

- 24-hour Telephone Number: (937) 847-3200

Use for urgent or emergency needs for technical support, service and/or replacement parts

- Routine Technical Inquiries: techsupport@motoman.com

Allow up to 36 hours for response

YRC1000 MAINTENANCE MANUAL

Procedures described in this maintenance manual should be carried out by the person who took the maintenance-relevant trainings offered by YASKAWA.

Upon receipt of the product and prior to initial operation, read these instructions thoroughly, and retain for future reference.

MOTOMAN INSTRUCTIONS

MOTOMAN-□□□ INSTRUCTIONS

YRC1000 INSTRUCTIONS

YRC1000 OPERATOR'S MANUAL (GENERAL) (SUBJECT SPECIFIC)

YRC1000 MAINTENANCE MANUAL

YRC1000 ALARM CODES (MAJOR ALARMS) (MINOR ALARMS)

Have the following information available when contacting the YASKAWA Representative:

- System
- Primary Application
- Software Version (*Located on Programming Pendant by selecting: {Main Menu} - {System Info} - {Version}*)
- Warranty ID (*Located on Robot Controller*)
- Robot Serial Number (*Located on Manipulator data plate*)
- Robot Sales Order Number (*Located on Robot controller data plate*)



DANGER

- This manual explains maintenance procedures of the YRC1000 system. Read this manual carefully and be sure to understand its contents before handling the YRC1000. Any matter not described in this manual must be regarded as “prohibited” or “improper”.
- General information related to safety are described in “Chapter 1. Safety” of the “YRC1000 INSTRUCTIONS”. To ensure correct and safe operation, carefully read “Chapter 1. Safety” of the YRC1000 INSTRUCTIONS.



CAUTION

- In some drawings in this manual, protective covers or shields are removed to show details. Make sure that all the covers or shields are installed in place before operating this product.
- YASKAWA is not responsible for incidents arising from unauthorized modification of its products. Unauthorized modification voids the product warranty.

NOTICE

- The drawings and photos in this manual are representative examples and differences may exist between them and the delivered product.
- YASKAWA may modify this model without notice when necessary due to product improvements, modifications, or changes in specifications. If such modification is made, the manual number will also be revised.
- If your copy of the manual is damaged or lost, contact a YASKAWA representative to order a new copy. Be sure to tell the representative the manual number listed on the front cover.

Notes for Safe Operation

Read this manual carefully before installation, operation, maintenance, or inspection of your product.

In this manual, the Notes for Safe Operation are classified as “DANGER”, “WARNING”, “CAUTION”, or “NOTICE”.



DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. Safety Signs identified by the signal word DANGER should be used sparingly and only for those situations presenting the most serious hazards.



WARNING

Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury. Hazards identified by the signal word WARNING present a lesser degree of risk of injury or death than those identified by the signal word DANGER.



CAUTION

Indicates a hazardous situation, which if not avoided, could result in minor or moderate injury. It may also be used without the safety alert symbol as an alternative to “NOTICE”.

NOTICE

NOTICE is the preferred signal word to address practices not related to personal injury. The safety alert symbol should not be used with this signal word. As an alternative to “NOTICE”, the word “CAUTION” without the safety alert symbol may be used to indicate a message not related to personal injury.

Even items described as “CAUTION” may result in a serious accident in some situations.



To ensure safe and efficient operation at all times, be sure to follow all instructions, even if not designated as “DANGER”, “WARNING” and “CAUTION”.



DANGER

- Before operating the manipulator, make sure the servo power is turned OFF by performing the following operations. When the servo power is turned OFF, the SERVO ON LED on the programming pendant is turned OFF.
 - Press the emergency stop buttons on the front door of the YRC1000, on the programming pendant, on the external control device, etc.
 - Disconnect the safety plug of the safety fence. (when in play mode or in remote mode)

If operation of the manipulator cannot be stopped in an emergency, personal injury and/or equipment damage may result.

Fig. : Emergency Stop Button



- Before releasing the emergency stop, make sure to remove the obstacle or error caused the emergency stop, if any, and then turn the servo power ON.

Failure to observe this instruction may cause unintended movement of the manipulator, that may result in personal injury.

Fig. : Release of Emergency Stop



- Observe the following precautions when performing a teaching operation within the manipulator's operating range:
 - Be sure to perform lockout by putting a lockout device on the safety fence when going into the area enclosed by the safety fence. In addition, the operator of the teaching operation must display the sign that the operation is being performed so that no other person closes the safety fence.
 - View the manipulator from the front whenever possible.
 - Always follow the predetermined operating procedure.
 - Always keep in mind emergency response measures against the manipulator's unexpected movement toward a person.
 - Ensure a safe place to retreat in case of emergency.

Failure to observe this instruction may cause improper or unintended movement of the manipulator, that may result in personal injury.

- Confirm that no person is present in the manipulator's operating range and that the operator is in a safe location before:
 - Turning ON the YRC1000 power
 - Moving the manipulator by using the programming pendant
 - Running the system in check mode
 - Performing automatic operations

Personal injury may result if a person enters the manipulator's operating range during operation. Immediately press an emergency stop button whenever there is a problem. The emergency stop buttons are located on the front panel of the YRC1000 and on the upper right of the programming pendant.

- Read and understand the Explanation of the Warning Labels before operating the manipulator.



WARNING

- Perform the following inspection procedures prior to conducting manipulator teaching. If there is any problem, immediately take necessary steps to solve it, such as maintenance and repair.
 - Check for a problem in manipulator movement.
 - Check for damage to insulation and sheathing of external wires.
- Always return the programming pendant to the hook on the YRC1000 cabinet after use.

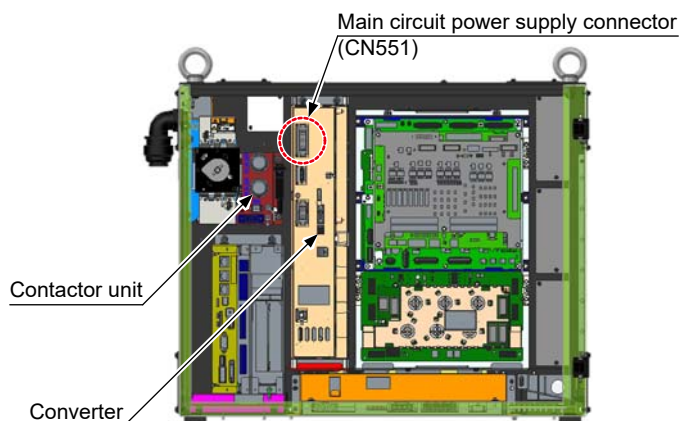
If the programming pendant is left unattended on the manipulator, on a fixture, or on the floor, etc., the Enable Switch may be activated due to surface irregularities of where it is left, and the servo power may be turned ON. If the operation of the manipulator starts, the manipulator or the tool may hit the programming pendant left unattended, that may result in personal injury and/or equipment damage.



CAUTION

- If the primary power supply breaker in the YRC1000 has tripped, use the following procedure to troubleshoot the problem before turning the power supply ON again.
 - ① Open the door, disconnect the main circuit power supply input connector (CN551) of the converter, and then close the door. Next, turn the power supply ON again.
 - ② If the welding alarm on the contactor unit has occurred after the power supply was turned ON, the issue may be welding caused by a converter fault. Refer to chapter 5 and replace both the contactor unit and converter.
 - ③ After the components have been replaced, connect the main circuit power supply input connector (CN551) to the converter, and then turn the power supply ON again.

If the power supply to the YRC1000 is turned ON again with a method other than that described above, the devices in the YRC1000 may be damaged.



Definition of Terms Used Often in This Manual

The MOTOMAN is the YASKAWA industrial robot product.

The MOTOMAN usually consists of the manipulator, the controller, the programming pendant, and manipulator cables.

In this manual, the equipment is designated as follows.

Equipment	Manual Designation
YRC1000 controller	YRC1000
YRC1000 programming pendant	Programming pendant
Cable between the manipulator and the controller	Manipulator cable

Descriptions of the programming pendant keys, buttons, and displays are shown as follows:

Equipment	Manual Designation
Programming Pendant	Character Keys /Symbol Keys The keys that have characters or symbols printed on them are denoted with []. e.g. [ENTER]
	Axis Keys /Numeric Keys [Axis Key] and [Numeric Key] are generic names for the keys for axis operation and number input.
	Keys pressed simultaneously When two keys are to be pressed simultaneously, the keys are shown with a "+" sign between them, e.g. [SHIFT]+[COORD].
	Mode Switch Mode Switch can select three kinds of modes that are denoted as follows: REMOTE, PLAY or TEACH. (The switch names are denoted as symbols)
	Button The three buttons on the upper side of the programming pendant are denoted as follows: START, HOLD, or EMERGENCY STOP. (The button names are denoted as symbols)
	Displays The menu displayed in the programming pendant is denoted with { }. e.g. {JOB}



Description of the Operation Procedure

In the explanation of the operation procedure, the expression “Select . . .” means that the cursor is moved to the object item and [SELECT] is pressed, or that the item is directly selected by touching the screen.

