NACHI

AX20 CONTROLLER MAINTENANCE MANUAL

14th edition

	■ Before attempting to operate the robot, please read through this operating manual carefully, and comply with all the safety-related items and instructions in the text. ■ The installation, operation and maintenance of this robot should be undertaken only by those individuals who have attended one of our robot courses.
	■ This operating manual must be given without fail to the individuals who will actually be operating the robot.
	■ Please direct any in queries about parts of this operating manual which may not be completely clear or any inquiries concerning the after-sale service of this robot to any of the service centers of Nachi Robotic Systems listed on the back cover.

NACHI-FUJIKOSHI CORP.

1103, EAXEN-005-014, 001

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Chapter 1 Safety precautions

This Chapter describes safety precautions for handling the robot and intends to be a general guide for safety precautions and procedures but not to provide all safety measures. Consequently, users are requested to prepare Safety Control Standards incorporating unique operation rules in accordance with actual factory requirements, and perform safety control for the assurance of safety for workers.

1.1 For safe use of robot

Before the installation, operation, maintenance or inspection of the robot, be sure to thoroughly read this Manual and all the Appendices attached to the Manual, and then learn all of the knowledge of equipment, safety information, and precautions. For the purpose of this Manual, safety symbols are classified as shown in the table below according to their importance.

DANGER	Cases where mishandling induces an imminently hazardous situation that, if not avoided, will result in death or serious injury to personnel.
WARNING	Cases where mishandling induces a potentially hazardous situation that, if not avoided, could result in death or serious injury to personnel.
CAUTION	Case where mishandling induces a potentially hazardous situation that, if not avoided, may result in moderate or minor injury to personnel or damage to equipment.

In addition, for safety instructions of primary importance, the following mark is used.

This mark indicates a safety instruction of primary importance.

Precautions for safe adjustment, operation, and maintenance

(1) Operators must wear overalls, a hard hat, and safety shoes.
(2) To turn ON the power supply, make sure there is no one present in the robot operating area.
(3) To conduct work in the robot operating area, make sure the power supply is turned OFF.
(4) If inspection or maintenance work should be conducted with power applied, be sure to conduct the work at least by a pair of two persons. One person must stay on guard to press an Emergency Stop button at any time, while the other person must promptly finish the work with thorough attention paid to the robot operating area. Furthermore, prior to starting the work, check for safe corridors.

The robot will be able to make a safe stop due to the incorporation of a variety of self-diagnosis functions and abnormality detection functions even if any abnormality occurs. Even so, the robot is not 100% safe.

DANGER

Many of robot accidents were caused due to the following reasons.
- Without making sure there was no one present within the robot operating area, automatic operation was initiated.
- With the system set to automatic operation mode, a person entered the robot operating area and the robot made a sudden movement.
- A person gave his concentration to a robot in front of him and paid no attention to another robot.

The reasons aforementioned share the following points in common.

"Safety procedures were neglected" and

"A robot made an unexpected movement even though it was seemed not to move."

In other words, **those robot accidents resulted from human-induced causes, i.e., unsafe acts such as "careless mistakes" or "nonobservance of established procedures"**. The "unexpected movement of the robot" is very likely to cause a disaster because operators are not able to take actions to avoid it, such as "press an Emergency Stop button" or "escape from a hazard".

The following section shows patterns of the unexpected movement.

- The robot made a sudden change from low-speed operation to high-speed operation.
- The robot was operated by other operator.
- The robot was operated with a different program due to a malfunction of peripheral equipment or a programming error.
- Malfunction due to a noise, breakdown, or failure.
- Mishandling.
- Robot was set to operate at a low speed but operated at a high speed.
- A work-piece being transported by the robot dropped down or flew off from the robot.
- The robot was put it in the stop state waiting for interlock, but the interlock was released to cause the robot to make a sudden move.
- An adjacent or rear robot initiated operation.

The patterns above are absolutely examples, besides of which there are many other unexpected patterns. In many cases, it is impossible to "stop" or "escape" from the robot that came into unexpected operation. To avoid accidents under these circumstances, make it a rule to;

DANGER

"Keep away from the robot."
Otherwise, when the robot makes a sudden move, if you touch to or are caught by the robot, it will result in death or serious injury.

DANGER

If you do not need to operate the robot, disable the robot operation.
Otherwise, when the robot makes a sudden move, if you touch to or are caught by the robot, it will result in death or serious injury.

DANGER

If you need to operate the robot, have a watcher (outsider) constantly keep a close eye on safety.
Otherwise, when the robot makes a sudden move, if you touch to or are caught by the robot, it will result in death or serious injury.

DANGER

If you need to operate the robot, conduct work ready to press the Emergency Stop button at any time.
Otherwise, when the robot makes a sudden move, if you touch to or are caught by the robot, it will result in death or serious injury.

In order to observe the rule, it is necessary to thoroughly understand and surely observe the safety measures described in the following sections.

1.1.1 Safety measures against the main unit of robot

IMPORTANT

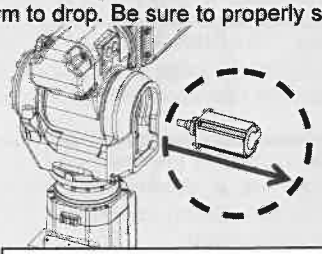
The robot is designed to eliminate excessive protrusions or edged sections and constructed of materials and structure adaptable to use environments, thus providing fail-safe structure by which no damage or accident takes place while in operation.
Furthermore, the robot incorporates a function to detect malfunctions while the robot is in operation and then stop the operation, emergency stop function, and interlock function to prevent any hazardous situation caused by the robot resulting from a malfunction of the peripheral equipment, thus avoiding the creation of hazardous situations.

WARNING

The main unit of the robot has an articulated arm construction, by which each articular angle varies with the robot movement at all times. While in teaching operation, be careful not to get caught between the articulations. Particularly, since stopper blocks are mounted on the operation ends of the articulations, pay utmost attention not to get caught between them. Furthermore, dismounting the motor or releasing the brake can cause the arm to drop from the robot due to its own weight or move in unexpected directions. To avoid that, be sure to take drop preventive measures and make sure safety around the robot before conducting operation.

WARNING

Dismounting the motor from the robot without properly supporting the arm can cause the arm to drop. Be sure to properly support the arm before dismounting the motor.



Dismounting the motor from the robot without properly supporting the arm

The arm may drop.

Since the zeroing pin can be improperly or incompletely inserted, do not rely only on this pin to fix the arm. Be sure to support the arm using wooden blocks, slings, or other means, and then dismount the motor from the robot. Furthermore, NEVER attempt to hold the robot arm with human's hands.

CAUTION

The balance spring device is internally compressed even in the normal state. Never attempt to dismount or disassemble this device. Doing so will result in a highly hazardous situation.

CAUTION

In order to mount equipment on the end effector and the arm, use the specified size and number of bolts, and completely fasten them to the specified torque using a torque wrench. Furthermore, use clean rust-free bolts. Fastening bolts in excess of the specified torque or by an imperfect method may cause the bolts to be unfastened, resulting in serious accidents.

CAUTION

To manufacture the end effector, apply the weight and static load moment within the permissible load range of the robot wrist.

CAUTION

To prevent the release or flying of a workpiece grasped by the robot even in the event of shutdown of power or air supply to the end effector, provide the fail-safe construction and ensure the finish of edged sections and protrusions, thus causing no damage to personnel or property.

CAUTION

In order to operate the robot, supply the robot with power, plant air, and cooling water for welding. However, NEVER supply them less or more than the specified amount. Doing so may have adverse influence on the robot performance or cause a malfunction or breakdown of damage to the robot, thus inducing a hazardous situation.

CAUTION

As to electromagnetic disturbances, it is impossible to take perfect measures against them using the existing technologies even though that depends on the types or strength of the electromagnetic disturbances. For measures to be taken while the robot in operation or power supply is being turned ON, refer to precautions for operation.
Furthermore, electromagnetic waves, other noises, or faulty printed circuit boards may erase programs recorded. To avoid that, back up programs, constants, and others to compact flash cards or the like.

1.1.2 Safety measures against teaching and inspection

 CAUTION	The robot must be operated by personnel who **took the specified training** on the NACHI ROBOT and are fully aware of its safety and functions. If the robot is operated by personnel who do not know much about the robot operation, accidents may result from their mishandling.
 CAUTION	If you enter the robot operating area with the servo power supply turned ON (Motors ON) for any reason, you must get ready to press the Emergency Stop button at any time. In addition, be sure to post **a watcher** outside the operating area that **can immediately press another Emergency Stop button.**
 WARNING	To operate the robot or enter the robot operating area, be sure to wear protective equipment such as a **hard hat** or **safety shoes**.
 WARNING	To enter the robot operating area, **carry along with you** a key switch or safety plug to shift to automatic operation mode so that other operator cannot accidentally shift to automatic operation mode. Leaving the safety plug on site could cause other operator to initiate automatic operation without knowing, thus resulting in accidents.
 WARNING	Put up a signboard indicating **"TEACHING IN PROGRESS"** on each operation panel so that other operators can immediately judge that teaching is in progress. Otherwise, other operators could initiate automatic operation without knowing that teaching is in progress, thus resulting in accidents.
 CAUTION	If two or more operators are involved in the teaching of a robot, **an operator holding the teaching pendant must act as a commander**, while other operators must follow instructions from the commander. Giving commands from two or more operators may cause mishandling, resulting in accidents.
 CAUTION	For a large-scaled system, if two or more operators are involved in teaching and needed to have communications among them from remote locations, give consideration for them to properly convey their desires using **arm and hand signals**. Otherwise, the desires cannot be properly conveyed due to ambient noises, resulting in accidents.
 CAUTION	Operators should always keep **an escape (escape route)** in their mind to perform operation so that they can immediately escape in an emergency.
 WARNING	Pay attention to the robot movements at all times and do not conduct work **with your back to** the robot. Doing so could cause you to delay in taking notice of the robot movements, resulting in accidents.
 WARNING	If you observe any abnormality, **immediately press the Emergency Stop button.** Furthermore, familiarize everyone with this effect. When you watch the robot while feeling that there is something strange about it, the robot could make a sudden movement.
 CAUTION	For methods of starting and operating the robot, measures against abnormalities, and others, prepare proper **operation rules** and **checklists** according to the installation locations and the contents of operation. Furthermore, proceed with the operation according to the operation rules. Operating the robot only according to the memory and knowledge of operators may result in accidents due to the loss of memory or by mistake.
 CAUTION	If the robot is not needed to move or operate, conduct work **with the power supply to the robot turned OFF**. The robot will never operate if the power supply is turned OFF.
 CAUTION	To conduct teaching, commit yourself to checking the robot for the **program number and step number** before operating the robot. Editing an incorrect program or step may result in accidents.


CAUTION

Protect edited programs from accidental editing by the use of the **memory protect function** or else. (The AX controller incorporates the memory protect function by which editing by each program or constant file is inhibited.)


CAUTION

When teaching is complete, check the robot for operation **at a low speed** using the **check go/back function** and **speed override function**.
Directly playing back a program at a 100% speed while in playback mode may result in accidents such as interference due to programming errors or else.


CAUTION

When teaching is complete, clean the inside of guard fence, and then check whether or not tools or else are left there. If the workplace has oil stains or tools are left there, that may result in accidents such as a fall to the floor.
"Keeping the workplace clean and tidy" is the first step to ensure safety.

1.1.3 Safety measures against test run

To perform test run on the robot, note that there is a possibility that design errors, teaching errors, or manufacturing errors exist in a variety of factors such as teaching programs, jigs, sequences, or else. In this connection, the test run should be performed with raised safety consciousness. Pay attention to the points listed in the table below.


WARNING

First, check pushbuttons and the like such as Emergency Stop buttons or Stop buttons as well as signals used to stop the robot for their operation. Then, check for operations related to the detection of abnormalities.
It is of primary importance to make sure the robot stops operation. In an emergency, unless the robot stops operation, no accidents may be prevented.


CAUTION

To perform test run on the robot, **check the robot for the operation at a low speed (approximately 5% to 10% of full speed)** using the speed override function while repeating two or three cycles. If any failures are observed, **immediately rectify** them.
Then, gradually increase the speed (e.g. 50% → 70% → 100%) and repeat two or three cycles at each speed to check the robot for operation.
Operating the robot directly at a high speed will not able to stop the robot even if there is a teaching error or else, thus resulting in accidents.


DANGER

Since it is not sure what failure will occur during a test run, **NEVER attempt** to check the robot for the operation within the guard fence. The test run is a stage possessing lower reliability, i.e., very likely to cause accidents as unpredictable abnormalities will occur.

1.1.4 Safety measures against automatic operation

 CAUTION	Commit yourself to **keeping** the workplace **clean and tidy** at the time of starting and ending work. Dirty or cluttered workplace may cause accidents such as a fall to the floor.
 CAUTION	To start the robot, be sure to **perform routine daily checks according to the checklist.** By observing abnormalities beforehand, accidents may be prevented from occurring. (For daily check items, refer to information in the Maintenance Manual. Furthermore, you are requested to create your own checklist based on the said check items and perform the checks without omission.)
 CAUTION	Post a sign **"IN OPERATION. KEEP OUT"** at all entrance of the guard fence and further familiarize all workers this effect. If not, they may enter the safety fences because the robot stops operation.
 DANGER	To initiate automatic operation, make sure **there is no one present** in the guard fence. Accidents due to the startup of the robot without making sure there is no one present in the guard fence are typical among past disasters.
 CAUTION	To initiate the automatic operation, make sure the robot **gets ready for initiating the automatic operation**, including the program number, step number, operation mode, startup selection, and others. If you initiate the automatic operation without noticing that a different program or step is selected, the robot will malfunction, thus resulting in accidents.
 CAUTION	To initiate the automatic operation, make sure the robot is **in a position from which the robot is able to initiate the automatic operation**. In addition, check whether or not the position of the robot is corresponding to the program number and step number. Even though the program number and stop number are correct, if the position of the robot is incorrect, the robot will malfunction, thus resulting in accidents.
 CAUTION	To initiate the automatic operation, initiate it under the **condition that the Emergency Stop button can be immediately pressed**, which is an essential condition to prepare for any contingency.
 CAUTION	It is recommended to keep track of the **operating routes, operating conditions, operating sounds**, and others of the robot on a routine basis so as to make a judgment on whether or not the robot is in the abnormal state. The robot can show some sort of symptoms before it breaks down. To identify these symptoms in advance, it is recommended to thoroughly keep track of the normal operating conditions of the robot on a routine basis.
 WARNING	If any abnormality is observed, **immediately make an emergency stop**, and then notify superiors or the personnel engaged in the maintenance to take proper measures. Taking an attitude, "The robot is moving. That's OK" will result in not only stoppage in production due to the failure of the robot but also serious injury.
 WARNING	To check the robot for the operation after the completion of measures against the abnormality, do not operate the robot even for a low-speed playback when a worker still remains inside the guard fence **until it is confirmed that the failure has been surely remedied.** Since the robot is still in the state possessing lower reliability, unexpected contingency such as another abnormality will occur.

1.1.5 Relocation, transfer, and sale of robot

CAUTION

- In order to relocate, transfer, or sell the robot, be sure to hand over all documents that came with the robot, such as the Operating Manual and Maintenance Manual, to a new end-user.
- Particularly, to relocate, transfer, or sell the robot overseas, it is necessary to have the end-user attach the Operating Manual/Maintenance Manual in a suitable language, amend the indication language, and/or apply to local laws and regulations on the end-user's own account.
- If the new end-user mishandles the robot or performs unsafe operation without reading the Operating Manual or else, accidents may occur.
- If the robot is relocated overseas, transfer, or sell (to a domestic or overseas user), the contract provisions for the original sale of the robot including those related to safety shall not be assigned to the new end-user, unless otherwise specially agreed.
A new contract should be concluded between the customer and the new end-user.

1.1.6 Scrapping of robot

CAUTION

- Do not disassemble, heat, or burn batteries used in the controller or the main unit of the robot. Otherwise it may result in firing, burst, or burn.
- Scrap the controller without disassembling it to smaller pieces than printed circuit boards or units. Otherwise, it may cause injury due to bursts, edged parts such as cut surface, or cables or wires.
- Scrap the wire harnesses or external wirings of the robot without disassembling them to smaller pieces than connectors or terminal blocks. Otherwise, it may cause injury to an eye or a hand due to conductors or else.
- To scrap the robot, be careful not to get caught in the robot or injured.
- For scrap items, put them into conditions under which no human injury may be caused.

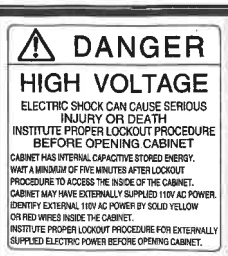
1.1.7 Symbols on the main unit of robot and controller

CAUTION

DANGER

- This mark indicates a power supply unit, and is affixed to the primary power supply inlet and the cover of transformer room on the controller and also to the wire harness connection on the main unit of the robot.
- On the controller, removing the cover with this mark will expose the primary power supply unit (having a voltage of 200VAC to 480VAC), which induces a hazardous situation to cause electric shocks. In order to conduct work with the cover removed, turn OFF not only the power circuit breaker of the controller but also the power supply on the switchboard side.
- This mark indicates a power supply port for the main unit of the robot. Through the power supply port with this mark, power supplied from the motor power and detector unit is passed to the connectors and terminal blocks under the covers of each part of the main unit of the robot.
- You may get electric shocks during work. To avoid that, be careful not to touch the connectors or terminal blocks directly or with conductive items. Furthermore, disconnecting the connectors or terminal block with power applied will result in electric shocks or a malfunction of the robot. To conduct work, be sure to turn OFF the power supply of the controller.

CAUTION



- This label indicates precautions for touching the controller for maintenance or else. Even if the primary power supply is turned OFF, the controller will still have internal

current-carrying parts. Touching the controller immediately after the primary power supply is turned OFF will result in electric shocks, which will induce an imminently hazardous situation.
- To touch the inside of the controller, be sure to turn OFF the primary power supply, and then wait for a lapse of five minutes.
- Do not touch the inside of the controller by a wet hand. Doing so may result in electric shocks. Furthermore, putting moisture to the inside of the controller may result in a malfunction or failure.
- Part replacement must be done by following the contents of the maintenance manual. Wrong procedure may result in a malfunction or failure.

CAUTION

In order to touch a part with this mark, check to be sure that the part is not hot. Touching it unduly may result in burns.

CAUTION

Be careful never to touch parts with this mark. Brakes may be forcedly released not only while in teaching but also even if the servo power supply of the robot (Motors ON) is turned OFF. To touch these parts for maintenance or else, take thorough preventive measures not to be get caught by them.

CAUTION

- Dismounting the motor without providing proper support to them will cause the arm to drop. Before dismounting the motor, be sure to properly support the arm. Since the erroneous insertion or imperfect insertion of the location pin can happen, do not rely only on this pin to fix the arm. Securely support the arm using wooden blocks, springs, or other means, and then dismount the motor from the robot. However, do not attempt to support the robot arm with hands.
- To dismount the motor, stay out from under the arm.
- It is recommended to insert a zeroing pin before removing the motor to make the zeroing operation easier. However, zeroing pin is just a tool to adjust the mechanical reference position and is not a fixing tool for the arm.

CAUTION

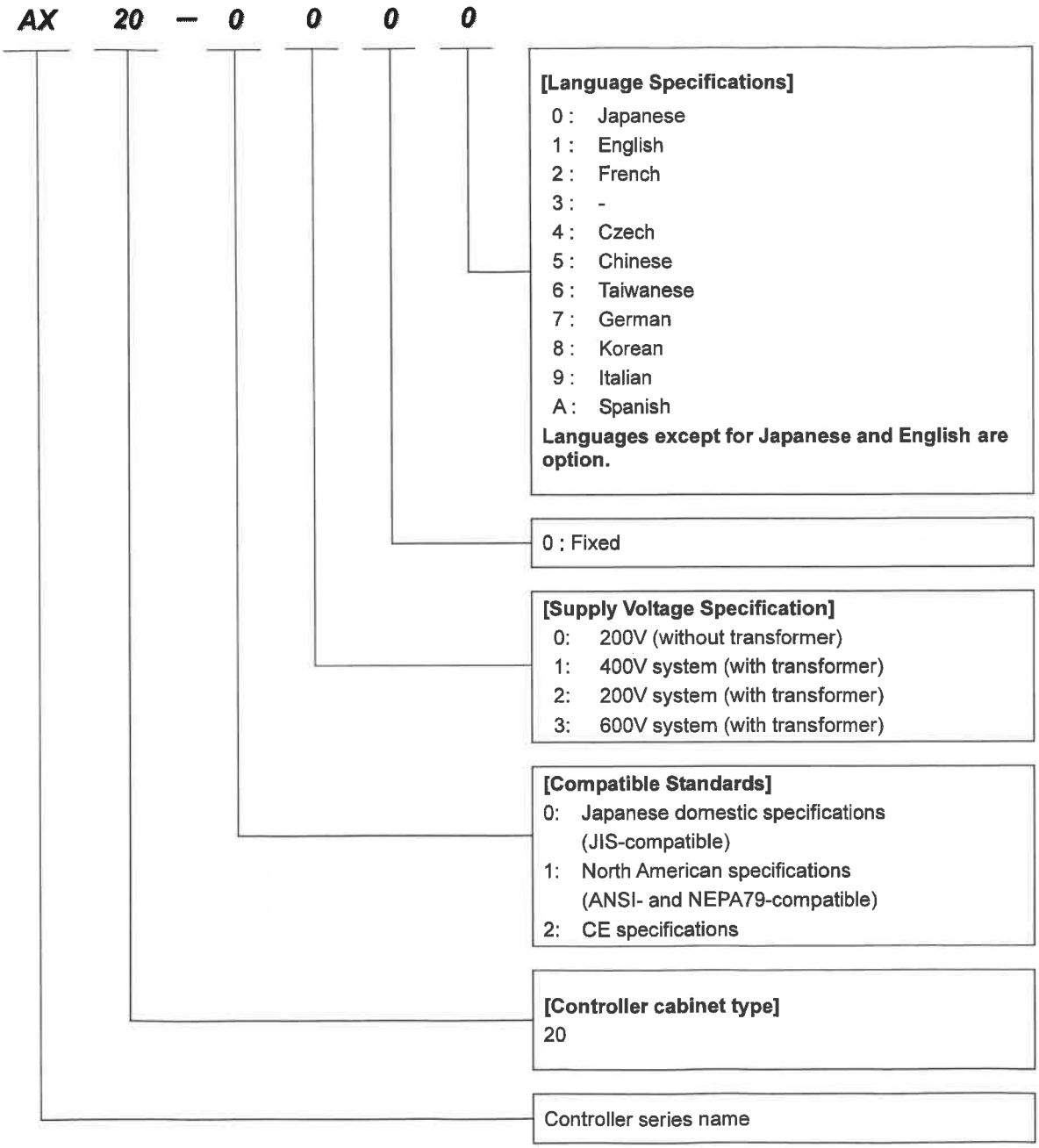
Even to disassemble the robot for maintenance, NEVER disassemble parts with this mark. Otherwise it may result in death or heavy injury.

Chapter 2 Configuration

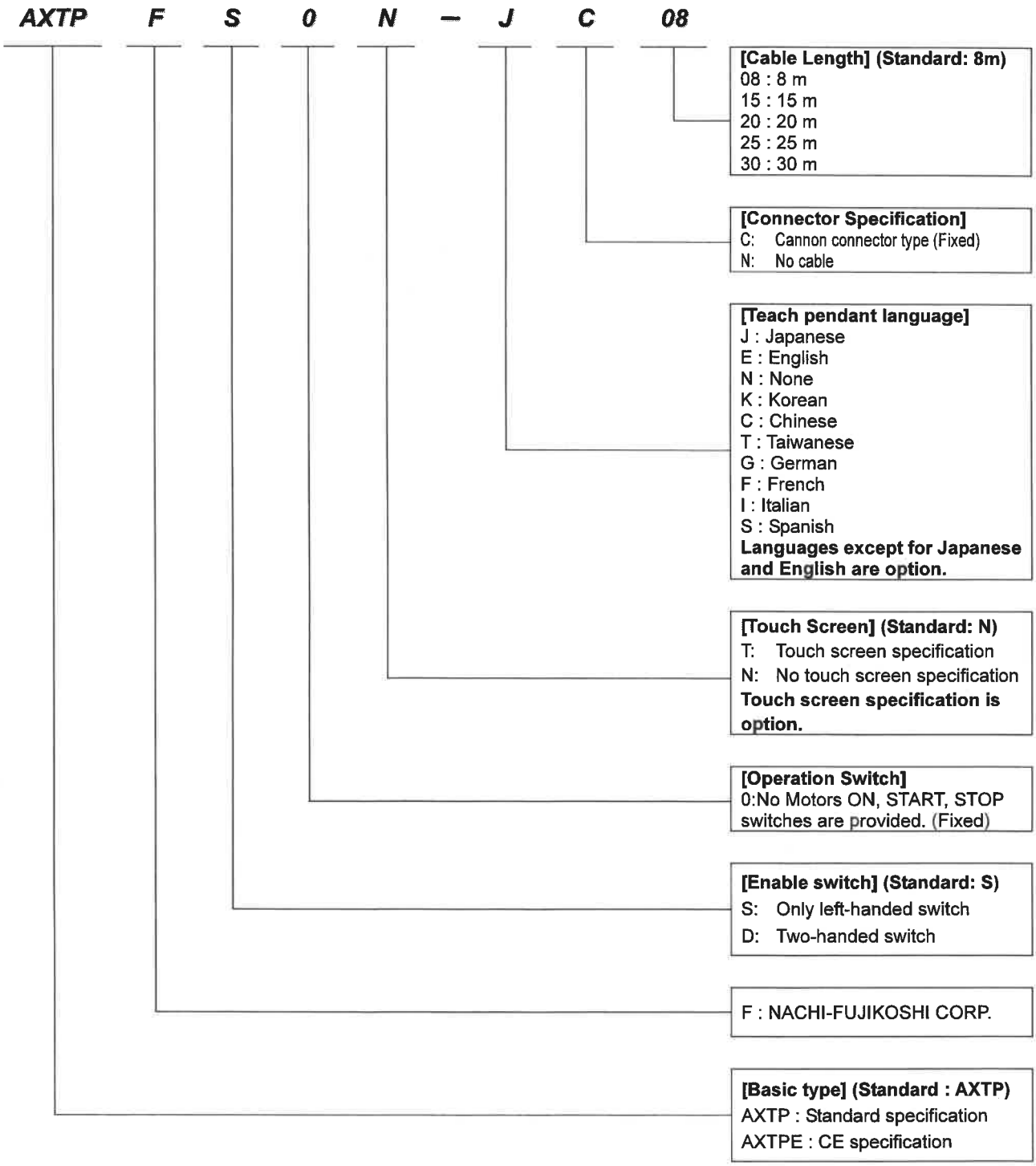
This Chapter describes the configuration of the controller and individual units.

2.1 Specifications of controller

2.1.1 Nomenclature of model name of controller



2.1.2 Nomenclature of model name of teach pendant



2.1.3 Basic Specifications

Table 2.1.1 Basic specifications

Item	Specification
Name	AX20 controller
Application	Spot welding, arc welding, material handling, sealing, palletizing, and others (Note 1)
Construction	Enclosed box type
Cooling system	Indirect cooling system
Ambient temperature	0-45 °C
Ambient humidity	20 - 85% (No dew condensation)
Outline dimensions	For specifications without transformer : W450 x H880 x D550 mm (including caster section) For specifications with transformer : W450 x H1300 x D550 mm (including caster section)
Weight	Approx. 85 kg (without transformer) Approx. 190 kg (with transformer)
Dust-proof/Drip-proof performance	IP54
Input supply voltage	Without transformer: AC200V - 220V +/- 10% (3 phase, 50/60Hz) With transformer: AC380V - 480V +/- 10% (3 phase, 50/60Hz) For details, refer to information in "3.2.2 Transformer Tap Switching Procedure". *(Supplement)* When connecting an over current protection device, please select one whose specification is 375A or less.
Power consumption Peak power while in playback of operation program: The power consumption varies from the robot motion pattern.	ST series Approx. 5 kVA SC heavy load series Approx. 10 kVA LF500S Approx. 9 kVA (3 pillar specification) MR20、MC20 Approx. 2 KVA MR35/50 Approx. 4 KVA MC35/50/70 Approx. 5 KVA
Coated color	Munsell 10GY9/1
Cables to robot (wire harness)	Standard cable length: 5 m (for floor-mounted or rack-mounted type) (10-m, 15-m, 20-m, and 25-m cables are option.)
Operator protective function	• Teach mode/Playback mode interlock • Enable switch (Deadman switch) • Emergency stop button (Operation panel / Teach pendant / External signal input) • Guard fence door interlock signal (SFP) • Enable switch interface
Self-diagnosis function	Used to self-diagnose errors of the robot and controller. (Available for approx. 700 types of errors)
Error detection function	Used to monitor the status of the robot and controller at all times. Used to make the robot an immediate stop when an error occurs.

(NOTE 1) There may be cases where optional boards or optional software should be installed.

Table 2.1.2 Teach pendant basic specifications

Item	Specification
Screen	6.5-inch color TFT LCD (256-color display of 640 × 480 with a back light)
Weight	Approx. 1.3 kg (excluding connection cables)
Touch screen (Option)	Digital touch screen
Enable switch (Deadman switch)	One-handed 3-position Enable switch (Deadman switch) (Two-handed switch is option.)
Operation keys	Function keys (software keys), axis operation keys, CHECK GO/BACK keys, numeric keys, cursor keys, record/delete/position correction keys, and others (A total of 66 keys are provided.)
Switches and buttons	Emergency stop button, teach pendant enable switch, and Enable switch (Deadman switch)
Cable length	Standard cable length: 8 m (15-m, 20-m, 25-m, and 30-m cables are option.)
Display languages	Two languages are selectable from the languages shown below. (Languages except for Japanese and English are option.) (NOTE 2) Japanese, English, Korean, Chinese (Simplified Chinese), Taiwanese (Traditional Chinese), German, French, Italian, and Spanish

(NOTE 2) For details of languages except for Japanese and English, contact our sales representative.

2.2 Parts layouts

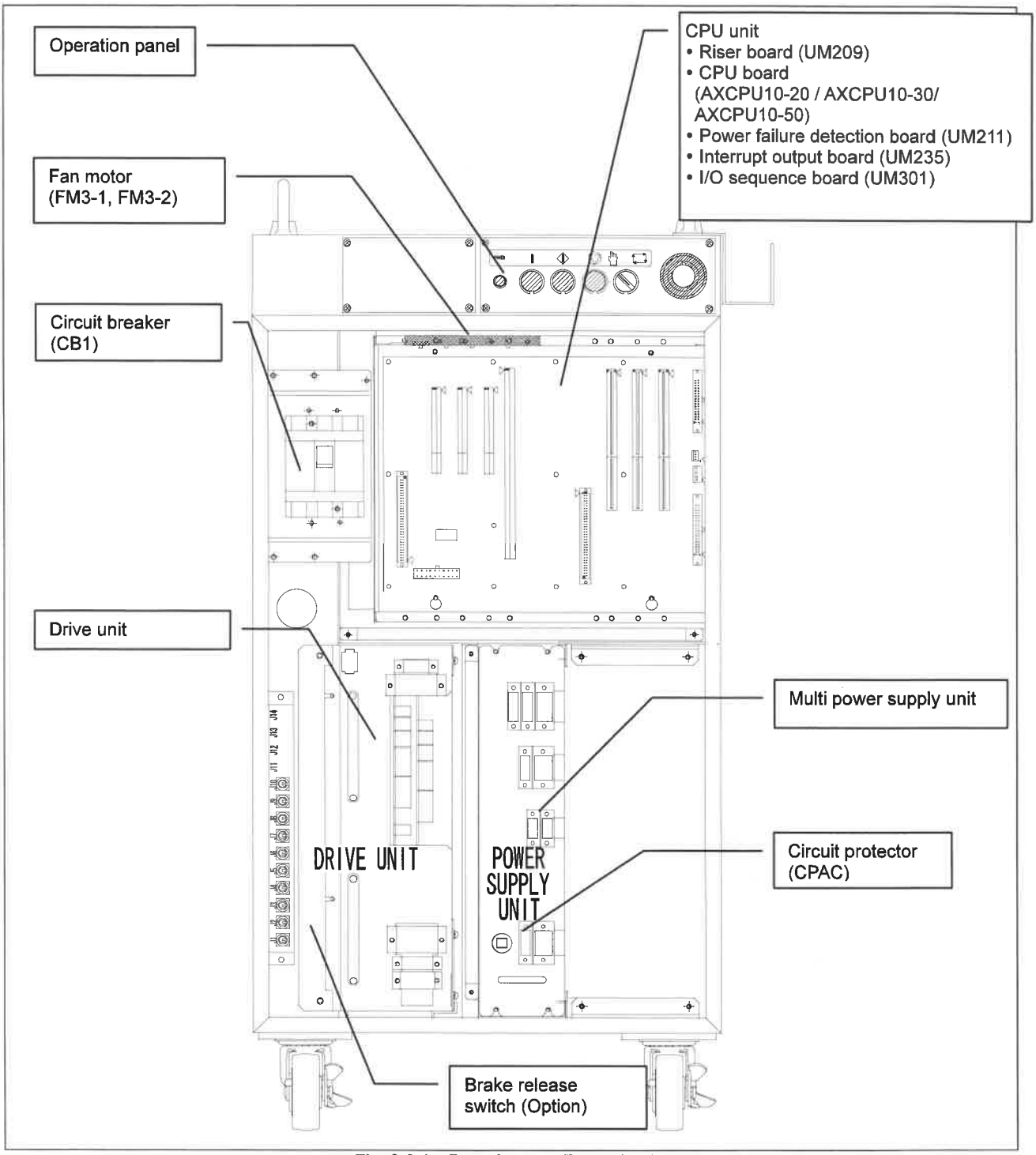


Fig. 2.2.1 Parts Layout (Front View)

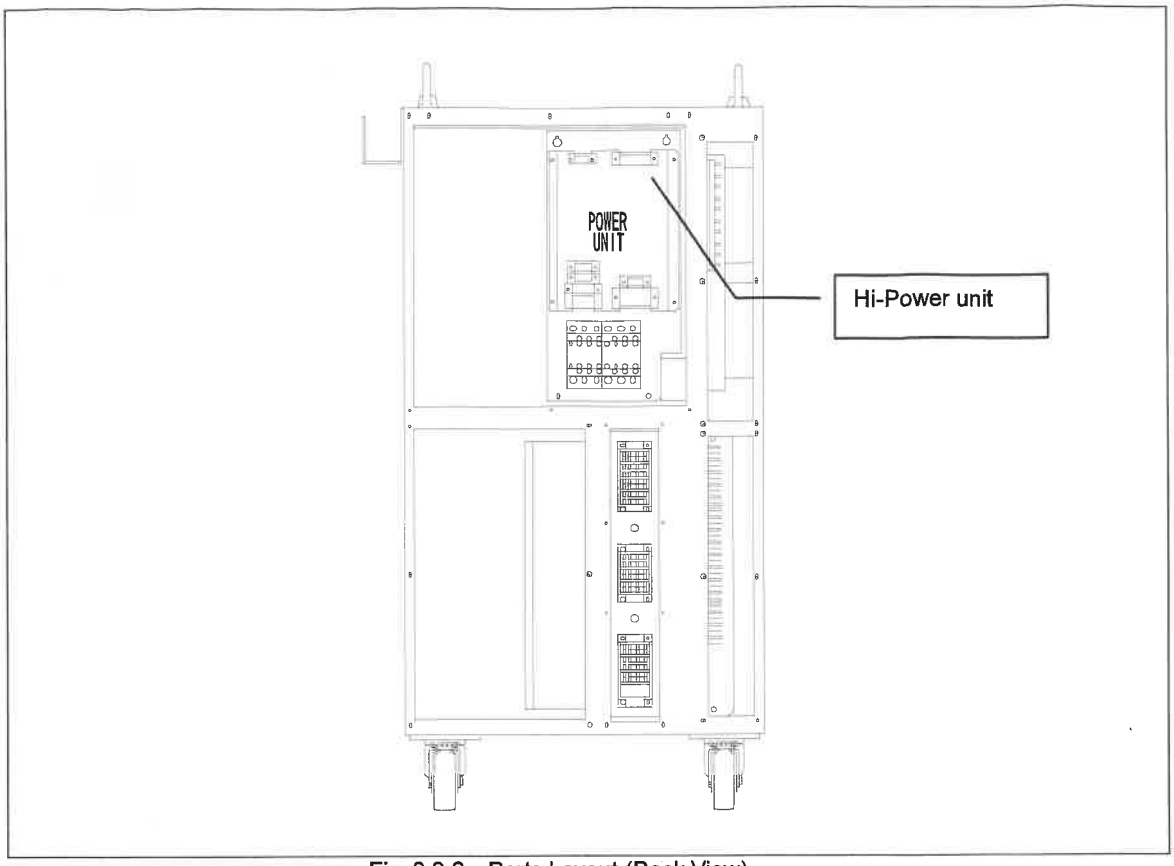


Fig. 2.2.2 Parts Layout (Back View)

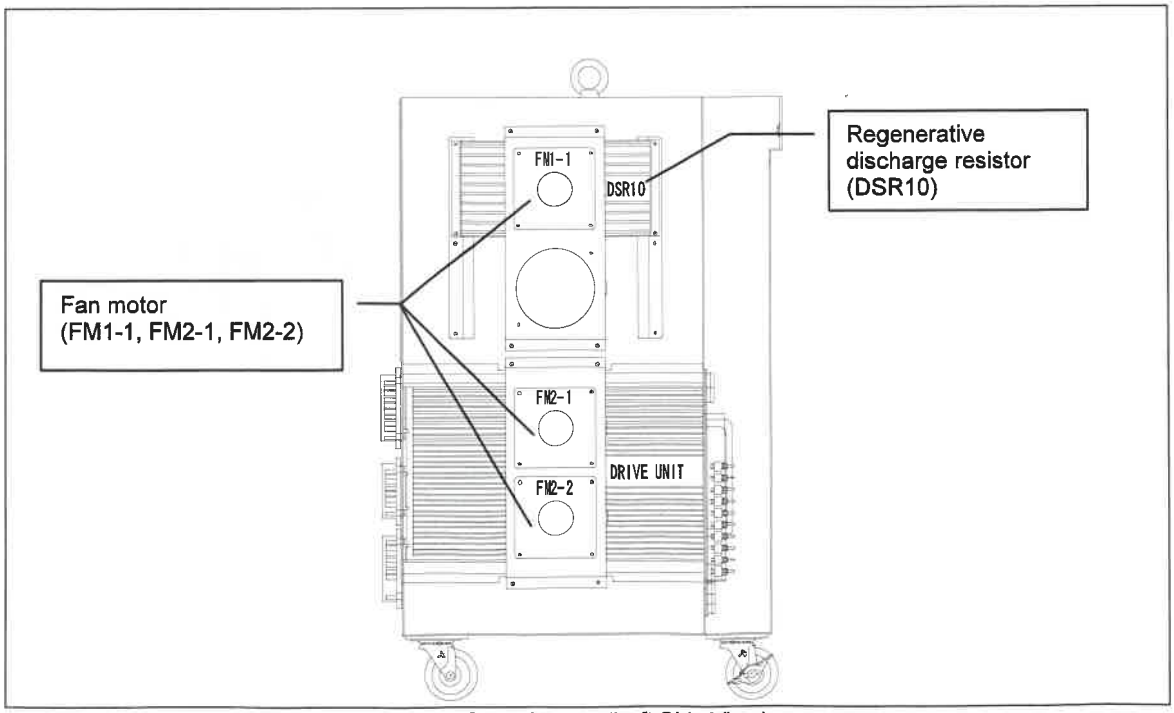


Fig. 2.2.3 Parts Layout (Left Side View)

2.3 Block diagram

2.3.1 Block diagram

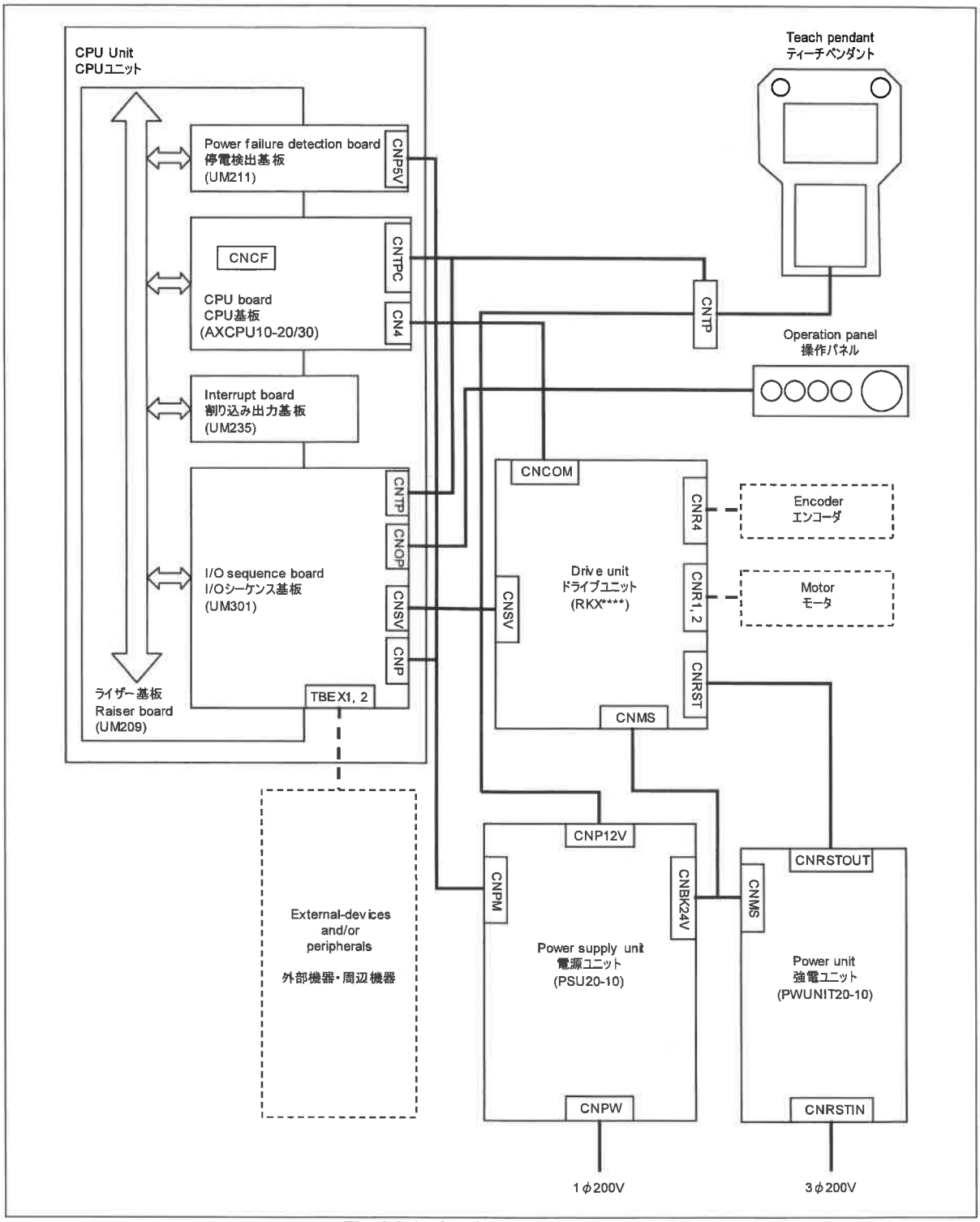


Fig. 2.3.1 Block diagram

2.3.2 Overview of each part

Table 2.3.1 Overview of Each Part

No.	Part/Unit name	Function
1	Riser board (UM209)	• Used for bus connection and power supply between boards
2	CPU board AXCPU10-20 or AXCPU10-30 or AXCPU10-50	• Microprocessor and its peripheral circuit • LCD I/F • RS422 • RS232C • Ethernet • PCI bus • ISA bus • Compact flash card (used for system and for program save) • Compact flash card interface (used for user data backup) • Teach pendant interface
3	Interrupt board *1 (UM235)	• Interrupt output circuit
	Strage board *1 (UM204-20)	• Arc welding interface circuit
4	I/O sequence board (UM301)	• Internal I/O circuit • Internal sequence circuit • Emergency stop safety circuit
5	Power failure detection board (UM211)	• Power failure detection circuit
6	Multi power supply unit (PSU20-10)	• DC+5V power supply SR1 • DC+12V power supply SR2 • DC+24V power supply SR3 (used for control) • DC+24V power supply SR4 (used for brake)
7	Hi-power unit (PWUNIT20-10) (PWUNIT20T-10) (PWUNIT20-20) (PWUNIT20T-20)	• Motor power supply magnet switch control
8	Drive unit (RKX****)	• Servo control CPU • Encoder interface • Motor drive power supply • Motor drive circuit • Magnet switch control MS1 and MS2 (,MS3) (MS3 is only for PWUNIT20T-10 and 20) • Brake control circuit • Shock sensor input signal
9	Teach pendant	• Operation switch circuit (Emergency stop, Automatic/Teach mode selector, and Enable switch (Deadman switch)) • Teaching, Keyboard for a variety of settings, LCD display, Touch screen (Option) circuits

*1 In case of standard specification, "Interrupt board(UM235" , in case of arc welding specification, "Storage board (UM204)" is installed to the connector CNSTR on the riser board UM209. (For details, refer to [2.4.1Riser board (UM209)])

2.4 Functions of each part and unit

The following section describes the functions of each part and unit.

2.4.1 Riser board (UM209)

The riser board (UM209) is a backplane board, to which a CPU board, I/O sequence board, power failure detection board, interrupt output board, PCI card, and others are mounted.

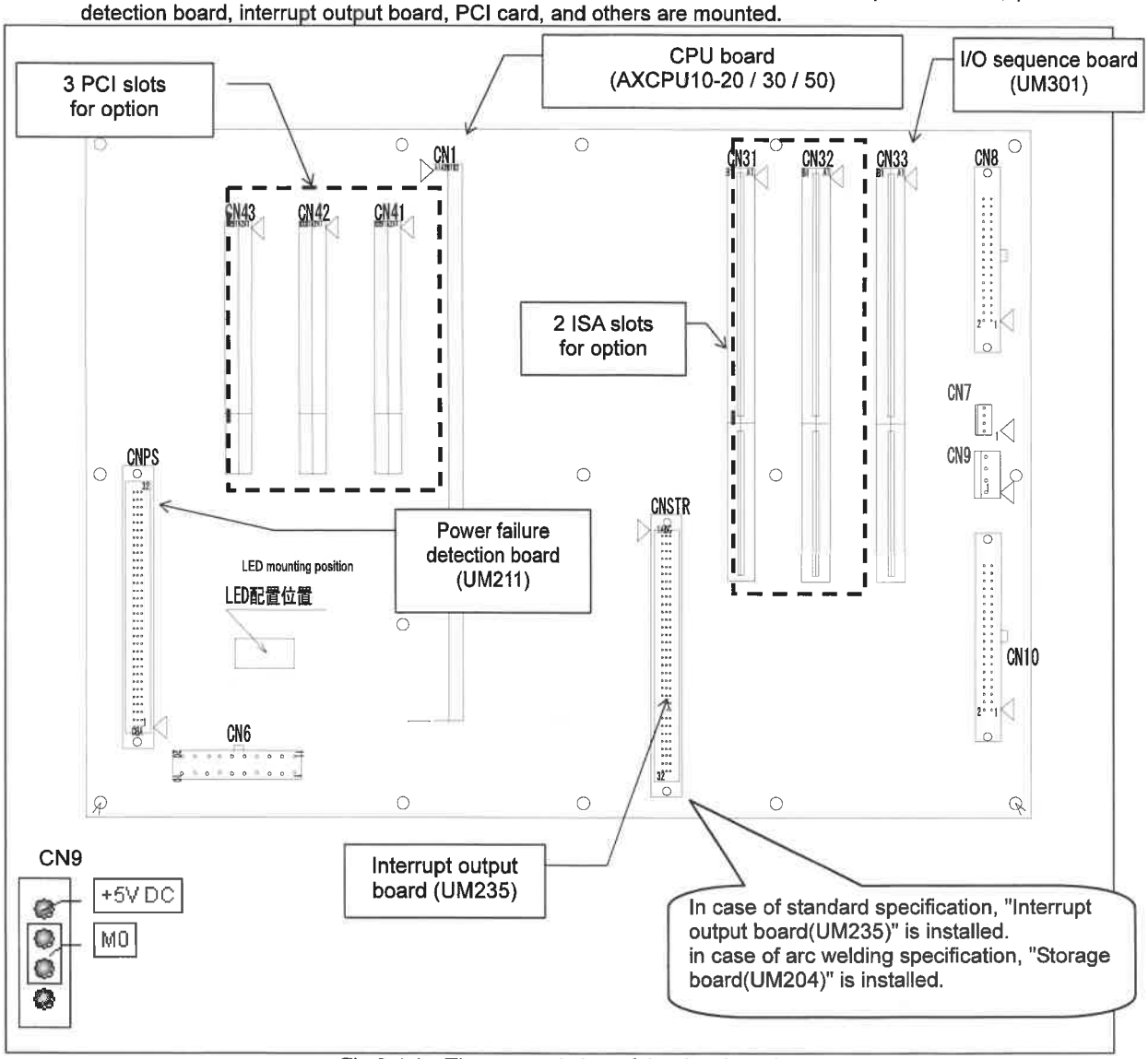


Fig 2.4.1 The external view of the riser board

Table 2.4.1 LEDs on the riser board

LED	Connection
K12V LED	This LED will be turned ON when the switching regulator (12V) of the multi power supply unit is in normal operation.
K3V LED	Not in use (Normally OFF)
K5V LED	This LED will be turned ON when the switching regulator (5V) of the multi power supply unit is in normal operation.
K MLX LED	This LED will be turned ON when the CPU board is normally mounted.

2.4.2 CPU board (AXCPU10-20 / AXCPU10-30) (August 2010 or before)

The CPU board (AXCPU10-20 / AXCPU10-30) is used to perform the robot control, user interface, and communications and control with peripheral equipment connected.

Functions:

- Microprocessor and its peripheral circuit
- Main CPU temperature sensor
- LCD I/F
- RS422
- RS232C
- Ethernet
- PCI bus
- ISA bus
- Compact flash card (used for system and for program save)
- Compact flash card interface (used for user data backup)
- Teach pendant interface

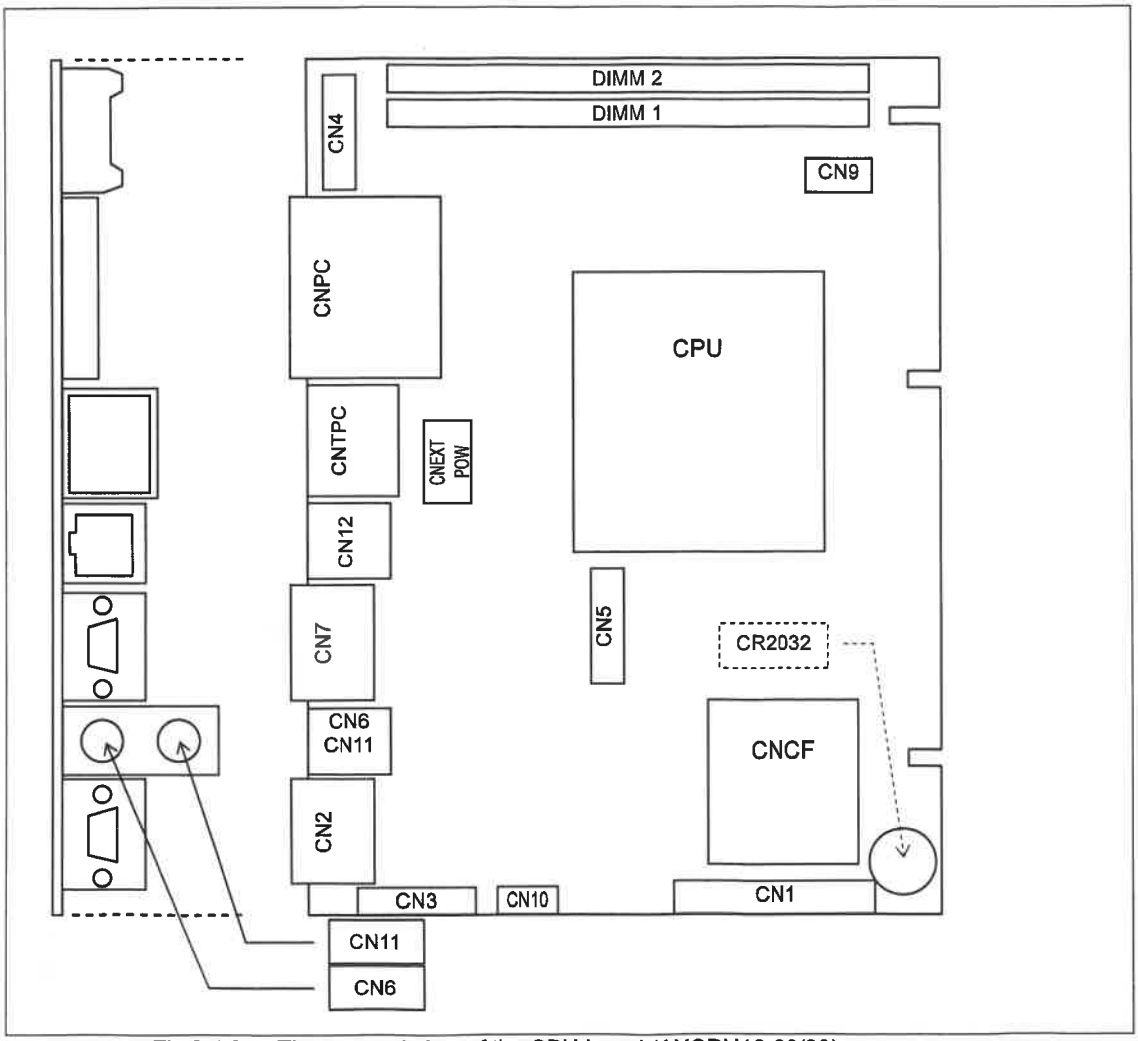


Fig 2.4.2 The external view of the CPU board (AXCPU10-20/30)

Table 2.4.2 Connection of the CPU board

Connector name	Function	Destination
CN1	Parallel port	Not connected.
CN2	RS232C	Not connected. (This connector may be used as an option.)
CN3	RS422	Not connected.
CN4	USB	Connected to the drive unit.
CN5	LCD	Not connected.
CN6	Mouse	Not connected.
CN7	VGA	Not connected.
CN9	CPU fan	Connected to the CPU fan in the board.
CN10	External battery	Not connected.
CN11	Keyboard	Not connected.
CN12	LAN	Not connected.
CNCF	IDE signal	Used to mount a compact flash card to save system software and operation programs.
CNPC	PCMCIA signal	Used to connect a compact flash card for user data backup.
CNTPC	Panel link signal RS422 signal	Connected to the teach pendant.
CNEXTPOW	12V	Not connected.

CAUTION

To users of optional software:
If you replace a CPU board, request our Service Center to make resetting of the optional software. If the resetting is not made, the optional software will be completely locked after a lapse of two weeks.

CAUTION

About battery:
The CPU board has a battery (CR2032) for built-in clock. Replace this battery at regular intervals of time, i.e., every 3 years.
For the replacement procedure, refer to "3.1.6 Replacement of battery for calendar".

2.4.3 CPU board (AXCPU10-50) (September 2010 or after)

The CPU board (AXCPU10-50) is used to perform the robot control, user interface, and communications and control with peripheral equipment connected.

Functions:

- Microprocessor and its peripheral circuit
- Main CPU temperature sensor
- RS232C
- Ethernet
- PCI bus
- ISA bus
- Compact flash card (used for system and for program save)
- Compact flash card interface (used for user data backup)
- Teach pendant interface

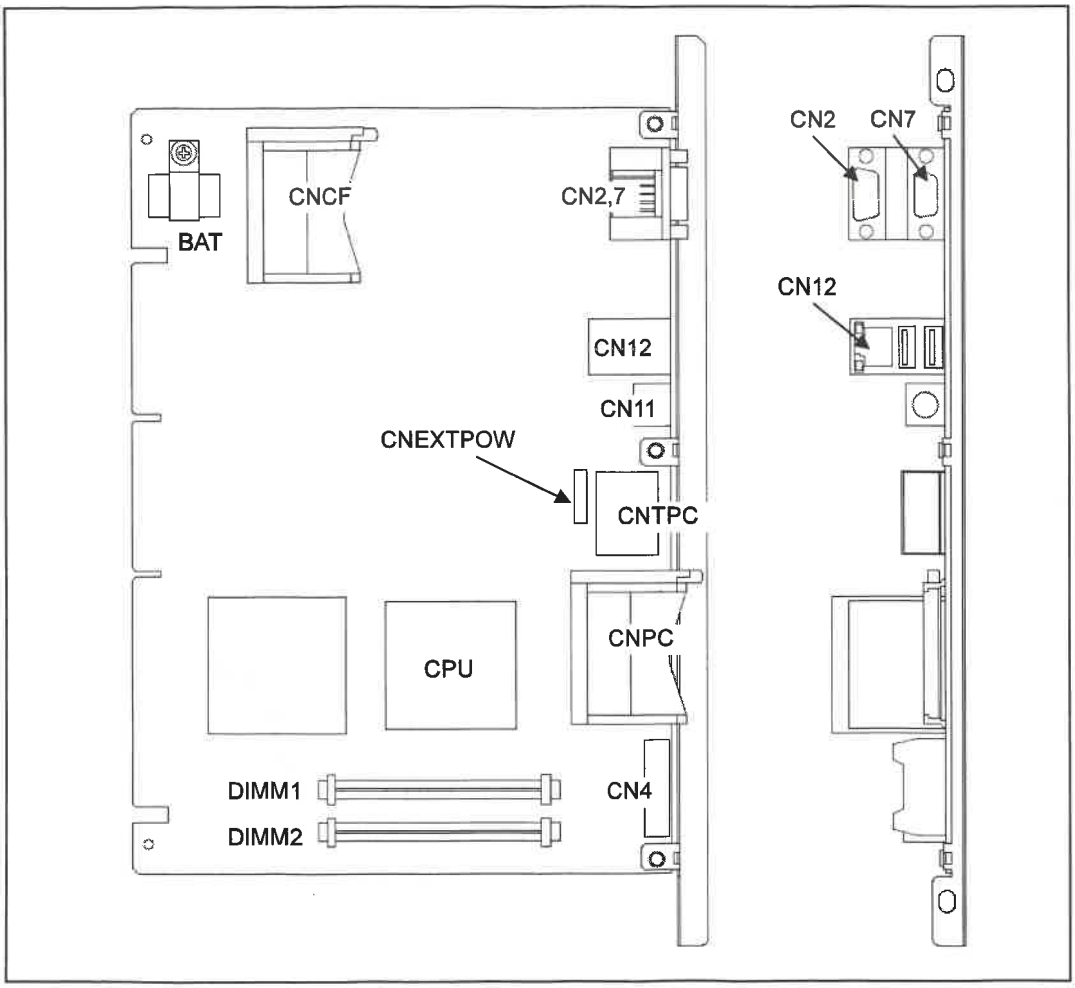


Fig.2.4.3 The external view of the CPU board (AXCPU10-50)

Table 2.4.3 Connection of the CPU board

Connector name	Function	Destination
CN2	RS232C	Not connected. (This connector may be used as an option.)
CN4	USB	Connected to the drive unit.
CN7	Display	Not connected.
CN11	Keyboard	Not connected.
CN12	LAN	Not connected.
CNCF	IDE signal (System CF)	Used to mount a compact flash card to save system software and work programs.
CNPC	PCMCIA signal (User CF)	Used to connect a compact flash card for user data backup.
CNTPC	Panel link signal RS422 signal	Connected to the teach pendant.
CNEXTPOW	12V	Not connected.

CAUTION

To users of optional software:
If you replace a CPU board, request our Service Center to make resetting of the optional software. If the resetting is not made, the optional software will be completely locked after a lapse of two weeks.

CAUTION

About battery:
The CPU board (AXCPU10-50) has a battery (R00877) for built-in clock. Replace this battery at regular intervals of time, i.e., every 5 years.
For the replacement procedure, refer to "3.1.6 Replacement of battery for calendar".

2.4.4 Interrupt output board (UM235)

The UM235 board is used to output interrupt signals.

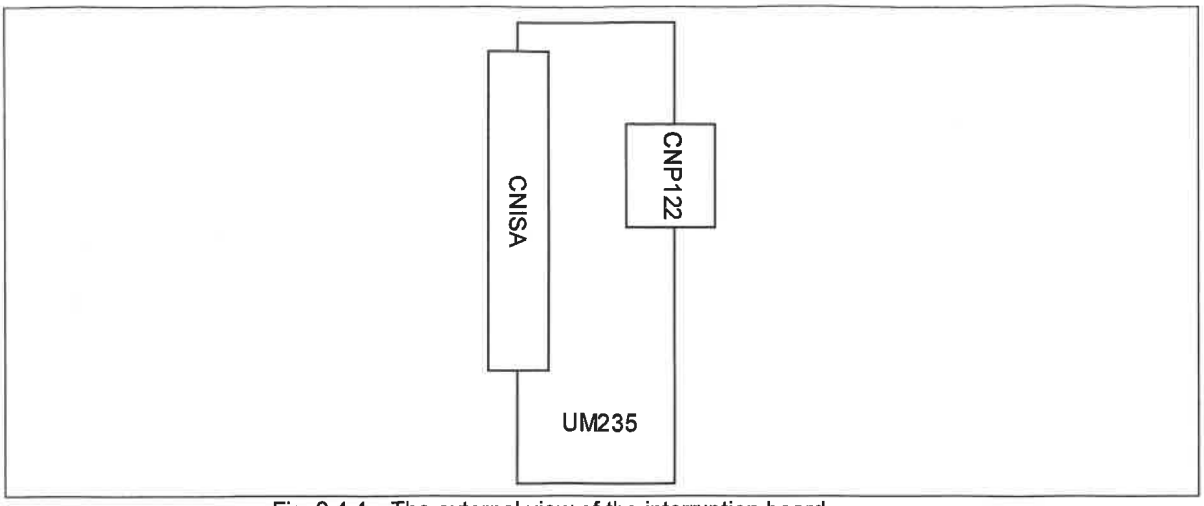


Fig. 2.4.4 The external view of the interruption board

Table 2.4.4 Connection of the interrupt output board

Connector name	Function	Destination
CNISA	CPU bus	Connected to the riser board (UM209).
CNP122	12V	Not connected.

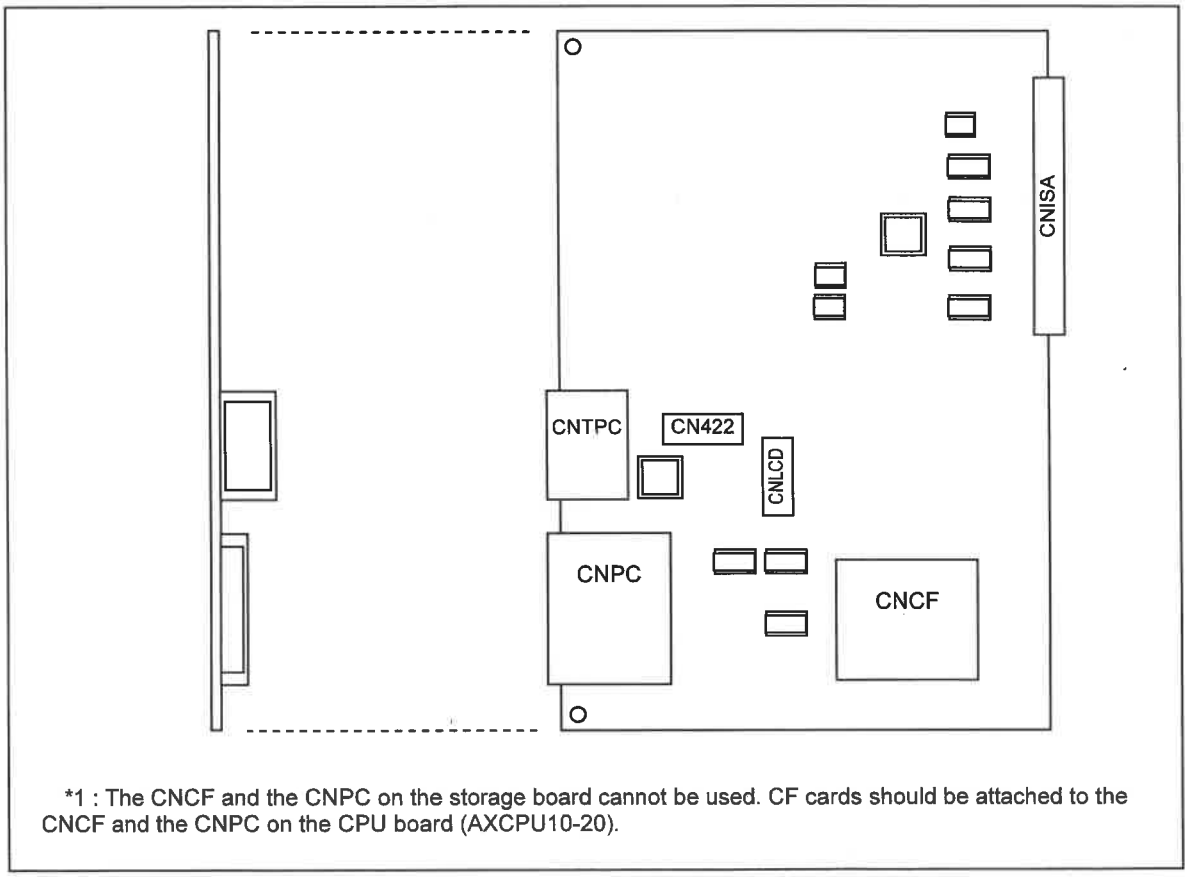
2.4.5 Storage board (UM204-20)

The storage board (UM204) is a board incorporating a welder interface circuit.

Function:

- Welder interface circuit (for arc welding specifications)

External View



*1 : The CNCF and the CNPC on the storage board cannot be used. CF cards should be attached to the CNCF and the CNPC on the CPU board (AXCPU10-20).

Fig. 2.4.5 The external view of the storage board

Table 2.4.5 Connection of the storage board

Connector name	Function	Destination
CNCF	IDE signal	Not connected.
CNPC	PCMCIA signal	Not connected.
CNISA	CPU bus	Connected to the riser board (UM209).
CNTPC	Panel link signal RS422 signal	Not connected.
CNLCD	LCD signal	Not connected.
CN422	RS422 signal	Not connected.

Table 2.4.6 JP setting of the storage board (x: Open(one-sided insertion) o: Short circuit)

Setting location	Setting status	
J1	1-2	×
J2	1-2	×
J3	1-2	O
J4		Not in use
J13 - J18		Not in use

2.4.6 I/O sequence board (UM301)

The I/O sequence board (UM301) is used to control digital I/O signals inside of the controller and perform the motors ON sequence control operation.

Functions:

- Internal I/O circuit
- Internal sequence circuit
- Emergency stop safety circuit

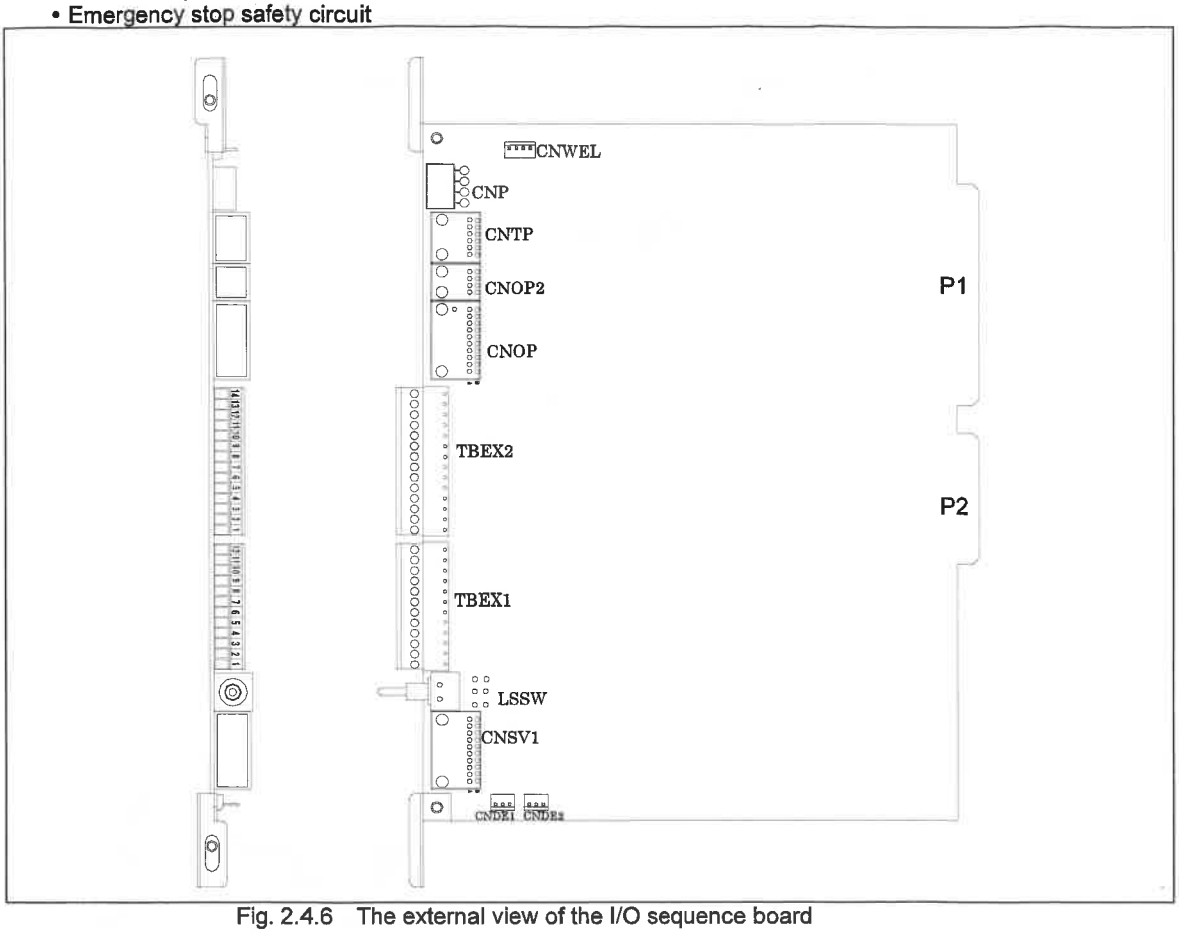


Fig. 2.4.6 The external view of the I/O sequence board

Table 2.4.7 Connection of the I/O sequence board

Connector name	Function	Destination
CNP	DC+24V power supply input	Connected to the Multi power supply unit.
CNTP	Teach pendant signal	Connected to the teach pendant.
CNOP2	Not in use	Not connected yet.
CNOP	Operation panel switch signal	Connected to the operation panel.
TBEX2	External connection I/O signal	Connected to the external equipment.
TBEX1	External connection input signal	Connected to the external equipment.
LSSW	LS release SW	Used to release the limit switch.
CNSV	Servo amplifier I/O signal	Connected to the drive unit.
P1	CPU bus	Used to connect CPU bus signal. Connected to the riser board (UM209).
P2	CPU bus	Connected to the riser board (UM209).

