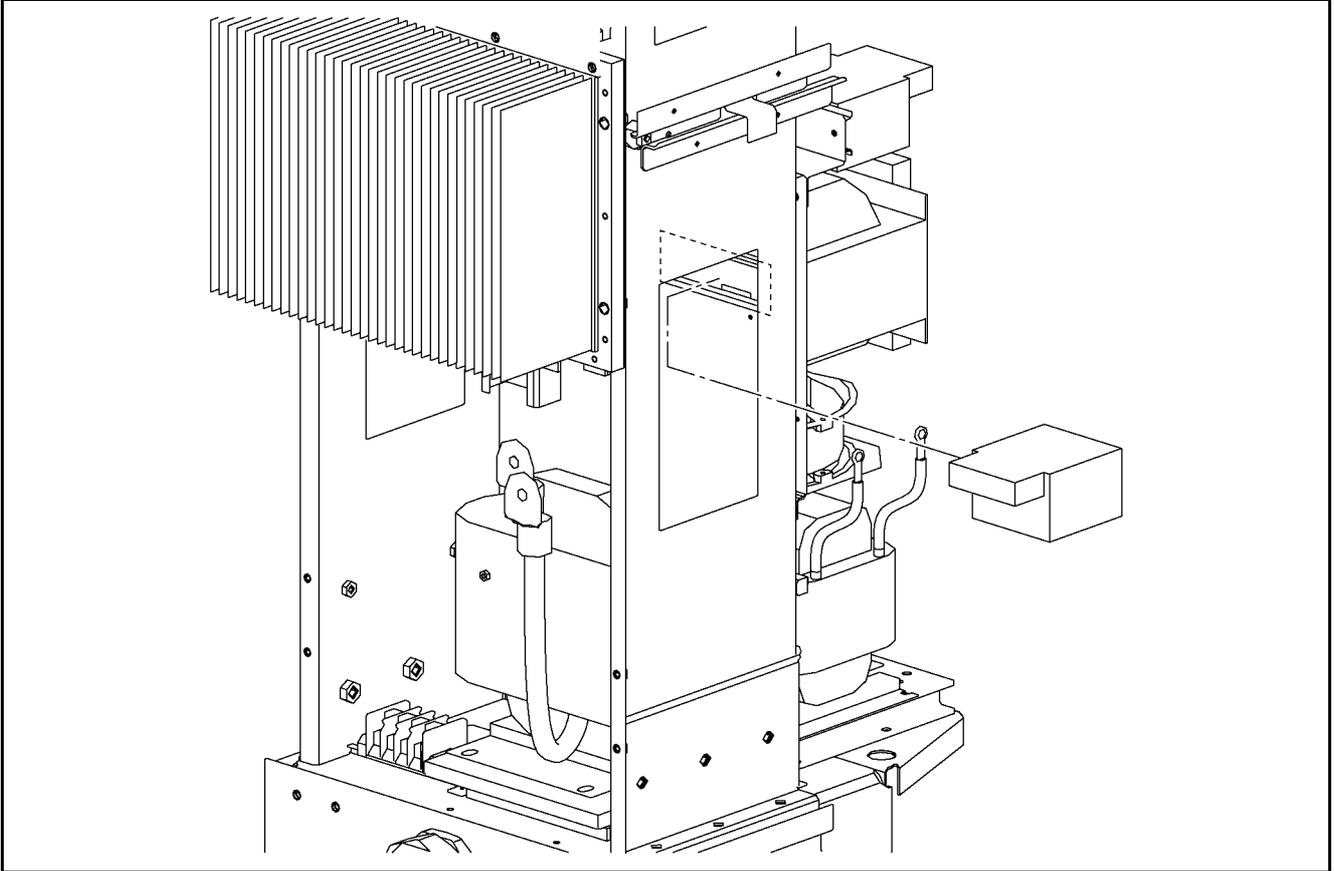
Install in the reverse order of removal.

5 - 48 : Space Heater (Rear) (Cold Specifications)

CAUTION 1: Record the wiring connections in a notebook or other place in order to prevent incorrect installation when they are reconnected.

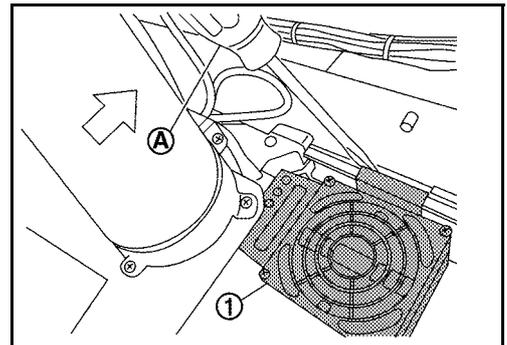
CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

5 - 48 - 1 : COMPONENT PARTS LOCATION



5 - 48 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the PWB1.
- 8) Disconnect space heater (rear) harness.
- 9) Insert minus screwdriver (A) between the rail and space heater front side to remove the joint with rail, and remove space heater (Rear) (1).



5 - 48 - 3 : INSTALLATION

Install in the reverse order of removal.

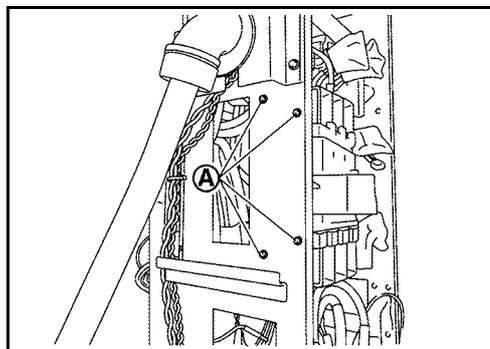
5 - 49 :SPD Assy- Input

CAUTION 1: Record the wiring connections and the up-down orientation of the emergency stop terminals in a notebook or other place in order to prevent incorrect installation when they are reconnected.

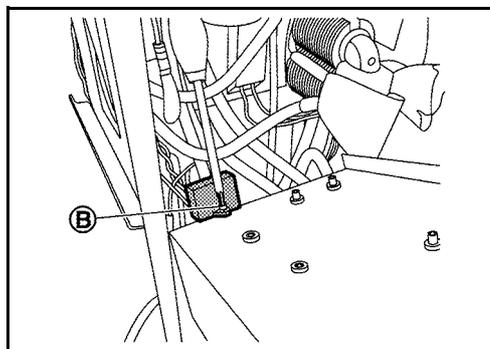
CAUTION 2: Never drop or lose the washers, and be sure to reinstall them.

5 - 49 - 1 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove circuit breaker assy- 1st (ELCB1) and circuit breaker assy- 2nd (ELCB2) bracket mounting screws (A).



- 8) Remove SPD assy mounting screws (B).

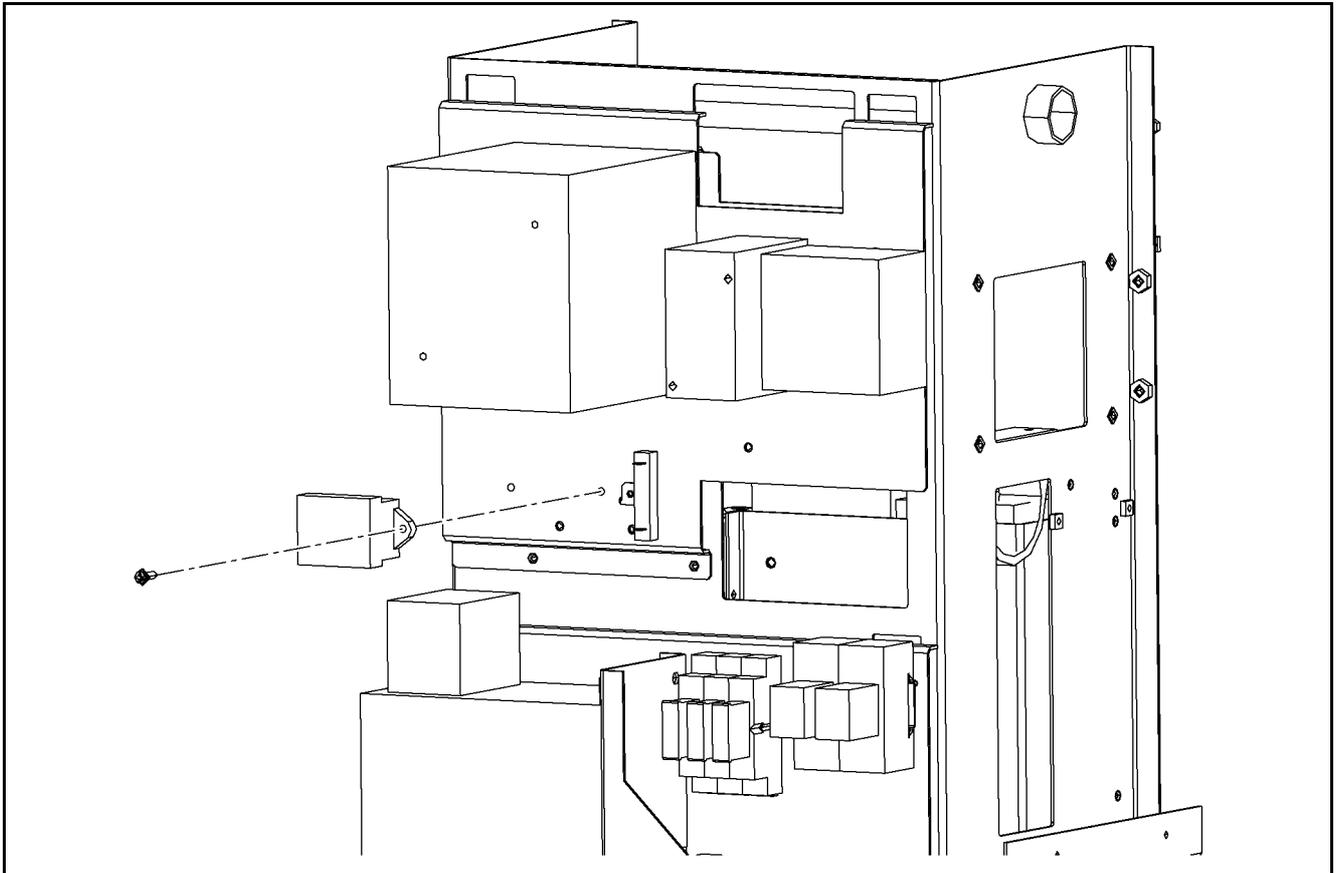


5 - 49 - 2 : INSTALLATION

Install in the reverse order of removal.

5 - 50 : Relay Assy- Earth Leak Test (CR30) (Type1)

5 - 50 - 1 : COMPONENT PARTS LOCATION



5 - 50 - 2 : REMOVAL

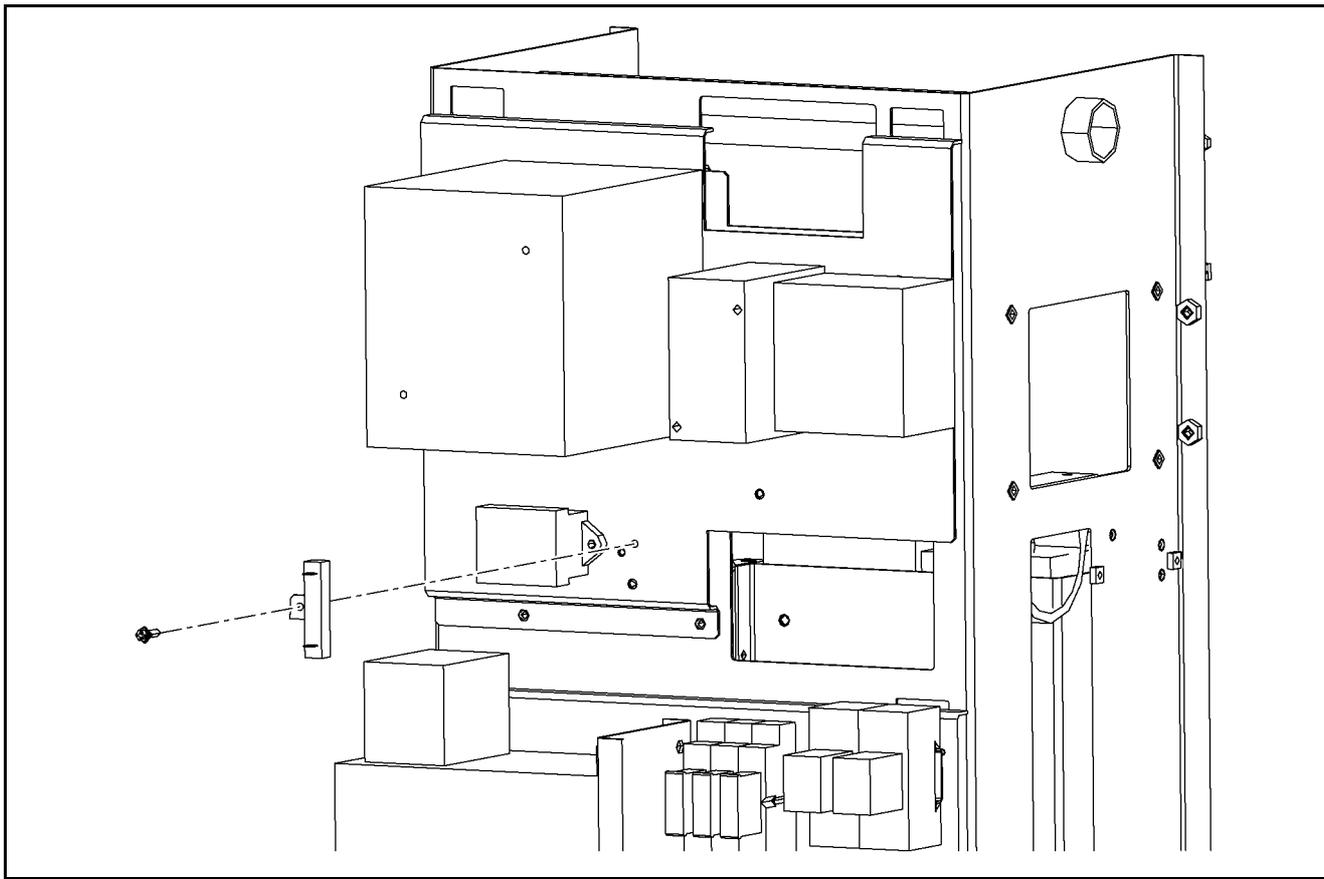
- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Disconnect relay assy- earth leak test (CR30) harness.
- 8) Remove relay assy- earth leak test (CR30) mounting screw.

5 - 50 - 3 : INSTALLATION

Install in the reverse order of removal.

5 - 51 : Resistor Assy- Earth Leak Test (R30) (Type1)

5 - 51 - 1 : COMPONENT PARTS LOCATION



5 - 51 - 2 : REMOVAL

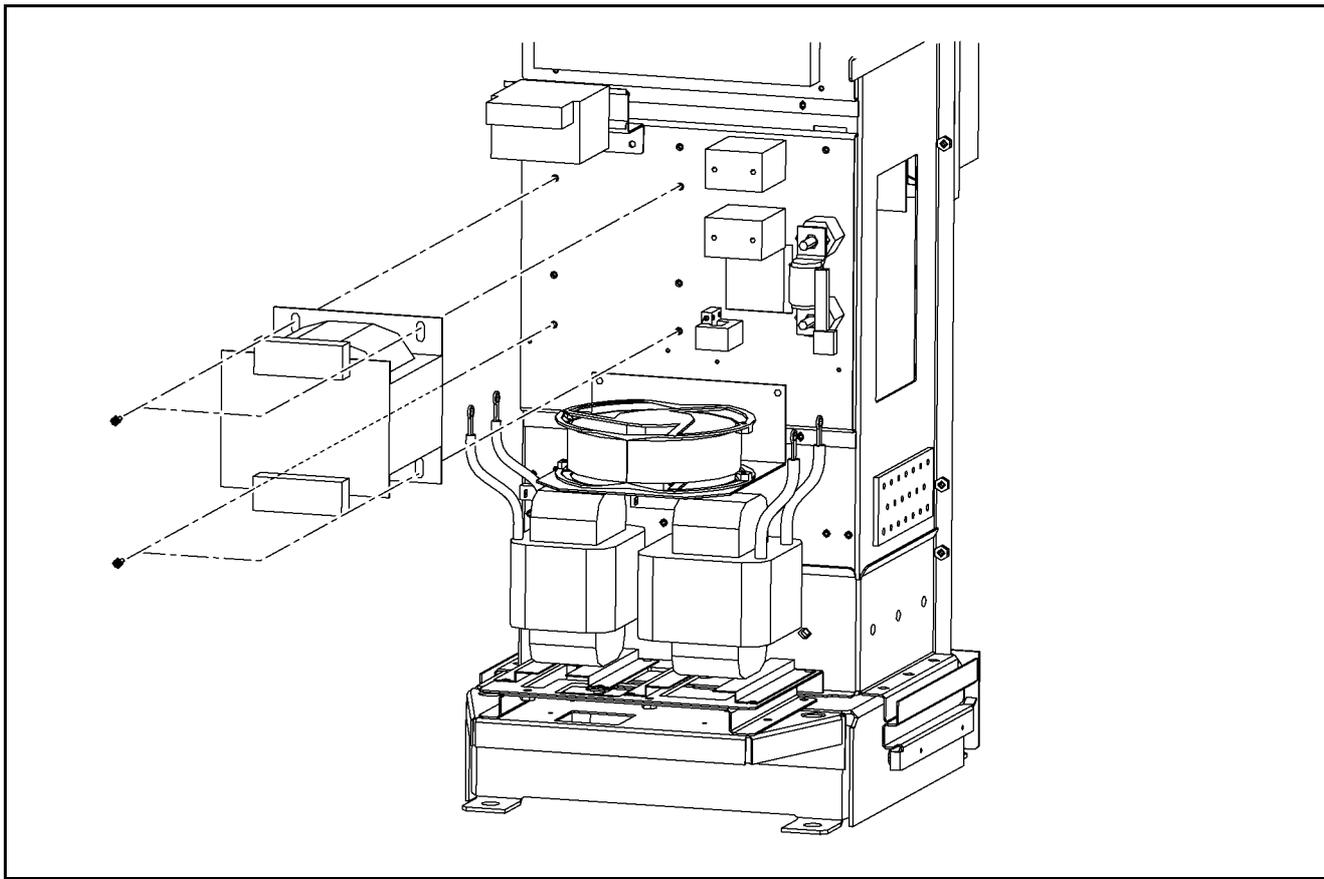
- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove resistor assy- earth leak test (R30) harness.
- 8) Remove resistor assy- earth leak test (R30) mounting screw.