Registered Trademark

In this manual, names of companies, corporations, or products are trademarks, registered trademarks, or brand names for each company or corporation. The indications of (R) and TM are omitted.

Explanation of Warning Labels

The following warning labels are attached to the manipulator and YRC1000.
Fully comply with the precautions on the warning labels.


DANGER

- The label described below is attached to the manipulator.

Observe the precautions on the warning labels.
Failure to observe this caution may result in injury or damage to equipment.
Refer to the manipulator manual for the warning label location.

Collision hazard label



NJ4032

Crush hazard label



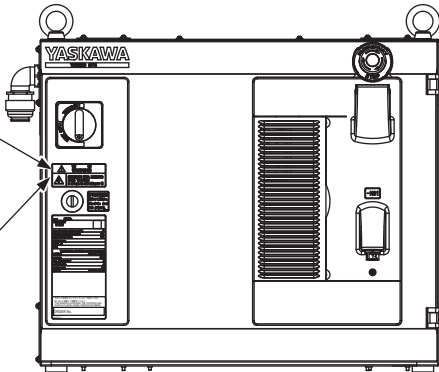
NJ4036

- The following warning labels are attached to YRC1000.

Observe the precautions on the warning labels.
Failure to observe this warning may result in injury or damage to equipment.

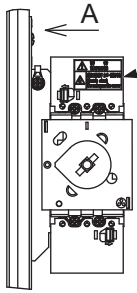


For Japan, Asia, North America



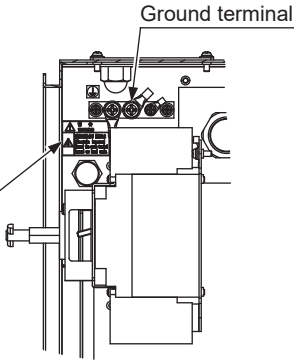


For Europe



Internal Breaker





View A: Ground terminal



Contents

1	Equipment Configuration	1-1
1.1	Arrangement of Units and Circuit Boards	1-1
1.1.1	Arrangement.....	1-1
1.2	Power Flow	1-11
1.3	Signal Flow	1-18
2	Security System	2-1
2.1	Protection Through Security Mode Settings	2-1
2.1.1	Security Mode	2-1
2.1.1.1	Changing the Security Mode	2-6
2.1.2	User ID	2-9
2.1.2.1	Changing a User ID.....	2-9
2.1.3	Main CPU SD Card ID.....	2-11
3	Inspections.....	3-1
3.1	Regular Inspections.....	3-1
3.2	YRC1000 Inspections	3-2
3.2.1	Checking If the Doors Are Firmly Closed	3-2
3.2.2	Checking for Gaps or Damage in the Sealed Construction Section.....	3-2
3.3	Cooling Fan and Air Filter Inspections.....	3-3
3.3.1	Cooling Fan Inspections	3-3
3.3.2	Air Filter Inspection and Cleaning Procedure	3-5
3.4	Emergency Stop Button Inspections.....	3-7
3.5	Enable Switch Inspections.....	3-7
3.6	Battery Inspections	3-8
3.7	Power Supply Voltage Confirmation	3-8
3.8	Open Phase Check.....	3-10
4	Preparation before Replacing Parts.....	4-1
4.1	Creating a Check Program	4-4
4.2	Advanced Preparations for Replacing the Programming Pendant	4-5
5	Replacing Parts.....	5-1
5.1	Replacing YRC1000 Parts.....	5-1
5.1.1	Replacing Parts of the CPU Unit	5-5
5.1.1.1	Replacing the CPU Board (JANCD-ACP01-E).....	5-6
5.1.1.2	Replacing the Robot I/F Board (JZNCD-AIF01-□E)	5-14

Contents

5.1.1.3	Replacing the Battery	5-20
5.1.1.4	Replacing the SD Card.....	5-27
5.1.2	Replacing the General-Purpose I/O Board (JANCD-AIO0□-E)	5-30
5.1.3	Replacing the Safety Circuit Board (JANCD-ASF01-E).....	5-33
5.1.4	Replacing the Inverter Unit (CSRA-SDA□□H01A).....	5-36
5.1.5	Replacing the Converter (CSRA-CV□□□□□□)	5-44
5.1.6	Replacing the Power Supply Contactor Unit (JZRCR-APU0□-1)	5-48
5.1.7	Replacing the Control Power Supply Unit (CSRA-CPS01K□).....	5-50
5.1.8	Replacing Fuses	5-53
5.1.8.1	Power Supply Contactor Unit	5-53
5.1.8.2	General-Purpose I/O Board	5-54
5.1.8.3	Servo Control Board	5-55
5.1.9	Replacing Backside Duct Fan.....	5-56
5.1.10	Replacing the Air Filter of the Heat Exchanger.....	5-58
5.1.11	Replacing the Fan of the Heat Exchanger	5-60
5.1.11.1	Replacing the Interior Fan	5-60
5.1.11.2	Replacing the Exterior Fan	5-62
5.1.12	Replacing the Filter and the Filter Kit of the Heat Exchanger	5-65
5.1.12.1	TCMSY-312DC.....	5-65
5.1.12.2	TCMSY-320DC, TCMSY-322DC.....	5-67
5.1.13	Replacing the Fan of the Heat Exchanger	5-68
5.1.13.1	Replacing the Interior Fan *Common to each heat exchanger.....	5-68
5.1.13.2	Replacing the Exterior Fan (TCMSY-312DC).....	5-70
5.1.13.3	Replacing the Exterior Fan (TCMSY-320DC, TCMSY-322DC).....	5-73
5.1.14	Replacing the Power Supply for the Manipulator Fan	5-75
5.1.15	Replacing the Single-Axis Amplifier (CSRA-SDB□□HA)	5-77
5.1.16	Replacing the Fan Control Relay.....	5-78
5.1.17	Replacing the Programming Pendant.....	5-79
5.1.17.1	Installing Advanced Preparation Data	5-79
5.1.18	Replacing the Control Power Supply Unit Fans (CSRA-CPS01KB-FN).....	5-80
5.2	YRC1000 Parts List	5-83
5.3	Supplied Parts List.....	5-86
5.4	Recommended Spare Parts.....	5-87
5.5	Confirming Revision Number of YRC1000 Replacement Circuit Board	5-99
6	Operations after Replacing Parts	6-1
6.1	Home Position Calibration	6-3
6.1.1	Home Position Calibration	6-3

Contents

6.1.2	Calibrating Operation.....	6-4
6.1.2.1	Registering All Axes at One Time	6-4
6.1.2.2	Registering Individual Axes	6-6
6.1.2.3	Changing the Absolute Data	6-7
6.1.2.4	Clearing Absolute Data	6-8
6.1.3	Home Position Posture of Manipulator	6-9
6.2	Position Deviation Check Using the Check Program.....	6-10
6.3	Checking of the Check Program.....	6-11
6.3.1	Motion of the Check Program.....	6-11
6.3.2	Checking of the Check Program.....	6-11
6.3.3	Home Position Data Correction	6-12
6.4	Setting the Second Home Position (Check Point)	6-13
6.4.1	Purpose of Position Check Operation	6-15
6.4.2	Procedure for the Second Home Position Setting (Check Point)	6-17
6.4.3	Procedure after the Alarm	6-18
7	System Diagnosis	7-1
7.1	System Version.....	7-1
7.2	Manipulator Model	7-1
7.3	Input/Output Status.....	7-2
7.3.1	General-Purpose Input	7-2
7.3.1.1	GENERAL PURPOSE Input Window.....	7-2
7.3.1.2	General-Purpose Simple Window	7-2
7.3.2	General-Purpose Output	7-3
7.3.2.1	General-Purpose Output Window	7-3
7.3.2.2	General-Purpose Output Simple Window	7-3
7.3.2.3	Modifying the Output Status	7-4
7.3.3	Specific Input.....	7-5
7.3.3.1	Specific Input Window	7-5
7.3.3.2	Specific Input Simple Window	7-5
7.3.4	Specific Output	7-6
7.3.4.1	Specific Output Window	7-6
7.3.4.2	Specific Output Simple Window	7-6
7.3.5	External Input	7-7
7.3.5.1	External Input Window	7-7
7.3.5.2	External Input Detail Window	7-7
7.3.6	External Output	7-8
7.3.6.1	External Output Window.....	7-8
7.3.6.2	External Output Detail Window	7-8
7.3.7	RIN Input	7-9