(JP3 setting)

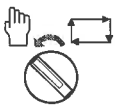
Default	Description
1-2 short	Power supply output setting from TBEX2 (1-2 short: external 1-2 open: Internal)

How to use Over-travel LS release switch "LSSW"

When the robot works over the software limit range, the Over-travel LS may work. In this case, the robot stops for safety, therefore recover the robot according to the following procedures.

WARNING

The LSSW must be operated by the other worker. If the work is carried out by oneself, sufficient attention may not be paid to the robot motion, and accidents such as interference or so may occur.



1 Select Teach mode.

2 Select the operator class **EXPERT.**

(NOTE) Concerning the **EXPERT** and the operator class, please refer to the chapter 4 of "Installation manual(TAXEN-053)".

3 Confirm the mechanism number currently selected.
If the desired mechanism is not selected, please change the mechanism number using [UNIT/MECH.] key.

4 Select the manual operation mode "JOINT" by pressing [Interpolation/Coordinate] key.

>> Displayed icon on the teach pendant changes like the icon shown above.

5 Enter [3 Machine constants][5 software Limit] by pressing f5 <Constant Setting> key.

CAUTION

When entering [5 Software Limit] screen, because the software limit function is temporarily disabled, please be sure to pay special attention to the operation of the robot.

6 Press the LSSW on the UM301 board. Because this switch returns to the original position automatically, please keep pressing.
(NOTE) Although this switch can be pushed not only upward but also downward, this switch works only while being pushed upward.

I

7 Press the [Motors ON] button.

8 Grasp the Enable switch(Deadman switch).

9 Move the axis that touches the Over-travel LS by pressing axis operation keys so that the robot goes into the range of the software limit.
Please pay special attention to the direction of the operation to avoid unexpected interference to the mechanical stopper.

10 Release the finger from the LSSW.

After confirming the motion of the robot efficiently, re-start the normal operation.

Electrical Input/Output specification of the terminal blocks

Electric input specification : DC24 V, 10 mA

The input signal must have been closed for 150ms or longer. Connect the relay contact (dry contact) and the relay to satisfy the above specification to avoid contact failure and other fault.

IMPORTANT

Electric output specification :

Relay contact (dry contact) output AC100V or DC30V, 1A

To connect the coil circuit such as relay, be sure to install the surge absorb circuit in advance.

The following value is a rough standard of the minimum load level. It may vary depending on the switching frequency, the environment condition and the expecting reliability standard, therefore, check with the actual load prior to use.

Rough standard of minimum load : Minimum current 5V, 1mA

Table 2.4.8 Pin layout of TBEX1

Pin No	Signal name	Function	Description
12	MATSW2	Teaching enable switch input 2-	This is a teach enable switch input terminal. When not using this terminal, connect jumper wires as shown below. Connect 9 and 10 Connect 11 and12
11		Teaching enable switch input 2+	
10	MATSW1	Teaching enable switch input 1-	
9		Teaching enable switch input 1+	
8	SFP2	Safety plug input 2-	This is a safety plug input terminal.
7		Safety plug input 2+	
6	SFP1	Safety plug input 1-	
5		Safety plug input 1+	
4	E.STOP2	External emergency stop input 2-	This is an external emergency stop input terminal. When not using this terminal, connect jumper wires as shown below. Connect 3 and 4 Connect 1 and2
3		External emergency stop input 2+	
2	E.STOP1	External emergency stop input 1-	
1		External emergency stop input 1+	

(NOTE)
Be sure to make a redundant contact when applying either of E.STOP, SFP or MATSW.
< Example > When applying E.STOP : Pin1-2 and Pin3-4>

Table 2.4.9 Pin layout of TBEX2

Pin No	Signal name	Function	Description
14	M2	External power ground	Supplying the external power (DC24V) between the terminals P2-M2 makes the power supply possible to the emergency stop circuit in the robot controller. Even the primary power of robot controller has been shut off, the emergency stop circuit effectively works if the external power (DC24V) is supplied with this function. Then, the emergency stop output 1 and 2 switches ON/OFF according to the condition of the emergency stop button. (Normally, short-circuited) **Note**: When using the external power, specify the JP3 setting to 2-3 short circuit. (The default setting is 1-2 short circuit.) M2 terminal is connected with M1 terminal in the controller.
13	P2	External power 24V input	
12	M1	Ground	Terminal for DC24V - 0V power inside the robot controller. Do not use this terminal outside the robot controller since this is for the internal use only. Also, do not use this terminal when other devices are to be installed.
11	P1	24V	
10	RMD_EN	External mode select (input) (X0041)	Optional function. To use this function, an optional product should be purchased. When RMD_EN is ON (connected with MONCOM), the controller is switched to "playback mode" if E.MODE is turned ON (connected with MONCOM). Using this function, it is possible to select the teach mode and the playback mode from the external operation panel.
9	E.MODE	External teach/ playback (input) (X0039)	
8	E.MON	External Motors ON (input) (X0055)	Input terminal to externally input the Motors ON signal. If this terminal is connected with MONCOM, the motors are turned ON. In order to enable this terminal input, specify [2 MotorsON/START sel source] to "External" in [Service][1 Teach/Playback Condition] setting screen.
7	MONCOM	Common	Common terminal for Pin No. 8,9, and 10.
4	E.STOP.OUT2	Emergency stop output 2- (dry contact)	Dry contact A output terminal to indicate the status of the emergency stop signal. When the emergency stop button on the operation panel of the controller or the teach pendant is pressed, this signal turns OFF(the contact is open). This output has been designed dual. (The dry contact output has been provided in two individual systems.)
3		Emergency stop output 2+ (dry contact)	
2	E.STOP.OUT1	Emergency stop output 1- (dry contact)	
1		Emergency stop output 1+ (dry contact)	

*1 : Pin7 is connected to Pin11 inside the PCB. It is also possible to use Pin11 as MONCOM.

IMPORTANT

When using relays, ensure that the configuration has relays of less than DC 24 V. AC relays cannot be used.

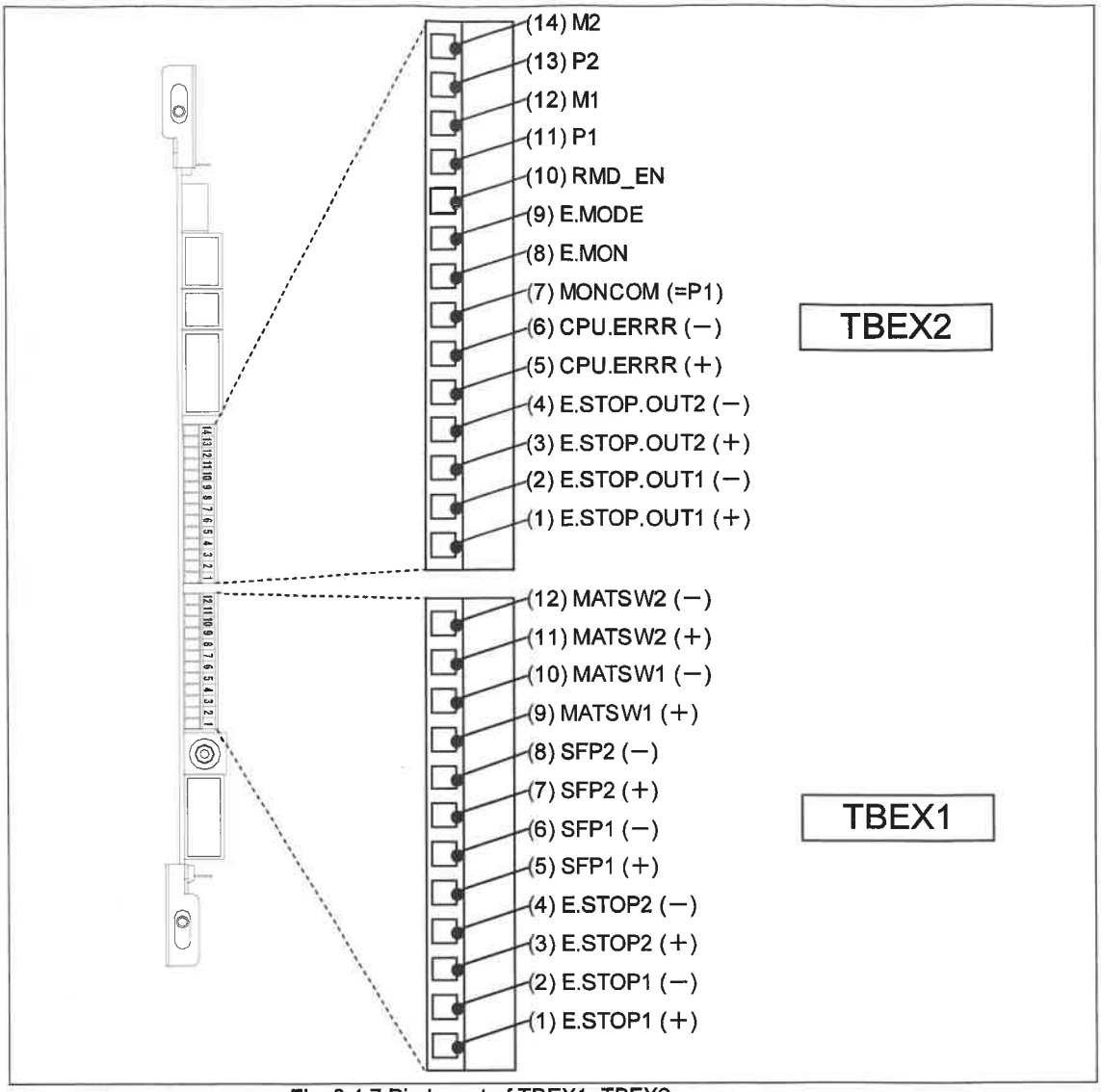


Fig. 2.4.7 Pin layout of TBEX1, TBEX2

2.4.7 Power failure detection board (UM211)

The UM211 board incorporates a primary power supply voltage monitoring circuit and is used to originate an interrupt to the CPU when the power goes out.

Function:

- Primary power supply voltage monitoring circuit

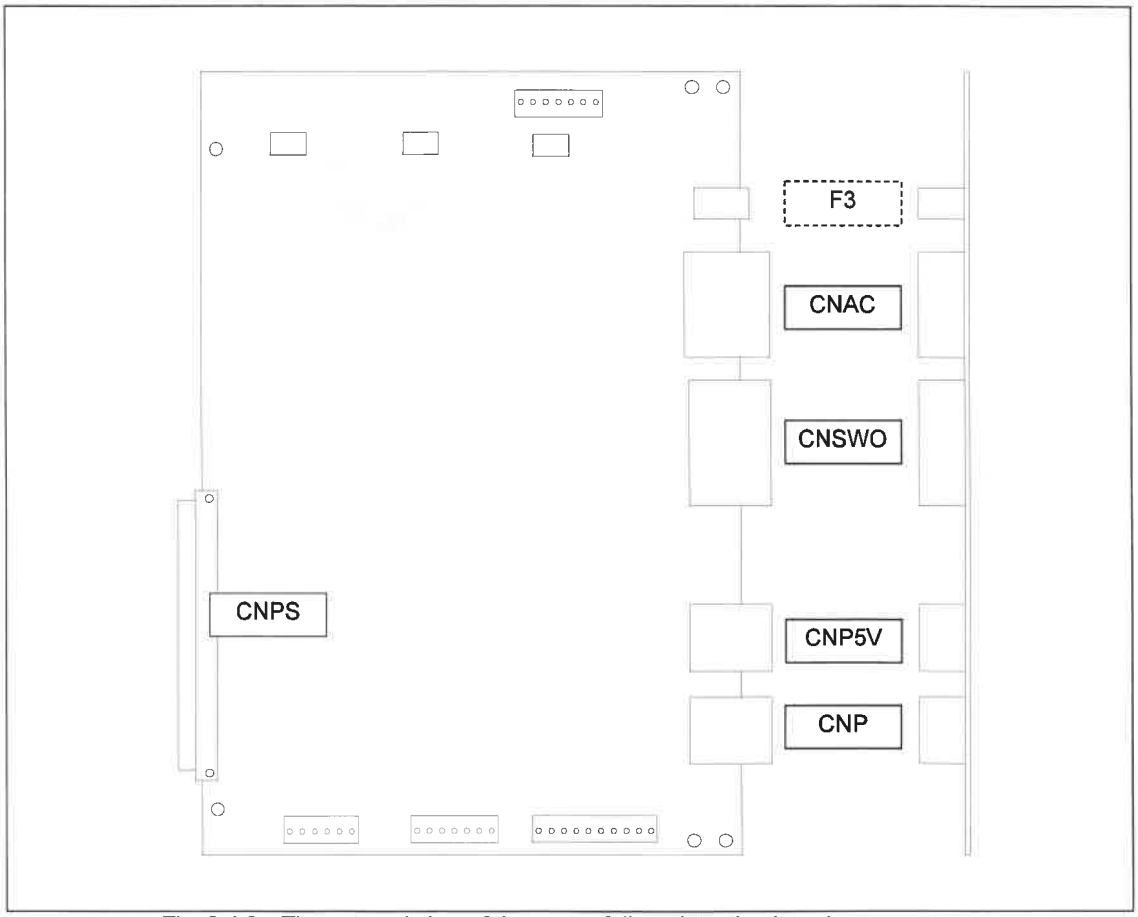


Fig. 2.4.8 The external view of the power failure detection board

Table 2.4.10 Connection of the power failure detection board

Connector name	Function	Destination
CNP	Not in use	Not connected.
CNP5V	DC+5V power supply input	Connected to the Multi-power supply unit.
CNSWO	200-VAC power supply output	Not connected.
CNAC	200-VAC power supply input/output	Connected to the Multi-power supply unit and the drive unit.
CNPS	Power supply to the riser board	Connected to the riser board (UM209).

Table 2.4.11 Fuses on the power failure detection board

No.	Function	Description
F3	Circuit protection (3A)	Used to break the circuit when over current occurs in the fan motor line.

2.4.8 Multi power supply unit (PSU20-10)

This unit is used to supply DC power to the inside of the control panel.

Functions:

- DC+5V power supply SR1
- DC+12V power supply SR2
- DC+24V power supply SR3 (used for control)
- DC+24V power supply SR4 (used for brake)

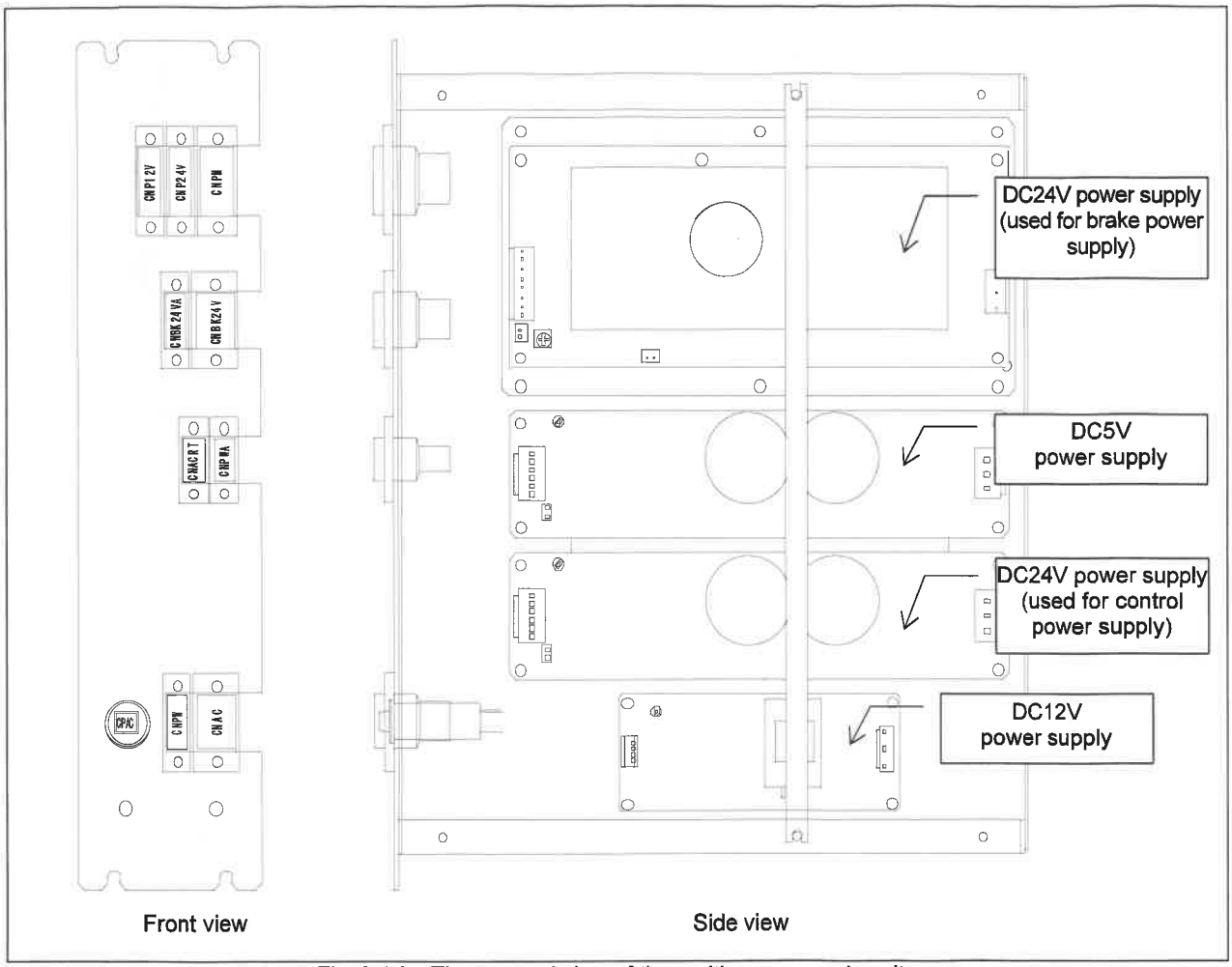


Fig. 2.4.9 The external view of the multi power supply unit

Table 2.4.12 Connection of the multi power supply unit

Connector name	Function	Destination
CNPM	DC+5V power supply output	Connected to the power failure detection board (UM211).
	DC+24V power supply output	Connected to the I/O sequence board (UM301) and the drive unit.
CNP24V	DC+24V power supply output	Not connected.
CNP12V	DC+12V power supply output	Connected to the teach pendant.
CNBK24V	DC+24V power supply output	Connected to the drive unit.
CNBK24VA	DC+24V power supply output	Not connected.
CNPWA	CP trip detection	Not connected.
CNACRT	CP trip detection	Connected to the drive unit.
CNAC	AC200V power supply output	Connected to the drive unit and the power failure detection board (UM211).
CNPW	AC200V power supply input	Connected to the Hi-power unit.

Table 2.4.13 Circuit protector on the multi power supply unit

No.	Function	Description
CPAC	Circuit protection (10A)	Used to break the circuit when over current occurs in the AC power line.

2.4.9 Hi-power unit (PWUNIT20-10/20T-10/20-20/20T-20)

The Hi-power unit consists of magnet switches that control power to the drive unit using signals from the sequence board and a noise filter.

Function:

- Control of magnet switches for motor power supply

PWUNIT20-10

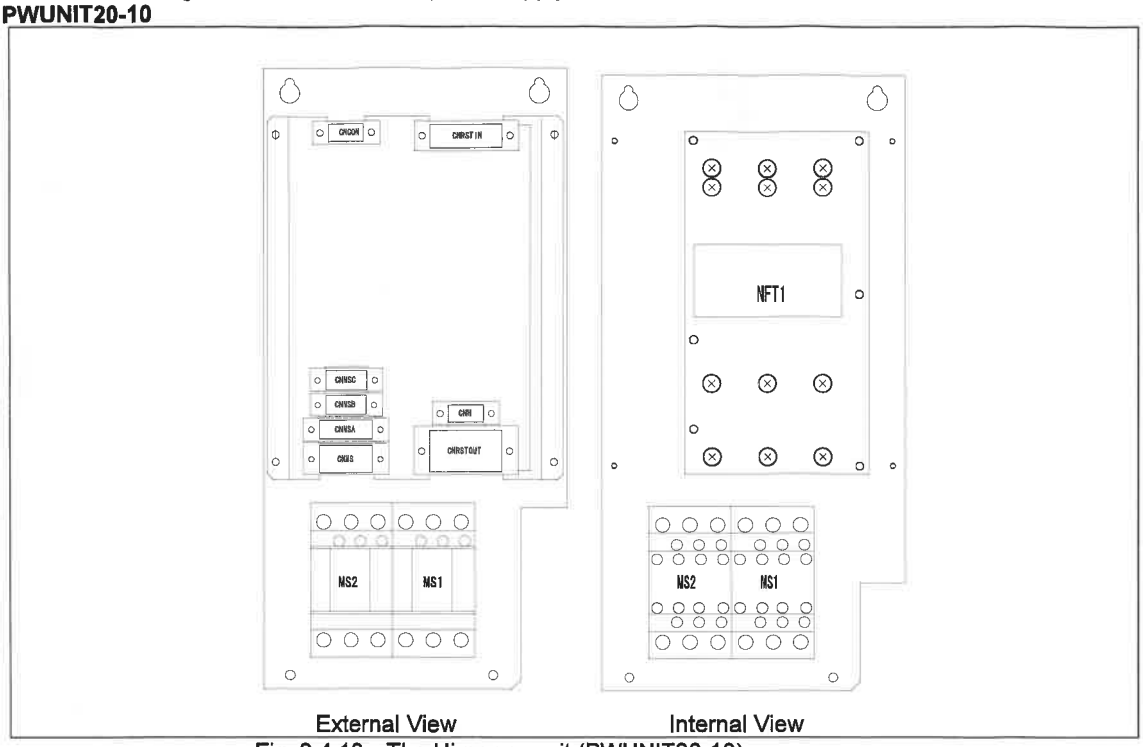


Fig. 2.4.10 The Hi-power unit (PWUNIT20-10)

PWUNIT20-20

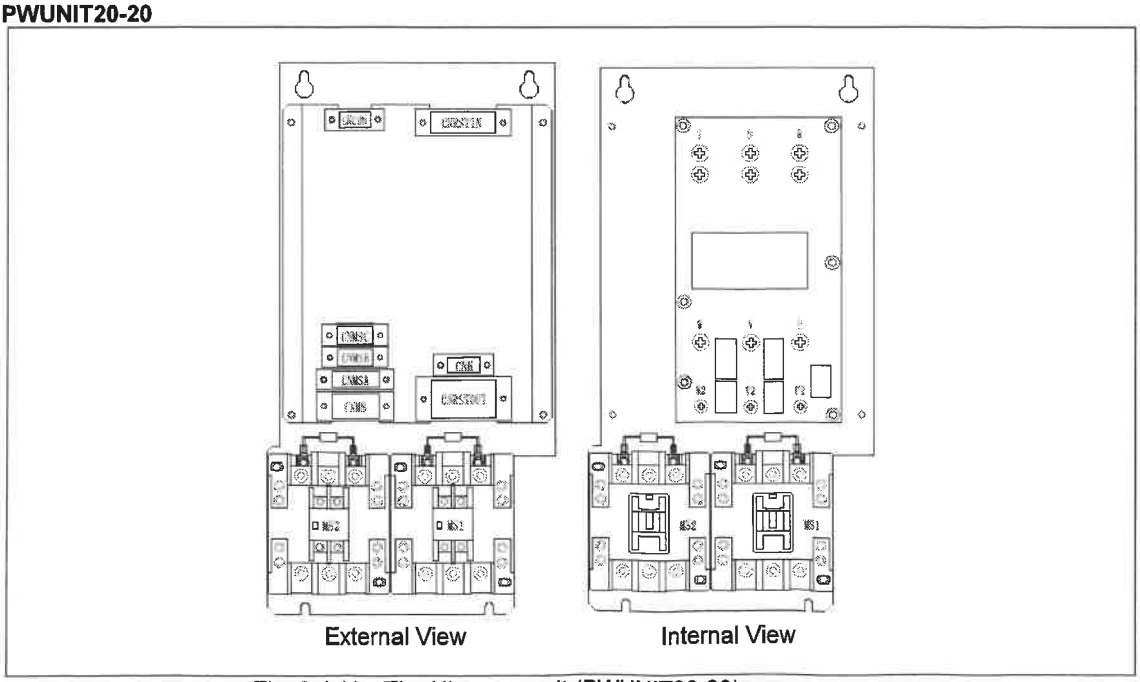


Fig. 2.4.11 The Hi-power unit (PWUNIT20-20)

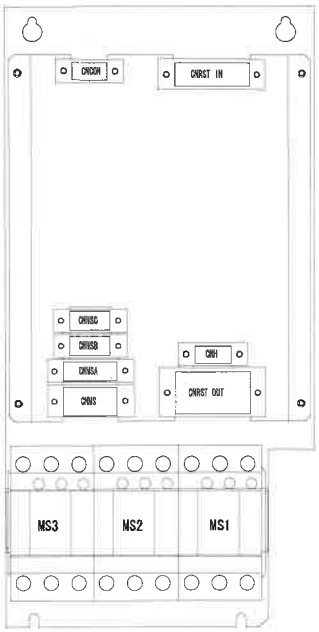
Table 2.4.14 Connection of the Hi-power unit (PWUNIT20-10/20)

Connector name	Function	Destination
CNRSTIN	3-phase 200-VAC input	Connected to the circuit breaker (CB1).
CNRSTOUT	Power supply output for the drive unit and for the DC power supply	Connected to the drive unit and the multi power supply unit.
CNMS	Magnet switch contact	Connected to the drive unit.
CNMSA	Magnet switch contact	Not connected.
CNMSB	Magnet switch contact	Not connected.
CNMSC	Magnet switch contact	Not connected.
CNH	Hour meter output	Not connected. (Option)
CNCON	Outlet output	Not connected. (Option)

Hi-power unit (PWUNIT20T-10/20) has 3 magnet switches inside. (These units are for CE specification)

PWUNIT20T-10

External View



Internal view

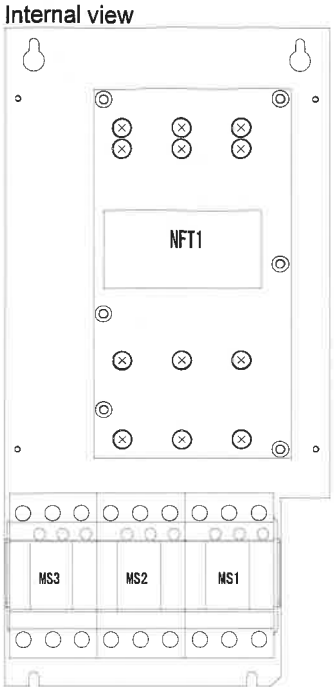
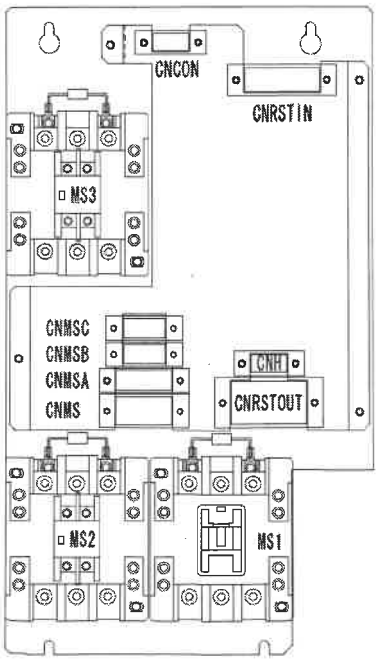


Fig. 2.4.12 The Hi-power unit (PWUNIT20T-10)

PWUNIT20T-20

External View



Internal view

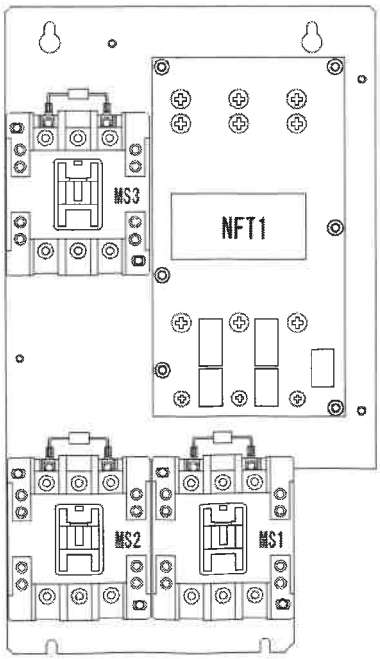


Fig. 2.4.13 The Hi-power unit (PWUNIT20T-20)

Table 2.4.15 Connection of the Hi-power unit (PWUNIT20T-10 / PWUNIT20T-20)

Connector name	Function	Destination
CNRSTIN	3-phase 200-VAC input	Connected to the circuit breaker (CB1).
CNRSTOUT	Power supply output for the drive unit and for the DC power supply	Connected to the drive unit and the multi power supply unit.
CNMS	Magnet switch contact	Connected to the drive unit / UM301 board.
CNMSA	Magnet switch contact	Not connected.
CNMSB	Magnet switch contact	Not connected.
CNMSC	Magnet switch contact	Not connected.
CNH	Hour meter output	Not connected. (Option)
CNCON	Outlet output	Not connected. (Option)

2.4.10 Drive unit

The drive unit is a servo amplifier to drive the motor and consists of an encoder interface, motor drive circuit, brake control circuit, and others.

Functions:

- Servo control CPU
- Encoder interface
- Motor drive power supply
- Motor drive circuit
- Brake control circuit

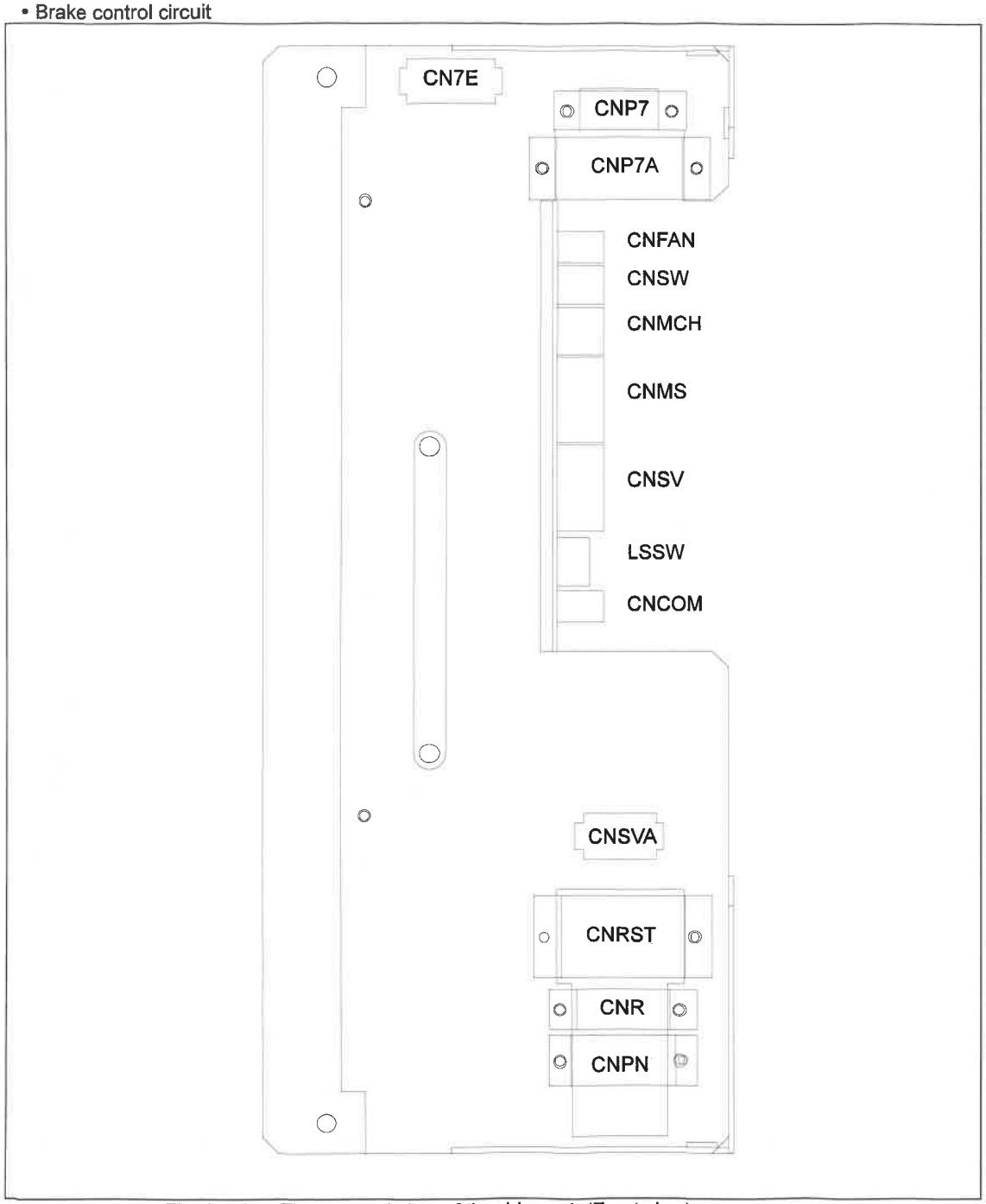


Fig. 2.4.14 The external view of the drive unit (Front view)

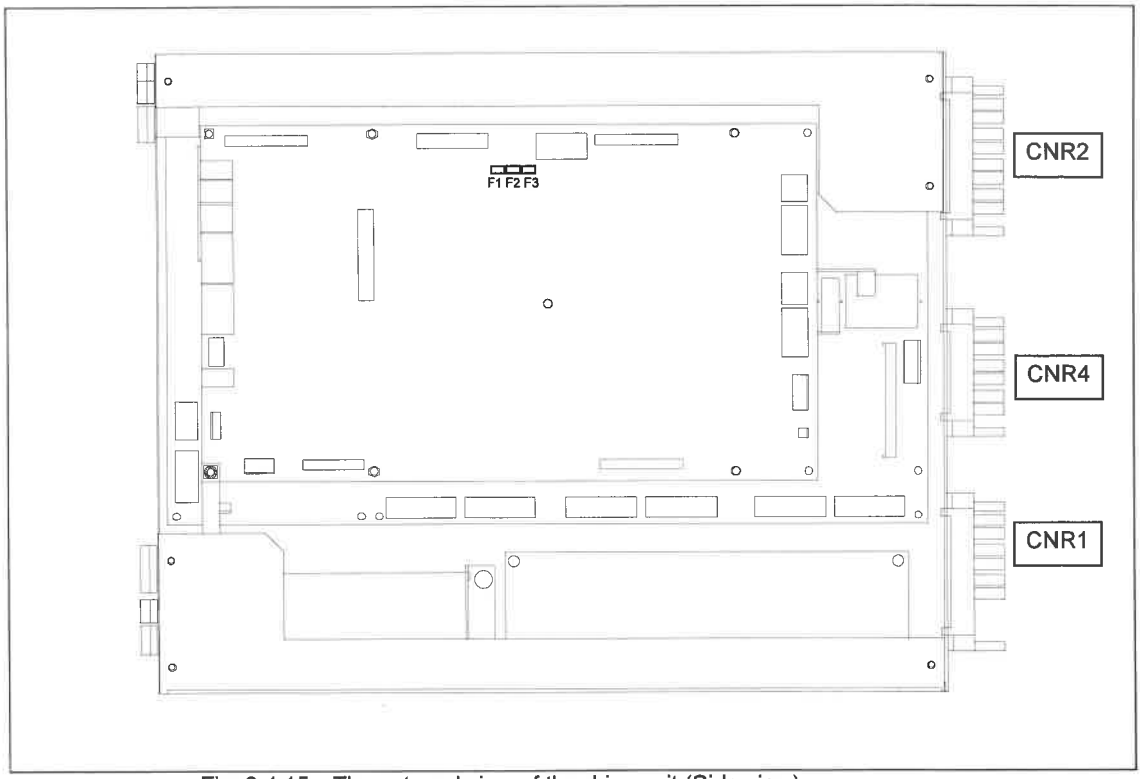


Fig. 2.4.15 The external view of the drive unit (Side view)

Table 2.4.16 Connection of the drive unit

Connector	Function	Destination
CNRST	3-phase 200V input	Connected to the Hi-power unit.
CNPN	280-VDC output	Connected to the additional axis drive unit.
CNR	Regenerative discharge resistor pin	Used to connect the regenerative discharge resistor.
CNR1,2	Motor power output	Connected to the manipulator motor.
CNR4	Encoder interface	Connected to the manipulator encoder.
CNCOM	USB interface	Connected to the CN4 on the CPU board.
CNMS	Magnet switch contact input Brake power supply input	Connected to the Hi-power unit and the multi power supply unit.
CNSV	Digital I/O signal	Connected to the I/O sequence board (UM301).
CNSW	Brake release input	Used to connect the brake release switch.
CNMECH	Mechanism control output	Connected to the mechanism control option unit.
CNFAN	Air cooling fan output	Used to connect fans for air cooling of the heat sink and for cooling of the regenerative discharge resistor.
LSSW	Limit switch release	Not used
CNP7	Motor power for external axis 1	Connected to the external equipment to use the external axis 1.
CNP7A	Motor brake for external axis 1	Connected to the external equipment to use the external axis 1.
CN7E	Encoder/Limit switch for external axis 1	Connected to the external equipment to use the external axis 1.

Fuses

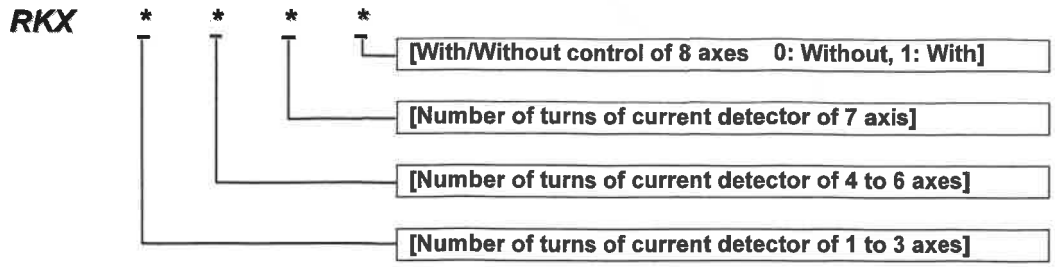
Fuse Name	Function	Specification
F1	for 1st axis - 3rd axis brake power	5A
F2	for 4th axis - 6th axis brake power	5A
F3	for 7th axis	2A

Nomenclature of model number of drive units

The following section shows the nomenclature of the model number of basic drive units.

Basic drive units

The basic drive units are available to the control of a maximum of seven axes.



Compatibility table

Robot type	Drive unit type number							Misc.
	(Without 8th axis) RKX1110 RKX1120 RKX1140 (With 8th axis) RKX1111 RKX1121 RKX1141	(Without 8th axis) RKX1420B (With 8th axis) RKX1421B	(Without 8th axis) RKX1410B RKX1440B (With 8th axis) RKX1411B RKX1441B	(Without 8th axis) RKX4410S RKX4440S (With 8th axis) RKX4411S RKX4441S	(Without 8th axis) RKX2610SB RKX2620SB (With 8th axis) RKX2611SB RKX2621SB	(Without 8th axis) RKX2640SB (With 8th axis) RKX2641SB	(Without 8th axis) RKX4640SB (With 8th axis) RKX4641SB	(NOTE 1) (NOTE 2) (NOTE 3) (NOTE 4)
ST-02 series ST-F-01 series	O							
ST70L-01	O							
ST100-01	O							
SG160R-06	O							
SC15F-02				O				
SC35F-01 SC50F-01		O	O					
SC300F-03 SC400L-02 SC500-02 SC700DL-05	O							
LF500S***-02	O							
MA15E-01				O				
MR20-01							O	
MR20-02						O		
MR35-01 MR50-01		O						
MC20-01					O	O		
MC35-01 MC50-01 MC70-01		O	O					

(NOTE 1) "B" : This mark stands for a drive unit that has UM300E board (bus connection type encoder available type). A drive unit that has "B" can be used instead of a drive unit that does not have "B". But a replacement of opposite direction is impossible.

	(Before)		(After)	
example :	RKX1410	→	RKX1410**B**	o : Replacement is available
	RKX1410**B**	→	RKX1410	x : Replacement is unavailable

(NOTE 2) A drive unit that has 8th axis can be used instead of a drive unit that does not have 8th axis. But a replacement of opposite direction is impossible.

	(Before)		(After)	
example :	RKX261**0**SB	→	RKX261**1**SB	o : Replacement is available
	RKX261**1**SB	→	RKX261**0**SB	x : Replacement is unavailable (When using the 8th axis)

(NOTE 3) In case of RKX14**B, a UM300 board of which the circuit number is "1F" or after is necessary.

(NOTE 4) Basically, it is strongly recommended to prepare a drive unit whose type number is completely the same with the original one inside the robot controller.

2.4.11 Teach pendant

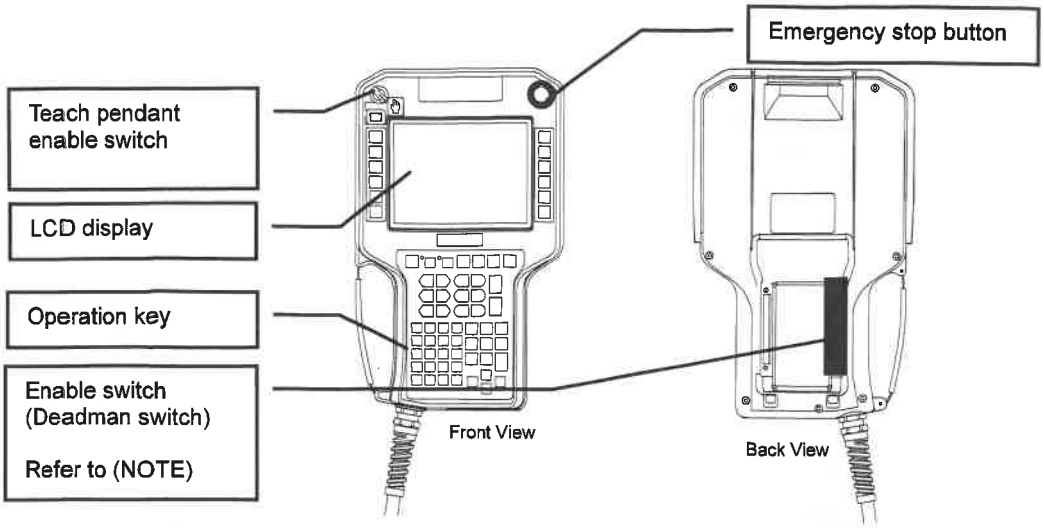


Fig. 2.4.16 The external view of the teach pendant

Table 2.4.17 Descriptions for the respective switches

Name	Descriptions
LCD Display Screen	The LCD display screen is used to display the contents of operation in progress, information on errors when the robot malfunctions, and others.
Operation Key	A variety of keys such as the numeric keys, function keys, axis keys, command selector keys, and others are allocated on the keypad. For use and operation procedures of each key, refer to the Instruction Manual.
Teach Pendant Enable Switch	This switch is used to enable or disable the servo power supply from the teach pendant. If this switch is set to Teach after the controller is set to Teach mode, the servo power supply will be turned ON by holding the "Enable switch" (Deadman switch). Setting this switch to Playback after the controller is set to Playback mode, the servo power supply will not be turned ON by the "Enable switch" (Deadman switch). If the status of the mode selector switch on the operation panel does not correspond to that of the teach pendant enable switch, the servo power supply will not be turned ON.
Emergency Stop Switch	To make the robot an emergency stop, press this button. Pressing this button will cut off the servo power supply to activate the brake. To release the emergency stop, turn this button clockwise. To set the system back to the motors ON status, the "motors ON button" should be pressed.
Enable switch (Deadman Switch)	A part, which will hit against your left hand when you hold the teach pendant with both hands, is the ***"Enable switch"*** (Deadman switch). (Two-handed operation is optional.) The Enable switch is a three-position switch, which is only functional while in teach mode, and makes it possible to turn ON the servo power supply only while it is being held and OFF by holding it tight. If the servo power supply turns OFF in the third position, releasing the Enable switch once and then holding it again will turn ON the servo power supply. For safety reasons, the Enable switch cannot be disabled.

CAUTION

When pressing the Enable switch (Deadman switch) softly, E1052 may be detected. When this error occurs, turn the Motors ON again after resetting the error and confirm that the Enable switch works correctly.

2.4.12 I/O board (UM212) (Option)

AX20 controller can use DC24V I/O signals by using this I/O board (UM212) as an option. The number of the signals that can be used are INPUT 32 points and OUTPUT 32 points for 1 board.

Functions

- Digital input//output circuit
- I/O circuit for external Interlock

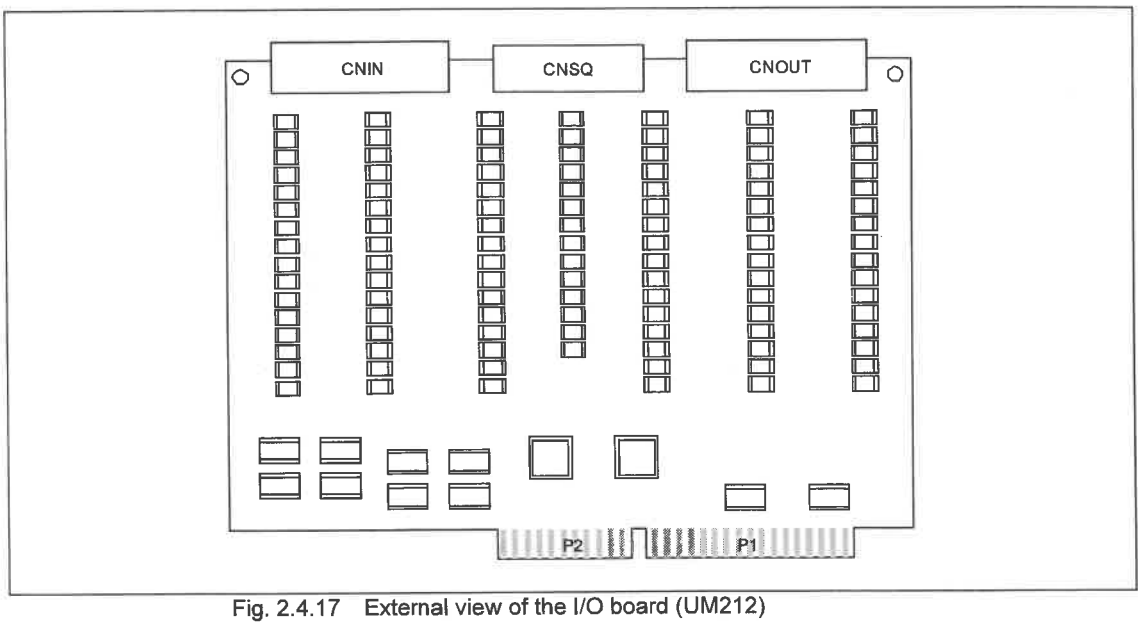


Fig. 2.4.17 External view of the I/O board (UM212)

Table 2.4.18 Connection of the I/O board (UM212)

Connector name	Function	Connection
CNIN	Digital input	The input signal from the outside is connected. The number of the signals is 32 points.
CNOUT	Digital output	The output signal to the outside is connected. The number of the signals is 32 points.
CNSQ	Digital input/output	This connector is used in case of AX20-OP125-C (internal power supply specification) (Connected to the multi power supply unit)
P1	CPU bus	Connected to the CPU bus. Connected to the riser board (UM209).
P2	CPU bus	Connected to the riser board (UM209).

IMPORTANT

I/O board (UM212) is not equipped with a standard specification AX20 controller.

IMPORTANT

If the number of the signals that are necessary is large, it is recommended to use option functions like DeviceNet, CC-LINK etc.

Table 2.4.19 Adding I/O board UM212 (option)

Condition	I/O board UM212	Input signals	Output signals	DIP SW(SW1) setting	
AX20-OP125-A (option) is added	1st board	1 - 32	1 - 32	1 : OFF 2 : OFF	
AX20-OP125-C (option) is added (internal power supply)	1st board	1 - 32	1 - 32	1 : OFF 2 : OFF	
AX20-OP125-B (option) is added	1st board	1 - 32	1 - 32	1 : OFF 2 : OFF	
	2nd board	33 - 64	33 - 64	1 : ON 2 : OFF	

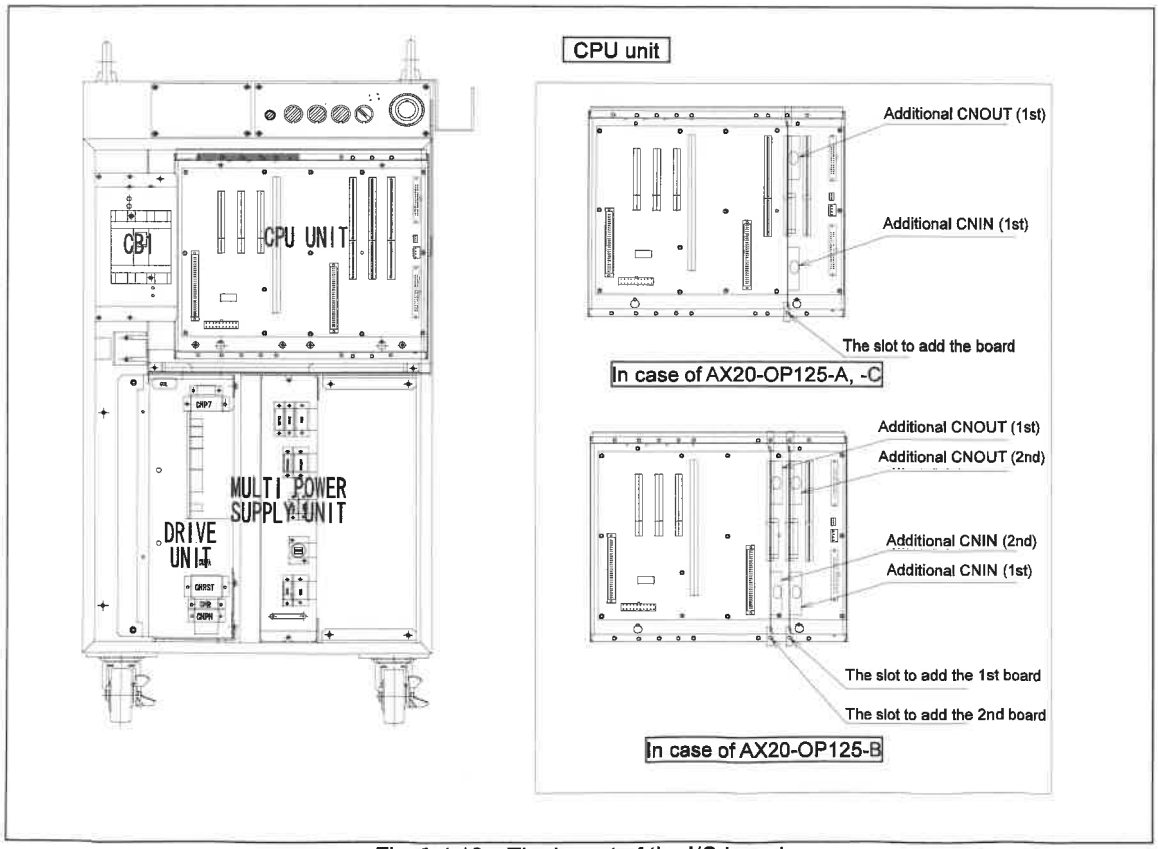


Fig. 2.4.18 The layout of the I/O board

(Supplement)

In case of AX20-OP125-C (internal power supply specification), please make a connection using the attached cable. By making this connection, DC24V power is supplied from the multi power supply unit of the controller to the DC24V I/O circuit.

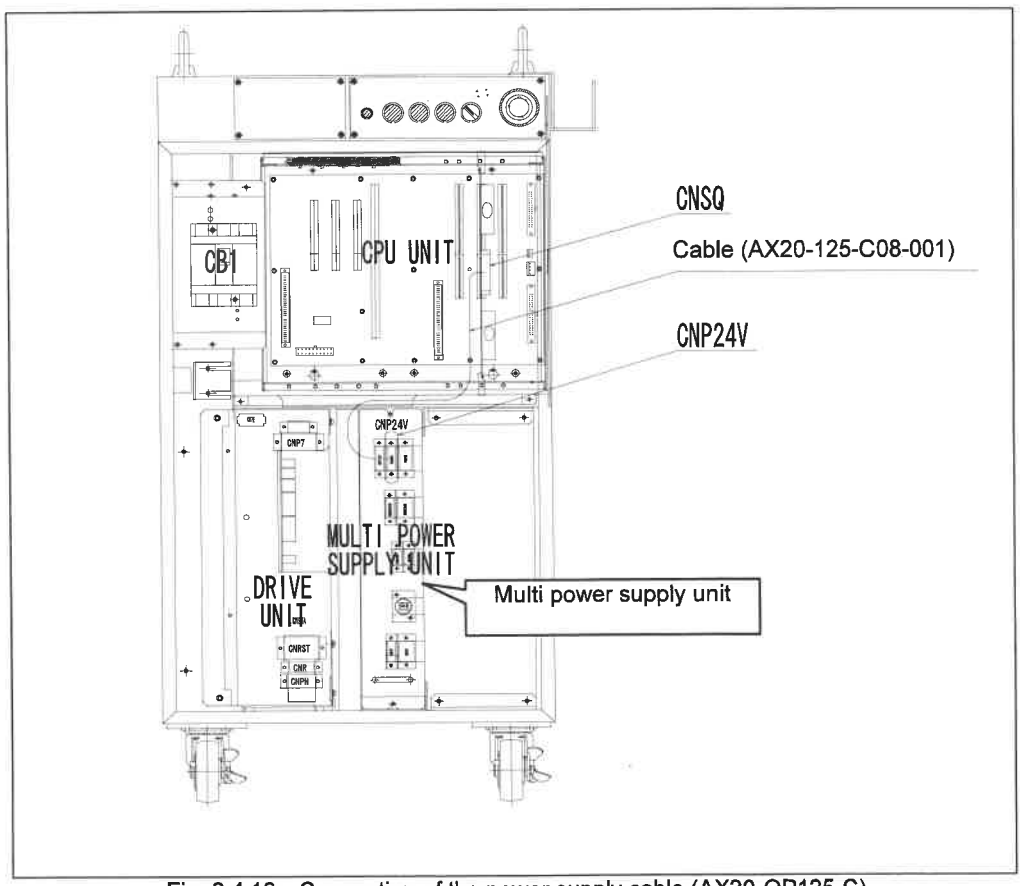


Fig. 2.4.19 Connection of the power supply cable (AX20-OP125-C)

IMPORTANT

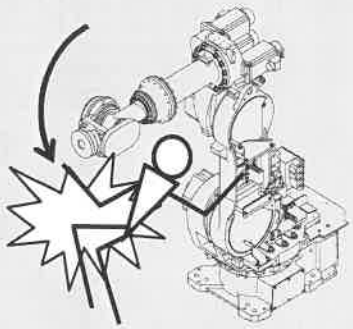
In case of AX20-OP125-A or AX20-OP125-B, it is necessary to prepare DC24V power supply separately. For more details, refer to the instruction manual ***"AX CONTROLLER OPERATING MANUAL : ADDITIONAL DC I/O SIGNALS (TAXEN-068)"***.

2.4.13 Brake release unit (option)

This unit is used to release the brakes inside the motors forcibly when the motor power cannot be turned ON due to servo errors etc.

DANGER

The arm drops under the force of its own gravity.
Release the brake after taking steps to hold or support the arm and any other parts. Death or serious injury may result if you make contact with the robot or are squeezed between the robot and another part.



There are two types of brake release unit.

Table 2.4.20 Brake release switch

Type	Description	Option part number
Type 1	A type installed inside the controller's cabinet	AX20-OP90-A(7 axes), AX20-OP90-C(8 axes)
Type 2	A portable type	AX10-OP90-B-* (*: cable length) AX20-OP90-B

IMPORTANT

To use type 2, both of "Switch box (AX10-OP90-B-*) and "Cable(AX20-OP90-B)" are necessary.

Type 1 : AX20-OP90-A (7axes spec), AX20-OP90-C (8 axes spec.)

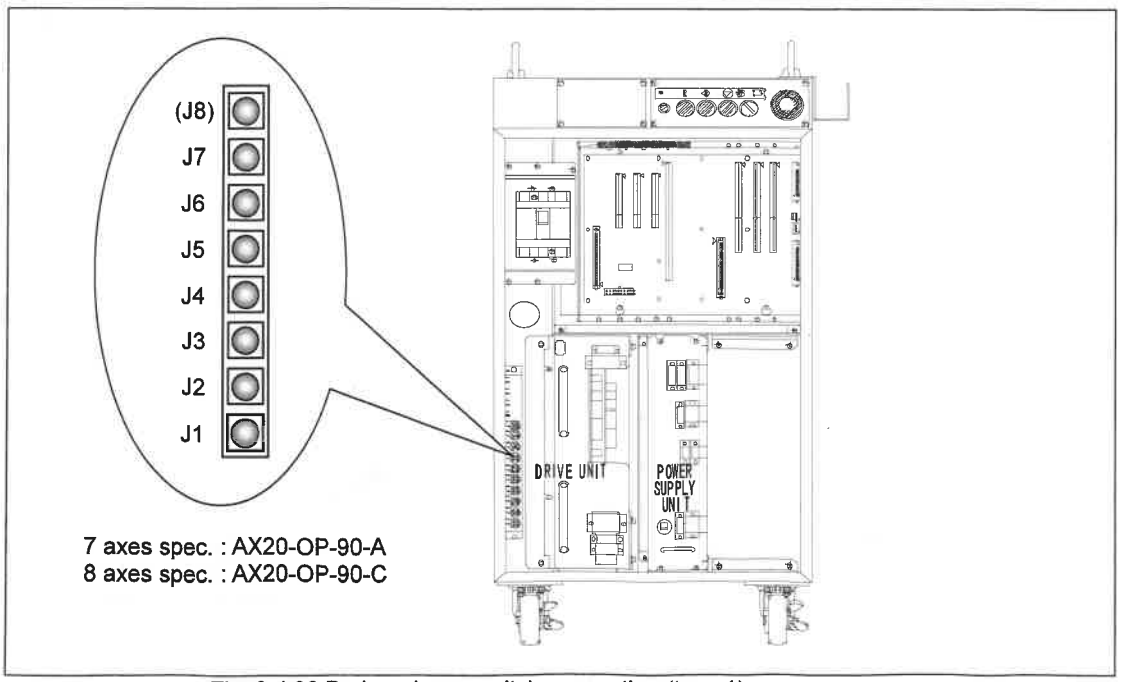


Fig. 2.4.20 Brake release switch connection (type 1)

Type 2 : AX10-OP90-B-*＋AX20-OP90-B

Connection must be done with the main power supply of the controller is OFF.

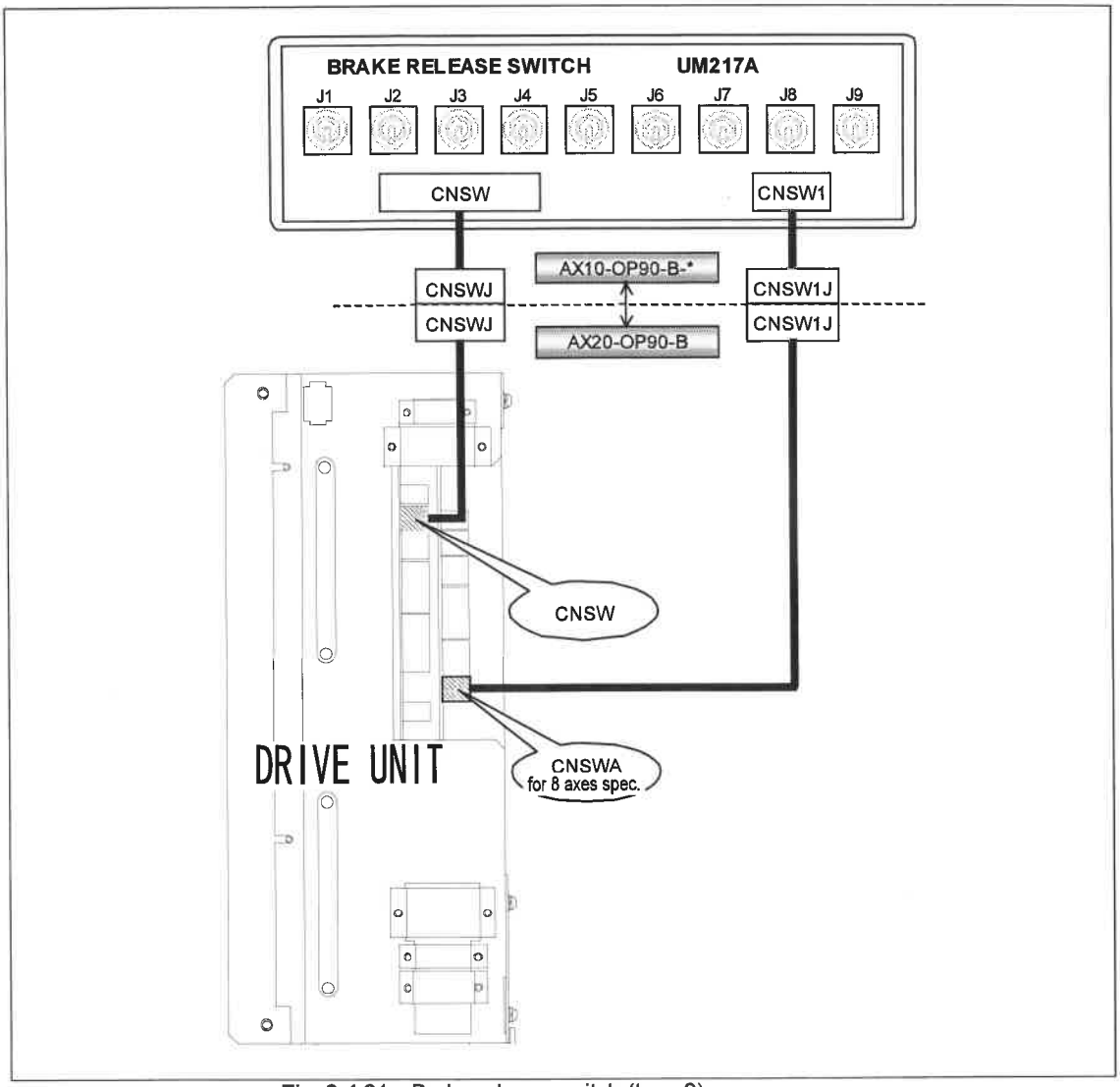


Fig. 2.4.21 Brake release switch (type 2)

Procedure for using the brake release unit

1 **Turn ON the primary power of the controller.**

2 **Press the brake release switch for the axis concerned for an instant only.**
>> Check that the axis concerned drops slightly.

3 **Press the brake release switch for the axis concerned.**
>> While the brake release switch is pressed, the brake is released, and the axis concerned can be moved.

DANGER

With an axis which drops in the gravity direction, release the brake while exercising great care. If the brake release switch is held down, the impact resulting from the dropping of the arm will be greater. For this reason, keep the time during which the switch is pressed as short as possible.

4 **Release the switch when the work is finished.**
>> The brake is now locked.

Chapter 3 Parts replacement and adjustment procedures

This Chapter describes the parts replacement and adjustment procedures.

3.1 Parts replacement procedure

The AX controller is designed to complete replacement of a printed circuit board or each unit within approximately 10 minutes. For safe replacement, observe the precautions shown below.

 DANGER	Turn OFF the primary power supply. Then, after a lapse of five minutes, conduct replacement work. Do not replace the parts with wet hands. Otherwise it will result in electric shocks, thus leading to serious injury or death.
 WARNING	Replacement work must be conducted by the personnel who took the training course on maintenance of the robot that was implemented at the Robot School by the Company. Otherwise, you could receive electric shocks or get caught in the robot, thus resulting in serious injury or death.
 WARNING	Conduct replacement work only after short-circuiting between the operator's body and the "G pin" of the controller to provide the same electric potential. Otherwise it could result in electric shocks, thus leading to serious injury or death.
 WARNING	Numbers of connectors are connected to each printed circuit board. In order to replace the printed circuit board, be careful not to connect wrong connectors or fail to connect connectors. Otherwise it could result in electric shocks or fire, thus leading to serious injury or death.
 WARNING	During replacement work, do not cause damage to wirings. During replacement work, NEVER attempt to touch the electronic parts or patterns on the printed circuit boards. As to the printed circuit boards, hold their circumference. Touching them could result in electric shocks, thus leading to serious injury or death.

3.1.1 Replacement of CPU board

Make sure the primary power supply is turned OFF. Then, after a lapse of five or more minutes, replace the CPU board. The reason is that electric charges remain in the board and electrolytic capacitor. The CPU board type varies from the date of shipping.(AXCPU10-30 and AXCPU10-50)


CAUTION

If optional software is installed:
If you replaced the CPU board, request our Service Center to make resetting of the optional software. If the resetting is not made, the optional software will be completely locked after a lapse of two weeks.


CAUTION

About "System memory protection function";
"System memory protection function" is a function to protect the files of the operating system by prohibiting the writing operation for those files. Concerning the backup data restoration work after the replacement of the CPU board, there are some precautions. For details, please refer to ***"3.3 Precautions for "File Restore" operation"***


CAUTION

If the system CF card causes damage:
If the system CF card causes damage, prepare a new system CF card. In this case, a tentative setting should be made to restore the backup file. For new system CF cards, contact our Service Center.


CAUTION

When replacing the CPU board to a different type:
When replacing a CPU board to a different type, the motion trajectory of the robot arm may change. Do not forget to execute the robot program with CHECK GO/BACK operation to check the motion before starting the automatic playback operation.

[How to replace AXCPU10-30 to AXCPU10-30]

Dismounting procedure:

(1) Disconnect all connectors from the CPU board.
(2) Unfasten the two screws that fix the CPU board bracket.
(3) Dismount the CPU board.
(4) Dismount the system CF card from the CNCF on the CPU board.

Mounting procedure:

(1) Mount the system CF card dismounted to the card slot (CNCF) on the new CPU board.
(2) Insert the new CPU board in the CPU unit, and then fix it by fastening the two CPU board bracket fixing screws.
(3) Connect all the connectors.
(4) Turn ON the main power of the AX controller, and then make sure the system normally starts up.

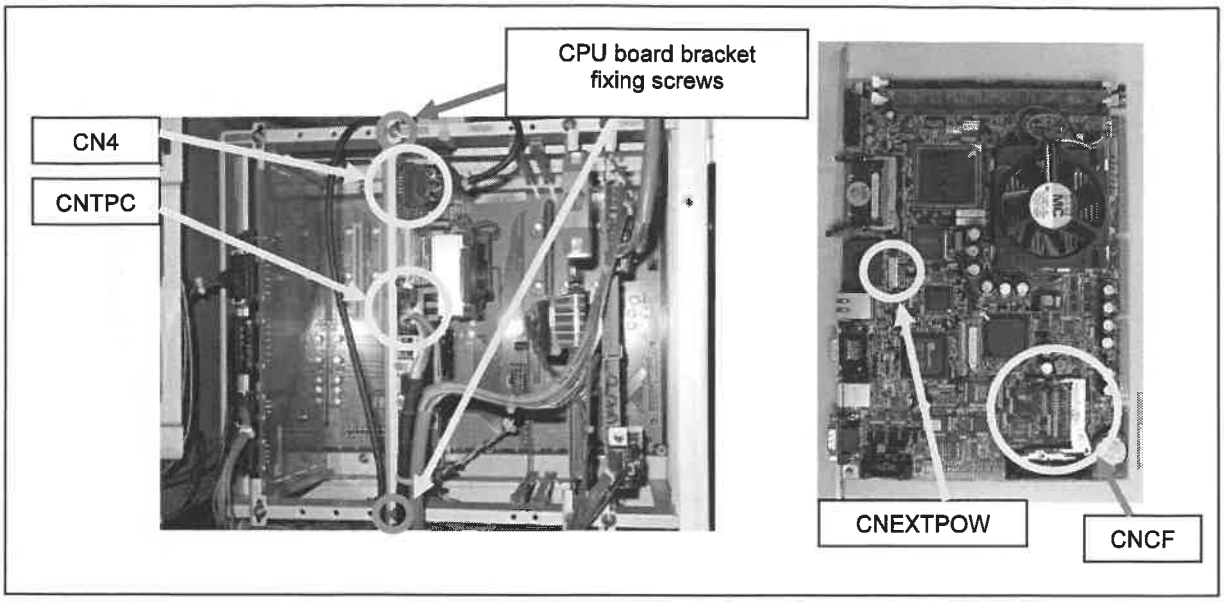


Fig.3.1.1 Replacement of the CPU board (AXCPU10-30)

[How to replace AXCPU10-50 to AXCPU10-50]

Dismounting procedure:

(1) Disconnect all connectors from the CPU board.
(2) Unfasten the two screws that fix the CPU board bracket.
(3) Dismount the CPU board.
(4) Dismount the system CF card from the CNCF on the CPU board.

Mounting procedure:

(1) Mount the system CF card which was dismounted to the card slot (CNCF) on the new CPU board.
(2) Insert the new CPU board in the CPU unit, and then fix it by fastening the two CPU board bracket fixing screws.
(3) Connect all the connectors.
(4) Turn ON the main power of the AX controller, and then make sure the system normally starts up.

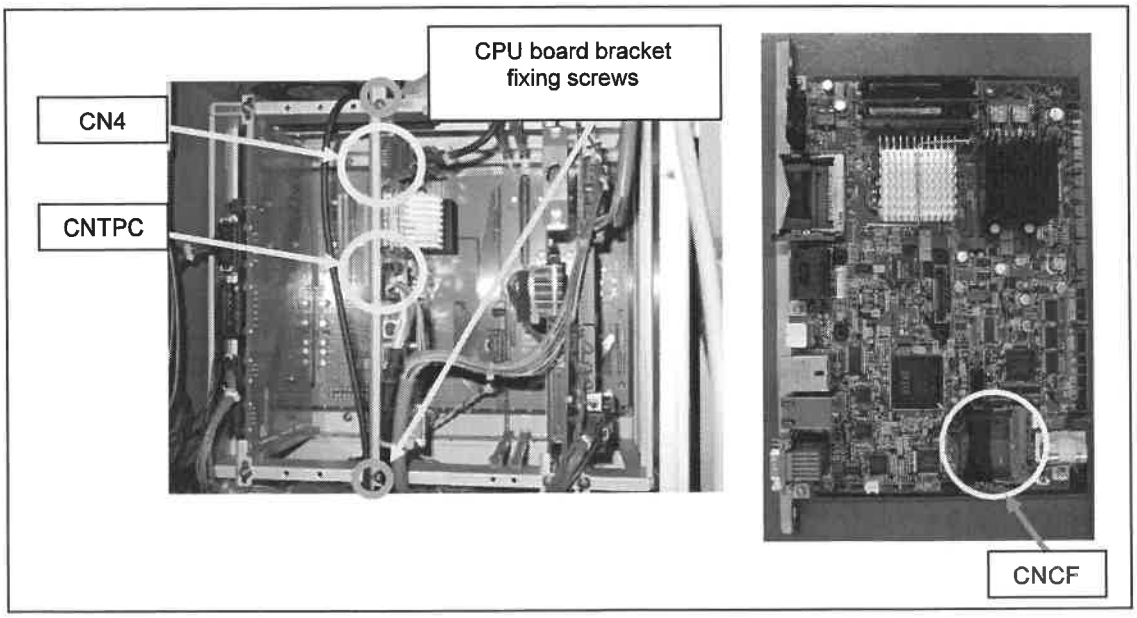


Fig.3.1.2 Replacement of the CPU board (AXCPU10-50)

[How to replace AXCPU10-30 to AXCPU10-50]
Before starting this replacement, it is necessary to prepare a system CF card for AXCPU10-50.
On the system CF for AXCPU10-50, a sticker of "CF-01-**" is attached.