5 - 51 - 3 : INSTALLATION

Install in the reverse order of removal.

5 - 52 : Transformer Assy- Input Power Circuit (TR2)

5 - 52 - 1 : COMPONENT PARTS LOCATION



5 - 52 - 2 : REMOVAL

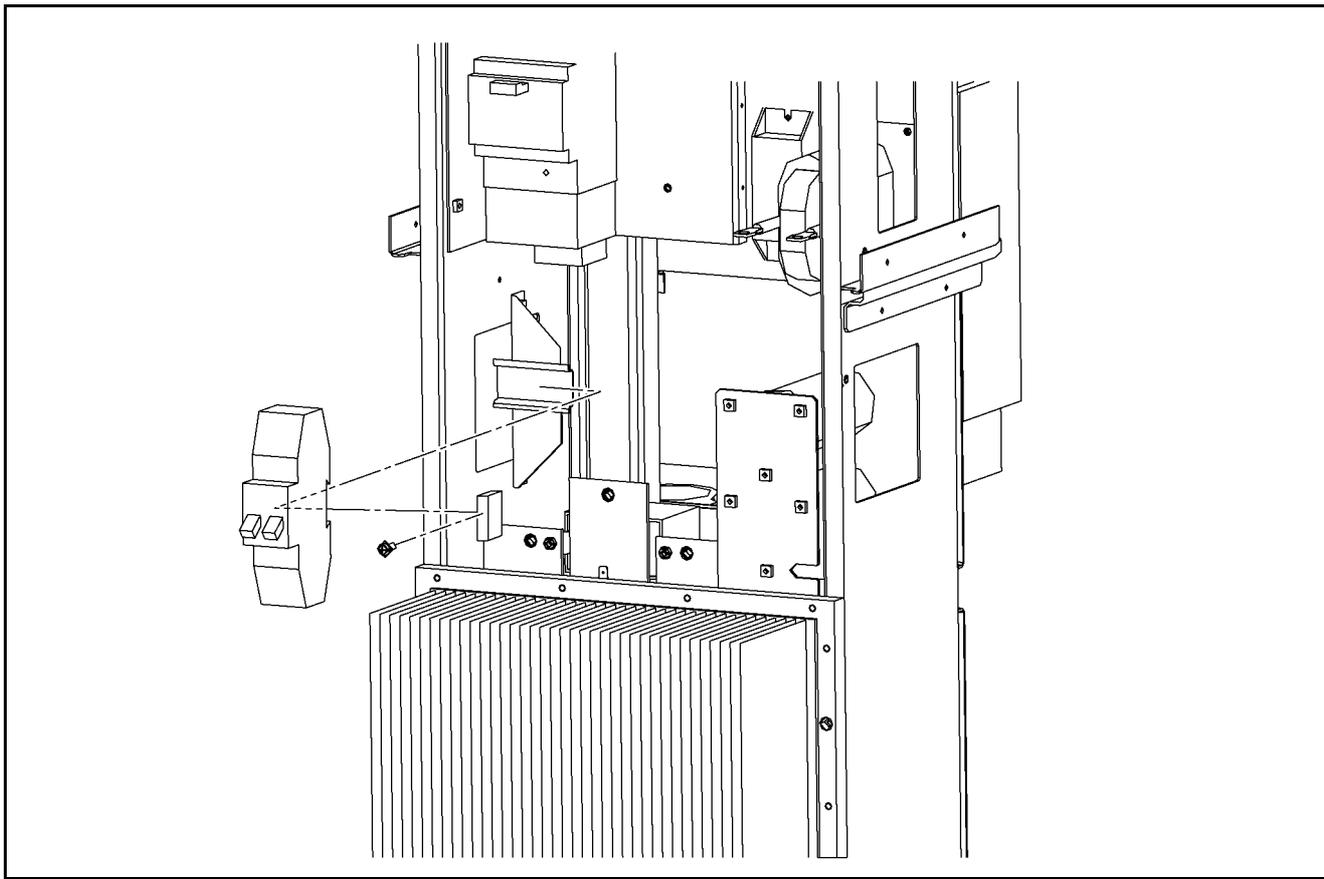
- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove transformer assy- input power circuit (TR2) harness.
- 8) Remove transformer assy- input power circuit (TR2) mounting screws.

5 - 52 - 3 : INSTALLATION

Install in the reverse order of removal.

5 - 53 : Heater Assy- Control (CP1) (Cold Specifications)

5 - 53 - 1 : COMPONENT PARTS LOCATION



5 - 53 - 2 : REMOVAL

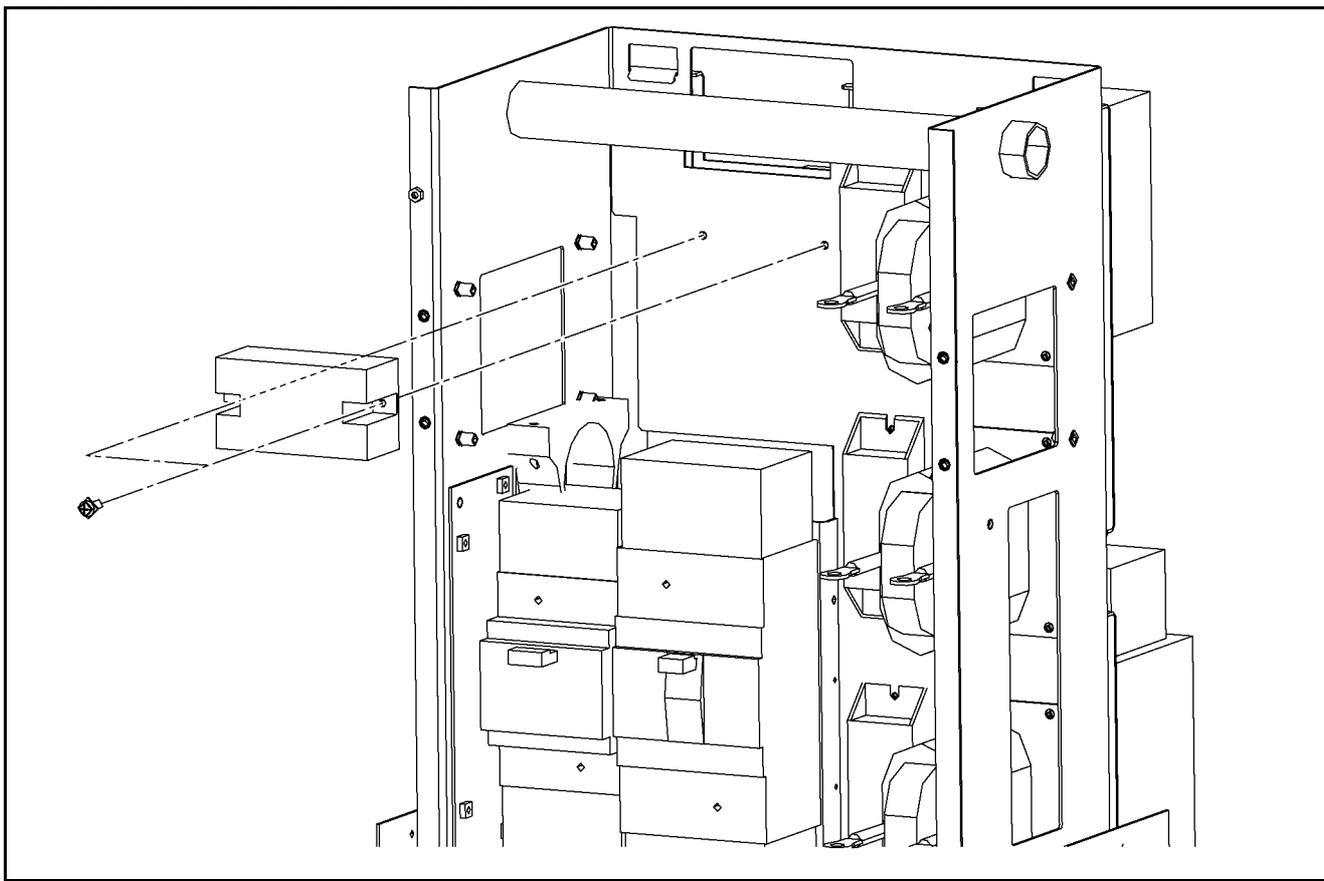
- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove the circuit breaker assy- 1st (ELCB1). Refer to the removal procedure in "5-28: circuit breaker assy- 1st (ELCB1) (Type1)" or "5-28: circuit breaker assy- 1st (ELCB1) (Type2)".
- 8) Remove heater assy- control (CP1) harness.
- 9) Slide heater assy- control (CP1) to the right to remove it.

5 - 53 - 3 : INSTALLATION

Install in the reverse order of removal.

5 - 54 : Filter Assy- Noise, 1st (NF2)

5 - 54 - 1 : COMPONENT PARTS LOCATION



5 - 54 - 2 : REMOVAL

- 1) Remove the heat sink cover. Refer to the removal procedure in "5-2: Heat sink cover".
- 2) Remove the plate assy-back (upper). Refer to the removal procedure in "5-3: Plate Assy- Back (Upper)".
- 3) Remove the plate assy- back (lower). Refer to the removal procedure in "5-4: Plate Assy- Back (Lower)".
- 4) Remove the plate assy- back (side RH and LH). Refer to the removal procedure in "5-5: Plate Assy- Back (Side RH and LH)".
- 5) Remove the cover-supt clamp, charger connector cable. Refer to the removal procedure in "5-7: Cover- Supt Clamp, Charger Connector Cable".
- 6) Remove the side panel. Refer to the removal procedure in "5-8: Side Panel Assy".
- 7) Remove filter assy- noise, 1st (NF2) harness.
- 8) Remove filter assy- noise, 1st (NF2) mounting screw.

5 - 54 - 3 : INSTALLATION

Install in the reverse order of removal.

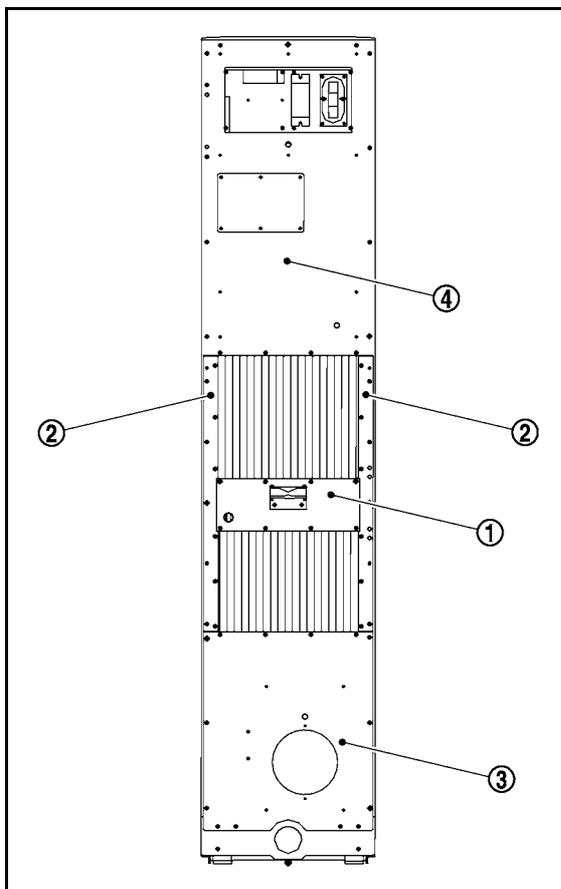
5 - 55 : Plate Assy-back Installation Procedure

CAUTION1: When whole Plate Assy-Back is removed, install it as indicated in the procedure in order to keep the watertightness.
CAUTION2: As installation procedure is set for each Plate Assy-Back, be sure to follow the corresponding procedure.

5 - 55 - 1 : Installation procedure for each Plate Assy-Back

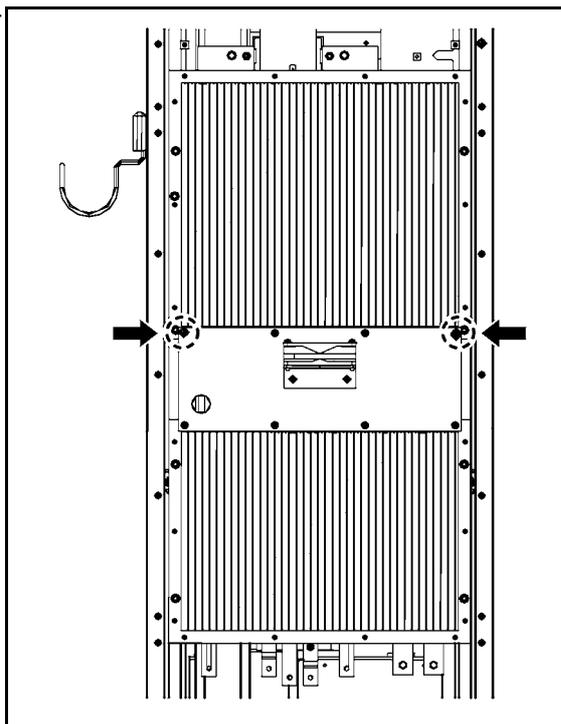
The procedure to install the Plate Assy-Back is shown below.

- 1) Plate Assy- Back (Middle) (1)
- 2) Plate Assy- Back (Side RH and LH) (2)
- 3) Plate Assy- Back (Lower) (3)
- 4) Plate Assy- Back (Upper) (4)



5 - 55 - 2 : Plate Assy- Back (Middle)

After locating by two points as shown with black arrows in the figure, install other screws.

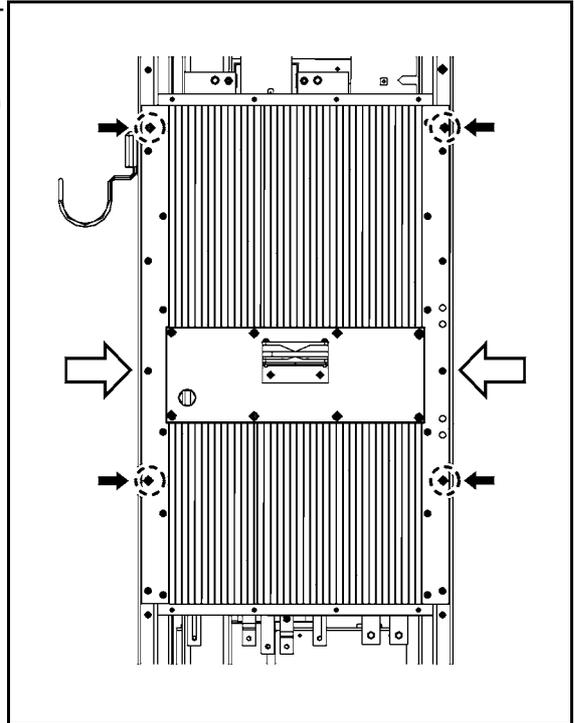


5 - 55 - 3 : Plate Assy- Back (Side RH and LH)

After locating by two points as shown with black arrows in the figure, install other screws.

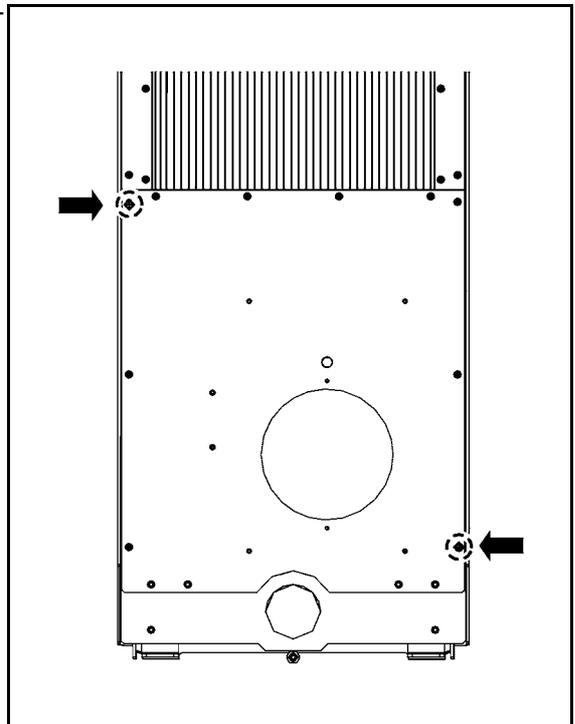
CAUTION: When installing the plate assy-back (Side RH and LH), install it by pressing against the Plate Assy-Back (Middle), as shown with white arrow.

NOTE: As two screws at top end are installation screws of heat sink cover, remove them after locating the plate assy-back.



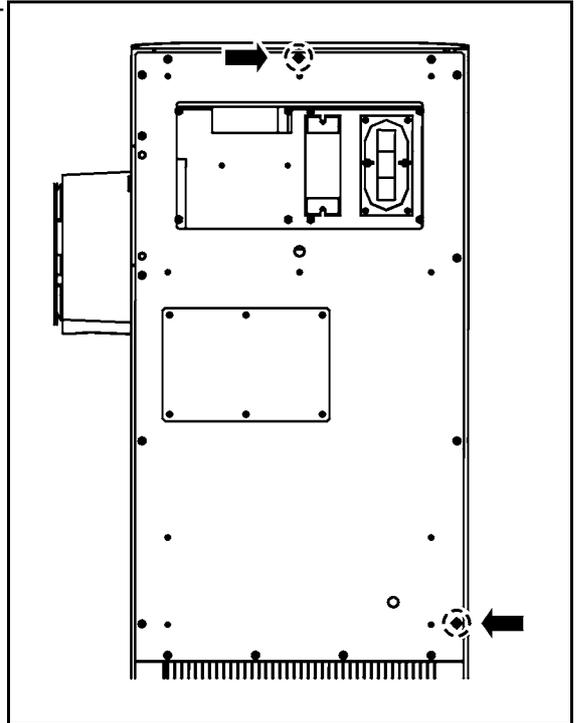
5 - 55 - 4 : Plate Assy- Back (Lower)

After locating by two points as shown with black arrows in the figure, install other screws.