Contents

7.3.7.1	RIN Input Window.....	7-9
7.3.8	Signal Number Search.....	7-10
7.3.8.1	Direct Search on the General Purpose/Specified Input/Output Window.....	7-10
7.3.8.2	Search from the Menu.....	7-11
7.3.9	Relay Number Search.....	7-13
7.3.9.1	Direct Search on the General Purpose/Specified Input/Output Window.....	7-13
7.3.9.2	Search from the Menu.....	7-14
7.3.10	Modification of the Signal Name.....	7-16
7.3.10.1	Direct Modification on the General Purpose/Specified Input/Output Window.....	7-16
7.3.10.2	Modification from the Menu.....	7-17
7.4	System Monitoring Time Display.....	7-18
7.4.1	System Monitoring Time Display Window.....	7-18
7.4.2	Individual Window of the System Monitoring Time Display.....	7-19
7.4.3	Initializing the System Monitoring Time Display.....	7-20
7.5	Alarm History.....	7-22
7.5.1	Alarm History Window.....	7-22
7.5.2	Change the Listing Order of Alarm History.....	7-23
7.5.3	Alarm History Detailed Information Window.....	7-24
7.5.4	Clearing the Alarm History.....	7-25
7.6	I/O Message History.....	7-26
7.6.1	I/O Message History Window.....	7-26
7.6.1.1	Search.....	7-26
7.6.2	Clearing the I/O Message History.....	7-27
7.7	Position Data When Power Is Turned ON/OFF.....	7-28
7.7.1	Power ON/OFF Position Window.....	7-28
7.8	Current Position.....	7-29
7.8.1	Current Position Window.....	7-29
7.9	Servo Monitoring.....	7-30
7.9.1	Servo Monitor Window.....	7-30
7.9.1.1	Changing the Monitor Items.....	7-31
7.9.1.2	Clearing Maximum Torque Data.....	7-33
7.10	State of the Robot Drop Tolerance Error.....	7-34
7.10.1	Check the Robot Drop Tolerance.....	7-34
7.10.2	Display of the Drop Value Number Window.....	7-34
7.10.3	Display of the Drop Value Check Window.....	7-35

Contents

7.10.4	Clear the Times of the Drop Value Number	7-36
8	Alarm.....	8-1
8.1	Outline of Alarm	8-1
8.2	Alarm Display.....	8-2
8.2.1	Displaying and Releasing Alarm.....	8-2
8.2.1.1	Releasing Alarms	8-2
8.2.2	Special Alarm Display.....	8-3
8.3	Display of Alarm Details.....	8-5
8.3.1	Parameter	8-5
8.3.2	Display of Alarm Detail Window	8-5
8.3.3	Transition of Alarm Detail Window	8-7
8.4	Alarm Message List	8-8
9	Error	9-1
9.1	Error Message	9-1
9.1.1	System and General Operation	9-2
9.1.2	Editing	9-5
9.1.3	Job Defined Data.....	9-9
9.1.4	External Memory Equipment	9-14
9.1.5	Concurrent I/O	9-19
9.1.6	Maintenance Mode	9-20
9.2	Particular Error Message	9-22
9.2.1	Message	9-22
9.2.1.1	Fatal Error	9-22
9.2.1.2	Application Transaction Error	9-23
9.2.1.3	Other Errors	9-24
9.2.2	When the Error Is Indicated.....	9-25
9.2.2.1	Fatal Error	9-25
9.2.2.2	Application Transaction Error	9-25
9.2.2.3	Other Errors	9-25
10	Job Data Simplified Restoration Function.....	10-1
10.1	Outline	10-1
10.2	Job Data Restoration	10-2
10.2.1	How to Check Job Data Inconsistent Status	10-2
10.2.2	Job Data Restoration Method.....	10-4
10.2.2.1	In Case Same Position Data Is Chained	10-4
10.2.2.2	In Case Not-Registered Position Data Is Chained	10-7

Contents

10.2.2.3	In Case Not-Chained Position Data Exists	10-10
10.3	If Fail in Simplified Restoration	10-12
10.3.1	Rechecking Job Data.....	10-12
10.3.2	If Data Inconsistency Alarm Occurs Again	10-13
10.4	Related Parameters	10-14
10.5	Specific Output Signal.....	10-14
11	LED Indicator on Circuit Board.....	11-1
11.1	LED Indicator on ACP 01 Circuit Board	11-2
11.2	LED Indicator on CPU Board	11-2
11.3	The 7 SEG-LED Indicator	11-3
11.3.0.1	The 7 SEG-LED Indicator Status (1-Digit Indication) of Each Unit at Error Occurrence	11-4
11.3.0.2	The 7 SEG-LED Indicator Status (4-Digit Indication) of Each Unit at Error Occurrence	11-5
11.4	LED Indicator	11-6
11.5	LED Indicator of the Control Power Supply Unit.....	11-6
12	Program Upload Function	12-1
12.1	About Program Upload Function.....	12-1
12.1.1	When the System Program Is Required	12-1
12.2	Program Upload Procedure	12-2
12.2.1	Preparation of SD Card	12-2
12.2.1.1	Uploading	12-3
12.3	Restoration Procedure 1 (Writing the Program).....	12-5
12.3.1	Determining Failure of SD Card.....	12-5
12.3.2	Preparation of SD Card for ACP01	12-5
12.3.3	Preparation of SD Card for Wiring the Program	12-5
12.3.4	Writing the System Program.....	12-6
12.4	Restoration Procedure 2 (Loading the Batch Data)	12-7
12.4.1	When the Batch Data Is “CMOS.BIN”.....	12-7
12.4.2	When the Batch Data Is “CMOSBK.BIN”	12-10
12.5	Restoration Procedure 3 (Loading Other Data (Installation)).....	12-12
12.5.1	Installation of Application Program in Maintenance Mode	12-12
12.6	In Case of the SD Card Failure.....	12-16
12.6.1	Preparation of SD Card for ACP01	12-16
12.6.2	Program Upload.....	12-16

Contents

12.6.3	Backup the Batch Data.....	12-16
12.6.4	Saving the MotoPlus Application.....	12-16
12.6.5	Saving the Programming Pendant Customized Application.....	12-16
13	Trouble Shooting When Alarm Is Not Displayed.....	13-1
14	Troubleshooting a Communication Error between the CPU Board and the Servo Control Board.....	14-1
15	Procedures When Alarm 1325 and 1377 Occur	15-1

1 Equipment Configuration

The YRC1000 is comprised of individual units and modules (circuit boards). Malfunctioning components can generally be easily repaired after a failure by replacing a unit or a module. This section explains the configuration of the YRC1000 equipment.

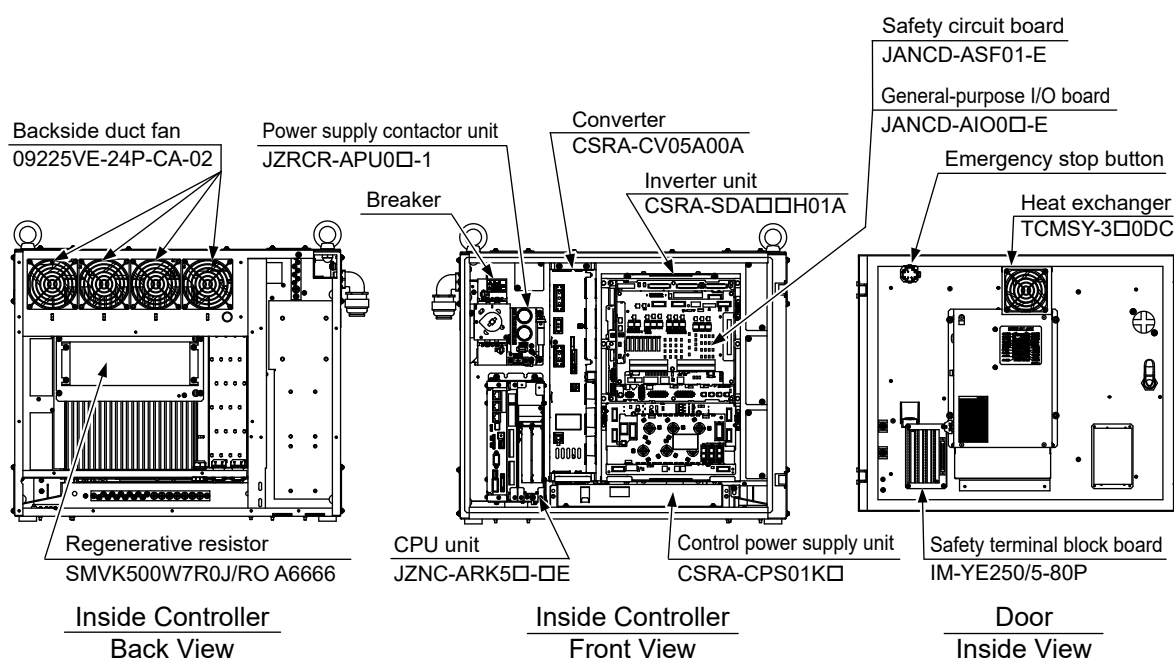


- For the YRC1000 type that is not described in this manual, refer to the YRC1000 supplementary instructions.
- The combination of the YRC1000 type and the manipulator, refer to this manual or the table 5-1 "Basic Specifications" of Chapter 5 in the manipulator's instruction manual.