Items to prepare

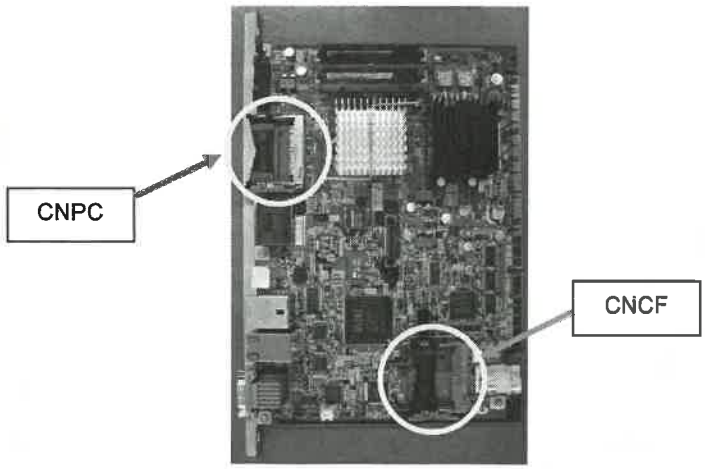
- A system CF card which can support AXCPU10-50.
- A CF card to make a backup data.

Procedure

(1) At first, make a backup data of the work-programs and setting (constant files) using a CF card for backup. For details about the backup operation, refer to the operating manual "AX CONTROLLER OPERATING MANUAL: BASIC OPERATIONS MANUAL (TAXEN-002)".

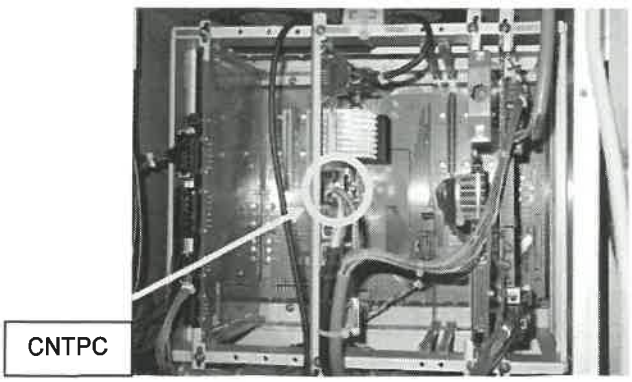
(2) By referring to **[How to replace AXCPU10-30 to AXCPU10-30]**(p3-3), dismount the AXCPU10-30 from the CPU unit.

(3) Attach the CF card for backup to the CNPC on the AXCPU10-50. The system CF card (which is inserted to CNCF) must be a one which can support AXCPU10-50.



(4) By referring to **[How to replace AXCPU10-50 to AXCPU10-50]**(p3-4), mount the AXCPU10-50 to the CPU unit.

(5) Connect the teach pendant cable to CNTPC on the AXCPU10-50.



(6) Restore the backup data to the internal memory of the AX controller.

[How to replace AXCPU10-50 to AXCPU10-30]

It is necessary to prepare a CF card for AXCPU10-30.

Items to prepare

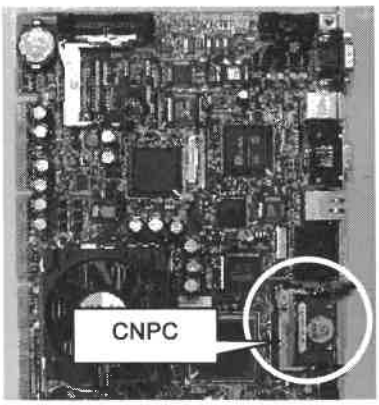
- A system CF card which can support AXCPU10-30.
- A CF card to make a backup data.

Procedure

(1) At first, make a backup data of the work-programs and setting (constant files) using a CF card for backup. For details about the backup operation, refer to the operating manual "AX CONTROLLER OPERATING MANUAL: BASIC OPERATIONS MANUAL (TAXEN-002)".

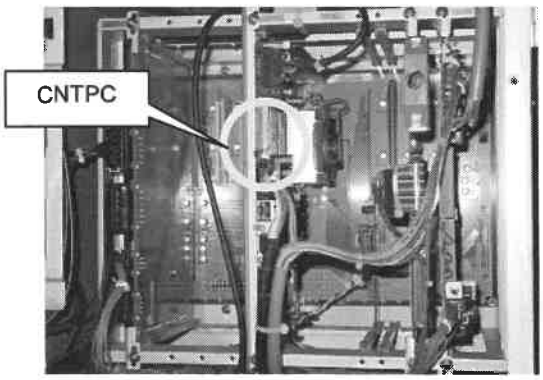
(2) By referring to **[How to replace AXCPU10-50 to AXCPU10-50]**(p3-4), dismount the AXCPU10-50 from the CPU unit.

(3) Attach the CF card for backup to the CNPC on the AXCPU10-30. The system CF card (which is inserted to CNCF) must be a one which can support AXCPU10-30.



(4) By referring to **[How to replace AXCPU10-30 to AXCPU10-30]**(p3-3), mount the AXCPU10-30 to the CPU unit.

(5) Connect the teach pendant cable to CNTPC on the AXCPU10-30.



(6) Restore the backup data to the internal memory of the AX controller.

An operating procedure when the system CF card is broken and replaced

[Making a temporary setting (constant file)]

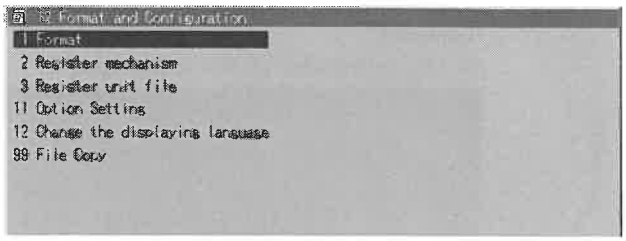
The temporary setting necessary for startup of the controller is created. The setting created here is overwritten by a backup file later, therefore, **there is no need to set it same as the actual structure.**

1 Turn on the main power source of the controller.

>> In the case of a new system CF card, because there is not a constant file necessary for startup, the following screen is displayed.

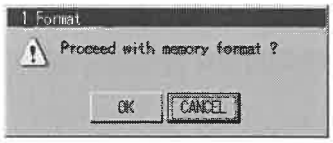
2 Press [Enter].

>> The following menu is displayed.



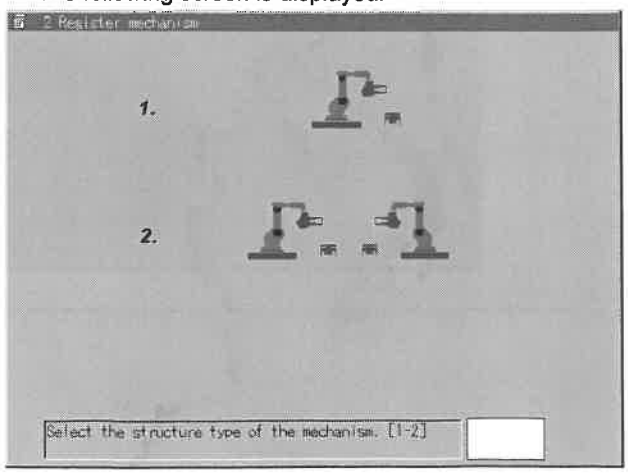
3 Select "1 Format" and press [Enter].

>> The confirmation screen is displayed.



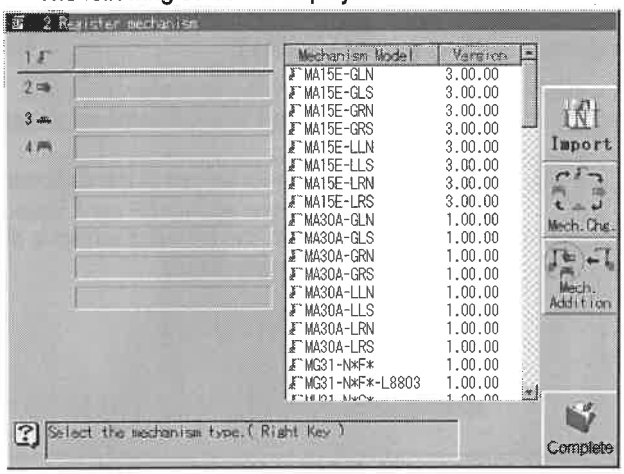
4 Select [OK] and press [Enter].

>> The following screen is displayed.



5 Press [1] and press [Enter].

>> The following screen is displayed.

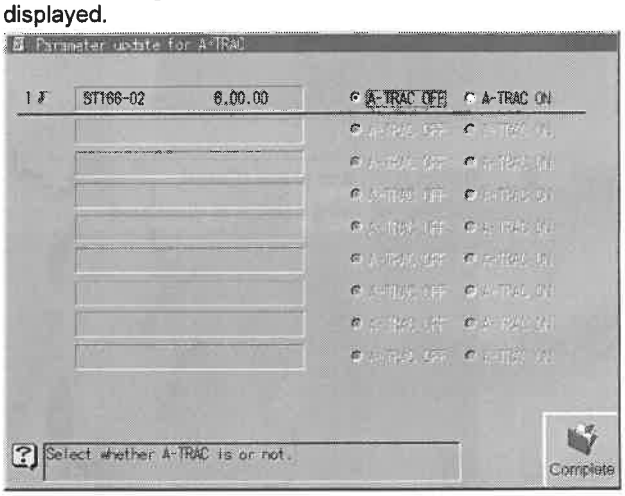


6 Select "ST166-02" in the column of mechanism 1, press [Enter] and press the f12 "Complete".

>> The confirmation screen is displayed.

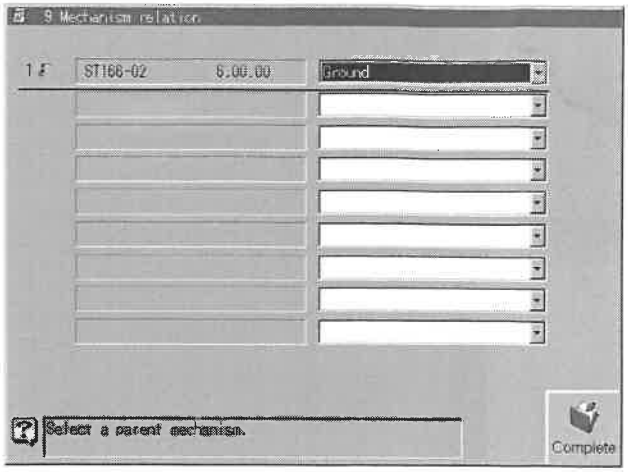
7 Select "YES" and then press [Enter].

>> After the registration of the mechanism, a screen like shown below will be displayed.



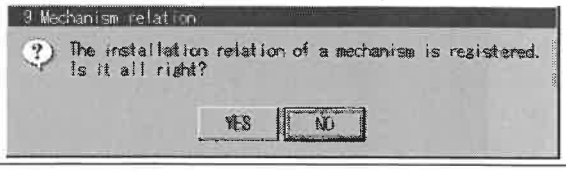
8 Press f-key <Complete>.

>> The following screen is displayed.



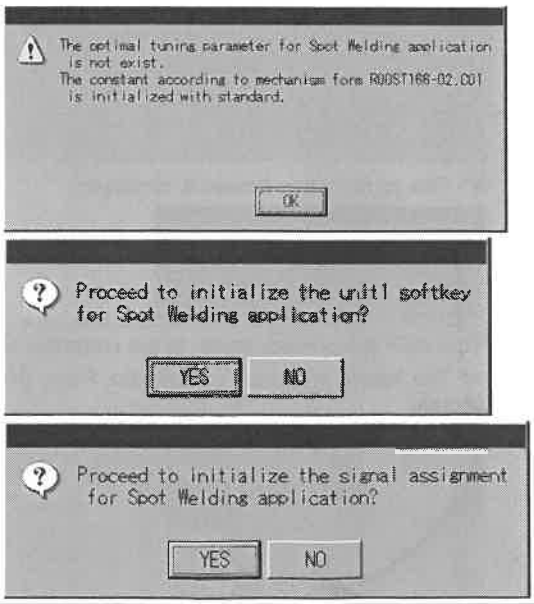
9 Press f-key <Complete>.

>> The confirmation screen is displayed.

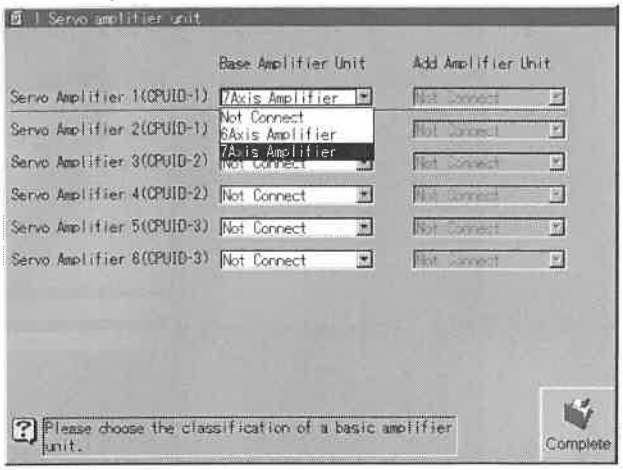


10 Select "YES" and then press [Enter].

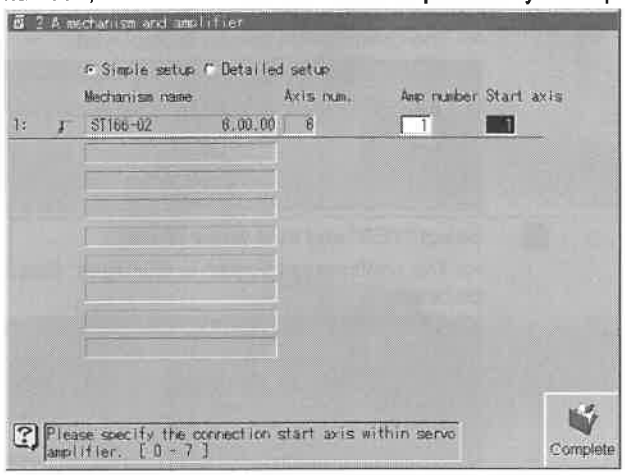
>> The confirmation screen is displayed. Select "OK" / "YES" then press [Enter] to proceed.



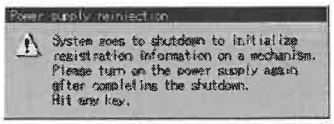
11 When [1 Servo amplifier unit] screen is displayed, Set "7 axis Amplifier" for the "Servo Amplifier 1(CPUID-1)" : "Base Amplifier" and then press f-key <Complete>.



When [2 A mechanism and amplifier] screen is displayed, Set "1" for the "Amp number", "1" for the "Start axis" and then press f-key <Complete>.

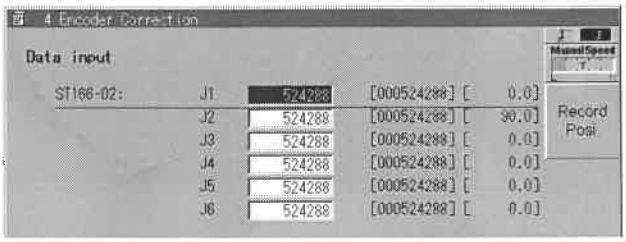


>> The confirmation screen is displayed.



12 Turn OFF the primary power of the controller and then turn ON the power again.

>> The following screen is displayed. Press [R/Reset] key to return to the basic screen.



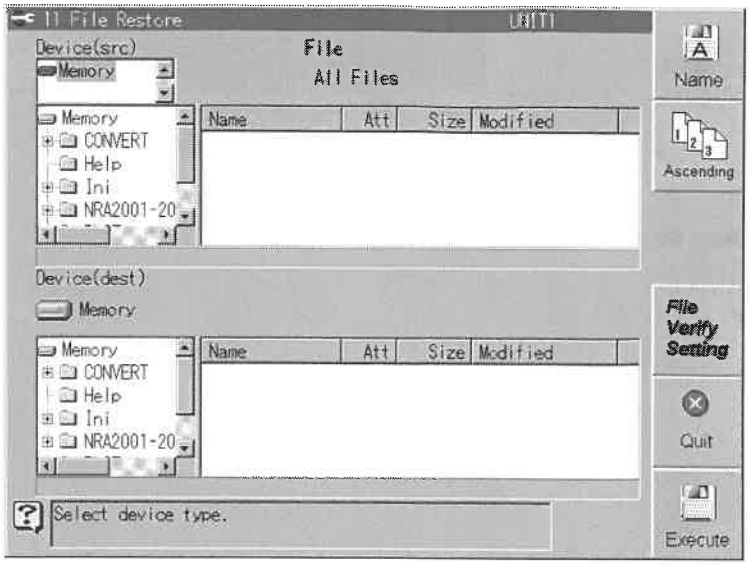
DANGER

At this stage, the robot will not work normally. Do not turn ON the motor power. Otherwise, the robot works unexpectedly, and if a worker is contacted or caught in, death or serious accident results.

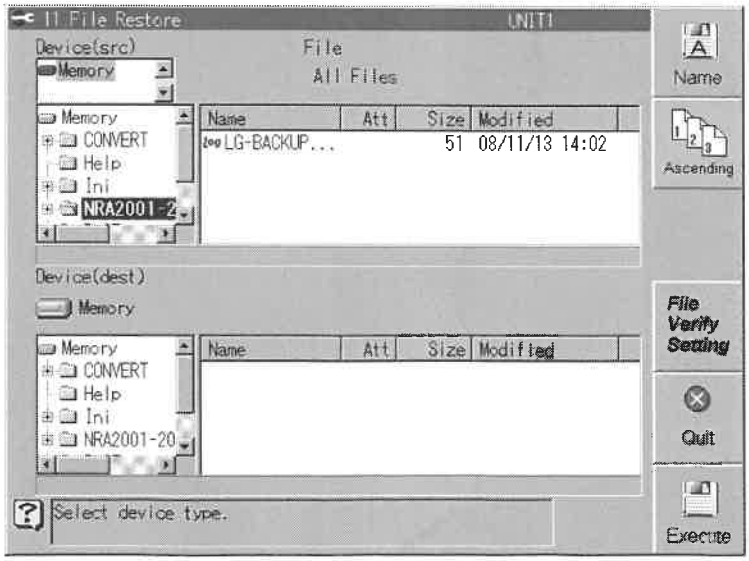
Now, the temporary setting is complete. Go on to the step of the "File Restore".

[File Restore]

1. Switch the operator class into ***EXPERT*** or higher.
2. Select [Service Utilities] [File Manager] [File Restore].
   >> The following screen is displayed.



3. Select "Memory" or "IC Card 1" in "Device (src)".
   Move to the folder selection column by use of left and right of cursor keys, select the folder of the backup file you want to restore, and press [Enter].
   Example: "NRA2001-2008-11-13-1402"



4 Press the f12 "Execute".
>> The following screen is displayed.

5 Select "YES" and then press [Enter].
>> File restore process is started.

Now, file restoring is complete.

3.1.2 Replacement of I/O sequence board and power failure detection board

Make sure the primary power supply is turned OFF. Then, after a lapse of five or more minutes, replace the I/O sequence board and power failure detection board. The reason is that electric charges remain in the board and electrolytic capacitor.

Dismounting procedure:

(1) Disconnect all connectors from the board.
(2) Unfasten the two screws that fix the board bracket.
(3) Dismount the board.

Mounting procedure:

(1) Insert the board in the rack along the board guide rail, and then push the board as far as it will go. Then fix the board by fastening the two board bracket fixing screws.
(2) Connect all the connectors.
(3) Turn ON the power of the controller and then confirm the operation carefully.

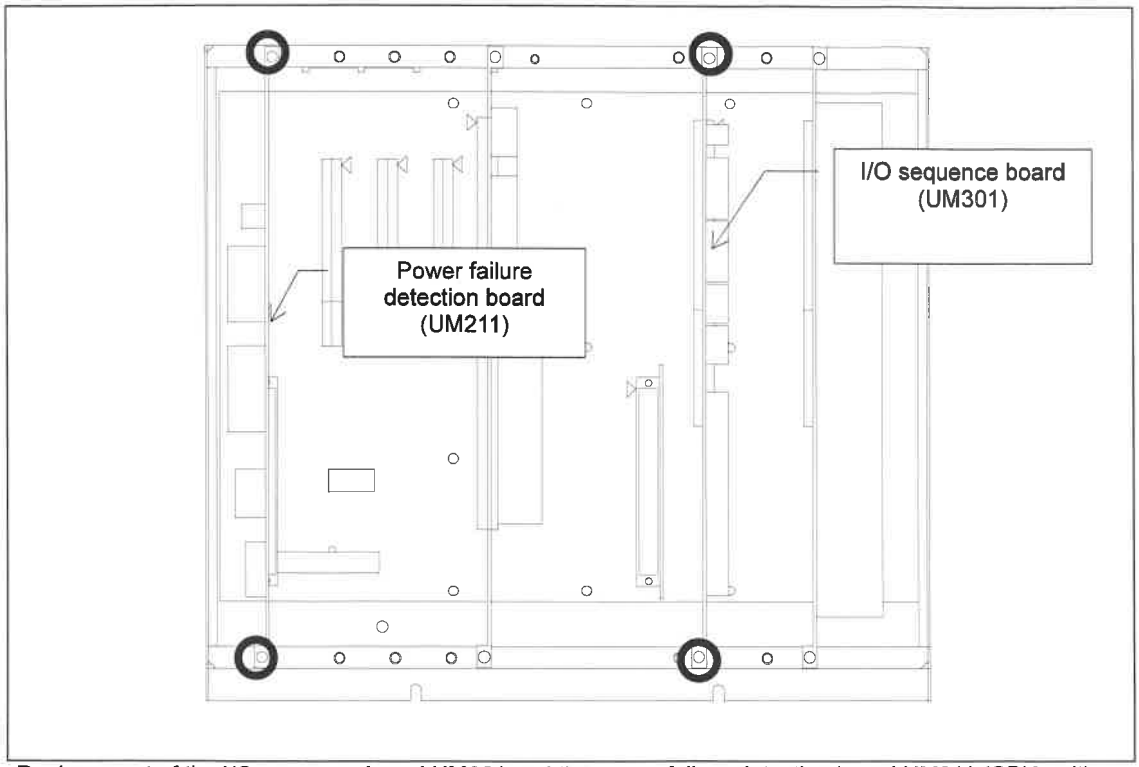


Fig 3.1.3 Replacement of the I/O sequence board UM301 and the power failure detection board UM211 (CPU unit)

3.1.3 Replacement of multi power supply unit

Make sure the primary power supply is turned OFF. Then, after a lapse of five or more minutes, replace the multi power supply unit. The reason is that electric charges remain in the board and electrolytic capacitor.

Dismounting procedure:

(1) Disconnect all connectors from the multi power supply unit.
(2) Unfasten the four screws that fix the multi power supply unit.
(3) Directly pull out the multi power supply unit to the front. At this time, to avoid touching the internal switching power supply, hold a part fabricated by plate working.

IMPORTANT

Do not touch the switching regulators inside the multi power supply unit.

Mounting procedure:

(1) Put the multi power supply unit in the controller from the front.
(2) Fix the multi power supply unit with the four screws.
(3) Connect all the connectors back to the multi power supply unit.

IMPORTANT

- Be careful not to stub your toe over the connectors disconnected and cause damage to them.
- Make sure to connect all the connectors. Otherwise it will cause the unit to malfunction.

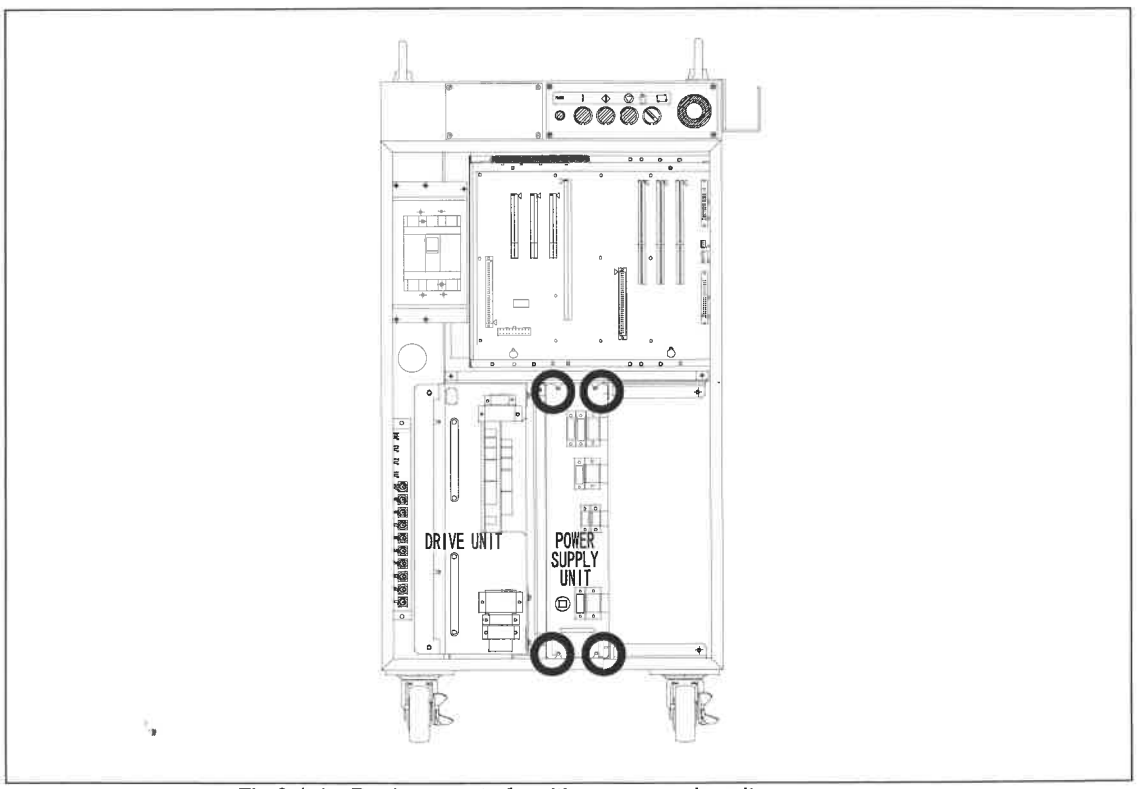


Fig 3.1.4 Replacement of multi power supply unit

3.1.4 Replacement of Hi-power unit

Make sure the primary power supply is turned OFF. Then, after a lapse of five or more minutes, replace the Hi-power unit. The reason is that electric charges remain in the board and electrolytic capacitor.

Dismounting procedure:

(1) Dismount the back panel from the controller.
(2) Disconnect all connectors from the Hi-power unit.
(3) Unfasten the four screws that fix the power unit.
(4) Directly pull out the power unit.

Mounting procedure:

(1) Put the Hi-power unit in the rear part of the controller and fix the Hi-power unit by fastening the four screws.
(2) Connect all the connectors back to the Hi-power unit.
(3) Mount the back panel.
(4) Turn ON the power of the controller and then confirm the operation carefully.

IMPORTANT

- Be careful not to stub your toe over the connectors disconnected and cause damage to them.
- Make sure to connect all the connectors. Otherwise it will cause the unit to malfunction.

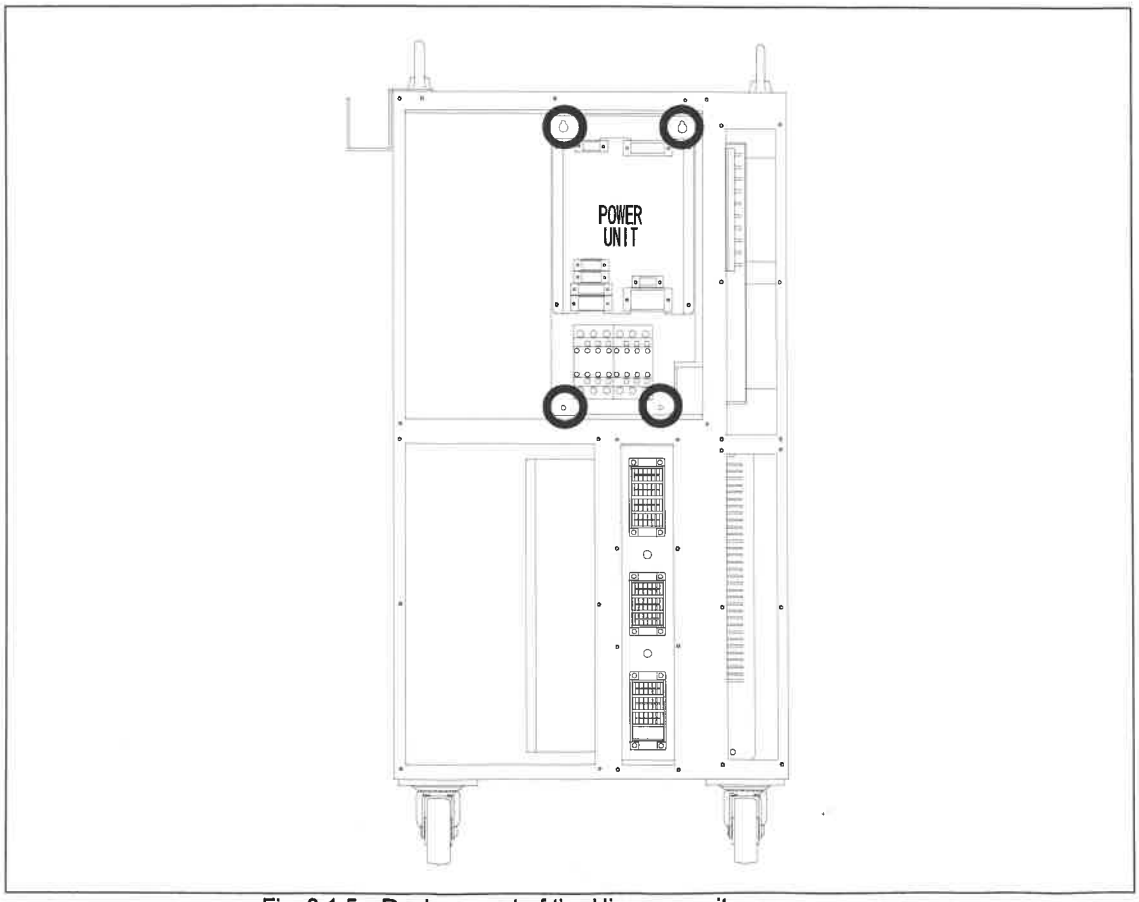


Fig. 3.1.5 Replacement of the Hi-power unit

3.1.5 Replacement of drive unit

Make sure the primary power supply is turned OFF. Then, after a lapse of five or more minutes, replace the drive unit. The reason is that electric charges remain in the board and electrolytic capacitor.

Dismounting procedure:

(1) Disconnect all connectors from the front panel of the drive unit.
(2) Unfasten the two screws that fix the drive unit.
(3) Directly pull out the drive unit to the front.

IMPORTANT

At this time, to avoid touching the printed circuit board and electrolytic capacitor, hold the knob part of the drive unit.

Mounting procedure:

(1) Put the drive unit in the controller from the front. and fasten screws to fix the drive unit.
(2) Connect all the connectors back to the drive unit.
(3) Turn ON the power of the controller and then confirm the operation carefully.

IMPORTANT

- The drive unit weighs approximately 13 kg. Be careful not to drop it on your foot.
- Be careful not to bump the side heat sink. Do not put the drive unit with the heat sink down side.
- Be careful not to stub your toe over the connectors disconnected and cause damage to them.
- Make sure to connect all the connectors. Otherwise it will cause the unit to malfunction.

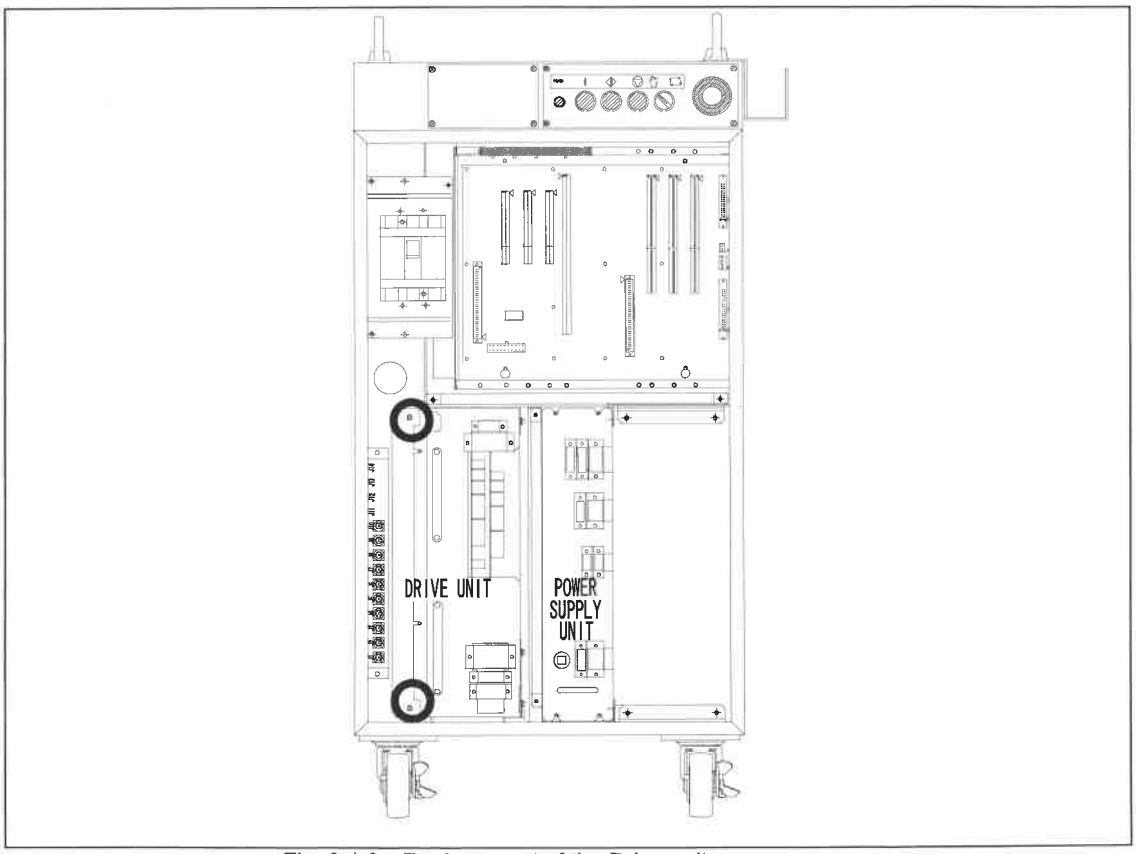


Fig. 3.1.6 Replacement of the Drive unit

3.1.6 Replacement of calendar battery (AXCPU10-20/30) (August 2010 or before)

Make sure the primary power supply is turned OFF. Then, after a lapse of five or more minutes, replace the battery. The reason is that electric charges remain in the board and electrolytic capacitor.

CAUTION

Replace the battery at regular intervals, i.e., once every 3 years. If the battery (CR2032) is replaced, make resetting of calendar date and time. If the resetting is not made, the date may go wrong, thus impairing the automatic backup function or else.

Dismounting procedure:

(1) Dismount the CPU board according to information in "3.1.1Replacement of CPU board".
(2) Dismount the battery (CR2032) from the CPU board.

Mounting procedure:

(1) Mount a new battery (CR2032) to the CPU board.
(2) Mount the CPU board according to information in "3.1.1Replacement of CPU board".

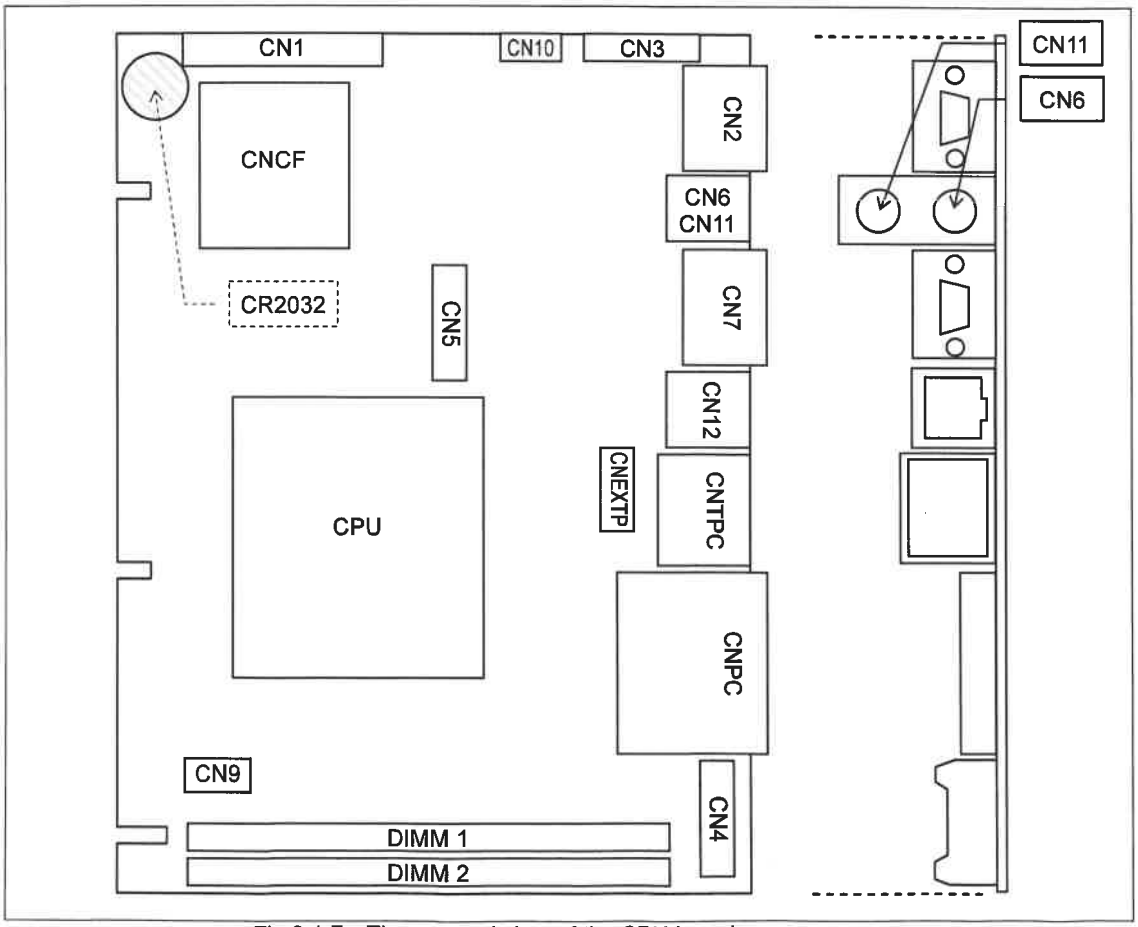


Fig.3.1.7 The external view of the CPU board

3.1.7 Replacement of calendar battery (AXCPU10-50) (September 2010 or after)

Make sure the primary power supply is turned OFF. Then, after a lapse of five or more minutes, replace the battery. The reason is that electric charges remain in the board and electrolytic capacitor.

CAUTION

Replace the battery at regular intervals, i.e., once every 5 years. If the battery (R00877) is replaced, make resetting of calendar date and time. If the resetting is not made, the date may go wrong, thus impairing the automatic backup function or else.

Dismounting procedure:

(1) Dismount the CPU board according to information in "3.1.1Replacement of CPU board".
(2) Dismount the battery (R00877) from the CPU board.

Mounting procedure:

(1) Mount a new battery (R00877) to the CPU board.
(2) Mount the CPU board according to information in "3.1.1Replacement of CPU board".

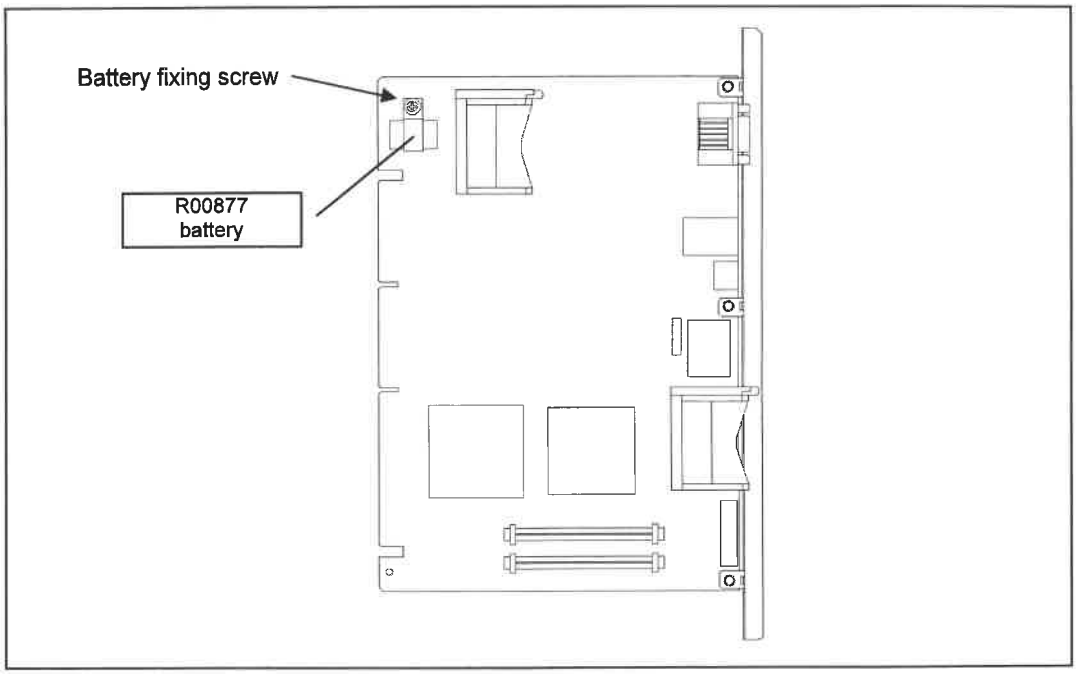


Fig. 3.1.8 Replacement of a battery for calendar

3.1.8 Replacement of cooling fans

Make sure the primary power supply is turned OFF, and then replace the cooling fans.

CAUTION

Regardless of operating hours, replace the cooling fans at regular intervals, i.e., once every four years. Failing to replace them accordingly may cause an abnormal rise in internal temperature of the controller, thus resulting in errors or malfunctions.

CAUTION

Mount the cooling fans so that convention of air will be provided in the direction shown in the figure. Mounting the cooling fans in the improper direction may cause an abnormal rise in internal temperature of the controller, thus resulting in errors or malfunctions.

There are five cooling fans FM1-1, 2-1, 2-2, 3-1, and 3-2 mounted inside the controller.
FM1-1, FM2-1, and FM2-2 are installed on the left side of the controller. FM3-1 and FM3-2 are installed on the top of the controller.

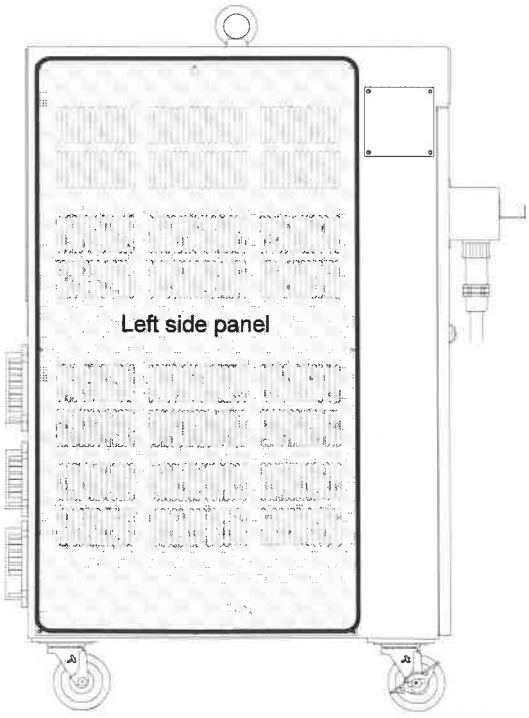
(a) Replacement procedure for FM1-1, FM2-1 and FM2-2

Dismounting procedure:

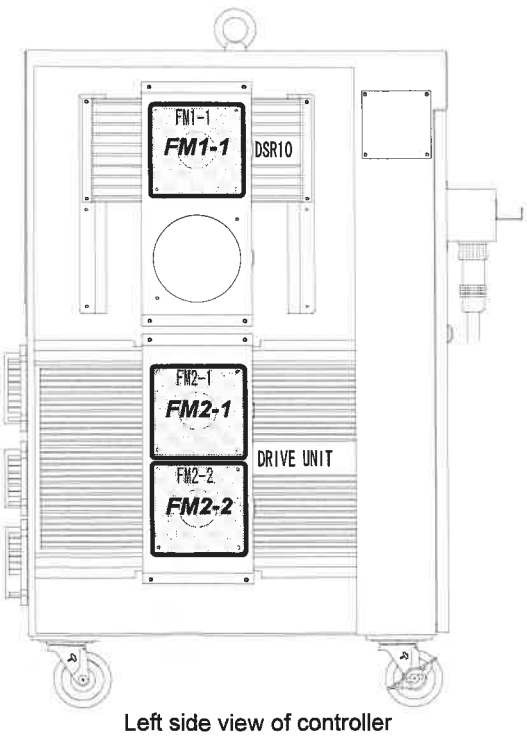
(1) Unfasten the eight screws from the left side panel of the controller, and then dismount the left side panel.
(2) Disconnect the fan motor connectors from the front panel of the controller.
(3) Unfasten the screws that fix the fan motor, and then dismount the fan motor.

Mounting procedure:

(1) Mount the fan motor to the panel, and then fix it with the screws.
(2) Route the fan motor cables to the front, and then connect the connectors to the cables.
(3) Mount the left side panel to the controller.
(4) Turn ON the power of the controller and then confirm the operation carefully.



Left side view of controller



Left side view of controller
(Showing after the side panel is dismounted)

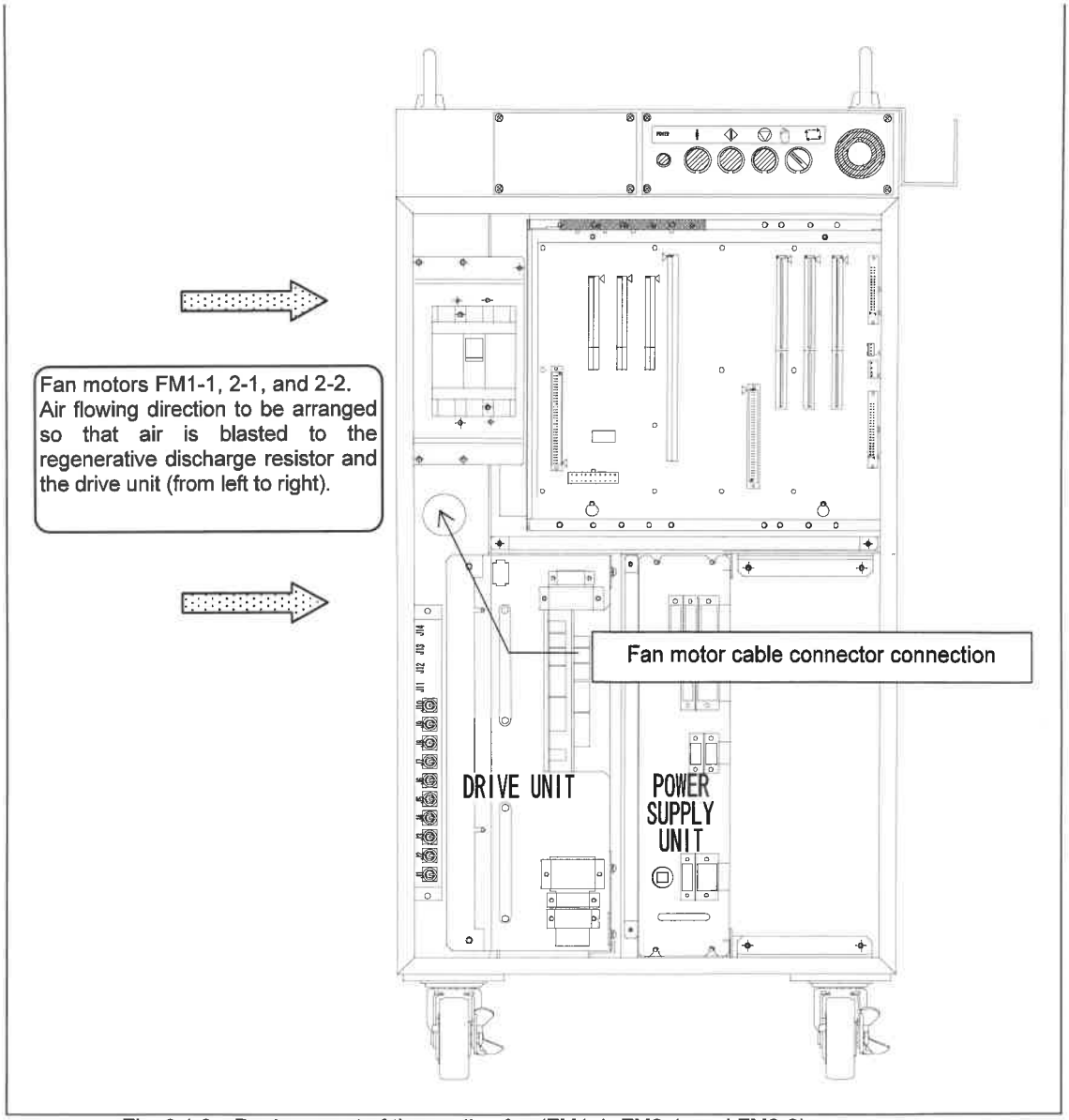


Fig. 3.1.9 Replacement of the cooling fan (FM1-1, FM2-1, and FM2-2)

(b) Replacement procedure for FM3-1 and 3-2

Dismounting procedure:

(1) Unfasten the six screws from the top of the controller, and then dismount the panel.
(2) Disconnect the power supply cable from the fan motor.
(3) Unfasten the screws that fix the fan motor.
(4) Then dismount the fan motor from the fan motor mounting panel.

Mounting procedure:

(1) Mount the fan motor to the fan motor mounting panel, and then fix it with screws.
(2) Connect the power supply cable to the fan motor.
(3) Mount the panel to the top of the controller.
(4) Turn ON the power of the controller and then confirm the operation carefully.

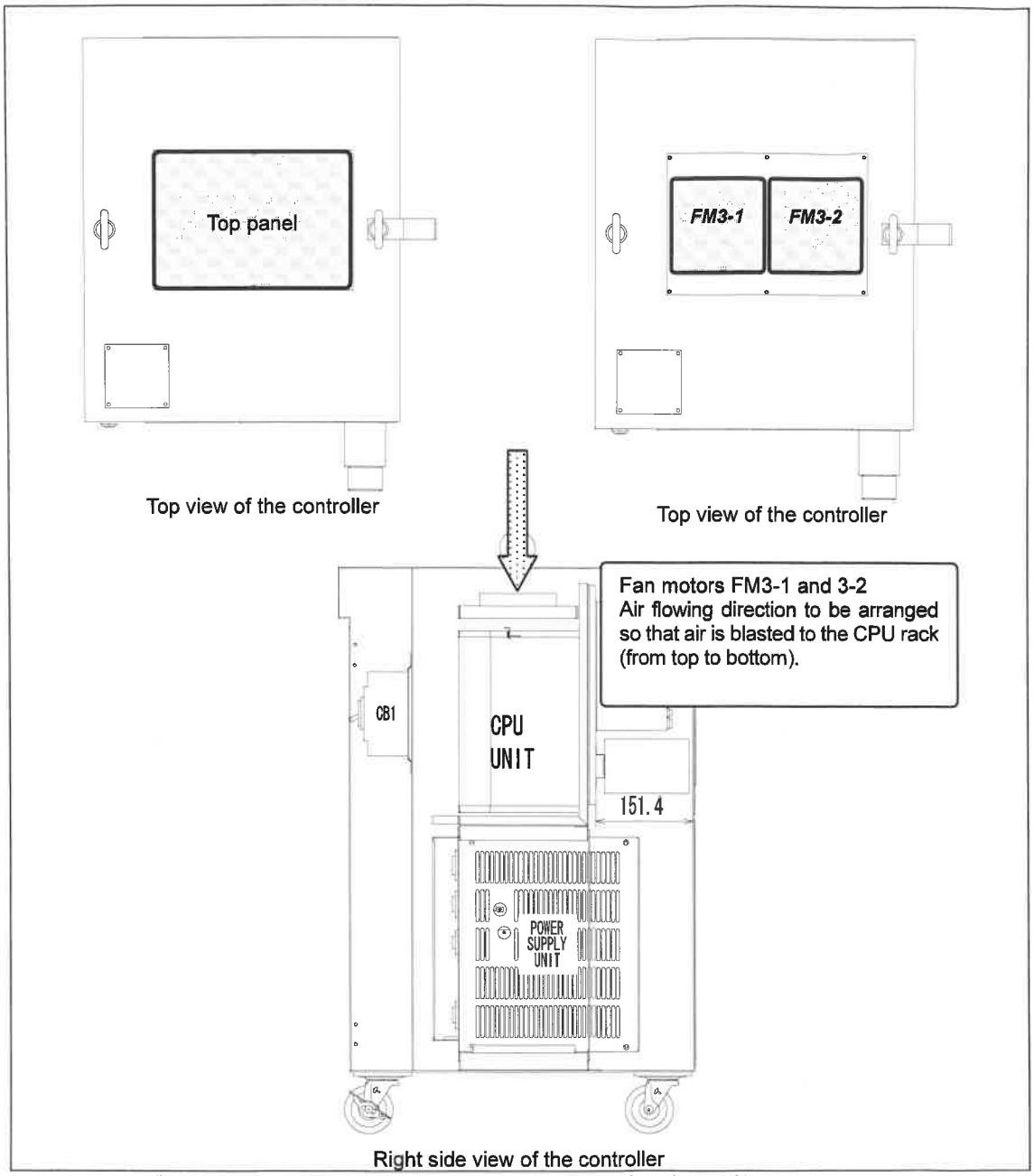


Fig. 3.1.10 Replacement of the cooling fan (FM3-1 and FM3-2)

3.1.9 CPU fan replacement

Only when the following message is displayed on the teach pendant screen, please replace the cooling fan of the CPU.

I3077 CPU fan alarm or E0077 CPU fan stop

CAUTION

Please be sure to start the procedures after confirming that the primary power supply of the controller if OFF.

Dismounting procedure:

(1) Remove the CPU board (Refer to "3.1.1Replacement of CPU board")
(2) Disconnect the cable for the CPU fan power supply.
(3) Pushing 4 hooks of the fan from their side by fingers, remove the fan.

Mounting procedure:

(1) After adjusting the positions of the hooks, install the fan.
(2) Connect the power supply cable of the CPU fan.
(3) Mount the CPU board. (Refer to "3.1.1Replacement of CPU board")

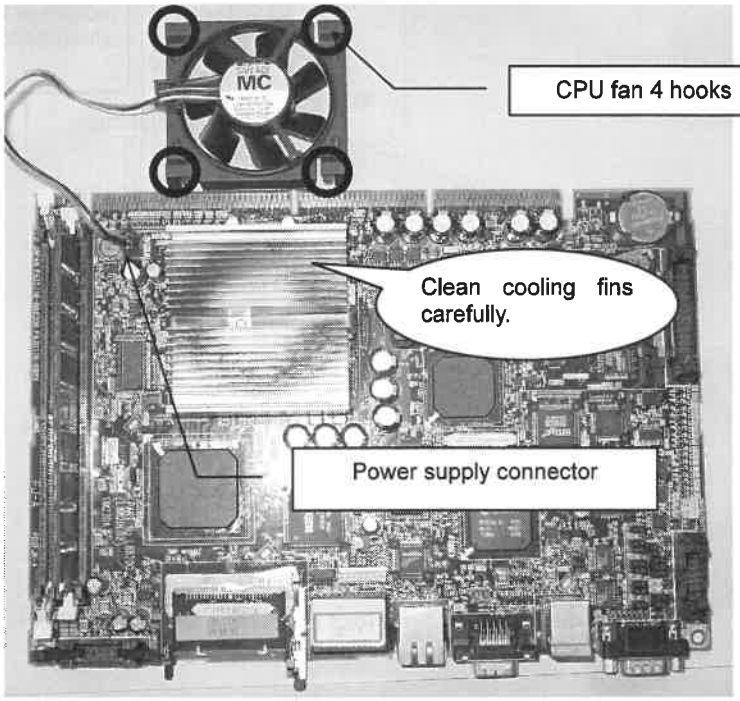


Fig.3.1.11 Replacement of the CPU fan

3.2 Adjustment procedure

CAUTION

The AX controller normally requires no adjustment.
Do not touch the adjustment points unless otherwise required, or even if the AX controller has any failure or defect, do not attempt to make adjustment until causes of the failure or defect are proven.

3.2.1 Adjustment of power supply system

If any trouble occurs with the power supply system or the power supply is changed, check for each power supply voltage by putting the check pin of a multiple meter in the cable section of each connector, and then make adjustment of voltages that deviate from the reference values. To measure the voltages, use a digital voltmeter.

Table 3.2.1 Measurement of the power supply voltage

Power supply	Measuring point (For details, refer to information on the following page.)	Reference value	Adjustment point
Primary power supply	Circuit breaker CB1	Specified voltage±10%	Change of primary tap of transformer T11 (NOTE 1)
P1-M1	Between CNP24V connector P1 and M1 of multi power supply unit	DC24V±1.0V (23.0~25.0VV)	None (NOTE 2)
PB-MB	Between CNBK24V connector PB and MB of multi power supply unit	DC26V±0.5V (25.5~26.5V)	Knob operating type potentiometer provided on the switching power supply in the multi power supply unit
P5-M0	Between CNP5V connector P5 and M0 of UM211 printed circuit board	DC5.15V+0.05V / -0.0V (5.15~5.20V)	Knob operating type potentiometer provided on the switching power supply in the multi power supply unit

(NOTE 1) Only available for the transformer specification. For the transformer tap changing procedure, refer to information on the following page.

(NOTE 2) If the measured value does not fall in the range of reference value, replace the multi power supply unit.

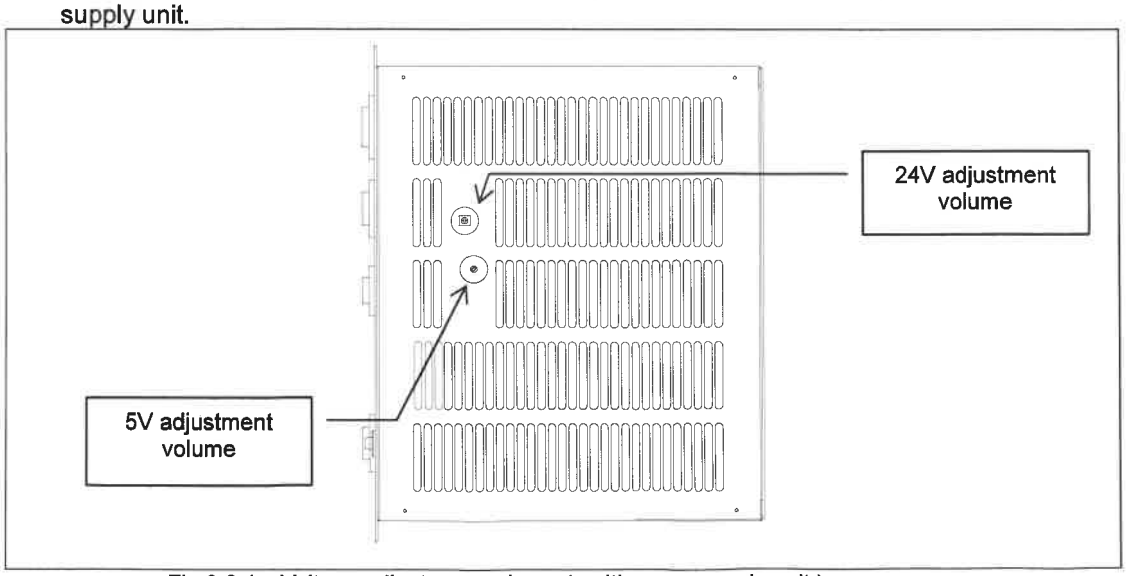


Fig 3.2.1 Voltage adjustment volume (multi power supply unit)

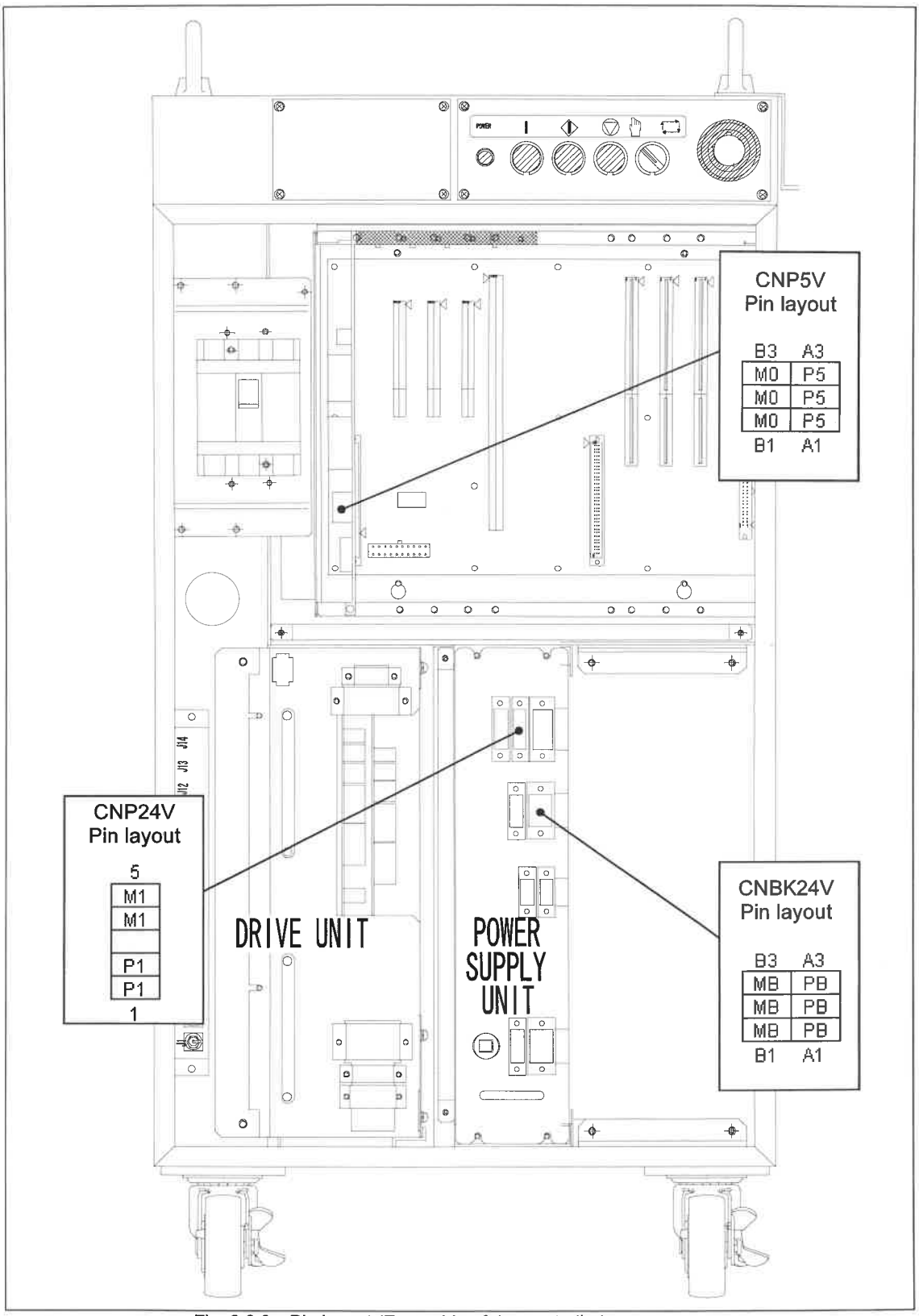


Fig. 3.2.2 Pin layout (Front side of the controller)

3.2.2 Transformer tap changing procedure

CAUTION

Please be sure to start the procedures after confirming that the primary power supply of the controller if OFF.

Tap changing steps:

(1) Turn OFF the primary power supply of the controller and the power distributer.
(2) Disconnect the cables R, S, and T from the primary connection of the transformer (380, 400, 420, 440, or 480V specification).
(3) Connect the cables to the terminal block of a voltage desired.

The connection ports of the terminal block vary with the specifications of the primary power supply voltage.

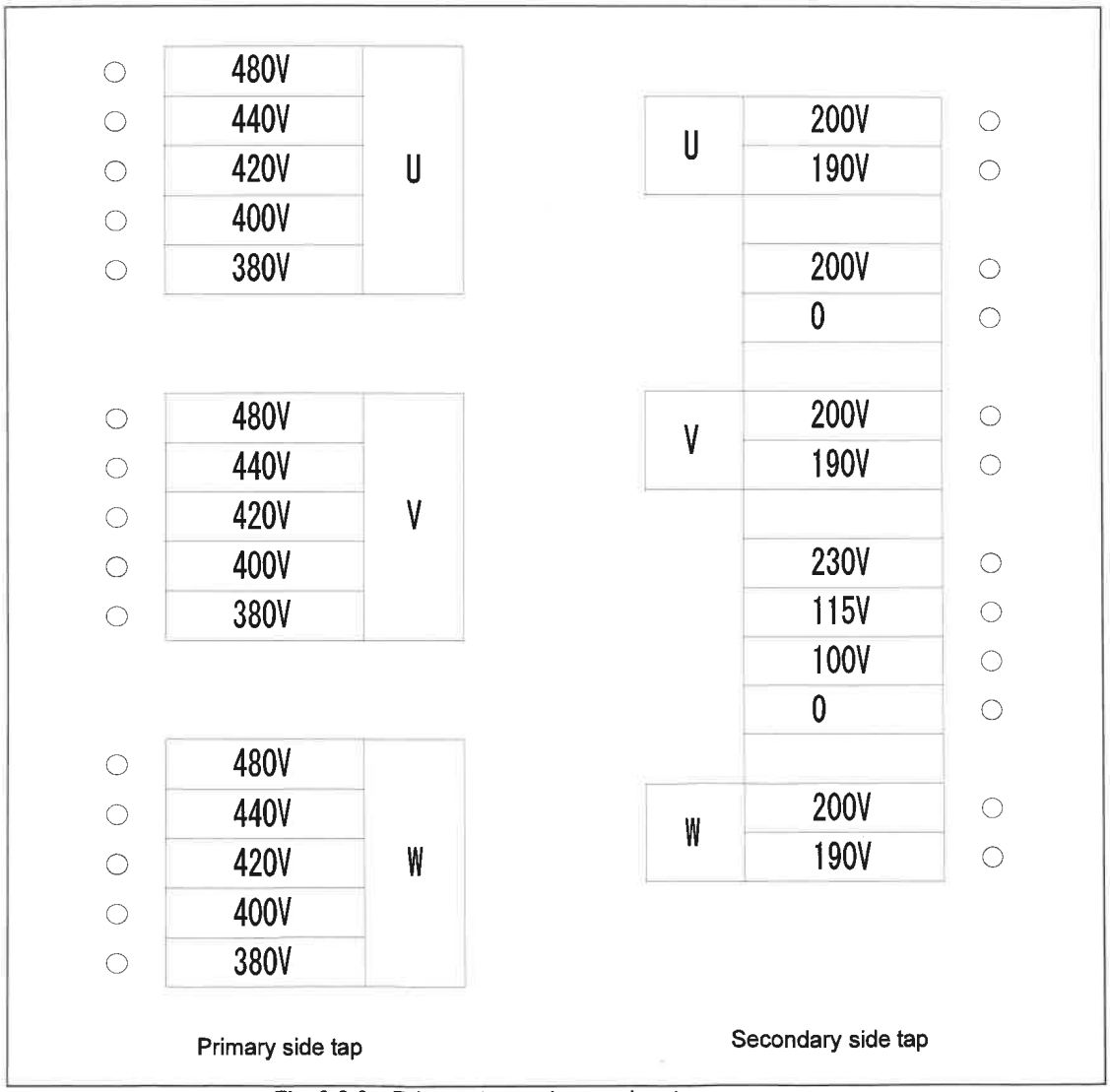


Fig. 3.2.3 Primary tap and secondary tap

3.3 Precautions for "File Restore" operation

To restore the option software with the "**File restore**" operation in the file manager menu, it is necessary to disable the "System memory protection" function in advance. The procedure for the backup restoration is shown as below. For more details, refer to the following pages.