5 - 55 - 5 : Plate Assy- Back (Upper)

After locating by two points as shown with black arrows in the figure, install other screws.



6. TROUBLE DIAGNOSIS

6 - 1 : Diagnosis Using An SD Card

6 - 1 - 1 : DESCRIPTION

When there is a malfunction with the vehicle or charger, it is possible to insert an SD card into the SD card slot on PWB1 and record the malfunction details.

With the Base Specifications, it is possible to determine the probable location of the malfunction using a PC.

With the Standard Specifications as well, in addition to using the monitor, it is also possible to check the malfunction details using this SD card.

For the detected error codes, refer to "6-3: ERROR CODE LIST".

6 - 1 - 2 : WRITING PROCEDURES OF ERROR CODE TO SD CARD

1) Turn breakers of circuit breaker assy- 1st (ELCB1) and circuit breaker assy- 2nd (ELCB2) to the OFF position.

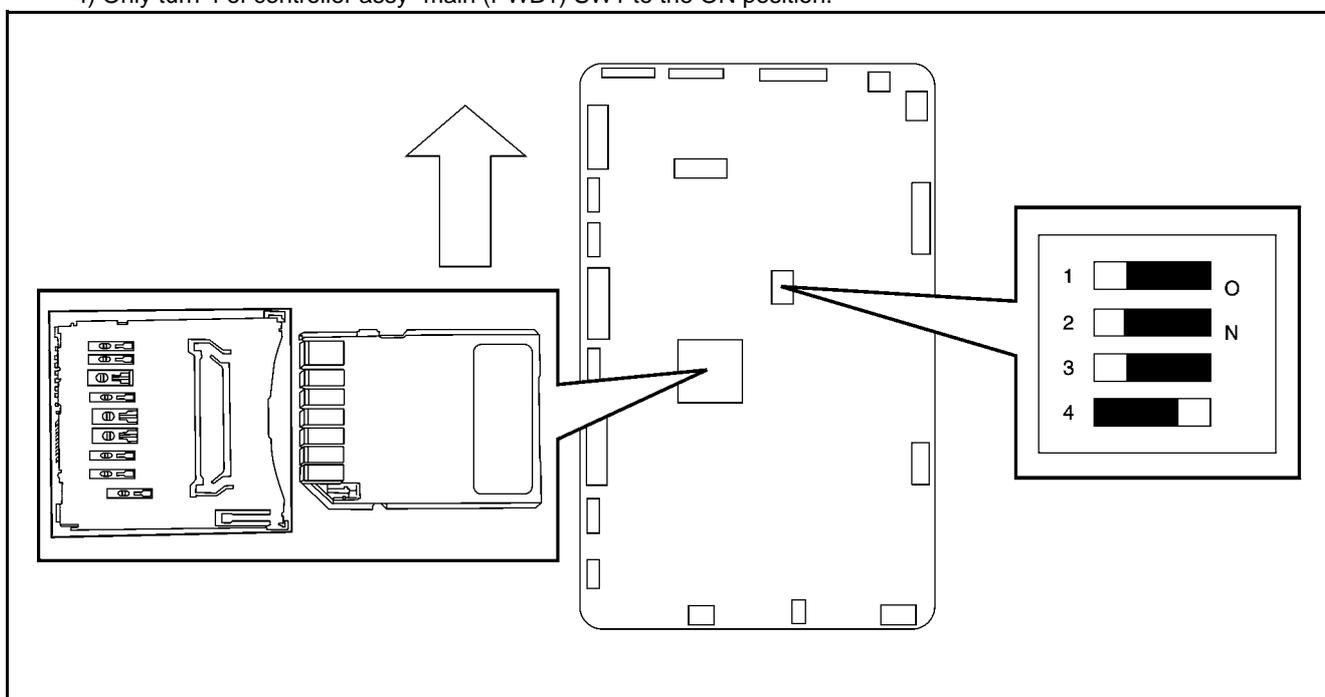
2) Create "Err" folder in SD card.

3) Insert SD card into socket of controller assy- main (PWB1).

CAUTION1: Insert SD card until it is locked.

CAUTION2: Be careful of the direction of insertion of SD card.

4) Only turn 4 of controller assy- main (PWB1) SW1 to the ON position.



5) Turn breakers of circuit breaker assy- 1st (ELCB1) and circuit breaker assy- 2nd (ELCB2) to the ON position.

6) Press START button (Each LED lamp of READY / CHARGE / ALARM all blink).

CAUTION: Never turn power supply OFF while each LED lamp blinks.

7) Check that each LED lamp of READY / CHARGE / ALARM turns OFF.

8) Turn breakers of circuit breaker assy- 1st (ELCB1) and circuit breaker assy- 2nd (ELCB2) to the OFF position.

9) Remove SD card from socket of controller assy- main (PWB1).

CAUTION: Before removing the SD card from the socket, press the SD card to release the lock.

10) Error code is written in "Err" folder in SD card.

6 - 2 : Content of SD Card Reading

6 - 2 - 1 : FILE NAME

ErrorLogyyyyymmddhhmmss.csv

yyyy	Year	The file name is set as the date and time when error code is written to the SD card.
mm	Month	
dd	Day	
hh	Hour	
mm	Minute	
ss	Second	

6 - 2 - 2 : FILE FORMAT

csv type

6 - 2 - 3 : DATA STRUCTURE

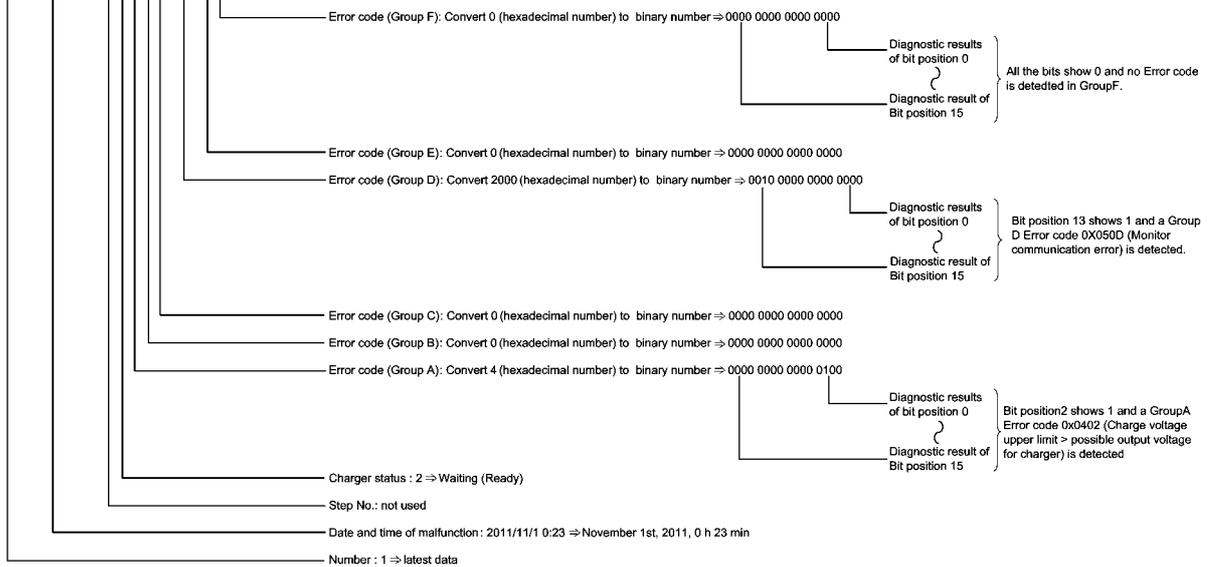
The information is written to SD card in the order of Number, malfunction generated date and time, status of the charger, step No., Error code (Group A), Error code (Group B), Error code (Group C), Error code (Group D), Error code (Group E), and Error code (Group F).

Number	-It displays the serial number of the memorized data at generation of malfunction. -It can memorize up to 100 sets of data.
Malfunction generated date and time	The date and time is displayed as (year / month / day / hour / minute)
Quick charger status	It indicates the status of the charger at generation of malfunction.
	0: Initial status
	1: Under initialization
	2: Waiting (ready status)
	3: Preparing (unready status)
	4: Preparing for charge
	5: Testing the insulation
	6: Pre-charge operation
	7: Charging
8: Stopping the charge	
50: Out of order	
Step No.	Not used for service work
Error code (Group A)	Refer to the error code list and below display example 6-2-4
Error code (Group B)	
Error code (Group C)	
Error code (Group D)	
Error code (Group E)	
Error code (Group F)	

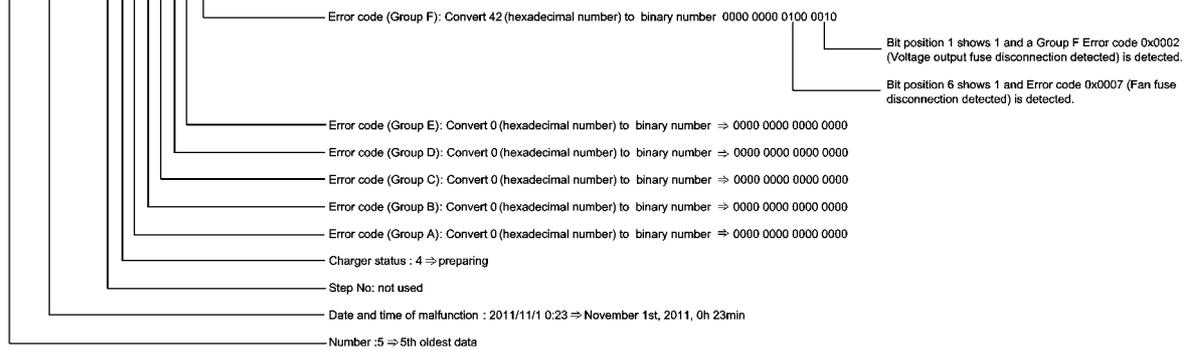
6 - 2 - 4 : EXAMPLE 1

Example of display: Perform the conversion as shown below to confirm the Error code

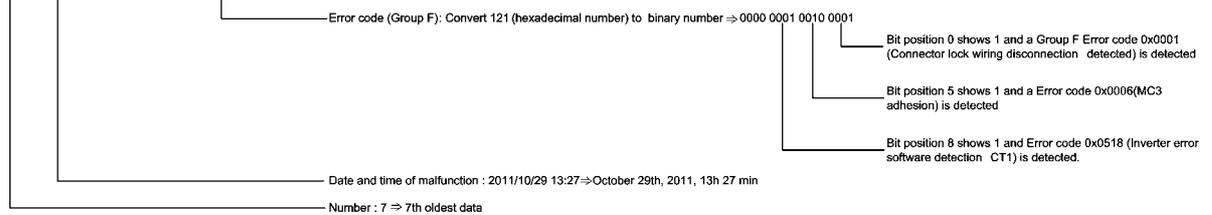
Example 1: 1, 2011/11/1 0:23, 2, 4, 0, 0, 0, 2000, 0, 0



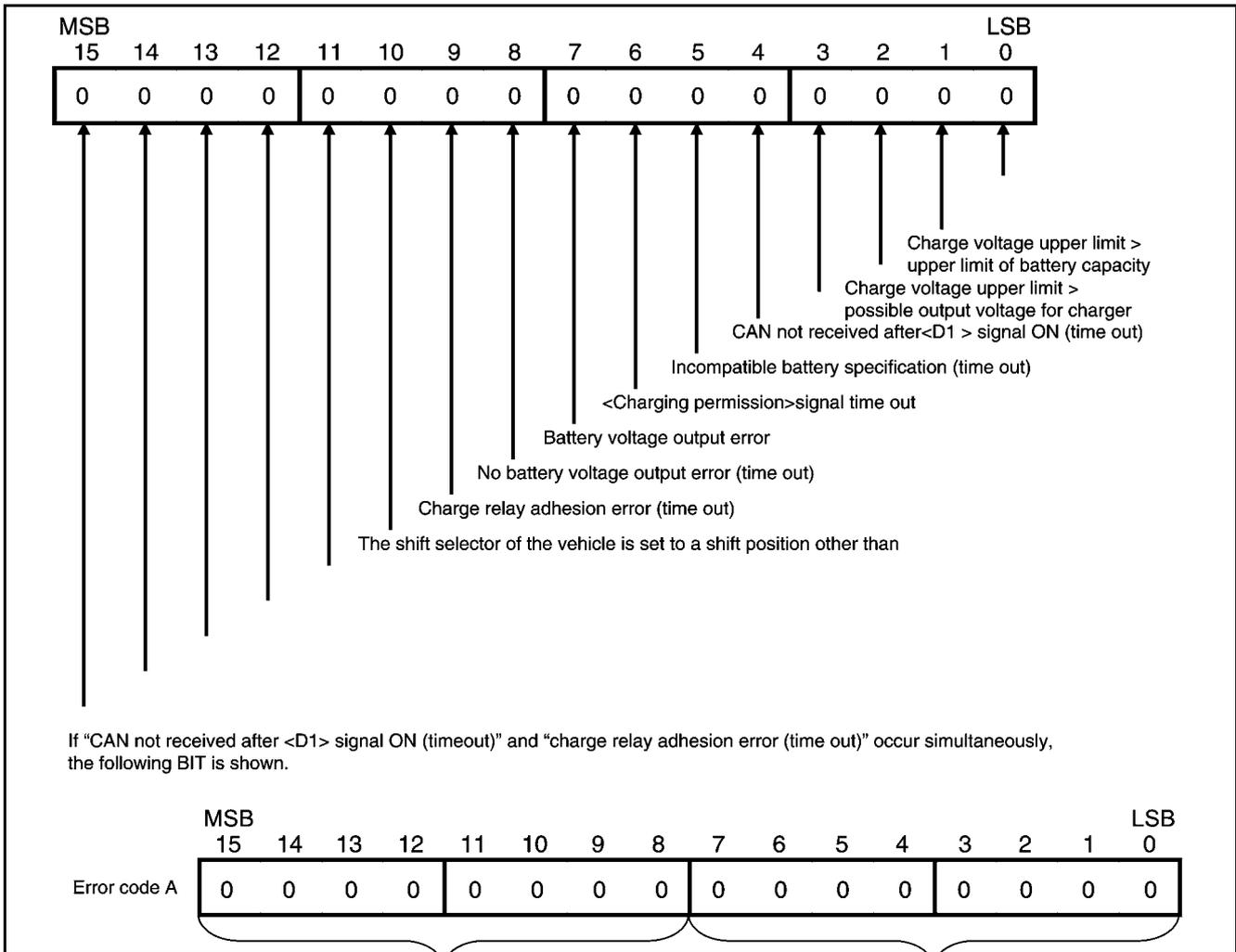
Example 2: 5, 2011/11/1 0:16, 2, 4, 0, 0, 0, 0, 42



Example 3: 7, 2011/10/29 13:27, 2, 4, 0, 0, 0, 0, 121



6 - 2 - 5 : EXAMPLE 2



6 - 2 - 6 : HEXADECIMAL NUMBER TO BINARY NUMBER

Hexadecimal number	Binary number
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
A	1010
B	1011
C	1101
D	1110
E	1111

6 - 2 - 7 : ERROR CODE LIST

Item	Bit position	Error code	Category	Error code name
Error code A	0	-	-	-
	1	0x0401	Vehicle malfunction	Charge voltage upper limit > upper limit of battery capacity
	2	0x0402	Vehicle malfunction	Charge voltage upper limit > possible output voltage for charger
	3	-	-	-
	4	0x0404	Vehicle malfunction	CAN not received after <D1 > signal ON (timeout)
	5	0x0405	Vehicle malfunction	Incompatible battery specification (time out)
	6	0x0406	Vehicle malfunction	<Charging permission > signal time out
	7	0x0407	Vehicle malfunction	Battery voltage output error
	8	0x0408	Vehicle malfunction	No battery voltage output error (time out)
	9	0x0409	Vehicle malfunction	Charge relay adhesion error (time out)
	10	0x040A	Vehicle malfunction	The shift selector of the vehicle is set to a shift position other than "parking".
	11	0x040B	Vehicle malfunction	CAN shut off error (time out)
	12	0x040C	Vehicle malfunction	Current command time out
	13	0x040D	Vehicle malfunction	Request for large amount of current from vehicle
	14	-	-	-
	15	-	-	-
Error code B	0	0x0101	Vehicle malfunction	Vehicle malfunction error (CAN): excess battery voltage
	1	0x0102	Vehicle malfunction	Vehicle malfunction error (CAN): insufficient battery voltage
	2	0x0103	Vehicle malfunction	Vehicle malfunction error (CAN): battery current discrepancy
	3	0x0104	Vehicle malfunction	Vehicle malfunction error (CAN): high battery temperature
	4	0x0105	Vehicle malfunction	Vehicle malfunction error (CAN): voltage discrepancy
	5	0x0106	Vehicle malfunction	Vehicle malfunction error (CAN): other malfunction
	6	-	-	-
	7	-	-	-
	8	-	-	-
	9	-	-	-
	10	-	-	-
	11	-	-	-
	12	-	-	-
	13	-	-	-
	14	-	-	-
	15	-	-	-

Item	Bit position	Error code	Category	Error code name
Error code C	0	0x2001	Charger warning	Input voltage disequilibrium.
	1	-	-	-
	2	-	-	-
	3	-	-	-
	4	-	-	-
	5	-	-	-
	6	-	-	-
	7	-	-	-
	8	-	-	-
	9	-	-	-
	10	-	-	-
	11	-	-	-
	12	-	-	-
	13	-	-	-
	14	-	-	-
15	-	-	-	
Error code D	0	0x1001	Charger warning	Emergency stop detected
	1	0x0501	Charger malfunction	Watchdog error
	2	0x0502	Charger malfunction	State transition error
	3	0x0503	Charger malfunction	CAN transmission error
	4	0x0504	Charger malfunction	CAN receiving error
	5	-	-	-
	6	-	-	-
	7	-	-	-
	8	-	-	-
	9	-	-	-
	10	-	-	-
	11	-	-	-
	12	-	-	-
	13	0x050D	Charger malfunction	Monitor communication error
	14	0x050E	Charger malfunction	Equipment settings parameter read out error
15	0x050F	Charger malfunction	MC status error when starting charging (MC2/MC4)	