1.1 Arrangement of Units and Circuit Boards

1.1.1 Arrangement

Fig. 1-1(a): Configuration for 200 to 240 VAC Specification
(Small-Capacity Model 1)

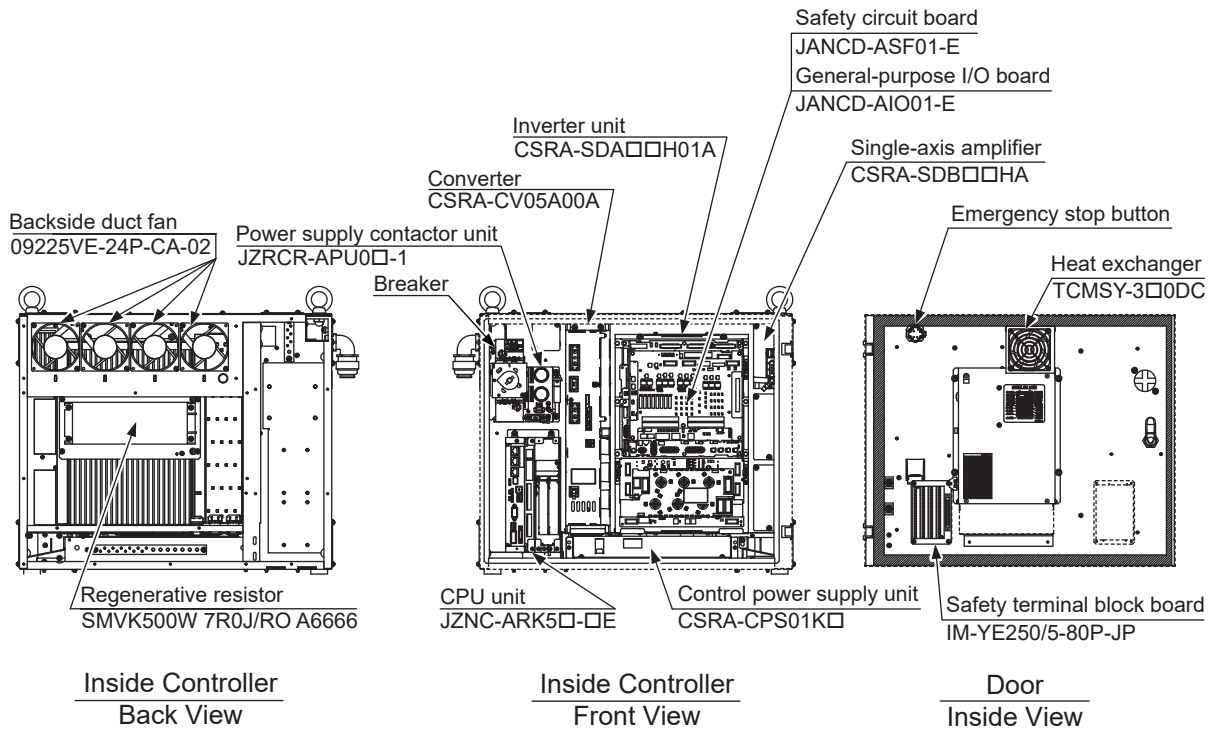


YRC1000 For Japan	Major manipulator type
ERAR-1000-06VX8-A00	GP7
	AR900
	GP8
	AR700
ERAR-1000-06VXH25-A00	GP10
	GP12
	AR1440
	GP25
	AR1730
	GP25-12
	AR2010

1 Equipment Configuration

1.1 Arrangement of Units and Circuit Boards

*Fig. 1-1(b): Configuration for 200 to 240 VAC Specification
(Small-Capacity Model 2)*

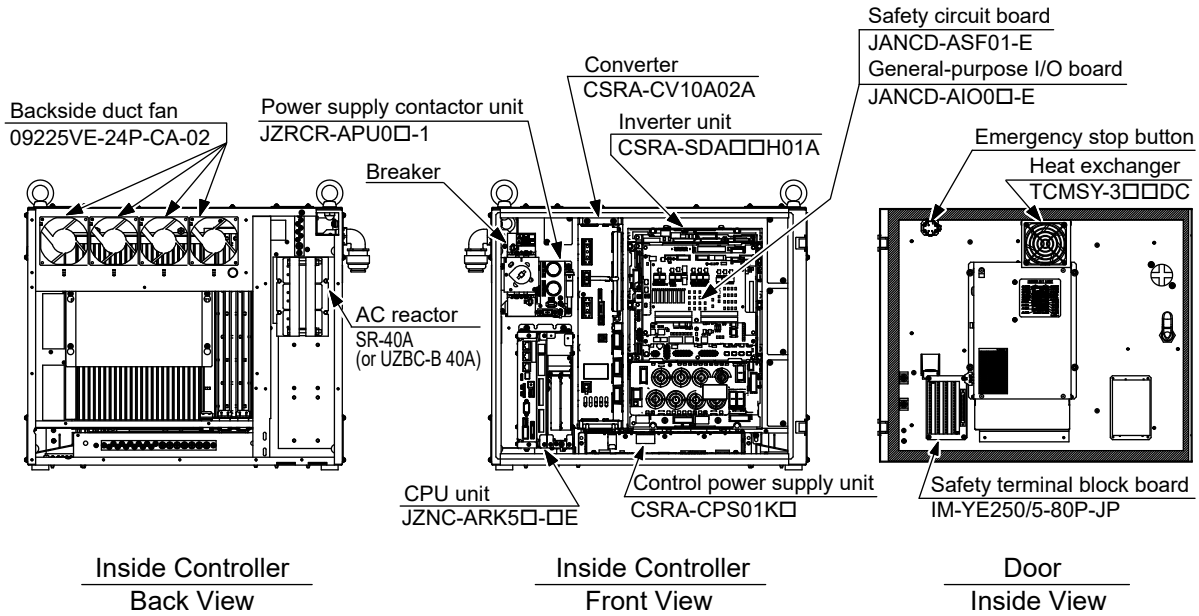


YRC1000	Major manipulator type
For Japan	
ERAR-1000-07VXHE6-A00	AR1440E

1 Equipment Configuration

1.1 Arrangement of Units and Circuit Boards

Fig. 1-1(c): Configuration for 200 to 240 VAC Specification
(Medium/Large-Capacity Model 1)