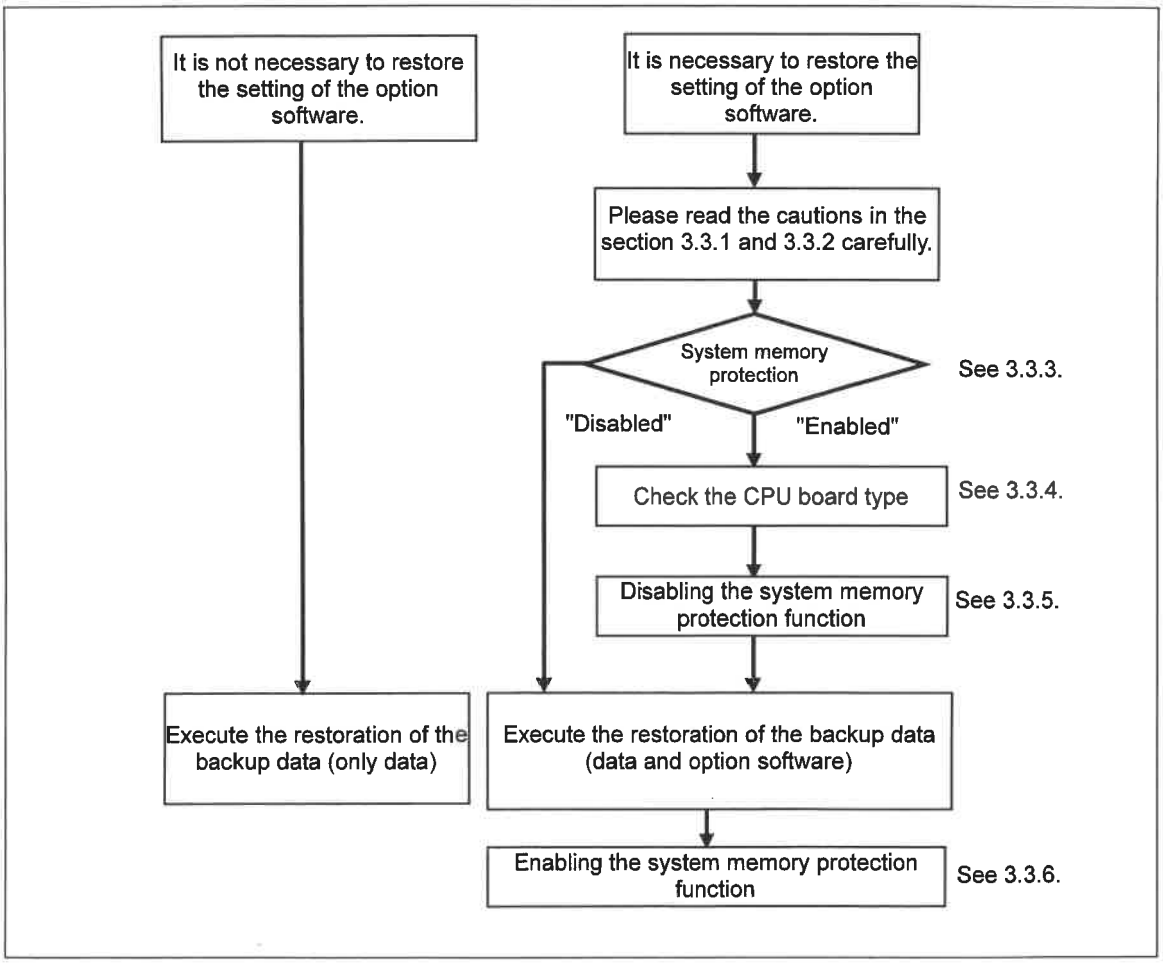


Fig. 3.3.1 How to restore the option software setting after restoring the back-up data

3.3.1 Restoring the option software

When executing "File Restore" menu, please select the appropriate procedure referring the table shown as below. Depending on the replacement condition of the CPU board and the system CF and the software version of the AX system, the procedure to be selected is different. ***If an incorrect procedure is performed, some troubles may happen.(e.g. option software is locked after several days etc.)***

And, because the following table shows the procedures for a file restore operation with the condition in which "Restoring the registries (software options) of the Windows : enabled", please disable "System memory protection" function in advance. Concerning the system memory protection function, please refer to the following pages.

Replacement condition of the hardware devices	AX system software version	
	AXV07.06 or before	AXV07.07or after
CPU board : not changed System CF : not changed	- The setting of the option software is not changed.	- The option software setting is automatically restored. It is not necessary to ask our service center to setup the option software.
CPU board : not changed System CF : changed	- After the completion of the file restoring operation, the setting of the option software within 2 weeks is required. (NOTE 1)	
CPU board : changed System CF : not changed	- Because the option software is deleted after the completion of the file restoring operation, the setting of the option software is required again. (NOTE 1)	- After the completion of the file restoring operation, the option software setting must be done within 2 weeks. (NOTE 1)
CPU board : changed System CF : changed	- After the completion of the file restoring operation, the option software setting must be done within 2 weeks. (NOTE 1)	

"changed" : Replace the old hardware device with a new one.
"not changed" : Continue to use the original hardware device.

(NOTE 1) If the option software setting is necessary, please ask our service center.

3.3.2 System memory protection function

"System memory protection function" is a function to protect the files of the operating system by prohibiting the writing operation for those files. But, if the system memory protection function is enabled, some operations are restricted. (Registry restoring operation, modification of the option software settings, etc.)

Therefore, if those operations are necessary, please disable the system memory protection function temporarily, and then enable the function again after finishing the setting operation by referring the table shown as below.

In case of AXCPU10-20 or AXCPU10-30, a PS/2 connector keyboard for PC is required to disable the system memory protection function. The keyboard must be prepared by the customer in advance.

Details of the procedure	System memory protection function
Executing the "File restore" function (Restoring the registries (option software) : No) (NOTE 2)	It is not necessary to disable the system memory protection function before performing the setting work.
Executing the "File restore" function (Restoring the registries (option software) : Yes) (NOTE 3)	Perform the setting work after disabling the system memory protection function.
Setting the option software in [Constant Setting][1 Control Constants][5 Option setting] menu. (NOTE 4)	

(NOTE 1) Concerning the operation of the "File restore" menu, please refer to "6.11 Restoring all files from backup" of "BASIC OPERATIONS MANUAL (TAXEN-002)".

(NOTE 2) If the CPU board and the system CF were not replaced after making a backup data was made and if you just want to restore the backup data, please select this.

(NOTE 3) If the CPU board and/or the system CF was replaced after making a backup data was made, please select this.

(NOTE 4) If the option software setting is necessary, please ask our service center.

Concerning the details of "System memory protection function", please refer to the following pages.

3.3.3 Confirming the condition of the system memory protection function

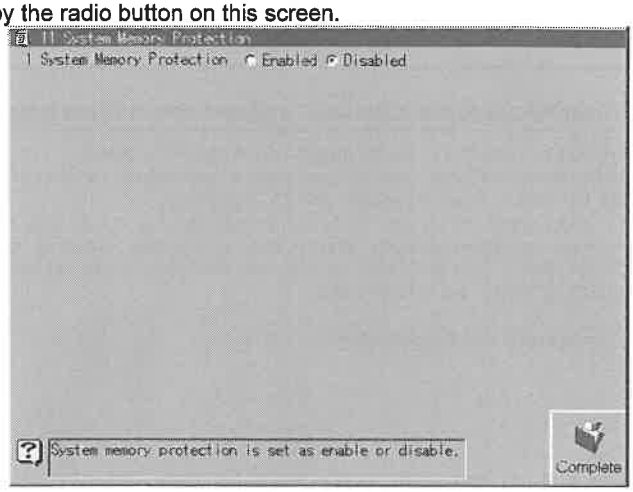
Before confirming the condition of the system memory protection function, it is necessary to choose the operator class **EXPERT** or higher.

Operation procedures

1 **Open [Constant Settings][1 Control Constants] [11. System Memory Protection].**

>> The [System Memory Protection] screen now appears.

Whether the system memory protection has been set to "enabled" or "disabled" is indicated by the radio button on this screen.



In case of AXCPU10-20 or AXCPU10-30;

In this screen, the setting item is normally grayed out. It is not possible to change the setting from "Enabled" to "Disabled"(Only confirming the setting condition is possible) How to change the setting to "Disabled" is described in the following pages.

In case of AXCPU10-50;

The setting item is not grayed out. It is possible to change the setting from "Enabled" to "Disabled" in this screen,

3.3.4 How to check the CPU board type

Before releasing the system memory protection function, please check the CPU board type by following the procedure shown as below.

1 **Open [Service Utilities][13 System Version].**

>>A system environment information screen will show up.

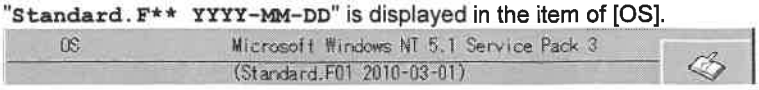
In case of AXCPU10-20 or 30

"**SP6A.** ** **YYYY-MM-DD**" is displayed in the item of [OS].

(An example)

In case of AXCPU10-50

"**Standard.F**** **YYYY-MM-DD**" is displayed in the item of [OS].



(An example)

**	: The version number of the Operating System
YYYY	: Year
MM	: Month
DD	: Day

3.3.5 How to disable the system memory protection function

Operation procedures (for AXCPU10-20 or AXCPU10-30)

1. **With the power OFF, connect the keyboard (PS/2 connector type) to the CPU board, and then turn on the control power.**
2. When the screen shown below appears, press space bar on the keyboard.

```
OS Loader V4.01
...
Press spacebar NOW to invoke Hardware Profile/Last Known Good menu
```

>>When the space bar is pressed, a screen shown below appears.

```
Hardware Profile/Configuration Recovery Menu
This menu allows you to select a hardware profile
to be used when Windows NT is started.
If your system is not starting correctly, then you may switch to a previous
system configuration, which may overcome startup problems.
IMPORTANT: System configuration changes made since the last successful
startup will be discarded.

  Original Configuration



Use the up and down arrow keys to move the highlight
to the selection to you want. Then press ENTER.
To switch to the Last Known Good configuration, press 'L'
To Exit this menu and restart your computer, press F3.
```

3. **Press "L" key on the keyboard.**
>>A screen shown below appears.

```
Hardware Profile/Configuration Recovery Menu
This menu allows you to select a hardware profile
to be used when Windows NT is started.
If your system is not starting correctly, then you may switch to a previous
system configuration, which may overcome startup problems.
IMPORTANT: System configuration changes made since the last successful
startup will be discarded.

  Original Configuration



Use the up and down arrow keys to move the highlight
to the selection to you want. Then press ENTER.
To switch to the default configuration, press 'D'
To Exit this menu and restart your computer, press F3.
```

What is displayed at the bottom of the screen differs from what is shown on the screen in 2.

4. **Press the [Return (Enter)] key on the keyboard.**
>> Windows will re-start, and the AX software then starts up. Once the AX software starts up, the system memory protection function is set to "disabled."

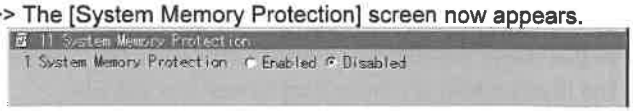
(NOTE) While the start-up process, a warning dialog window will be displayed on the screen and stays for a while. But, please ignore this dialog window.

Operation procedures (for AXCPU10-50)

To set the system memory protection function "Disabled", the operator class **SPECIALIST** or higher is required.

1 **Open [Constant Settings][1 Control Constants] [11. System Memory Protection].**

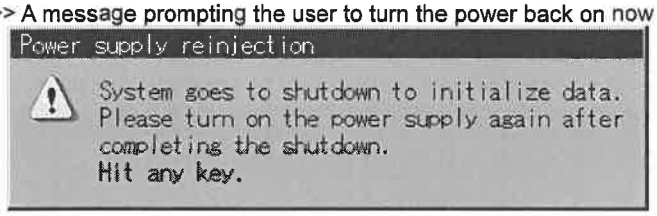
>> The [System Memory Protection] screen now appears.



2 **Press the [ENABLE] key and [→] key at the same time to select "Disabled."**

3 **Upon completion of the settings, press f12 <Complete>.**

>> A message prompting the user to turn the power back on now appears.



4 **Press any key and wait until the following screen is displayed. And then turn OFF and ON the control power.**

>>Now the setting is completed.

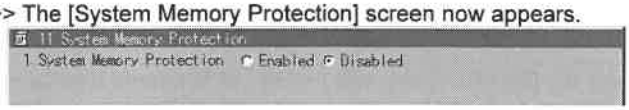
3.3.6 How to enable the system memory protection function

After completing the file restore operation and the option software setting etc., set the system memory protection function to "Enabled" again by following the procedure shown below. To set the system memory protection function "Enabled", the operator class **SPECIALIST** or higher is required.

Operation procedures

1 **Open [Constant Settings][1 Control Constants] [11. System Memory Protection].**

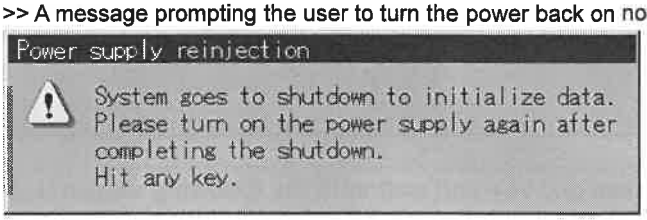
>> The [System Memory Protection] screen now appears.



2 **Press the [ENABLE] key and [←] key at the same time to select "Enabled."**

3 **Upon completion of the settings, press f12 <Complete>.**

>> A message prompting the user to turn the power back on now appears.



4 **Press any key, wait until "再起動(Restart)" is displayed, and then turn the control power back on.**

In case of AXCPU10-50, "再起動(Restart)" is not displayed. Turn OFF the controller power after the following screen is displayed. And then, turn ON the controller power.

Chapter 4 Periodical inspection

This Chapter describes the periodical inspection.

4.1 Regular inspection schedule

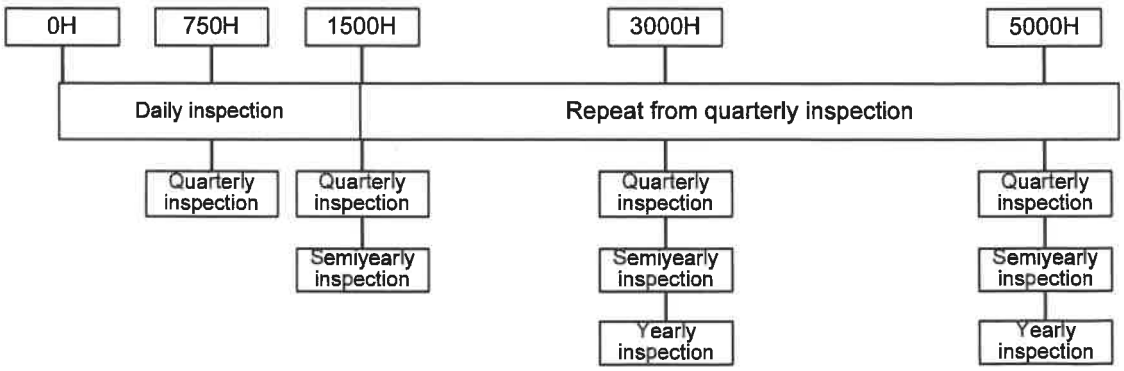
To conduct the inspection and parts replacement, observe the precautions shown below for safe work.

DANGER	Turn OFF the primary power supply. Then, after a lapse of five minutes, conduct replacement work. Do not replace the parts with wet hands. Otherwise it will result in electric shocks, thus leading to serious injury or death.
WARNING	Replacement work must be conducted by the personnel who took the training course on maintenance of the robot that was implemented at the Robot School by the Company. Otherwise, you could receive electric shocks or get caught in the robot, thus resulting in serious injury or death.
WARNING	Conduct replacement work only after short-circuiting between the operator's body and the "G pin" of the controller to provide the same electric potential. Otherwise it could result in electric shocks, thus leading to serious injury or death.
WARNING	Numbers of connectors are connected to each printed circuit board. In order to replace the printed circuit board, be careful not to connect wrong connectors or fail to connect connectors. Otherwise it could result in electric shocks or fire, thus leading to serious injury or death.
WARNING	During replacement work, do not cause damage to wirings. During replacement work, NEVER attempt to touch the electronic parts or patterns on the printed circuit boards. As to the printed circuit boards, hold their circumference. Touching them could result in electric shocks, thus leading to serious injury or death.

In order to prevent failures, ensure the safety, and maintain the performance of the robot, conduct necessary daily inspections and periodical inspections. The following section describes precautions for and the contents of periodical inspections.

4.1.1 Inspection Schedule

Conduct the inspections basically according to the schedule shown in the chart below.



4.1.2 Precautions for periodical inspection

(1) The personnel engaged in the periodical inspection must take the training course on maintenance of the robot that is implemented at the Robot School by the Company.
(2) Before conducting the inspection, be sure to check for the parts, tools, and drawings necessary for the inspection.
(3) To replace any parts, use parts specified by the Company.
(4) To conduct the inspection on the robot, be sure to turn OFF the power supply.
(5) To open the door of the controller, be sure to turn OFF the primary power supply and pay utmost attention not to cause dust or else enter the controller from the circumference.
(6) To touch any component parts of the controller by hand, clean oil stains or the like off the hand. Particularly, to touch printed circuit boards, connectors, or else, pay attention not to cause damage to IC parts due to electrostatic discharge or else.
(7) To conduct the inspection while operating the robot, NEVER enter the robot operating range.
(8) Be sure to make voltage measurement in designated places, and pay utmost attention not to receive electric shocks or short-circuit wirings.
(9) Do not conduct inspections on the robot and the controller at one time.
(10) After the completion of inspection, be sure to check the robot for operation while in idling mode, and then put the robot into the normal operation.

CAUTION

Before using the controller, be sure to close the door and lock the lock key shown in the figure below. Using the controller without locking the lock key may cause dust, spatters from welding, or else to enter the controller, thus resulting in failures.

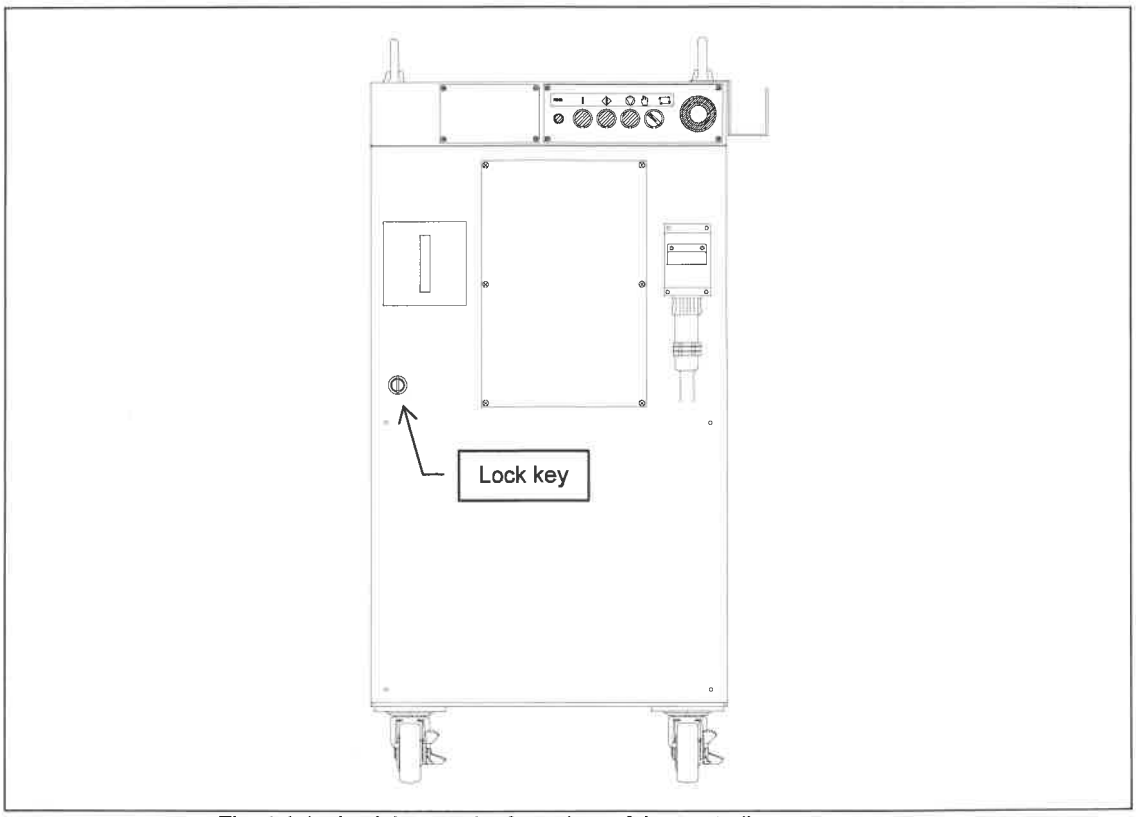


Fig. 4.1.1 Lock key on the front door of the controller

4.1.3 Inspection items

Referring to information in Sections 3.2 Adjustment Procedure and 5. Parts Layout in this "AT CONTROLLER MAINTENANCE SERVICE GUIDE", conduct the maintenance and inspection according to items listed in the table below.

No.	Period				Inspection item	Inspection/maintenance point	Judgment
	Daily	Quarterly	Semiyearly	Yearly			
1		O	O	O	Door packing Lock key	• Clearance and deformation of packing • Engagement of lock key	Visual inspection Visual inspection
2		O	O	O	Left side panel of controller	• Cleaning of cooling fan fin and rotation of fan • Fouling and cleaning of regenerative discharge resistor	Visual inspection and cleaning Visual inspection and cleaning
3		O	O	O	Wire harness	• Damage and crushes of harness • Unfastened connector	Visual inspection Refastening
4			O	O	Drive unit	• Unfastened connector	Refastening
5			O	O	Board connector	• Unfastened connector	Pushing by hand
6	O	O	O	O	Operation switch	• Functions of pushbutton switches and others	Visual inspection and cleaning
7	O	O	O	O	Whole controller	• Dirt and dust	Visual inspection and cleaning
8		O	O	O	Transformer	• Heat generation, abnormal sounds, and abnormal odor	Visual, hearing, and touching inspections
9			O	O	Ground	• Looseness and defects	Visual inspection and refastening
10			O	O	Relay	• Stains and defects	Visual inspection
11		O	O	O	Teach pendant	• Damage • Cleaning and indication of operation labels	Visual inspection Visual inspection and cleaning
12			O	O	Battery	• Battery voltage	Not less than 3.0V (using a tester)
13			O	O	Voltage measurement	• Primary power supply voltage • R3-S3-T3 • P5-M0 • P1-M1 • PB-MB	Specified voltage ±10% AC200V±10% DC+5.15V+0.05V -0.0V DC+24V±1.0V DC+26V±0.5V (using a tester)
14			O		CPU fan motor	• Dirt and dust / Cleaning the fan & heat sink • Rotation of the fan / Warning message of the fan rotation	Visual inspection
15	O				Emergency stop button Enable switch	• Check if these devices work normally	Check the servo ON/OFF operation

4.1.4 Inspection of the emergency stop button

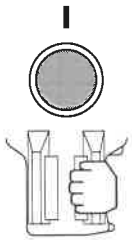
The emergency stop buttons are installed on the operation panel of the front panel of the controller and on the teach pendant.

Before moving the robot, check that both emergency stop buttons are working properly (when the emergency stop button is pressed after servo has been turned ON, the servo will be turned OFF).

4.1.5 Inspection of the Enable Switch (Deadman switch)

Three-position enable switch (deadman switch) is provided on the teach pendant.

Perform the operations described below, and check that the enable switch (deadman switch) is working properly.



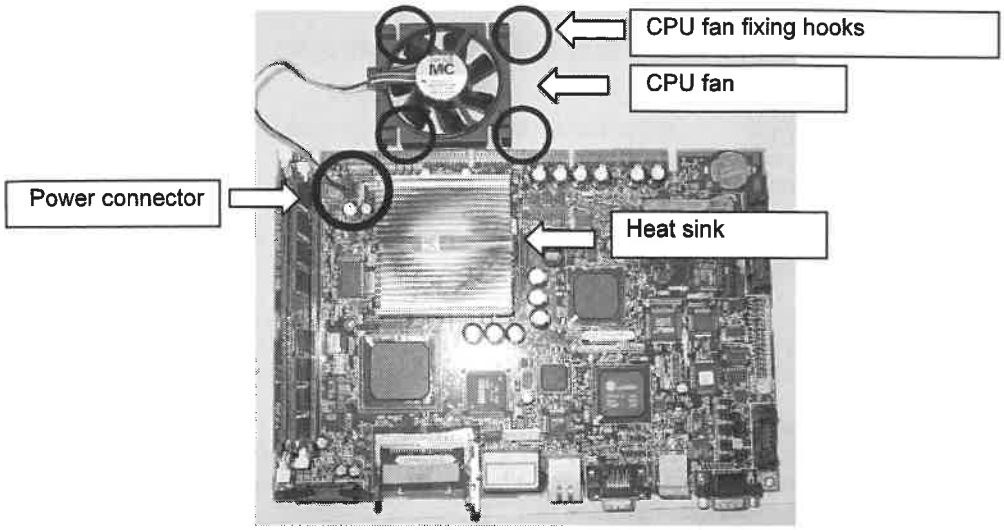
1. Select the Teach mode.
2. Press the "Motors-ON" button on the operation panel.
3. Hold the Enable Switch (Deadman Switch).
   >> The servo is turned ON while the Enable Switch is held.
4. Hold the Enable Switch more tightly, or release it.
   >> The servo is turned OFF.

4.1.6 Inspection before a long-term shutdown

To turn OFF the power supply of the robot for a long vacation or else, be sure to conduct inspections on the robot for the following points.

(1) If the controller displays the error message "I1016 Encoder battery voltage dropped", replace the battery. Failing to replace the battery may destroy the encoder data, thus requiring the resetting and correction of the encoder. To replace the battery, refer to information in the "ROBOT MAINTENANCE SERVICE MANUAL".
(2) Make sure the door of the controller is closed and the lock key is locked.

4.1.7 Cleaning the CPU fan and the heat sink



Cleaning the CPU fan

(1) Disconnect the power supply connector of the CPU fan.
(2) Pushing 4 hooks of the fan from their side by fingers, remove the fan.
(3) Using air blow, clean the CPU cooling fan (especially, the gap of the rotation part's root). At this time, pay attention not to let the dust and particles stick the PCB surface.(This work should be done in a place that is far from the CPU board)

Cleaning the heat sink

Overturn the CPU board and remove the dusts and the particles on the heat sink using a brush etc. At this time, the heat sink should be lower side. Pay attention not to let the dust and particles stick the PCB surface.

CAUTION

Do not use air blow for the cleaning of the heat sink. If air blow is used, the dust and the particles may stick on the board and PCB damage because of short-circuits etc. may occur.

4.2 Maintenance parts

4.2.1 List of maintenance parts

Recommended spare parts are broadly divided into two categories A and B according to the service life and frequency in use of the parts.

Maintenance parts A Major maintenance parts to be provided for daily maintenance and inspection
- **A-1 Important backup parts**
- **A-2 Periodical replacement parts**

Maintenance parts B Maintenance parts to be provided if two or more robots are purchased
- **B-1 Parts recommended purchasing from NACHI**

Parts including in A-1 and A-2 categories are essential to maintain the normal operation of the robot. Therefore, it is recommended to provide a complete set of these parts. Furthermore, printed circuit boards have high-reliability parts. Pay careful attention to the following points for the maintenance of the boards.

- **Storage temperature: -10 to +50°C**
  If the parts are needed to store for an extended period of time, it is recommended to store them at a temperature of 25°C±10°C in order to maintain reliability. Furthermore, do not store them in places with sharp changes in temperature (e.g. 10°C/hour).

- **Storage humidity: 20 to 85%RH**
  If the parts are needed to store for an extended period of time, it is recommended to store them at humidity of 45 to 65% in order to maintain reliability. Furthermore, do not store them under conditions that tend to cause dew condensation or molds.

- **Antistatic measures**
  If the parts are stored under extremely dry conditions, they will be apt to take charge. Consequently, shocks caused by discharge may result in the destruction of semiconductors. To avoid that, put the parts in antistatic bags for storage.

- **Other ambient conditions**
  Store the parts in atmosphere with no toxic gas generation and minimal dirt and dust. Furthermore, do not store the parts under conditions causing loads to be applied.

Table 4.2.1 A-1 Important backup parts

No.	Part name	Type	Manufacturer	Recommended quantity	Remark
1	Drive unit (Note 1)	RKX1120	NACHI	1	7-axes specifications for ST Series
2	Teach pendant (Note 2)	AXTPFS0N-JC**	NACHI	1	Japanese / One-handed Enable switch spec.
		AXTPFD0N-EC**	NACHI	1	English / Two-handed Enable switch spec.
		AXTPFS0T-JC**	NACHI	1	Japanese / One-handed Enable switch / Touch screen spec. (Option)
		AXTPFD0T-EC**	NACHI	1	English / Two-handed Enable switch / Touch screen spec. (Option)
3	CPU board	AXCPU10-20 AXCPU10-30	NACHI	1	AXCPU10-30 has a compatibility with AXCPU10-20. (Holes to install UM308 board are added onto the AXCPU10-30) (August 2010 or before)
		AXCPU10-50	NACHI	1	(September 2010 or after)
		AXCPU10-50-CF-*	NACHI	1	Including a system CF *3
4	Printed circuit board	UM204-20	NACHI	1	Storage board (Arc welding spec.)
5	Printed circuit board	UM211-10	NACHI	1	Power failure detection board
6	Printed circuit board	UM301-10	NACHI	1	I/O sequence board
7	Multi power supply unit	PSU20-10	NACHI	1	
8	Hi-power unit	PWUNIT20-10	NACHI	1	
		PWUNIT20T-10	NACHI	1	For CE specification
		PWUNIT20-20	NACHI	1	
		PWUNIT20T-20	NACHI	1	For CE specification
9	Printed circuit board	UM235-10	NACHI	1	Interrupt output board (Except for arc welding spec.)
10	CPU fan	PDS-MA01E0107	NACHI	1	for AXCPU10-20
11	Fuse	HM50	Daito Communication Apparatus	1	for drive unit F1, F2
12	Fuse	HM20	Daito Communication Apparatus	1	for drive unit F3

(Note 1) The type of the drive unit varies with the robot model, number of axes to use, and with or without attachment axis and its motor capacity.
Check for the type to use, and then check for the number of axes to use and the attachment axis motor specifications.

(Note 2) The type of the teach pendant varies with the robot specifications.

(Note 3) In this type number, a system CF is attached to AXCPU10-50. ("*" stands for the customer specification) When replacing AXCPU10-20/30 to AXCPU10-50, please prepare this spare part.

(Note 4) PWUNIT20-20 has an upper compatibility for PWUNIT20-10. When purchasing a new part, please order PWUNIT20-20. PWUNIT20T-20 has an upper compatibility for PWUNIT20T-10. When purchasing a new part, please order PWUNIT20T-20.

Table 4.2.2 A-2 Periodical replacement parts

No.	Part name	Type	Manufacturer	Recommended quantity	Remark
1	Battery (Button battery)	CR2032 for AXCPU10-30 (August 2010 or before)	Every manufacturer Recommended manufacturer: Panasonic	1	Used for CPU boards. Regardless of operating time, replace the battery once every 3 years.
2	Battery (Cylinder shape battery)	R0087 for AXCPU10-50 (September 2010 or after)	NACHI	1	Used for CPU boards. Regardless of operating time, replace the battery once every 5 years.
3	Fan motor ASSY	AX20-SP-C08-011	NACHI (Royal Electric)	3	Used for the heat sink of the drive unit and cooling of regenerative discharge resistor. (FM1-1, FM2-1, FM2-2) Regardless of operating time, replace the battery once every four years.
4	Fan motor	4715MS-20T- B50-B00	Minebea	2	Used for cooling the inside of the controller. (FM3-1, FM3-2) Regardless of operating time, replace the battery once every four years.

Table 4.2.3 B-1 Parts recommended purchasing from NACHI

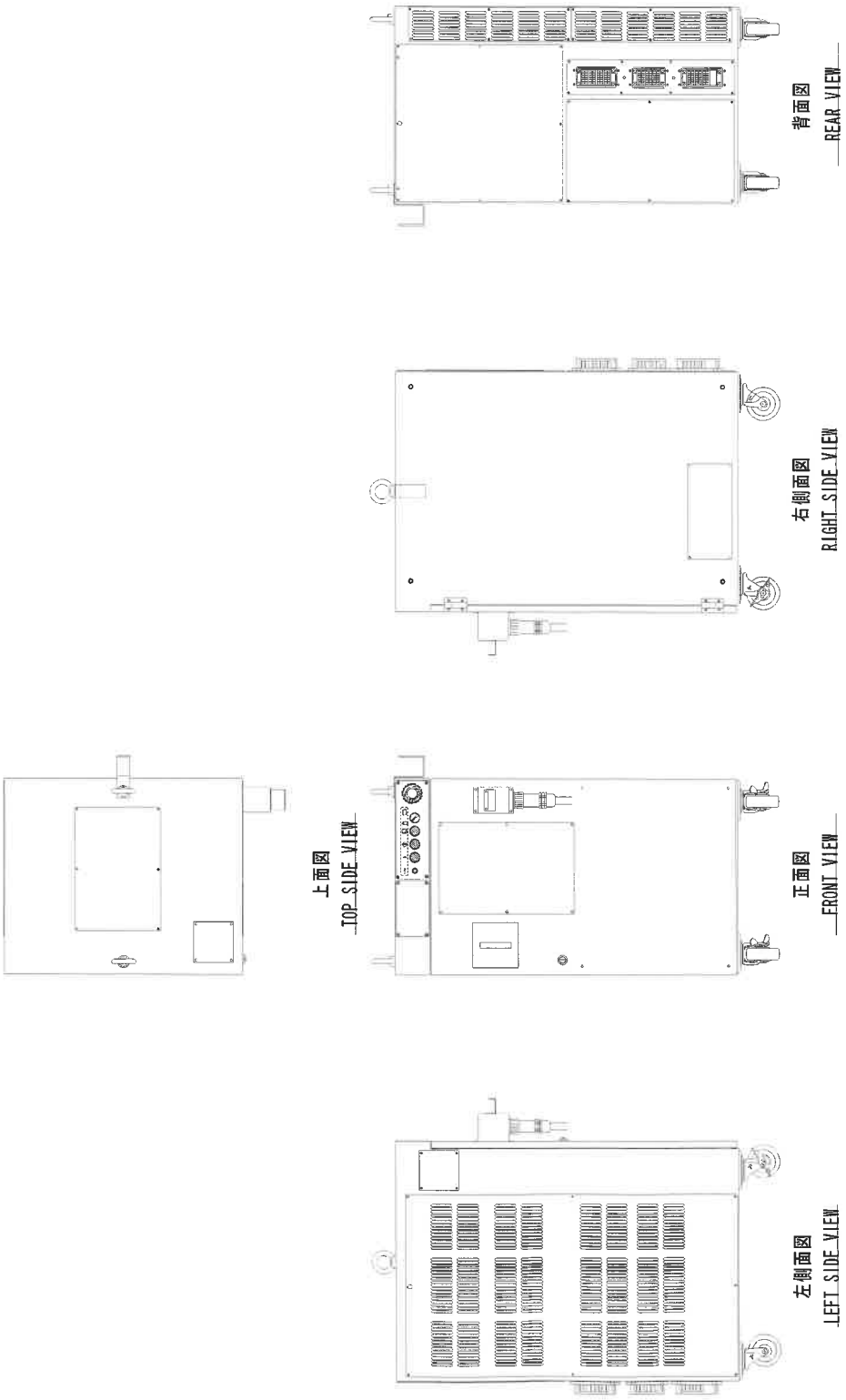
No.	Part name	Type	Manufacturer	Recommended quantity	Applicable model
1	Wire harness	HK100X-J1-**-A "**" represents the length of cable.	NACHI	1	ST

Chapter 5 Parts layouts and electric circuit diagram

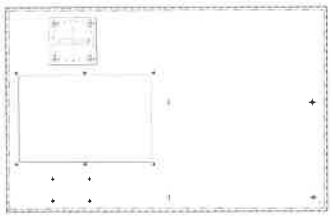
This Chapter shows the parts layouts and electric circuit diagrams.

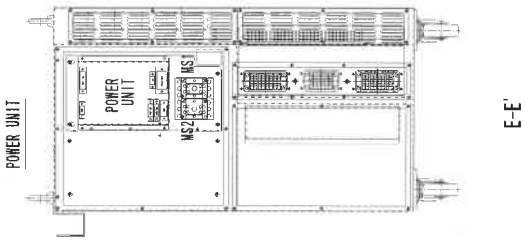
5.1 AX20 - Parts layout and electric circuit diagrams (Nov. 2006 or before)

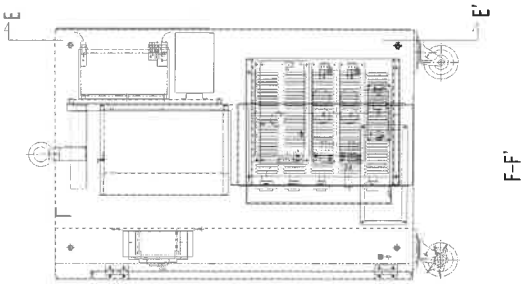
5.1.1 External view

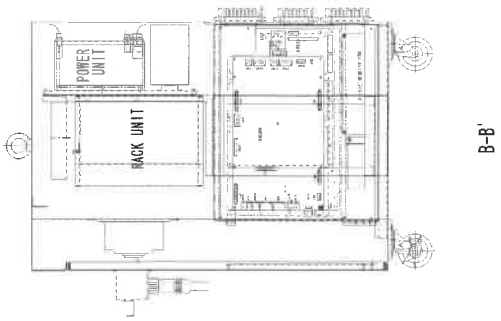


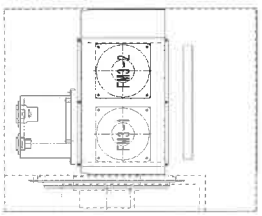
5.1.2 Parts layout

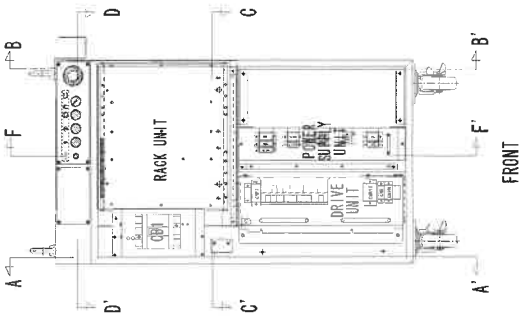


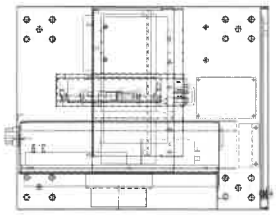


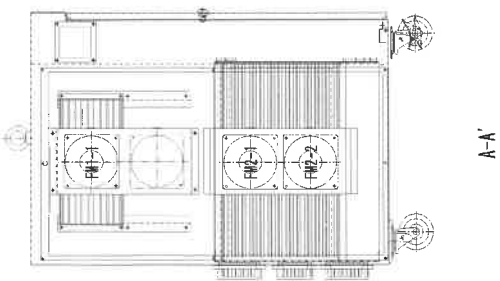




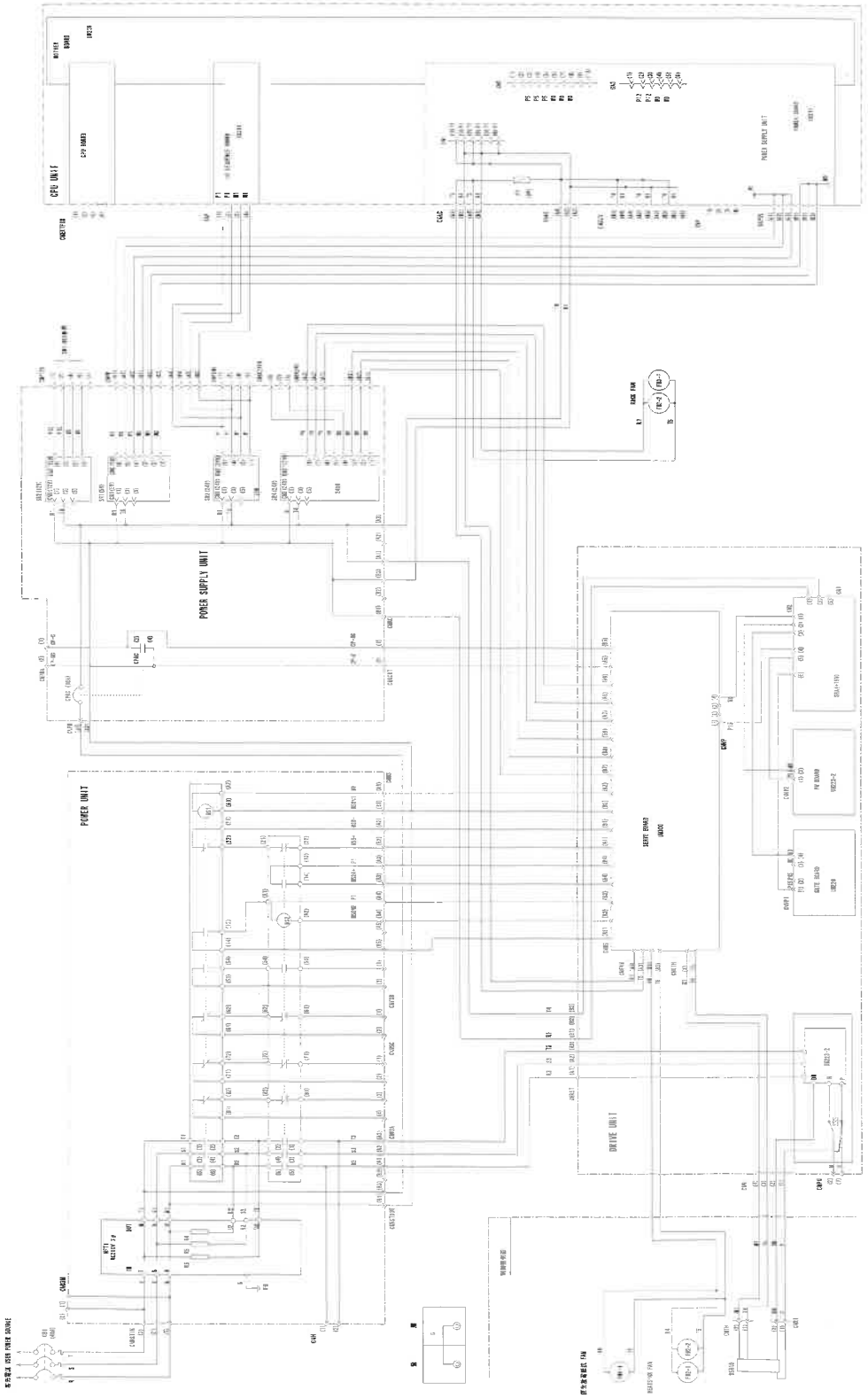




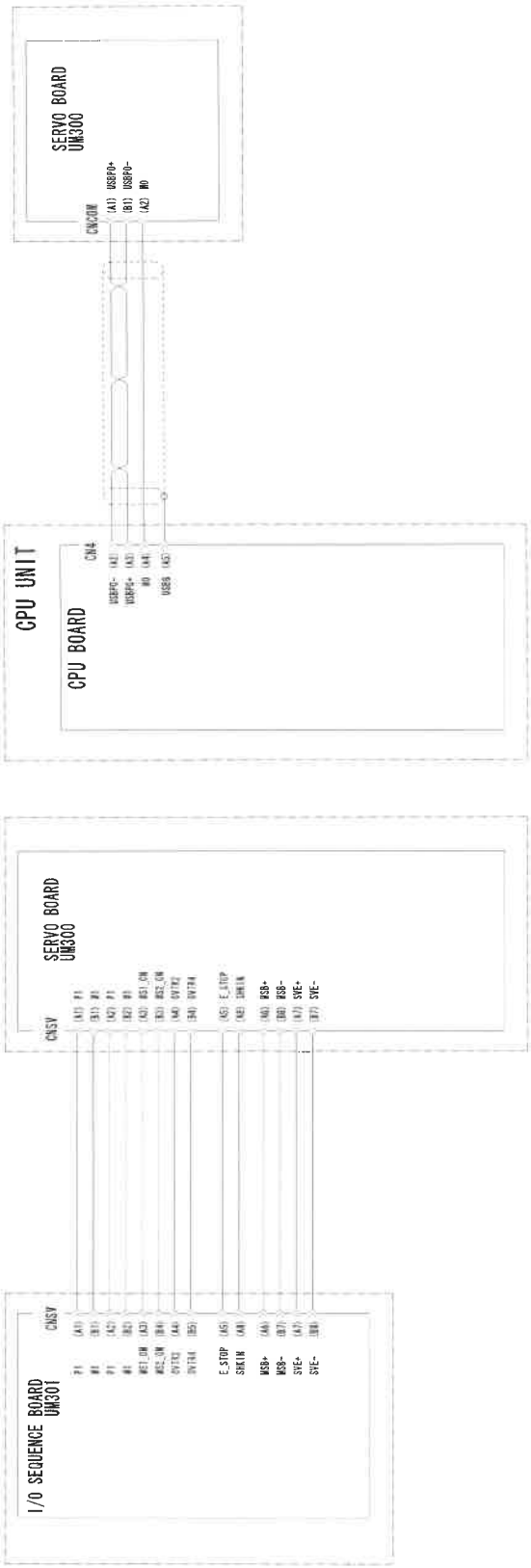




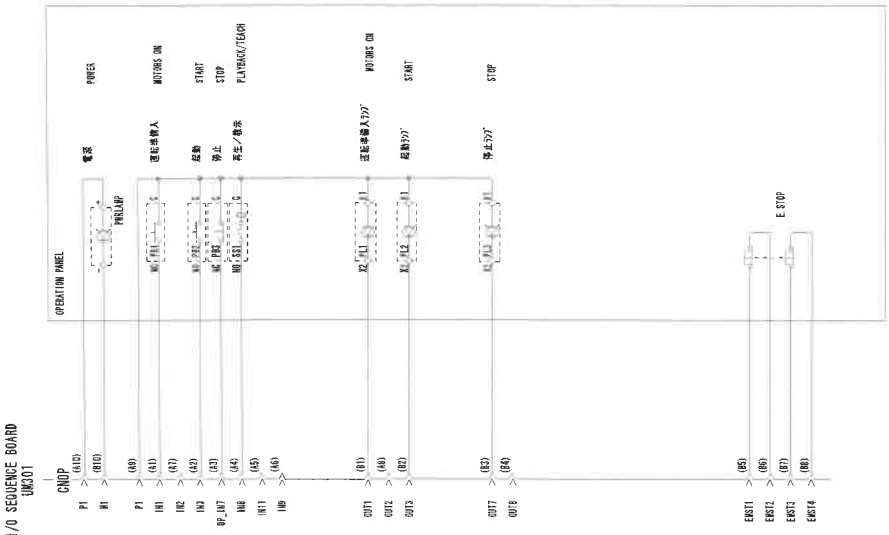
5.1.3 Unit connection diagram (1): Power supply circuit

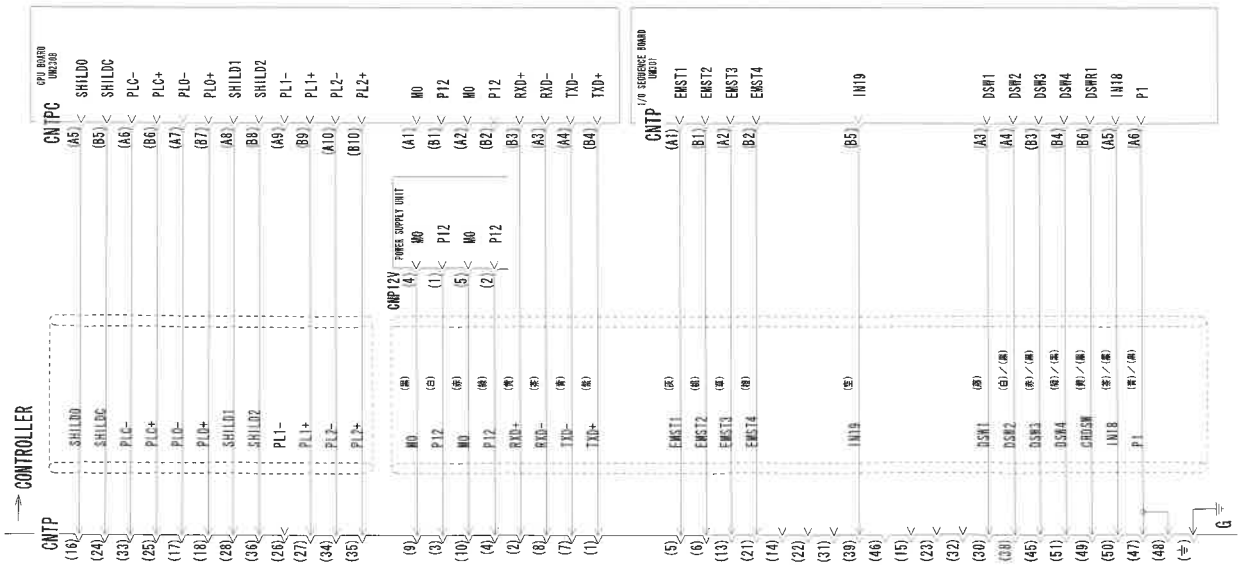


5.1.4 Unit connection diagram (2): Sequence circuit



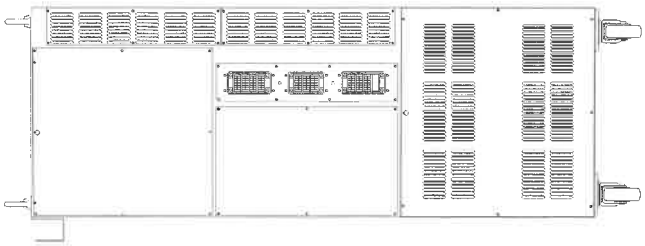
5.1.5 Unit connection diagram (3): Teach pendant and operation panel

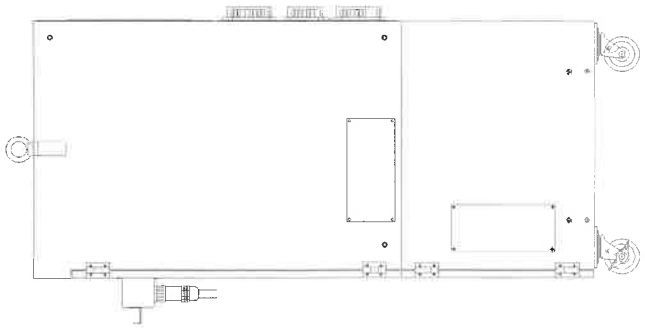


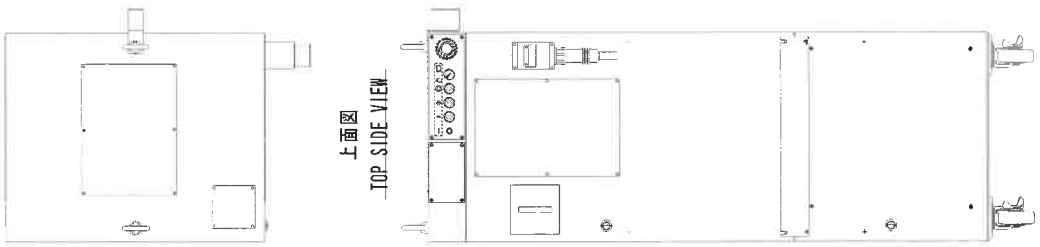


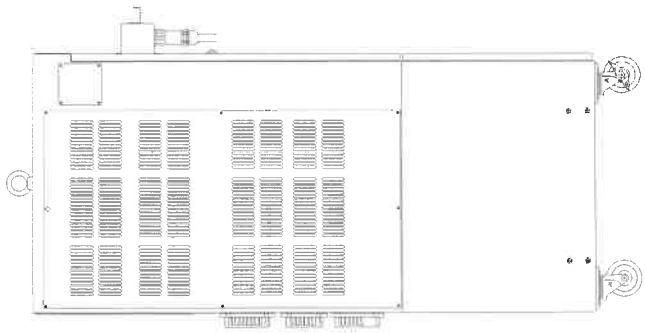
5.2 AX20 (with transformer) - Parts layout and electric circuit diagrams (Nov. 2006 or before)

5.2.1 External view

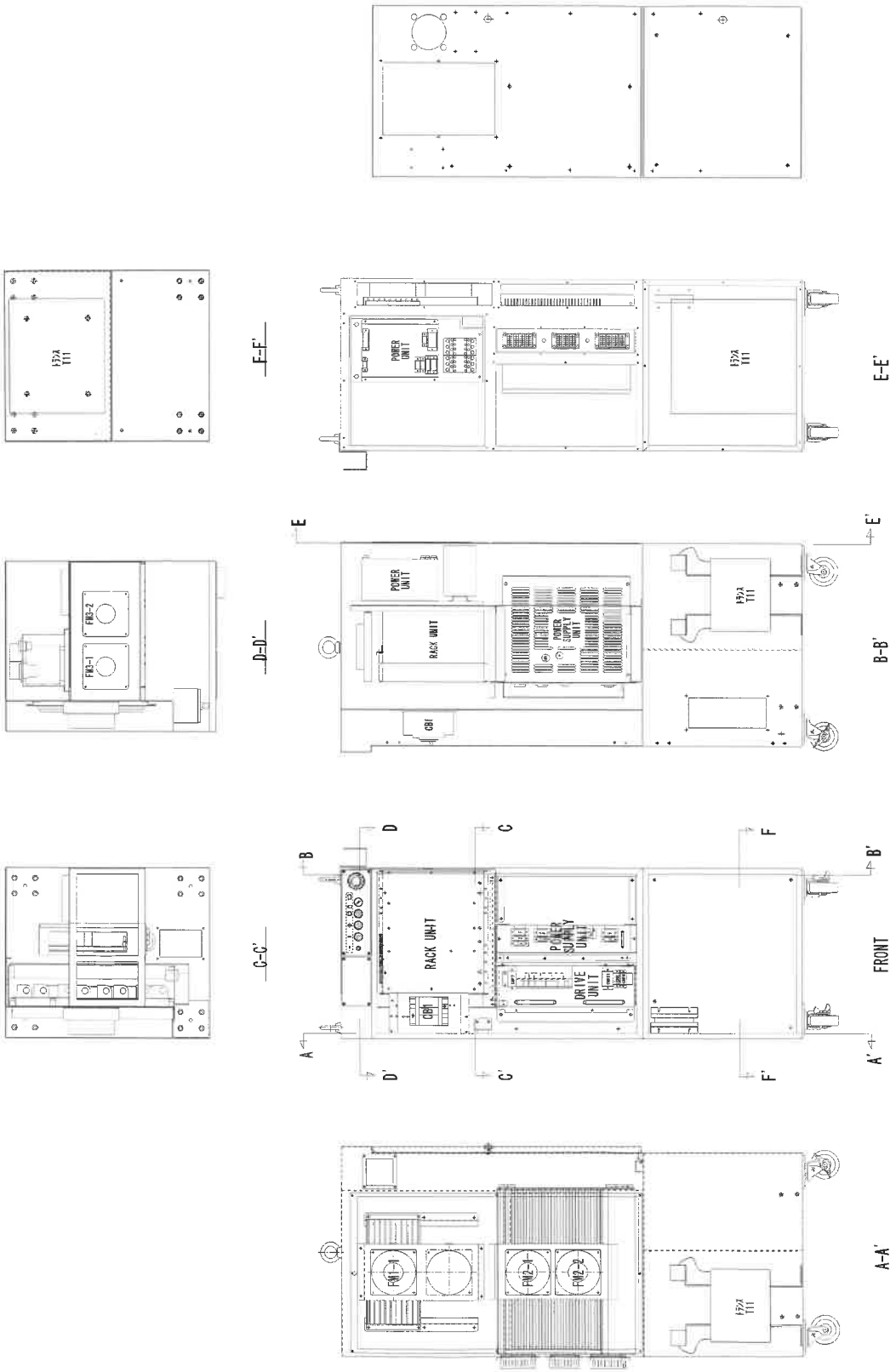




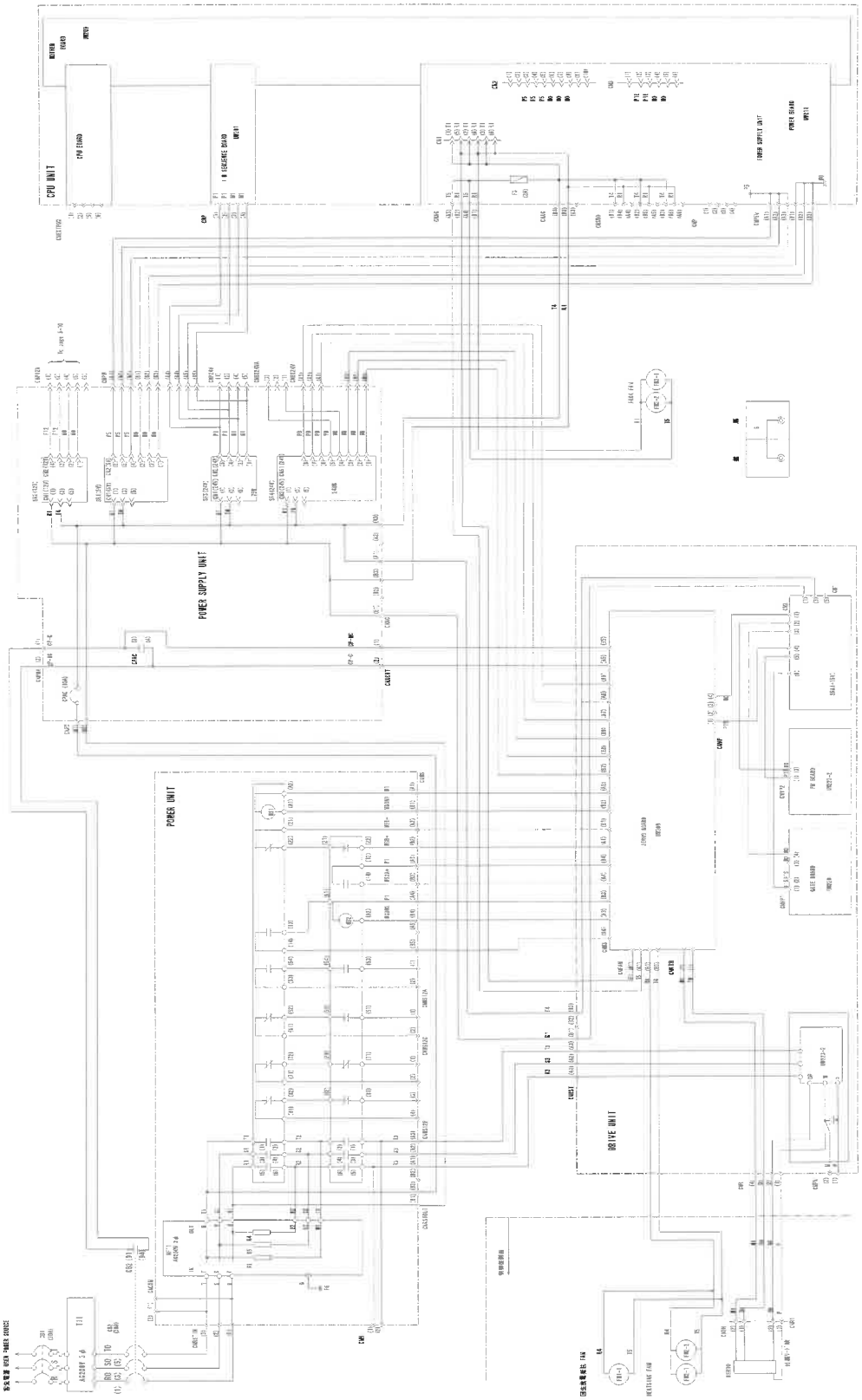




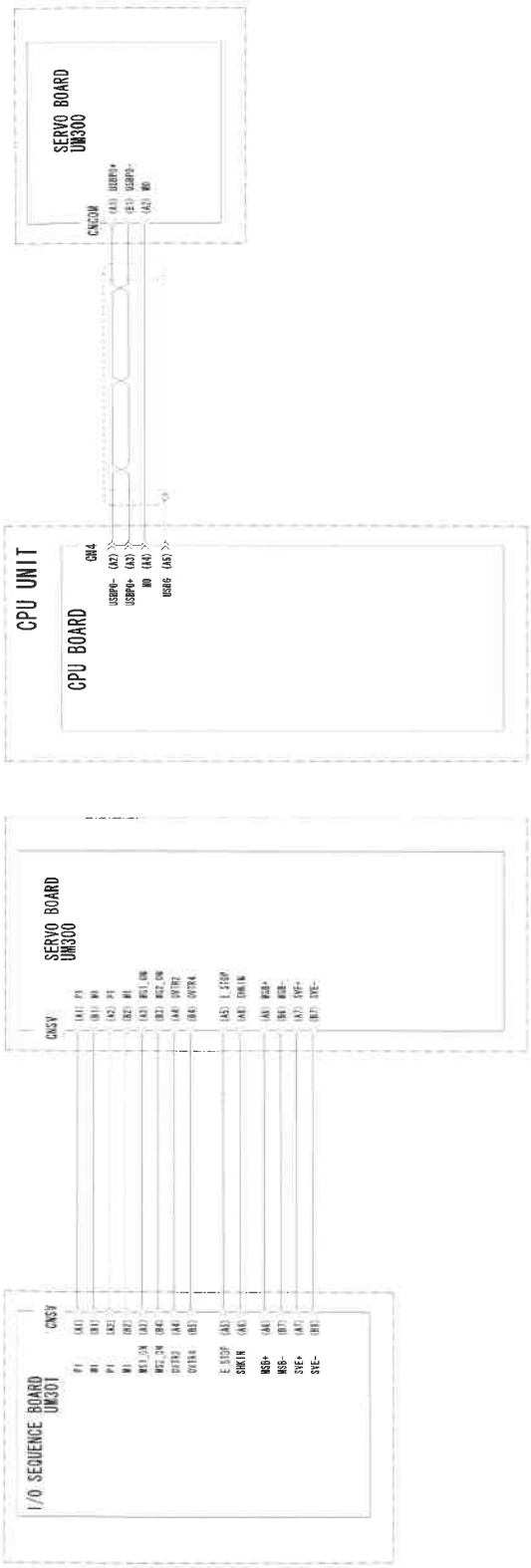
5.2.2 Parts layout



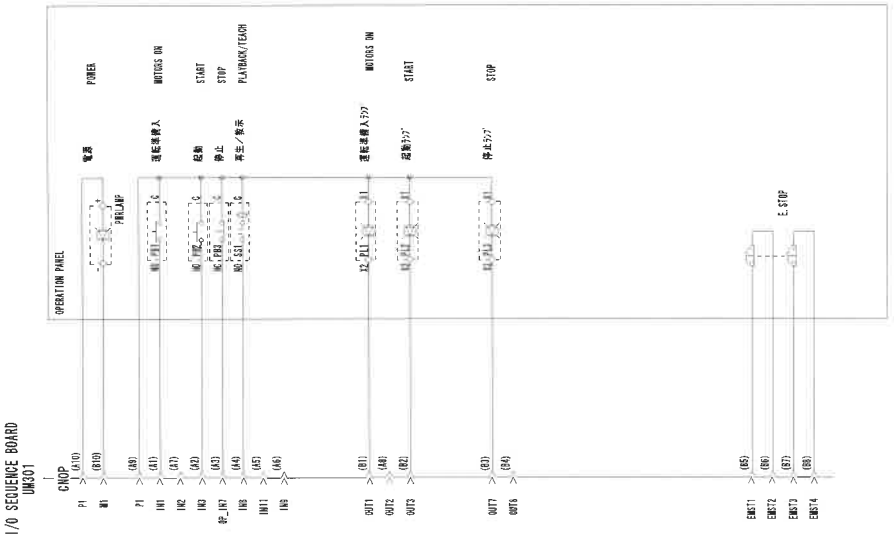
5.2.3 Unit connection diagram (1): Power supply circuit

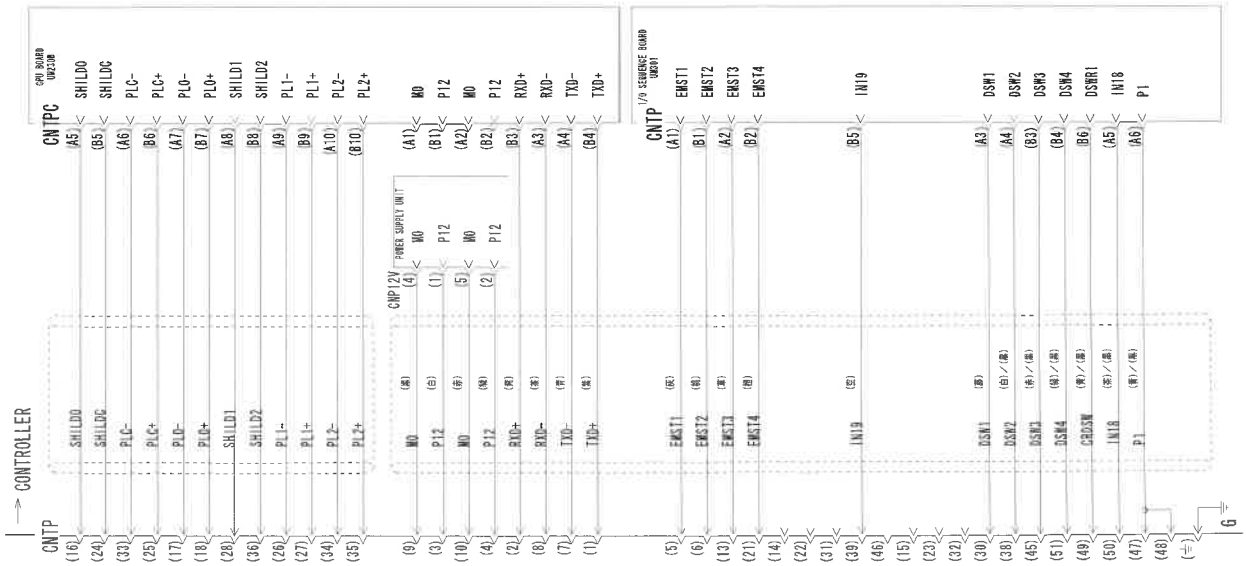


5.2.4 Unit connection diagram (2): Sequence circuit



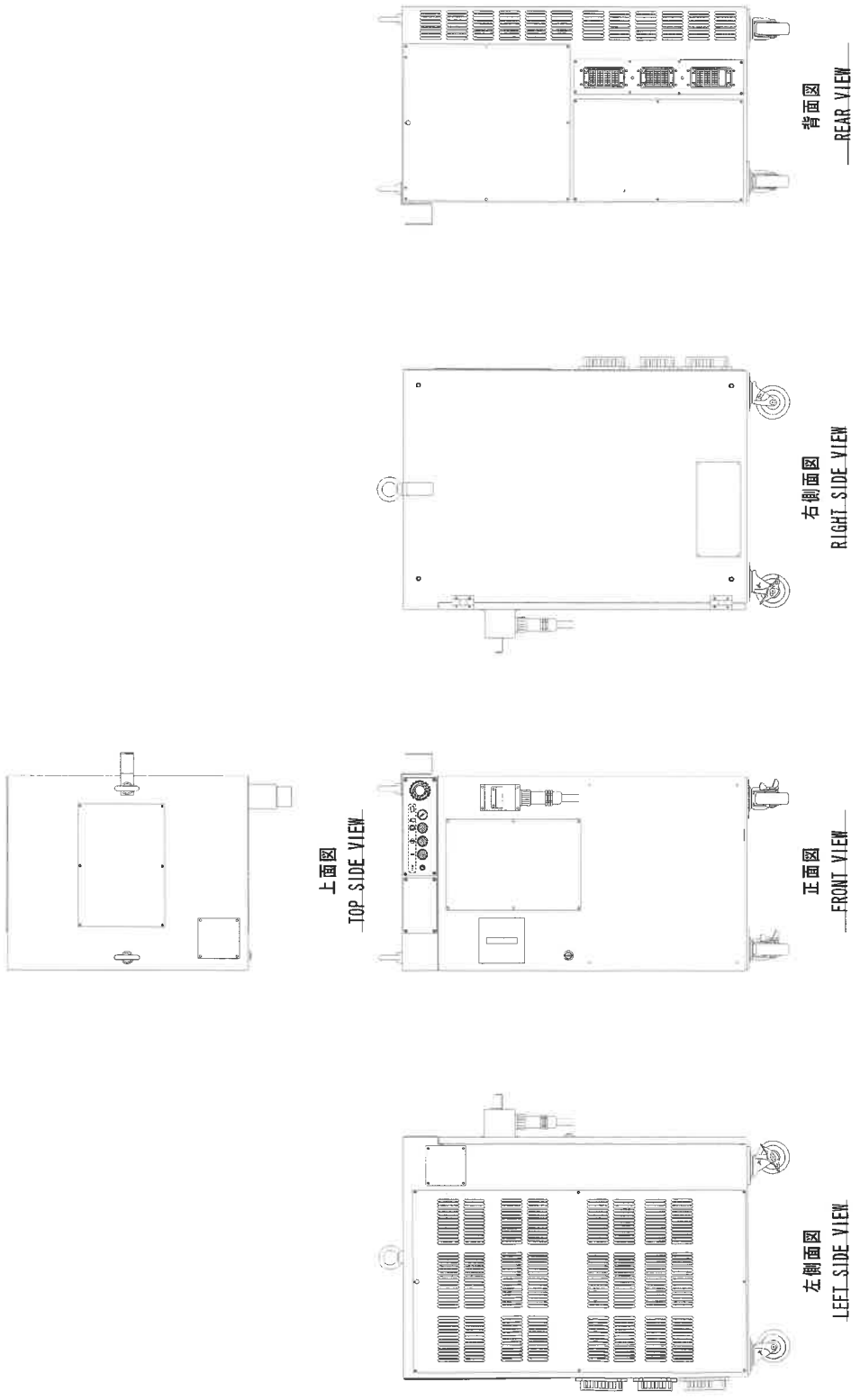
5.2.5 Unit connection diagram (3): Teach pendant and operation panel