Item	Bit position	Error code	Category	Error code name
Error code E	0	0x0510	Charger malfunction	Charger insulation error
	1	0x0511	Charger malfunction	Inverter error CT1
	2	0x0512	Charger malfunction	Inverter error CT2
	3	0x0513	Charger malfunction	Inverter error OV1
	4	0x0514	Charger malfunction	Inverter error OV2
	5	-	-	-
	6	0x0516	Charger malfunction	Inverter error SNB
	7	-	-	-
	8	-	-	-
	9	-	-	-
	10	-	-	-
	11	-	-	-
	12	-	-	-
	13	-	-	-
	14	-	-	-
15	-	-	-	
Error code F	0	0x0001	Charger malfunction	Connector lock wiring disconnection detected
	1	0x0002	Charger malfunction	Voltage output fuse disconnection detected
	2	0x0003	Charger malfunction	Ground error detected
	3	-	-	-
	4	0x0005	Charger malfunction	Gate circuit board short circuit
	5	0x0006	Charger malfunction	MC3 adhesion
	6	0x0007	Charger malfunction	Fan fuse disconnection detected
	7	0x0008	Charger malfunction	Error in ground error detection circuit
	8	0x0518	Charger malfunction	Inverter error (software detection) CT1
	9	0x0519	Charger malfunction	Inverter error (software detection) CT2
	10	0x051A	Charger malfunction	Inverter error (software detection) OV1
	11	0x051B	Charger malfunction	Inverter error (software detection) OV2
	12	0x051C	Charger malfunction	Inverter error (software detection) OV3
	13	0x051D	Charger malfunction	Insufficient input voltage (ELCB1 secondary voltage)
	14	0x051E	Charger malfunction	Thermostat error
15	0x051F	Charger malfunction	Upper and lower limits exceed the input voltage	

6 - 3 :Error Code List

*: Type1

ERROR CODE (category)	MONITOR DISPLAY	ACTION TO TAKE	TIME WHEN ERROR OCCURS
0x0001 (Charger malfunction)	CONNECTOR LOCK WIRING DISCONNECTION DETECTED	Perform reset and begin the charging operation again from the beginning. If malfunction is not corrected, contact the maintenance company.	- During preparation for charging - During insulation test - During pre-charging process - During actual charging - During charging stop work
0x0002 (Charger malfunction)	VOLTAGE OUTPUT FUSE DISCONNECTION DETECTED	Contact the maintenance company.	All states (primarily during insulation test or during actual charging)
0x0003 (Charger malfunction)	GROUND ERROR DETECTED	Contact the maintenance company.	- During insulation test - During actual charging
0x0005 (Charger malfunction)	GATE CIRCUIT BOARD SHORT CIRCUIT	Contact the maintenance company.	All states (primarily during insulation test or during actual charging)
0x0006 (Charger malfunction)	MC3 ADHESION	Contact the maintenance company.	During insulation test
0x0007 (Charger malfunction)	FAN FUSE DISCONNECTION DETECTED	Contact the maintenance company.	All states
0x0008 * (Charger malfunction)	ERROR IN GROUND ERROR DETECTION CIRCUIT	Contact the maintenance company.	During insulation test
0x0101 (Vehicle malfunction)	VEHICLE MALFUNCTION ERROR(CAN): EXCESS BATTERY VOLTAGE	Disconnect the charge connector from the vehicle and reset.	- During preparation for charging - During insulation test - During pre-charging process - During actual charging
0x0102 (Vehicle malfunction)	VEHICLE MALFUNCTION ERROR(CAN): INSUFFICIENT BATTERY VOLTAGE	Disconnect the charge connector from the vehicle and reset.	- During preparation for charging - During insulation test - During pre-charging process - During actual charging
0x0103 (Vehicle malfunction)	VEHICLE MALFUNCTION ERROR(CAN): BATTERY CURRENT DISCREPANCY	Disconnect the charge connector from the vehicle and reset.	- During preparation for charging - During insulation test - During pre-charging process - During actual charging
0x0104 (Vehicle malfunction)	VEHICLE MALFUNCTION ERROR(CAN): HIGH BATTERY TEMPERATURE	Disconnect the charge connector from the vehicle and reset.	- During preparation for charging - During insulation test - During pre-charging process - During actual charging

ERROR CODE (category)	MONITOR DISPLAY	ACTION TO TAKE	TIME WHEN ERROR OCCURS
0x0105 (Vehicle malfunction)	VEHICLE MALFUNCTION ERROR(CAN): VOLTAGE DISCREPANCY	Disconnect the charge connector from the vehicle and reset.	- During preparation for charging - During insulation test - During pre-charging process - During actual charging
0x0106 (Vehicle malfunction)	VEHICLE MALFUNCTION ERROR(CAN): OTHER MALFUNCTION	Disconnect the charge connector from the vehicle and reset.	- During preparation for charging - During insulation test - During pre-charging process - During actual charging
0x0401 (Vehicle malfunction)	CHARGE VOLTAGE UPPER LIMIT > UPPER LIMIT OF BATTERY CAPACITY	This is a vehicle-side malfunction. Disconnect the charge connector from the vehicle and reset.	During preparation for charging
0x0402 (Vehicle malfunction)	CHARGE VOLTAGE UPPER LIMIT > POSSIBLE OUTPUT VOLTAGE FOR CHARGER	This is a vehicle-side malfunction. Disconnect the charge connector from the vehicle and reset.	During preparation for charging
0x0404 (Vehicle malfunction)	CAN NOT RECEIVED AFTER <D1> SIGNAL ON (TIMEOUT)	This is a vehicle-side malfunction. Disconnect the charge connector from the vehicle and reset.	During preparation for charging
0x0405 (Vehicle malfunction)	INCOMPATIBLE BATTERY SPECIFICATION (TIME OUT)	Disconnect the charge connector from the vehicle and reset.	During preparation for charging
0x0406 (Vehicle malfunction)	<CHARGING PERMISSION>SIGNAL TIME OUT	Disconnect the charge connector from the vehicle and reset.	During preparation for charging
0x0407 (Vehicle malfunction)	BATTERY VOLTAGE OUTPUT ERROR	Disconnect the charge connector from the vehicle and reset.	During preparation for charging
0x0408 (Vehicle malfunction)	NO BATTERY VOLTAGE OUTPUT ERROR (TIME OUT)	Disconnect the charge connector from the vehicle and reset.	Pre-charging process
0x0409 (Vehicle malfunction)	CHARGE RELAY ADHESION ERROR (TIME OUT)	Disconnect the charge connector from the vehicle and reset.	During charging stop work
0x040A (Vehicle malfunction)	THE SHIFT SELECTOR OF THE VEHICLE IS SET TO A SHIFT POSITION OTHER THAN "PARKING"	Disconnect the charge connector from the vehicle and reset.	- During preparation for charging - During insulation test - During pre-charging process - During actual charging
0x040B (Vehicle malfunction)	CAN SHUT OFF ERROR (TIME OUT)	Disconnect the charge connector from the vehicle and reset.	During charging stop work
0x040C (Vehicle malfunction)	CURRENT COMMAND TIME OUT	Disconnect the charge connector from the vehicle and reset.	During actual charging
0x040D (Vehicle malfunction)	REQUEST FOR LARGE AMOUNT OF CURRENT FROM VEHICLE	Disconnect the charge connector from the vehicle and reset.	- During preparation for charging - During insulation test - During pre-charging process - During actual charging

ERROR CODE (category)	MONITOR DISPLAY	ACTION TO TAKE	TIME WHEN ERROR OCCURS
0x0501 (Charger malfunction)	WATCHDOG ERROR	Contact the maintenance company.	All states
0x0502 (Charger malfunction)	STATE TRANSITION ERROR	Contact the maintenance company.	All states
0x0503 (Charger malfunction)	CAN TRANSMISSION ERROR	Perform reset. If malfunction is not corrected, contact the maintenance company.	- During preparation for charging - During insulation test - During pre-charging process - During actual charging
0x0504 (Charger malfunction)	CAN RECEIVING ERROR	Perform reset. If malfunction is not corrected, contact the maintenance company.	- During preparation for charging - During insulation test - During pre-charging process - During actual charging
0x050D (Charger malfunction)	MONITOR COMMUNICATION ERROR	Perform reset. Check that a communications malfunction is displayed on the touch panel. Contact the maintenance company.	All states (when upper-level system is connected)
0x050E (Charger malfunction)	EQUIPMENT SETTINGS PARAMETER READ OUT ERROR	Contact the maintenance company.	All states
0x0510 (Charger malfunction)	CHARGER INSULATION ERROR	Contact the maintenance company.	During insulation test
0x0511 (Charger malfunction)	INVERTER ERROR CT1	Contact the maintenance company.	All states (primarily during insulation test or during actual charging)
0x0512 (Charger malfunction)	INVERTER ERROR CT2	Contact the maintenance company.	All states (primarily during insulation test or during actual charging)
0x0513 (Charger malfunction)	INVERTER ERROR OV1	Contact the maintenance company.	All states
0x0514 (Charger malfunction)	INVERTER ERROR OV2	Contact the maintenance company.	
0x0516 (Charger malfunction)	INVERTER ERROR OV3	Contact the maintenance company.	All states (primarily during preparation for charging, insulation test, pre-charging process, or actual charging)
0x0518 (Charger malfunction)	INVERTER ERROR (SOFTWARE DETECTION) CT1	Contact the maintenance company.	All states (primarily during insulation test or during actual charging)
0x0519 (Charger malfunction)	INVERTER ERROR (SOFTWARE DETECTION) CT2	Contact the maintenance company.	All states (primarily during insulation test or during actual charging)
0x051A (Charger malfunction)	INVERTER ERROR (SOFTWARE DETECTION) OV1	Contact the maintenance company.	All states

ERROR CODE (category)	MONITOR DISPLAY	ACTION TO TAKE	TIME WHEN ERROR OCCURS
0x051B (Charger malfunction)	INVERTER ERROR (SOFTWARE DETECTION) OV2	Contact the maintenance company.	All states (primarily during insulation test or during actual charging)
0x051C (Charger malfunction)	INVERTER ERROR (SOFTWARE DETECTION) OV3	Contact the maintenance company.	All states
0x051D (Charger malfunction)	INSUFFICIENT INPUT VOLTAGE (ELCB1 SECONDARY VOLTAGE)	Contact the maintenance company.	- During preparation for charging - During insulation test - During pre-charging process - During actual charging
0x051E (Charger malfunction)	THERMOSTAT ERROR	Check for clogging of the charger air intake. If it is clogged, clean and perform reset. If malfunction is not corrected, contact the maintenance company.	All states
0x051F (Charger malfunction)	UPPER AND LOWER LIMITS EXCEED THE INPUT VOLTAGE	Contact the maintenance company.	- During insulation test - During actual charging
0x1001 (Charger warning)	EMERGENCY STOP DETECTED	[Base Specifications] Release the emergency stop button. Perform reset after releasing. [Standard Specifications] Contact the maintenance company.	All states
0x2001 (Charger warning)	INPUT VOLTAGE DISEQUILIBRIUM	Contact the maintenance company.	- During insulation test - During actual charging

6 - 4 : Diagnosis Procedure

NOTE: For the charger inspection methods which require the "final inspection unit", refer to the instruction manual from the final inspection unit manufacturer.

0x0001 CONNECTOR LOCK WIRING DISCONNECTION DETECTED

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0001 (Charger malfunction)	When the lock between the charge cable and connector and the vehicle charge port is disengaged	- Charge cable and connector - PWB1

Diagnosis Procedure

1. CHECK THE CHARGE CABLE AND CONNECTOR

Check the charge cable and connector terminals visually for deformation, damage, or foreign material intrusion. (lock arm and semi-lock arm)

Is the check result normal?

YES >> GO TO 2.

NO >> Remove any foreign material or replace the charge cable and connector.

2. CHECK CONTINUITY WIRING

Check the continuity between PWB1 CN16 connector.

PWB1				Continuity
Connector No.	Terminal	Connector No.	Terminal	
CN16	8	CN16	9	46 ohm

Is the check result normal?

YES >> Replace PWB1.

NO >> Replace the charge cable and connector

0x0002 VOLTAGE OUTPUT FUSE DISCONNECTION DETECTED

ERROR CODE (Category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0002 (Charger malfunction)	When an open circuit is detected in fuse F4	- Fuse F4 - Capacitor C21/C22 - Charge cable and connector - Rectifier diode - PWB1

Diagnosis Procedure

1. CHECK FOR FUSE 4 OPEN CIRCUIT

Check the continuity of terminal F4.

Is the check result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2. CHECK FOR F4 OPEN CIRCUIT DETECTION

Check the continuity of the harness between F4 terminal - PWB1 CN20 while F4 is in the connected status.

PWB1				Continuity
Connector No.	Terminal	Connector No.	Terminal	
CN20	5	CN20	6	Not existed

Is the check result normal?

YES >> Replace PWB1.

NO >> Replace fuse F4 or harness between terminal 4 - PWB1 CN20.

3. CHECK THE CHARGE CABLE AND CONNECTOR

Check the charge cable and connector terminals visually for deformation, damage, or foreign material intrusion.

Is the check result normal?

YES >> GO TO 4.

NO >> Remove any foreign material or replace the charge cable and connector.

4. CHECK FOR SHORT CIRCUITS BETWEEN CHARGE CABLE AND CONNECTOR HARNESS

1. Disconnect TB1 terminal (white / black). Remove PWB1 CN16.

2. Check that there are no short circuits in all harnesses of the charge cable and connector.

Is the check result normal?

YES >> GO TO 5.

NO >> Replace the charge cable and connector.

5. CHECK CAPACITORS

Check capacitors C21/C22 and check that there are no short circuits.

Is the check result normal?

YES >> Replace rectifier diode.

NO >> Replace capacitor C21 or C22.

NOTE: Prepare fuses in multiple numbers.

0x0003 GROUND ERROR DETECTED

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0003 (Charger malfunction)	When a short circuit to ground is detected	- Charge cable and connector - PWB1

Diagnosis Procedure

1. CHECK THE CHARGE CABLE AND CONNECTOR

Check the charge cable and connector terminals visually for deformation, damage, or foreign material intrusion.

Is the check result normal?

YES >> GO TO 2.

NO >> Remove any foreign material or replace the charge cable and connector.

2. CHECK FOR SHORT CIRCUITS BETWEEN CHARGE CABLE AND CONNECTOR HARNESS

1. Disconnect TB1 terminal (white / black). Remove PWB1 CN16.

2. Check that there are no short circuits between all harnesses of the charge cable and connector and FG.

Is the check result normal?

YES >> GO TO 3.

NO >> Replace the charge cable and connector.

3. CHECK SHORT CIRCUITS BETWEEN TB1 - PWB1 CN9

1. Remove PWB1 CN9 connector.

2. Check that there are no short circuits between all harnesses of TB1 - PWB1 CN9 and frame ground.

Is the check result normal?

YES >> Replace PWB1.

NO >> Replace harness of TB1 - PWB1 CN9.

0x0005 GATE CIRCUIT BOARD SHORT CIRCUIT

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0005 (Charger malfunction)	When the gate drive PCB detected an IGBT short circuit	- Gate drive PCB - Matrix converter - Rectifier diode - PS1 - PWB1

Diagnosis Procedure

1. CHECK FOR DAMAGE TO THE FLAT CABLE

Check that there is no damage in the flat cable between PWB1 CN11 and gate PCB CN26.

Is the check result normal?

YES >> GO TO 2.

NO >> Replace flat cable.

2. CHECK FOR DAMAGE TO CABLE OF MC1 - PWB1 CN8

Check that there is no damage or disconnection in the cable between MC1 - PWB1 CN8.

Is the check result normal?

YES >> GO TO 3.

NO >> Replace harness between MC1 - PWB1 CN8.

3. CHECK THE PS1 DC VOLTAGE (+24 V) OUTPUT

Check PS1 output voltage +24 V.

Is the check result normal?

YES >> GO TO 4.

NO >> Replace PS1.

4. REPLACE PWB1

Replace PWB1 and check the operation.

Is the check result normal?

YES >> INSPECTION END

NO >> Replace matrix converter.

NOTE: Perform connector re-fixing of gate PCB CN1 - CN24, if possible.

0x0006 MC3 ADHESION

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0006 (Charger malfunction)	When a malfunction in MC3 operation occurs or the contacts become fused	- MC3 - PWB1

Diagnosis Procedure

1. CHECK MC3 STATUS

Perform a test from charge start to completion using the final inspection unit or vehicle. Check the continuity status between terminals 13-14 of MC3-1 and MC3-2.

MC3				Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	13	-	14	Changes as Not existed - Existed - Not existed

Is the check result normal?

YES >> GO TO 2.

NO >> Replace MC3.

2. CHECK CONTINUITY WIRING-1

1. Check the continuity in the harness between MC3 - PWB1 CN18.

MC3		PWB1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	A1	CN18	5	Existed

2. Check the continuity in the harness between MC3 - MC1.

MC3		MC1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	A2	-	A2	Existed

Is the check result normal?

YES >> Replace PWB1.

NO >> Replace harness between MC3 - MC1.

0x0007 FAN FUSE DISCONNECTION DETECTED FAN

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0007 (Charger malfunction)	When an open circuit is detected in fuse F5	- Fuse F5 - Fan - PWB1

Diagnosis Procedure

1. CHECK FUSE F5

Check whether or not there is an open circuit in fuse F5.

Is there an open circuit?

YES >> GO TO 2.

NO >> GO TO 3.

2. CHECK THE FANS

Measure the resistance value between the power terminal (+) and ground terminal (-) for each fan.