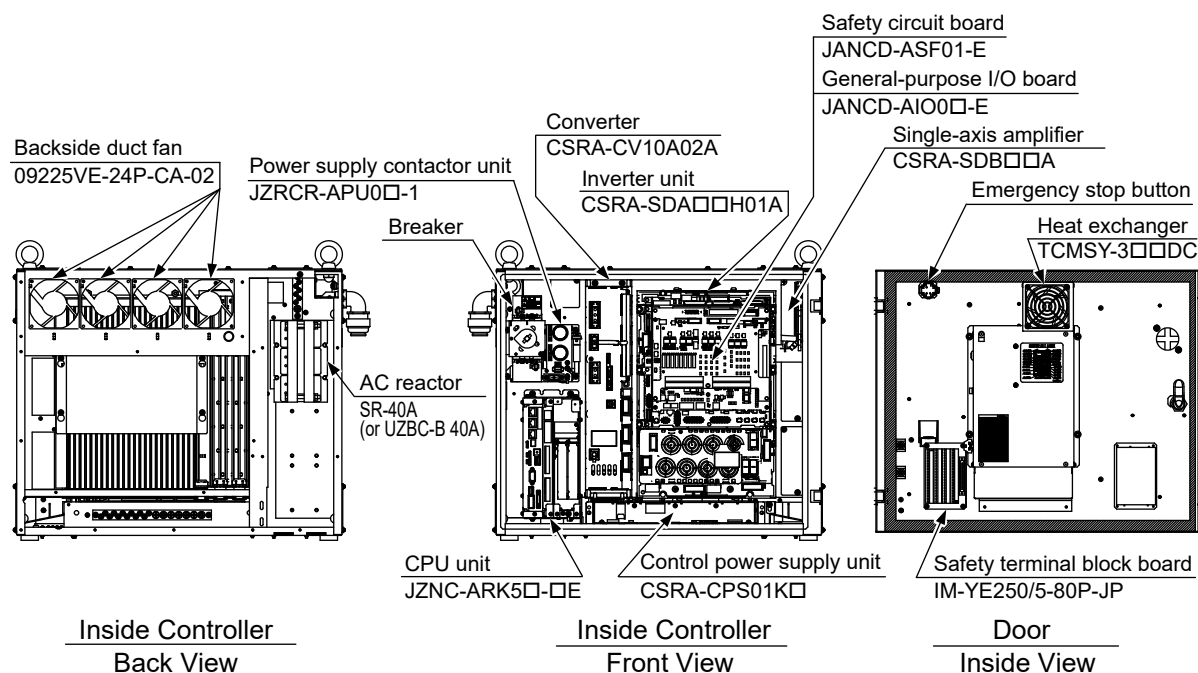


YRC1000 For Japan	Major manipulator type
ERAR-1000-06VXHL20-A00	GP20HL
	AR3120
ERAR-1000-06VX280-A00	GP50
	GP35L
	GP88
	SP80
	GP110
	SP100
	SP130
	GP180
	SP165
	GP180-120
	SP165-105
	GP200S
	GP215
	GP225
	SP210
	GP250
	SP235
	GP280
	GP280L
	GP165R
	SP150R
	GP200R
	SP185R
	SP110H
	SP180H
	SP180H-110
	SP225H
	GP360
	ME1000
ERAR-1000-06VXG250-A00	GG250

1 Equipment Configuration
1.1 Arrangement of Units and Circuit Boards

YRC1000 For Japan	Major manipulator type
ERAR-1000-06VX600-A00	GP400
	GP600
	GP400R

Fig. 1-1(d): Configuration for 200 to 240 VAC Specification
(Medium/Large-Capacity Model 2)

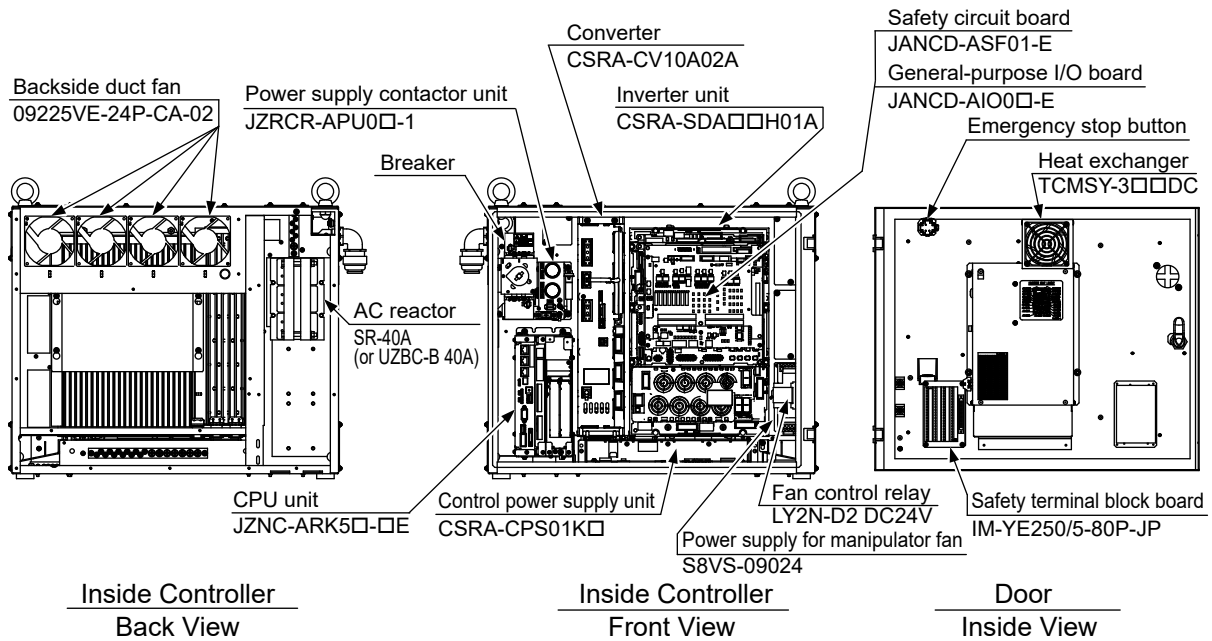


YRC1000 For Japan	Major manipulator type
ERAR-1000-07VXB110-A00	GP110B
	SP100B

1 Equipment Configuration

1.1 Arrangement of Units and Circuit Boards

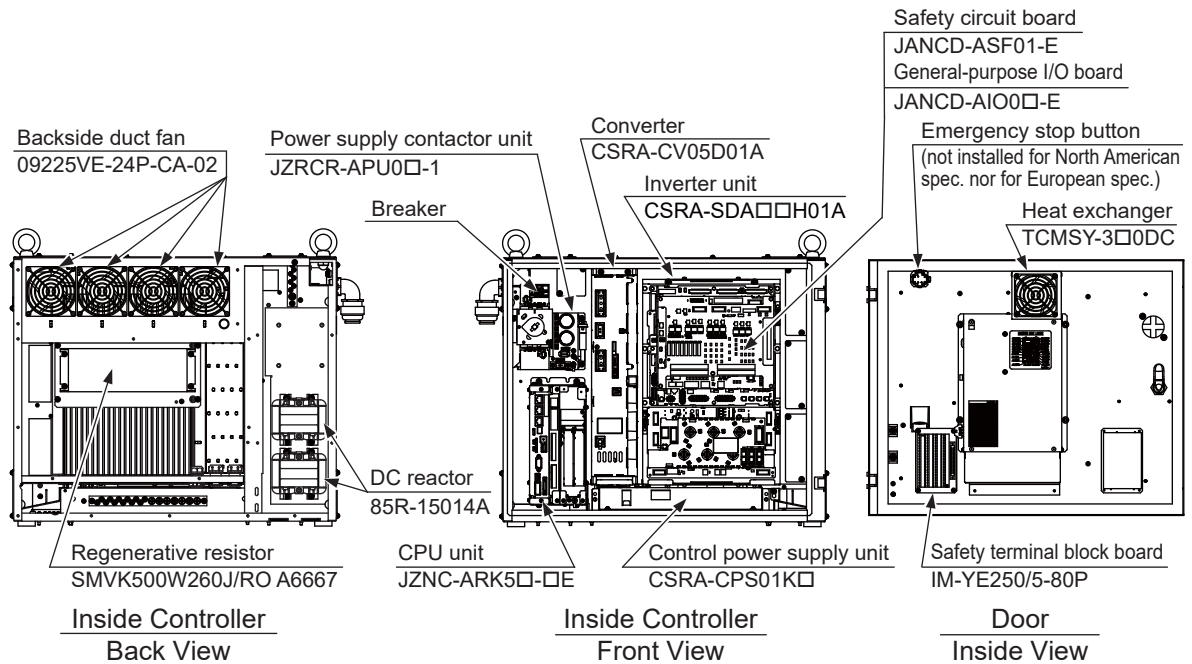
Fig. 1-1(e): Configuration for 200 to 240 VAC Specification
(Medium/Large-Capacity Model 3)



YRC1000	Major manipulator type
For Japan	
ERAR-1000-06VRF130-A00	PH130RF
	PH130F
	PL500

1 Equipment Configuration
1.1 Arrangement of Units and Circuit Boards

Fig. 1-2(a): Configuration for 380 to 440 VAC or 380 to 480 VAC
Specification (Small-Capacity Model 1)