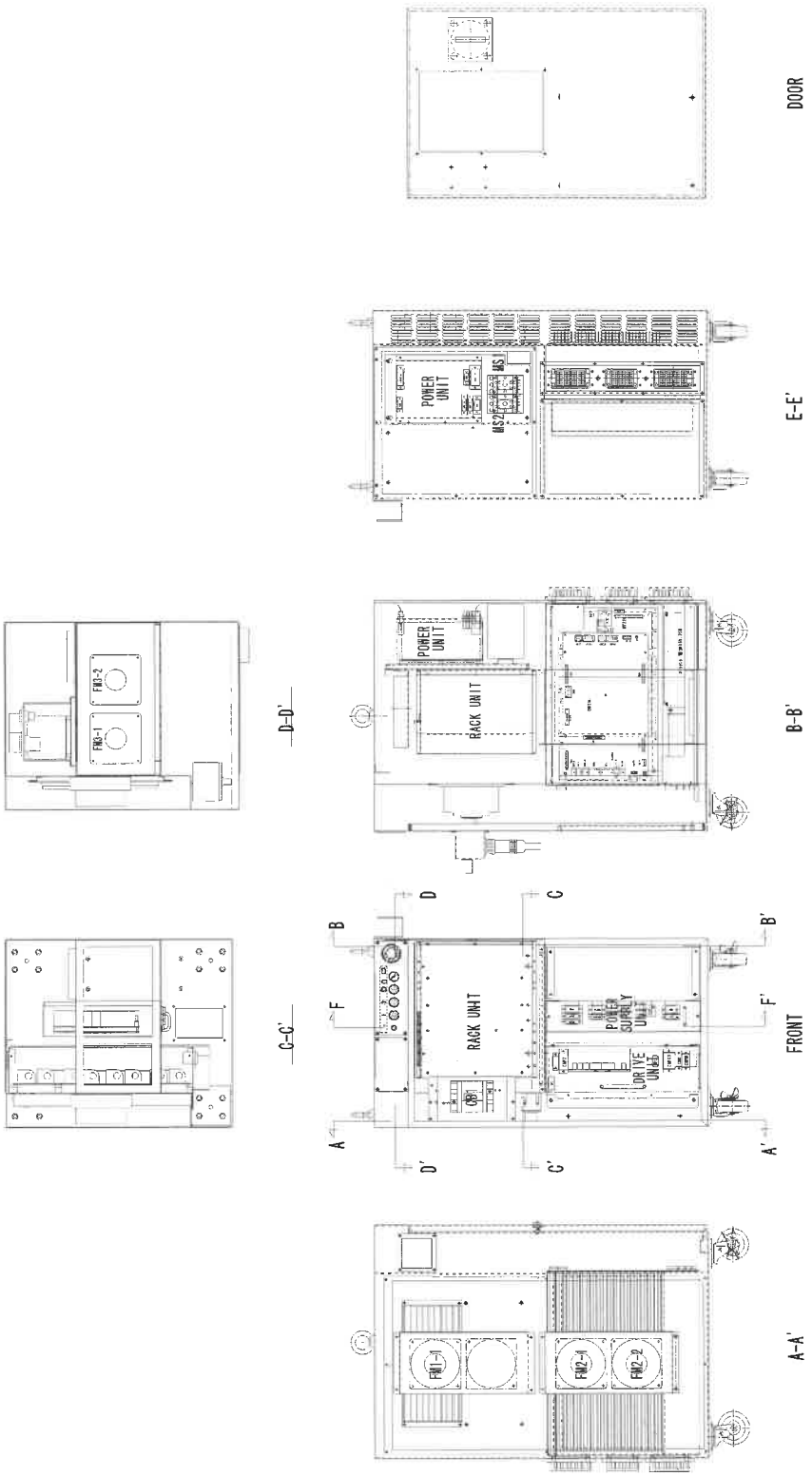


5.3 AX20 - Parts layout and electric circuit diagrams (Dec. 2006 or after)

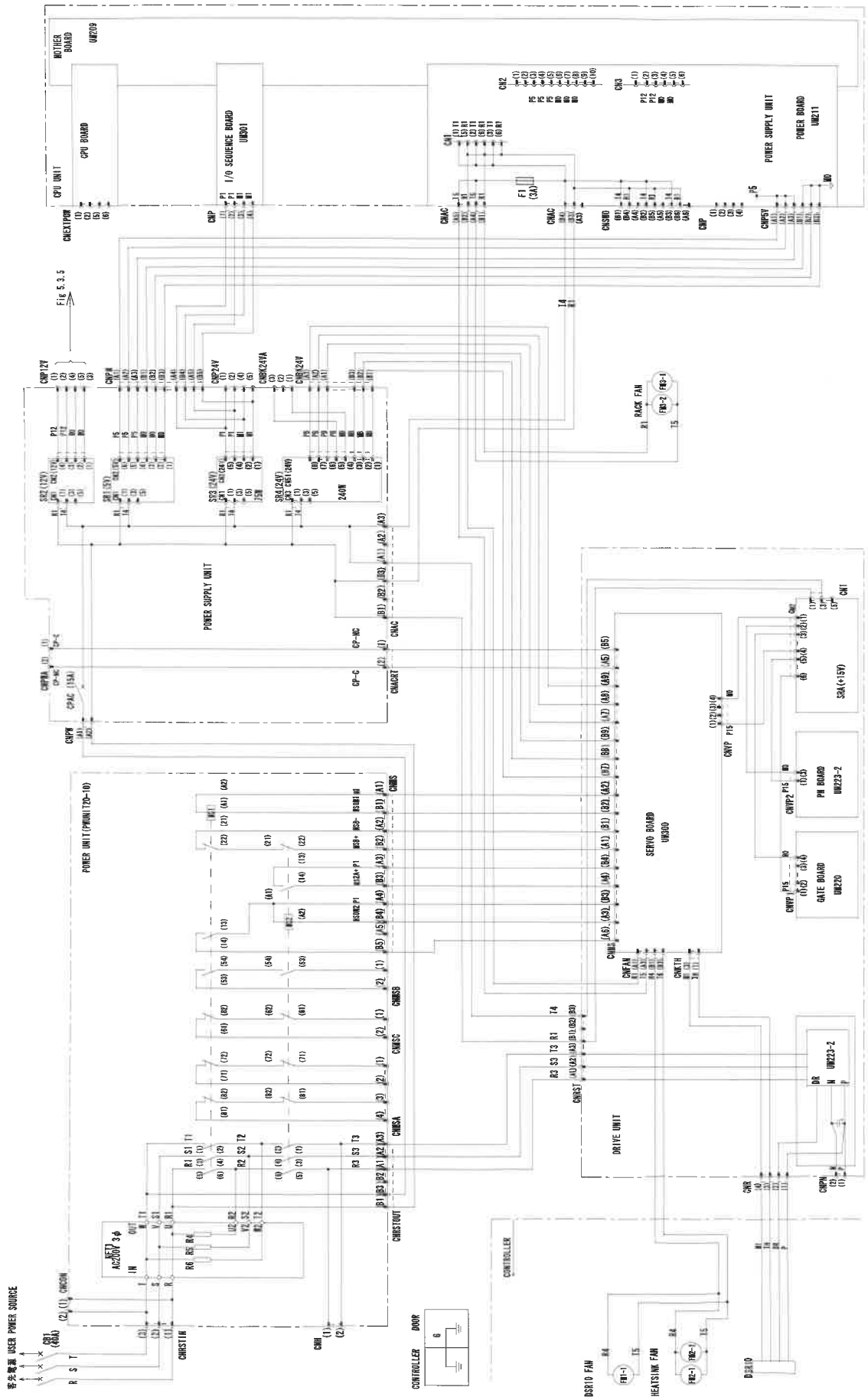
5.3.1 External view



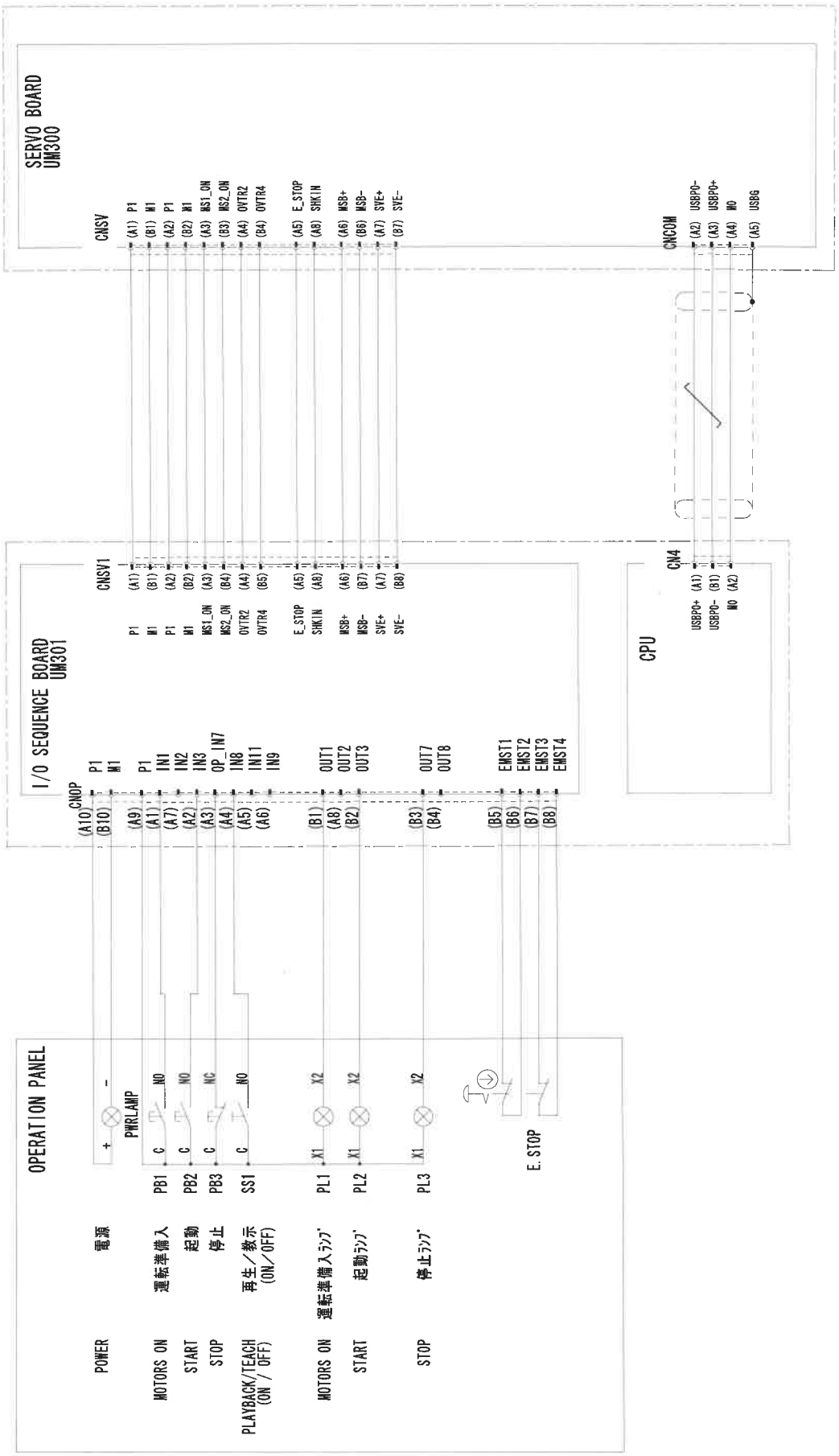
5.3.2 Parts layout



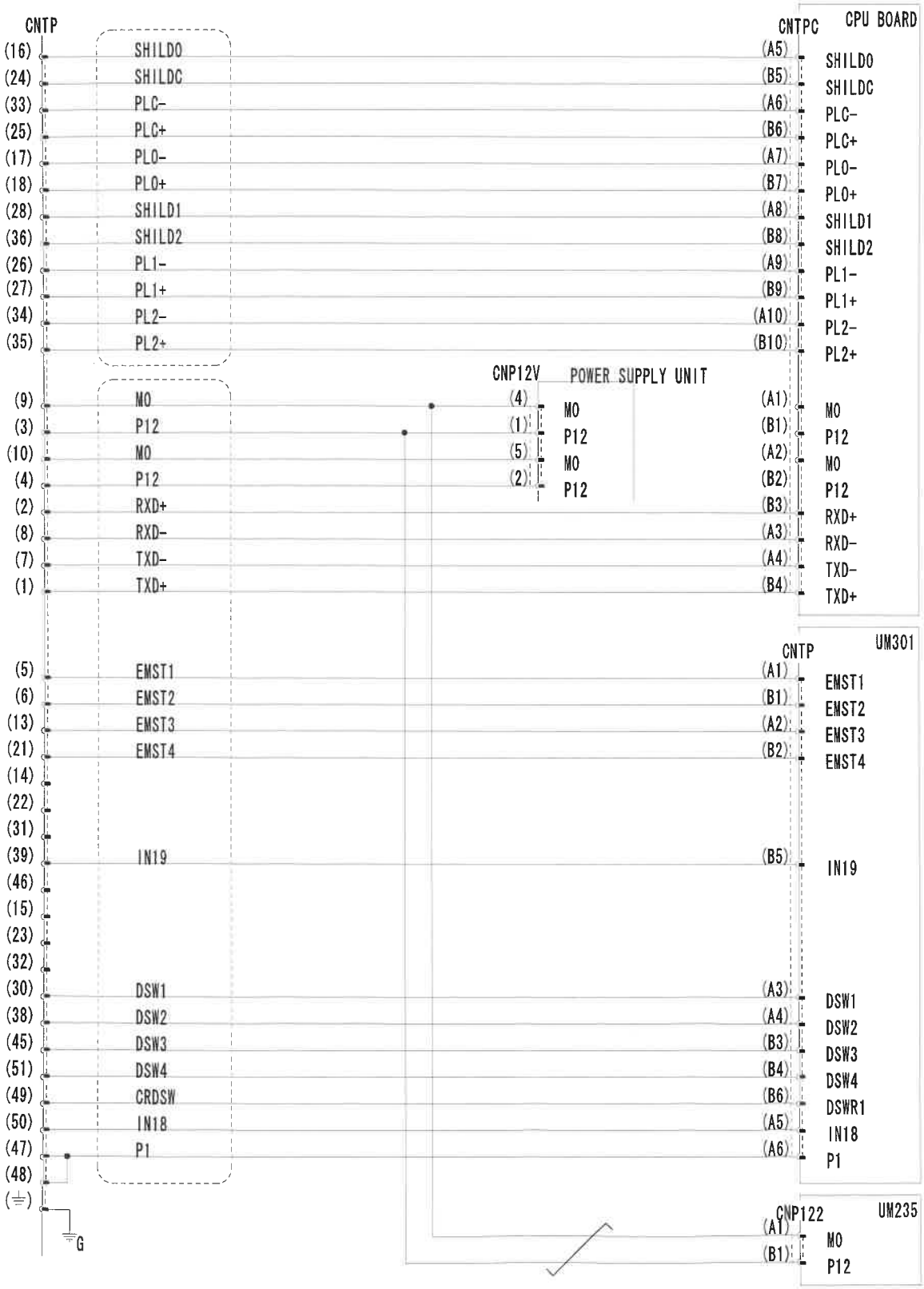
5.3.3 AX20ユニット接続図(1) 電源回路
5.3.3 AX20 UNIT CONNECTION(1) POWER CIRCUIT



5.3.4 AX20ユニット接続図(2) シーケンス回路
5.3.4 AX20 UNIT CONNECTION(2) SEQUENCE CIRCUIT

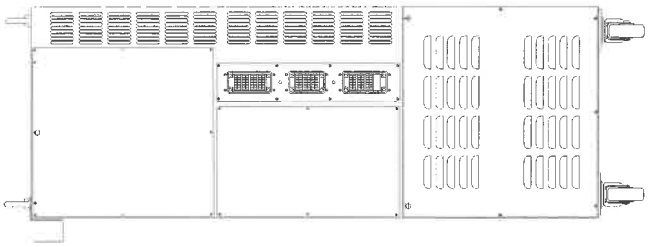


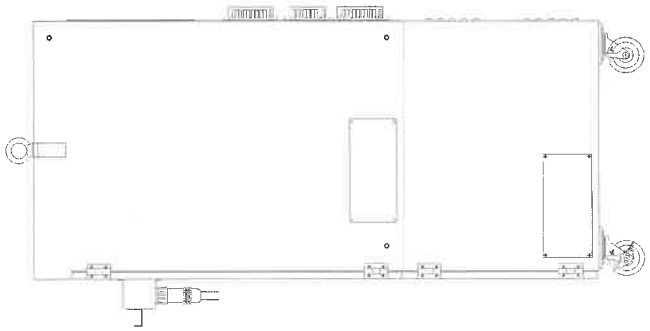
5.3.5 AX20ユニット接続図(3) TP接続
5.3.5 AX20 UNIT CONNECTION(3) TP CONNECTION

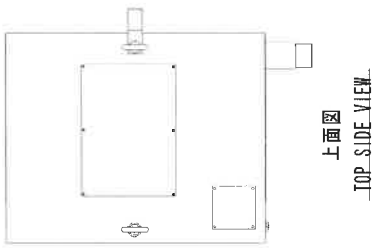


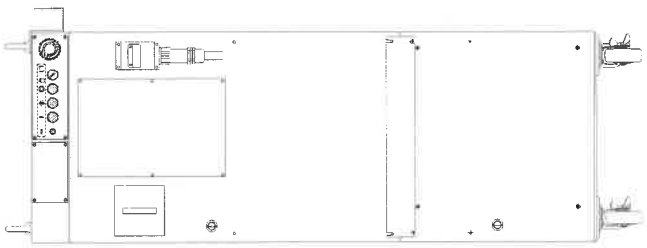
5.4 AX20 (with transformer) - Parts layout and electric circuit diagrams (Dec. 2006 or after)

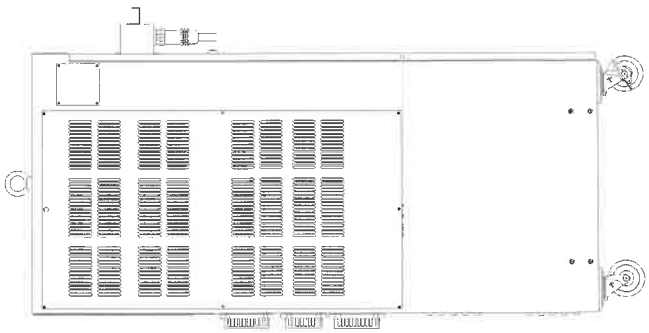
5.4.1 External view



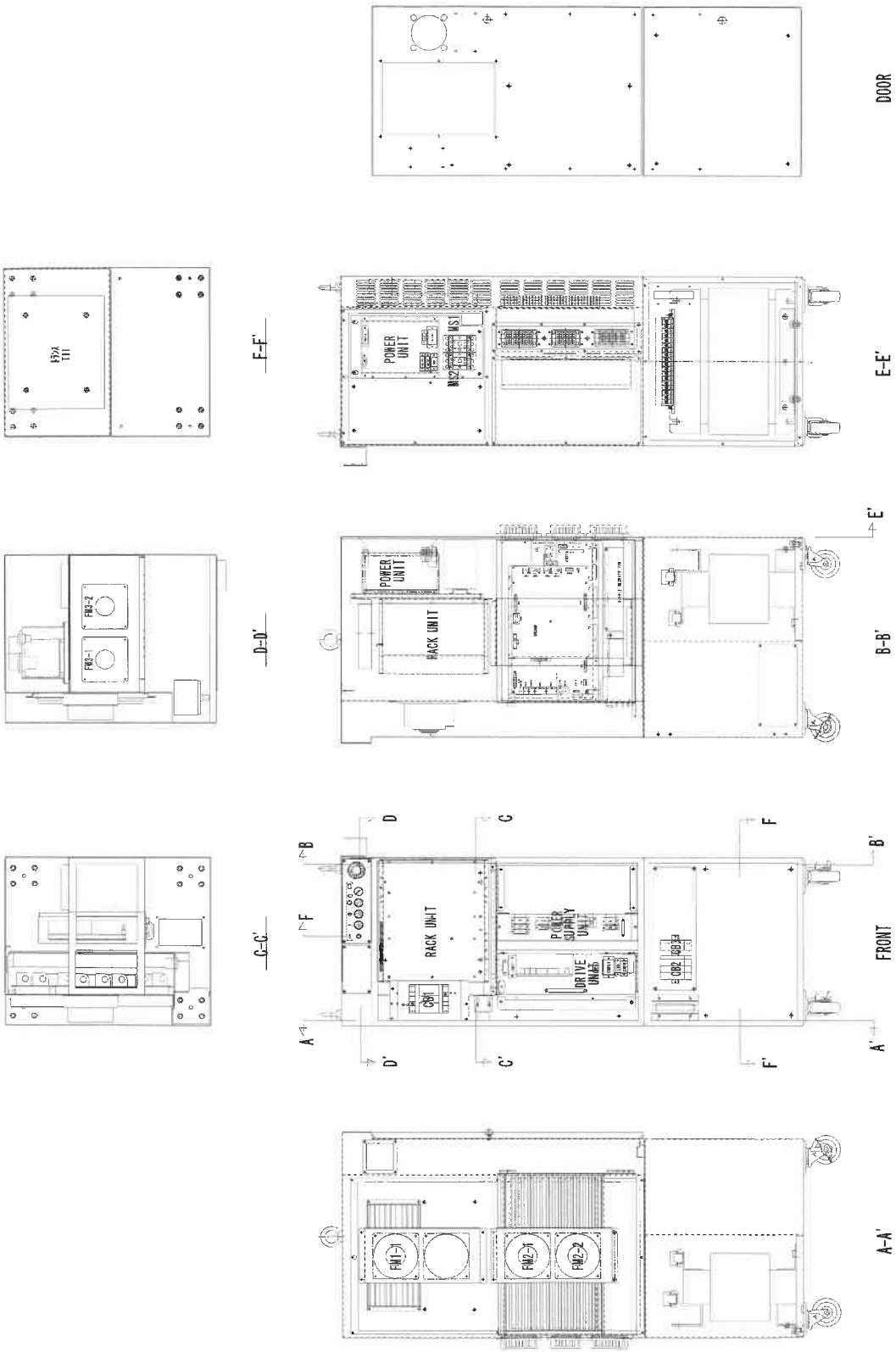






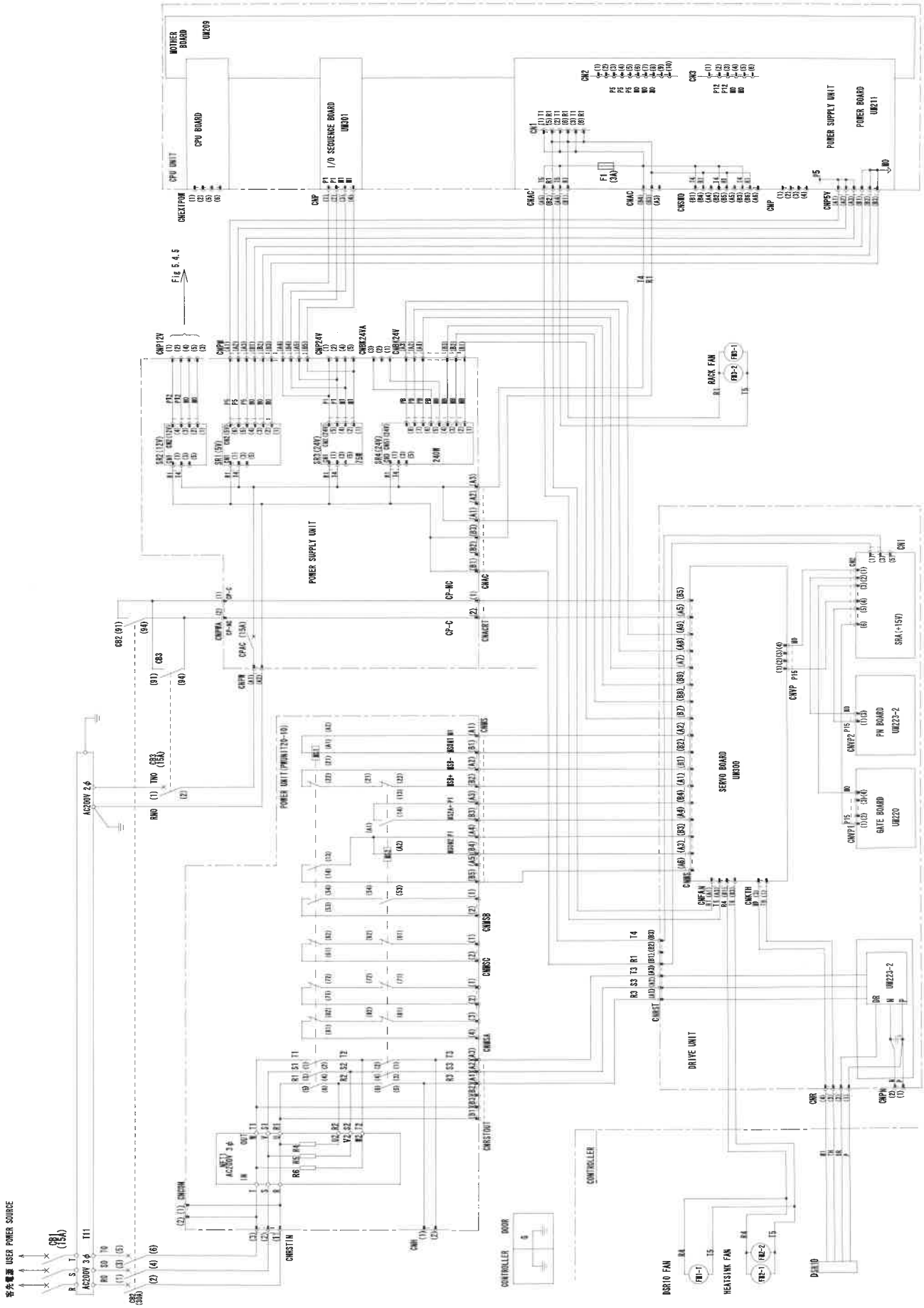


5.4.2 Parts layout

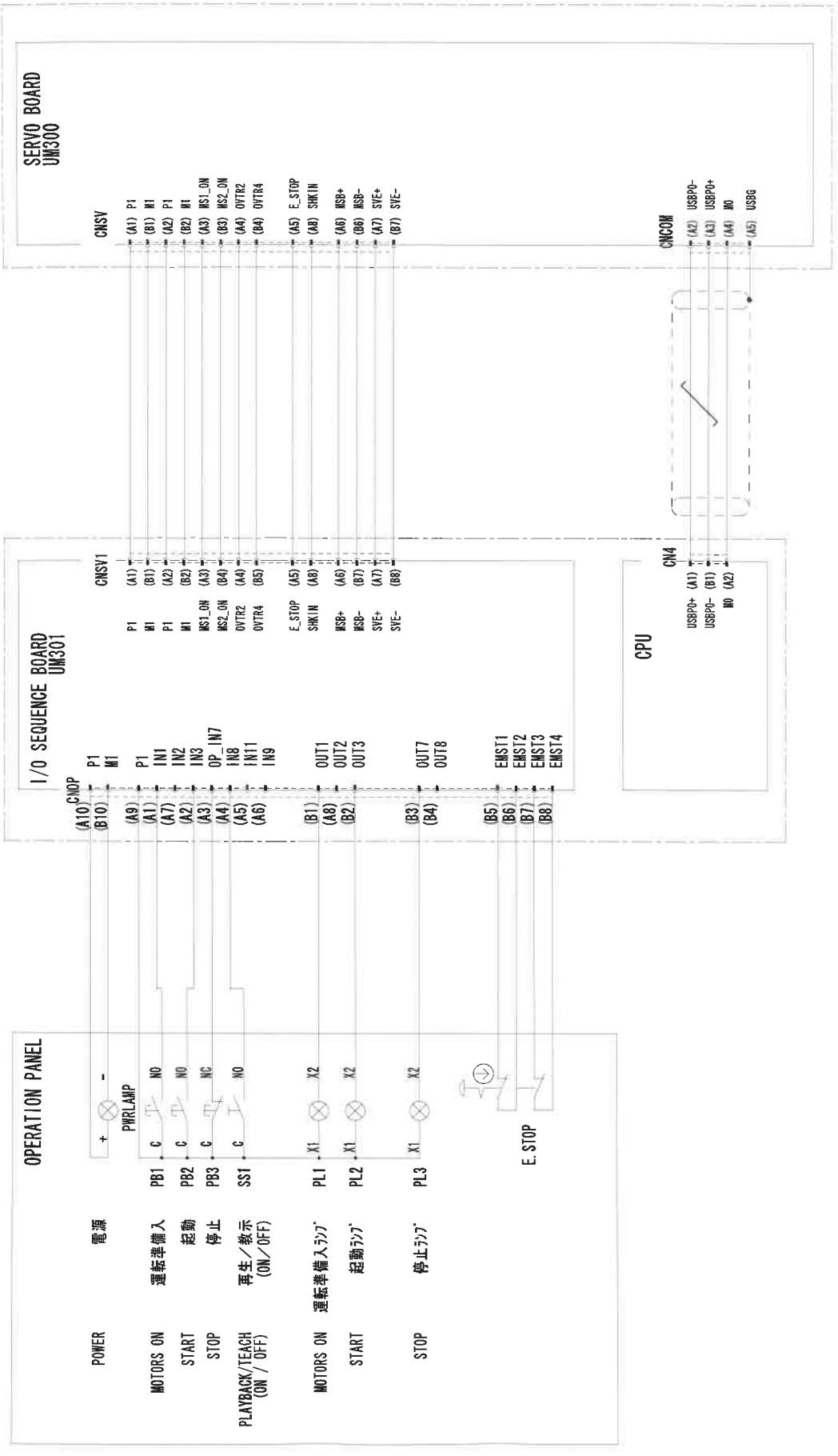


5.4.3 AX20(トランス付)ユニット接続図(1) 電源回路

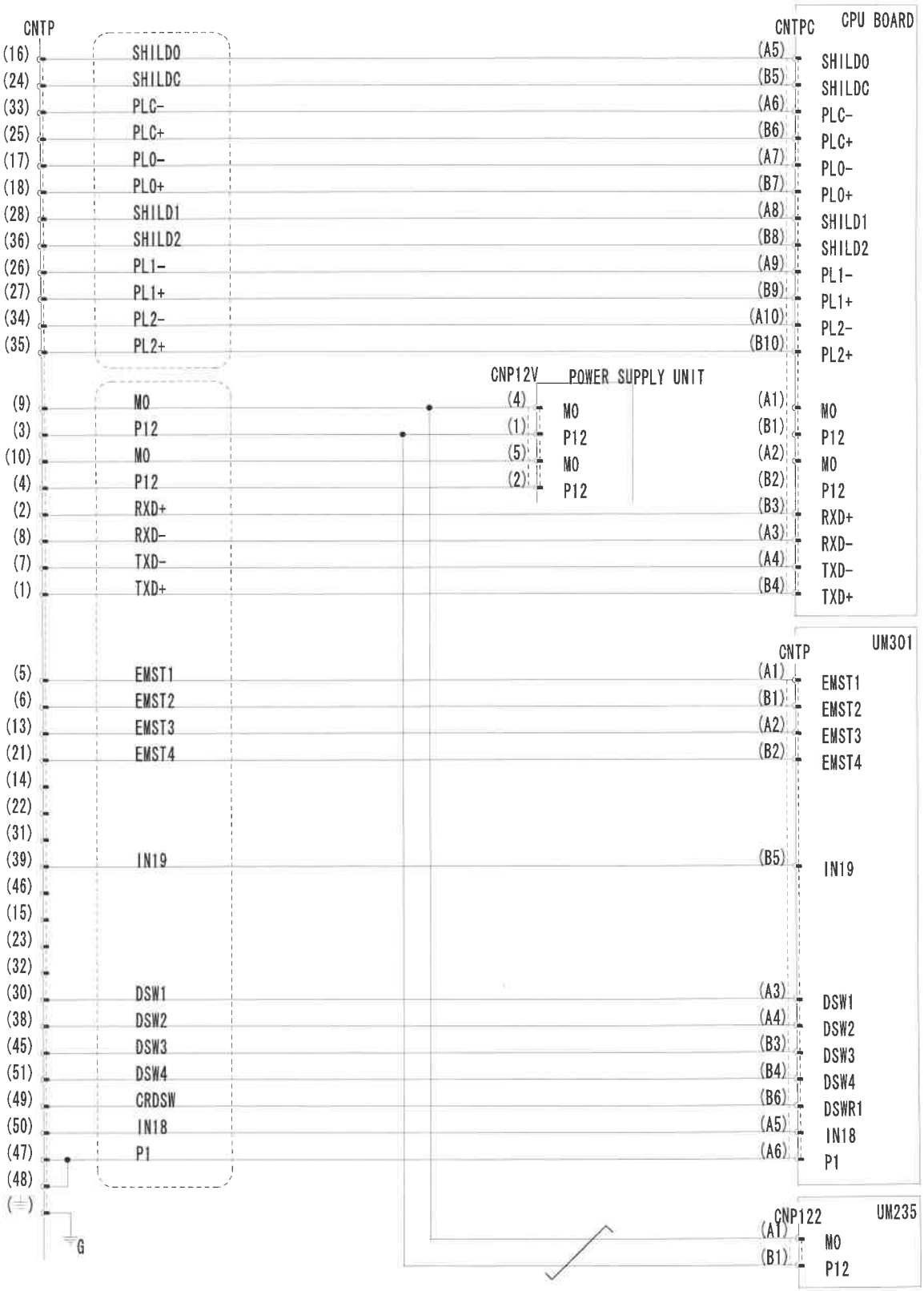
5.4.3 AX20(WITH TRANSFORMER) UNIT CONNECTION(1) POWER CIRCUIT



5.4.4 AX20(トランス付)ユニット接続図(2)シーケンス回路
5.4.4 AX20(WITH TRANSFORMER) UNIT CONNECTION(2) SEQUENCE CIRCUIT

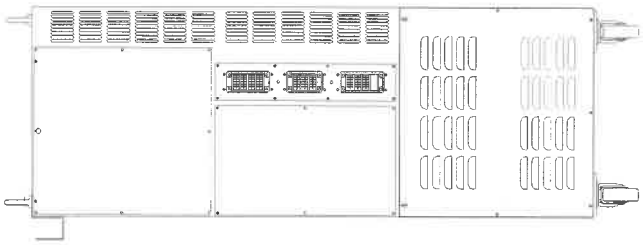


5.4.5 AX20(トランス付)ユニット接続図(3) TP接続
5.4.5 AX20(WITH TRANSFORMER) UNIT CONNECTION(3) TP CONNECTION

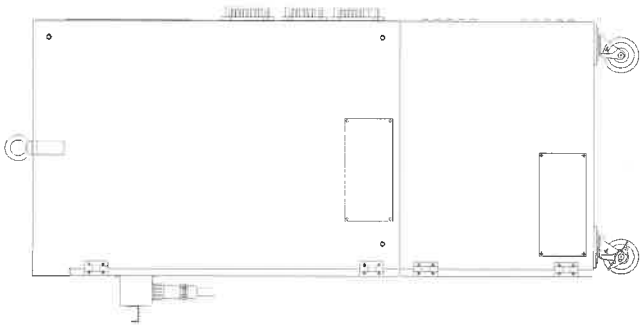


5.5 AX20 (CE specification) - Parts layout and electric circuit diagrams

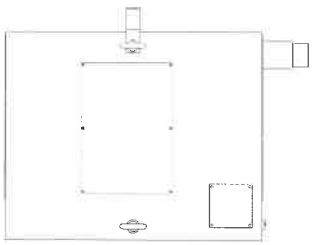
5.5.1 External view



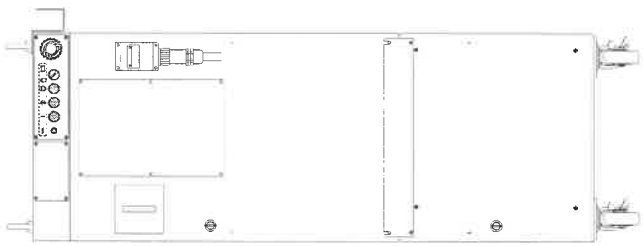
背面図
REAR VIEW



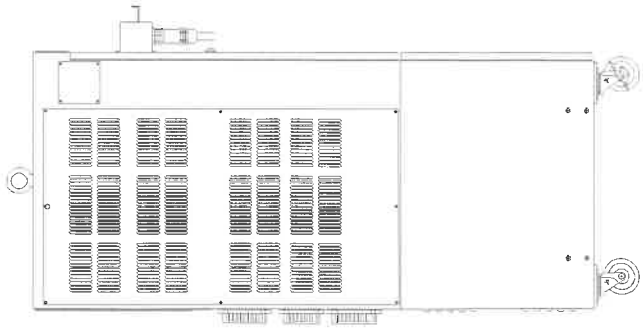
右側面図
RIGHT SIDE VIEW



上面図
TOP SIDE VIEW

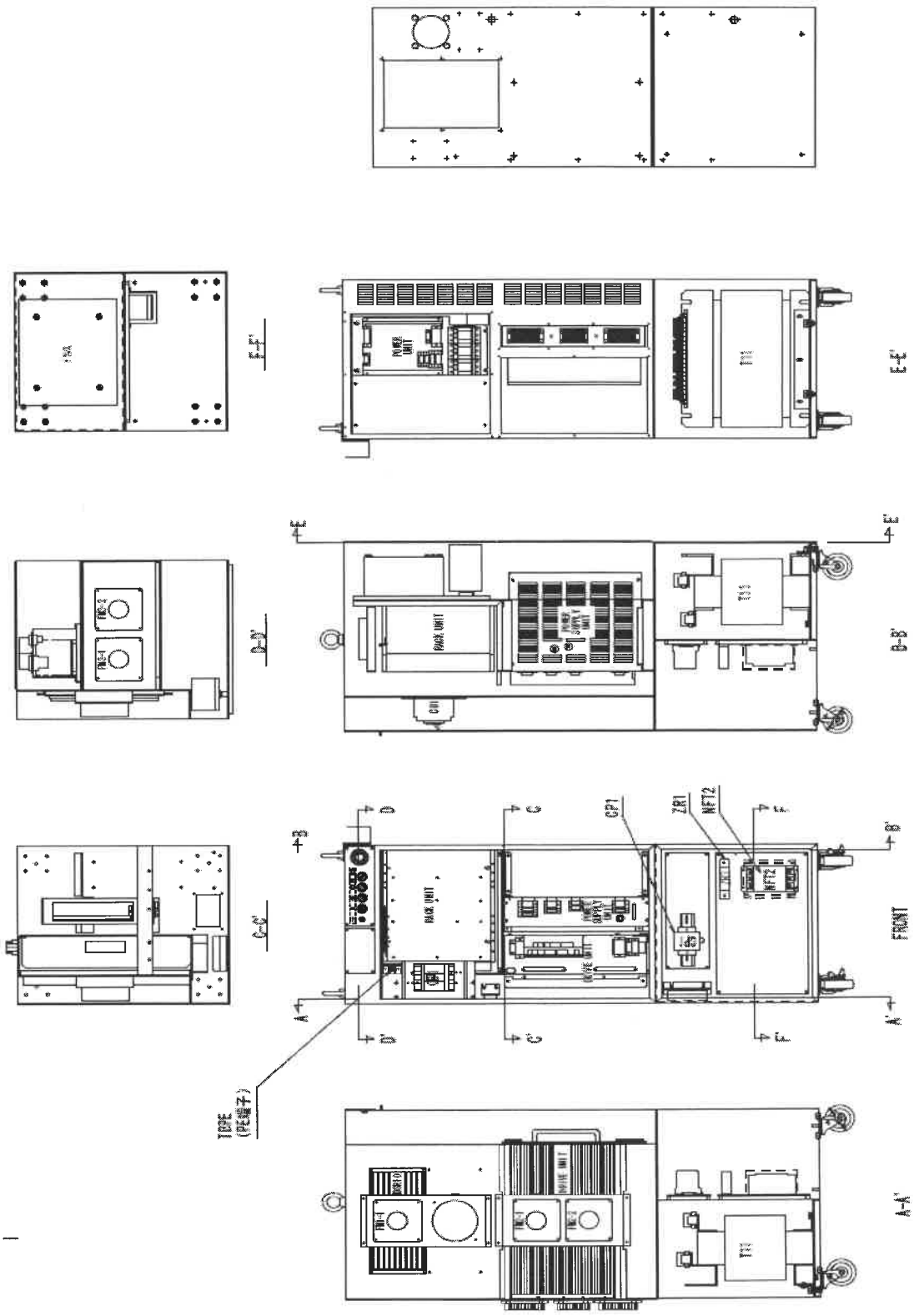


正面図
FRONT VIEW

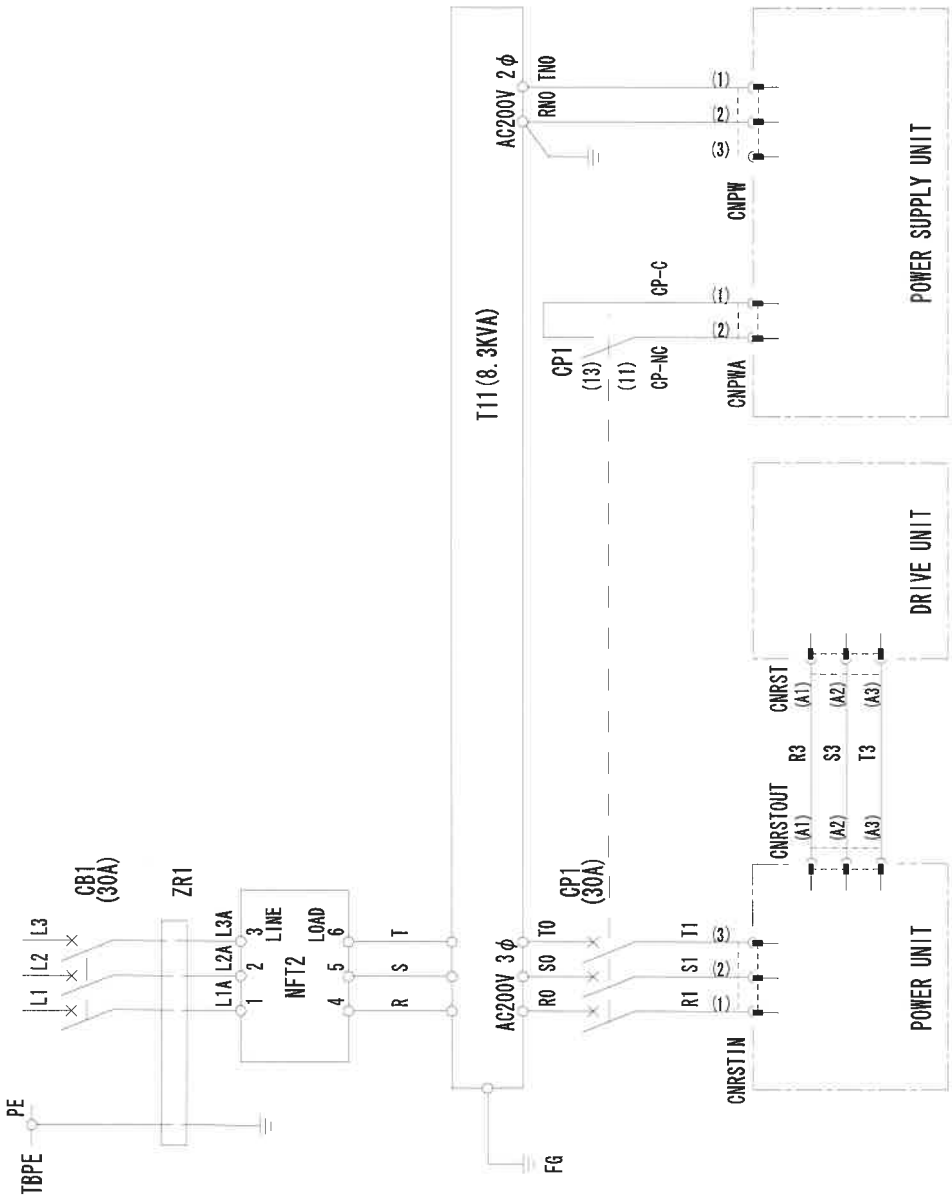


左側面図
LEFT SIDE VIEW

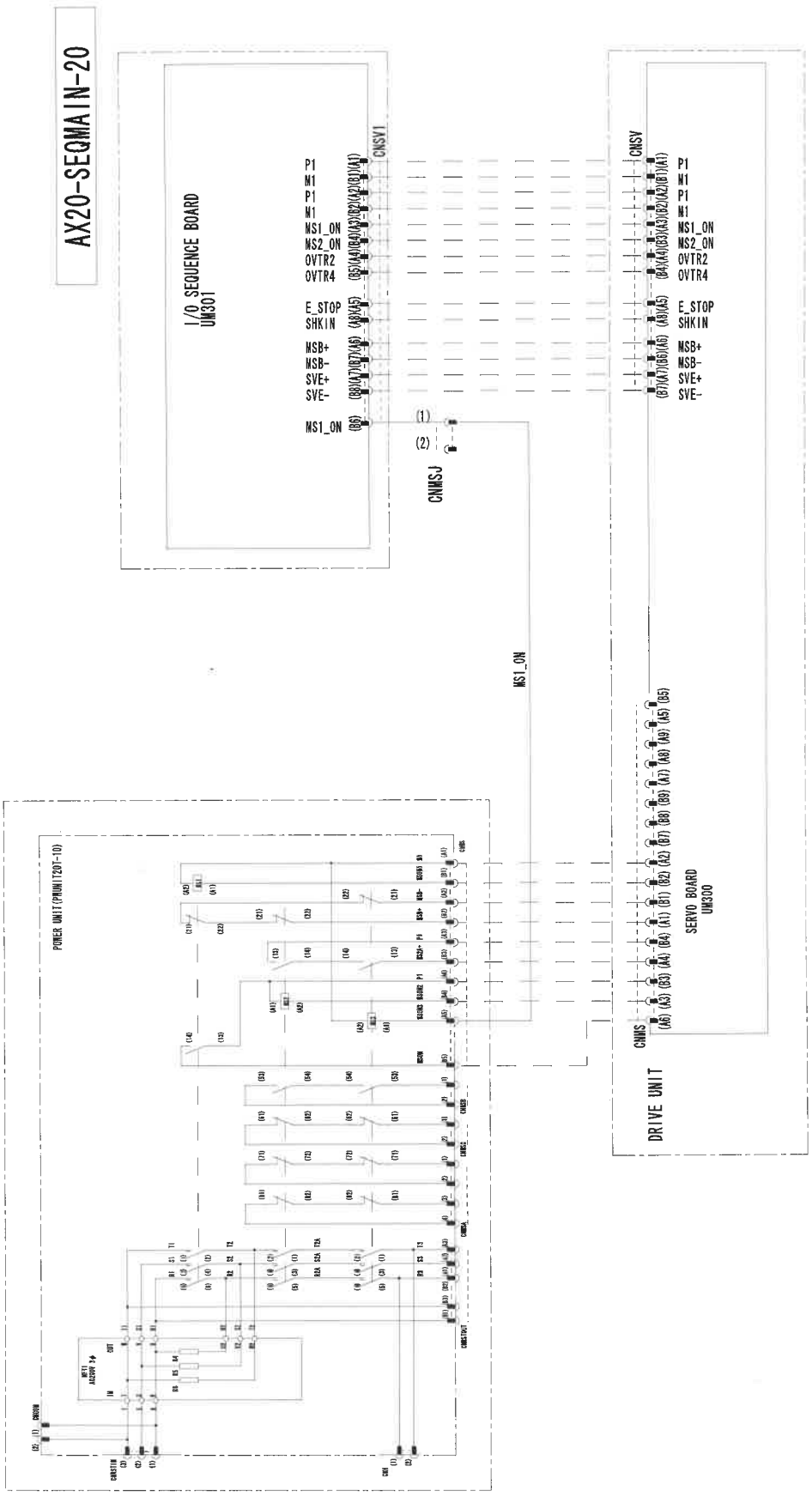
5.5.2 Parts layout

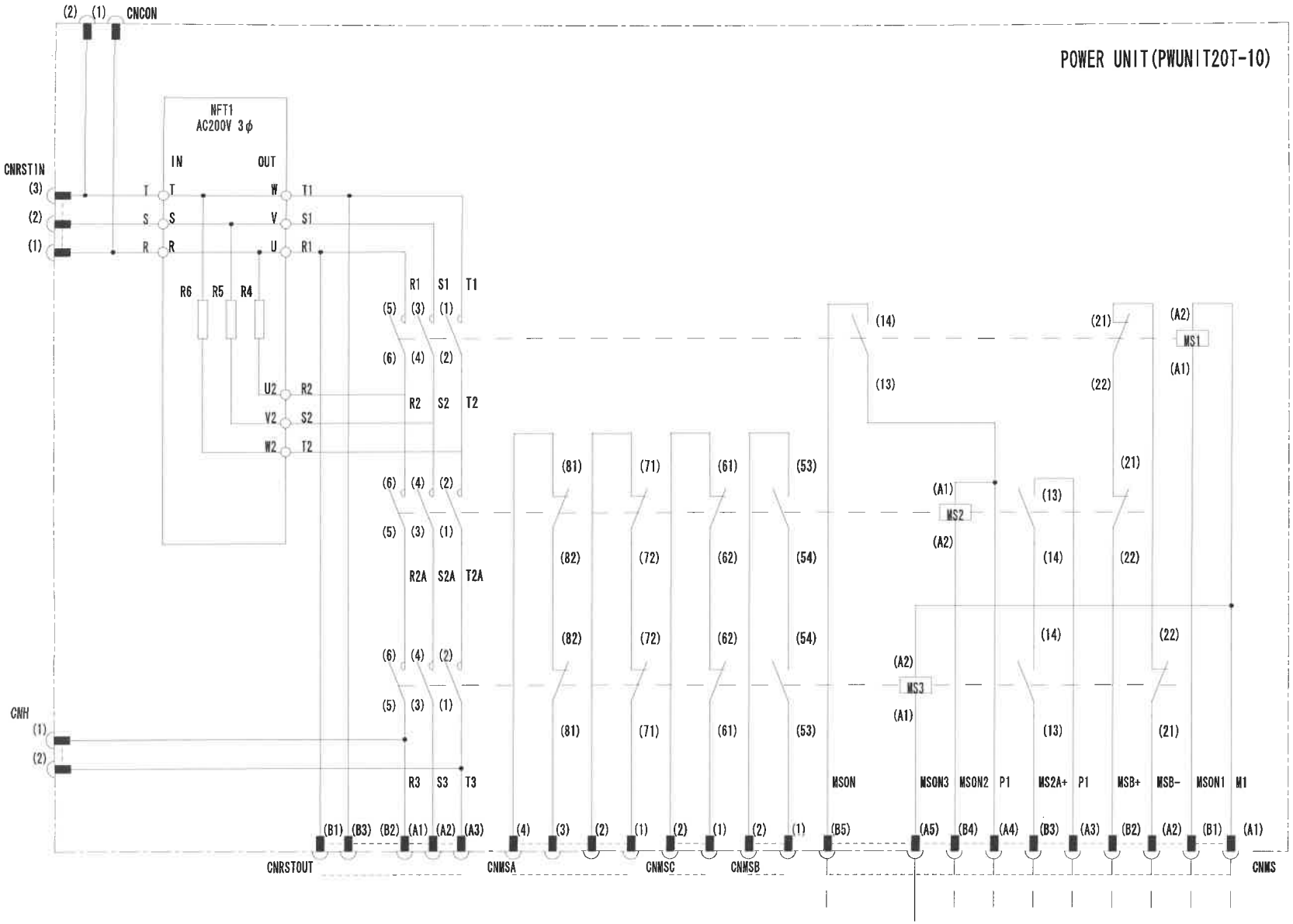


5.5.3 ユニット接続図(1) 追加電源回路CE仕様
5.5.3 UNIT CONNECTION(1) ADDITIONAL POWER CIRCUIT (CE)

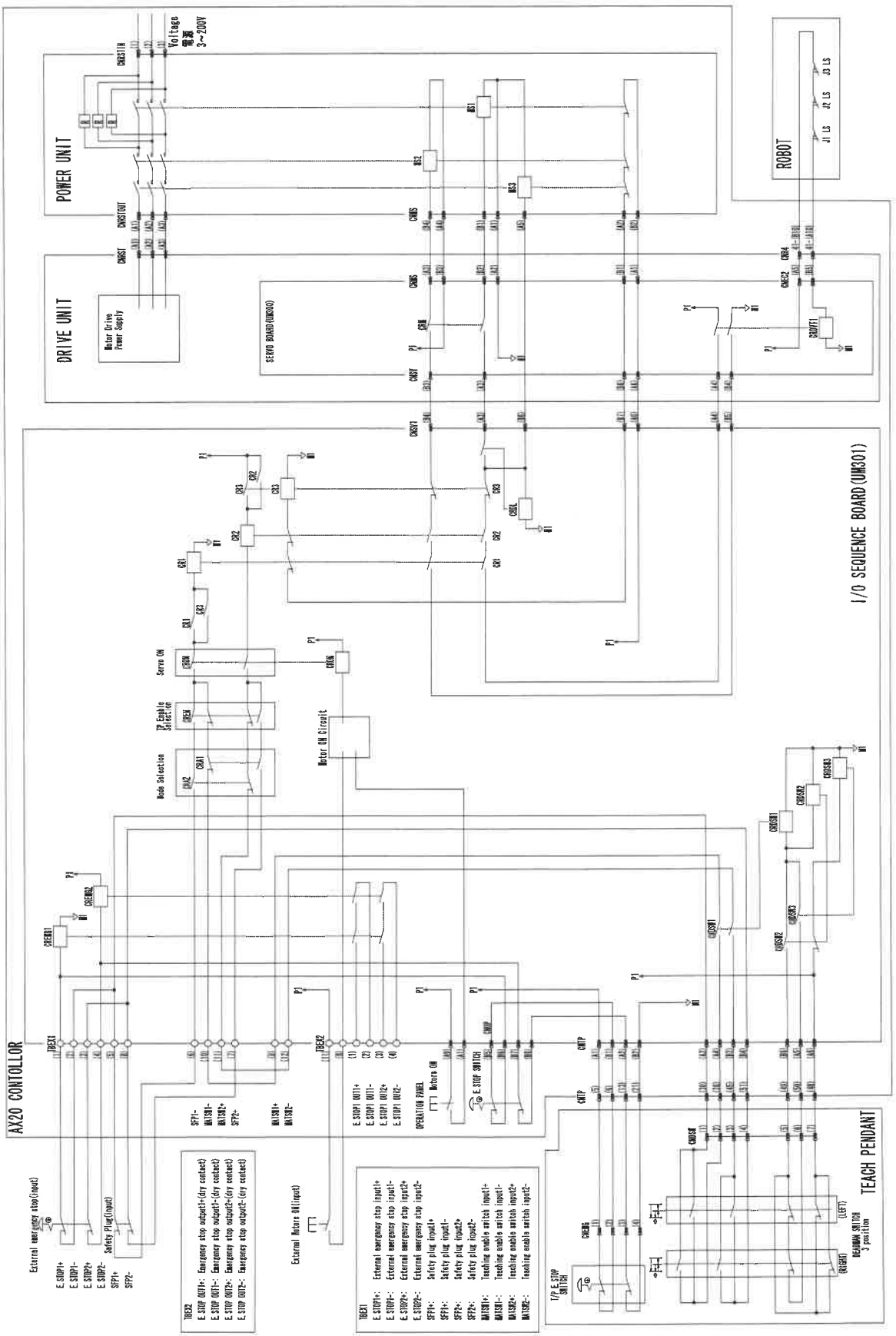


5.5.4 ユニット接続図(2) 追加電源回路CE仕様
5.5.4 UNIT CONNECTION(2) ADDITIONAL POWER CIRCUIT (CE)




POWER UNIT(PWUNIT20T-10)
CNCON
NFT1
AC200V 3φ
IN
OUT
CNRSTIN
R6
R5
R4
R1
S1
T1
R2
S2
T2
R2A
S2A
T2A
R3
S3
T3
CNH
MS1
MS2
MS3
MSON
MSON3
MSON2
P1
MS2A+
P1
MSB+
MSB-
MSON1
M1
CNRSTOUT
CNMSA
CNMSC
CNMSB
CNMS

5.5.5 LS/非常停止/ﾃﾞｯﾄﾞﾏﾝSW接続図 CE仕様
5.5.5 CONNECTION DIAGRAM OF LS/E.STOP/DEADMAN SWITCH (CE)



Chapter 6 Error Code List

The list of error codes and counter measures are described on this chapter.

■Error classification

"Classification" is prepared to make it easier to specify the position where the error is made.

Error classification	Main errors	
Emergency stop failure	Emergency stop triggered by input from overrun, shock sensor, etc.	
Control failure	Failure detected by monitoring of control systems such as magnet switches and circuit protectors, etc.	
CPU board failure	Watchdog timer detection or other CPU board-related failure occurrence.	
Servo failure	Failure detected by IPM drive unit software.	
Amplifier unit failure	Failure detected by IPM drive unit hardware.	
Encoder failure	Failure detected by internal of encoder.	
Teach pendant failure	Failure detected by teach pendant.	
PLC failure	Failure detected by PLC.	
User failure	Failure defined by the operator	
Operational failure	Failure caused by an operation error made by operator.	
Spot weld failure	"Spot welding function" related failures	(not included above)
Arc weld failure	"Arc welding function" related failures	
Shift failure	"Shift motion function" related failures	
Sealing failure	"Sealing function" related failures	
Sensor failure	"Sensor function" related failures	
Fieldbus failure	"Fieldbus function" related failures	
FLEX hand failure	"Flex Hand function" related failures	
Vision sensor failure	"Vision sensor" related failures	
Preventive maintenance message	"Preventive maintenance message" related failures	

■Error code

The error codes are expressed using the following format

[Example] Control sequence failure code E1140

E	1	1	4	0
(A)	(B)			

(A) Criticality codes
The failure detected by the robot is classified into three types by their level of criticality.

Type of failure	Details
E (errors)	Failure caused by parts failure or internal data failure which prohibits continued operation until the cause of the failure is eliminated, and failure which may potentially injure the operator or damage the robot system if operation is continued are classified as E (errors). If E (error) occurs during the auto operation, the robot system servo is turned off.
A (alarms)	Failure which may lead to an error at a future point in time, failure which must be remedied now or failure requiring simple operations, checks and/or remedial action before robot operation or movements are continued even though it may not potentially injure the operator or damage the robot system are classified as A (alarms). If A (alarm) occurs during the auto operation, the robot system servo remains on, stopping temporarily.
I (Information)	Failure requiring that the operator and ambient devices be informed of the occurrence of irregularities even though they will not interfere with continued robot operations or movements is classified as I (information). Information may sometimes be conveyed not when a failure has occurred but when the robot is operating normally. If I (information) occurs during the auto operation, robot system displays the message on the teach pendant, operating continuously.

(B) Erroe codes
These are 4-digit numbers used to identify a failure (See the following pages)

6.1 Error Code List

Table 6.1.1 Error Code List

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
2	CPU board failure	Program check-sum fault.	Error occurs when abnormality is found in the work program.	Please copy the file by the file restore.	Error reset.	Alarm	Alarm
4	CPU board failure	Power failure auto-saving fault during latest shut-down.	When Primary power is lost or voltage drops the current status of the controller is saved to RESUME.DAT.	Check that output from the power unit(SR1) on the PCB rack is 5V. If not replace power unit(SR1).	Error reset.	Alarm	Alarm
12	Servo failure	The robot is not corresponding to the record point.	This error occurs when the robot does not reach the position even if ten seconds have passed since the command position was output to the robot.	There are another equipment and a possibility to interfere.	Please do error reset or turn on the drive preparation.	Error	Error
20	Servo failure	Abnormal velocity command. Modify abnormal axis motion.	Abnormal velocity command data is calculated.	Modify abnormal axis motion to be minimized. Contact our service department in case axis motion is not so big.	After removal of failure, please carry out "failure-reset".	Error	Error
21	Servo failure	Abnormal servo tracking	This failure occurs when the robot does not follow to the command position.	(1)Please confirm that the Pay-load is within the nominal rating. (2)Please confirm whether the power-supply voltage decreases. (3)Please check whether the robot's ambient temperature is not below 0oC. (4)By the break release function, please confirm whether the axis is having difficulties when moving mechanically. (5)Please replace drive unit. (6)Please replace motor. (7)Please replace power unit(brake power). (8)Please confirm internal cables and cable between controller and robot, by referring to manual.	After removal of failure, please carry out "failure-reset".	Error	Error
22	Servo failure	Position Deviation error	This failure occurs when the deviation between the command and encoder data position exceeds the set permissible deviation.	(1)Please confirm whether the robot manipulator interferes in something. (2)Please confirm that the Pay-load is within the nominal rating. (3)If failure persists, the problem may be a mechanical defect in the manipulator, contact our service department.	After removal of failure, please carry out "failure-reset".	Error	Error
23	Amplifier unit failure	Encoder wiring disconnection	This failure occurs when the wiring for the encoder has been disconnected, or there is no encoder power supply.	(1)Please confirm whether connector CNEC1/CNEC2 of servo substrate UM221(L8800X00) is correctly connected. (2)Please confirm the power supply voltage of the encoder. (3)Please confirm whether CNR4 is correctly connected. (4)Please confirm wiring in the robot manipulator referring to "Manipulator Maintenance Manual".	After removal of failure, please carry out "failure-reset".	Error	Error
24	Amplifier unit failure	Servo CPU stop	This failure occurs when the servo CPU on servo substrate UM221 stops.	(1)Please confirm servo substrate UM221 insertion. (2)Please confirm the power supply of servo substrate UM221(L8800X). (3)Please replace the drive unit.	After removal of failure, please turn on power supply of the controller again.	Error	Error
25	Servo failure	Encoder Bit jump	This failure occurs when the amount of the change of the encoder data is abnormal	(1)Please confirm whether connector CNEC1/CNEC2 of servo substrate UM221(L8800X) is correctly connected. (2)Please confirm the power supply voltage of the encoder. (3)Please confirm whether CNR4 is correctly connected. (4)Please confirm wiring in the robot manipulator referring to "Manipulator Maintenance Manual".	After removal of failure, please carry out "failure-reset".	Error	Error
26	Servo failure	Interference detected	This failure occurs when the robot manipulator collides with something.	(1)Please confirm whether the robot manipulator interferes in something.(2)Please confirm that the weight, center of gravity, moment of inertia of the tool are corresponding to actual load.(3)Please lower the detection level or invalidate the problem part by using FN230.(4)Please confirm whether to move easily in an abnormal axis mechanically by using the brake release.(5)Please confirm the cable between the controller and the robot.(6)Please exchange the brake power supply units.	After removal of failure, please carry out "failure-reset".	Error	Error
27	Servo failure	Encoder data change after stop	This failure occurs when the encoder data continues to change after the command position is stops changing(i.e. manipulator should not be moving).	(1)Please confirm whether connector CNEC1/CNEC2 of servo substrate UM221(L8800X) is correctly connected. (2)Please confirm whether CNR4 is correctly connected. (3)Please confirm wiring in the robot manipulator referring to "Manipulator Maintenance Manual". (4)Please confirm the manipulator is not obstructed by anything. (5)Please confirm that the Pay-load is within the nominal rating.	After removal of failure, please carry out "failure-reset".	Error	Error
28	Amplifier unit failure	Low voltage of motor power	This failure occurs when the Motor power supply voltage(P-N) are lower than regular setting level.	(1)Please confirm whether the supply voltage decreases more than a normal value. (2)Please replace the drive unit.	After removal of failure, please carry out "failure-reset".	Error	Error
29	Encoder failure	Encoder absolute data error	Error occurs when fault is detected in the encoder.	(1)Check the encoder supply voltage is normal (Refer to Controller Maintenance Manual). (2)Check encoder wiring. (3)If error persists change the encoder/motor.	After removal of failure, please turn on power supply of	Error	Error

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
					the controller again.		
30	Encoder failure	Encoder absolute data failure	This failure occurs when fault is detected in the encoder.	(1)Please confirm the supply voltage of the encoder refering to "AX controller maintenance manual". (2)Please confirm the wiring of the encoder. (3)Please reset the encoder.	After removal of failure, please turn on power supply of the controller again.	Error	Error
31	Encoder failure	Motor rotation too fast when turning Motors ON	This failure occurs if at the time of turning Motors ON, the encoder speed is too fast.	(1)Please confirm the supply voltage of the encoder refering to "AX controller maintenance manual". (2)Please confirm the wiring of the encoder. (3)Please reset the encoder.	After removal of failure, please turn on power supply of the controller again.	Error	Error
32	Servo failure	Over current	This failure occurs when the current in the drive unit exceeds the rated value.	(1)Please confirm whether the robot manipulator interferes in something. (2)Please confirm that the Pay-load is within the nominal rating. (3)Please confirm the cable between the controller and the robot manipulator.	After removal of failure, please carry out "failure-reset".	Error	Error
33	Servo failure	Synchronous failure of servo command.	Synchronous failure of servo command occurred in servo system.	If error persists, Contact our service department.	Error reset.	Error	Error
37	Encoder failure	Over temperature of encoder	This failure occurs when the encoder temperature rises abnormally.	(1)Please confirm that the Pay-load is within the nominal rating. (2)Please stop the robot in order to lowering the motor temperature, and restart. (3)If failure persists, please lower the operation speed of the robot. (4) Please exchange motor and encoder.	After removal of failure, please carry out "failure-reset".	Error	Error
38	Servo failure	Over load	This failure occurs when the current in the motor or drive unit exceeds the rated value.	(1)Please confirm whether the robot manipulator interferes in something. (2)Please confirm that the Pay-load is within the nominal rating. (3)Please confirm the cable between the controller and the robot manipulator.	After removal of failure, please carry out "failure-reset".	Error	Error
39	Servo failure	Over rotation	This failure occurs when the number of rotations of motors exceeds a maximum rotation speed limit.	(1)Please confirm whether setting of the Pay-load and center of gravity is correct. (2)Please confirm that the Pay-load is within the nominal rating. (3)If failure persists, the problem may be a mechanical defect in the manipulator, contact our service department.	After removal of failure, please carry out "failure-reset".	Error	Error
40	TP failure	The abnormalities in CPU in a T/P	CPU built in the teach pendant stopped.	Please check whether there are any abnormalities in a T/P and a connection cable. Please reswitch on a power supply. Please exchange a T/P, when an error still comes out.	Turn on the power again.	Error	Error
42	Amplifier unit failure	Over temperature of motor	This failure occurs when the motor temperature rises abnormally.	(1)Please confirm that the Pay-load is within the nominal rating.(2)Please confirm the wiring of the motor thermostat refering to "Manipulator Maintenance Manual".(3)Please check motor fan and wirings of UM343 motor fan failure detection substrate.(4)Please stop the robot in order to lowering the motor temperature, and restart.(5)If failure persists, please lower the operation speed of the robot.	After removal of failure, please carry out "failure-reset".	Error	Error
43	Amplifier unit failure	Over speed	This failure occurs when the rotation speed of motors is abnormal.	(1)Please confirm whether connector CNEC1/CNEC2 of servo substrate UM221(L8800X) is correctly connected.(2)Please confirm whether CNR4 is correctly connected.(3)Please confirm wiring in the robot manipulator referring to "Manipulator Maintenance Manual".	After removal of failure, please carry out "failure-reset".	Error	Error
44	Amplifier unit failure	Over voltage of motor power	This failure occurs when the Motor power supply voltage(P-N) are higher than regular setting level.	(1)Please confirm whether CNR is correctly connected.(2)Please confirm that the Pay-load is within the nominal rating.(3)Please confirm the cable between the controller and the robot manipulator.	After removal of failure, please carry out "failure-reset".	Error	Error
46	Amplifier unit failure	Over temperature of regenerative discharge resister	This failure occurs when the temperature of the regenerative discharge resister rises abnormally.	(1)Check the fans are operating.(2)Please secure space 20cm or more in backside of controller.(3)Please check wiring of the thermostat for regenerative discharge resister.(4)Please confirm the CNSV connector of the sequence PCB is connected.	After removal of failure, please carry out "failure-reset".	Error	Error
50	Encoder failure	Encoder counter overflow/underflow	This failure occurs when the counter overflow/underflow of the encoder is occured.	(1)Please confirm the supply voltage of the encoder refering to "AX controller maintenance manual".(2)Please confirm the wiring of the encoder.(3)Please reset the encoder.	After removal of failure, please turn on power supply of the controller again.	Error	Error
51	Servo failure	Encoder data transmission failure	This failure occurs when the communication data with the encoder is abnormal or the encoder has been disconnected.	(1)Please confirm whether connector CNEC1/CNEC2 of servo substrate UM221(L8800X) is correctly connected.(2)Please confirm the power supply voltage of the encoder.(3)Please confirm whether CNR4 is correctly connected.(4)Please confirm wiring in the robot manipulator referring to "Manipulator Maintenance Manual".	After removal of failure, please turn on power supply of the controller again.	Error	Error
52	Encoder failure	Encoder battery charge low	This failure occurs when the voltage of the battery in the encoder has decreased.	(1)Please confirm the supply voltage of the encoder refering to "AX controller maintenance manual".(2)Please confirm the wiring of the encoder.(3)Please reset the encoder.	After removal of failure, please turn on power supply of the controller again.	Error	Error
54	Servo failure	Encoder data abnormal	This failure occurs when the change in the encoder data is abnormal.	(1)Please confirm the supply voltage of the encoder refering to "AX controller maintenance manual".(2)Please confirm the wiring of the encoder.	After removal of failure, please carry out "failure-reset".	Error	Error
55	Encoder failure	Motor rotation too	Because the motor had been rotated at	(1)Please confirm the supply voltage of the encoder	After removal of	Error	Error

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		fast when power off	high speed when the power off, the amount of the rotation of the encoder was not able to be detected correctly.	refering to "AX controller maintenance manual".(2)Please confirm the wiring of the encoder.(3)Please reset the encoder.	failure, please turn on power supply of the controller again.		
56	Servo failure	Encoder pre-load failure	This failure occurs if the pre-load operation of the encoder was not correctly done.	(1)Please confirm the supply voltage of the encoder refering to "AX controller maintenance manual".(2)Please confirm whether the robot manipulator interferes in something.(3)Please confirm the wiring of the encoder.	After removal of failure, please carry out "failure-reset".	Error	Error
57	Encoder failure	Encoder count status failure	This failure occurs when the Encoder data(absolute) is abnormal.	(1)Please confirm the supply voltage of the encoder refering to "AX controller maintenance manual".(2)Please confirm the wiring of the encoder.(3)Please reset the encoder.	After removal of failure, please turn on power supply of the controller again.	Error	Error
59	Control failure	Can't follow conveyer speed.	Error occurs when the robot system can not perform its task at the current conveyer speed.	Reduce the speed of the conveyer, or check the connection of conveyer pulse line.	Error reset.	Error	Error
61	Amplifier unit failure	Circuit protector tripped	This failure occurs when a circuit breaker trips.	(1)Please confirm wire harness and wiring in the robot manipulator. (2)Please confirm whether the motor power line does the short-circuit.	After removal of failure, please carry out "failure-reset".	Error	Error
62	Control failure	Emergency stop was shortly input or Magnetic SW was cut off.	Error occurs when it has a condition that communication cable, connection of Emergency stop, Over travel limit switch, Arm interference limit switch or motor thermostats is open or poor connection.	Turn power ON again and try again.	After removal of failure, please carry out "failure-reset".	Error	Error
63	CPU board failure	Controller temperature fault.	Error occurs when the temperature of the core of the controller becomes abnormality high.	Check the fans are operating, or clean up the heat exchanger.	After removal of failure, please carry out "failure-reset".	Error	Error
64	Amplifier unit failure	Drive unit power failure	This failure occurs when drive unit power VP15(+15V) was not supplied.	Please replace the drive unit.	After removal of failure, please carry out "failure-reset".	Error	Error
65	Amplifier unit failure	Over travel limit switch activated	This failure occurs when an axis reaches the end of its travel and actuates an Over travel limit switch(LS). This error seldom occurs because the Software limit usually stops the manipulator before it reaches the LS.	(1) If no LS is physically being actuated then wiring to a LS is disconnected or cut off.(2) If LS is physically being actuated, then move the manipulator by the teach pendant operation while LS releasing switch ON.	After removal of failure, please carry out "failure-reset".	Error	Error
66	Amplifier unit failure	Low voltage of brake power	This failure occurs when brake power supply PB decreases.	(1)Please confirm the CNMS connector of the power unit is connected. (2)Please confirm the CNPW connector of the power unit is connected. (3).Please confirm whether fuse (F2) of the power unit is cut. (4)Please confirm the CNSV connector of the sequence PCB is connected.	After removal of failure, please carry out "failure-reset".	Error	Error
72	Amplifier unit failure	Drive unit IPM failure	This failure occurs when current of power module (IPM) in the drive unit flows more than permitted range.	(1)Please confirm internal wirings and the cable between the controller and the robot manipulator.(2)Please replace the drive unit.(3)Please replace the abnormal motor.	After removal of failure, please carry out "failure-reset".	Error	Error
73	Amplifier unit failure	Drive Unit heatsink temperature fault	This failure occurs when the temperature of the heatsink in the drive unit exceeds the permitted range.	(1)Please confirm whether the ambient temperature exceeds the specification. (2) Please confirm the power-supply voltage is within ±10%. (3)Please confirm the rear fan rotates. (4)Please confirm whether the heat sink is blockaged.	After removal of failure, please carry out "failure-reset".	Error	Error
74	Amplifier unit failure	Motor regeneration circuit fault	This failure occurs when the regenerative discharge circuit is disconnected by a large current or heat.	(1)Please confirm whether the CNR connector of the drive unit is connected. (2)Please confirm resistance of the discharge register 5 ohm.	After removal of failure, please carry out "failure-reset".	Error	Error
75	Amplifier unit failure	Error of brake control circuit	The breakdown was detected in brake control circuit (relay, diode),or break release switches was used just after the motor-off sequence. Please do not release the brake, so that there is danger to which the arm falls.	Please replace the Drive Unit.	After removal of failure, please turn on power supply of the controller again.	Error	Error
77	CPU board failure	CPU fan fault.	Error occurs when the fan of the CPU becomes 2700 r.p.m. or less	(1)Check the fans are operating, or clean up the fans.(2)Replace the CPU fan.(3)Replace the CPU bord.	After removal of failure, please carry out "failure-reset".	Error	Error
78	CPU board failure	CPU bord power fault.	Error occurs when the power of the CPU becomes 10% or less	Check the power supply unit, or exchange the Power supply unit.	After removal of failure, please carry out "failure-reset".	Error	Error
79	CPU board failure	CPU bord temperature fault.	Error occurs when the temperature of the CPU becomes abnormality high.	Check the fans are operating, or clean up the fans.	After removal of failure, please carry out "failure-reset".	Error	Error
80	CPU board failure	CPU bord power fault.	Error occurs when the power of the CPU becomes 5% or less	Check the power supply unit, or exchange the Power supply unit.	After removal of failure, please carry out "failure-reset".	Error	Error
81	CPU board failure	CPU bord battery failure	Error occurs when the voltage of lithium battery on CPU bord has decreased.	(1)Please set up the date correctly. (2)Please exchange battery.	After removal of failure, please carry out "failure-reset".	Error	Error
99	Operational failure	5th axis operating range exceeded.	Error occurs when 5th-axis moves out of its Operating range. Operating range can be exceeded when the 5th-axis(and	Select [Constants][Machine constants] and use the correct axis operation keys to move back into the 5th-axis Operating range. Warning! damage can occur if	No reset operations neccesary.	Alarm	Error