If there is a fan with a resistance value that is significantly lower than the other fans, check it.

Is there a fan with a lower resistance value?

YES >> Replace the appropriate fan and fuse F5.

NO >> Check for short circuits in the fan wiring.

3. CHECK THE WIRING

With fuse F5 removed, check the continuity of the cable between fuse F5 and PWB1 CN20.

PWB1				Continuity
Connector No.	Terminal	Connector No.	Terminal	
CN20	7	CN20	8	Not existed

Is the check result normal?

CLOSE >> Replace the cable between fuse F5 and PWB1 CN20.

OPEN >> Replace PWB1.

0x0008 ERROR IN GROUND ERROR DETECTION CIRCUIT

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0008 (Charger malfunction) [Type1]	When the Ground error detection circuit does not operate	- Ground error detection circuit - PWB1

Diagnosis Procedure

1. CHECK RELAY OPERATING SOUND

Check that CR30 relay sounds an operating sound while performing ground short protection test.

Is the check result normal?

YES >> GO TO 2.

NO >> GO TO 4.

2. CHECK R30

Check continuity between CR30 to frame ground.

CR30		-		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	2	-	Frame ground	Approx. 50 k ohm

Is the check result normal?

YES >> GO TO 3.

NO >> Replace R30 or harness.

3. CHECK CONTINUITY WIRING-1

Check continuity between TB1 to frame ground.

TB1		-		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	1	-	Frame ground	Existed

Is the check result normal?

YES >> GO TO 7.

NO >> Repair or replace harness.

4. CHECK FUSE F6

Check continuity of fuse F6.

Is the check result normal?

YES >> GO TO 5.

NO >> Replace fuse F6.

5. CHECK CONTINUITY WIRING-2

Check continuity between PS1 to CR30.

PS1		CR30		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	5	-	6	Existed

Is the check result normal?

YES >> GO TO 6.

NO >> Repair or replace harness.

6. CHECK CONTINUITY WIRING-3

Check continuity between CR30 to PWB1 CN18.

CR30		PWB1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	5	CN18	8	Existed

Is the check result normal?

YES >> GO TO 7.

NO >> Repair or replace harness.

7. REPLACE CR30

Replace CR30 and check the operation.

Is the check result normal?

YES >> INSPECTION END

NO >> Replace PWB1.

0x0101 VEHICLE MALFUNCTION ERROR(CAN): EXCESS BATTERY VOLTAGE

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0101 (Vehicle malfunction)	When error information (flag) is detected by CAN communication from the vehicle	Vehicle

Diagnosis Procedure

The charger is normal.

Because the vehicle may be malfunctioning, ask the customer to contact the dealer.

0x0102 VEHICLE MALFUNCTION ERROR(CAN): INSUFFICIENT BATTERY VOLTAGE

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0102 (Vehicle malfunction)	When error information (flag) is detected by CAN communication from the vehicle	Vehicle

Diagnosis Procedure

The charger is normal.

Because the vehicle may be malfunctioning, ask the customer to contact the dealer.

0x0103 VEHICLE MALFUNCTION ERROR (CAN): BATTERY CURRENT DISCREPANCY

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0103 (Vehicle malfunction)	When error information (flag) is detected by CAN communication from the vehicle (In some cases, a malfunction in the charger may cause a vehicle-side error.)	- Vehicle - CT2 - PWB1

Diagnosis Procedure

1. INSPECTION USING THE FINAL INSPECTION UNIT OR VEHICLE

1. Connect the final inspection unit.
2. Check the series of operations.

Does it operate normally?

YES >> Charger is normal.

NO >> Replace CT2 or PWB1.

0x0104 VEHICLE MALFUNCTION ERROR(CAN): HIGH BATTERY TEMPERATURE

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0104 (Vehicle malfunction)	When error information (flag) is detected by CAN communication from the vehicle	Vehicle

Diagnosis Procedure

The charger is normal.

Because the vehicle may be malfunctioning, ask the customer to contact the dealer.

0x0105 VEHICLE MALFUNCTION ERROR(CAN): VOLTAGE DISCREPANCY

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0105 (Vehicle malfunction)	When error information (flag) is detected by CAN communication from the vehicle (In some cases, a malfunction in the charger may cause a vehicle-side error.)	- Vehicle - PWB1

Diagnosis Procedure

1. Inspection using the final inspection unit or vehicle

1. Connect the final inspection unit or vehicle.
2. Check the series of operations.

Does it operate normally?

YES >> Charger is normal.

NO >> Replace PWB1.

0x0106 VEHICLE MALFUNCTION ERROR(CAN): OTHER MALFUNCTION

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0106 (Vehicle malfunction)	When error information (flag) is detected by CAN communication from the vehicle	Vehicle

Diagnosis Procedure

The charger is normal.

Because the vehicle may be malfunctioning, ask the customer to contact the dealer.

0x0401 CHARGE VOLTAGE UPPER LIMIT > UPPER LIMIT OF BATTERY CAPACITY

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0401 (Vehicle malfunction)	When error information (value) is detected from the vehicle side	Vehicle

Diagnosis Procedure

The charger is normal.

Because the vehicle may be malfunctioning, ask the customer to contact the dealer.

0x0402 CHARGE VOLTAGE UPPER LIMIT > POSSIBLE OUTPUT VOLTAGE FOR CHARGER

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0402 (Vehicle malfunction)	When error information (value) is detected from the vehicle side	Vehicle

Diagnosis Procedure

The charger is normal.

Because the vehicle may be malfunctioning, ask the customer to contact the dealer.

0x0404 CAN NOT RECEIVED AFTER<D1>SIGNAL ON (TIMEOUT)

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0404 (Vehicle malfunction)	When CAN communication initial data is not sent from the vehicle within a set length of time after the d1 switch turned ON	- Vehicle - Charge cable and connector - PS2 - PWB1

Diagnosis Procedure

1. INSPECTION OF THE CHARGE CABLE AND CONNECTOR

Check the charge cable and connector terminals visually for deformation, damage, or foreign material intrusion.

Is the check result normal?

YES >> GO TO 2.

NO >> Remove any foreign material or replace the charge cable and connector.

2. CHECK THE PS1 DC VOLTAGE (12V) OUTPUT

Check the voltage between PWB1 CN19 terminals.

PWB1		PWB1		Voltage
Connector No.	Terminal	Connector No.	Terminal	
CN19	1	CN19	4	12 V

Is the check result normal?

YES >> GO TO 3.

NO >> Replace PS2.

3. CHECK CONTINUITY WIRING

Check the continuity in the harness between the charge cable and connector terminals and PWB1 CN16.

Charge cable and connector		PWB1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	4	CN16	1	Existed
	3		5	
	7		6	
	9		7	

Is the check result normal?

YES >> Replace PWB1.

NO >> Replace the charge cable and connector.

0x0405 INCOMPATIBLE BATTERY SPECIFICATION (TIME OUT)

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0405 (Vehicle malfunction)	When error information (value) is detected from the vehicle side	- Vehicle - Charge cable and connector - PWB1

Diagnosis Procedure

1. INSPECTION OF THE CHARGE CABLE AND CONNECTOR

Check the charge cable and connector terminals visually for deformation, damage, or foreign material intrusion.

Is the check result normal?

YES >> GO TO 2.

NO >> Remove any foreign material or replace the charge cable and connector.

2. WIRING CONTINUITY CHECK

Check the continuity in the harness between the charge cable and connector terminals and PWB1 CN16.

Charge cable and connector		PWB1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	1	CN16	5	Existed
	8		6	
	9		7	

Is the check result normal?

YES >> Replace PWB1.

NO >> Replace the charge cable and connector.

0x0406 <CHARGING PERMISSION> SIGNAL TIME OUT

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0406 (Vehicle malfunction)	When the charge permit k switch inside the vehicle did not turn ON within a set period of time after the charge start button turned ON	- Vehicle - Charge cable and connector - PWB1

Diagnosis Procedure

1. INSPECTION OF THE CHARGE CABLE AND CONNECTOR

Check the charge cable and connector terminals visually for deformation, damage, or foreign material intrusion.

Is the check result normal?

YES >> GO TO 2.

NO >> Remove any foreign material or replace the charge cable and connector.

2. CHECK CONTINUITY WIRING

Check the continuity in the harness between the charge cable and connector terminals and PWB1 CN16.

Charge cable and connector		PWB1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	4	CN16	3	Existed

Is the check result normal?

YES >> Replace PWB1.

NO >> Replace the charge cable and connector.

0x0407 BATTERY VOLTAGE OUTPUT ERROR

ERROR CODE (category)	Detection conditions	Possible causes
0x0407 (Vehicle malfunction)	When 10 V or more is output between the power supply terminals after the charging permit k switch turned ON	- Vehicle - MC3 - PWB1

Diagnosis Procedure

1. INSPECTION USING THE FINAL INSPECTION UNIT OR VEHICLE

1. Connect the final inspection unit or vehicle.

2. Check the series of operations.

Does it operate normally?

YES >> Charger is normal.

NO >> GO TO 2.

2. CHECK CONTINUITY WIRING-1

Perform a test from charge start to completion using the final inspection unit or vehicle. Check the continuity status between terminals 13-14 of MC3-1 and MC3-2.

MC3		MC6		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	13	-	14	Changes as Not existed - Existed - Not existed

Is the check result normal?

YES >> GO TO 3.

NO >> Replace MC3.

3. CHECK CONTINUITY WIRING-2

1. Check the continuity in the harness between MC3 - PWB1 CN18.

MC3		MC6		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	A1	CN18	5	Existed

2. Check the continuity in the harness between MC3 - MC1.

MC3		MC1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	A2	-	A2	Existed

Is the check result normal?

YES >> Replace PWB1.

NO >> Replace harness.

0x0408 NO BATTERY VOLTAGE OUTPUT ERROR (TIME OUT)

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0408 (Vehicle malfunction)	When 50 V or more is output between power supply terminals within a set period of time after the EV contactor inside the vehicle turned ON	- Vehicle - Charging power supply line - PWB1

Diagnosis Procedure

1. INSPECTION USING THE FINAL INSPECTION UNIT OR VEHICLE

1. Connect the final inspection unit or vehicle.

2. Check the series of operations.

Does it operate normally?

YES >> Charger is normal.

NO >> GO TO 2.

2. CHECK CONTINUITY WIRING-1

Check the continuity of the cable between the charge cable and connector and TB1.

Charge cable and connector		TB1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	5	-	2	Existed
	6		1	

Is the check result normal?

YES >> GO TO 3.

NO >> Replace the charge cable and connector.

3. CHECK CONTINUITY WIRING-2

Check the continuity in the harness between the charge cable and connector and PWB1 CN16.

Charge cable and connector		PWB1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	8	CN16	2	Existed

Is the check result normal?

YES >> GO TO 4.

NO >> Replace the charge cable and connector.

4. CHECK CONTINUITY WIRING-3

Check the continuity in the harness between TB1 and PWB1 CN9.

TB1		PWB1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	1 (White)	CN9	1	Existed
	2 (Black)		4	

Is the check result normal?

YES >> Replace PWB1.

NO >> Replace the harness between TB1 and PWB1 CN9.

0x0409 CHARGE RELAY ADHESION ERROR (TIME OUT)

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0409 (Vehicle malfunction)	When 10 V or more is output to the power supply terminals after the d1 and d2 switches turned OFF (fusing of the EV contactor inside the vehicle)	- Vehicle - MC3 - PWB1

Diagnosis Procedure

1. INSPECTION USING THE FINAL INSPECTION UNIT OR VEHICLE

1. Connect the final inspection unit or vehicle.

2. Check the series of operations.

Does it operate normally?

YES >> Charger is normal.

NO >> GO TO 2.

2. CHECK CONTINUITY WIRING-1

Perform a test from charge start to completion using the final inspection unit or vehicle. Check the continuity status between terminals 13-14 of MC3-1 and MC3-2.

MC3		MC6		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	13	-	14	Changes as Not existed - Existed - Not existed

Is the check result normal?

YES >> GO TO 3.

NO >> Replace MC3.

3. CHECK CONTINUITY WIRING-2

1. Check the continuity in the harness between MC3 - PWB1 CN18.

MC3		MC6		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	A1	CN18	5	Existed

2. Check the continuity in the harness between MC3 - MC1.

MC3		MC1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	A2	-	A2	Existed

Is the check result normal?

YES >> Replace PWB1.

NO >> Replace harness.

0x040A THE SHIFT SELECTOR OF THE VEHICLE IS SET TO A SHIFT POSITION OTHER THAN "PARKING"

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x040A (Vehicle malfunction)	When parking brake release information (flag) is detected from the vehicle	Vehicle

The charger is normal.

Because the vehicle may be malfunctioning, ask the customer to contact the dealer.

0x040B CAN SHUT OFF ERROR (TIME OUT)

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x040B (Vehicle malfunction)	When the vehicle does not end CAN communication within a set period of time after connector lock release is transmitted from the charger	- Vehicle - Charge cable and connector - PWB1

Diagnosis Procedure

1. INSPECTION USING THE FINAL INSPECTION UNIT OR VEHICLE

1. Connect the final inspection unit or vehicle.

2. Check the series of operations.

Does it operate normally?

YES >> Charger is normal.

NO >> Replace PWB1.

0x040C CURRENT COMMAND TIME OUT

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x040C (Vehicle malfunction)	When the current command is not transmitted from the vehicle within a set period of time after d2 turns ON	Vehicle

Diagnosis Procedure

The charger is normal.

Because the vehicle may be malfunctioning, ask the customer to contact the dealer.

0x040D REQUEST FOR LARGE AMOUNT OF CURRENT FROM VEHICLE

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x040D (Vehicle malfunction)	When error information (flag) from the vehicle is detected by CAN communication Vehicle	Vehicle

Diagnosis Procedure

The charger is normal.

Because the vehicle may be malfunctioning, ask the customer to contact the dealer.

0x0501 WATCHDOG ERROR

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0501 (Charger malfunction)	PWB1 operation malfunction (when processing in the internal operation monitoring timer is not possible)	PWB1

Diagnosis Procedure

Replace PWB1.

0x0502 STATE TRANSITION ERROR

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0502 (Charger malfunction)	When a Flash memory malfunction is detected	PWB1

Diagnosis Procedure

Replace PWB1.

0x0503 CAN TRANSMISSION ERROR

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0503 (Charger malfunction)	When a CAN communication malfunction is detected between the charger and the vehicle	- Vehicle - Charge cable and connector - PWB1

Diagnosis Procedure

1. INSPECTION OF THE CHARGE CABLE AND CONNECTOR

Check the charge cable and connector terminals visually for deformation, damage, or foreign material intrusion.

Is the check result normal?

YES >> GO TO 2.

NO >> Remove any foreign material or replace the charge cable and connector.

2. CHECK CONTINUITY WIRING

Check the continuity in the harness between the charge cable and connector terminals and PWB1 CN16.

Charge cable and connector		PWB1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	1	CN16	5	Existed
	8		6	
	9		7	

Is the check result normal?

YES >> Replace PWB1.

NO >> Replace the charge cable and connector.

NOTE: Charge cable CAN signal harness, orange, and red must be wound to the zero phase reactor for 5 turns.

0x0504 CAN RECEIVING ERROR

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0504 (Charger malfunction)	When a CAN communication malfunction is detected between the vehicle and the charger	- Vehicle - Charge cable and connector - PWB1

Diagnosis Procedure

1. INSPECTION OF THE CHARGE CABLE AND CONNECTOR

Check the charge cable and connector terminals visually for deformation, damage, or foreign material intrusion.

Is the check result normal?

YES >> GO TO 2.

NO >> Remove any foreign material or replace the charge cable and connector.

NOTE: Charge cable CAN signal harness, orange, and red must be wined to the zero phase reactor for 5 turns.

2. CHECK CONTINUITY WIRING

Check the continuity in the harness between the charge cable and connector terminals and PWB1 CN16.

Charge cable and connector		PWB1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	1	CN16	5	Existed
	8		6	
	9		7	

Is the check result normal?

YES >> Replace PWB1.

NO >> Replace the charge cable and connector.

NOTE: Charge cable CAN signal harness, orange, and red must be wined to the zero phase reactor for 5 turns.

0x050D MONITOR COMMUNICATION ERROR

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x050D (Charger malfunction)	When a communications malfunction is detected between PWB1 and the LCD monitor	- LCD monitor - PS1 - PWB1

Diagnosis Procedure

1. CHECKING THE LCD MONITOR DISPLAY

Check whether or not there anything is displayed on the LCD monitor.

Is the check result normal?

YES >> GO TO 2.

NO >> GO TO 4.

2. CHECK CONTINUITY WIRING-1

Check the continuity in the harness between the LCD monitor and PWB1 CN3.

LCD monitor		PWB1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	RD	CN3	1	Existed
	SD		2	
	SG		3	

Is the check result normal?

YES >> GO TO 3.

NO >> Replace the harness between the LCD monitor and PWB1 CN3.

CAUTION: The knitting of harness between LCD monitor - PWB1 CN3 must not be loosened.

3. REPLACE LCD MONITOR

Replace LCD monitor and check the operation.

Is the check result normal?

YES >> INSPECTION END

NO >> Replace PWB1.

4. CHECK THE LCD MONITOR VOLTAGE

Check the voltage between the LCD monitor terminals.

LCD monitor				Voltage
+		-		
Connector No.	Terminal	Connector No.	Terminal	
-	+ (Positive)	-	- (Negative)	DC24 V

Is the check result normal?

YES >> Replace the LCD monitor.

NO >> GO TO 5.

5. CHECK CONTINUITY WIRING-2

Check the continuity in the harness between the LCD monitor and EMS.

LCD monitor		EMS		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	+ (Positive)	-	12	Existed

Check the continuity in the harness between the LCD monitor and PS1 CN3.

LCD monitor		PS1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	- (Negative)	CN3	5	Existed

Check the continuity in the harness between the EMS and PS1.

EMS		PS1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	12	CN2	5	Existed

Is the check result normal?

YES >> Replace PS1.

NO >> Replace the corresponding harness.