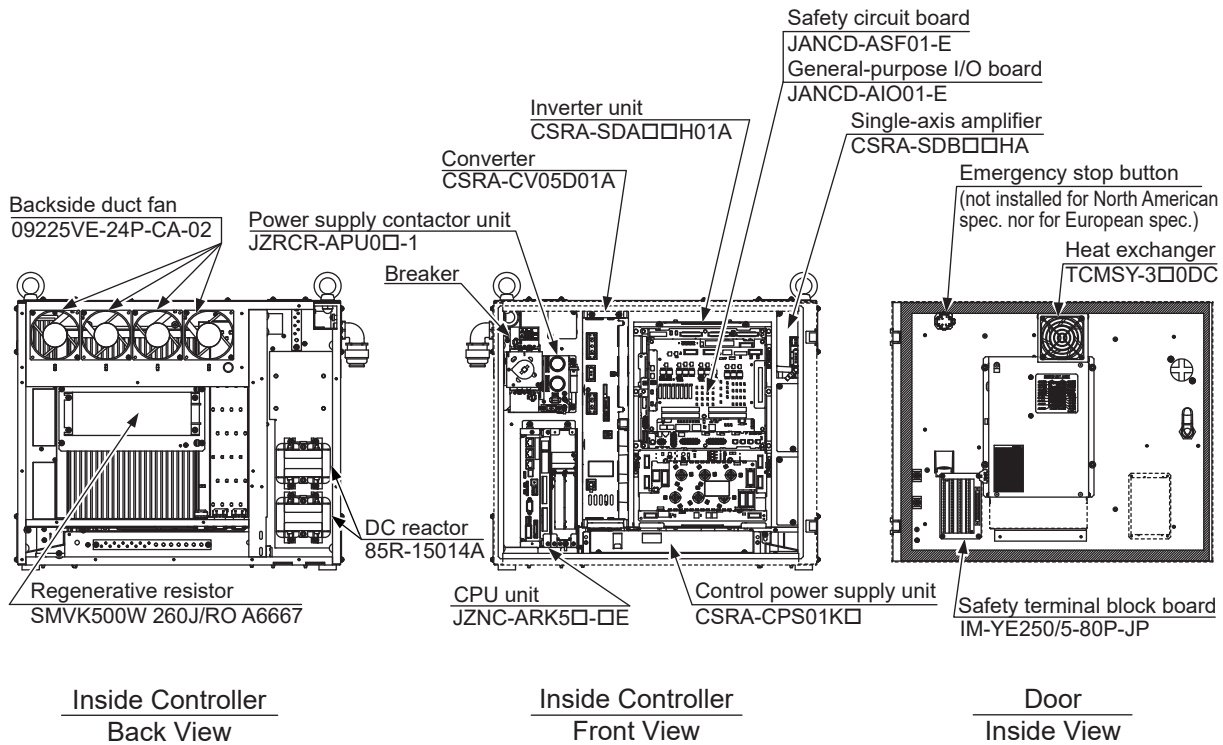


YRC1000			Major manipulator type
For Asia	For North America	For Europe	
ERAR-1000-06VX8-A10	ERAR-1000-06VX8-B15	ERAR-1000-06VX8-E10	GP7
			AR900
			GP8
			AR700
ERAR-1000-06VXH25-A10	ERAR-1000-06VXH25-B15	ERAR-1000-06VXH25-E10	GP10
			GP12
			AR1440
			GP25
			AR1730
			GP25-12
			AR2010

1 Equipment Configuration

1.1 Arrangement of Units and Circuit Boards

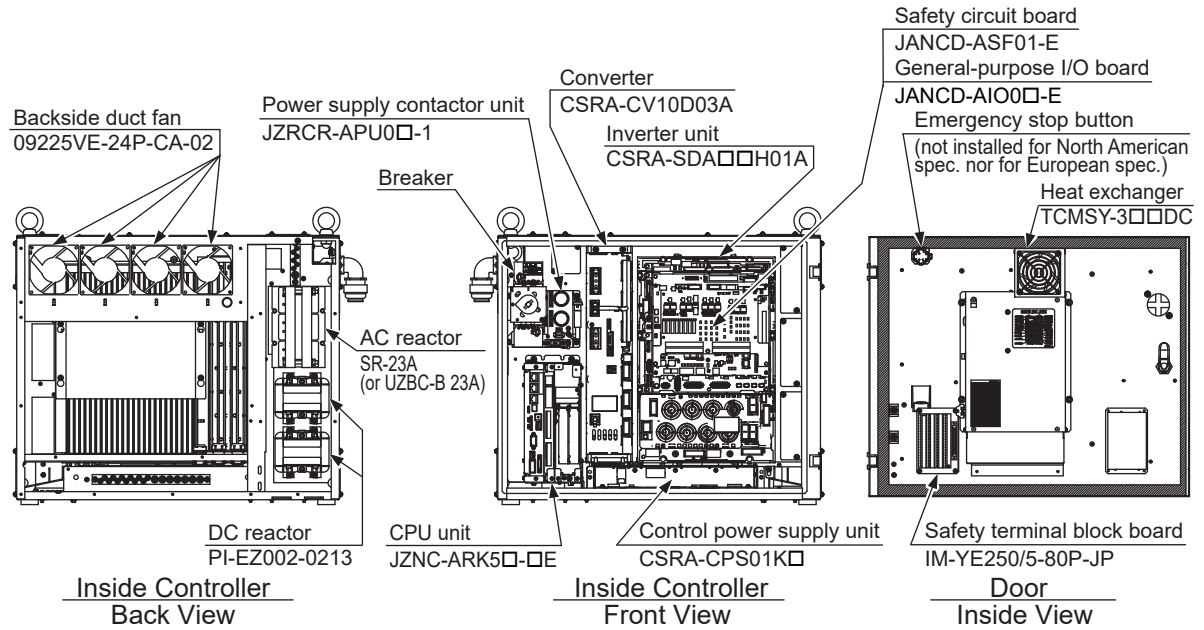
Fig. 1-2(b): Configuration for 380 to 440 VAC or 380 to 480 VAC Specification (Small-Capacity Model 2)



YRC1000			Major manipulator type
For Asia	For North America	For Europe	
ERAR-1000-07VXHE6-A10	ERAR-1000-07VXHE6-B15	ERAR-1000-07VXHE6-E10	AR1440E

1 Equipment Configuration
1.1 Arrangement of Units and Circuit Boards

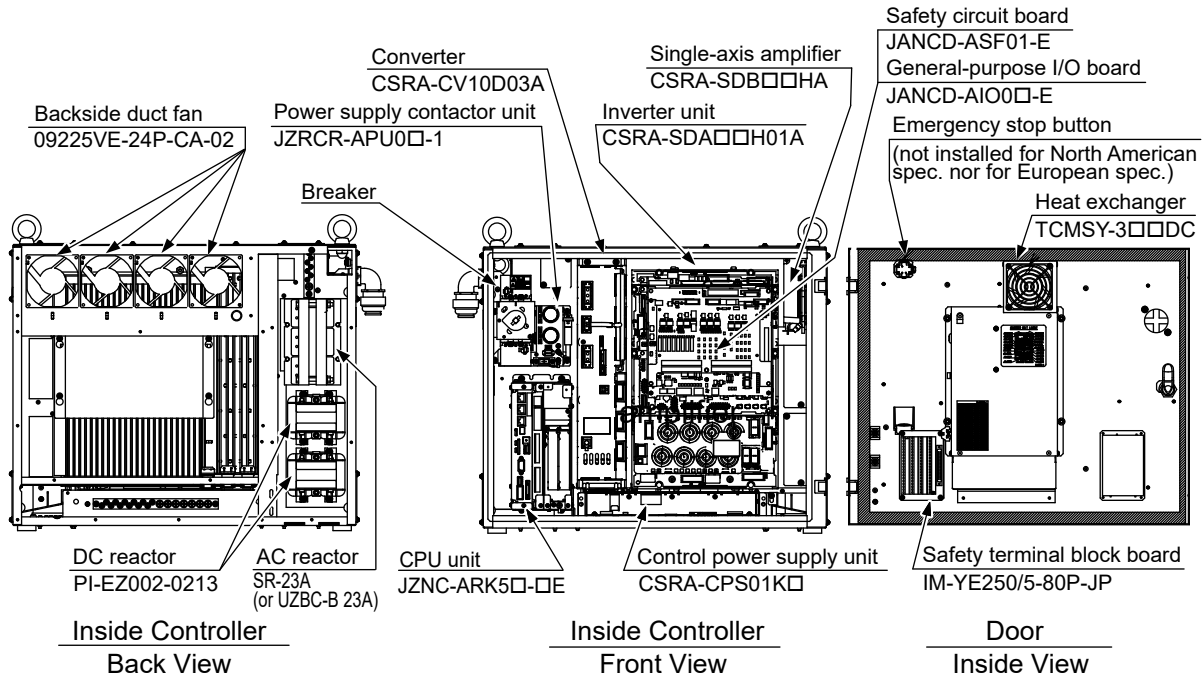
Fig. 1-2(c): Configuration for 380 to 440 VAC or 380 to 480 VAC
Specification (Medium/Large-Capacity Model 1)



YRC1000			Major manipulator type
For Asia	For North America	For Europe	
ERAR-1000-06VXHL20-A10	ERAR-1000-06VXHL20-B15	ERAR-1000-06VXHL20-E10	GP20HL
			AR3120
ERAR-1000-06VX280-A10	ERAR-1000-06VX280-B15	ERAR-1000-06VX280-E10	GP50
			GP35L
			GP88
			SP80
			GP110
			SP100
			SP130
			GP180
			SP165
			GP180-120
			SP165-105
			GP200S
			GP215
			GP225
			SP210
			GP250
			SP235
			GP280
			GP280L
			GP165R
			SP150R
			GP200R
			SP185R
			SP110H
			SP180H
			SP180H-110
			SP225H
			GP360
			ME1000
ERAR-1000-06VXG250-A10	ERAR-1000-06VXG250-B15	ERAR-1000-06VXG250-E10	GG250
ERAR-1000-06VX600-A10	ERAR-1000-06VX600-B15	ERAR-1000-06VX600-E10	GP400
			GP600
			GP400R