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
			6th-axis) is moved via the rotation of the 4th-axis.	5th-axis hits arm 1.			
105	Control failure	Ext. Motors-off signal is being given or Motors-OFF button being held.	Error occurs when Motors-ON button is pressed while the Motors-OFF button is held or external motors-OFF signal is being given.	Ensure that Motors-OFF is not being given when pressing Motors-ON button.	After removal of failure, please carry out "failure-reset".	Error	Error
106	Operational failure	The motors are not ON.	The motors are not ON.	Turn motors ON by pressing the Motor-ON button.	No reset operations neccesary.	Inform ation	Alarm
116	TP failure	TP connect failure	It becomes this failure when TP isn't connected and a cable is out.	Connect TP properly. Exchange TP when it is out.	After removal of failure, please carry out "failure-reset".	Error	Error
117	TP failure	TP connect failure	This error occurs when TP is connected after the control power supply is turned on.	Connect TP properly. Exchange TP when it is out.	Turn on the power again.	Error	Error
118	TP failure	The teach pendant reception is abnormal.	Abnormality was detected by the key notification reception from teach pendant.	Please confirm whether there is something that it is possible to become a noise source in the vicinity of teach pendant and the cable.	Error reset.	Alarm	Alarm
121	Operational failure	The robot's joint angle exceeded the software stroke range.	It will become this error if a robot joint angle reaches the software stroke range.	Please move to software stroke within the limits by manual operation (each axis).	Error reset.	Alarm	Error
122	Servo failure	The robot's joint angle exceeded the software stroke range.(Current position)	It will become this error if a robot joint angle reaches the software stroke range.(Current position)	Please motor power on in machine constant/software limit at the EXPERT level and move to software stroke within the limit by manual operation. Please turn on the motor as it is, when error occurred only with the axis without brakes.	Error reset.	Error	Error
129	Operational failure	The angle which an arm makes is too large.	The 1st arm and the 2nd arm may cause interference with a position.	Please move in the direction where interference does not take place by manual operation.	Error reset.	Alarm	Error
130	Operational failure	The angle which an arm makes is too small.	The 1st arm and the 2nd arm may cause interference with a position.	Please move in the direction where interference does not take place by manual operation.	Error reset.	Alarm	Error
131	Control failure	Collision sensor actuated.	Error occurs when a signal is received from the collision sensor.	Remove obstruction, check condition of the tool, reset the collision sensor, and restart robot.	After removal of failure, please carry out "failure-reset".	Error	Error
132	Operational failure	The robot's joint angle exceeded the link software stroke range.	It will become this error if a robot joint angle reaches the link software stroke range.	Please move to link software stroke within the limits by manual operation (each axis).	Error reset.	Alarm	Error
173	Operational failure	Shift value limit exceeded.	This error occurs if the allowable shift distance is too large.	Reset the limit value[Constants][Shift limit & evaluation value] and retry program.	No reset operations neccesary.	Error	Error
177	Emergency stop failure	Primary power supply fault.	Error occurs when the Power supply unit detects that primary power is below nominal level.	Check the status of the Primary(mains) power supply.	Error reset.	Error	Error
179	Control failure	An axis key was held while 'Motors-ON' signal was given.	This error occurs when an axis key on the teach pendant is actuated while motors-ON signal is given.	Input Motors-ON signal ensuring the axis keys are not held down.	After removal of failure, please carry out "failure-reset".	Error	Error
201	Shift failure	Palletize-end does not follow Palletize function.	This error occurs when a palletize-end function(M47) does not follow Palletize function(M48).	Correct the sequence of Palletize and Palletize end functions in the program.	No reset operations neccesary.	Error	Error
202	Shift failure	More than 32 Palletizing routines not allowed.	When palletizing of 32 or more is executed at the same time, this error is detected.	Please refer to Palletize function manual for details.	No reset operations neccesary.	Error	Error
203	Shift failure	Palletize data is abnormal.	This error occured caliculate shift value is failed from palletize data.	Please refer to palletize data.	No reset operations neccesary.	Error	Error
243	Operational failure	Designated command position exceeds Robot operating area.	Error occurs when a shift function, etc. tries to send the robot out of the robot operating area.	Correct the program.	No reset operations neccesary.	Alarm	Error
244	Operational failure	Danger of Robot interference.	Robot wrist may interfere with under the part of manipulator body.	Correct the program.	No reset operations neccesary.	Alarm	Error
245	Operational failure	The bend direction of J3 axis is different, interpolation cannot be continued.	The bend direction of J3 axis is different at the starting point and the terminal point.	Please correct the angle of J3 axis to the same direction.	After removal of failure, please carry out "failure-reset".	Alarm	Error
246	Operational failure	Wrist posture calculation fault. Please insert the middle step.	When the posture is calculated, this error occurs when the wrist goes the inverse direction from teaching position.	Please insert the step in the middle so that the change amount of the wrist axis in one step may become small. Please reduce the accuracy in the step before and after the error's occurring.	No reset operations neccesary.	Alarm	Error
247	Operational failure	There is a tool which exceeds rating.	Because tool center of gravity or tool weight has exceeded rating, it becomes medium speed playback.	(1)Please execute automatic tool center of gravity setting.(2)Please verify whether the tool has not exceeded rating.(3)When the tool has exceeded rating, please make sure to be settled inside rating.	No reset operations neccesary.	Inform ation	Inform ation
248	Control failure	The gravity bend	The flexion it tried to revise, but the	Please take a second look tool setting. Center of gravity	No reset operations	Alarm	Error

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		revision quantity is too big.	revision quantity exceeded error inspection angle.	of the tool or mass of the tool, occur when it is large. Please execute Automatic COG setting.	neccesary.		
250	Operational failure	Controller cannot make trajectory at the J1 singular area.	When the robot moves by the linear/circle interpolation, the robot's wrist center point cannot pass the J1 singular area.	At the teach mode, the robot's wrist center point moves from the J1 singular area by joint jog operation. At the playback mode, please modify the teach point and/or change for the joint interpolation.	No reset operations neccesary.	Alarm	Error
251	Operational failure	The bend direction of J4 axis is different, interpolation cannot be continued.	The direction of J5 arm is different more than 180 degrees at the starting point and the terminal point.	Please correct the angle of J4 axis so that the direction of J5 arm becomes less than 180 degrees.	After removal of failure, please carry out "failure-reset".	Alarm	Error
257	Operational failure	Pose calculation failed.	This error occurs when all axis angles can not be calculated in robot language file.	Check pose data.	No reset operations neccesary.	Error	Error
270	Control failure	Conveyer motion during test .	Error occurs when the conveyer running signal is detected during executing a program in Conveyer simulation or test mode.	Stop the conveyer, reset, and restart test.	Error reset.	Error	Error
271	Control failure	Conveyer pulses exceeded limit.	Error occurs when the number of conveyer pulses exceeds 10KHz.	Check that the pulse generator is functioning correctly.	Error reset.	Error	Error
367	PLC failure	The error was detected by Built-in PLC.	It becomes this error when Built-in PLC detects an error.	Check the environment of Built-in PLC of operation.	Unusual reset is carried out after changing Built-in PLC into a starting state.	Error	Error
379	Control failure	Safety plug is not inserted or the state of safety plug signal has changed in teach mode.	This error occurs when a Motors ON command(button) is given in Auto mode when the Safety plug is not inserted or the state of safety plug signal has changed in teach mode.	Insert the Safety plug in Auto mode.	After removal of failure, please carry out "failure-reset".	Error	Error
493	Operational failure	Compound motion limit over.	| J5 axis | + | J6 axis | exceeded limit value.	Please move to the limit by manual operation (each axis).When it cannot move, at the [Constants][Machine constants][Software limit] please try again.	No reset operations neccesary.	Alarm	Error
494	Operational failure	Over movable area of ATRAC4 flat type.	Compound motion J5 and J6 of ATRAC4 flat type over movable area.	Please move to the limit by manual operation (each axis).When it cannot move, at the [Constants][Machine constants][Software limit] please try again.	No reset operations neccesary.	Alarm	Error
550	PLC failure	It is scan time over of Built-in PLC.	It detects, when the scanning time of Built-in PLC is too long.	Correct Ladder program.	An error will be canceled if it is download after correcting ladder program so that Scan time may be set to less than 30 msecs.	Error	Error
582	Vision sensor failure	Vision sensor not connected.	It detects, when the vision sensor is not connected.	Correct vision sensor connection line.	After removal of failure, please turn on power supply of the controller again.	Error	Error
659	TP failure	Teach pendant touch panel error.	Error occurs if at the time of turning power ON, the touch panel of teach pendant is pushed.	Touch panel is not touched for turn power ON again. If error persists change the Teach pendant.	After removal of failure, please turn on power supply of the controller again.	Error	Error
674	Spot weld failure	Welder communication fault(No reply).	Error occurs when the welder board is not correctly connected, or backup files are incorrect.	(1)Check power supply of the welder and communication cables, and power ON again. (2)Initialize welder data.	Error reset.	Alarm	Alarm
675	Spot weld failure	Welder communication fault(Check sum).	Error occurs when received data from the welder board is abnormal.	Check power supply of the welder and communication cables, and power ON again.	Error reset.	Alarm	Alarm
676	Spot weld failure	Welder communication fault(Message wrong).	Error occurs when received data from the welder board is abnormal.	Check power supply of the welder and communication cables, and power ON again.	Error reset.	Alarm	Alarm
677	Spot weld failure	Major Welder fault.	Error occurs when the welder board generate the weld fault.	Remove the cause of weld fault.	Error reset.	Error	Error
694	Spot weld failure	Executive EPROM checksum error.	Error occurs when a system software checksum error of welder timer substrate is detected.	Install the system software once more.	Turn on the power again.	Error	Error
695	Spot weld failure	LCA EPROM checksum error.	Error occurs when a system software checksum error of welder timer substrate is detected.	Install the system software once more.	Turn on the power again.	Error	Error
696	Spot weld failure	Application EPROM checksum error.	Error occurs when an application EPROM checksum error of welder timer substrate is detected.	Install the system software once more.	Turn on the power again.	Error	Error
697	Spot weld failure	DPR error.	Error occurs when a DPR error of welder timer substrate is detected.	Install the system software once more.	Turn on the power again.	Error	Error
704	Control failure	Invalid Conveyer register value.	Error occurs when a conveyer register value exceeded value of <Err.detect.just	Check a conveyer pulse input circuit.	Error reset.	Error	Error

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
			after playback>.				
705	Operational failure	The angle between 3rd axis and ground is over.	The 3rd axis tended to operate exceeding 3rd angle incline.	Please move in the direction where 3rd angle incline does not take place by manual operation.	Error reset.	Alarm	Error
727	Servo failure	Robot over temperature	This failure occurs when the temperature of the motor, the encoder, the harness, and the connector guessed from the motor current and the motor speed is abnormal.	(1)Please confirm that the Pay-load is within the nominal rating. (2)Please confirm the wiring of the motor brake refering to "Manipulator Maintenance Manual". (3)Please lowering the temperature of an abnormal location, and lowering the outside temperature. (4)If failure persists, please lower the operation speed of the robot.	After removal of failure, please carry out "failure-reset".	Error	Error
749	Spot weld failure	Spot Welder SCR1 thermal switch actuated.	Failure occurs when the Thermo. Temp. fault signal is received by the controller.	Check the Thermo. Temp. fault signal and the spot welding unit.	After removal of failure, please carry out "failure-reset".	Error	Error
750	Spot weld failure	Spot Welder SCR2 thermal switch actuated.	Failure occurs when the Thermo. Temp. fault signal is received by the controller.	Check the Thermo. Temp. fault signal and the spot welding unit.	After removal of failure, please carry out "failure-reset".	Error	Error
759	Spot weld failure	Isolation contact failed to pull in.	Failure occurs when the isolation contact of the welder fails to actuate correctly.	Refer to the Welder timing Manual.	After removal of failure, please carry out "failure-reset".	Error	Error
760	Spot weld failure	Isolation contact stuck close.	Failure occurs when the isolation contact of the welder fails to actuate correctly.	Refer to the Welder timing Manual.	After removal of failure, please carry out "failure-reset".	Error	Error
762	Spot weld failure	Welder board not installed.	Error occurs if the welding timer PCB does not exists in the controller when welding is attempted.	Install the welder board.	Error reset.	Error	Error
777	Control failure	Robot moved during Motors-on sequence.	This error occurs when shock sensor actuated while torch touches a work.	Check manipulator arm interference with jig. if error persists, abort Motor-on and contact our dept.	After removal of failure, please carry out "failure-reset".	Error	Error
783	CPU board failure	Motion stop.	It becomes this error when main CPU detects a motion stop.	(1)Turn on the power again. Please confirm the error is released.(2)Please reinstall the system.(3)Please replace the CPU board.	Turn on the power again.	Error	Error
785	CPU board failure	I/O timeout.	It becomes this error when main CPU detects a I/O system stop.	Turn on the power again. If the error is not released, reinstall the system.	Turn on the power again.	Error	Error
787	CPU board failure	Watchdog Timeout Error.	It becomes this error when Watchdog Circuit detects a motion stop.	(1)Turn on the power again. Please confirm the error is released.(2)Please enlarge Interpolation Cycle Time.(3)Please insert a CPU board or an I/O board(UM212/L8800M) firmly again.	Turn on the power again.	Error	Error
788	CPU board failure	Movement too large in Compliance control.	Error occurs when movement by an external force is too large while in Compliance control.	Check the condition of the Compliance control performance.	Check the constants of the Compliance control function.	Error	Error
789	CPU board failure	CPU error.	It becomes this error when an CPU error occurs in CPU board.	(1)Turn on the power again. Please confirm the error is released.(2)Please insert a CPU board firmly again.(3)When the phenomenon recurs, please inform our service section.	Turn on the power again.	Error	Error
895	Control failure	Conveyer not running.	Error occurs when conveyer pulse never changes more than 1 second, after start LS is given.	Check the conveyor is functioning. Or check the wiring between Pulse Generator and AX controller.	Error reset.	Error	Error
897	Control failure	Too little conveyer pulse counted.	Error occurs when a After conveyer start LS is input, though it was passed <Conv.pulse check start time>, when it is short of value of <Conv.pulse error check> value.	Separate input timing of a starting command from conveyer start LS signal.	Error reset.	Error	Error
898	Servo failure	Servo command stop	This failure occurs when the update of the command value transmitted to the servo stops during a certain time.	Please refer to the troubleshooting of the controller maintenance manual.	After removal of failure, please carry out "failure-reset".	Error	Error
902	Amplifier unit failure	serveo clock halted	This failure occurs when the clock of servo substrate UM221 halted.	(1)Please confirm the supply voltage of the servo substrate UM221(L8800X).(2)Please replace the drive unit.	After removal of failure, please turn on power supply of the controller again.	Error	Error
903	Amplifier unit failure	Servo communication stop	This failure occurs when the communication between CPU substrate and the servo substrate stops.	(1)Please confirm whether connector CNUSB of servo substrate UM221 is correctly connected.(2)Please confirm the supply voltage of the servo substrate UM221.(3)Please replace the drive unit.	After removal of failure, please carry out "failure-reset". Wait more than 5 seconds for next motor power on.	Error	Error
904	CPU board failure	I/O board connect failure.	I/O board(UM212/L8800M) is not recognized. (1)I/O board connect failure.(2)I/O board troubles. (MACH etc.) (3)I/O board DIP-SW setting mistake.(4)Contact failure between CPU board and Riser board (UM209/L8800R). (5)Storage board trouble.	Please confirm whether I/O board is correctly connected.	Turn on the power again.	Error	Error
910	Amplifier unit failure	Abnormal output of the servo gun	Error occurs when 1) disconnect between pressure sensor and AX controller, 2)	Please check 1) connector on the analog sensor board, 2) the conection between pressure sensor and AX	After removal of failure, please turn	Error	Error

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		pressure sensor.	pressure sensor troubles, 3) troubles of the analog sensor board in AX controller.	controller, 3) exchange new pressure sensor.	on power supply of the controller again.		
911	Amplifier unit failure	Autozero failure of analog input.	Beause analog input signal has the offset value, autozero cannot be executed.	Please check 1) connection of analog input line 2) analog input signal by its manual.	After removal of failure, please turn on power supply of the controller again.	Error	Error
919	Operational failure	The allowed unbalanced torque is exceeded.	This failure is detected when moving to the position in which the allowed unbalanced torque is exceeded.	(1)Please move the robot to the position in a permissible torque in the constant setting mode. (2)Please correct the teaching so as not to exceed the position in a permissible torque. (3)Please confirm installed posture. (4)Please confirm the tool load.	Error reset.	Alarm	Error
956	FieldBus failure	The communication error occurred.	The details of a communication error should check a sub code.	An unusual cause is removed based on a sub code.	After removal of failure, please carry out "failure-reset".	Error	Error
957	FieldBus failure	The system error was detected.	The details of a communication error should check a sub code.	Please inform system service of a sub code.	After removal of failure, please carry out "failure-reset".	Error	Error
958	FieldBus failure	The error was detected with the self check of a communication board.	They are the abnormalities of a communication board. Please check the details of abnormalities to system service.	The defect of a communication board is considered.	A communication board is exchanged.	Error	Error
959	FieldBus failure	A communication board is not found.	The communication board specified on the constant setting screen is not found.	Please check the slot ID of a field bus hardware setup.	The setting value of a field bus hardware setup is changed.	Error	Error
960	FieldBus failure	A part or all I/O links are stopping.	Since the between title has occurred in the I/O device, a robot cannot be started.	Please check the device which the problem has generated by the field bus monitor.	If a problem is solved, it will restore automatically. (In order to solve a problem, the re-injection of a power supply may be required)	Error	Error
967	Control failure	T/P selector switch is MANUAL.	Playback is impossible while T/P selector switch is set to MANUAL.	Set T/P selector switch to AUTO.	After removal of failure, please carry out "failure-reset".	Error	Error
973	Control failure	Playback unavailable because Deadman SW is not released position.	Error occurs when you input playback command while you were gripping the Deadman SW.	Please input playback command after Deadman SW is released position.	After removal of failure, please carry out "failure-reset".	Error	Error
975	Control failure	Magnetic switch is not active.	Error occurs when a signal from a magnetic switch is not received within the specified time after Motors ON signal is given.	Please exchange sequence board UM213.	After removal of failure, please carry out "failure-reset".	Error	Error
1001	Control failure	PWM was cut off.	Error occurs when software can't be selected the cause which a PWM signal was cut off.	(1)Replace power unit. (2)Replace drive unit.	Error reset.	Error	Error
1003	Control failure	Analog input board is not installed. Or analog output board is not installed.	Although analog input (output) board is not installed, analog input (output) function is executed.	Turn off the power and connect analog input (output) board correctly.	Error reset.	Error	Error
1012	Control failure	PWM of the disconnected mechanism has been turned on.	This error occurs when PWM is not turned off even if a certain time passes after the mechanism diconnection.	There are some problems in the brake and the PWM control circuit of sequence PCB. Please replace the sequence PCB or the drive unit.	After removal of failure, please carry out "failure-reset".	Error	Error
1016	Encoder failure	Manipulator battery warning	This warning occurs when the voltage of the battery in the robot manipulator decreases.	(1)Please exchange the battery referring to "Robot Manipulator Maintenance Manual". (2) Please perform the Encoder Reset and Encoder Correction.	After the battery is exchanged, please carry out "failure-reset" and then turn on the power supply of the controller again.	Inform ation	Inform ation
1024	Servo failure	Robot over temperature	This failure occurs when the temperature of the motor, the encoder, the harness, and the connector guessed from the motor current and the motor speed is abnormal.	(1)Please confirm that the Pay-load is within the nominal rating. (2)Please confirm the wiring of the motor brake refering to "Manipulator Maintenance Manual". (3)Please lowering the temperature of an abnormal location, and lowering the outside temperature. (4)If failure persists, please lower the operation speed of the robot.	After removal of failure, please carry out "failure-reset".	Inform ation	Inform ation
1048	Control failure	Contact of magnetic switch.	Error occurs when the contact of magnetic switch.	After wiring is confirmed, magnetic switch is exchanged when the error occurs again.	After removal of failure, please carry out "failure-reset".	Error	Error
1049	Spot weld failure	This IWB does not support MFDC	Error occurs when the IWB version is old.	Replace new version.	After removal of failure, please carry out "failure-reset".	Error	Error
1050	FieldBus failure	Analog output	Analog output board is not exists in the	Install the analog output board.	Error reset.	Error	Error

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		board not installed.	controller.				
1052	Control failure	The inconsistency was detected with the sequence circuit.	This failure occurs when the inconsistency or abnormal was detected in duplicated signal at the deadman switch, the emergency stop, the safety plug, and the mat switch.	(1)Please confirm whether one of signals is input or contact is weld at the deadman switch, the emergency stop, the safety plug, and the mat switch. (2)Please exchange I/O sequence substrate UM301.	After removal of failure, please carry out "failure-reset".	Error	Error
1055	Spot weld failure	The welder board failed in initialization.	Error occurs when the initialization of the welder board is not complete.	Power ON again. If error persists replace the I/F printed circuit board.	Error reset.	Alarm	Alarm
1056	Spot weld failure	Memory error is detected by the welder board.	Error occurs when an internal memory of the welder board is destroyed.	Power ON again after executing R930, and confirm each parameter of the timer.	Error reset.	Alarm	Alarm
1058	Spot weld failure	Timer controller CPU is not ready.	Nothing acknowledge from timer controller CPU.	Replace the timer PCB (PMU).	Error reset.	Alarm	Alarm
1140	Control failure	Conveyer mode can not be changed while playback	Conveyer mode was tried to be changed while robot moving.	Change conveyer mode after stopped.	Error reset.	Error	Error
1155	Spot weld failure	The welder board failed in initialization.	Error occurs when the initialization of the RE-01 welder board is not complete.	Power ON again. If error persists replace the welder board (RE-01).	Error reset.	Alarm	Alarm
1156	Spot weld failure	Memory error is detected by the welder board.	Error occurs when an internal memory of the welder board is destroyed.	Power ON again. If error occurs again, replace the welder board.	After removal of failure, please turn on power supply of the controller again.	Error	Error
1158	Spot weld failure	Timer controller CPU is not ready.	Nothing acknowledge from timer controller CPU.	Replace the timer PCB (RE-01).	Error reset.	Error	Error
1174	Operational failure	Invalid relative program call command found.	Error occurs when a CALL is made within a relative program call function more than 2 times.	Alter relative program call functions in the program.	Error reset.	Alarm	Alarm
1181	Control failure	Conveyer running signal was not received.	Conveyer running signal was not received in conveyer normal mode.	In conveyer normal mode, turn on conveyer running signal.	Error reset.	Error	Error
1792	CPU board failure	The Hibernation is not enabled.	Because an external memory storage (Compact Flash card) was in the card slot when making a Hibernation file, the Hibernation could not be enabled.	Enable the Hibernation function again after removing the external memory storage.	Error reset.	Error	Error
1820	Sealing failure	The gun nozzle is choked up.	The flow pressure exceeded a set value.	Please clean the gun nozzle.	Error reset.	Error	Error
1821	Sealing failure	The pressure exceeded the upper bound.	The flow pressure exceeded a set value.	Please clean the gun nozzle.	Error reset.	Error	Error
1822	Sealing failure	The pressure exceeded the lower bound.	The flow pressure exceeded a set value.	Please clean the gun nozzle.	Error reset.	Error	Error
1823	Operational failure	This function cannot be available during Adaptive Motion.	The function which cannot be used during Adaptive Motion was used.	Please record this function on the step which is not Adaptive Motion.	Error reset.	Alarm	Alarm
1824	Operational failure	Movement too large in Adaptive Motion.	Error occurs when movement by an external force is too large while in Adaptive Motion.	Check Adaptive Motion conditions.	Error reset.	Error	Error
1825	Operational failure	Controller cannot make trajectory at the singular area.	Robot cannot pass the singular area during Adaptive Motion 'Follow' type.	Please modify the teach point.	Error reset.	Error	Error
2002	Control failure	Playback unavailable because motors-off sequence is executing.	Error occurs when input playbk command while it is executing the motor-off sequence.	Please input playback command after motors-on is thrown.	After removal of failure, please carry out "failure-reset".	Alarm	Alarm
2003	Spot weld failure	Spot welding function can not be carried out.	The mistake of the method of recording the welding function is found.	(1)Please confirm the welding number. (2)Please record spot welding function after step 1. (3)You tried to drive the GUN mechanism which was not able to be driven with this unit.	After recording the move step, Please Check Go.	Alarm	Alarm
2006	Control failure	T/P selector switch is AUTO.	Manual operation is impossible while T/P selector switch is set to AUTO.	Set T/P selector switch to MANUAL.	After removal of failure, please carry out "failure-reset".	Alarm	Alarm
2010	Operational failure	It was going to start while the work program was edited on the screen.	This error occurs if it starts while the work program was edited on the screen.	Please start after ending the editor on the screen.	This error is released if it starts again after ending the editor on the screen.	Alarm	Alarm
2021	Operational failure	WI cancel operation is disabled. (Servo gun)	This error occurs when WI cancel is operated during a servo gun motor power off.	Please operate WI cancel after a motor power on.	No reset operations neccesary.	Inform ation	Inform ation
2022	Operational failure	Variable which gives speed parameter is invalid.	This error occurs when speed parameter of Moving command made by Robot Language is given by variable and its	Please set value to the variable or change speed parameter to numerical value.	Please set value to the variable or change speed	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
			value is invalid.		parameter to numerical value.		
2027	Spot weld failure	The change in the tip consumption detected by search 3 is abnormal.	The difference between the consumption detected by search 3 and the consumption detected by search 1 exceeded the search 3 abnormal tip change.	Check the lack of gun tip. If it is no trouble, execute gun search 1.	Error reset.	Alarm	Alarm
2030	Operational failure	Designated command position exceeds Robot operating area.	This failure occurs when the operation radius exceeds the limitation.	(1)Please move the robot to the position in a permissible torque in the constant setting mode. (2)Please correct the teaching so as not to exceed the position in a permissible torque. (3)Please confirm installed posture. (4)Please confirm the tool load.	Error reset.	Alarm	Error
2038	Spot weld failure	The function can not be used while servo gun is separating.	The function was attempted that is not allowable while servo gun is separationg.	Please execute the function after releasing the separation.	Error reset.	Alarm	Alarm
2044	Spot weld failure	The encoder data of gun axis is not steady.	The servo gun axis did not stop while waiting to reach the specified pressure.	Please reconsider the recorded position. If the position has no problem, replace the Drive Unit	Error reset.	Alarm	Alarm
2048	Spot weld failure	The command pressure is out of range.	Error occurs when a pressure too great or too small for the Servo gun is designated.	Use pressures adequate for the Servo gun being used.	Error reset.	Alarm	Alarm
2049	Spot weld failure	Ready to weld status from welder board isn't completed, or a weld-enabled signal isn't input.	Welder power turned off or welder error occurred, a weld-enabled signal not given.	Check the peripheral system or welder.	Error reset.	Alarm	Alarm
2050	Operational failure	Robot does not keep the basic position between multi driven axises.	This error occurs if robot does not keep the basic position between multi driven axises.	Return robot to the basic position by manual operation without Multi Drive Contol. If this error occurs again, check the basic position or the level of error detection.	Error reset.	Error	Error
2055	Spot weld failure	Pressure already achieved to the designated value for manual operation.	Servo Gun Pressure already achieved to the designated value for manual operation.	Pressure value is too low when servo gun axis does not move. Review pressure data.	Error reset.	Alarm	Alarm
2059	Operational failure	There is a possibility that the interpolation operation and the de-and acceleration control are not correctly done due to a set disagreement of rectangular coordinate system.	Setting rectangular coordinate system is different registering the tool and now.	Please set the tool constant (length and center of gravity) again by present rectangular coordinate system. Or, please change setting rectangular coordinate system.	The error is not released until measures are executed.	Alarm	Alarm
2060	Operational failure	4th axis operating range exceeded.	Error occurs when 4th-axis moves out of its Operating range. Though 4th axis is within the software motion range, the 4th axis occasionally exceeds the range of motion by receiving axis interference from other axes.	Select [Constants][Machine constants] and use the correct axis operation keys to move back into the 4th-axis Operating range. Warning! damage can occur if 4th-axis hits arm 1.	No reset operations neccesary.	Alarm	Error
2062	Spot weld failure	Weld condition dose not exist.	Weld condition setting with group, the weld condition is 1-16(Group16 is 1-15).Weld condition number is out of range.	Check the desired condition number and retry.	The error is not released until measures are executed.	Alarm	Alarm
2063	Spot weld failure	Weld condition group number is not set.	Spot weld function(Fn119 or Fn303) was executed without recording weld condition with group function(Fn282).	Please record weld condition with group function(Fn282) before executing spot welding function(Fn119 or Fn303).	The error is not released until measures are executed.	Alarm	Alarm
2082	Operational failure	The memory medium is not prepared.	The detection reason is that the specified device was not detected when the file operation is done.	Whether the device such as memory cards specified by the file operation menu is correctly installed is confirmed.	It will be canceled if some keys are pushed.	Inform ation	Inform ation
2083	Operational failure	The memory medium is read-only.	When it is going to copy a file to a write-protected memory cards etc., this error sets.	Please prepare the memory medium to which writing is made and perform a copy from the beginning once again.	It will be canceled if some keys are pushed.	Alarm	Alarm
2089	Operational failure	It cannot process in the same device.	It was going to copy to the same device by the same file name.	Please change a file name or a device and redo copy operation again.	It will be canceled if some keys are pushed.	Alarm	Alarm
2090	Control failure	Max. follow angle over.	Error occurs when the robot was about to follow more than the max. follow angle.	Check the press syncronize parameters.	Error reset.	Error	Error
2091	Control failure	Record point of press synchronous step is not available.	Error occurs when the position of press interlock waiting step and a synchronous step is different.	Confirm record point of press synchronous step.	Error reset.	Error	Error

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
2092	CPU board failure	It is not possible to start from a current step.	Error occurs when playback start is done from press synchronous step.	Please do playback start from steps other than press synchronous step.	Error reset.	Alarm	Alarm
2093	Control failure	Press brake sync. is not available.	Error occurs if execution of a function related to the press brake is attempted when Press is not selected with Conveyer type.	Set Conveyer shape in Press.	Error reset.	Error	Error
2100	FieldBus failure	Specified channel number or slave node number is not used.	Channel number or the slave node number specified with FN312 or R502 is not used.	Please confirm channel number or the slave node number.	Error reset.	Error	Error
2101	Operational failure	Stop or External stop signal being given.	Error occurs when a Start command is given while the Stop button is being held or External stop signal is being given.	Release Stop button or External stop signal(if External stop signal cable is cut the external stop signal is considered as being given.	Error reset.	Information	Information
2103	Operational failure	The emergency stop button or the external emergency stop is inputted.	Where an emergency stop button or an external emergency stop signal is inputted, it detects, when the Motors-ON signal or the External Motors-ON signal is inputted.	Please cancel an emergency stop button and an external emergency stop signal.	Error reset.	Information	Information
2104	Operational failure	Motors-OFF button or external Motors-OFF is inputted.	In the state where the Motors-OFF button or the external Motors-OFF signal is inputted, when the Motors-ON signal or the external Motors-ON signal is inputted, it detects.	Please cancel a Motors-OFF button and an external Motors-OFF signal.	Error reset.	Information	Information
2106	Operational failure	Playback unavailable because servo system has not been turned on yet.	The start is impossible, because the start operation is done before MSHP is turned on.	Please start after turning on MSHP.	Error reset.	Information	Information
2108	Operational failure	It is not possible to start by specifying the function step	This It is prohibited to start specifying the function because there is the position where the function is executed is not an original position but a possibility.	Please start after specifying the move step.	Error reset.	Information	Information
2110	PLC failure	Toyopuc I/F:The sequence program has stopped.	Toyopuc I/F:The sequence program has stopped.	Please confirm Toyopuc I/F.	Automatically restores, when the problem is solved.	Error	Error
2111	Operational failure	The internal operation signal was inputted in the state of external selection.	It detects, when starting selection tends to push the Motors-ON button or a starting button in the state of the exterior or it is going to choose a program from TP in the state of the program selection exterior.	Please operate it after setting starting selection or program selection as an inside.	Error reset.	Information	Information
2112	Operational failure	The external operation signal was inputted in the state of internal selection.	It detects, when the Motors-ON or the start signals are inputted from the exterior in the state of an inside of start selection or a program selection signal is inputted from the exterior in the state of the inside of program selection.	Please perform external operation after setting up starting selection or program selection outside.	Error reset.	Information	Information
2113	Operational failure	Settings were changed. To initialize the ststus, please cycle the primary power.	This error is detected when Motors-ON command is inputted in a state where some settings were changeed.	Please cycle the primary power to initialize the state.	Error reset.	Error	Error
2118	Shift failure	Shift register contains no data.	Error occurs when data aren't established in specified shift register.	Setting data in shift register.	Error reset.	Alarm	Alarm
2138	Operational failure	Setting the call instruction is improper.	This error occurs when the number of step call and return instruction is match or the multiple call exceeds eight times.	Please correct the program so that the number of call return instructions is corresponding, and a multiple call should not exceed eight times.	This error is released if the step set do over again and restart playback.	Alarm	Alarm
2141	Operational failure	The unit composition is a different program.	This error occurs when the program jump or call instruction directly jumps or calls the program that the unit is different.	Please correct the called program number value.	This failure is released if a correct program is setted and restart playback.	Alarm	Alarm
2142	Operational failure	Program number selected is not available.	This error occurs when the program number designated is more than 9999.	Check the desired program number and retry.	No reset operations neccesary.	Information	Information
2144	Operational failure	There is no end.	If there is no end mark when playback executing, this error is detected after the last step is executed.	Please record the end instruction.	This error is released if restart playback.	Information	Information
2150	Operational failure	Program is too large.	Error occurs when number of bytes of a program is too large.	Edit program in order to reduce its size.	No reset operations neccesary.	Information	Information
2151	Operational failure	The program or the file does not exist.	This error occurs when the program number is specified which does not exist in the program jump call instruction.	Please correct the program number to a correct value the jump call ahead.	This failure is released if a correct program is setted and restart playback.	Information	Information

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
2152	Operational failure	The step does not exist.	This error is detected when the step number which does not exist in the step jump call instruction is specified.	Please correct the step number to a correct value at the jump destination.	This error is released if the correct step set do over again and restart playback.	Inform ation	Inform ation
2155	Operational failure	The usage of the flow control instruction is improper..	This error is detected when the usage of the flow control instruction is wrong.	Please correct the program so that the usage of the flow control instruction may become proper.	his error is released if it reactivates after the program is corrected so that the usage of the flow control instruction may become proper.	Alarm	Alarm
2161	Operational failure	Change of a coordinate system cannot be performed during circular.	This error occurs if a coordinate system is changed during circular.	Please teach by the same coordinate system during circular.	This error will be canceled if a program is corrected and restarted.	Inform ation	Inform ation
2164	Operational failure	Change of a tool cannot be performed during circular.	This error occurs if a tool is changed during circular.	Please teach by the same tool during circular.	This error will be canceled if a program is corrected and restarted.	Inform ation	Inform ation
2165	Operational failure	The file is protected.	All protected files or files partially protected (program or constant) tried to be corrected and deleted.	Because the specified file (program or constant) contains important data, protecting is put so that the content is not carelessly changed.	Please release protecting the file (program or constant).	Inform ation	Inform ation
2166	Operational failure	The reproduction protection of the program is carried out.	It detects, when it is going to carry out reproduction or check GO of the work program which required reproduction protection from a head step (Step 0).	The specified work program is not a program which should be used for operation operation.	When you start, please choose Step 1 from T/P.	Alarm	Alarm
2167	Operational failure	The amount of the movement of each axis is too small in the automatic tool constant setting. Or, the number of record steps does not suffice.	When there is no point or less 10 point data effective to the calculation, and the program is not clearly recorded the same point excluding the error by the teaching.	Recreate the 10 point program (4 point under tool constant setting only) ensuring the recorded points are exactly the same point in space.	Error reset.	Inform ation	Inform ation
2168	Preventive maintenance message	There is an axis of less than 1,000 hours till overhaul cycle attainment.	In the state of the present operation, the life-expectancy time (time until it reaches a life) of the displayed axis turned into 1,000 or less hours.	Please exchange the slowdown machine of the axis displayed as early as possible. Please clear "the consumption time by present" zero with an overhaul cycle prediction menu after exchange. (The qualification more than Expert is required)	Error reset.	Alarm	Alarm
2169	Operational failure	A step number is unsuitable..	It is displayed, when the specified step does not exist, or when the step of a reference program is the function step.	Please specify a move function.	Error reset.	Alarm	Alarm
2170	Operational failure	Tool postures differ.	It is displayed when the tool posture in two specified points is not the same.	Please make a tool posture the same.	Error reset.	Alarm	Alarm
2171	Operational failure	Tool number do not match.	The tool number recorded on the specified step differs from the selected tool number.	Please make a tool number the same.	Error reset.	Alarm	Alarm
2173	Shift failure	Shift value limit exceeded.	This error occurs if the allowable shift distance is too large.	Reset the limit value[Constants][Shift limit & evaluation value] and retry program.	No reset operations neccesary.	Alarm	Alarm
2174	Control failure	This function cannot be available during conveyor synchronization.	The function which cannot be used during conveyor synchronization was used.	Please record this function on the step which is not conveyor synchronization.	Error reset.	Alarm	Alarm
2175	Operational failure	The file path is not found.	The system cannot find the path specified.	Please check whether a file path is right.	No reset operations neccesary.	Inform ation	Inform ation
2176	Operational failure	The file access is denied.	The process cannot access the file because it is being used by another process.	Please try once again. If it still recurs, please re-switch on the controller.	No reset operations neccesary.	Inform ation	Inform ation
2181	Control failure	Conveyer running signal was not received.	Conveyer running signal was not received in conveyer normal mode.	In conveyer normal mode, turn on conveyer running signal. If the signal is not used, set [When turning off conveyor running signal. = Ignore] in [Constant: 20 Conveyor constant: 4 Conveyor added function] menu.	No reset operations neccesary.	Alarm	Alarm
2185	Operational failure	Step number selected is not available.	This error occurs when designated step number does not exist.	Check the desired step number and retry.	No reset operations neccesary.	Inform ation	Inform ation
2194	Operational failure	The program is not recorded nor selected.	This error occurs when the program which is not recorded is selclted and start playback.	Please start after recording the program or selecting other programs.	This error is released if it sets a correct program and restart playback.	Inform ation	Inform ation
2201	Shift failure	Palletize-end does not follow Palletize	This error occurs when a palletize-end function(M47) does not follow Palletize	Correct the sequence of Palletize and Palletize end functions in the program.	No reset operations neccesary.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		function.	function(M48).				
2202	Shift failure	More than 32 Palletizing routines not allowed.	When palletizing of 32 or more is executed at the same time, this error is detected.	Terminate the unnecessary palletize.(by using R55 or R377)	No reset operations neccesary.	Alarm	Alarm
2203	Shift failure	Palletize data is abnormal.	This error occurred calculate shift value is failed from palletize data.	Please refer to palletize data.	No reset operations neccesary.	Alarm	Alarm
2204	Shift failure	Multiplex palletize over.	This error occurs when multiplex palletize beyond 8 is carried out.	Please confirm a robot program.	No reset operations neccesary.	Alarm	Alarm
2230	Control failure	Conveyer sync. is not available.	Failure occurs if execution of a function related to the Conveyer is attempted when Conveyer synchronization has not been enabled.	Enable Conveyer synchronization	Error reset.	Alarm	Alarm
2240	Operational failure	PUBLIC.INC file is wrong.	This failure occurs when the mistake is found in the method of defining the variable.	Please confirm the definition of variables.	Error reset.	Alarm	Alarm
2241	Operational failure	COSNT.INC file is wrong.	This failure occurs when the mistake is found in the method of defining the name.	Please confirm the definition of names.	Error reset.	Alarm	Alarm
2242	Operational failure	Module file is wrong.	This failure occurs when the mistake is found in the method of recording the function.	Please confirm the method of the function.	Error reset.	Alarm	Alarm
2243	Operational failure	The variable Data file is wrong.	This failure occurs when it failed in the preservation of the variable data file.	Please set the initial data of variables, after to select program.	Error reset.	Alarm	Alarm
2244	Operational failure	The variable data is an irregular value.	The variable of irregular data cannot be used.	Please set the initial data of variable.	Error reset.	Alarm	Alarm
2245	Operational failure	The variable cannot be rewritten.	The variable data of an other unit cannot be rewritten.	Please review the variable.	Error reset.	Alarm	Alarm
2246	Operational failure	The variable doesn't exist.	The variable that doesn't exist cannot be used.	Please review the variable.	Error reset.	Alarm	Alarm
2247	Operational failure	The variable has already existed.	The existing variable cannot be redefined.	Please review the variable.	Error reset.	Alarm	Alarm
2248	Operational failure	The mistake is found in the method of recording the function.	The function command that cannot be used is recorded. whether to find the mistake in the method of recording the function.	Please confirm the method of the function.	Error reset.	Alarm	Alarm
2250	Operational failure	The step data is abnormal.	This error occurs when the value which is not permitted as a parameter of the function instruction is setted while playback executing, and the robot stops.	Please set a correct parameter again.	This error is released if a correct program or step is setted and restart playback.	Alarm	Alarm
2251	Operational failure	Incorrect Register or variable number.	Error occurs when incorrect Register or variable number is used in a program.	Enter the correct register or variable number.	Error reset.	Alarm	Alarm
2252	Operational failure	Failed in reading or writing variable.	This error occurs when the variable is continuously read or written.	Please confirm the number of variables which are read or written.	Error reset.	Alarm	Alarm
2253	Operational failure	The parameter for the function command exceeds the normal range.	This error occurs when an illegal parameter is found in the function command while playback operation, and the robot stops.	Please correct the parameter.	Althogh re-start operation is possible, please correct the teaching program.	Alarm	Alarm
2254	Operational failure	The Dynalog function command exceeds the normal range.	This error occurs when an illegal function command is found while playback operation, and the robot stops.	Please set a correct function command again.	This error is released if a correct program or step is setted and restart playback.	Alarm	Alarm
2255	Operational failure	Division by 0.	This error occurs when a value is divided by 0 in robot language file.	Check the program.	Check the program.	Alarm	Alarm
2256	Operational failure	Playback unavailable because compilation process is executing.	Error occurs when input playback command while it is executing the compilation process.	Please start after the compilation processing ends.	No reset operations neccesary.	Alarm	Alarm
2258	Operational failure	Outside wrist posture limit range	The wrist operated by posture beyond the limits of the posture limit setting.	Please operate the robot so that the wrist posture may operate within the range of the limit.	Error reset.	Alarm	Alarm
2259	Operational failure	It is the tool which does not appoint limit angle	Step of the tool where 0 is set to limit angle the when regulation effective of wrist posture limit was played back.	When step of the tool which does not use wrist posture limit is played back, please set wrist posture limit to invalidity.	Error reset.	Alarm	Alarm
2268	Operational failure	The program can not reserve any more.	This error occurs when the number of program reservations exceeds ten.	The number of program reservation should cope with it by the sequence etc. not to accumulate too much.	Error reset.	Alarm	Alarm
2272	Control failure	Conveyer running signal is ON.	Error occurs when a Conveyer running signal is inputed when conveyer simulation or test mode.	Turn off the conveyer running input signal OFF.	Error reset.	Error	Error
2277	Spot weld failure	Analog input override and digital input override can not be used at same time.	Error occurs when analog input override (FN169) and digital input override (FN277) are played at the same time.	Check the program, and delete function.	Error reset.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
2300	Spot weld failure	No signal input while executing FN227	The specified interruption signal was not input whiel executing FN227.	Please confirm the state of the sensor, the connection with the controller and the number of the signal.	Error reset.	Alarm	Alarm
2301	Operational failure	There is no referring to point for the circle middle point (C1).	This error occurs when the program on which the move command is not recorded before or after the circle middle point (C1) is started.	Please start after recording a move command before or after the circle middle point (C1).	This error will be canceled if a program is corrected and restarted.	Alarm	Alarm
2302	Operational failure	There is no referring to point for the circle end point (C2).	This error occurs when the program on which the move command is not recorded before the circle middle end (C2) is started.	Please start after recording a move command before the circle end point (C2).	This error will be canceled if a program is corrected and restarted.	Alarm	Alarm
2353	Operational failure	It is protected with the password.	It detects, when it is going to correct or delete the file (a program, constant) protected with the password.	Since the specified file (program or constant) contains important data, protection is applied so that the contents may not be changed carelessly.	Please release protecting the file (program or constant).	Alarm	Alarm
2356	Shift failure	Playback mode of Search write function is not corrected.	This error occurs when Search write function is attempted when not in <1 cycle> mode.	Select <1 cycle> mode.	No reset operations neccesary.	Alarm	Alarm
2357	Shift failure	Search range exceeded.	This error occurs when the robot moves beyond search range	Modify(enlarge) the search range or program to rectify error.	No reset operations neccesary.	Alarm	Alarm
2358	Shift failure	Search base step position is not defined.	This error occurs if a Search is attempted without the existence of the Search base step position.	The Search base step position(s) will be automatically written into the functions.	No reset operations neccesary.	Alarm	Alarm
2359	Shift failure	Search Start not followed by Search End.	This error occurs when a Search start does not follow a Search End function.	Alter program to give correct Search start/end sequence.	No reset operations neccesary.	Alarm	Alarm
2360	Operational failure	The setting of a case jump function is unsuitable.	This failure occurs when a case jump and a case jump end do not correspond while playback executing, and the robot will stop.	Please check a case jump and correspondence of a case jump end.	This failure is released if a correct program is setted and restart playback.	Inform ation	Inform ation
2361	Operational failure	It was going to jump beyond the case jump range.	This failure occurs when the condition value of a case jump is too large and there is no jump step in the program while playback executing, this abnormality is detected, and the robot will stop.	Please set a correct parameter again.	This failure is released if a correct program is setted and restart playback.	Inform ation	Inform ation
2367	PLC failure	Scan of Built-in PLC has stopped.	Although Built-in PLC status is except <Disabled>, when scan of Built-in PLC has stopped, it becomes this error at the time of robot operation.	Built-in PLC status is set as <RUN> by constant mode, and scan is started.	Unusual reset is carried out after changing Built-in PLC into a starting state.	Alarm	Alarm
2368	PLC failure	Connection with Built-in PLC cannot be performed.	It becomes this error when connection with Built-in PLC cannot be performed.	Please check the environment of Built-in PLC of operation.	Unusual reset is carried out after changing Built-in PLC into a starting state.	Alarm	Alarm
2369	PLC failure	Built-in PLC cannot be started.	It becomes this error when Built-in PLC cannot be started.	Please check the environment of Built-in PLC of operation.	Unusual reset is carried out after changing Built-in PLC into a starting state.	Alarm	Alarm
2370	PLC failure	Built-in PLC cannot be stopped.	It becomes this error when Built-in PLC cannot be stopped.	Please check the environment of Built-in PLC of operation.	Unusual reset is carried out after changing Built-in PLC into a starting state.	Alarm	Alarm
2371	PLC failure	There is no resource performed by Built-in PLC.	It will become this error if a starting demand is performed in the state where there is no resource performed by Built-in PLC.	Download a PLC ladder program.	After download, it changes into a starting state and unusual reset is carried out.	Alarm	Alarm
2372	PLC failure	PLC-Engine has not been started.	It becomes this error when it is not able to start by the starting demand of PLC-Engine.	Please check the environment of Built-in PLC of operation.	Again, a starting setup is carried out, it changes into a starting state, and unusual reset is carried out.	Alarm	Alarm
2373	PLC failure	The error was detected by Program check at the time of PLC-Engine starting.	It becomes this error when an error is detected by Program check at the time of PLC-Engine starting.	Please carry out program check by [3 PLC program check] of [14 PLC program Edit] of Service.	Error reset.	Alarm	Alarm
2383	Operational	The function data is	This error occurs when the function	Please set the function again.	This error is	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
	failure	abnormal.	instruction which is not permitted is setted while playback executing, and the robot stops.		released if a correct program or step is setted and restart playback.		
2387	Shift failure	3 of the step points for On-transfer are in line.	Error occurs when 3 step points are situated along the same line for the On-line Transfer(M53,M54).	Designate step positions not in the same line for the On-line transfer function.	Designate step positions not in the same line for the On-line transfer function.	Alarm	Alarm
2390	Operational failure	There is no user function definition data.	Error occurs when there is no data which defined the specified user function.	Create a user function definition file.	A power supply is re-switched on after creating a user function definition file.	Alarm	Alarm
2391	Operational failure	There is no user function definition data.	Error occurs when there is no data which defined the specified user function.	Create a user function definition file.	A power supply is re-switched on after creating a user function definition file.	Alarm	Alarm
2400	Emergency stop failure	Emergency stop signal input line failure.	This Error occurs when disagreement has happened between dual emergency stop signal input lines. (1) Cable failure(contact failure, broken wire) (2)Emergency stop switch troubles.	First, release all emergency stop switches, and perform operation again. If the error recurs, check whether the emergency stop SW line is correctly wired.	First, release all emergency stop switches, and perform operation again. If impossible, remove the cause of the error, and turn on the power again.	Error	Error
2401	Emergency stop failure	Safety signal input line failure(Safety plug)	This Error occurs when disagreement has happened between dual safety signal input lines. (1) Cable failure(contact failure, broken wire) (2)Safety plug troubles.	First, release sefety plugs, and perform operation again. If the error recurs, check whether the safety plug line is correctly wired.	First, release safety plugs, and perform operation again. If impossible, remove the cause of the error, and turn on the power again.	Error	Error
2402	Emergency stop failure	Safety signal input line failure(Deadman/Mat SW)	This Error occurs when disagreement has happened between dual safety signal input lines. (1) Cable failure(contact failure, broken wire) (2)Deadman/Mat SW troubles.	First, release deadman switches, and perform operation again. If the error recurs, check whether the deadman SW line is correctly wired.	First, release deadman switches, and perform operation again. If impossible, remove the cause of the error, and turn on the power again.	Error	Error
2410	Operational failure	User failure is not defined.	The error file was not found.	Please define Failure by [Service]→[25 Robot Diagnosis]→[6 User Error].	Error reset.	Error	Error
2411		It became a check time limit.	check	Please do the check completion processing after it checks.	The check completion processing is done.	Information	Information
2412		Information by number of failure log	The number of remainder failure log reached a set value.	The failure log file is backing up preserved if necessary. Afterwards, "Failure log clear" is executed by the failure logging monitor. Or, information on the number of failure log is set to "Not Occur" by the error logger item.	Error reset.	Information	Information
2413		Information by number of another preservation failure log	The number of remainder another preservation failure log reached a set value.	The failure log file is backing up preserved if necessary. Afterwards, "Failure log clear" is executed by the failure logging monitor. Or, information on the number of another preservation failure log is set to "Not Occur" by the error logger item.	Error reset.	Information	Information
2435	Spot weld failure	The specified welder cannot be used with this unit.	The servo gun connected with the specified welder is not defined as a mechanism of this unit.	Modify the program.	Error reset.	Alarm	Alarm
2436	Spot weld failure	The servo gun is not connected with the specified welder.	The welder with which the servo gun was not connected when the servo gun function was used was specified.	Modify the program.	Error reset.	Alarm	Alarm
2437	Spot weld failure	Abnormal panel thickness detected.	Dramatic difference of panel thickness exists between recorded value in weld condition and detected value.	Check the weld condition data and real work piece thickness.	This error is released if restart playback.	Alarm	Alarm
2497	FieldBus failure	RIO detected the communications error.	An abnormal communication was generated by the RIO link.	Please check the connection and the RIO scanner of the communication cable.	Error reset.	Alarm	Alarm
2498	FieldBus failure	The RIO interface is abnormal.	There is no answer from the RIO interface.	Please exchange the RIO interface.	Error reset.	Alarm	Alarm
2518	Operational failure	Step number not designated.	This error occurs when a command only valid after designating a step number is attempted without step designation.	Please designate a step number and retry.	This error is released if a correct program or step is setted and restart	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
					playback.		
2527	Operational failure	File read or write fault.	This failure occurs when the media format does not match the format selected in the controller or the file has been corrupted.",	Please try once again, after delete the file.	No reset operations neccesary.	Inform ation	Inform ation
2528	Operational failure	The memory medium is not discriminable.	When memory media, such as a FIROPPI disk and an memory card, are not initialized, this error occurs.	By Service / File Manager / Format memory card/Floppy disk, please use it after initializing a memory medium.	It will be canceled if some keys are pushed.	Inform ation	Inform ation
2535	Spot weld failure	File operation of FTP client is canceled.	FTP client menu is closed, when upload or download executed.	The file under writing might been damaged. Please confirm the file that is uploaded or downloaded. Please delete and execute download or upload again when the file has been damaged.	No reset operations neccesary.	Alarm	Alarm
2536	Spot weld failure	Welder fault.	Error occurs when a Welder fault input signal is received by the controller after the completion of a welding sequence.	Check the welder unit.	This error is released if restart playback.	Alarm	Alarm
2537	Spot weld failure	Welding time exceeded limit.	Error occurs if a Weld competed signal is not input before the designated time period.	Check the welder is operating normally.	This error is released if restart playback.	Alarm	Alarm
2538	Spot weld failure	The gun not open.	Error occurs if the Gun closed signal is received after the welding sequence ends.	Check the GUN or welding unit.	This error is released if restart playback.	Alarm	Alarm
2539	Spot weld failure	The gun is not half open.	Error occurs if the Gun half-open signal is not received after Open gun half signal is output by the controller.	Check the GUN or welding unit.	This error is released if restart playback.	Alarm	Alarm
2540	Spot weld failure	The gun is not fully open.	Error occurs if the Gun full-open signal is not received after Open gun fully signal is output by the controller.	Check the GUN or welding unit.	This error is released if restart playback.	Alarm	Alarm
2541	Spot weld failure	Stuck Weld GUN detected.	Error occurs if the System fault signal is detected after completion of a welding sequence.	Error occurs if the Weld stuck signal is received when the welding sequence ends.	This error is released if restart playback.	Alarm	Alarm
2542	Spot weld failure	Coolant fault #1.	Error occurs if the Water flow switch #1 signal is detected after completion of a welding sequence.	Check the GUN or welding unit.	This error is released if restart playback.	Alarm	Alarm
2543	Spot weld failure	Coolant fault #2.	Error occurs if the Water flow switch #2 signal is detected after completion of a welding sequence.	Check the GUN or welding unit.	This error is released if restart playback.	Alarm	Alarm
2544	Spot weld failure	Air pressure fault.	Error occurs if the Air pressure switch signal is detected after completion of a welding sequence.	Check the GUN or welding unit.	This error is released if restart playback.	Alarm	Alarm
2545	Spot weld failure	Transformer temperature fault.	Error occurs if the Thermo. temp. fault signal is detected after completion of a welding sequence.	Check the GUN or welding unit.	This error is released if restart playback.	Alarm	Alarm
2546	Spot weld failure	Peripheral system fault.	Error occurs if the System fault signal is detected after completion of a welding sequence.	Check the GUN or welding unit.	This error is released if restart playback.	Alarm	Alarm
2552	Spot weld failure	Both of half-open and full-open signals are given.	Error occurs if both the Gun half-open signal and Gun full-open signal are received simultaneously after Open gun half signal is output by the controller.	Check the GUN or welding unit to determine the cause of the two simultaneous signals.	This error is released if restart playback.	Alarm	Alarm
2555	Spot weld failure	Servo-gun is not executed to obey the welder sequence.	Error occurs when the servo gun is not achieved to command pressure.	Please confirm to the sequence of weld-timer.	This error is released if restart playback.	Alarm	Alarm
2570	Vision sensor failure	Vision sensor communication data error.	Internal error in the vision sensor system was detected.	Please check hardware of vision sensor.	After removal of failure, please turn on power supply of the controller again.	Alarm	Alarm
2571	Vision sensor failure	Vision sensor command/reply buffer overflow.	Too many commands to vision sensor or replies from vision sensor at the same time.	Please modify timing of function execution.	After removal of failure, please carry out "failure-reset".	Alarm	Alarm
2572	Vision sensor failure	Vision sensor recognition error.	Vision sensor could not recognize the measure object.	Please check the measure object is within measure area. If the object is within measure area, please modify measure condition parameters or adjust lighting environment.	After removal of failure, please turn on power supply of the controller again.	Alarm	Alarm
2573	Vision sensor failure	Vision sensor shift error.	The measure object isn't within shift area or vision sensor could not recognize the measure object.	Please check the measure object is within shift area. If the object is within shift area, please modify measure condition parameters or adjust lighting environment.	After removal of failure, please turn on power supply of the controller again.	Alarm	Alarm
2574	Vision sensor failure	Error about frame grabber.	Frame grabber is out of order.	Please replace the frame grabber board.	After removal of failure, please turn on power supply of the controller again.	Alarm	Alarm
2575	Vision sensor failure	Image acquire error.	Acquiring image timeout detected. Or Camera cable is cut / camera is out of order.	Please check camera setting. If this is right, replace the camera cable / camera.	After removal of failure, please turn on power supply of the controller again.	Alarm	Alarm
2576	Vision sensor	Vision sensor	Fail to create the socket which connect to	Please check setting of connection to vision sensor unit.	After removal of	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
	failure	socket error.	vision sensor unit.		failure, please turn on power supply of the controller again.		
2577	Vision sensor failure	Vision sensor type error.	Vision sensor function recorded by another vision sensor type is done.	Please remove the vision sensor function and record again.	After removal of failure, please turn on power supply of the controller again.	Alarm	Alarm
2582	Vision sensor failure	Vision sensor communication data error.	Error was detected in the data format which had been sent from the vision sensor.	Please confirm whether there is loosening of connector.	After removal of failure, please turn on power supply of the controller again.	Alarm	Alarm
2583	Vision sensor failure	Vision sensor returns no answer.	It takes time to process the vision sensor too much.	Please modify setting of the vision sensor.	After removal of failure, please turn on power supply of the controller again.	Alarm	Alarm
2584	Vision sensor failure	Vision sensor error.	Error was detected in the vision sensor.	Please refer to the manual of the vision sensor.	After removal of failure, please turn on power supply of the controller again.	Alarm	Alarm
2585	Vision sensor failure	Vision sensor function can not be carried out.	The function execution by the check go/back is not permitted in the vision mode.	Please cancel the vision mode, and do the check go/back.	Error reset.	Alarm	Alarm
2586	Vision sensor failure	A synchronous gap was occered by a vision correction conveyer synchronous function.	The vision sensor was not able to complete processing while the conveyer moved at trigger intervals.	Please slow down the conveyer speed.	Error reset.	Alarm	Alarm
2587	Spot weld failure	Playback unavailable because visual teaching correction is valid.	The visual teaching correction function is set as enable.	Please set the visual teaching correction function to disable.	Error reset.	Alarm	Alarm
2588	Vision sensor failure	The measurement point exceeded the distance limit.	The distance between the measurement points is abnormal or the shape of the measurement point is abnormal.	Please measure these points again.	Error reset.	Inform ation	Inform ation
2589	Vision sensor failure	A multiple measurement happened.	The measurement had been executed again before the measurement was completed.	Please modify the measurement execution timing.	Error reset.	Alarm	Alarm
2590	Vision sensor failure	Shift range over.	The measurement result is out of shift range.	Please check the position of the work.	Error reset.	Inform ation	Inform ation
2591	Vision sensor failure	Vision sensor error.	Error was detected in the vision sensor.	Please refer to the manual of the vision sensor.	After removal of failure, please carry out "failure-reset".	Inform ation	Inform ation
2592	Operational failure	Multiple shift failure.	A shift, an online transformation, and the base coordinate shift with the vision sensor were executed in the multiple.	Modify program to rectify error.	Error reset.	Alarm	Alarm
2593	Vision sensor failure	The measurement time is over.	The measurement processing time too much or the trigger signal line has been disconnected.	Please modify the method of measuring the vision sensor, and check the trigger signal line.	Error reset.	Inform ation	Inform ation
2594	Spot weld failure	Seam welding function can not be carried out.	Carrying out this function is not permitted during seam welding. Or errors are in constant data.	Please modify program or constant data.	Error reset.	Alarm	Alarm
2595	Spot weld failure	It was going to execute the function which is not permitted during seam welding.	The function about another units, such as CALLFAR, is not permitted during seam welding.	Please modify program.	Error reset.	Alarm	Alarm
2596	Vision sensor failure	No base position data set.	There is no base position before doing the shift function.	Please register base position.	Error reset.	Inform ation	Inform ation
2597	Vision sensor failure	Measure point datas is abnormal.	This failure occurs when the measurement point data is insufficient or the measurement position contradicts the data of a base position when the shift amount is calculated.	(1)Please measure these points again. (2)Please confirm base positional data.	Error reset.	Inform ation	Inform ation
2598	Vision sensor failure	The measurement type is abnormal.	When the measurement type was a setting of 2D, it tried to execute 'VLOCCVT' function.	(1)Please confirm the measurement type. (2)Please use the 'SHIFTR' function at 2D measurement.	Error reset.	Alarm	Alarm
2599	Shift failure	Shift register contains no data.	Error occurs when data aren't established in specified shift register.	Setting data in shift register.	Error reset.	Inform ation	Inform ation
2601	Operational failure	Servo gun auto-setting gets abnormal data.	It is not possible to compute the servo gun inertia using current gathered by parametor auto-setting	(1)Please make the servo gun position more wildly between pose 1 and pose 2. (2)Please confirm the servo parameters of target servo gun mechanism.	No reset operations neccesary.	Alarm	Alarm
2605	Operational failure	User coordinate does not exist.	Failure occurs when use of User coordinate is attempted without the coordinate system being pre-defined.	Define User coordinate system(s) in [Service][10 User Coord. Definition]before attempting to use it.	No reset operations neccesary.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
2606	Operational failure	User coordinate is indefinite.	This error is detected when the base of specified user coordinates is not in agreement with the operation standard mechanism of the current unit.	Define User coordinate system(s) in [Service][10 User Coord. Definition]before attempting to use it.	No reset operations neccesary.	Alarm	Alarm
2607	Operational failure	The user coordinate number which cannot be used as the Stationary tool coordinate was chosen.	Failure occurs although step is Stationary tool interpolation, the operation standard mechanism is chosen as the base of Stationary tool coordinate.	Please select stationary tool defined by the world coordinate using FN67.	No reset operations neccesary.	Alarm	Alarm
2608	Operational failure	The user coordinate number which cannot be used was chosen.	This function is not permitted for using user coordinate on TCF coordinate system.	Please define user coordinate defined by the world coordinate.	No reset operations neccesary.	Alarm	Alarm
2609	Operational failure	The coordinate which cannot be used was chosen.	Work coordinate or user coordinate on TCF coordinate was used for the manipulator set as the operation standard mechanism.	Please change coordinate.	No reset operations neccesary.	Alarm	Alarm
2610	Operational failure	Pause substitution overlaps.	Without executing move command, pause substitution to the same mechanism was performed.	Please teach move command after LETCOORDP function and execute.	No reset operations neccesary.	Alarm	Alarm
2611	Operational failure	Modifying user coordinate failed.	Modifying user coordinate failed for one reason of the followings. (1)[OZX order] is chosen though it is instruction of two or less points. (2)The points are less than three points. (3)Three points are on the same line. (4)Position data is not encoder. (5)User coordinates register file does not exist.	Please correct instruction points.	No reset operations neccesary.	Alarm	Alarm
2620	PLC failure	SHARP I/F: JW32CV module cannot be recognized.	When the data exchange with the module cannot be processed, this error is detected.	Please confirm setting of JW32CV module.	Error reset.	Alarm	Alarm
2621	PLC failure	SHARP I/F: Memory error detected.	Error occurs when Memory failure in the JW32CV module self-check is detected.	Refer to the Self-check section of the JW32CV Manual.	Error reset.	Alarm	Alarm
2622	PLC failure	SHARP I/F: CPU error detected.	Error occurs when CPU failure in the JW32CV module self-check is detected.	Refer to the Self-check section of the JW32CV Manual.	Error reset.	Alarm	Alarm
2623	PLC failure	SHARP I/F: I/O error detected.	Error occurs when I/O failure in the JW32CV module self-check is detected.	Refer to the Self-check section of the JW32CV Manual.	Error reset.	Alarm	Alarm
2624	PLC failure	SHARP I/F: Special I/O error detected.	Error occurs when Special I/O failure in the JW32CV module self-check is detected.	Refer to the Self-check section of the JW32CV Manual.	Error reset.	Alarm	Alarm
2625	PLC failure	SHARP I/F: Option error detected.	Error occurs when Option failure in the JW32CV module self-check is detected.	Refer to the Self-check section of the JW32CV Manual.	Error reset.	Alarm	Alarm
2626	PLC failure	SHARP I/F: Power error detected.	Error occurs when Power failure in the JW32CV module self-check is detected.	Refer to the Self-check section of the JW32CV Manual.	Error reset.	Alarm	Alarm
2627	PLC failure	SHARP I/F: Extend Power error detected.	Error occurs when Extend Power failure in the JW32CV module self-check is detected.	Refer to the Self-check section of the JW32CV Manual.	Error reset.	Alarm	Alarm
2628	PLC failure	SHARP I/F: Sequence program is stopping.	A sequence program of JW32CV module is stopping.	Please start a sequence program of JW32CV module.	Error reset.	Alarm	Alarm
2651	PLC failure	Toyopuc I/F is a uninstallation.	Toyopuc I/F is not found.	Please confirm whether Toyopuc I/F is installed.	Please turn on the power supply again after Toyopuc I/F installs.	Error	Error
2652	PLC failure	Toyopuc I/F:I/O refreshing has stopped.	There is no response from Toyopuc I/F.	Please confirm Toyopuc I/F.	Automatically restores, when the problem is solved.	Error	Error
2653	PLC failure	Toyopuc I/F:Abnormality is found in the dual port memory.	Toyopuc I/F detected the dual port memory malfunction.	Please refer to the manual of Toyopuc I/F.	Automatically restores, when the problem is solved.	Error	Error
2654	PLC failure	Error occurred by toyopuc I/F.	Toyopuc I/F detected the error.	Please refer to the manual of toyopuc I/F.	Automatically restores, when the problem is solved.	Error	Error
2655	PLC failure	The communication with Toyopuc I/F got the suspension.	The communication with Toyopuc I/F did the time-out.	The bad electrical contact of Toyopuc I/F or bad functionality of UM237 is thought.	Please reenter the power supply after removing a wrong cause.	Error	Error
2656	Spot weld failure	Current of tip dresser abnormaled.	This error occurs when the servo dresser is exceeded beyond current range.	(1)Please confirm the tip dress condition.(2)Please confirm the cable between the controller and the servo tip dresser.(3)Please replace the motor.(4)Please replace the drive unit.	After removal of failure, please turn on power supply of the controller again.	Alarm	Alarm
2657	Spot weld failure	Tip dresser	This error occurs when normal input	Please check the normal input signal from the tip	This error is	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		abnormal.	signal from tip dresser is lost during tip dress function.	dresser.	released if restart playback.		
2658	Operational failure	The user window has not been opened.	The user window has not been opened.	The user window has not been opened.	This error will be canceled if a program is corrected and restarted.	Inform ation	Inform ation
2659	Operational failure	Other user tasks use the user window.	Other user tasks use the user window.	Other user tasks use the user window.	This error will be canceled if a program is corrected and restarted.	Inform ation	Inform ation
2660	Spot weld failure	length of tip dressed abnormaled.	This error occurs when the dress length of tip is exceeded beyond dress length range.	(1)Please confirm the tip dress condition.(2)Please confirm the tip consumption.	After removal of failure, please turn on power supply of the controller again.	Alarm	Alarm
2661	Spot weld failure	Tip dress cannot be executed that is servo gun search write is enabled.	Servo gun tip cannot be dressing during of search write.	(1)If tip dress control "servo" then set the tip dress search write "Enabled", else set the servo gun search write "Disabled".	After removal of failure, please turn on power supply of the controller again.	Alarm	Alarm
2662	PLC failure	2port ram is abnormal.	Abnormality of 2port ram occurred.	Please confirm the contact failure of Toyopuc I/F, confirm the stop of PC, and confirm reset of PC.	Please reenter the power supply after removing a wrong cause.	Error	Error
2663	PLC failure	The interface is abnormal with PC.	Failed in the data reading from PC.	Please confirm the contact failure of Toyopuc I/F, confirm the stop of PC, and confirm reset of PC.	Please reenter the power supply after removing a wrong cause.	Error	Error
2669	Shift failure	X Bending shift volume is bigger than the error limit.	For glass handling, X bending shift is calculated too big.	Modify XY bending table to correct value.	Error reset.	Error	Error
2670	Shift failure	Y Bending shift volume is bigger than the error limit.	For glass handling, Y bending shift is calculated too big.	Modify XY bending table to correct value.	Error reset.	Error	Error
2671	Control failure	Conveyer synchronization not ON	Error occurs if a command or function is attempted requiring Conveyer synchronization ON.	Turn Conveyer synchronization ON	Error reset.	Alarm	Alarm
2672	Shift failure	Usage of MAPPING function is wrong.	MAPPING function is re-executed while MAPPING execution.	Modify program to rectify error.	Error reset.	Alarm	Alarm
2673	Shift failure	Usage of ALIGNMENT function is wrong.	ALIGNMENT function is re-executed while ALIGNMENT execution.	Modify program to rectify error.	Error reset.	Alarm	Alarm
2674	Shift failure	Sensors don't turn on.(ALIGMNENT)	There was no input of alignment sensors while ALIGNMENT searching.	Confirm that the work passes on the alignmnet sensors. Adjust sensor sensitivity. Confirm connection from sensors.	Error reset.	Alarm	Alarm
2675	Shift failure	Bending shift volume is bigger than the error limit.	For glass handling, bending shift is calculated too big.	Modify bending table to correct value.	Error reset.	Error	Error
2676	Shift failure	No support function for SJ type manipulator.	This error occurs if no support function for SJ is executed.	No support function is not used.	No reset operations neccesary.	Alarm	Alarm
2677	Spot weld failure	Major Welder error(Fault).	Error occurs when the welder board generate the error(Fault).	Remove the cause of the error.	Error reset.	Alarm	Alarm
2678	Spot weld failure	Welding command is not execute.	Error occurs when the welder board abort welding command sequence.	Remove the cause of weld error.	Error reset.	Alarm	Alarm
2679	Shift failure	Torsion shift volume is bigger than the error limit.	For glass handling, torsion shift is calculated too big.	Modify twist table to correct value.	Error reset.	Error	Error
2680	Operational failure	The position of X1 exceeded the amount of the compulsion return.	The position of X1 of the robot exceeds the amount of the compulsion return.	Please correct the position of X1 by use of Adjust Position key.	Error reset.	Alarm	Alarm
2681	Operational failure	The position of X1 exceeded the record position tolerable quantity.	The value of X1 in the set step exceeds the record position tolerable quantity.	Please set X1 below the record position tolerable quantity.	Error reset.	Alarm	Alarm
2682	Shift failure	Sensors don't turn on.(MAPPING)	There was no input of alignment sensors while MAPPING.	Confirm connection from sensors.	Error reset.	Alarm	Alarm
2683	Shift failure	Glass Handling : The SJ type manipulator's 1st and 2nd arms are unbalanced.	For glass handling, the J1 angle of the earth does not equal to the J2 angle of the earth.	1) On [Constant Setting]-[Machine Parameters]-[Encoder Correct], the J1 angle of the earth equals to the J2 angle of the earth. 2) After the memory format of the controller, this error occurs. The encoder correct is exactly executed.	Error reset.	Error	Error
2684	Shift failure	Glass Handling : Dynamic twisted correction value	For glass handling, dynamic twisted correction value exceeded error inspection level.	Please take a second look accelerating twisted revision parameter.	Error reset.	Alarm	Error