0x050E EQUIPMENT SETTINGS PARAMETER READ OUT ERROR

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x050E (Charger malfunction)	When there is a malfunction in the settings data that is written to the Flash memory in PWB1	PWB1

Diagnosis Procedure

Replace PWB1.

0x0510 CHARGER INSULATION ERROR

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0510 (Charger malfunction)	When CT2 (current sensor) detected 3 A or more at the charger single unit insulation check before the start of charging	- Charge cable - Capacitor C21/C22 - MC3 - CT2 - PWB1

Diagnosis Procedure

1. INSPECTION OF THE CHARGE CABLE AND CONNECTOR

Check the charge cable and connector terminals visually for deformation, damage, or foreign material intrusion.

Is the check result normal?

YES >> GO TO 2.

NO >> Remove any foreign material or replace the charge cable and connector.

2. CHECK FOR SHORT CIRCUITS BETWEEN CHARGE CABLE AND CONNECTOR HARNESS

Disconnect the charge cable and connector from the charger.

Check that there are no short circuits in all harnesses of the charge cable and connector.

Is the check result normal?

YES >> GO TO 3.

NO >> Replace the charge cable and connector.

3. CHECK THE CAPACITORS

Check capacitors C21/C22 and check that there are no short circuits.

Is the check result normal?

YES >> GO TO 4.

NO >> Replace capacitor C21 or C22.

4. CHECK FOR MC3 FUSING

Check that MC3 is not fused.

Is the check result normal?

YES >> GO TO 5.

NO >> Replace MC3.

5. REPLACE CT2

Replace CT2, then use the final inspection unit or vehicle and perform the charging operation. Confirm that operation is normal.

Is the check result normal?

YES >> INSPECTION END

NO >> Replace PWB1.

0x0511 INVERTER ERROR CT1

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0511 (Charger malfunction)	When CT1 (current sensor) detected input overcurrent (200 A or more) by hardware means	- PWB1 - TR1 - Matrix converter - Rectifier diode

Diagnosis Procedure

1. CHECKING ELCB1 OUT VOLTAGE

Measure the voltage between the OUT side RST while ELCB1 is in the ON status.

Is the check result normal?

ELCB1				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	2 (R)	-	4 (S)	AC 480 V (Type 1) AC 400 V (Type 2)
-	4 (S)	-	6 (T)	
-	2 (R)	-	6 (T)	

Is the check result normal?

YES >> GO TO 2.

NO >> Ask for an inspection to the electric power supply source.

2. MEASURE INSULATION RESISTANCE

Perform the insulation resistance measurement.

Is the check result normal?

YES >> GO TO 3.

NO >> Check for insufficient isolation portion.

3. REPLACE EACH UNIT

Replace unit in a sequential order of CT2, PWB1, TR1, matrix converter, and rectifier diode. Check the operation.

0x0512 INVERTER ERROR CT2

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0512 (Charger malfunction)	When CT2 (current sensor) detected output overcurrent (150A or more) by hardware means	- Charge cable and connector - Capacitor C21/C22 - Rectifier diode - CT2 - PWB1

CAUTION: When burning odor of electronic devices is detected inside of charger, check rectifier diode and capacitor first.

Diagnosis Procedure

1. INSPECTION OF THE CHARGE CABLE AND CONNECTOR

Check the charge cable and connector terminals visually for deformation, damage, or foreign material intrusion.

Is the check result normal?

YES >> GO TO 2.

NO >> Remove any foreign material or replace the charge cable and connector.

2. CHECK FOR SHORT CIRCUITS BETWEEN CHARGE CABLE AND CONNECTOR HARNESS

Disconnect the charge cable and connector from the charger.

Check that there are no short circuits in all harnesses of the charge cable and connector.

Is the check result normal?

YES >> GO TO 3.

NO >> Replace the charge cable and connector.

3. CHECK THE CAPACITORS

Check capacitors C21/C22 and check that there are no short circuits.

Is the check result normal?

YES >> GO TO 4.

NO >> Replace capacitor C21 or C22.

4. REPLACE CT2

Replace CT2. Perform the charge operation using the final inspection unit or vehicle. Check that operation is normal.

Is the check result normal?

YES >> GO TO 5.

NO >> Replace PWB1.

5. REPLACE PWB1

Replace PWB1. Perform the charge operation using the final inspection unit or vehicle. Check that operation is normal.

Is the check result normal?

YES >> INSPECTION END

NO >> Replace rectifier diode.

0x0513 INVERTER ERROR OV1

ERROR CODE (category)	DETECTION CONDITIONS		POSSIBLE CAUSES
0x0513 (Charger malfunction)	Type 1	When phase voltage for input power voltage RST of more than AC 720 V is detected by hardware means	- Input voltage - PWB1
	Type 2	When phase voltage for input power voltage RST of more than AC 600 V is detected by hardware means	

Diagnosis Procedure

1. CHECK THE ELCB1 IN AC VOLTAGE

Measure the ELCB IN voltage between RST.

ELCB1				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	1 (R)	-	3 (S)	AC 480 V (Type 1) AC 400 V (Type 2)
-	3 (S)	-	5 (T)	
-	1 (R)	-	5 (T)	

Is the check result normal?

YES >> Replace PWB1.

NO >> Ask for an inspection to the electric power supply source.

0X0514 INVERTER ERROR OV2

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0514 (Charger malfunction)	When output voltage of more than DC 550 V is detected by hardware means	- Input voltage - CT2 - TR1 - Matrix converter - Rectifier diode - PWB1

Diagnosis Procedure

1. CHECK THE ELCB1 OUT VOLTAGE

Measure the ELCB OUT voltage between RST.

ELCB1				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	2 (R)	-	4 (S)	AC 480 V (Type 1) AC 400 V (Type 2)
-	4 (S)	-	6 (T)	
-	2 (R)	-	6 (T)	

Is the check result normal?

YES >> GO TO 2.

NO >> Check the power supply source.

2. CHECK CT2 HARNESS VISUALLY

Visually check that PWB1 CN7 is normal (without connector disconnection or open circuit).

Is the check result normal?

YES >> GO TO 3.

NO >> Apply countermeasure for CT2 harness malfunction.

3. MEASURE THE TR1 OUTPUT VOLTAGE

Use the final inspection unit or vehicle and output the designated voltage. Measure the TR1 output voltage between the terminals.

Bus bar				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	8	-	9	Designated voltage using final inspection unit or vehicle

NOTE: A tester of which frequency response is more than 10 kHz or an oscilloscope is necessary for measuring the voltage.

Is the check result normal?

YES >> GO TO 4.

NO >> Replace Matrix converter.

4. MEASURE TR1 OUTPUT VOLTAGE

Use the final inspection unit or vehicle and output the designated voltage. Measure TR1 output voltage between the terminals.

Bus bar				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	13	-	14	Designated voltage using final inspection unit or vehicle

NOTE: A tester of which frequency response is more than 10 kHz or an oscilloscope is necessary for measuring the voltage.

Is the check result normal?

YES >> GO TO 5.

NO >> Replace the TR1.

5. MEASURE THE RECTIFIER DIODE OUTPUT VOLTAGE

Use the final inspection unit or vehicle and output the designated voltage. Measure the rectifier diode output voltage between the terminals.

Bus bar				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	10	-	12	Designated voltage using final inspection unit or vehicle

NOTE: A tester of which frequency response is more than 10 kHz or an oscilloscope is necessary for measuring the voltage.

Is the check result normal?

YES >> Replace PWB1.

NO >> Replace the rectifier diode.

0X0516 INVERTER ERROR OV3

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0516 (Charger malfunction)	When voltage of more than DC 1,000 V is detected by hardware means at both ends of snubber electrolytic capacitor C4	- Input voltage - Matrix converter - PWB1

Diagnosis Procedure

1. CHECK HARNESS BETWEEN PWB1 - MATRIX CONVERTER

Check that harness between PWB1 CN10 - matrix converter (C4) is stranded normally.

Is the check result normal?

YES >> GO TO 2.

NO >> Strand the harness to the normal status.

2. CHECK THE ELCB1 OUT VOLTAGE

Measure the ELCB1 OUT voltage between RST.

ELCB1				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	2 (R)	-	4 (S)	AC 480 V (Type 1) AC 400 V (Type 2)
-	4 (S)	-	6 (T)	
-	2 (R)	-	6 (T)	

Is the check result normal?

YES >> GO TO 3.

NO >> Ask for an inspection to the electric power supply source.

3. REPLACE THE MATRIX CONVERTER

Replace the matrix converter, then use the final inspection unit or vehicle and perform charging operation. Check that operation is normal.

Is the check result normal?

YES >> INSPECTION END

NO >> Replace PWB1.

0x0518 INVERTER ERROR (SOFTWARE DETECTION) CT1

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0518 (Charger malfunction)	When input overcurrent is detected by software means based on the value read from current sensor CT1	- CT1 - Matrix converter - Rectifier diode - TR1 - PWB1

Diagnosis Procedure

1. CHECK THE ELCB1 OUT VOLTAGE

With ELCB1 ON, measure the voltage between the OUT side RST.

ELCB1				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	2 (R)	-	4 (S)	AC 480 V (Type 1) AC 400 V (Type 2)
-	4 (S)	-	6 (T)	
-	2 (R)	-	6 (T)	

Is the check result normal?

YES >> GO TO 2.

NO >> Ask for an inspection to the electric power supply source.

2. MEASURE INSULATION RESISTANCE

Perform the insulation resistance measurement.

Is the check result normal?

YES >> GO TO 3.

NO >> Check for insufficient isolation portion.

3. REPLACE EACH UNIT

Replace unit in a sequential order of PWB1, TR1, matrix converter, and rectifier diode. Check the operation.

0x0519 Inverter error (software detection) CT2

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x0519 (Charger malfunction)	When input overcurrent (140 A or more) is detected by software means based on the value read from current sensor CT2	- charge cable and connector - CT2 - Rectifier diode - TR1 - PWB1

Diagnosis Procedure

1. INSPECTION OF THE CHARGE CABLE AND CONNECTOR

Check the charge cable and connector terminals visually for deformation, damage, or foreign material intrusion.

Is the check result normal?

YES >> GO TO 2.

NO >> Remove any foreign material or replace the charge cable and connector.

2. CHECK FOR SHORT CIRCUITS BETWEEN CHARGE CABLE AND CONNECTOR HARNESS

Disconnect the charge cable and connector from the charger.

Check that there are no short circuits in all harnesses of the charge cable and connector.

Is the check result normal?

YES >> GO TO 3.

NO >> Replace the charge cable and connector.

3. CHECK THE CAPACITORS

Check capacitors C21/C22 and check that there are no short circuits.

Is the check result normal?

YES >> GO TO 4.

NO >> Replace capacitor C21 or C22.

4. REPLACE CT2

Replace CT2, then use the final inspection unit or vehicle and perform the charging operation. Confirm that operation is normal.

Is the check result normal?

YES >> GO TO 5.

NO >> Replace PWB1.

5. REPLACE PWB1

Replace PWB1. Perform the charge operation using the final inspection unit or vehicle. Check that operation is normal.

Is the check result normal?

YES >> INSPECTION END

NO >> Replace rectifier diode.

0x051A INVERTER ERROR (SOFTWARE DETECTION) OV1

ERROR CODE (category)	DETECTION CONDITIONS		POSSIBLE CAUSES
0x051A (Charger malfunction)	Type 1	When phase voltage for input power voltage RST of more than AC 720 V is detected by software means	- Input voltage - PWB1
	Type 2	When phase voltage for input power voltage RST of more than AC 600 V is detected by software means	

Diagnosis Procedure

1. CHECK THE ELCB1 IN AC VOLTAGE

Measure the ELCB IN voltage between RST.

ELCB1				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	1 (R)	-	3 (S)	AC 480 V (Type 1) AC 400 V (Type 2)
-	3 (S)	-	5 (T)	
-	1 (R)	-	5 (T)	

Is the check result normal?

YES >> Replace PWB1.

NO >> Ask for an inspection to the electric power supply source.

0X051B INVERTER ERROR (SOFTWARE DETECTION) OV2

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x051B (Charger malfunction)	When output voltage of more than DC 520 V is detected by software means	- Input voltage - CT2 - TR1 - Matrix converter - Rectifier diode - PWB1

Diagnosis Procedure

1. CHECK THE ELCB1 OUT VOLTAGE

Measure the ELCB OUT voltage between RST.

ELCB1				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	2 (R)	-	4 (S)	AC 480 V (Type 1) AC 400 V (Type 2)
-	4 (S)	-	6 (T)	
-	2 (R)	-	6 (T)	

Is the check result normal?

YES >> GO TO 2.

NO >> Ask for an inspection to the electric power supply source.

2. CHECK CT2 HARNESS VISUALLY

Visually check that PWB1 CN7 is normal (without connector disconnection or open circuit).

Is the check result normal?

YES >> GO TO 3.

NO >> Apply countermeasure for CT2 harness malfunction.

3. MEASURE THE MATRIX CONVERTER OUTPUT VOLTAGE

Use the final inspection unit or vehicle and output the designated voltage. Measure the voltage between the terminals.

Bus bar				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	8	-	9	Designated voltage using final inspection unit or vehicle

NOTE: A tester of which frequency response is more than 10 kHz or an oscilloscope is necessary for measuring the voltage.

Is the check result normal?

YES >> GO TO 4.

NO >> Replace the matrix converter.

4. MEASURE THE TR1 OUTPUT VOLTAGE

Use the final inspection unit or vehicle and output the designated voltage. Measure the TR1 output voltage between the terminals.

Bus bar				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	13	-	14	Designated voltage using final inspection unit or vehicle

NOTE: A tester of which frequency response is more than 10 kHz or an oscilloscope is necessary for measuring the voltage.

Is the check result normal?

YES >> GO TO 5.

NO >> Replace TR1.

5. MEASURE THE RECTIFIER DIODE OUTPUT VOLTAGE.

Use the final inspection unit or vehicle and output the designated voltage. Measure the rectifier diode output voltage between the terminals.

Bus bar				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	10	-	12	Designated voltage using final inspection unit or vehicle

Is the check result normal?

YES >> Replace PWB1.

NO >> Replace the rectifier diode.

0x051C INVERTER ERROR (SOFTWARE DETECTION) OV3

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x051C (Charger malfunction)	When voltage of more than DC 900 V is detected by software means at both ends of snubber electrolytic capacitor C4	- Input voltage - Harness between matrix converter and PWB1 - Matrix converter - PWB1

Diagnosis Procedure

1. CHECK HARNESS BETWEEN PWB1 - MATRIX CONVERTER

Check that harness between PWB1 CN10 - matrix converter (C4) is stranded normally.

Is the check result normal?

YES >> GO TO 2.

NO >> Strand the harness to the normal status.

2. CHECK THE ELCB1 OUT VOLTAGE

Measure the ELCB1 OUT voltage between RST.

ELCB1				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	2 (R)	-	4 (S)	AC 480 V (Type 1) AC 400 V (Type 2)
-	4 (S)	-	6 (T)	
-	2 (R)	-	6 (T)	

Is the check result normal?

YES >> GO TO 3.

NO >> Ask for an inspection to the electric power supply source.

3. REPLACE MATRIX CONVERTER

Replace the matrix converter, then use the final inspection unit or vehicle and perform charging operation. Check that operation is normal.

Is the check result normal?

YES >> INSPECTION END

NO >> Replace PWB1.

0x051D INSUFFICIENT INPUT VOLTAGE (ELCB1 SECONDARY VOLTAGE)

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x051D (Charger malfunction)	When the voltage between phases (R-T, S-T, R-T) of the input power voltage is 100 V or less	- Input voltage - ELCB1 - PWB1

Diagnosis Procedure

1. CHECK THE ELCB1 IN VOLTAGE

Measure the ELCB IN voltage between RST.

ELCB1				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	1 (R)	-	3 (S)	AC 480 V (Type 1) AC 400 V (Type 2)
-	3 (S)	-	5 (T)	
-	1 (R)	-	5 (T)	

Is the check result normal?

YES >> GO TO 2.

NO >> Ask for an inspection to the electric power supply source.

2. CHECK THE ELCB1 OUT VOLTAGE

Measure the ELCB OUT voltage between RST.

ELCB1				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	2 (R)	-	4 (S)	AC 480 V (Type 1) AC 400 V (Type 2)
-	4 (S)	-	6 (T)	
-	2 (R)	-	6 (T)	

Is the check result normal?

YES >> Replace PWB1.

NO >> Replace ELCB1.

0x051E THERMOSTAT ERROR

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x051E (Charger malfunction)	When an abnormal temperature is detected by the thermostat	- Filter - Fan - Devices around the applicable position (R25, Heat sink 1/2, TR1, L4) - TSTR 1/2/3/4/5 - PWB1

Diagnosis Procedure

1. CHECK THERMOSTAT OPERATION

Check that the same error occurs immediately after supplying the power supply to charger while charger is in a cool status.

Is the check result normal?

YES >> GO TO 2.

NO >> GO TO 5.

2. CHECK FAN OPERATION

Check the operation of the fans.

Is the check result normal?

YES >> GO TO 3.

NO >> Replace the applicable fan.

3. CHECK THE AIR INTAKE AND EXHAUST PORTS

Check the air intake and exhaust ports.

Is the check result normal?

YES >> GO TO 4.

NO >> Clean and replace the fan filter.

4. CHECK HEAT SOURCE AROUND THERMOSTAT

Check the area around each thermostat (TSTR) for a heat-generating object and scorches.

Is the check result normal?

YES >> GO TO 5.

NO >> Identify the cause of generated heat and apply countermeasure.

5. CHECK CONTINUITY THERMOSTAT CIRCUIT

1. Disconnect PWB1 CN20 connector.

2. Check continuity between PWB1 CN13 connector terminals.

PWB1				Continuity
Connector No.	Terminal	Connector No.	Terminal	
CN20	1	CN20	2	Existed

Is the check result normal?

YES >> Replace PWB1.

NO >> GO TO 6.

6. CHECK EACH THERMOSTAT

Check continuity between thermostat (R25, Heat sink 1&2, TR1, and L4) connector terminals.

Thermostat				Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	+ (Positive)	-	- (Negative)	Existed

Is the check result normal?

YES >> Repair or replace harness.