1 Equipment Configuration
1.1 Arrangement of Units and Circuit Boards

Fig. 1-2(d): Configuration for 380 to 440 VAC or 380 to 480 VAC
Specification (Medium/Large-Capacity Model 2)

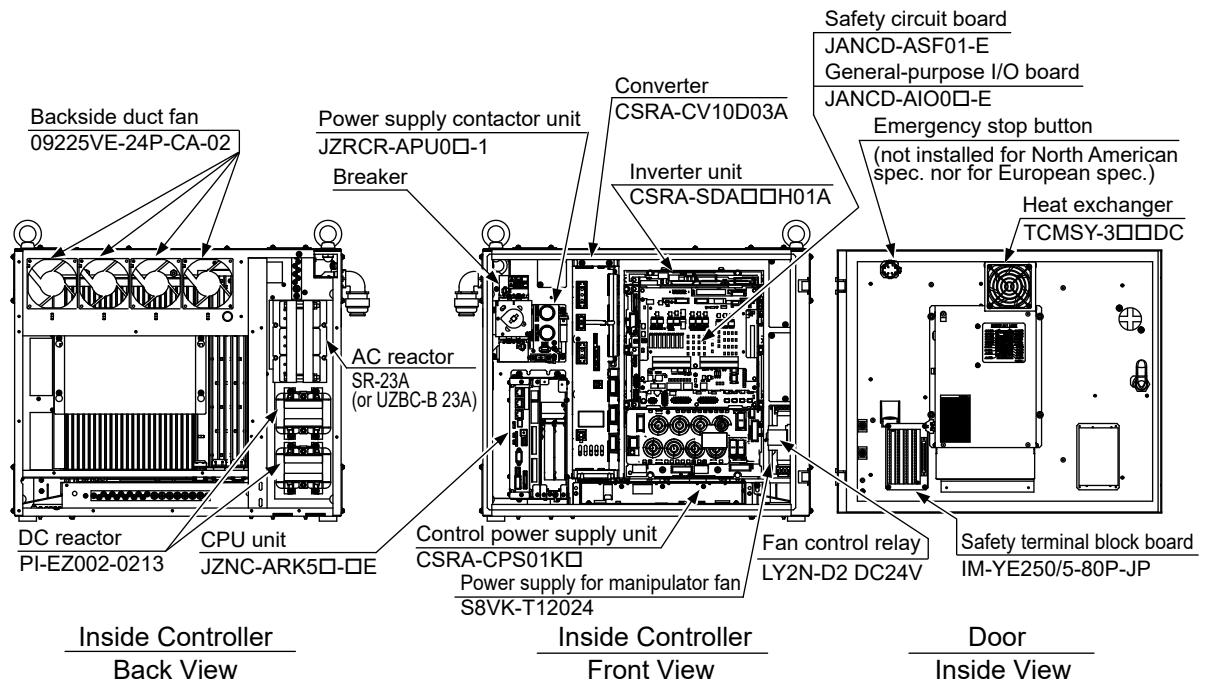


YRC1000			Major manipulator type
For Asia	For North America	For Europe	
ERAR-1000-07VXB110-A10	ERAR-1000-07VXB110-B15	ERAR-1000-07VXB110-E10	GP110B
			SP100B

1 Equipment Configuration

1.1 Arrangement of Units and Circuit Boards

Fig. 1-2(e): Configuration for 380 to 440 VAC or 380 to 480 VAC
Specification (Medium/Large-Capacity Model 3)



YRC1000			Major manipulator type
For Asia	For North America	For Europe	
ERAR-1000-06VRF130-A10	ERAR-1000-06VRF130-B15	ERAR-1000-06VRF130-E10	PH130RF
			PH130F
			PL500

1.2 Power Flow

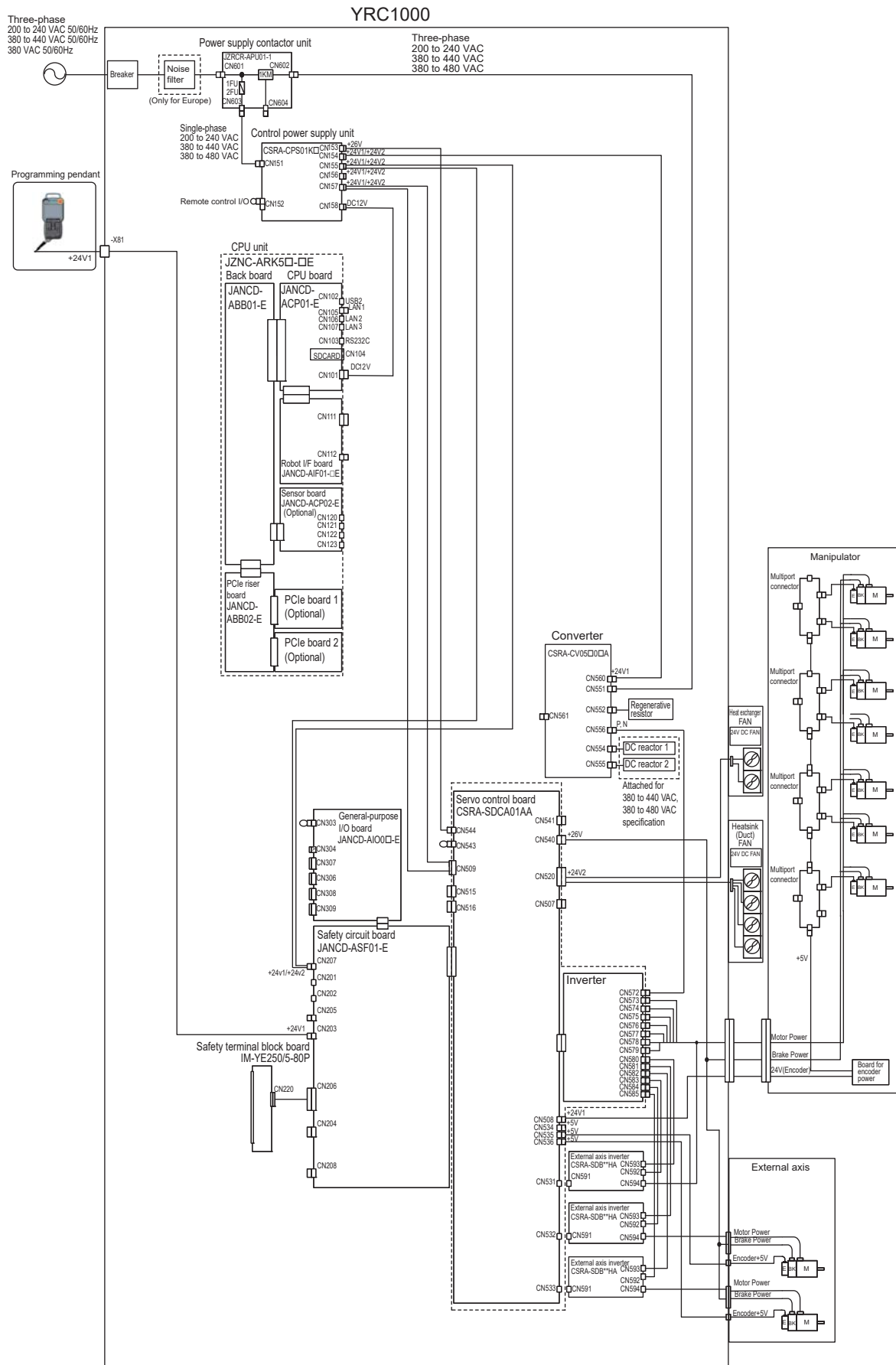
Table 1-1: Correspondence Table of Power Flow and Signal Flow

YRC1000 type	Major manipulator type	Power flow	Signal flow
ERAR-1000-06VX8-□□□	GP7/AR900 GP8/AR700	<i>fig. 1-3(a)</i>	<i>fig. 1-4(a)</i>
ERAR-1000-06VXH25-□□□	GP10/GP12/AR1440 GP25/AR1730 GP25-12/AR2010		
ERAR-1000-07VXHE6-□□□	AR1440E	<i>fig. 1-3(b)</i>	<i>fig. 1-4(b)</i>
ERAR-1000-06VXHL20-□□□	GP20HL/AR3120	<i>fig. 1-3(c)</i>	<i>fig. 1-4(a)</i>
ERAR-1000-06VX280-□□□	GP50 GP35L GP88/SP80 GP110/SP100 SP130 GP180/SP165 GP180-120/SP165-105 GP200S GP215 GP225/SP210 GP250/SP235 GP280 GP280L GP165R/SP150R GP200R/SP185R SP110H SP180H SP180H-110 SP225H GP360 ME1000		
ERAR-1000-06VXG250-□□□	GG250	<i>fig. 1-3(c)</i>	<i>fig. 1-4(a)</i>
ERAR-1000-07VXB110-□□□	GP110B/SP100B	<i>fig. 1-3(d)</i>	<i>fig. 1-4(b)</i>
ERAR-1000-06VRF130-□□□	PH130RF PH130F PL500	<i>fig. 1-3(e)</i>	<i>fig. 1-4(a)</i>
ERAR-1000-06VX600-□□□	GP400 GP600 GP400R	<i>fig. 1-3(f)</i>	