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		over.(Accelerating revision)					
2685	Shift failure	Glass Handling : Dynamic twisted correction value over.(Teach point revision)	For glass handling, dynamic twisted correction value exceeded error inspection level.	Please take a second look teach point twisted revision parameter.	Error reset.	Alarm	Error
2686	Shift failure	Glass Handling : Dynamic twisted correction value over.(Position)	For glass handling, dynamic twisted correction value exceeded error inspection level.	Please take a second look position twisted revision parameter.	Error reset.	Alarm	Error
2687	Spot weld failure	Major Welder error.	Error occurs when the welder board generate the weld error.	Remove the cause of weld error.	Error reset.	Alarm	Alarm
2688	Spot weld failure	Welding command is not execute.	Error occurs when the welder board abort welding command sequence.	Remove the cause of weld error.	Error reset.	Alarm	Alarm
2698	Operational failure	Data level too low for Auto tool load center setting.	In the automatic tool center of gravity set function, it is not possible to calculate by the gathered current value.	(1)Teach points that enough unbalanced torque is exerted on J3,J5 and J6 axis. (2)Make the wrist posture vary greatly between step 1 and step 2 positions.	No reset operations neccesary.	Alarm	Alarm
2699	Operational failure	The measurement result of the automatic setting of tool moment of inertia is abnormal.	This failure occurs when gathered speed or current data are abnormal.	(1)Please correct the teaching so that move range is wide as much as possible. (2)Please correct the teaching so that the move axis is not influenced by gravity.	No reset operations neccesary.	Alarm	Alarm
2701	Spot weld failure	Servo gun pressure is not achieved.	Error occurs when the set gun pressure is not achieved within the time period set in [Constant][General characteristic of Servo Gun].	Error occurs when the set gun pressure is not achieved within the time period set in [Constant][General characteristic of Servo Gun].	This error is released if restart playback.	Alarm	Alarm
2702	Spot weld failure	Servo gun pressure sensor output is 0.	When spot welding is executed, servo gun pressure sensor output is equal to zero.	Please replace the servo gun with the pressure sensor.	Error reset.	Alarm	Alarm
2703	Spot weld failure	GUN SEARCH not complete.	Error occurs when a GUN search function is abnormally interrupted by a Spot welding function. Or, the order of executing the tip consumption detection is wrong.	Please modify the execution timing of the tip consumption detection.	Error reset.	Alarm	Alarm
2710	Spot weld failure	WI signal does not become off.	Error occurs when a WI signal, from the last weld sequence, remains on more than 5s after a GUN or WELD signal is output by the controller.	Check the welder is operating normally.	This error is released if restart playback.	Alarm	Alarm
2757	Spot weld failure	Weld control is not supported by MEDLAN command.	Error occurs when the weld control software is too old.	Install the latest software version.	Error reset.	Alarm	Alarm
2763	Spot weld failure	Different spot welding gun mounted.	Error occurs when a gun different from the gun specified in a Spot welding function is detected.	Correct the program, otherwise attach the correct gun before using Spot welding function.	Error reset.	Alarm	Alarm
2781	Spot weld failure	Servo Gun Move-tip consumption exceeded maximum limit.	Servo Gun Move-tip consumption exceeded the maximum limit.	Replace the worn Move-tip and detect tip consumption again.	Error reset.	Alarm	Alarm
2782	Spot weld failure	Servo Gun Settle-tip consumption exceeded maximum limit.	Servo Gun Settle-tip consumption exceeded the maximum limit.	Replace the worn Settle-tip and detect tip consumption again.	Error reset.	Alarm	Alarm
2783	Spot weld failure	The difference of tip consumption is too large. The synchronous welding was not executed.	When the synchronous welding was executed, the difference of tip consumption of master gun and slave gun exceeded the alarm detection level.	Please execute synchronous welding again after exchanging the tip, and detecting the tip consumption.	Error reset.	Alarm	Alarm
2784	Spot weld failure	The synchronous welding cannot be executed.	(1)Specified cancer is not connected. (2)The same welder is specified. (3)Specified gun is not in the unit. (4) Guns with different installation has been selected. (5)The servo gun exists together to the air gun. (6)MEDbus welding I/F is specified in SYNCSPOT(FN303). (7)MEDbus welding I/F is not specified in SYNCSPOTIWB(FN316).	Please reconsider gun/welder number.	Error reset.	Alarm	Alarm
2785	Spot weld failure	Welding point is far from a recorded point.	This error occurs when the welding point is far from a recorded point.	Please check not to collide from other equipment. Please check settings as below, servo gun contact detect, tool constant parameters, servo gun tip consumption, servo gun bend characters.	Error reset.	Alarm	Alarm
2786	Spot weld failure	It was going to start while waiting for WI of manual or external welding.	It will generate, if it starts while waiting for WI of manual or external welding.	Please start after releasing WI.	Error reset.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
2800	Operational failure	Mechanism is not mounted.	Error occurs when a mount mechanism function is attempted without a mechanism being attached. Or, the sub-mechanism input signal line has been disconnected.	Attach a mechanism before using a mount mechanism function.	Error reset.	Alarm	Alarm
2801	Operational failure	Sub-mechanism cannot be selected.	Because two or more submechanism input signal has been turned on, the connected mechanism cannot be selected.	Please input the submechanism input signal correctly, and using a mount mechanism function.	Error reset.	Alarm	Alarm
2802	Operational failure	Mechanism number is wrong.	The mechanism number that was not able to change the mechanism or was being registered with the Connection simultaneously mech. table by the slave was selected. .	Please set the mechanism number correctly.	Error reset.	Alarm	Alarm
2803	Operational failure	Different mechanism mounted.	Error occurs when a mechanism different from the mechanism specified in a step is detected.	Please correct the program.	Error reset.	Alarm	Alarm
2804	Operational failure	Conflict of mechanism change.	Error occurs when the change function was executed for the mechanism using other units.	Please correct the program.	Error reset.	Alarm	Alarm
2805	Operational failure	Mechanism number is wrong.	The mechanism number which was not able to change the mechanism was selected.	Please set the mechanism number correctly.	Error reset.	Alarm	Alarm
2806	Operational failure	The state of the master mechanism and the slave mechanism is the disagreements.	The connection of the mechanism registered in "Connection simultaneously mech. table" of the mechanism change is a disagreement.	Please connect the mechanism again after separating the mechanism once.	Error reset.	Alarm	Alarm
2823	Sealing failure	The temperature of the material exceeded the upper bound.	The temperature of the seal material exceeded the set upper bound value.	Please check the temperature adjuster.	Error reset.	Alarm	Alarm
2824	Sealing failure	The temperature of the material exceeded the lower bound.	The temperature of the seal material exceeded the set lower bound value.	Please check the temperature adjuster.	Error reset.	Alarm	Alarm
2825	Sealing failure	Flow ready fault.	Error occurs when the set pressure is not achieved within the time period set in constant.	Please check whether the specified pressure is appropriate.	Error reset.	Alarm	Alarm
2826	Sealing failure	The material is lack.	The seal material in the pump does not suffice for the specified amount.	Please modify the timing of reload.	Error reset.	Alarm	Alarm
2827	Sealing failure	The sealing incomplete.	The robot stopped while flowing or the pump position reached flow limit.	Please cancel the cause of stopping or modify the timing to flow after the reload operation is done.	Error reset.	Alarm	Alarm
2828	Sealing failure	The sealing operation cannnot be executed.	Other sealing operation is executing.	Please modify the timing of operation.	Error reset.	Alarm	Alarm
2829	Sealing failure	The reload operation is incomplete.	Because Motor's on is turn off while reloading, reload operation is not able to be completed.	Please modify the timing of operation.	Error reset.	Alarm	Alarm
2830	Sealing failure	Dispense incomplete.	Reached flow limit.	Please modify the timing to flow after the reload operation is done.	Error reset.	Alarm	Alarm
2831	Sealing failure	The analog input board is a uninstallation.	It is setting which uses the thermo sensor and the pressure sensor though the analog input board is not installed.	Please modify setting whether to install the analog input board.	Error reset.	Alarm	Alarm
2832	Sealing failure	The dispense function can not be carried out.	Specified gun is not defined in the unit.	Please modify program.	Error reset.	Alarm	Alarm
2850	Operational failure	The command which is not permitted was executed in the controller with the force/Torque sensor.	In a controller with the force/torque sensor, the commands (SPDDOWNA etc.) which use the analog input's of those other than a force/torque sensor cannot be used.	Please correct not to use the analog input use function of a force/torque sensor and others with the same controller.	No reset operations neccesary.	Alarm	Alarm
2851	Operational failure	The force/torque sensor function can not be carried out.	Force/torque sensor function is disabled.	Please modify parameter.	Error reset.	Alarm	Alarm
2852	FLEXhand failure	Clamp position limit over.	It detects when clamping motion quantity exceeds 'Clamp position limit' setting.	(1)Confirm a place of the work piece. (2)Confirm the recorded position of the clamping start step.	Error reset.	Alarm	Alarm
2853	FLEXhand failure	The air assist mechanism is abnormal.	It detects when the air assist mechanism is located on the clamping end during the clamp function is executed.	(1)Confirm whether FLEXhand grips the work correctly.(2)Confirm whether FLEXhand is dropping the work.	Error reset.	Alarm	Alarm
2854	FLEXhand failure	FLEXhand clamping motion time over.	It detects when clamping motion time exceeds the setting 'Wait time for clamp action'.	(1)Confirm FLEXhand clamps the work piece well. if it doesn't, correct its position or recorded step position. (2)Correct setting 'Clamping pressure' higher.	Error reset.	Alarm	Alarm
2855	FLEXhand failure	Air assist	It detects when input signal from the air	Confirm whether the air assist mechanism works	Error reset.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		mechanism does not work.	assist mechanism is not change even if its activation signal is output.	correctly. (2)Confirm whether the signal from the air assist mechanism is input correctly.			
2856	FLEXhand failure	Clamp function usage is wrong.	It detests when FN362 clamp function is executed again while FLEXhand is clamping.	Confirm and correct the program.	Error reset.	Alarm	Alarm
2857	FLEXhand failure	Unclamp function usage is wrong.	It detests when FN363 unclamp function is executed while FLEXhand is not clamping.	Confirm and correct the program.	Error reset.	Alarm	Alarm
2858	FLEXhand failure	Unclamp direction is not correct.	It detests when FLEXhand tries to move to clamping direction when unclamp function is executed.	(1)Confirm setting of 'Opened finger position'. (2)If the parameter is 0, the setting 'Standard unclamp distance' in service menu is used. Confirm the setting.	Error reset.	Alarm	Alarm
2859	Operational failure	A fetched signal status has changed.	I-signal status fetched by 'FN528 FETCH' function must not change before a function referring the I-signal is executed.	(1)Control the I-signal status so as not to change until a function referring the signal is executed. (2)Modify 'FN528 FETCH' recorded step.	This failure is released if restart playback.	Error	Error
2861	Shift failure	The designated palletize No. is not registered.	The palletize pattern of designated number is not defined.	(1)Please designated a defined palletize number. (2)Please define palletize pattern of the designated number.	After removal of failure, please carry out "failure-reset".	Alarm	Alarm
2862	Shift failure	The designated palletize number has never been executed yet.	Palletize status is registered in palletize register when executing it once, and maintained until resetting it. This operation cannot be done to palletize number unregistered in the palletize register.	(1)Please designated an executed palletize number. (2)Please execute palletize of the designated number even once before doing this operation.	After removal of failure, please carry out "failure-reset".	Alarm	Alarm
2863	Shift failure	Designate a palletize number under execution.	This operation is possible only the palletize number under execution.	(1)Please designated a palletize number under execution. (2)Please execute palletize of the designated number before doing this operation.	After removal of failure, please carry out "failure-reset".	Alarm	Alarm
2864	Shift failure	This function is not supported to the unit without manipulator.	This error occurs if this function is executed in the unit without manipulator.	Do not use this function in the unit without manipulator.	No reset operations neccesary.	Alarm	Alarm
2908	Spot weld failure	The specified welder is not effective.	The specified welder is not effectively set by the spot welding constant.	Modify the welder number.	Error reset.	Alarm	Alarm
2923	Spot weld failure	Spot welding gun is not mechanically connected	It was judged that spot welding gun was not mechanically connected because the connection signal was not input.	Connect gun mechanically. When gun is connected, check the disconnection of the signal line.	Error reset.	Alarm	Alarm
2937	Operational failure	Speed type endless cannot be executed.	Error occurs when speed type endless was not able to be executed.	Please set the mechanism number again.	The error is not released until measures are executed.	Alarm	Alarm
2938	Operational failure	The change in an endless control cannot be executed.	Because the endless control method is not set to "Change", the specified mechanism cannot be executed.	1. Please confirm the endless control method. 2. Please confirm the mechanism number.	Error reset	Alarm	Alarm
2939	Operational failure	The function can not be used in velocity control.	The function was attempted that is not allowable while change type endless axis is controlled by velocity control.	Please execute the function after change control type of change type endless axis to position control.	Error reset	Alarm	Alarm
2945	Operational failure	Signals of multi input are not designated.	Error occurs when a multi input function was attempted playback with no condition number.	Create the multi input conditions, or replace the function to normal input.	Error reset.	Inform ation	Inform ation
2946	Shift failure	User coordinate number is not selected.	It is necessary to select user coordinate number before shift function at user coordinate.	Execute [FN113 Change coordinate for shift] before shift functions.	No reset operations neccesary.	Alarm	Alarm
2961	FieldBus failure	Setted area of common memory is overlapped.	Area of common memory setted by AX is already used by other node.	After change setting into correct one, perform re-initialization of field bus.	No reset operations neccesary.	Alarm	Alarm
2971	Operational failure	Stationary tool is not selected.	Failure occurs when Stationary tool is not selected although step is Stationary tool interpolation.	Please select stationary tool using FN67.	No reset operations neccesary.	Alarm	Alarm
2973	Control failure	Playback unavailable because Deadman SW is not released position.	Error occurs when you input playback command while you were gripping the Deadman SW.	Please input playback command after Deadman SW is released position.	After removal of failure, please carry out "failure-reset".	Alarm	Alarm
2974	Operational failure	Pause or External pause signal being given.	Error occurs when a Start command is given while the pause signal is being held or External pause signal is being given.	Release Pause or External pause signal(if External pause signal cable is cut the external pause signal is considered as being given.	Error reset.	Alarm	Alarm
2999	Operational failure	Duplicate output signal attribute.	FN35 was going to carried out or set on output signal which assigned attribute already.	Please clear attribute assignment in order not to attribute is duplicate.	Error reset.	Alarm	Alarm
3010	Control failure	Far distance between a current position and a position at putting servo-power off.	Since stopping during high-speed playback and so on, robot couldn't normally stop on the trajectry. Since the distance is over the limit for error detection value, robot can't recovery.	If a limit for error detection is too small, change the value in constant setting. Position Recovery is invalidated setting both recovery limit values to zero.	Robot can restart from there without reset operation.	Inform ation	Inform ation
3018	Spot weld failure	Weld tip may be	This warning occurs when the Weld	Check the Gun tip and reset the counter.	No reset operations	Inform	Inform

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		worn.	counter exceeds the limit value.		neccesary.	ation	ation
3021	Control failure	Too far distance between a current position and a position at putting servo-power off.	Since stopping during high-speed playback and so on, robot couldn't normally stop on the trajectry. Since the distance is over the limit for error detection value, robot can't recovery.	If a limit for error detection is too small, change the value in constant setting.	Error reset. Robot can't playback, untill step is set.	Alarm	Alarm
3022	Operational failure	Take care of not recovering position at the next servo on.	Since the position for recovery couldn't recorded, never recover the position at the next servo on without related to distance. This might be occured at servo off during recovery position.	There is no way.	No reset operations neccesary.	Inform ation	Inform ation
3037	Spot weld failure	The external operation of servo gun is not permitted while running program.	The external operation of servo gun was executed while running program.	Please execute of external operation while program is stopping or servo gun is separating.	No reset operations neccesary.	Inform ation	Inform ation
3057	Spot weld failure	Cannot startup while read/write text executing.	When the startup is input during the processing execution by text read/write screen, this error is output.	Please input the startup instruction after text read/write operation ends.	No reset operations neccesary.	Inform ation	Inform ation
3077	CPU board failure	CPU fan warning	Error occurs when rpm of the fan on the CPU board decreases.	(1)Check the fans are operating, or clean up the fans.(2)Replace the CPU fan.(3)Replace the CPU bord.	Error reset.	Inform ation	Inform ation
3079	CPU board failure	CPU bord temperature warning.	Error occurs when detecting the temperature alarm on the CPU board.	(1)Check the fans are operating, or clean up the fans.(2)Replace the CPU fan.(3)Replace the CPU bord.	Error reset.	Inform ation	Inform ation
3081	Operational failure	Auto backup can't connect to FTP server for auto backup.	It was not a connection to the FTP server that was backing up of an automatic backup ahead. Or, neither an initial folder nor the folder of this name existed on the home directory of the FTP server.	Please confirm host name, user ID, password, and initial folder of ftp client.	No reset operations neccesary.	Inform ation	Inform ation
3082	Operational failure	Abnormality occurred while backing up automatically.	The thing backed up automatically cannot be done. The storage medium is not prepared, and read-only and memory capacity shortage, etc. are thought.	Please confirm the state of the storage medium.	No reset operations neccesary.	Inform ation	Inform ation
3083	Operational failure	The memory medium is read-only.	When it is going to copy a file to a write-protected memory cards etc., this error sets.	Please prepare the memory medium to which writing is made and perform a copy from the beginning once again.	It will be canceled if some keys are pushed.	Inform ation	Inform ation
3084	Operational failure	Media device is full.	Failure occurs if there is no memory space left when attempting to copy to external device or internal memory.",	Create space in current media device or use another.	No reset operations neccesary.	Inform ation	Inform ation
3085	Operational failure	The memory media is not prepared.	The detection reason is that the specified device was not detected when the file operation is done.	Whether the device such as memory cards specified by the file operation menu is correctly installed is confirmed.	It will be canceled if some keys are pushed.	Inform ation	Inform ation
3089	Operational failure	It cannot process in the same device.	It was going to copy to the same device by the same file name.	Please change a file name or a device and redo copy operation again.	It will be canceled if some keys are pushed.	Inform ation	Inform ation
3097	Spot weld failure	Cannot startup while read/write text executing.	When the startup is input during the processing execution by text read/write screen, this error is output.	Please input the startup instruction after text read/write operation ends.	No reset operations neccesary.	Inform ation	Inform ation
3110	Operational failure	Number of axes miss-matched.	Failure occurs when the number of axes used in a program is not compatible with the unit constant files.	Check the program file type is comptible with the constants currently in use.	No reset operations neccesary.	Inform ation	Alarm
3111	PLC failure	The alarm was generated by Toyopuc I/F.	Toyopuc I/F detected the alarm.	Please refer to the manual of Toyopuc I/F.	Automatically restores, when the problem is solved.	Alarm	Alarm
3112	PLC failure	SHARP I/F: Battery error occurred.	Warning occurs when the battery for the memory backup is nothing or discharged.	Replace the battery for the memory backup.	No reset operations.	Inform ation	Inform ation
3113	PLC failure	SHARP I/F: It exists together to fieldbus functions.	It exists together to fieldbus functions.	Disable fieldbus functions, and reenter the power supply.	Error reset.	Inform ation	Inform ation
3134	Operational failure	Data given is incorrect.	Data keyed-in is out of range or not defined.	Input suitable data.	No reset operations neccesary.	Inform ation	Inform ation
3137	Spot weld failure	Servo Gun Dramatic tip consumption change detected.	Warning is given when the set warning limit for gun tip consumption is exceeded. Tip consumption warning signal is outputted.	Check the lack of gun tip.	No reset operations neccesary.	Inform ation	Inform ation
3138	Spot weld failure	Welder version is unmatched.	Welder version is unmatched.	Initialize welder data.	No reset operations neccesary.	Inform ation	Inform ation
3141	Spot weld failure	Welder backup file is not found.	Welder backup file is not found.	Initialize welder data.	No reset operations neccesary.	Inform ation	Inform ation
3142	Spot weld failure	Welder error occurred.	Welder detects ALERT or FAULT.	Refer to the Welder Manual.	Error reset.	Inform ation	Inform ation
3146	Preventive maintenance message	It seems to reach at the grease exchange time.	The decelerator of the displayed axis reached at the grease exchange time.	(1)Please execute the grease exchange. (2)Please refer to the robot maintenance manual for the exchange method and the exchange part.	After exchanging grease, Please reset at the [Service][Robot	Inform ation	Inform ation

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
					Diagnosis][Grease Exchange Cycle] menu.		
3147	Preventive maintenance message	It seems to reach at the grease replenishment time.	The decelerator, the bearing or balancer of the displayed axis reached at the grease replenishment time.	(1)Please execute the grease replenishment. (2)Please refer to the robot maintenance manual for the replenishment method and the replenishment part.	After replenishing grease, Please reset at the [Service][Robot Diagnosis][Grease Exchange Cycle] menu.	Inform ation	Inform ation
3148	Preventive maintenance message	There is an axis which exceeds the allowance and maximum torque.	The presumption generation torque exceeded a permissible value by displayed program step and axis.	(1)Change to ratings or less when the robot load condition is investigated, and weight and the wrist torque exceed it to ratings.(Gravity setting is used) (2)There is a possibility to exceed the acceleration which can be used. (Check the step before and after) (3)There is a possibility with a large interference torque, too. (Drop the acceleration of the displayed step.)	Error reset.	Inform ation	Inform ation
3149	Preventive maintenance message	It is a program which remarkably shortens longevity.	In the displayed program, longevity is within at 5000 hours.There is a possibility which is the program of call/jump origin when the call/jump are used.	(1)Change to ratings or less when the robot load condition is investigated, and weight and the wrist torque exceed it to ratings. (Gravity setting is used) (2)The amount of operation is, and the average speed and the average torque greatly exceed ratings because of largeness or high speed, and there is a possibility that longevity has shortened. Reduce the amount of operation of the object axis or slow down the speed if there is no obstacle in work. (program diagnosis) (3)There is a possibility to be generated because the cycle time is remarkably short. Slow down the speed overall.	Error reset.	Inform ation	Inform ation
3150	Preventive maintenance message	There is a possibility that the setting of the load weight and center of gravity is inapposite.	IIt is detected when there is a big difference between the longevities calculated from longevity and the motor speed calculated from the current.	(1)Please confirm whether the setting of the load weight and center of gravity is correct. (2)Please change to ratings or less when the robot load condition is investigated, and weight and the wrist torque exceed it to ratings. (3)There is a possibility that the trouble occurs in the robot when not corresponding to the above-mentioned.	Error reset.	Inform ation	Inform ation
3151	Operational failure	The program or the file does not exist.	This error occurs when the program number is specified which does not exist in the program jump call instruction.	Please correct the program number to a correct value the jump call ahead.	This failure is released if a correct program is setted and restart playback.	Inform ation	Inform ation
3156	Spot weld failure	Servo Gun Move-tip consumption approaching limit.	Warning is given when the set warning for Move-tip consumption limit is exceeded. Tip consumption warning signal is outputted.	Check the Gun tip. If tips are good check the setting otherwise change the tip to the new one, and detect tip consumption again.	Error reset.	Inform ation	Inform ation
3157	Spot weld failure	Servo Gun Settle-tip consumption approaching limit.	Warning is given when the set warning for Settle-tip consumption limit is exceeded. Tip consumption warning signal is outputted.	Check the Gun tip. If tips are good check the setting otherwise change the tip to the new one, and detect tip consumption again.	Error reset.	Inform ation	Inform ation
3158	Spot weld failure	Servo Gun Move-tip consumption exceeded maximum limit.	Servo Gun Move-tip consumption exceeded the maximum limit.	Replace the worn Move-tip and detect tip consumption again.	Error reset.	Inform ation	Inform ation
3159	Spot weld failure	Servo Gun Settle-tip consumption exceeded maximum limit.	Servo Gun Settle-tip consumption exceeded the maximum limit.	Replace the worn Settle-tip and detect tip consumption again.	Error reset.	Inform ation	Inform ation
3160	Spot weld failure	The change in the tip consumption detected by search 3 is abnormal.	The difference between the consumption detected by search 3 and the consumption detected by search 1 exceeded the search 3 abnormal tip change.	Check the lack of gun tip. If it is no trouble, execute gun search 1.	Error reset.	Inform ation	Inform ation
3161	Spot weld failure	Servo gun pressure is not achieved.	Error occurs when the set gun pressure is not achieved.	Check the external pressure value.	Error reset.	Inform ation	Inform ation
3162	Spot weld failure	GUN SEARCH not complete.	The order of executing the tip consumption detection is wrong.	Please modify the execution timing of the tip consumption detection.	Error reset.	Inform ation	Inform ation
3165	Operational failure	The file is protected.	All protected files or files partially protected (program or constant) tried to be corrected and deleted.	Because the specified file (program or constant) contains important data, protecting is put so that the content is not carelessly changed.	Please release protecting the file (program or constant).	Inform ation	Inform ation
3168	Preventive maintenance message	There is the axis in 1000 hours for overhaul.	The life time of the axis displayed with present operated (time to reaching to longevity) became 1,000 hours or less.	Exchange the axis early. After that 0 clearing of "Consumption time until present".	Error reset.	Inform ation	Inform ation
3169	Preventive maintenance message	There is the axis in 0 hours for overhaul.	The life time of the axis displayed with present operated (time to reaching to longevity) became 0 hour or less.	Exchange the axis. After that 0 clearing of "Consumption time until present".	Error reset.	Inform ation	Inform ation

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
3170	Operational failure	It was going to start, when unit was not ready.	This error occurs if it starts when unit is not ready.	Please check unit ready signal output conditions, and start after making it the unit ready.	This error is released if it starts again after making it the unit ready.	Inform ation	Inform ation
3175	Spot weld failure	Abnormal panel thickness detected.	Dramatic difference of panel thickness exists between recorded value in weld condition and detected value.	Check the weld condition data and real work piece thickness.	No reset operations neccesary.	Inform ation	Inform ation
3177	CPU board failure	Controller temperature fault.	Information occurs when the temperature of the core of the controller exceeds 60℃. If this state lasts 10 min, motor power will be automatically shutdown and E0063 displayed.,	Check the fans are operating, or clean up the heat exchanger.	No reset operations neccesary.	Inform ation	Inform ation
3178	Spot weld failure	Re-weld is not allowed.	You did re-weld except for the time of abnormal welding.	Please restart after set a step in auto mode, or do manual weld.	No reset operations neccesary.	Inform ation	Inform ation
3181	Control failure	Conveyer running signal was not received.	Conveyer running signal was not received in conveyer normal mode.	In conveyer normal mode, turn on conveyer running signal.	No reset operations neccesary.	Inform ation	Inform ation
3194	Operational failure	The program is not recorded nor selected.	This error occurs when the program which is not recorded is selcited and reserve playback.	Please reserve after recording the program or selecting other programs.	This error is released if it sets a correct program and reserve playback.	Inform ation	Inform ation
3218	Operational failure	Command not possible while running program.	This command is not able to be used during the execution of a program.	Stop the program and retry the command.	No reset operations neccesary.	Inform ation	Inform ation
3353	Operational failure	It is protected with the record-disable-switc h or the password.	It detects, when it is going to correct or delete the file (a program, constant) protected with the password.	Since the specified file (program or constant) contains important data, protection is applied	Set the record-disable-switc h to OFF or release password protecting.	Inform ation	Inform ation
3354	Servo failure	Rising of motor torque is observed.	The motor torque in a cycle went up as compared with the average value the 10 cycles past.	Check whether there is any cause of raising motor torque, about motors, reduction gears or cables etc.	No reset operations neccesary.	Inform ation	Inform ation
3355	Spot weld failure	Current feedback of servo gun is abnormal.	In the servo gun with pressure sensor, the axis current to pressurizing power is abnormal.	Please check the pressure sensor, the axis motor of servo gun, or those cables connected.	No reset operations neccesary.	Inform ation	Inform ation
3528	Operational failure	The memory medium is not discriminable.	When memory media, such as a FIROPPI disk and an memory card, are not initialized, this error occurs.	By Service / File Manager / Format memory card/Floppy disk, please use it after initializing a memory medium.	It will be canceled if some keys are pushed.	Inform ation	Inform ation
3536	Spot weld failure	Welder fault.	Error occurs when a Welder fault input signal is received by the controller after the completion of a welding sequence.	Check the welder unit.	No reset operations neccesary.	Inform ation	Inform ation
3537	Spot weld failure	Welding time exceeded limit.	Error occurs if a Weld competed signal is not input before the designated time period.	Check the welder is operating normally.	No reset operations neccesary.	Inform ation	Inform ation
3538	Spot weld failure	The gun not open.	Error occurs if the Gun closed signal is received after the welding sequence ends.	Check the GUN or welding unit.	No reset operations neccesary.	Inform ation	Inform ation
3539	Spot weld failure	The gun is not half open.	Error occurs if the Gun half-open signal is not received after Open gun half signal is output by the controller.	Check the GUN or welding unit.	No reset operations neccesary.	Inform ation	Inform ation
3540	Spot weld failure	The gun is not fully open.	Error occurs if the Gun full-open signal is not received after Open gun fully signal is output by the controller.	Check the GUN or welding unit.	No reset operations neccesary.	Inform ation	Inform ation
3541	Spot weld failure	Stuck Weld GUN detected.	Error occurs if the System fault signal is detected after completion of a welding sequence.	Error occurs if the Weld stuck signal is received when the welding sequence ends.	No reset operations neccesary.	Inform ation	Inform ation
3542	Spot weld failure	Coolant fault #1.	Error occurs if the Water flow switch #1 signal is detected after completion of a welding sequence.	Check the GUN or welding unit.	No reset operations neccesary.	Inform ation	Inform ation
3543	Spot weld failure	Coolant fault #2.	Error occurs if the Water flow switch #2 signal is detected after completion of a welding sequence.	Check the GUN or welding unit.	No reset operations neccesary.	Inform ation	Inform ation
3544	Spot weld failure	Air pressure fault.	Error occurs if the Air pressure switch signal is detected after completion of a welding sequence.	Check the GUN or welding unit.	No reset operations neccesary.	Inform ation	Inform ation
3545	Spot weld failure	Transformer temperature fault.	Error occurs if the Thermo. temp. fault signal is detected after completion of a welding sequence.	Check the GUN or welding unit.	No reset operations neccesary.	Inform ation	Inform ation
3546	Spot weld failure	Peripheral system fault.	Error occurs if the System fault signal is detected after completion of a welding sequence.	Check the GUN or welding unit.	No reset operations neccesary.	Inform ation	Inform ation
3552	Spot weld failure	Both of half-open and full-open signals are given.	Error occurs if both the Gun half-open signal and Gun full-open signal are received simultaneously after Open gun half signal is output by the controller.	Check the GUN or welding unit to determine the cause of the two simultaneous signals.	No reset operations neccesary.	Inform ation	Inform ation
3553	Spot weld failure	Manual axis moving	Error occurs if manual axis moving during	Please releasing WI.	Please release the	Inform	Inform

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		cannot be operated during waiting for WI.	waiting for WI.		WI.	ation	ation
3555	Spot weld failure	Servo-gun is not executed to obey the welder sequence.	Error occurs when the servo-gun is not achieved to command pressure.	Please confirm to the sequence of weld-timer.	No reset operations neccesary.	Inform ation	Inform ation
3656	Spot weld failure	Current of tip dresser abnormaled.	This error occurs when the servo dresser is exceeded beyond current range.	(1)Please confirm the tip dress condition.(2)Please confirm the cable between the controller and the servo tip dresser.(3)Please replace the motor.(4)Please replace the drive unit.	Error reset.	Inform ation	Inform ation
3660	Spot weld failure	Current of tip dresser abnormaled.	This error occurs when the dress length of tip is exceeded beyond dress length range.	(1)Please confirm the tip dress condition.(2)Please confirm the tip consumption.	Error reset.	Inform ation	Inform ation
3666		Cooler fans stopped.	Error occurs when cooler fans stopped.	Please exchange cooler fans.	Please exchange cooler fans.	Inform ation	Inform ation
3677	Spot weld failure	Minor Welder warning(Alarm).	Error occurs when the welder board generate the warning(Alarm).	Remove the cause of the warning.	Error reset.	Inform ation	Inform ation
3678	Spot weld failure	Weld error reset is not execute.	Error occurs when welder command execute without reset the error.	Error reset.	Error reset.	Inform ation	Inform ation
3687	Spot weld failure	Minor Welder error.	Error occurs when the welder board generate the weld error.	Remove the cause of weld error.	Error reset.	Inform ation	Inform ation
3688	Spot weld failure	Weld error reset is not execute.	Error occurs when welder command execute without reset the error.	Error reset.	Error reset.	Inform ation	Inform ation
3689	Spot weld failure	RE-01 battery error	Lithem battery cannot be used if it does.	Please exchange the lithem batteries referring to the "RE-01 maintenance manual".	After removal of failure, please turn on power supply of the controller again.	Alarm	Alarm
3690	Spot weld failure	RE-01 battery charge low	Error occurs when the voltage of lithium battery on RE-01 bord has decreased.	Please exchange the lithem batteries referring to the "RE-01 maintenance manual".	After removal of failure, please turn on power supply of the controller again.	Alarm	Alarm
3700	Operational failure	It stopped in the home stop position.	It will generate, if it comes to the position registered by setup of a home stop position function.	Please carry out manual operation again.	No reset operations neccesary.	Inform ation	Inform ation
3701	Operational failure	Option un-setting up.	It generates, when it is going to use the option function which is not set up.	Please set up an option.	No reset operations neccesary.	Inform ation	Inform ation
3702	Vision sensor failure	Illigal request of conveyor sync.	Conveyor sync. request method is different from vision sensor constant setting. Or, it was requested when edit mode of vision sensor.	Please modify constant setting. Or, cancel edit mode.	No reset operations neccesary.	Inform ation	Inform ation
3703	Vision sensor failure	The measurement number is a unsetting.	When conveyor sync. is requested, the measurement number is a unsetting.	Please modify parameters. Or, check input signals.	No reset operations neccesary.	Inform ation	Inform ation
3704	Vision sensor failure	The buffer is full. The measurement result was not able to be stored.	The conveyer speed is too fast.	Please slow down the conveyer speed.	No reset operations neccesary.	Inform ation	Inform ation
3782	Vision sensor failure	The pose search shift data cannot be acquired.	The shift data corresponding to the master data number that has been sent from the vision sensor is not registered.	Please check master data for pose search.	No reset operations neccesary.	Inform ation	Inform ation
3790	Encoder failure	The error counter of the encoder exceeded the setting value.	The error counter of the encoder exceeded the setting value.	Please check the encoder.	Error reset.	Inform ation	Inform ation
3800	User failure	Abnormal shift data received.	The received shift data contains the status that notifies abnormality.	Please confirm the state of PC that transmits the shift data.	No reset operations neccesary.	Inform ation	Inform ation
3960	FieldBus failure	A part or all I/O links are stopping.	Since the between title has occurred in the I/O device, a robot cannot be started.	Please check the device which the problem has generated by the field bus monitor.	If a problem is solved, it will restore automatically. (In order to solve a problem, the re-injection of a power supply may be required)	Inform ation	Inform ation
4000	Arc weld failure	Communication timeout occurred between the controller and the welding power supply.	The welding power supply didn't respond.	Check the connection of the welding power supply to the controller.	Turn on the controller and the welding power supply again.	Error	Error
4001	Arc weld failure	Received data failure.	The data which are received from the welding power supply are incorrect.	Check the connection of the welding power supply to the controller.	Turn on the controller and the welding power supply again.	Error	Error
4002	Arc weld failure	Can't communicate	The communication between the	Check the connection of the welding power supply to	Turn on the	Error	Error

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		with the welding power supply.	controller and the welding power supply is shutdown.	UM204(L8800S).	controller and the welding power supply again.		
4003	Arc weld failure	Can't communicate with the welding power supply.	The communication driver detected the failure.	Check the connection of the welding power supply to the controller. And check the connection of UM204(L8800S) board.	Turn on the controller and the welding power supply again.	Error	Error
4004	Arc weld failure	The registration of the welding power supply is incorrect.	The kind of registered WPS and actual WPS are not same, or the Dip switch setting of Robot I/F board inside the welding power supply is wrong.	Register WPS correctly, or set Dip switch of Robot I/F board correctly.	After registeration/setting , turn on the controller and the welding power supply again.	Error	Error
4005	Arc weld failure	The welding power supply of old version is connected.	The controll software of the welding power supply is old.	Please update the welding power supply.	After updating, turn on the controller and the welding power supply again.	Error	Error
4006	Arc weld failure	The welding power supply version is wrong for the servo wire feed control.	The servo of the wire feed control unit does not turn on/off because the software of the welding power supply is old.	Please update the welding power supply.	After updating, turn on the welding power supply again.	Error	Error
4007	Arc weld failure	The control software is abnormal in the welding power supply.	The welding power supply doesn't correspond to the stitch pulse welding function.	The control software of the welding power supply must improve in the version.	The control software of the welding power supply improves in the version, and the power supply in the robot controller and the welding power supply is turned on again.	Error	Error
4008	Arc weld failure	The welding power supply version does not support the Synchro-welding by CAN communication.	The Synchro-welding is not executed because the software of the welding power supply does not support the Synchro-welding by CAN communication.	Please update the welding power supply.	After updating, turn on the welding power supply again.	Error	Error
4009	Arc weld failure	The welding power supply does not support the Synchro-welding by CAN communication.	The Synchro-welding is not executed because the welding power supply does not support the Synchro-welding by CAN communication.	Please setup the Synchro-welding by RS-422 communication.	Error reset.	Error	Error
4010	Arc weld failure	The arc welding cannot be done.	The arc welding power supply doesn't correspond to the welding condition slope function.	The upgrade should do the software of the arc welding power supply.	Error reset.	Error	Error
4011	Arc weld failure	The arc welding cannot be done.	The arc welding power supply doesn't correspond to the welding characteristic data self adjustment function.	The upgrade should do the software of the arc welding power supply.	Error reset.	Error	Error
4012	Arc weld failure	The gas mass flow control function cannot be used.	The arc welding power supply doesn't correspond to the gas mass flow control function.	The upgrade should do the software of the arc welding power supply.	Error reset.	Error	Error
4085	Arc weld failure	Communication timeout occurred inside the welding power supply.	The contollor of the welding power supply didn't respond.	Turn off the power supply in the welding power supply, and contact our service.	Turn the welding power supply on again.	Error	Error
4099	Arc weld failure	It was not possible to communicate with the arc welding power supply.	There is no response from the arc welding power supply.	Check the connection of the welding power supply to UM204.	Turn the welding power supply on again.	Error	Error
4102	Operational failure	It is weaving condition disagreement.	In simultaneous weaing, weaving conditions are not in agreement.	Please make weaving conditions in agreement.	Error reset.	Alarm	Error
4900	Operational failure	Mechanism Error in External axis relative move function (FN407).	The mechanism number specified in the 1st parameter is not belong to current unit.	Specify correct mechanism number which belongs to current unit.	Error reset.	Error	Error
4901	Operational failure	Axis Error in External axis relative move function (FN407:RELMOV)	The axis number specified in the 2nd parameter is not defined in a mechanism of 1st parameter.	Check the axis number of 2nd parameter taught in the function command, and teach again.	Error reset.	Error	Error
4902	Operational failure	Mechanism type error.	The mechanism specified in 1st paramter is neither positioner nor slider.	Select a unit which has positioner or slider, and then specify a positioner or a slider in 1st parameter.	Error reset.	Error	Error
4903	Operational failure	G-STOP input value is not corresponding.	This error is detected when the G-STOP input value in two systems is not corresponding.	Please confirm the G-STOP input value.	After removal of failure, please turn on power supply of	Error	Error