NO >> Replace corresponding Thermostat.

0x051F UPPER AND LOWER LIMITS EXCEED THE INPUT VOLTAGE

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x051F (Charger malfunction)	The reference value of input voltage is maintained at the start of charge, and an abnormal value of $\pm 15\%$ to the reference value is detected during charge	- Input voltage - ELCB1 - PWB1

Diagnosis Procedure

1. CHECK ELCB1 IN VOLTAGE

Measure the ELCB IN voltage between RST at charge start and during charge operation in progress. Compare the each value.

ELCB1				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	1 (R)	-	3 (S)	AC 480 V (Type 1) AC 400 V (Type 2)
-	3 (S)	-	5 (T)	
-	1 (R)	-	5 (T)	

Is voltage difference at charge start and during charge operation in progress 15% or more?

YES >> GO TO 3.

NO >> GO TO 2.

2. CHECK ELCB1 OUT VOLTAGE

Measure the ELCB OUT voltage between RST at charge start and during charge operation in progress. Compare the each value.

ELCB1				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	2 (R)	-	4 (S)	AC 480 V (Type 1) AC 400 V (Type 2)
-	4 (S)	-	6 (T)	
-	2 (R)	-	6 (T)	

Is voltage difference at charge start and during charge operation in progress 15% or more?

YES >> Replace ELCB1.

NO >> Replace PWB1.

3. MEASURE INSULATION RESISTANCE

Perform the insulation resistance measurement.

Is the check result normal?

YES >> Ask for an inspection to the electric power supply source.

NO >> Check for insufficient isolation portion.

0x1001 EMERGENCY STOP DETECTED

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x1001 (Charger warning)	When the emergency stop button is pressed	- Emergency stop button - PWB1

[Reactivation procedure]

1. Reset (Base Specifications disengages lock while rotating switch.)
2. Press and hold the charge stop button. (Touch Reset button on the LCD.)

Diagnosis Procedure

1. CHECK THE EMERGENCY STOP BUTTON STATUS

Emergency stop button pressed?

YES >> Perform the reactivation procedure.

NO >> GO TO 2.

2. CHECK CONTINUITY WIRING

Check the continuity of the following harnesses.

Harness between emergency stop button and PWB1 CN14

EMS		PWB1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	11	CN14	2	Existed

Harness between EMS terminal and LCD terminal

EMS		LCD		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	12	-	+	Existed

Harness between EMS terminal and PS1 CN2

EMS		PS1		Continuity
Connector No.	Terminal	Connector No.	Terminal	
-	12	CN2	5	Existed

Is the check result normal?

YES >> Replace PWB1.

NO >> Replace the corresponding harness.

0x2001 INPUT VOLTAGE DISEQUILIBRIUM

ERROR CODE (category)	DETECTION CONDITIONS	POSSIBLE CAUSES
0x2001 (Charger malfunction)	When the correlated voltage of R-S-T phases is misaligned for 15% or more and 20 msec or more.	- Input voltage - ELCB1 - PWB1

Diagnosis Procedure

1. CHECK ELCB1 IN VOLTAGE

Check the voltage and wave form between R-S-T of ELCB1 IN.

ELCB1				Voltage
Connector No.	Terminal	Connector No.	Terminal	
-	1 (R)	-	3 (S)	AC 480 V (Type 1) AC 400 V (Type 2)
	3 (S)		5 (T)	
	1 (R)		5 (T)	

Is the check result normal? (Is the sinusoidal wave normal?)

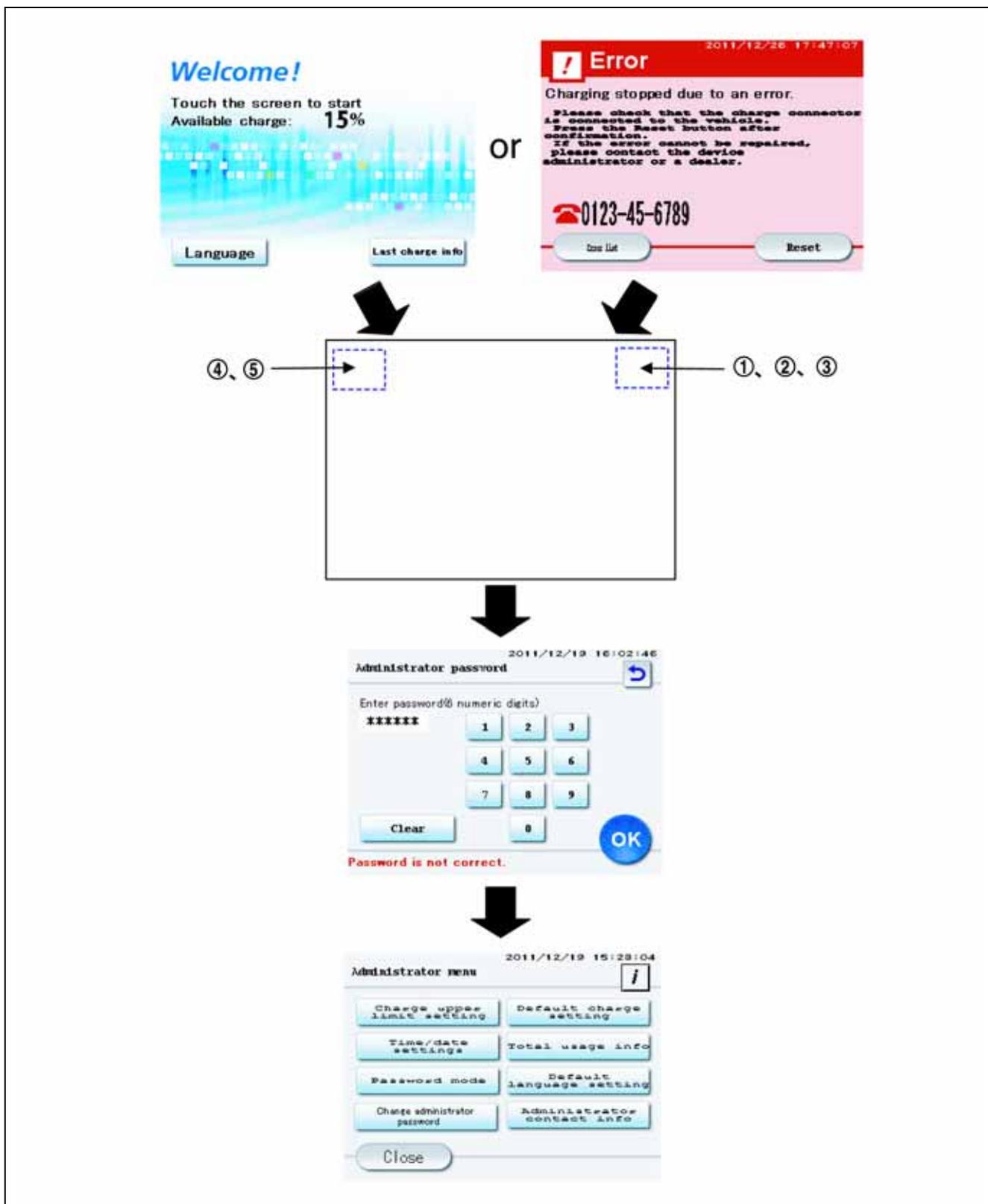
YES >> GO TO 2.

NO >> Ask for an inspection to the electric power supply source.

7. ADMINISTRATOR MENU

7 - 1 :Switching to the Administrator Menu

On either the "Welcome" screen or malfunction screen shown below, touch the screen in the order shown by (1) - (5) and enter the password to switch to the Administrator Menu screen.



7 - 2 :Explanation of Screen

7 - 2 - 1 : Administrator Menu



- 1) Charging upper limit setting
Set the charging upper limit time or upper limit charge level (%).
- 2) Time / Date setting
Change the current date and time
- 3) Password mode
Change the user password.
- 4) Charge administrator password
Change the administrator password.
- 5) Default charge setting
Change the default values for charge ratio and charge time.
- 6) Total usage info
Displays cumulative information.
- 7) Default language setting
Change the language setting.
- 8) Administrator contact info
Set whether or not to display the administrator company contact information.
- 9) Close
Press the "Close" button to return to the "Welcome" screen.

7 - 2 - 2 : Charging upper limit setting



- 1) Upper limit mode (On / Off)
 - a) Select "On" button to set the "Ratio" or "Time".
 - b) Select "Off" button to set normal charging.
- 3) Ratio
Adjust using the UP button (+5%) and DOWN button (-5%) and set the upper limit ratio (%).
- 4) Time
Adjust using the UP button (+5 minutes) and DOWN button (-5 minutes) and set the upper limit time.
- 5) Cancel
Return to the Administrator Menu. If the charging time button is pressed when a charging time upper limit is set, then charging will be restricted by the upper limit time.
- 6) OK
Press the "OK" button to apply the changed setting and return to the Administrator Menu.

7 - 2 - 3 : Time / Date setting



- 1) Year / month / day / hours / minutes / seconds
Displays the current date and time. Press the UP or DOWN button of the location to be changed in order to increase or decrease the value.
- 2) Cancel
Return to the Administrator Menu.
- 3) OK
Press the "OK" button to apply the changed setting and return to the Administrator Menu.

7 - 2 - 4 : Password mode



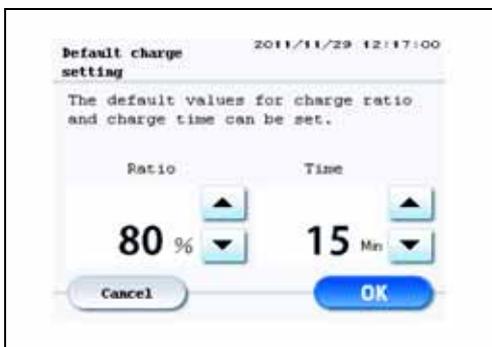
- 1) "User password is changed"
This is displayed after the "OK" button is pressed.
- 2) Password mode (On / Off)
When the "On" button is selected, a screen requiring password entry is displayed before charging.
When the "Off" button is selected, password entry is not required.
- 3) User password (4 numeric digits)
Displays the password that must be input before charging. To change it, press the button to display a numeric keypad and enter the new password.
- 4) Change
Press the "Change" button to display a numeric keypad and enter the new password.
- 5) Cancel
Return to the Administrator Menu.
- 6) OK
Press the "OK" button to apply the changed setting, display the message in 1), and return to the Administrator Menu.

7 - 2 - 5 : Change administrator password



- 1) "Administrator password is changed"
This is displayed after the "OK" button is pressed.
- 2) Administrator password (6 numeric digits)
Displays the administrator password. To change it, press the button to display a numeric keypad and enter the new password.
- 3) Change
Press the "Change" button to display a numeric keypad and enter the new password.
- 4) Cancel
Return to the Administrator Menu.
- 5) OK
Press the "OK" button to change the setting and return to the Administrator Menu.

7 - 2 - 6 : Default charge setting



- 1) Ratio / Time
When normal charging is set and the user selects to set a charge ratio (%) and charge time, this is the charge level that is initially displayed. Use the UP button (+5% or +5 minutes) and DOWN button (-5% or -5 minutes) to set the initial value.
- 2) Cancel
Return to the Administrator Menu.
- 3) OK
Press the "OK" button to change the setting and return to the Administrator Menu.

7 - 2 - 7 : Total usage info



- 1) Amount of charge
Display the total electric output.
- 2) Number of charges
Display the total frequency.
- 3) Time
Display the total time.
- 4) Close
Return to the Administrator Menu.

7 - 2 - 8 : Default language setting



- 1) Initial language setting
The lamp indicating the currently set language is lit. To change the language, press the language button to change the lamp which is lit. The lamp which is lit indicates the selected language.
- 2) Cancel
Return to the Administrator Menu.
- 3) OK
Press the "OK" button to set the selected language and return to the Administrator Menu.

7 - 2 - 9 : Administrator contact info

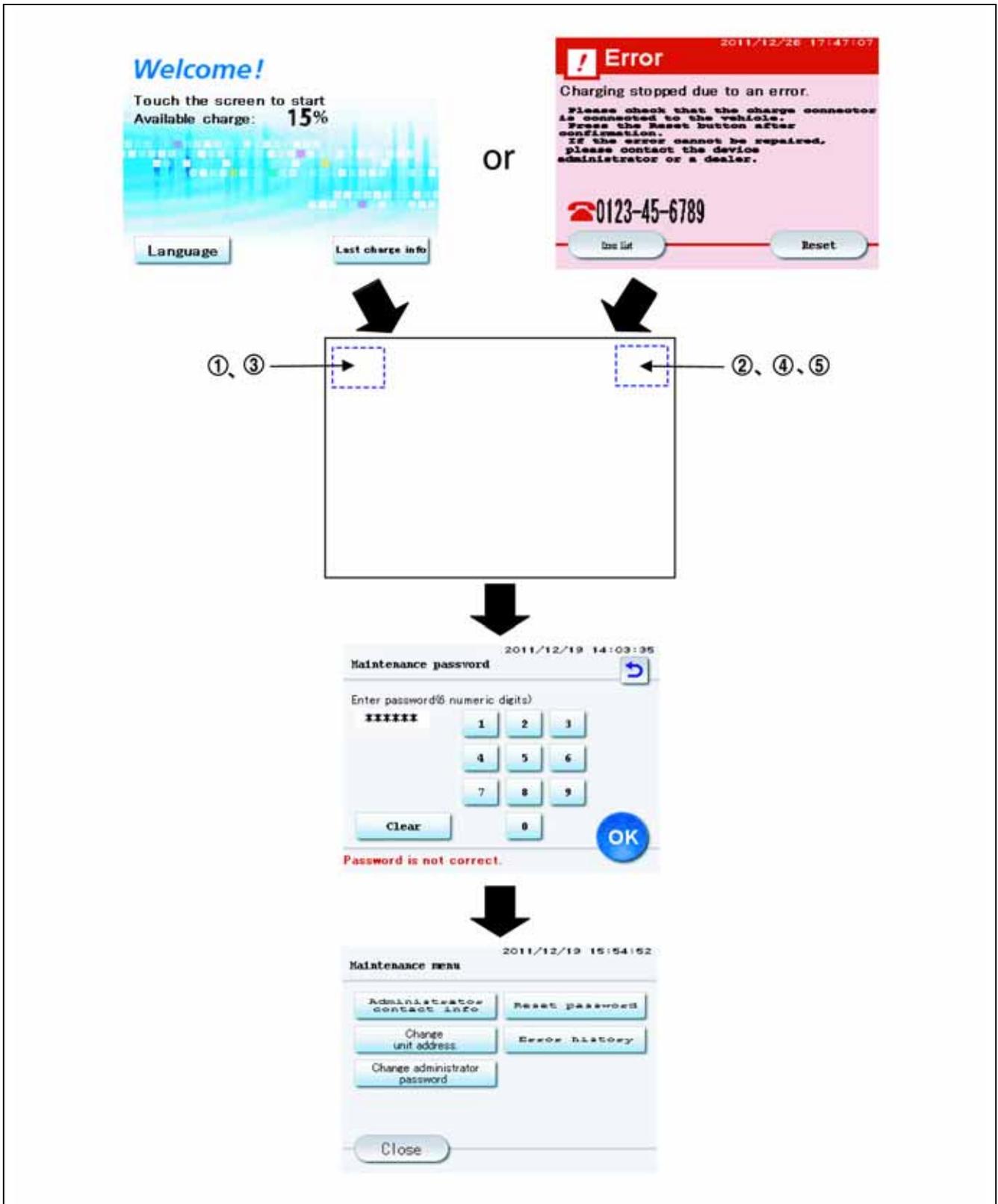


- 1) Display contact info (On / Off)
The administrator company contact information is displayed when the "ON" button is selected and not displayed when the "OFF" button is selected.
- 2) Change
Displays the number that is displayed when the administrator company contact information display is ON. To change it, press the button to display a numeric keypad and enter the new number.
- 3) Cancel
Return to the Maintenance Menu screen.
- 4) OK
After entering the new number, press the "OK" button to change the number and return to the Maintenance Menu screen.

8. MAINTENANCE MENU

8 - 1 :Switching to the Maintenance Menu

On either the "Welcome" screen or malfunction screen shown below, touch the screen in the order shown by (1) - (5) and enter the password to switch to the Maintenance Menu screen.



8 - 2 :Explanation of Screen

8 - 2 - 1 : Maintenance Menu screen



- 1) Administrator contact info.
Set whether or not to display the administrator company contact information.
- 2) Change the unit address
Change the station number.
- 3) Change administrator password
Change the administrator password.
- 4) Reset password
Reset the user password and administrator password.
- 5) Error history
Displays a history of the past malfunctions which occurred.
- 6) Close
Press the "Close" button to return to the "Welcome" screen.

8 - 2 - 2 : Administrator company contact info.



- 1) Display contact info (On / Off)
The administrator company contact information is displayed when the "ON" button is selected and not displayed when the "OFF" button is selected.
- 2) Change
Displays the number that is displayed when the administrator company contact information display is ON. To change it, press the button to display a numeric keypad and enter the new number.
- 3) Cancel
Return to the Maintenance Menu screen.
- 4) OK
After entering the new number, press the "OK" button to change the number and return to the Maintenance Menu screen.

8 - 2 - 3 : Change unit address



- 1) Change
Press the "Change" button to display a numeric keypad and enter the new station number.
- 2) Cancel
Return to the Maintenance Menu screen.
- 3) OK
After entering the new unit address, press the "OK" button to change the unit address and return to the Maintenance Menu screen.

8 - 2 - 4 : Change administrator password



- 1) "Administrator password is changed"
This is displayed after the "OK" button is pressed.
- 2) Administrator password
Displays the administrator password. To change it, press the button to display a numeric keypad and enter the new password.
- 3) Change
Press the "Change" button to display a numeric keypad and enter the new password.
- 4) Cancel
Return to the Maintenance Menu screen.
- 5) OK
Press the "OK" button to display the message in 1) and return to the Maintenance Menu screen.

8 - 2 - 5 : Reset password



- 1) Cancel
Return to the Maintenance Menu screen.
- 2) Reset
Press the "Reset" button to reset the password.