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
					the controller again.		
4905	Operational failure	Playback was started in the state that the basic posture of any axes is not setup.	Since the data when power failure did not be saved correctly, the position data of endless rotation axis has not been resumed to the data before power failure.	Please perform the Encoder Correction (with position record method) to the axis in which abnormalities have generated.	Error reset.	Alarm	Alarm
4906	Operational failure	The position of the endless rotation axis is abnormal.	The basic position of endless rotation axis was not able to be restored correctly by the mechanism change.	Please perform the Encoder reset and Correction (with position record method) to the axis in which abnormalities have generated.	Error reset.	Error	Error
4910	Operational failure	Mechanism* is servo off.	The manual operation, check operation or playback operation has been performed for a mechanism whose servo power has been individually set to OFF.	Check the mechanism whose servo power is OFF, and turn it ON.	Error reset.	Alarm	Error
4911	Operational failure	SPN parameter error.	Mechanisms other than the ones targeted for operation have been specified in the servo ON command (SPN).	Review the mechanisms which have been specified by the servo ON command (SPN).	Error reset.	Alarm	Error
4912	Operational failure	SPF parameter error.	Mechanisms other than the ones targeted for operation have been specified in the servo OFF command (SPF).	Review the mechanisms which have been specified by the servo OFF command (SPF).	Error reset.	Alarm	Error
4914	Servo failure	Mechanism servo OFF cannot be executed.	Because robot doesn't reach the command position, servo OFF cannot be executed.	(1)Please confirm whether the robot manipulator interferes in something.(2)Please confirm that the Pay-load is within the nominal rating.(3)If failure persists, the problem may be a mechanical defect in the manipulator, contact our service department.	After removal of failure, please carry out "failure-reset".	Error	Error
4915	Operational failure	The instruction value of the mechanism to which servo OFF is set has changed.	This error detected when the difference between the instruction position and the current position exceeds a regulated value in the mechanism to which servo OFF is set.	Please confirm followings to the mechansim to which servo off is set. (1)Instruction angle is not changed. (2)Current angle is not changed, by the external force.	After removal of failure, please carry out "failure-reset".	Alarm	Error
4920	Emergency stop failure	Shock sensor detected the collision.	Since the shock sensor detected the collision, the robot was stopped for safety.	Cancel shock sensor by manual operation.	Error reset.	Alarm	Error
4921	Operational failure	Module mechanism interpolation failure.	This failure occurs when a module mechanism cannot reach the position and the posture.	Please change a interporation type to [joint] or make the same the wrist axis angle of a starting point and an ending point.	Error reset.	Alarm	Error
4930	Operational failure	The connection mechanism of the Spray machine does not exist.	This error is detected, when the Spray machine set as the first parameter is not registered or the connection mechanism is not set up.	Please improve registration of the Spray machine, and a setup of a connection mechanism.	Error reset.	Error	Error
4931	Operational failure	The Spray machine does not belong to a current unit.	This error is detected when the mechanism connected to the Spray machine set as the first parameter does not belong to the present unit.	Please record by the Spray machine number belonging to the present unit.	Error reset.	Error	Error
4932	Operational failure	Rotation shaft information is unusual.	By the case of extension synchronization control, the rotation shaft information over the shaft number set as Thermal spraying start conditions is not set up, or this error is detected when the interval of a start position-end position is less than 300mm.	Please reset up correctly the rotation shaft information corresponding to the shaft number set as the Thermal spraying start conditions.	Error reset.	Error	Error
4999	Emergency stop failure	Alarm carried out number-of-times generating of regulation, and was breaking down.	Alarm carried out number-of-times generating of regulation, and was breaking down.	Please fix failure from the cause of alarm.	Error reset.	Error	Error
5005	Arc weld failure	The weaving trajectory exceeded regulation speed.	The speed of weaving trajectory has been exceeded the regulation speed, since the move distance between weaving points is too long, or the frequency (speed) is too high.	Correct the distance between weaving points, frequency, or speed.	After removal of failure, please carry out "failure-reset".	Alarm	Alarm
5006	Arc weld failure	The amount of posture change of taught weaving exceeded the restriction value.	The amount of posture change between weaving points is too large.	Please correct posture change of taught weaving pattern data.	After removal of failure, please carry out "failure-reset".	Alarm	Alarm
5007	Arc weld failure	Pose calculation failed.	Each axis angle can't be calculated. The posture data specified in the weaving condition is incorrect.	Check the posture data in weaving condition.	After removal of failure, please carry out "failure-reset".	Alarm	Alarm
5008	Operational failure	Permission speed over occurred.	The stop time of weaving conditions was too large at maintenance of welding time, or frequency was too high, and permission speed over occurred.	Stop time is made small or frequency is dropped. Or please change into not carrying out welding time maintenance.	Error reset.	Alarm	Alarm
5010	Arc weld failure	The welding current value has exceeded the allowable limit.	The difference between the welding current value measured by the welding power supply and the taught one has exceeded the allowable limit set by the arc constants.	Check the welding conditions(wire extension etc). There is possibility of missmatch the welding characteristic data to your environment if this failure occurs over and over again. In such case, adjust the welding characteristic data by the adjudstment of welding condition function etc.	Error reset.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
5011	Arc weld failure	The welding voltage value has exceeded the allowable limit.	The difference between the welding voltage value measured by the welding power supply and the taught one has exceeded the allowable limit set by the arc constants.	Check the welding conditions(wire extension etc). There is possibility of missmatch the welding characteristic data to your environment if this failure occurs over and over again. In such case, adjust the welding characteristic data by the adjudstment of welding condition function etc.	Error reset.	Alarm	Alarm
5013	Arc weld failure	The welding power supply has been turned off.	The controller couldn't communicate with the welding power supply.	Turn on the welding power supply. In case the welding power supply has been already turned on, check the connection of the welding power supply to the controller.	Error reset.	Alarm	Alarm
5014	Arc weld failure	Arc start failure.	No arc has been generated in spite of retrying the arc start.	Check the workpiece's condition, wire's condition, and connection of the cable.	This failure is released if restart playback.	Alarm	Alarm
5015	Arc weld failure	Arc outage was detected.	Arc outage occurred during welding.	Eliminate all causes of arc outage, for instance by adjusting the wedling conditions, fixing wire feed failure, and so on.	This failure is released if restart playback.	Alarm	Alarm
5016	Arc weld failure	Wire stick has been detected.	Wire has stuck.	Cut stuck wire.	This failure is released if restart playback.	Alarm	Alarm
5017	Arc weld failure	Low gas pressure.	Low gas pressure signal is inputted.	Supply gas.	Error reset.	Alarm	Alarm
5018	Arc weld failure	Lack of wire was detected.	Wire not fed signal is inputted.	Supply wire.	Error reset.	Alarm	Alarm
5020	Arc weld failure	Lack of water was detected.	Cooling water signal is inputted.	Supply water.	Error reset.	Alarm	Alarm
5021	Arc weld failure	Arc welding characteristic data failure.	The registered welding characteristic data isn't for the connected welding power supply.	Register the welding characteristic data for the using one.	Error reset.	Alarm	Alarm
5022	Arc weld failure	Welding voltage adjustment method can't be changed while welding.	Welding voltage adjustment method has been changed from the synergetic control to the individual control, and vise versa while welding.	Modify the task program.	Error reset.	Alarm	Alarm
5023	Arc weld failure	Failure of the welding power supply occurred.	W.P.S failure signal is inputted, or failure of the welding power supply occurs.	Read through the welding power supply instruction manual and eliminate all causes.	Error reset.	Alarm	Alarm
5024	Arc weld failure	Input voltage shortage failure ocurred in the welding power supply.	The primary input voltage of the welding power supply has decreased.	Refer to the instruction manual of the welding power supply(Failure Name: Input voltage shortage) and eliminate all causes.	Error reset.	Alarm	Alarm
5025	Arc weld failure	Output overcurrent occurred in the welding power supply.	The average current used for the inner control of the welding power supply exceeds the limit.	Refer to the instruction manual of the welding power supply (Failure Name: Output overcurrent) and eliminate all causes.	Error reset.	Alarm	Alarm
5026	Arc weld failure	Thermal overload occurred in the welding power supply.	An internal temperature of the welding power supply rises.	Refer to the instruction manual of the welding power supply (Failure Name: Thermal overload) and eliminate all causes.	Error reset.	Alarm	Alarm
5027	Arc weld failure	Input overvoltage occurred in the welding power supply.	The primary input voltage of the welding power supply exceeds the threshold.	Refer to the instruction manual of the welding power supply (Failure Name: Input overvoltage) and eliminate all causes.	Error reset.	Alarm	Alarm
5028	Arc weld failure	Loss of phase occurred in the welding power supply.	Loss of phase in the primary input of the welding power supply.	Refer to the instruction manual of the welding power supply (Failure Name: Loss of phase) and eliminate all causes.	Error reset.	Alarm	Alarm
5029	Arc weld failure	Inverter drive circuit failure occurred in the welding power supply.	The failure occurs around the inverter drive circuit of the welding power supply.	Refer to the instruction manual of the welding power supply (Failure Name: Inverter drive circuit error) and eliminate all causes.	Error reset.	Alarm	Alarm
5030	Arc weld failure	Arc voltage detection failure occurred in the welding power supply.	Arc voltage detection failure or arc voltage detecting line failure occurred.	Refer to the instruction manual of the welding power supply (Failure Name: Arc voltage detecting line error/detection error) and eliminate all causes.	Error reset.	Alarm	Alarm
5031	Arc weld failure	Microcomputer failure occurred in the welding power supply.	The failure occurs in the welding power supply.	Refer to the instruction manual of the welding power supply (Failure Name: Microcomputer failure) and eliminate all causes.	Error reset.	Alarm	Alarm
5032	Arc weld failure	Encoder failure was detected by the welding power supply.	Failure exists in the encoder of a wire feed unit or encoder cables are not connected.	Refer to the instruction manual of the welding power supply (Failure Name: Encoder error) and eliminate all causes.	Error reset.	Alarm	Alarm
5033	Arc weld failure	Current detection line failure occurred in the welding power supply.	The failure(the connector is disconnected etc) exists in the current detecting cable of the welding power supply.	Refer to the instruction manual of the welding power supply (Failure Name: 9. Current detection error).	Error reset.	Alarm	Alarm
5034	Arc weld failure	Gas check failure	The gas check switch of the welding	Turn OFF the gas check switch of the welding power	Error reset.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		occurred in the welding power supply.	power supply is ON for more than two minutes without a break.	supply.			
5035	Arc weld failure	Secondaly transistor failure occurred in the welding power supply.	The surge power of the second transistor for the welding power supply is abnormally high.	Refer to the instruction manual of the welding power supply (Failure Name: Secondaly transistor failure) and eliminate all causes.	Error reset.	Alarm	Alarm
5036	Arc weld failure	Water pressure failure occurred in the welding power supply.	Cooling water flow is not sufficient when using a water cooled torch.	Refer to the instruction manual of the welding power supply (Failure Name: Water pressure error) and eliminate all causes.	Error reset.	Alarm	Alarm
5037	Arc weld failure	Secondaly transistor failure occurred in the welding power supply.	The surge power of the second transistor for the robot welding power supply is abnormally high.	Refer to the instruction manual of the welding power supply (Failure Name: Secondaly transistor failure) and eliminate all causes.	Error reset.	Alarm	Alarm
5038	Arc weld failure	The specified welding power supply can't use in this unit.	The specified welding power supply isn't defined in this unit.	Register the welding power supply which is specified by the task program, or modify the task program.	Error reset.	Alarm	Alarm
5039	Arc weld failure	A control power supply failure occurred in the welding power supply.	A control power supply failure occurred in welding power supply.	Refer to the instruction manual of the welding power supply (Failure Name: (The wire feed control board)Control power supply) and eliminate all causes.	Error reset.	Alarm	Alarm
5040	Arc weld failure	An electric detection vessel failure occurred in welding power supply.	A connector inside the welding power supply may be miss-connected.	Refer to the instruction manual of the welding power supply (Failure Name: The first·second electric current error) and eliminate all causes.	Error reset.	Alarm	Alarm
5041	Arc weld failure	The excess failure of the use rate occurred in welding power supply.	Inside temperature of the welding power supply rises.	Refer to the instruction manual of the welding power supply (Failure Name: The excess of the use rate) and eliminate all causes.	Error reset.	Alarm	Alarm
5042	Arc weld failure	A temperature failure occurred in the wire feed control circuit ing the welding power supply.	An unusual fever appears on the wire feed control circuit of the welding power supply.	Refer to the instruction manual of the welding power supply (Failure Name: The temperature wrong point of the wire feed control circuit) and eliminate all causes.	Error reset.	Alarm	Alarm
5043	Arc weld failure	The load of wire feed exceeded allowable value.	The wire feed load has exceeded the allowable value set in the arc constant.	A load is on the wire feeder by wear of the liner, the chip defect, and so on. Remove the factors.	Error reset.	Alarm	Alarm
5045	Arc weld failure	The control power supply of the welding power supply was reset.	The control power supply of the welding power supply was reset.	The voltage of primary power may decrease in an instance. Check the voltage of primary power.	Failure reset, and turn on the welding power supply again.	Alarm	Alarm
5046	Arc weld failure	The welding characteristic data are not installed.	If the welding characteristic data are not installed, Arc function commands can't be execute.	Turn on the welding power supply again.	Error reset.	Alarm	Alarm
5047	Arc weld failure	The arc characteristic can't be changed while arc welding.	The arc function attempted changing the arc characteristic into the incorrect one.	Please modify the task program.	Error reset.	Alarm	Alarm
5048	Arc weld failure	The incorrect welding method is specified.	The welding method of the arc function and the welding method of the arc characteristic aren't the same.	Please modify the task program.	Error reset.	Alarm	Alarm
5049	Arc weld failure	The arc characteristic file can't be read.	Read file failure occurs while reading the arc characteristic file.	Please initialize the arc characteristic file.	Error reset.	Alarm	Alarm
5050	Arc weld failure	The wire feed characteristic file can't be read.	Read file failure occurs while reading the wire feed characteristic file.	Please initialize the wire feed characteristic file.	Error reset.	Alarm	Alarm
5051	Arc weld failure	The arc welding wave control file can't be read.	Read file failure occurs while reading the arc welding wave control file.	Please initialize the arc welding wave data file.	Error reset.	Alarm	Alarm
5052	Arc weld failure	The arc constant file can't be read.	Read file failure occurs while reading the arc constant file.	Please initialize the arc constant file.	Error reset.	Alarm	Alarm
5053	Arc weld failure	Welding voltage adjustment method differs.	The voltage adjusting method currently taught differs from the voltage adjusting method of characteristic data.	Modify the task program.	Error reset.	Alarm	Alarm
5054	Arc weld failure	WCR Short-circuit Error	WCR of W-I/F had short-circuited at the time of arc start.	Please check the state of W-I/F or a welding power supply.	This failure is released if restart playback.	Alarm	Alarm
5056	Arc weld failure	The electrode	The electrode and the work are	Please modify the task program.	Error reset.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		short-circuited failure.	short-circuited while arc welding.				
5057	Arc weld failure	The Filler Wire heating failure.	During Filler Wire heating, inside the electric supply tip, a wire melts and was cut.	Please check the wire inside an electric supply tip, and the heating cable failure (contact failure, broken wire).	This failure is released if restart playback.	Alarm	Alarm
5058	Arc weld failure	The Filler Wire heating Defect.	It can consider that there was no wire in an electric supply tip, or a wire melts and was cut inside the electric supply tip at the time of heating.	Please check the wire inside an electric supply tip, and the heating cable failure (contact failure, broken wire).	This failure is released if restart playback.	Alarm	Alarm
5059	Arc weld failure	The wire short-circuited failure.	The wire and the work are short-circuited while arc welding.	Please check the state of W-I/F, and a welding power supply.	This failure is released if restart playback.	Alarm	Alarm
5060	Arc weld failure	The heating characteristic file can't be read.	Read file failure occurs while reading the heating characteristic file.	Please initialize the heating characteristic file.	Error reset.	Alarm	Alarm
5061	Arc weld failure	The arc condition file doesn't exist.	The arc condition file which is specified by the arc welding function doesn't exist.	Please create the arc condition file or edit the task program.	Error reset.	Alarm	Alarm
5062	Arc weld failure	The offset condition file or the multi offset file doesn't exist.	The offset condition file or the multi offset file which is specified by the multi offset function doesn't exist.	Please create the offset condition file or the multi offset file, or edit the task program.	Error reset.	Alarm	Alarm
5063	Arc weld failure	The weaving synchronization went wrong.	A communication failure has been detected between the welding power supply and the extension serial board.	Please check connection between an extension serial board and a welding power supply.	Turn on the controller and the welding power supply again.	Alarm	Alarm
5064	Arc weld failure	The weaving condition file doesn't exist.	The weaving condition file which is specified by the weaving function doesn't exist.	Please create the weaving condition file or edit the task program.	Error reset.	Alarm	Alarm
5065	Arc weld failure	The power supply of a feed control device is not on.	Communication with a feed control device was not completed.	When you turn on a feed control device or the power supply is already on, please check connection with a feed control device.	Error reset.	Alarm	Alarm
5066	Arc weld failure	Pump failure occurred in the welding power supply.	Cooling water flow is not sufficient when using a water cooled torch.	Refer to the instruction manual of the welding power supply (Failure Name: Pump error) and eliminate all causes.	Error reset.	Alarm	Alarm
5067	Arc weld failure	The arc retry condition file doesn't exist.	The arc retry condition file which is specified by the arc welding function doesn't exist.	Please create the arc retry condition file or edit the task program.	Error reset.	Alarm	Alarm
5068	Arc weld failure	The arc robotrs condition file doesn't exist.	The arc robotrs condition file which is specified by the arc welding function doesn't exist.	Please create the robotrs condition file or edit the task program.	Error reset.	Alarm	Alarm
5069	Arc weld failure	The robot move condition file doesn't exist.	The robot move condition file which is specified by the arc welding function doesn't exist.	Please create the robot move condition file or edit the task program.	Error reset.	Alarm	Alarm
5070	Arc weld failure	The arc rs condition file doesn't exist.	The arc rs condition file which is specified by the arc welding function doesn't exist.	Please create the rs condition file or edit the task program.	Error reset.	Alarm	Alarm
5071	Arc weld failure	The module error in WPS.	Abnormality occurs by the module in the welding power supply.	Refer to the instruction manual of the welding power supply and eliminate all causes.(An abnormal number of the welding power supply has been described in the above-mentioned parentheses.)	Error reset.	Alarm	Alarm
5072	Arc weld failure	The speed failure of the wire feed control circuit occurred in the welding power supply.	The speed failure of the wire feed control circuit occurred in the welding power supply.	Refer to the instruction manual of the welding power supply and eliminate all causes.	Error reset.	Alarm	Alarm
5073	Arc weld failure	Input voltage shortage failure ocurred in the welding power supply.	The primary input driver of the welding power supply has decreased.	Refer to the instruction manual of the welding power supply(Failure Name: The primary input driver) and eliminate all causes.	Error reset.	Alarm	Alarm
5074	Arc weld failure	The cooler fan failure ocurred in the welding power supply.	The cooler fan's rotation has fallen or it stops.	Refer to the instruction manual of the welding power supply(Failure Name: The cooler fan failure) and eliminate all causes.	Error reset.	Alarm	Alarm
5075	Arc weld failure	A control power supply abnormal temperature occurred in the welding power supply.	The temperature rises in the control power supply.	Refer to the instruction manual of the welding power supply(Failure Name: A control power supply abnormal temperature) and eliminate all causes.	Error reset.	Alarm	Alarm
5076	Arc weld failure	The arc welding power supply detected abnormality of the servo feeder unit.	The failure occurs in servo feeder unit.	Refer to the instruction manual of the servo feeder unit and eliminate all causes.(An abnormal number of the servo feeder unit has been described in the above-mentioned parentheses.)	Error reset.	Alarm	Alarm
5077	Arc weld failure	The controller	Abnormality occurred by the	Please confirm the connection of the arc welding power	Error reset.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		couldn't communicate with the servo feeder unit.	communication between the arc welding power supply and the servo feeder unit.	supply and the servo feeder unit.			
5078	Arc weld failure	The power supply of a gas mass flow control unit is not on.	Communication with a gas mass flow control unit was not completed.	When you turn on a gas mass flow control unit or the power supply is already on, please check connection with a gas mass flow control unit.	Error reset.	Alarm	Alarm
5079	Arc weld failure	The gas equipment file doesn't exist.	The gas equipment file which is specified by the gas mass flow control file doesn't exist.	Please create the gas equipment file or edit the gas mass flow control data.	Error reset.	Alarm	Alarm
5080	Operational failure	Resources were not securable at the time of starting.	The wait time of resource reservation was over.	Modify the wait time specified in FORK or CALLFAR command.	Error reset.	Alarm	Alarm
5081	Operational failure	The appointed program cannot be edited / playback.	The same number program exists.	Delete the program not to overlap with file operation.	Error reset.	Alarm	Alarm
5082	Operational failure	Operation or command for Multi-unit cannot be executed.	The option of Multi-unit is not set up.	Please set up the option of Multi-unit.	Error reset.	Alarm	Alarm
5083	Operational failure	The unit-branch commands cannot be executed.	Some unit-branch commands were tried to execute at the same time.	Please correct the program so that the unit-branch commands does not be executed at the same time.	Error reset.	Alarm	Alarm
5084	Operational failure	The unit-branch commands cannot be executed.	A unit-branch commands FORK were tried to execute in the already forked program.	Please correct the program so that the unit-branch commands does not be executed in the already forked program.	Error reset.	Alarm	Alarm
5085	Arc weld failure	Communication timeout occurred inside the welding power supply.	The contollor of the welding power supply didn't respond.	Check the route of cable and ground connection.	Turn the welding power supply on again.	Alarm	Alarm
5086	Arc weld failure	There is a illegal section of melt down control within a arc welding section.	Condition changing from Melt Down Control to Normal Control or from Normal Control to Melt Down Control, is not acceptable.	Please correct the taught program.	No reset operations neccesary.	Alarm	Alarm
5087	Arc weld failure	There is a illegal section of melt down control within a arc welding section.	Condition changing from Melt Down Control to Normal Control or from Normal Control to Melt Down Control, is not acceptable.	Please correct the taught program.	No reset operations neccesary.	Alarm	Alarm
5088	Arc weld failure	Back bead has detected.	Arc welder has changed the welding condtion.	Please re-designe the welding condition or the taught path.	No reset operations neccesary.	Inform ation	Inform ation
5089	Arc weld failure	Deviation of welding path has detected.	Deviation of welding path toward upper plate has occured.	Please re-designe the taught path.	No reset operations neccesary.	Inform ation	Inform ation
5090	Arc weld failure	Tandem-Arc-Start-command is incorrect.(Fe-wire)	A move command must be inserted between preceding and trailing arc-start-command.	Modify the task program.	Error reset.	Alarm	Alarm
5091	Arc weld failure	Tandem-Arc-Start-command is incorrect.(Al-wire)	Trailing-arc-start-command must follow preceding-arc-start-command continually.	Modify the task program.	Error reset.	Alarm	Alarm
5092	Arc weld failure	The Electrode type is incorrect.	Trailing-arc-start-command is taught before preceding-arc-start-command.	Modify the task program.	Error reset.	Alarm	Alarm
5093	Arc weld failure	The current execution pass is in another multipass section	It is prohibited to start since the different offset might be applied.	Please set the step which the multipass section suitable for the current execution pass or change the current execution pass.	Error reset.	Alarm	Alarm
5094	Arc weld failure	The arc welding power supply is installed.	During installation of an arc welding power supply, neither operation of the arc welding power supply nor execution of playback command can be performed.	Please perform again after the completion of installation of an arc welding power supply.	Error reset.	Alarm	Alarm
5095	Arc weld failure	Motor overcurrent occurred in the welding power supply.	Short circuit in the power line to the motor or motor overload happens.	Refer to the instruction manual of the welding power supply (Failure Name: Motor overcurrent) and eliminate all causes.	Error reset.	Alarm	Alarm
5096	Arc weld failure	The emergency is stopping or the welding power supply is stopping.	The emergency stop is input or the wiring of the STOP terminals in the welding power supply is disconnected.	Please cancel an emergency stop button and an external emergency stop signal, and check the connection of the welding power supply to the controller.	Error reset.	Alarm	Alarm
5097	Arc weld failure	Arc voltage cannot be detected while RS control.	Arc start faiulre using RS control or arc voltage detection failure occurred in the welding power supply.	Check the workpiece's condition, wire's condition, connection of the cable, and RS control condition. Or refer to the instruction manual of the welding power supply (Failure Name: Arc voltage detection error) and eliminate all causes.	Error reset.	Alarm	Alarm
5098	Arc weld failure	EP start failure.	The arc welding characteristic data of EP mode isn't registered. Or the welding	Register the correct welding characteristic data. Or Correct EP start condition.	Error reset.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
			voltage adjustment method of EP mode is different from EN mode.				
5099	Arc weld failure	The arc welding power supply was operated during playback.	The arc welding power supply cannot be operated during playback.	Please do not operate the welding power supply during playback.	Failure reset, and turn on the welding power supply again.	Alarm	Alarm
5100	Arc weld failure	EP start failure.	EP start condition of AS function is wrong.	Correct EP start condition.	Error reset.	Alarm	Alarm
5101	Arc weld failure	An adjustment movement start is unusual.	Arc-Monitor isn't indicated.	Indicate Arc-Monitor, and confirm an adjustment condition.	This failure is released if restart playback.	Alarm	Alarm
5102	Arc weld failure	An adjustment program choice is unusual.	An start program is different from the adjustment program.	Start by the specified adjustment program.	This failure is released if restart playback.	Alarm	Alarm
5103	Arc weld failure	Adjustment welding mode wrong point.	The welding mode of the AS function is different from the welding mode of the adjustment object.	Check the welding mode to adjust.	Error reset.	Alarm	Alarm
5104	Arc weld failure	Pilot arc start failure.	The pilot arc was not turned on.	Check the connection condition of the cable.	This failure is released if restart playback.	Alarm	Alarm
5105	Arc weld failure	A plasma unit is abnormal.	Abnormality occurs by a plasma fine unit.	Please see the manual of a plasma fine unit.	Error reset.	Alarm	Alarm
5106	Arc weld failure	The pilot arc outage is abnormal.	The pilot arc outage occurred.	Check the connection condition of the cable.	This failure is released if restart playback.	Alarm	Alarm
5107	Arc weld failure	Pilot arc OFF error.	The pilot arc was not able to be turned off.	Check the connection condition of the cable.	Error reset.	Alarm	Alarm
5108	Arc weld failure	Pilot arc ON error.	Since the purge was turned on, the pilot arc was not able to be turned on.	Turn off the purge.	Error reset.	Alarm	Alarm
5109	Arc weld failure	The error occurs in servo wire feed control unit.	The error occurs in servo wire feed control unit.	Refer to the instruction manual of the servo wire feed control unit and eliminate all causes.	Error reset.	Alarm	Alarm
5110	Arc weld failure	Retract operation was executed over 10 seconds.	Stop retract for the protection of Assist Feeder.	If you operate retract more, execute 90 seconds later.	Error reset.	Alarm	Alarm
5111	Arc weld failure	Stitch pulse welding control error.	The synchronized control, the FC control, the slope control or the adjustment of the WCD cannot be executed by the stitch pulse welding.	Please change the welding condition.	Error reset.	Alarm	Alarm
5112	Arc weld failure	Stitch pulse welding unit setting error.	The stitch pulse cannot weld with the unit to which two or more welding machines are registered.	Please change the registration of the weld power supply in the unit.	Error reset.	Alarm	Alarm
5113	Arc weld failure	WCR input signal unsetting.	The WCR input signal is not allocated.	Please allocate the WCR input signal.	Error reset.	Alarm	Alarm
5114	Arc weld failure	Arc welding unit setting abnormality.	For the unit to which two or more welding machines are registered, it is not possible to weld.	Please change the registration of the welding machine in the unit.	Error reset.	Alarm	Alarm
5115	Arc weld failure	The WCR OFF time-out is abnormal.	WCR was not turned off in the time limit.	Please check the WCR signal from "WCR OFF waiting time" of the welding constant and the welding power supply.	Error reset.	Alarm	Alarm
5118	Arc weld failure	There is a wrong arc start command in the tool change setting welding power supply.	The AS command more than two passing is recorded by one mechanism.	Please modify the task program.	Error reset.	Alarm	Alarm
5119	Arc weld failure	There is a wrong AS command.	The Synchro or FC welding is taught to the AS command.	Please teach again after deleteing the AS command.	Error reset.	Alarm	Alarm
5120	Arc weld failure	The arc welding power supply detected abnormality of the gas mass flow control unit.	The failure occurs in gas mass flow control unit.	Refer to the instruction manual of the gas mass flow control unit and eliminate all causes.(An abnormal number of the gas mass flow control unit has been described in the above-mentioned parentheses.)	Error reset.	Alarm	Alarm
5121	Arc weld failure	The gas mass flow value has exceeded the allowable limit.	The difference between the gas mass flow value measured by the welding power supply and the taught one has exceeded the allowable limit set by the contloler.	Please confirm [The remainder pressure of gas cylinder, the piping of the gas, and the setting of the gas mass flow control unit.	Error reset.	Alarm	Alarm
5122	Arc weld failure	The gas pressure value has exceeded the allowable limit.	The gas pressure measured in the arc welding power supply exceeded the limiting value set with the controller.	Please confirm the remainder pressure of gas cylinder, the piping of the gas, and the setting of the gas mass flow control unit.	Error reset.	Alarm	Alarm
5123	Arc weld failure	The set gas mass flow is not output.	The set gas mass flow was not output in specified time.	Please confirm the residual quantity of the gas cylinder, the piping of the gas, and the setting of the gas mass flow control unit.	Error reset.	Alarm	Alarm
5124	Arc weld failure	The gas flow control unit was reset.	The control data in the gas flow control unit was reset.	Please confirm the power cable of the gas flow control unit.	Error reset.	Alarm	Alarm
5125	Arc weld failure	The data to the gas flow control unit cannot be set.	The data set to the gas flow control unit is abnormal.	Please confirm the data of the gas flow control unit.	Error reset.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
5126	Arc weld failure	Zero deviation error on the gas flow control unit was detected.	Even if passing the specified time after Gas OFF, the actual gas flow could not restore 0 on the gas flow control unit.	1.Check the error judgment delay time. 2.Check the gas type and the gas pressure at main cock. 3.The gas flow control unit may be damaged or broken down. Please contact our customer service center.	Error reset.	Alarm	Alarm
5130	Operational failure	Welding mode option un-setting up.	Welding mode option which is not set up was used.	Please set up a welding mode option.	No reset operations neccesary.	Alarm	Alarm
5131	Operational failure	Welding mode option can't use.	Since the welding mode option is not set up correctly, it can't use.	Since system memory protection was effective, an option was not able to be written in a system memory.Please once repeal a system memory protection function and start a system again.	No reset operations neccesary.	Alarm	Alarm
5132	Arc weld failure	Specified mode can't use.	Since the welding unit is not supporting specified mode, it can't use.	Please use a welding unit with specified mode.	No reset operations neccesary.	Alarm	Alarm
5133	Operational failure	Welding mode option can't use.	Since the welding mode option is not set up correctly, it can't use.	Please restore the welding mode option on the welding mode option screen.	No reset operations neccesary.	Alarm	Alarm
5136	Arc weld failure	The multipass section is abnormal.	The 'ASM' function, the 'AEM' function, the 'OFFSET' function, and the 'EP' function cannot be executed outside the multipass section.	Please teach the 'MPS' function and the 'MPE' function.	Error reset.	Alarm	Alarm
5200	Sensor failure	Sensor Function cannot be executed.	Wrong usage of sensor function is detected in teaching program	Please record sensor search function after move step.	After recording the move step, Please Check Go.	Alarm	Alarm
5201	Sensor failure	Search range exceeded.	This error occurs when the robot moves beyond search range	Modify(enlarge) the search range or program to rectify error.	No reset operations neccesary.	Alarm	Alarm
5202	Sensor failure	Search range is short	This error occurs when the robot detect the touch status within minimum search range.	Modify(shorten) the search range or program to rectify error.	No reset operations neccesary.	Alarm	Alarm
5203	Sensor failure	Deviation range exceeded.	This error occurs when the robot moves beyond deviation range	Modify(enlarge) the deviation range or program to rectify error.	No reset operations neccesary.	Alarm	Alarm
5204	Sensor failure	Sensor number is mismatched.	This error occures when the sensor number in the sensor step does not meet that of the connected sensor.	Check that sensor settings and /or teaching programs.	Error reset.	Alarm	Alarm
5205	Sensor failure	The input-and-output signal is not assigned.	This error occurs when the input-and-output signal required for search operation is not assigned.	Set up an input-and-output signal.	Error reset.	Alarm	Alarm
5206	Sensor failure	A deviation file is wrong.	This error occurs when read-out of a deviation file goes wrong.	Check a deviation file.	Error reset.	Alarm	Alarm
5207	Sensor failure	A deviation file is not found.	This error occurs when the specified deviation file cannot be found.	Correct the file number.	Error reset.	Alarm	Alarm
5208	Sensor failure	Mechanism type is mismatched.	This error occurs when the mechanism type in specified deviation file is mismatched.	Correct the file number.	Error reset.	Alarm	Alarm
5209	Sensor failure	A detecting wire extension file is wrong.	This error occurs when read-out of a detecting wire extension file goes wrong.	Check a detecting wire extension file.	Error reset.	Alarm	Alarm
5210	Sensor failure	A detecting wire extension file is not found.	This error occurs when the specified detecting wire extension file cannot be found.	Correct the file number.	Error reset.	Alarm	Alarm
5211	Sensor failure	Coordinate systems are mismatched.	This error occurs when the coordenate systems are not matched between selected deviation files.	Correct the file number.	Error reset.	Alarm	Alarm
5212	Sensor failure	Cannot search.	Search direction cannot be specified because the search vector is not taught, or calculating search vector was failed.	(1)Specify the search vector. (2)When the search vector was already specified, modify the search vector.	Error reset.	Alarm	Alarm
5213	Sensor failure	Gap Over	Detected gap is exceeded beyond maximum allowable value.	Check that gap amount and modify allowable value if needed.	Error reset.	Alarm	Alarm
5214	Sensor failure	Gap short	Detected gap becomes lower than minimum allowable value.	Check that gap amount and modify allowable value if needed.	Error reset.	Alarm	Alarm
5215	Sensor failure	Groove depth over	Detected groove depth is exceeded beyond maximum allowable value.	Check that groove depth amount and modify allowable value if needed.	Error reset.	Alarm	Alarm
5216	Sensor failure	Groove depth short	Detected groove depth becomes lower than minimum allowable value.	Check that groove depth amount and modify allowable value if needed.	Error reset.	Alarm	Alarm
5217	Sensor failure	Angle1 over	Detected angle1 is exceeded beyond maximum allowable value.	Check that angle1 amount and modify allowable value if needed.	Error reset.	Alarm	Alarm
5218	Sensor failure	Angle1 short	Detected angle1 becomes lower than minimum allowable value.	Check that angle1 amount and modify allowable value if needed.	Error reset.	Alarm	Alarm
5219	Sensor failure	Angle2 over	Detected angle2 is exceeded beyond maximum allowable value.	Check that angle2 amount and modify allowable value if needed.	Error reset.	Alarm	Alarm
5220	Sensor failure	Angle2 short	Detected angle2 becomes lower than minimum allowable value.	Check that angle2 amount and modify allowable value if needed.	Error reset.	Alarm	Alarm
5221	Sensor failure	Groove un-detected	Groove position cannot be detected	(1)Check setting parameters in GFF file. (2)If you are provided with the optional data terminal, use Groove Data function in RD/AD tab menu, and modify the teaching program so that laser data are properly obtained.	Error reset.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
5222	Sensor failure	Seaching time over	This error occurs when searching time is too long.	To short the searching time less than 2s or modify sample rate in GFF file.	Error reset.	Alarm	Alarm
5223	Sensor failure	Sensor mounting parameter error	This error occurs when sensor mounting parameter is not set.	Specify sensor mounting direction.	Error reset.	Alarm	Alarm
5224	Sensor failure	Unstable detection	This error occurs when measured data is unstable.	Check that target surface condition and/or measurement angle.	Error reset.	Alarm	Alarm
5225	Sensor failure	Out of measurement distance	This error occurs when measured distance is out of range.	Check that target piece is located at desired position.	Error reset.	Alarm	Alarm
5226	Sensor failure	Reference point error	This error occurs when reference point is not stored.	Execute trial motion to get reference point.	Error reset.	Alarm	Alarm
5227	Sensor failure	ZG1 workpiece undetected	This error occurs when the laser reflection beam is not sufficiently received in ZG1 starting.	(1)At the ZG1 start point, the workpiece must be taught within the measurement range. (2)When the workpiece is placed within the measurement range, adjust the angle of laser against the workpiece, and constantly light the distance LED on laser head. (3)If you are provided with the optional data terminal, use RD/AD tab menu, and check that always 206 or higher laser beam in the LEVEL display is received.	Error reset.	Alarm	Alarm
5228	Sensor failure	Gap file error	This error occurs when wrong data is detected in gap file.	Check the contents in gap file.	Error reset.	Alarm	Alarm
5229	Sensor failure	No gap file	This error occurs when the specified gap file is not exist.	Check the gap file number.	Error reset.	Alarm	Alarm
5230	Sensor failure	Gff file error	This error occurs when wrong data is detected in GFF file.	Check that contents in GFF file.	Error reset.	Alarm	Alarm
5231	Sensor failure	No gff file	This error occurs when the specified GFF file is not exist.	Check that GFF file number.	Error reset.	Alarm	Alarm
5232	Sensor failure	Sensor disconnected (Laser search)	This error occurs when there is no communication between laser sensor and RC.	Turn on the sensor unit. In case the sensor unit has been already turned on, check the connection of the sensor unit to the controller.	Error reset.	Error	Error
5233	Sensor failure	Communication timeout occurred between the controller and the sensor unit	This error occurs when there is no response from Laser Sensor Unit.	Check the connection of the sensor unit to the controller.	Turn on the controller and the sensor unit again.	Error	Error
5234	Sensor failure	Sensor condition file error	This error occurs when wrong data is detected in LSF or LSR file.	Check that contents in LSF or LSR file.	Error reset.	Alarm	Alarm
5235	Sensor failure	Sensor condition file is not exist.	This error occurs when specified LSF or LSR file is not exist.	Check that LSF or LSR file number.	Error reset.	Alarm	Alarm
5236	Sensor failure	Sensor Failure	This failure occurs when the error is issued from the sensor controller	Check the sensor status by WinUser.	Error reset.	Error	Error
5237	Sensor failure	Start Point un-detected	This failure occurs when the start point is not detected during ZF search.	(1)Check the groove recognization by WinUser. (2)Enlarge the ZF maximum search range.	Error reset.	Alarm	Alarm
5238	Sensor failure	Cannot restart during seam tracking.	Cannot restart during seam tracking.	Do not modify the position and posture of the robot when the robot is stopped in ZT period if the restarting is required.	Error reset.	Alarm	Alarm
5239	Sensor failure	ZF Deviation range exceeded	This error occurs when the distance between the detected start point and ZF taught point exceeded the deviation range.	Check detected position. If no problems exist, moodify(enlarge) the ZF deviation range parameter or program to rectify error.	Error reset.	Alarm	Alarm
5240	Sensor failure	ZF search range exceeded	This error occurs when the robot moves beyond search range	Modify(enlarge) the search range or program to rectify error.	Error reset.	Alarm	Alarm
5241	Sensor failure	ZT Position Deviation range exceeded	This error occurs when the robot moves beyond Position deviation range	Check the target position If no problems exist, moodify(enlarge) the ZT parameters or program to rectify error.	Error reset.	Alarm	Alarm
5242	Sensor failure	ZN offset range exceeded	This error occurs when the setting offset is beyond the range	Modify(enlarge) the ZN offset to rectify error.	Error reset.	Alarm	Alarm
5243	Sensor failure	ZN Search range exeeced.	This error occurs when the robot moves beyond search range during ZN.	Modify(enlarge) the ZN search range or program to rectify error.	Error reset.	Alarm	Alarm
5244	Sensor failure	End point un-detected	End point of workpiece is not detected.	Modify(enlarge) ZN search range or program to rectify error.	Error reset.	Alarm	Alarm
5245	Sensor failure	Deviation range exceeded.	This error occurs when the distance between the detected end point and taught point before ZE exceeded the deviation range.	Check the detected point. If no problems exist, Modify(enlarge) the deviation range or program to rectify error.	Error reset.	Alarm	Alarm
5246	Sensor failure	Laser ON Failed	Laser is not activated.	Turn on the Laser by ZON or manual operation.	Error reset.	Alarm	Alarm
5247	Sensor failure	Laser is not ready.	ZF/ZT/ZJ will be performed before 3 seconds after ZON is carried out.	Wait 3 seconds or longer after ZON was performed before ZF/ZT/ZJ.	Error reset.	Alarm	Alarm
5248	Sensor failure	Error in instruction of ZN command.	There is no move command immediately after ZN command to which a move command or ZT command does not exist before ZN command, or it is [that two or more move commands are taught between ZN - ZE, etc. and] a factor.	Please improve instruction.	Error reset.	Alarm	Alarm
5249	Sensor failure	ZT Posture Deviation range	This error occurs when the robot moves beyond Posture deviation range	Check the target posture If no problems exist, moodify(enlarge) the ZT parameters or program to	Error reset.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		exceeded		rectify error.			
5250	Sensor failure	Sensor disconnected	The controller couldn't communicate with the sensor unit.	Turn on the sensor unit. In case the sensor unit has been already turned on, check the connection of the sensor unit to the controller.	Error reset.	Alarm	Alarm
5251	Sensor failure	Correction amount by arc-sensor exceeds specified value.	Error is activated when the case that correction amount by the sensor exceeds the specified value in teaching parameter.	Check that currect torch position. If it is OK, extend the value CHASING RANGE in teaching parameter. If it is NG, try to adjust sensor parameters.	Error reset.	Alarm	Alarm
5252	Sensor failure	Calculation turns to unstable during arc-sensing process.	This error is activated when stability of welding arc decreased significantly.	Check that welding condition to be stable.	Error reset.	Alarm	Alarm
5253	Sensor failure	Welding position cannot be detected	This error is activated when the deviation detection cannot be calculated during arc-sensing process. Note that position correction is not executed.	Try to re-adjust sensing parameters.	Error reset.	Alarm	Alarm
5254	Sensor failure	Unstable wire-feeding.	Wire-feeding status turn to unstable. Deviation is lager than specified value.	Check that equipments for wire feeding.	Error reset.	Alarm	Alarm
5255	Sensor failure	ST parameter error.	The instruction parameter of ST command is over the setting range.	It improves whether each parameter is setting within the limits.	Error reset.	Alarm	Alarm
5256	Sensor failure	The ET command less program was performed.	ET command is not taught after ST command.	Please teaching ET command.	Error reset.	Alarm	Alarm
5257	Sensor failure	Abnormalities were found in the parameter of basic data.	An appointed basic data file does not exist or a file cannot be read.	Please check a basic data file with a service menu.	Error reset.	Alarm	Alarm
5258	Sensor failure	Error in instruction of ZG1 command.	ZG1 command in the weaving section cannot be executed.	Please improve instruction.	Error reset.	Alarm	Alarm
5259	Sensor failure	At the start-point detection or in the tracking section, the move command with no Synchromotion teaching (without "H") was found.	In the start-point detection section or the tracking section in Synchromotion system, the move command is not taught as Synchromotion teaching ("H").	Specify all the move commands, right before ZF command, in ST~ET section and in ZT~ZE section to Synchromotion teaching ("H").	Error reset.	Alarm	Alarm
5260	Sensor failure	Sensor stop signal input.	Stop signal is input into the laser sensor unit.	(1)Release Emergency Stop Button on the Laser Sensor Unit. (2)Close the Emergency Stop Alarm Input loop connected to CN2 on the laser sensor unit.	After removal of failure, please carry out "failure-reset".	Alarm	Alarm
5261	Sensor failure	Groove un-detected.	Groove cannot be detected.	(1)Check that LASER power is ON. (2)Check the cable between Laser Sensor Unit and Sensor Head is connected properly. (3)Check the cable between Robot Controller and Laser Sensor Unit is connected properly.	After removal of failure, please carry out "failure-reset".	Alarm	Alarm
5262	Sensor failure	Torch moving distance over.	The distance corrected by the sensor within 1 interpolation time was exceeded over the internal distance.	(1)Adjust the stability of groove detection by WinUser. (2)Check the cable between Robot Controller and Laser Sensor Unit is connected properly. In addition, also check the sensor head cable.	After removal of failure, please carry out "failure-reset".	Alarm	Alarm
5263	Sensor failure	No SFM file	This error occurs when specified SFM file is not exist.	Check SFM file number.	Error reset.	Alarm	Alarm
5264	Sensor failure	SFM file error	This error occurs when wrong data is detected in SFM file.	Check that contents in SFM file.	Error reset.	Alarm	Alarm
5265	Sensor failure	Error in instruction of DE command.	There is no move command immediately after DE command to which a move command or ST command does not exist before DE command, or it is [that two or more move commands are taught between DE - ET, etc. and] a factor.	Please improve instruction.	Error reset.	Alarm	Alarm
5266	Sensor failure	DE Corrected point failure	This error occurs when the order of DE corrected point and ET taught point are exchanged by tracking.	(1)Modify the AS speed so that it is close to the proper one.(2)Modify DE taught point so that the distance between DE and ET taught point is longer.	Error reset.	Alarm	Alarm
5267	Sensor failure	JOINT command exists in tracking section.	JOINT command cannot be executed in the tracking sensor section.	Modify JOINT command in the teaching section (ST~ ET, ZF~ZT~ZN~ZE) of tracking sensor to LIN command or CIR1/CIR2 command.	Error reset.	Alarm	Alarm
5268	Sensor failure	Sensor Function cannot be executed.	An error is in a connection setup of a sensor and a mechanism.	Please check a constant setup and instruction of a sensor.	No reset operations neccesary.	Alarm	Alarm
5269	Sensor failure	ZN Search destination point is exceeded range.	This error occurs when the robot moves beyond Software Limit range by ZN search.	Modify () the ZN mamimum distance so that the point extended ZN maximum distance from the previous point of ZE is within the robot working range.	Error reset.	Alarm	Alarm
5270	Sensor failure	The tracking speed is a negative value.	This error occurs when the tracking speed is set to a negative value by speed change of Adaptive Control.	(1)Specify the AS speed properly so that it will not become negative by Adaptive Control. (2)Connect WinUser to the sensor, and review the setting "gap - speed" in the spread sheet.	Error reset.	Alarm	Alarm
5271	Sensor failure	Error in instruction of ZE command	This error occurs when ZT command according to ZE does not exist.	Modify ZT or ZE command.	Error reset.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		outside tracking section					
5272	Sensor failure	Continuous ZT commands have same sensor number.	This error occurs when continuous ZT commands have same sensor number.	Check each sensor number of ZT command.	Error reset.	Alarm	Alarm
5273	Sensor failure	Continuous ZN commands have same sensor number.	This error occurs when continuous ZN commands have same sensor number.	Check each sensor number of ZN command.	Error reset.	Alarm	Alarm
5274	Sensor failure	Continuous ZE commands have same sensor number.	This error occurs when continuous ZE commands have same sensor number.	Check each sensor number of ZE command.	Error reset.	Alarm	Alarm
5275	Sensor failure	ZN command according to ZT does not exist.	This error occurs in case that ZN commands for all laser sensors is not instructed when the tracking by the plural laser sensors are performed.	Modify ZN commands.	Error reset.	Alarm	Alarm
5276	Sensor failure	ZE command according to ZT does not exist.	This error occurs when ZE command according to ZT is not instructed.	Modify ZT or ZE command.	Error reset.	Alarm	Alarm
5277	Sensor failure	ZT command according to ZN does not exist.	This error occurs when ZT command according to ZN is not instructed.	Modify ZT or ZN command.	Error reset.	Alarm	Alarm
5278	Sensor failure	ZT command according to ZE does not exist.	This error occurs when ZT command according to ZE is not instructed.	Modify ZT or ZE command.	Error reset.	Alarm	Alarm
5279	Sensor failure	ZT command exists in the section of continuous ZN or ZE commands.	This error occurs when ZT command is instructed just after ZN or ZE command.	Modify ZT, ZN or ZE command.	Error reset.	Alarm	Alarm
5280	Sensor failure	ZN command exists in the section of continuous ZT or ZE commands.	This error occurs when ZN command is instructed just after ZT or ZE command.	Modify ZT, ZN or ZE command.	Error reset.	Alarm	Alarm
5281	Sensor failure	ZE command exists in the section of continuous ZT or ZN commands.	This error occurs when ZE command is instructed just after ZT or ZN command.	Modify ZT, ZN or ZE command.	Error reset.	Alarm	Alarm
5282	Sensor failure	Abnormal setting of ON/OFF of External I/O detection in ZN commands.	This error occurs when both settings of External I/O detection in the continuous ZN instructions are not same.	Modify the setting of External I/O detection in each ZN command.	Error reset.	Alarm	Alarm
5283	Sensor failure	Abnormal setting of input port number of External I/O detection in ZN commands.	This error occurs when both settings of input port number of External I/O detection in the continuous ZN instructions are not same.	Modify the setting of input port number of External I/O detection in each ZN command.	Error reset.	Alarm	Alarm
5284	Sensor failure	Abnormal setting of "Maximum distance" in ZN commands.	This error occurs when both parameters of "Maximum distance" in the continuous ZN instructions are not same.	Modify "Maximum distance" in each ZN command.	Error reset.	Alarm	Alarm
5285	Sensor failure	A reference position has not been taught.	This error occurs if a reference position is not taught when executing SF2/ZF2.	Teach a reference position by executing manual operation, macro-execution or trial operation.	Error reset.	Alarm	Alarm
5286	Sensor failure	An undefined dummy point is being referred.	When executing SF2/ZF2, an undefined dummy point was attempted to be referred.	To make a reference to the dummy point, modify the patterned search macro so that the dummy point can be referred after defined.	Error reset.	Alarm	Alarm
5287	Sensor failure	A vector is not taught.	Since a vector is not taught, the motion direction of patterned search cannot be operated.	Teach a vector (both its start point and end point).	Error reset.	Alarm	Alarm
5288	Sensor failure	An undefined temporary buffer point is being referred.	When executing SF2/ZF2, an undefined temporary buffer point was attempted to be referred.	To make a reference to a temporary buffer point, modify the patterned search macro so that the temporary buffer point can be referred after defined.	Error reset.	Alarm	Alarm
5289	Sensor failure	A vector cannot be defined or identified when executing SF2/ZF2.	(1)The motion start/end point of S (search) command or M (move) command are the same. (2)When executing the vector intersection operation mode (a=1) by L (vector calcuation) command, two kinds of vector are identical.	(3)Check the vector specified by the temporary buffer point in each command, and remove the errors.	Error reset.	Alarm	Alarm
5290	Sensor failure	Logic error of the patterned search macro.	Parameter settings for the patterned search macro are fault, which causes a SF2/ZF2 execution failure.	Review the contents of the patterned search macro and parameter settings for the patterned search (including the set point).	Error reset.	Alarm	Alarm
5291	Sensor failure	An operation error occurred when	A search target point of S (search) command or a motion target point of M	Review the contents of the patterned search macro and parameter settings for the patterned search (including	Error reset.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		executing SF2/ZF2.	(move) command were not able to be obtained.	the set point) so that the search target point and the motion target point can be got within the robot motion range.			
5292	Sensor failure	DE Search range exeeced.	This error occurs when the robot moves beyond search range during DE.	Modify(enlarge) the DE search range or program to rectify error.	Error reset.	Alarm	Alarm
5293	Sensor failure	The command of teaching prohibition in ZF and after	This error occurs when the command not permitted has been taught in ZF-ZT and ZF-ZE section.	Review the teaching in ZF-ZT and ZF-ZE section.	Error reset.	Alarm	Alarm
5294	Sensor failure	Adaptive welding current over	Welding current specified by adaptive control exceeds maximum current watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, increase maximum current watch value of adaptive control.	Error reset.	Alarm	Alarm
5295	Sensor failure	Adaptive welding current short	Welding current specified by adaptive control becomes lower than minimum current watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, decrease minimum current watch value of adaptive control.	Error reset.	Alarm	Alarm
5296	Sensor failure	Adaptive welding voltage over	Welding voltage specified by adaptive control exceeds maximum voltage watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, increase maximum voltage watch value of adaptive control.	Error reset.	Alarm	Alarm
5297	Sensor failure	Adaptive welding voltage short	Welding voltage specified by adaptive control becomes lower than minimum voltage watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, decrease minimum voltage watch value of adaptive control.	Error reset.	Alarm	Alarm
5298	Sensor failure	Adaptive travel speed over	Travel speed specified by adaptive control exceeds maximum speed watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, increase maximum speed watch value of adaptive control.	Error reset.	Alarm	Alarm
5299	Sensor failure	Adaptive travel speed short	Travel speed specified by adaptive control becomes lower than minimum speed watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, decrease minimum speed watch value of adaptive control.	Error reset.	Alarm	Alarm
5300	Auto Calibration failure	Auto Calibration function can not be carried out.	An error is in the record method of an automatic calibration related function.	Please record an automatic calibration function behind a move command.Or please choose a mechanism correctly.	After recording the move step, Please Check Go.	Alarm	Alarm
5301	Auto Calibration failure	Other units are running program.	CALIBROB(FN702) cannot be performed while running the program of other units.	Please perform CALIBROB (FN702) again after stopping all units.	Error reset.	Alarm	Alarm
5302	Auto Calibration failure	The maximum compensation value error.	The amount of compensation of joint offset or a tool parameter is over the maximum set up by the constant.	Please acquire a measuring point again after correcting a gap of a robot using a torch gauge or a point mark.	Error reset.	Inform ation	Inform ation
5303	Auto Calibration failure	The maximum search distance error.	This error occurs when the robot moves beyond search range	Modify(enlarge) the search range or program to rectify error.	No reset operations neccesary.	Alarm	Alarm
5304	Auto Calibration failure	The reference point for automatic calibrations is not acquired.	This error occurs when reference points are not acquired.	Please acquired reference points.	No reset operations neccesary.	Alarm	Alarm
5305	Auto Calibration failure	Reference point Orientation error.	This error occurs when the "A" and "B" points have different orientation.	Please make "A" and "B" points into the same orientation.	No reset operations neccesary.	Alarm	Alarm
5306	Auto Calibration failure	Reference point orientation error(At the time of the direction search of Z).	It becomes this error when the orientation of the reference point at the time of the direction search of Z differs from A1, B1 or A2, and B-2.	Please make the same the orientation of B points of A1, B1 point, A points of the direction search of Z or A2, B-2 point, and the direction search of Z.	No reset operations neccesary.	Alarm	Alarm
5307	Auto Calibration failure	The auto calibration sensor is not registered.	This error occurs when the auto calibration sensor required for search operation is not set up.	Please register an automatic calibration sensor by constant setup.	Error reset.	Alarm	Alarm
5308	Auto Calibration failure	The input-and-output signal is not set up.	This error occurs when the input-and-output signal required for search operation is not set up.	Set up an input-and-output signal.	Error reset.	Alarm	Alarm
5309	Auto Calibration failure	File reading error.	A condition file cannot be read.	Please set up constant data again or perform initialization.	Error reset.	Alarm	Alarm
5310	Auto Calibration failure	The abnormalities in an automatic calibration parameter.	The parameter in an automatic calibration constant file is unusual.	Please set up a constant file correctly.	Error reset.	Alarm	Alarm
5311	Auto Calibration failure	Automatic calibration measurement file error.	It has not accessed whether a measurement file could be created.	Please enable it to create a measurement file.	Error reset.	Alarm	Alarm
5312	Auto Calibration failure	The abnormalities in automatic calibration correct.	Reliability is not in the measured data. There is a possibility that the sensor might incorrect-detect or a totter may be in attachment of a tool.	Please perform reference point acquisition again.	Error reset.	Alarm	Alarm
5313	Auto Calibration failure	The abnormalities in work program	Abnormalities occurred at the time of work program compensation.	Please perform reference point acquisition again.	Error reset.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		compensation.					
5314	Auto Calibration failure	The abnormalities in work program compensation.	Abnormalities occurred at the time of work program compensation.	It is not especially.	No reset operations neccesary.	Inform ation	Inform ation
5315	Auto Calibration failure	A robot's position is shifted greatly.	Since a robot's position is shifted greatly, measurement is uncontinuable.	Please acquire a measuring point again after correcting a gap of a robot to the range which can be measured using a torch gauge or a point mark.	Error reset.	Alarm	Alarm
5316	Auto Calibration failure	All measuring points are not acquired.	The gap of a robot was detected in the state where all measuring points have not measured.	Please measure all measuring points.	Error reset.	Alarm	Alarm
5317	Auto Calibration failure	CALIBROB (FN702) cannot be performed.	Datum point acquisition mode CALIBROB (FN702) was performed.	It is not especially.	Error reset.	Inform ation	Inform ation
5318	Auto Calibration failure	Cannot search.	It becomes this error when the inputted search operation distance is too large.	Modify(enlarge) the search range or program to rectify error.	Error reset.	Alarm	Alarm
5319	Auto Calibration failure	The minimum search distance error.	This error occurs when the robot moves beyond search range	Modify(enlarge) the search range or program to rectify error.	No reset operations neccesary.	Alarm	Alarm
5320	Auto Calibration failure	The abnormalities in calibration compensation at the time of remeasurement.	Reliability is not in the measured data. There is a possibility that the sensor might incorrect-detect or a totter may be in attachment of a tool.	Please perform measuring point acquisition again.	Error reset.	Alarm	Alarm
5321	Auto Calibration failure	The quick checki point is not measured.	Although the all-points measurement of the quick checki point is not carried out, MESPOS (FN700) was performed.	Please measure the quick checki point again.	Error reset.	Alarm	Alarm
5322	Auto Calibration failure	Reference point error.	Reference point was not taken from point 1Q.	Please perform taking reference point from point 1Q.	Error reset.	Alarm	Alarm
5323	Auto Calibration failure	Reference point error.	Reference point was not taken from point 1A.	Please perform taking reference point from point 1A.	Error reset.	Alarm	Alarm
5330	Auto Calibration failure	Measuring point Orientation error.	This error occurs when the "A" and "B" points have different orientation. There is a possibility that the sensor might incorrect-detect or a totter may be in attachment of a tool.	Please perform measuring point acquisition again.	No reset operations neccesary.	Alarm	Alarm
5331	Auto Calibration failure	Measuring point orientation error(At the time of the direction search of Z).	It becomes this error when the orientation of the measuring point at the time of the direction search of Z differs from A1, B1 or A2, and B-2.There is a possibility that the sensor might incorrect-detect or a totter may be in attachment of a tool.	Please perform measuring point acquisition again.	No reset operations neccesary.	Alarm	Alarm
5332	Auto Calibration failure	The abnormalities in automatic calibration correct.	Reliability is not in the measured data. There is a possibility that the sensor might incorrect-detect or a totter may be in attachment of a tool.	Please perform measuring point acquisition again.	Error reset.	Alarm	Alarm
5333	Auto Calibration failure	The abnormalities in work program compensation.	Abnormalities occurred at the time of work program compensation.	Please perform measuring point acquisition again.	Error reset.	Alarm	Alarm
5334	Auto Calibration failure	Measuring point error.	Measuring point was not taken from point 1Q.	Please perform taking measuring point from point 1Q.	Error reset.	Alarm	Alarm
5335	Auto Calibration failure	Measuring point error.	Measuring point was not taken from point 1A.	Please perform taking measuring point from point 1A.	Error reset.	Alarm	Alarm
5400	Sensor failure	Abnormal setting of the speed monitoring range	This error occurs when the minimum value of speed monitoring value exceeds the maximum value in the condition settings for the adaptive control.	Review the minimum and maximum value of the speed monitoring value.	Error reset.	Alarm	Alarm
5401	Sensor failure	Abnormal setting of the current monitoring range	This error occurs when the minimum value of current monitoring value exceeds the maximum value in the condition settings for the adaptive control.	Review the minimum and maximum value of the current monitoring value.	Error reset.	Alarm	Alarm
5402	Sensor failure	Abnormal setting of the voltage monitoring range	This error occurs when the minimum value of voltage monitoring value exceeds the maximum value in the condition settings for the adaptive control.	Review the minimum and maximum value of the voltage monitoring value.	Error reset.	Alarm	Alarm
5403	Sensor failure	Adaptive condition setting error	An illegal setting change of an adaptive condition was done in the tracking section. Effective and the invalidity of an adaptive control cannot be switched in the tracking section, and the number of samples of moving averages be changed.	Please confirm the specified LSR file number. Please confirm the content of the LSR file set when the specified number is correct.	Error reset.	Alarm	Alarm
5404	Sensor failure	Adaptive weaving amplitude over	Weaving amplitude specified by adaptive control exceeds maximum amplitude watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, increase maximum amplitude watch value of adaptive control.	Error reset.	Alarm	Alarm
5406	Sensor failure	ZF Posture Deviation range	This error occurs when the difference between the target posture calculated by	Check the target posture If no problems exist, moodify(enlarge) the ZF parameters or program to	Error reset.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		exceeded.	ZF instruction and the taught posture exceeds Posture deviation range.	rectify error.			
5408	Sensor failure	Maximum distance in ZN command is too long.	Target position calculated by ZN command is out of the movable area because Maximum distance in ZN command is too long.	Decrease the maximum distance in ZN command.	Error reset.	Alarm	Alarm
5410	Sensor failure	Stability waiting time over	The stability waiting time was exceeded.	(1)Modify(enlarge) stable waiting time to rectify error. (2)Modify the teaching point so that the groove is within the field of view of laser. (3)When the groove is within the field of view, modify the parameters by the software attached to the sensor so that the groove is detected normally.	Error reset.	Alarm	Alarm
5411	Sensor failure	ZJ Deviation range exceeded	This error occurs when the distance between the detected point and ZJ reference point exceeded the deviation range.	Check detected position. If no problems exist, modify(enlarge) the ZJ deviation range parameter or program to rectify error.	Error reset.	Alarm	Alarm
5412	Sensor failure	Adaptive Wire Speed Over	Wire Speed specified by adaptive control exceeds maximum wire speed watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, increase maximum wire speed watch value of adaptive control.	Error reset.	Alarm	Alarm
5413	Sensor failure	Adaptive Wire Speed Short	Wire speed specified by adaptive control becomes lower than minimum wire speed watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, decrease minimum wire speed watch value of adaptive control.	Error reset.	Alarm	Alarm
5414	Sensor failure	ZJ Area Over	Detected area is exceeded beyond maximum allowable value.	Check the area watch value(maximum) and enlarge if needed.	Error reset.	Alarm	Alarm
5415	Sensor failure	ZJ Area Short	Detected area becomes lower than minimum allowable value.	Check the area watch value(minimum) and decrease if needed.	Error reset.	Alarm	Alarm
5416	Sensor failure	ZJ Mismatch Over	Detected mismatch is exceeded beyond maximum allowable value.	Check the mismatch watch value(maximum) and enlarge if needed.	Error reset.	Alarm	Alarm
5417	Sensor failure	ZJ Mismatch Short	Detected mismatch becomes lower than minimum allowable value.	Check the mismatch watch value(minimum) and decrease if needed.	Error reset.	Alarm	Alarm
5418	Sensor failure	Search position was changed.	It differs from the position in which search position obtained reference position.	Please execute the trial movement or the edit, and get reference position again.	Error reset.	Alarm	Alarm
5419	Sensor failure	SF8 Max. Compensative-Surveilance val. Over	Contents of the register specified in SF8 exceeded beyond Max. Compensative-Surveilance val.	Check contents of the register specified in SF8. If there is no problem, increase Max. Compensative-Surveilance val. in SF8.	Error reset.	Alarm	Alarm
5420	Sensor failure	SF8 Min. Compensative-Surveilance val. Short	Contents of the register specified in SF8 becomes lower than Min. Compensative-Surveilance val.	Check contents of the register specified in SF8. If there is no problem, decrease Min. Compensative-Surveilance val. in SF8.	Error reset.	Alarm	Alarm
5421	Sensor failure	The touch detection point is abnormal.	It leaves the final instruction position too much the position in which the touch signal was detected.	Contact our service department. Back up files to external CF memory. Because the robot stop step is different to the execute step, step-set must be needed for restart.	Turn on the power again.	Alarm	Alarm
5422	Sensor failure	Adaptive EN Ratio Over	EN ratio specified by adaptive control exceeds maximum EN ratio watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, increase maximum EN ratio watch value of adaptive control.	Error reset.	Alarm	Alarm
5423	Sensor failure	Adaptive EN Ratio Short	EN ratio specified by adaptive control becomes lower than minimum EN ratio watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, decrease minimum EN ratio watch value of adaptive control.	Error reset.	Alarm	Alarm
5424	Sensor failure	Abnormal setting of the EN Ratio monitoring range	This error occurs when the minimum value of EN ratio monitoring value exceeds the maximum value in the condition settings for the adaptive control.	Review the minimum and maximum value of the EN ratio monitoring value.	Error reset.	Alarm	Alarm
5425	Sensor failure	Abnormal setting of the Wire speed monitoring range	This error occurs when the minimum value of Wire speed monitoring value exceeds the maximum value in the condition settings for the adaptive control.	Review the minimum and maximum value of the Wire speed monitoring value.	Error reset.	Alarm	Alarm
5430	Operational failure	Playback unavailable user task program because it is being used all user task.	Error occurs when it is not able to start user task program ,because used all user task or not exist user task program.	Please confirm the starting condition of user task.	Error reset.	Alarm	Alarm
5441	Sensor failure	The welding length of Test Tracking is insufficient.	Test Trackinig was not able to be completed normally, because the welding length was insufficient	Please correspond whether to lengthen the welding length or to slow down the speed or to raise the weaving frequency or to reduce one section measurement frequency of the Test Tracking setting.	No reset operations neccesary.	Alarm	Alarm
5442	Sensor failure	Test Tracking is stopped.	Test Tracking is discontinued for sensor OFF or weaving OFF.	Please OFF both sensor and weaving.	No reset operations neccesary.	Alarm	Alarm
5443	Sensor failure	Data Sending Error.	Data was not able to be sent to the sensor.	Reboot AX System. Still, there is a possibility that the increase serial board has been damaged when not released.	Turn on the power again.	Alarm	Alarm
5444	Sensor failure	Sensor Receive Data Error.	NAK frame was received from the sensor.	(1)Please confirm the connection of the cable between the robot controller system and the arc sensor unit.	Error reset.	Alarm	Alarm

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
				(2)Still, when it is not released, Control power supply is re-switched on.			
5445	Sensor failure	Sensor Send Data Error.	An abnormal frame was received from the sensor.	(1)Please confirm the connection of the cable between the robot controller system and the arc sensor unit. (2)Still, when it is not released, Control power supply is re-switched on.	After removal of failure, please carry out "failure-reset".	Alarm	Alarm
5446	Sensor failure	No Sensor Response.	Response command from the sensor was not able to be received.	(1)Please confirm the connection of the cable between the robot controller system and the arc sensor unit. (2)Still, when it is not released, Control power supply is re-switched on.	After removal of failure, please carry out "failure-reset".	Alarm	Alarm
5447	Sensor failure	Sensor ID error.	Illegal Sensor ID.	Please confirm the sensor setting.	After removal of failure, please carry out "failure-reset".	Alarm	Alarm
5448	Sensor failure	The controller could not communicate with the Sensor unit.	The controller could not communicate with the sensor unit.	Reboot AX System and sensor unit. In case that the error still occurs after rebooting, check the connection of the sensor unit to the controller.	Reboot AX system and sensor unit.	Error	Error
5449	Sensor failure	ST instruction or the sample data file is wrong.	The result of an online modification cannot be applied to the sample data.	Please set 0 to current response after executing the test tracking. If TIG-AVC, set 0 to arc standard voltage.	Error reset.	Alarm	Alarm
5500	User failure	Installation Angle is updated.	Installation Angle is updated by request from OLP.	Check [Constant Setting]->[12 Format and Configuration]->[5 Installation Angle].	No reset operations neccesary.	Alarm	Alarm
5501	User failure	Tool Constants are updated.	Tool Constants are updated by request from OLP.	Check [Constant Setting]->[3 Machine Constants]->[1 Tool Constants].	No reset operations neccesary.	Alarm	Alarm
5510	Operational failure	Playback unavailable user task program because it is being used all user task.	Error occurs when it is not able to start user task program ,because used all user task or not exist user task program.	Please confirm the starting condition of user task.	Error reset.	Information	Information
5701	Operational failure	Option un-setting up.	It generates, when it is going to use the option function which is not set up.	Please set up an option.	No reset operations neccesary.	Alarm	Alarm
5702	Operational failure	It cannot re-start.	Movement in a return position or a section state cannot be resumed.	Please re-start after a step-set out of the section.	No reset operations neccesary.	Alarm	Alarm
5703	Shift failure	The input-and-output signal is not set up.	This error occurs when the input-and-output signal is not set up.	Set up an input-and-output signal.	Error reset.	Alarm	Alarm
5704	Shift failure	Abnormality occurred by the parity check of the shift input signal.	The value of the shift input signal is not steady.	Please the parity bit of the shift input signal must normally input or confirm whether the noise has gotten on the signal.	No reset operations neccesary.	Alarm	Alarm
5705	Shift failure	Other units are running program.	This function command cannot be performed while running the program of other units.	Please perform again after stopping all units.	Error reset.	Alarm	Alarm
6005	Arc weld failure	The weaving trajectory exceeded regulation speed.	The amount of movements of weaving pattern data large, or frequency (speed) was large, the speed of a weaving trajectory exceeded regulation speed.	Please correct the amount of movements of weaving, or frequency (speed).	No reset operations neccesary.	Information	Information
6006	Arc weld failure	The amount of posture change of taught weaving exceeded the restriction value.	The amount of change of the posture of weaving pattern data is too large.	Please correct posture change of taught weaving pattern data.	Move posture change restriction-within the limits.	Information	Information
6010	Arc weld failure	The welding current value has exceeded the allowable limit.	The difference between the welding current value measured by the welding power supply and the taught one has exceeded the allowable limit set by the arc constants.	Check the welding conditions(wire extension etc). There is possibility of missmatch the welding characteristic data to your environment if this failure occurs over and over again. In such case, adjust the welding characteristic data by the adjudstment of welding condition function etc.	No reset operations neccesary.	Information	Information
6011	Arc weld failure	The welding voltage value has exceeded the allowable limit.	The difference between the welding voltage value measured by the welding power supply and the taught one has exceeded the allowable limit set by the arc constants.	Check the welding conditions(wire extension etc). There is possibility of missmatch the welding characteristic data to your environment if this failure occurs over and over again. In such case, adjust the welding characteristic data by the adjudstment of welding condition function etc.	No reset operations neccesary.	Information	Information
6014	Arc weld failure	Arc start failure.	No arc is generated after retrying.	Check the workpiece's condition, wire's condition, and connection of the cable.	No reset operations neccesary.	Information	Information
6015	Arc weld failure	Arc outage was detected.	Arc outage occurred during welding.	Eliminate all causes of arc outage, for instance by adjusting the wedling conditions, fixing wire feed failure, and so on.	No reset operations neccesary.	Information	Information
6016	Arc weld failure	Wire stick was detected.	Wire is stuck.	Cut stuck wire.	No reset operations neccesary.	Information	Information
6019	Arc weld failure	Wire shortage was detected.	Not enough wire signal is inputted.	Supply wire.	No reset operations neccesary.	Information	Information
6024	Arc weld failure	Input voltage shortage failure ocurred in the	The primary input voltage of the welding power supply has decreased.	Refer to the instruction manual of the welding power supply(Failure Name: Input voltage shortage) and eliminate all causes.	No reset operations neccesary.	Information	Information

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
		welding power supply.					
6043	Arc weld failure	The load of wire feed exceeded allowable value.	It exceeded the allowable value which the load of wire feed was set up to by the welding fixed number.	A load is on the wire feed department by wear of the liner, the chip defect, and so on. Get rid of load factors.	No reset operations neccesary.	Inform ation	Inform ation
6044	Arc weld failure	The battery of welding power supply is exhausted.	The battery of welding power supply is exhausted.	Exchange a battery because it can't be connected any more with the welding power supply.	No reset operations neccesary.	Inform ation	Inform ation
6054	Arc weld failure	WCR Short-circuit Error	WCR of W-I/F had connected too hastily at the time of an arc start.	Please check the state of W-I/F, and a welding power supply.	No reset operations neccesary.	Inform ation	Inform ation
6073	Arc weld failure	The arc rs condition file doesn't exist.	The arc rs condition file which is specified by the arc welding function doesn't exist.	Please create the rs condition file or edit the task program.	No reset operations neccesary.	Inform ation	Inform ation
6074	Arc weld failure	The cooler fan failure ocurred in the welding power supply.	The cooler fan's rotation has fallen or it stops.	Refer to the instruction manual of the welding power supply(Failure Name: The cooler fan failure) and eliminate all causes.	No reset operations neccesary.	Inform ation	Inform ation
6080	Operational failure	It was going to start the unit containing the resources under starting.	It will generate, if the unit containing the resources under starting is started.	Please start after waiting for the completion of starting.	No reset operations neccesary.	Inform ation	Inform ation
6085	Arc weld failure	Communication timeout occurred inside the welding power supply.	The contollor of the welding power supply didn't respond.	Check the route of cable and ground connection.	No reset operations neccesary.	Inform ation	Inform ation
6106	Arc weld failure	The pilot arc outage is abnormal.	The pilot arc outage occurred.	Check the connection condition of the cable.	No reset operations neccesary.	Inform ation	Inform ation
6107	Arc weld failure	Setting error of the failure limit type.	The failure limit by the rate cannot be set by the version of this welder.	In the welding constant, please set a relative value.	No reset operations neccesary.	Inform ation	Inform ation
6108	Arc weld failure	Pilot arc ON error.	The pilot arc was not able to be turned on.	Please check follows. (1)Turn off the purge. (2)Release the emergency stop. (3)Reset plasma unit error. (4)Set weld ON. (5)Set the registration of welder "PlasmaDA".	No reset operations neccesary.	Inform ation	Inform ation
6109	Arc weld failure	Purge ON error.	The purge was not able to be turned on.	Please check follows. (1)Turn off the pilot arc. (2)Release the emergency stop. (3)Reset plasma unit error.	No reset operations neccesary.	Inform ation	Inform ation
6116	Arc weld failure	The management of the consumption of the wire of the user maintenance function cannot be used.	The arc welding power supply doesn't correspond to the management of the consumption of the wire.	The upgrade should do the software of the arc welding power supply.	No reset operations neccesary.	Inform ation	Inform ation
6117	Arc weld failure	The Gas OFF Delay function cannot be used.	The arc welding power supply doesn't correspond to the Gas Off Delay function.	The upgrade should do the software of the arc welding power supply. Or, please set the Gas OFF Delay time to 0.	No reset operations neccesary.	Inform ation	Inform ation
6121	Arc weld failure	The gas mass flow value has exceeded the allowable limit.	The difference between the gas mass flow value measured by the welding power supply and the taught one has exceeded the allowable limit set with the controller.	Please confirm the remainder pressure of gas cylinder, the piping of the gas, and the setting of the gas mass flow control unit.	No reset operations neccesary.	Inform ation	Inform ation
6122	Arc weld failure	The gas pressure value has exceeded the allowable limit.	The gas pressure measured in the arc welding power supply exceeded the limiting value set with the controller.	Please confirm the remainder pressure of gas cylinder, the piping of the gas, and the setting of the gas mass flow control unit.	No reset operations neccesary.	Inform ation	Inform ation
6123	Arc weld failure	The set gas mass flow is not output.	The set gas mass flow was not output in specified time.	Please confirm the residual quantity of the gas cylinder, the piping of the gas, and the setting of the gas mass flow control unit.	No reset operations neccesary.	Inform ation	Inform ation
6237	Sensor failure	Start Point un-detected	This failure occurs when the start point is not detected during ZF search.	(1)Check the groove recognization by WinUser. (2)Enlarge the ZF maximum search range.	Error reset.	Inform ation	Inform ation
6238	Sensor failure	Cannot restart during seam tracking.	Cannot restart during seam tracking.	Do not modify the position and posture of the robot when the robot is stopped in ZT period if the restarting is required.	Error reset.	Inform ation	Inform ation
6239	Sensor failure	ZF Deviation range exceeded	This error occurs when the distance between the detected start point and ZF taught point exceeded the deviation range.	Check detected position. If no problems exist, moodify(enlarge) the ZF deviation range parameter or program to rectify error.	Error reset.	Inform ation	Inform ation
6240	Sensor failure	ZF search range exceeded	This error occurs when the robot moves beyond search range	Modify(enlarge) the search range or program to rectify error.	Error reset.	Inform ation	Inform ation
6241	Sensor failure	ZT Position Deviation range exceeded	This error occurs when the robot moves beyond Position deviation range	Check the target position If no problems exist, moodify(enlarge) the ZT parameters or program to rectify error.	Error reset.	Inform ation	Inform ation
6242	Sensor failure	ZN offset range exceeded	This error occurs when the setting offset is beyond the range	Modify(enlarge) the ZN offset to rectify error.	Error reset.	Inform ation	Inform ation
6243	Sensor failure	ZN Search range exeeced.	This error occurs when the robot moves beyond search range during ZN.	Modify(enlarge) the ZN search range or program to rectify error.	Error reset.	Inform ation	Inform ation
6245	Sensor failure	Deviation range exceeded.	This error occurs when the distance between the detected end point and taught point before ZE exceeded the deviation range.	Check the detected point. If no problems exist, Modify(enlarge) the deviation range or program to rectify error.	Error reset.	Inform ation	Inform ation

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
6249	Sensor failure	ZT Posture Deviation range exceeded	This error occurs when the robot moves beyond Posture deviation range	Check the target posture If no problems exist, moodify(enlarge) the ZT parameters or program to rectify error.	Error reset.	Inform ation	Inform ation
6294	Sensor failure	Adaptive welding current over	Welding current specified by adaptive control exceeds maximum current watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, increase maximum current watch value of adaptive control.	Error reset.	Inform ation	Inform ation
6295	Sensor failure	Adaptive welding current short	Welding current specified by adaptive control becomes lower than minimum current watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, decrease minimum current watch value of adaptive control.	Error reset.	Inform ation	Inform ation
6296	Sensor failure	Adaptive welding voltage over	Welding voltage specified by adaptive control exceeds maximum voltage watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, increase maximum voltage watch value of adaptive control.	Error reset.	Inform ation	Inform ation
6297	Sensor failure	Adaptive welding voltage short	Welding voltage specified by adaptive control becomes lower than minimum voltage watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, decrease minimum voltage watch value of adaptive control.	Error reset.	Inform ation	Inform ation
6298	Sensor failure	Adaptive travel speed over	Travel speed specified by adaptive control exceeds maximum speed watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, increase maximum speed watch value of adaptive control.	Error reset.	Inform ation	Inform ation
6299	Sensor failure	Adaptive travel speed short	Travel speed specified by adaptive control becomes lower than minimum speed watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, decrease minimum speed watch value of adaptive control.	Error reset.	Inform ation	Inform ation
6300	Sensor failure	Search range exceeded.	This error occurs when the robot moves beyond search range	Modify(enlarge) the search range or program to rectify error.	No reset operations neccesary.	Inform ation	Inform ation
6301	Sensor failure	Search range is short	This error occurs when the robot detect the touch status within minimum search range.	Modify(shorten) the search range or program to rectify error.	No reset operations neccesary.	Inform ation	Inform ation
6302	Sensor failure	Deviation range exceeded.	This error occurs when the robot moves beyond deviation range	Modify(enlarge) the deviation range or program to rectify error.	No reset operations neccesary.	Inform ation	Inform ation
6303	Sensor failure	Gap Over	Detected gap is exceeded beyond maximum allowable value.	Check that gap amount and modify allowable value if needed.	Error reset.	Inform ation	Inform ation
6304	Sensor failure	Gap short	Detected gap becomes lower than minimum allowable value.	Check that gap amount and modify allowable value if needed.	Error reset.	Inform ation	Inform ation
6305	Sensor failure	Groove depth over	Detected groove depth is exceeded beyond maximum allowable value.	Check that groove depth amount and modify allowable value if needed.	Error reset.	Inform ation	Inform ation
6306	Sensor failure	Groove depth short	Detected groove depth becomes lower than minimum allowable value.	Check that groove depth amount and modify allowable value if needed.	Error reset.	Inform ation	Inform ation
6307	Sensor failure	Angle1 over	Detected angle1 is exceeded beyond maximum allowable value.	Check that angle1 amount and modify allowable value if needed.	Error reset.	Inform ation	Inform ation
6308	Sensor failure	Angle1 short	Detected angle1 becomes lower than minimum allowable value.	Check that angle1 amount and modify allowable value if needed.	Error reset.	Inform ation	Inform ation
6309	Sensor failure	Angle2 over	Detected angle2 is exceeded beyond maximum allowable value.	Check that angle2 amount and modify allowable value if needed.	Error reset.	Inform ation	Inform ation
6310	Sensor failure	Angle2 short	Detected angle2 becomes lower than minimum allowable value.	Check that angle2 amount and modify allowable value if needed.	Error reset.	Inform ation	Inform ation
6311	Sensor failure	Groove un-detected	Groove position cannot be detected	Check setting parameters in GFF file.	Error reset.	Inform ation	Inform ation
6312	Sensor failure	Unstable detection	This error occurs when measured data is unstable.	Check that target surface condition and/or measurement angle.	Error reset.	Inform ation	Inform ation
6330	Sensor failure	Correction amount by arc-sensor exceeds specified value.	Error is activated when the case that correction amount by the sensor exceeds the specified value in teaching parameter.	Check that currect torch position. If it is OK, extend the value CHASING RANGE in teaching parameter. If it is NG, try to adjust sensor parameters.	Error reset.	Inform ation	Inform ation
6331	Sensor failure	Calculation turns to unstable during arc-sensing process.	This error is activated when stability of welding arc decreased significantly.	Check that welding condition to be stable.	Error reset.	Inform ation	Inform ation
6332	Sensor failure	Welding position cannot be detected	This error is activated when the deviation detection cannot be calculated during arc-sensing process. Note that position correction is not executed.	Try to re-adjust sensing parameters.	Error reset.	Inform ation	Inform ation
6333	Sensor failure	Unstable wire-feeding.	Wire-feeding status turn to unstable. Deviation is lager than specified value.	Check that equipments for wire feeding.	Error reset.	Inform ation	Inform ation
6334	Sensor failure	ST parameter error.	The instruction parameter of ST command is over the setting range.	It improves whether each parameter is setting within the limits.	Error reset.	Inform ation	Inform ation
6335	Sensor failure	ZJ Deviation range exceeded	This error occurs when the distance between the detected point and ZJ reference point exceeded the deviation range.	Check detected position. If no problems exist, modify(enlarge) the ZJ deviation range parameter or program to rectify error.	Error reset.	Inform ation	Inform ation
6336	Sensor failure	Adaptive Wire Speed Over	Wire Speed specified by adaptive control exceeds maximum wire speed watch	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK,	Error reset.	Inform ation	Inform ation

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
			value of adaptive control.	increase maximum wire speed watch value of adaptive control.			
6337	Sensor failure	Adaptive Wire Speed Short	Wire speed specified by adaptive control becomes lower than minimum wire speed watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, decrease minimum wire speed watch value of adaptive control.	Error reset.	Information	Information
6338	Sensor failure	ZJ Area Over	Detected area is exceeded beyond maximum allowable value.	Check the area watch value(maximum) and enlarge if needed.	Error reset.	Information	Information
6339	Sensor failure	ZJ Area Short	Detected area becomes lower than minimum allowable value.	Check the area watch value(minimum) and decrease if needed.	Error reset.	Information	Information
6340	Sensor failure	ZJ Mismatch Over	Detected mismatch is exceeded beyond maximum allowable value.	Check the mismatch watch value(maximum) and enlarge if needed.	Error reset.	Information	Information
6341	Sensor failure	ZJ Mismatch Short	Detected mismatch becomes lower than minimum allowable value.	Check the mismatch watch value(minimum) and decrease if needed.	Error reset.	Information	Information
6342	Sensor failure	Adaptive EN Ratio Over	EN ratio specified by adaptive control exceeds maximum EN ratio watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, increase maximum EN ratio watch value of adaptive control.	Error reset.	Information	Information
6343	Sensor failure	Adaptive EN Ratio Short	EN ratio specified by adaptive control becomes lower than minimum EN ratio watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, decrease minimum EN ratio watch value of adaptive control.	Error reset.	Information	Information
6404	Sensor failure	Adaptive weaving amplitude over	Weaving amplitude specified by adaptive control exceeds maximum amplitude watch value of adaptive control.	Check the lists of the specified spreadsheet in the sensor controller by WinUser. If the spreadsheet is OK, increase maximum amplitude watch value of adaptive control.	Error reset.	Information	Information
7000	User failure	User failure.	User failure.	Please carry out "failure-reset".	Error reset.	Error	Error
9001	Emergency stop failure	The robot's joint angle before and behind a record point was not in agreement.	The robot's joint angle was not in agreement at the starting point of this step and the target point of this step.	Contact our service department. Back up files to external CF memory. Because the robot stop step is different to the execute step, step-set must be needed for restart.	Error reset.	Alarm	Error
9002	Emergency stop failure	The amount of step movements is abnormal.	The result which added the amount of step movements to the robot's joint angle in a starting point is not in agreement with the robot joint angle in a target point.	Contact our service department. Back up files to external CF memory. Because the robot stop step is different to the execute step, step-set must be needed for restart.	Error reset.	Alarm	Error
9003	Operational failure	Abnormal velocity command. Modify abnormal axis motion.	Abnormal velocity command data is calculated.	Modify abnormal axis motion to be minimized. Contact our service department in case axis motion is not so big. Back up files to external CF memory. Because the robot stop step is different to the execute step, step-set must be needed for restart.	After removal of failure, please carry out "failure-reset".	Error	Error
9005	Servo failure	Position Deviation error	This failure occurs when the deviation between the command and encoder data position exceeds the set permissible deviation.	(1)Please confirm whether the robot manipulator interferes in something.(2)Please confirm that the Pay-load is within the nominal rating.(3)If failure persists, the problem may be a mechanical defect in the manipulator, contact our service department.	After removal of failure, please carry out "failure-reset".	Error	Error
9012	Emergency stop failure	The amount of step movements is abnormal.	The result which added the amount of step movements to the robot's joint angle in a starting point is not in agreement with the robot joint angle in a target point.	Contact our service department. Back up files to external CF memory. Because the robot stop step is different to the execute step, step-set must be needed for restart.	Turn on the power again.	Error	Error
9020	CPU board failure	Error of Interpolation Stop.	Motion control section detected the Time-out Error of Interpolation Stop.	Contact our service department. Back up files to external CF memory. Because the robot stop step is different to the execute step, step-set must be needed for restart.	Error reset.	Error	Error
9021	CPU board failure	Error of Waiting for arriving of target position.	Robot has not arrived at target position.	Contact our service department. Back up files to external CF memory. Because the robot stop step is different to the execute step, step-set must be needed for restart.	Error reset.	Error	Error
9022	CPU board failure	Error of Waiting for arriving of accuracy position.	Robot has not arrived at target position accurately.	Contact our service department. Back up files to external CF memory. Because the robot stop step is different to the execute step, step-set must be needed for restart.	Error reset.	Error	Error
9023	CPU board failure	Error of interruption of Position Command.	Position Command interrupted.	Contact our service department. Back up files to external CF memory. Because the robot stop step is different to the execute step, step-set must be needed for restart.	Error reset.	Error	Error
9024	CPU board failure	Error of mechanism resource acquisition.	Motion control section didn't acquire mechanism resource.	Contact our service department. Back up files to external CF memory.	Error reset.	Error	Error
9025	CPU board failure	Safety slow speed error	Robot speed does not become safety level.	Contact our service department. Back up files to external CF memory. Because the robot stop step is different to the execute step, step-set must be needed for restart.	Error reset.	Error	Error
9026	CPU board failure	Stop Release error	Stop command of Motion control section was not released.	Contact our service department. Back up files to external CF memory. Because the robot stop step is different to the execute step, step-set must be needed	Error reset.	Error	Error

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
				for restart.			
9028	CPU board failure	Motion Calculation error	Motion control section detected Calculation error.	Contact our service department. Back up files to external CF memory. Because the robot stop step is different to the execute step, step-set must be needed for restart.	Because the robot stop step is different to the execute step, step-set must be needed for restart. Error reset.	Error	Error
9030	Emergency stop failure	Error of brake delay in interference detection.	The axis that the brake doesn't lock even if prescribed time has passed since interference was detected exists..	Turn motors ON by pressing the Motor-ON button..	Please do error reset or turn on the drive preparation.	Error	Error
9031	Control failure	Extremely frequent input-signal was detected.	Frequent input-signal caused system busy.	Check input-signal.	Turn on the power again.	Error	Error
9032	Emergency stop failure	Reducer modeling reverse amends error.	When reversely making amends by the reducer modeling, the amount of amends exceeded a specified value.	Contact our service department. Back up files to external CF memory. Because the robot stop step is different to the execute step, step-set must be needed for restart.	Error reset.	Error	Error
9100	Emergency stop failure	Stop interpolation	Motion control section stopped the calculation of interpolation.	Contact our service department. Back up files to external CF memory. Because the robot stop step is different to the execute step, step-set must be needed for restart.	Turn on the power again.	Error	Error
9101	Emergency stop failure	Exceed operation time	The robot dose not work continuously.	Contact our service department. Back up files to external CF memory.	Turn on the power again.	Error	Error
9102	Emergency stop failure	Playback cannot be continued.	I/O signal was not able to be processed.	Contact our service department. Back up files to external CF memory.	Turn on the power again.	Error	Error
9103	CPU board failure	System Error (RT_BREAKPOINT).	A breakpoint was encountered.	Turn on the power again. If the error is not released, reinstall the system.	Turn on the power again.	Error	Error
9105	CPU board failure	System Error (RT_ACCESS_VIO LATION).	The thread attempted to read from or write to a virtual address for which it does not have the appropriate access.	Turn on the power again. If the error is not released, reinstall the system.	Turn on the power again.	Error	Error
9113	CPU board failure	System Error (RT_FLT_DENOR MAL_OPERAND).	One of the operands in a floating-point operation is denormal. A denormal value is one that is too small to represent as a standard floating-point value.	Turn on the power again. If the error is not released, reinstall the system.	Turn on the power again.	Error	Error
9114	CPU board failure	System Error (RT_FLT_DIVIDE_ BY_ZERO).	The thread attempted to divide a floating-point value by a floating-point divisor of zero.	Turn on the power again. If the error is not released, reinstall the system.	Turn on the power again.	Error	Error
9115	CPU board failure	System Error (RT_FLT_INEXACT _RESULT).	The result of a floating-point operation cannot be represented exactly as a decimal fraction.	Turn on the power again. If the error is not released, reinstall the system.	Turn on the power again.	Error	Error
9116	CPU board failure	System Error (RT_FLT_INVALID _OPERATION).	This exception represents any floating-point exception not included in this list.	Turn on the power again. If the error is not released, reinstall the system.	Turn on the power again.	Error	Error
9117	CPU board failure	System Error (RT_FLT_OVERFL OW).	The exponent of a floating-point operation is greater than the magnitude allowed by the corresponding type.	Turn on the power again. If the error is not released, reinstall the system.	Turn on the power again.	Error	Error
9119	CPU board failure	System Error (RT_FLT_UNDERF LOW).	The exponent of a floating-point operation is less than the magnitude allowed by the corresponding type.	Turn on the power again. If the error is not released, reinstall the system.	Turn on the power again.	Error	Error
9120	CPU board failure	System Error (RT_INT_DIVIDE_ BY_ZERO).	The thread attempted to divide an integer value by an integer divisor of zero.	Turn on the power again. If the error is not released, reinstall the system.	Turn on the power again.	Error	Error
9129	CPU board failure	System Error (RT_ILLEGAL_INS TRUCTION).	The method has terminated due to invalid parameters or property values.	Turn on the power again. If the error is not released, reinstall the system.	Turn on the power again.	Error	Error
9144	CPU board failure	System Error (MailBox Timeout Error).	System Error. MailBox Timeout.	(1)Please turn on the power again.(2)Please connect and disconnect CPU board or system CF.(3)Please reinstall the system.(4)Please replace the CPU board.	Turn on the power again.	Error	Error
9151	Emergency stop failure	Stop interpolation by system busy	Motion control section stopped the calculation of interpolation.	Contact our service department. Back up files to external CF memory.	Error reset.	Error	Error
9152	CPU board failure	The Hibernation is not enabled.	Because abnormality occurred when Hibernation file is made, the Hibernation is not enabled. (Details) (1)Device opening abnormality of D drive. (2)Hibernationfile cannot be made. (3)Can not lock D drive. (4)Can not dismount D drive.(5)Can not unlock D drive.	Turn on the power again. If the error is not released, contact our service department. Back up files to external CF memory.	Error reset.	Error	Error
9153	CPU board failure	An internal memory is not nomally allocated.	When initialize AX,an internal memory is not nomally allocated.	(1)Turn on the power again. If the error is not released, contact our service department.(2)Please replace system CF.	Turn on the power again.	Error	Error
9200	CPU board failure	Motion process is not recognized.	Can't recongnize Motion process.	Turn on the power again. If the error is not released, reinstall the system.	Turn on the power again.	Error	Error
9204	CPU board failure	I/O system is not recognized.	Can't recognize I/O system.	Turn on the power again. If the error is not released, reinstall the system.	Turn on the power again.	Error	Error
9208	CPU board	Servo	This failure occurs when the	(1)Please confirm whether connector of the drive unit	After removal of	Error	Error

No	Classification	Condition	Contents	Measure	Release	Teach	Playback
	failure	communication initialization failure	communication between CPU board and the drive unit (the servo board) cannot begin.	(RIX:CNUSB, RKX:CNCOM) is correctly connected. (2)Please confirm the power-supply voltage of 5V to the drive unit.(RIX only:CNP5V) (3)Please replace the drive unit. (4)Please replace the CPU board.	failure, please turn on power supply of the controller again.		
9209	Amplifier unit failure	Brake fuse off	This failure occurs when the fuse F1-1 or F1-2 or F1-3 on brake control substrate UM222(L8800Y) was cut.	Please exchange the brake fuse.	After removal of failure, please carry out "failure-reset".	Error	Error
9210	Amplifier unit failure	Brake fuse off.(additional axis)	This failure occurs when the fuse F1-1 or F1-2 on brake control substrate UM226(L9172Y) was cut.	Please exchange the brake fuse.	After removal of failure, please carry out "failure-reset".	Error	Error
9211	Amplifier unit failure	Contact of brake power control relay was stuck	This failure occurs when the contact of brake power control relay (CRBC1) on brake control substrate UM222 was stuck.	Please exchange the brake control substrate UM222 referring to "AX controller maintenance manual".	After removal of failure, please turn on power supply of the controller again.	Error	Error
9213	Amplifier unit failure	Drive unit power failure	This failure occurs when drive unit power PG15(+15V) was not supplied.	Please replace the drive unit.	After removal of failure, please carry out "failure-reset".	Error	Error
9214	Amplifier unit failure	Over temperature of motor.(additional axis)	This failure occurs when the motor temperature rises abnormally.	(1)Please confirm that the Pay-load is within the nominal rating.(2)Please confirm the wiring of the motor thermostat refering to "Manipulator Maintenance Manual".(3)Please stop the robot in order to lowering the motor temperature, and restart.(4)If failure persists, please lower the operation speed of the robot.	After removal of failure, please carry out "failure-reset".	Error	Error
9215	Amplifier unit failure	Over temperature of regenerative discharge resister.(additional axis)	This failure occurs when the temperature of the regenerative discharge resister rises abnormally.	(1)Check the fans are operating.(2)Please secure space 20cm or more in backside of controller.(3)Please check wiring of the thermostat for regenerative discharge resister.(4)Please confirm the CNSV connector of the sequence PCB is connected.	After removal of failure, please carry out "failure-reset".	Error	Error
9216	Control failure	Low voltage of sequence control power supply	This failure occurs when the voltage of sequence control power supply P1(24V) is decreases.	(1)Please confirm the voltage of sequence control power supply P1(24V). (2)Please confirm sequence control power supply connector CNP is correctly connected. (3)Please confirm the external signal wire of I/O is correctly connected. (4)Please exchange the power supply unit. (5)Please exchange the I/O sequence substrate.	After removal of failure, please turn on power supply of the controller again.	Error	Error
9217	Amplifier unit failure	Servo shared memory abnormal	This failure occurs when reading or wrinting data to the shared memory between servo communication CPU and servo CPU was not successfully finished.	Please replace the drive unit.	After removal of failure, please turn on power supply of the controller again.	Error	Error
9218	CPU board failure	Servo CPU(#2) DP memory error.	Servo CPU(#2) D.P.memory error	Replace the Drive Unit.	No reset operations.	Error	Error
9219	CPU board failure	Servo CPU(#3) DP memory error.	Servo CPU(#3) D.P.memory error	Replace the Drive Unit.	No reset operations.	Error	Error
9220	Servo failure	The inconsistency was detected with the servo failure.	This failure occurs when the inconsistency was detected in servo failure.	(1)Please confirm whether the cable connected with CNSV, CNSVA, and CNEX has been disconnected. (2)Please confirm whether the preparation of the servo system is completely finished. (3)Please replace the drive unit. (4)Please exchange the I/O sequence substrate.	After removal of failure, please turn on power supply of the controller again.	Error	Error
9225	CPU board failure	Servo CPU(#1 axis) is not ready.	Nothing acknowledge form servo CPU(#1 axis)	Replace the Drive Unit.	No reset operations.	Error	Error
9226	CPU board failure	Servo CPU(#2 axis) is not ready.	Nothing acknowledge form servo CPU(#2 axis)	Replace the Drive Unit.	No reset operations.	Error	Error
9227	CPU board failure	Servo CPU(#3 axis) is not ready.	Nothing acknowledge form servo CPU(#3 axis)	Replace the Drive Unit.	No reset operations.	Error	Error
9228	CPU board failure	Servo CPU(#4 axis) is not ready.	Nothing acknowledge form servo CPU(#4 axis)	Replace the Drive Unit.	No reset operations.	Error	Error
9229	Amplifier unit failure	Brake fuse off.(F1)	This failure occurs when the fuse F1 on servo substrate UM300 was cut.	(1)Please exchange the brake fuse. (2)Please confirm if brake wire was disconnect.	After removal of failure, please carry out "failure-reset".	Error	Error
9230	Amplifier unit failure	Brake fuse off.(F2)	This failure occurs when the fuse F2 on servo substrate UM300(L20400X) was cut.	(1)Please exchange the brake fuse. (2)Please confirm if brake wire was disconnect.	After removal of failure, please carry out "failure-reset".	Error	Error
9231	Amplifier unit failure	Brake fuse off.(F3)	This failure occurs when the fuse F3 on servo substrate UM300(L20400X) was cut.	(1)Please exchange the brake fuse. (2)Please confirm if brake wire was disconnect.	After removal of failure, please carry out "failure-reset".	Error	Error
9232	Amplifier unit failure	Additional servo substrate brake fuse off.(F1 or F2)	This failure occurs when the fuse F1 or F2 on additional servo substrate UM304(L20752C) was cut.	(1)Please exchange the brake fuse. (2)Please confirm if brake wire was disconnect.	After removal of failure, please carry out "failure-reset".	Error	Error
9233	CPU board failure	Servo CPU(#9 axis) is not ready.	Nothing acknowledge form servo CPU(#9 axis)	Replace the Drive Unit.	No reset operations.	Error	Error

NOTE

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