8 - 2 - 5 : Error history



- 1) No.
Displays the error history Numbers
NOTE: A maximum of 100 malfunctions can be registered in the malfunction history. When more than 100 malfunctions are detected, the existing malfunctions are erased beginning from the oldest.
- 2) Date / time
Displays the date and time when the malfunction occurred.
- 3) >>
Displays the details of the selected error history.
- 4) Close
Return to the Maintenance Menu screen.

8 - 3 :Master Password

	Month	Master password
When the last digit of the year is an uneven number	1	049476
	2	407095
	3	527228
	4	571542
	5	964870
	6	510637
	7	218049
	8	630310
	9	623622
	10	836196
	11	373128
	12	562943
When the last digit of the year is an even number	1	016977
	2	844213
	3	556388
	4	536079
	5	933673
	6	961381
	7	575580
	8	815978
	9	351447
	10	242612
	11	139433
	12	081476

Example1) The master password of October 2011 is "836196"

Example2) The master password of May 2018 is "933673".

9. CONTROLLER ASSY- MAIN (PWB1) INSTALLATION PROCEDURE

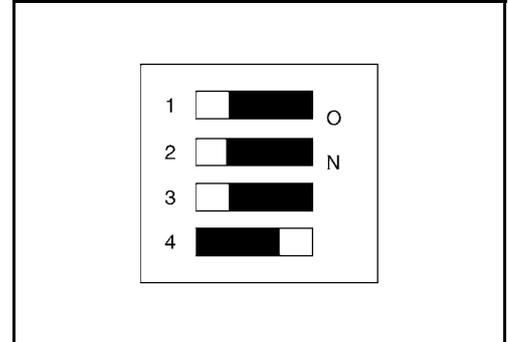
(1) Installation procedure

- 1) Turn breakers of circuit breaker assy- 1st (ELCB1) and circuit breaker assy- 2nd (ELCB2) to the OFF position.
- 2) Insert SD card into socket of controller assy- main (PWB1).

CAUTION1: Insert SD card until it is locked.

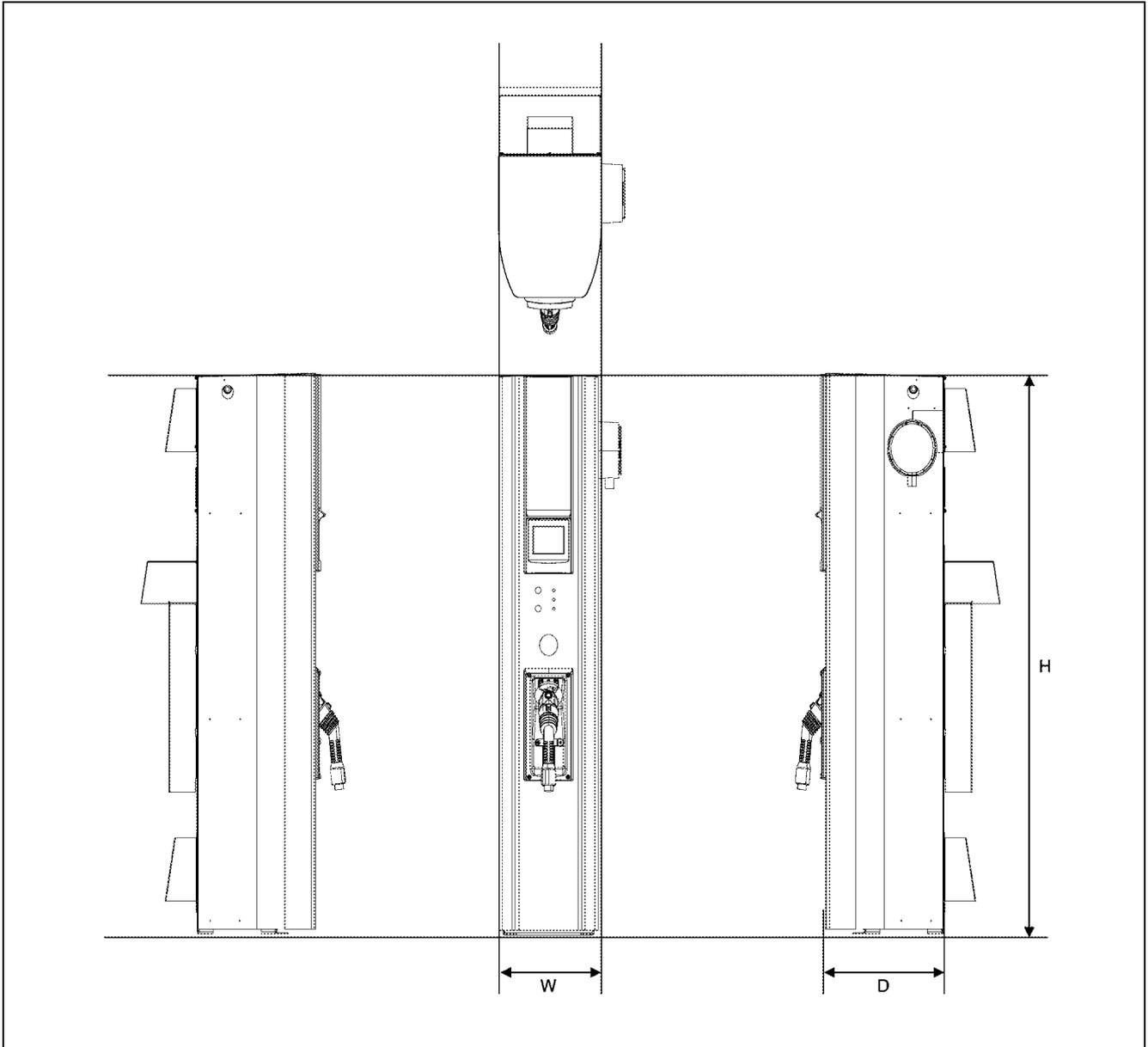
CAUTION2: Be careful of the direction of insertion of SD card.

- 3) Turn ON only 4 of the controller assy-main (PWB1) SW 1.



- 4) Turn breakers of circuit breaker assy- 1st (ELCB1) and circuit breaker assy- 2nd (ELCB2) to the ON position.
 - 5) Press STOP button (Each LED lamp of READY / CHARGE / ALARM all blink).
- CAUTION: Do not turn power supply OFF while each LED lamp blinks.
- 6) Check that each LED lamp of READY / CHARGE / ALARM turns OFF.
 - 7) Turn breakers of circuit breaker assy- 1st (ELCB1) and circuit breaker assy- 2nd (ELCB2) to the OFF position.
 - 8) Remove SD card from socket of controller assy- main (PWB1).
- CAUTION: Press SD card once to release the lock and then remove the card from the socket.

10. ASSEMBLY DIAGRAM

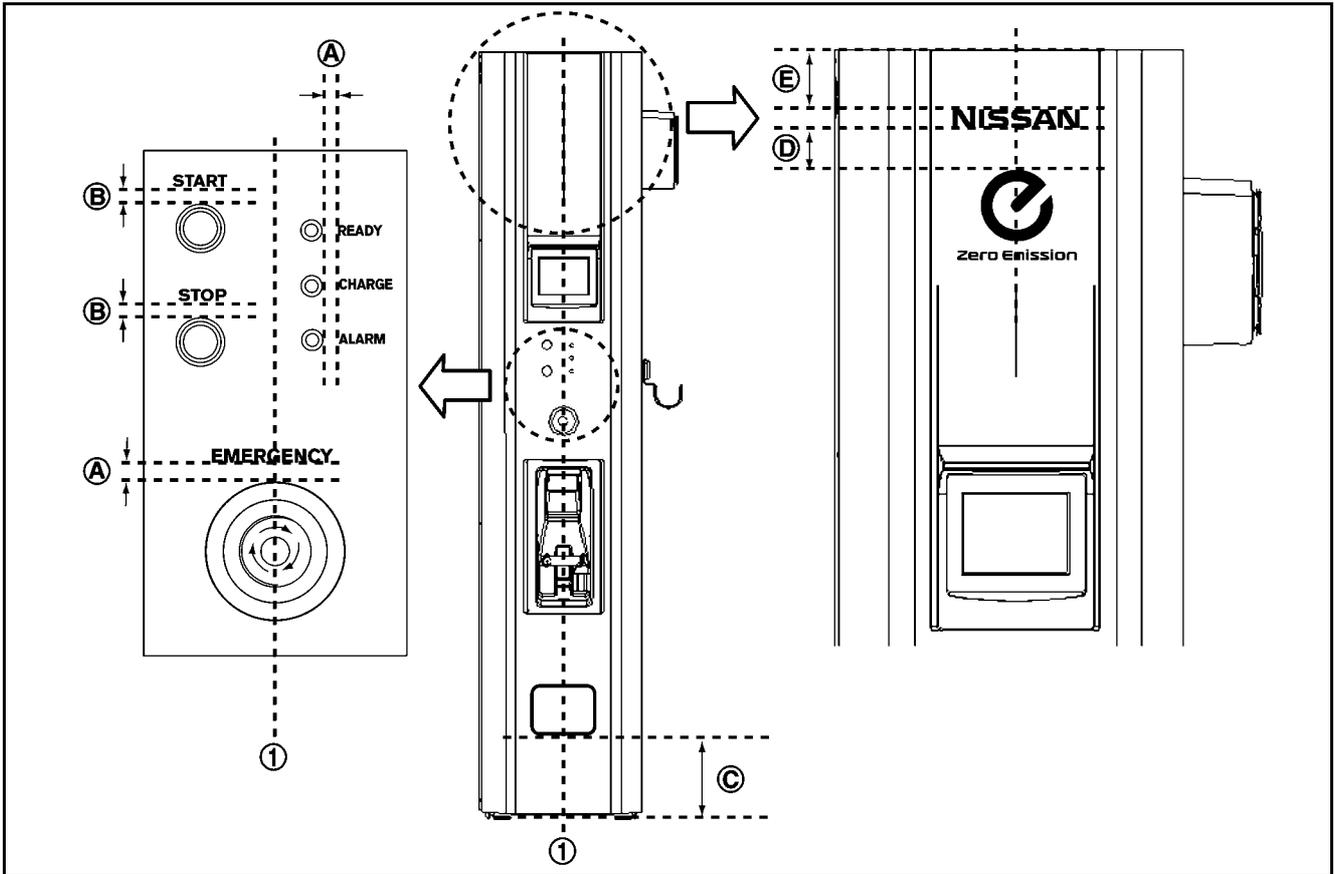


NOTE: The illustration shows the Standard Specifications.

Specifications	H (Height)	W (Width)	D (Depth)
Base specifications	1840 mm (72.44 in)	380 mm (14.96 in)	600 mm (23.62 in)
Standard specifications	1840 mm (72.44 in)	380 mm (14.96 in)	665 mm (26.18 in)
Cold specifications	1840 mm (72.44 in)	380 mm (14.96 in)	665 mm (26.18 in)

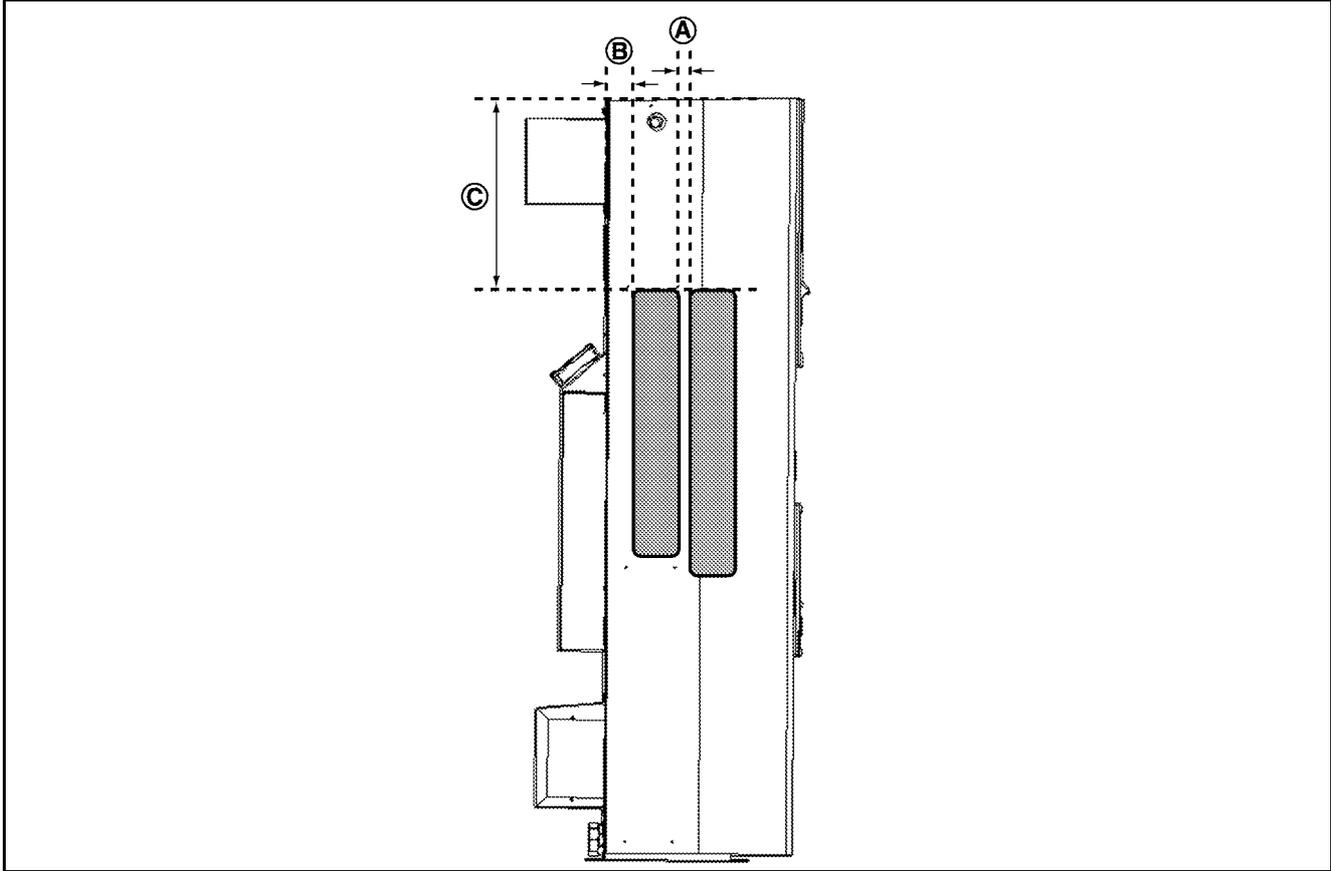
11. LOCATION OF LABEL APPLICATION

11 - 1 :Front Side



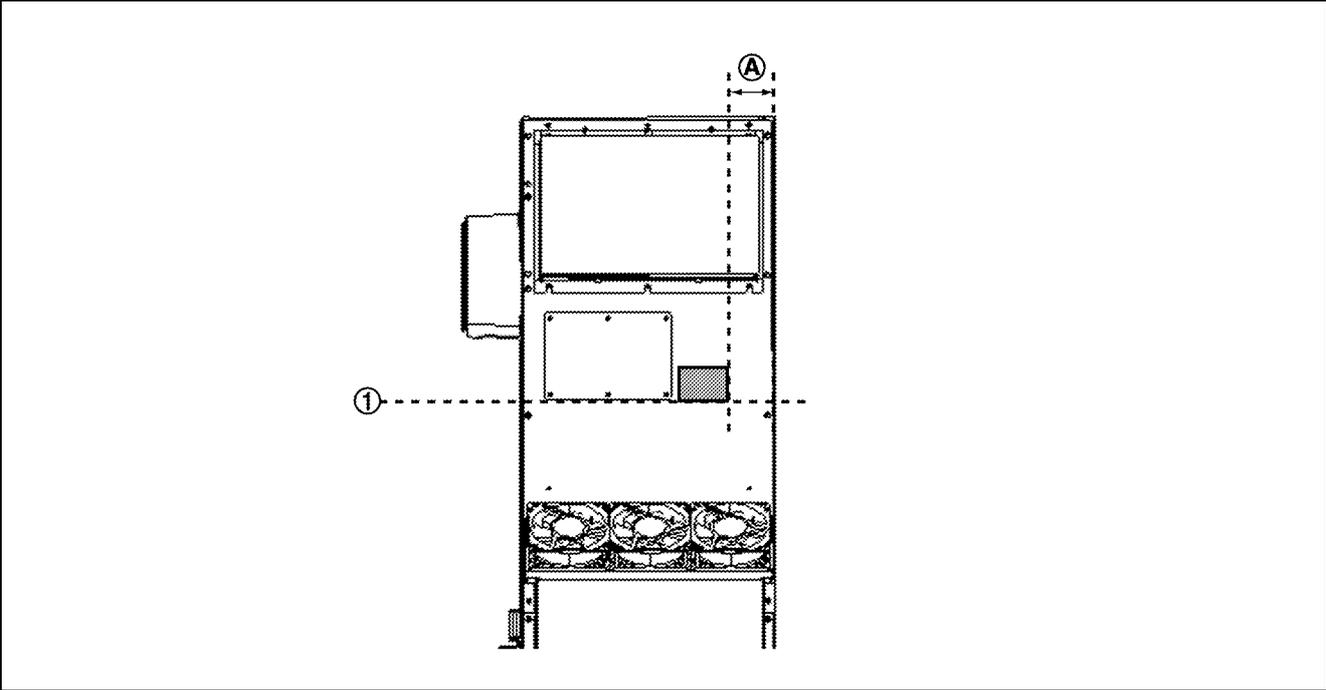
A: 10 mm (0.39 in)
B: 8 mm (0.31 in)
C: 350 mm (13.78 in)
D: 40 mm (1.57 in)
E: 60 mm (2.36 in)
1: Center of quick charger

11 - 2 : Right Side



A: 10 mm (0.39 in)
B: 90 mm (3.54 in)
C: 400 mm (15.75 in)

11 - 3 : Back Side



- A: 50 mm (1.97 in)
- 1: Arrange it in line with lower end of Circuit Breaker Assy Cover.



SERVICE