1 Equipment Configuration

1.2 Power Flow

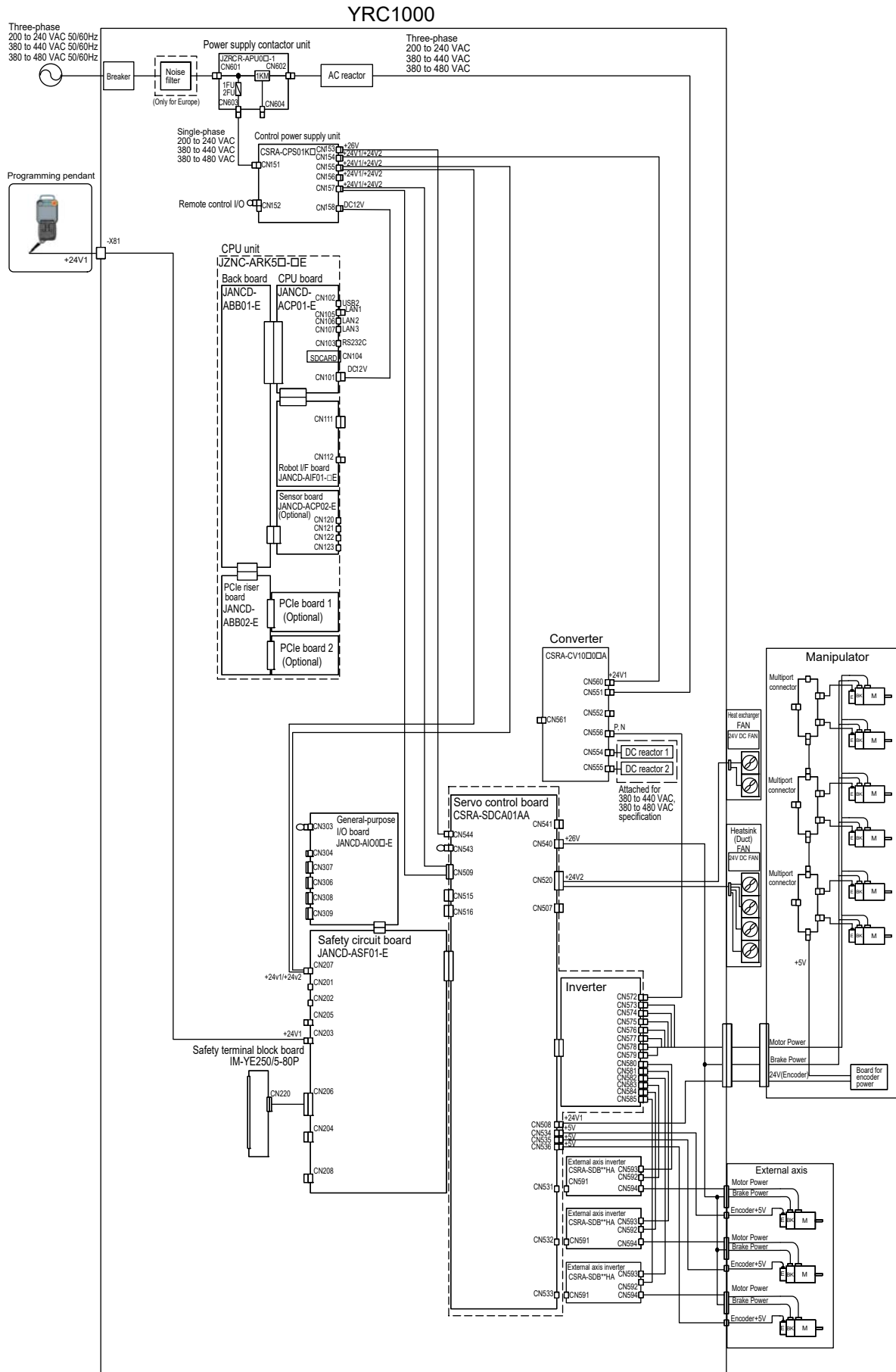
Fig. 1-3(b): Power Flow (Small-Capacity Model 2)



1 Equipment Configuration

1.2 Power Flow

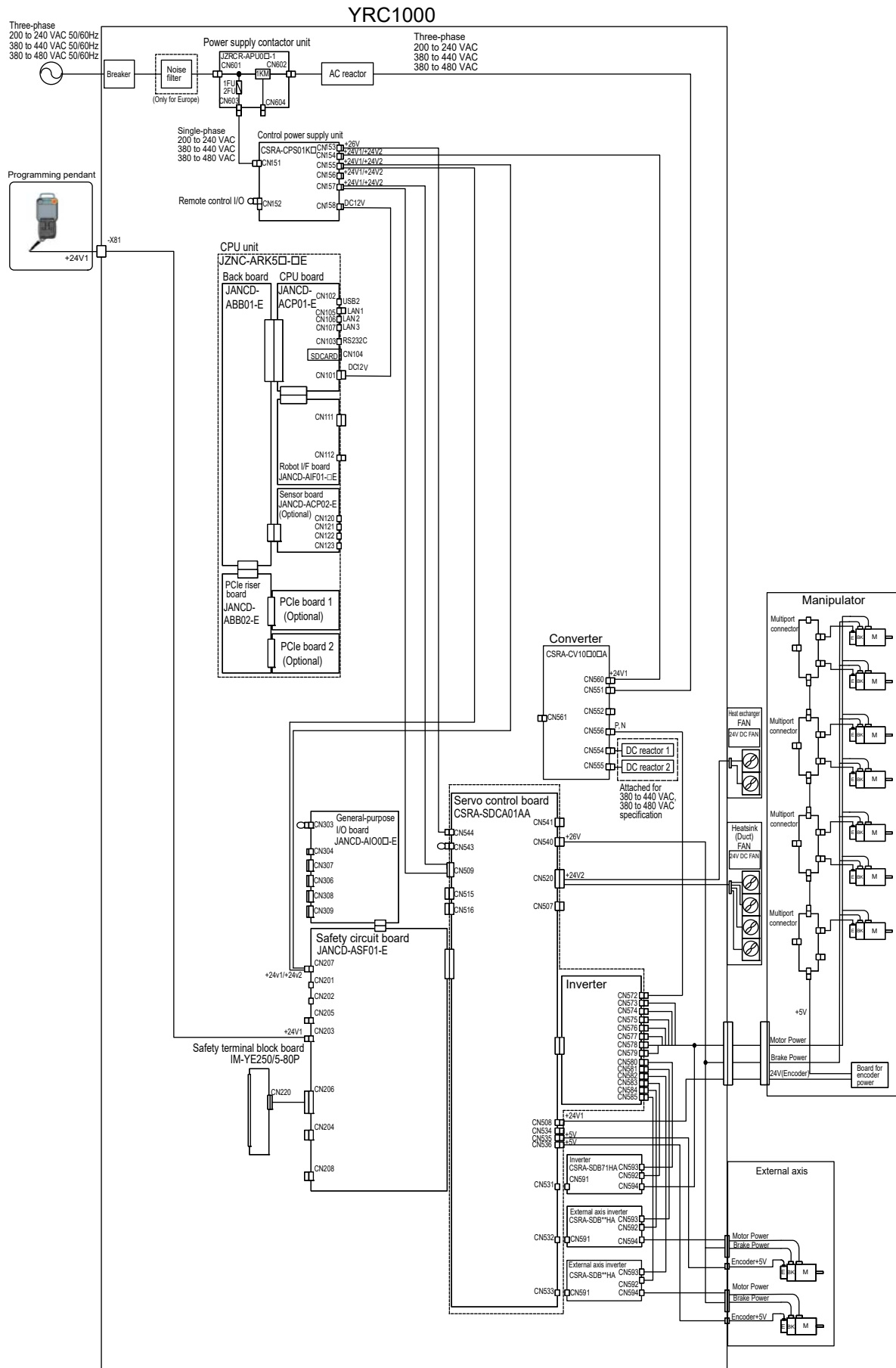
Fig. 1-3(c): Power Flow (Medium/Large-Capacity Model 1)



1 Equipment Configuration

1.2 Power Flow

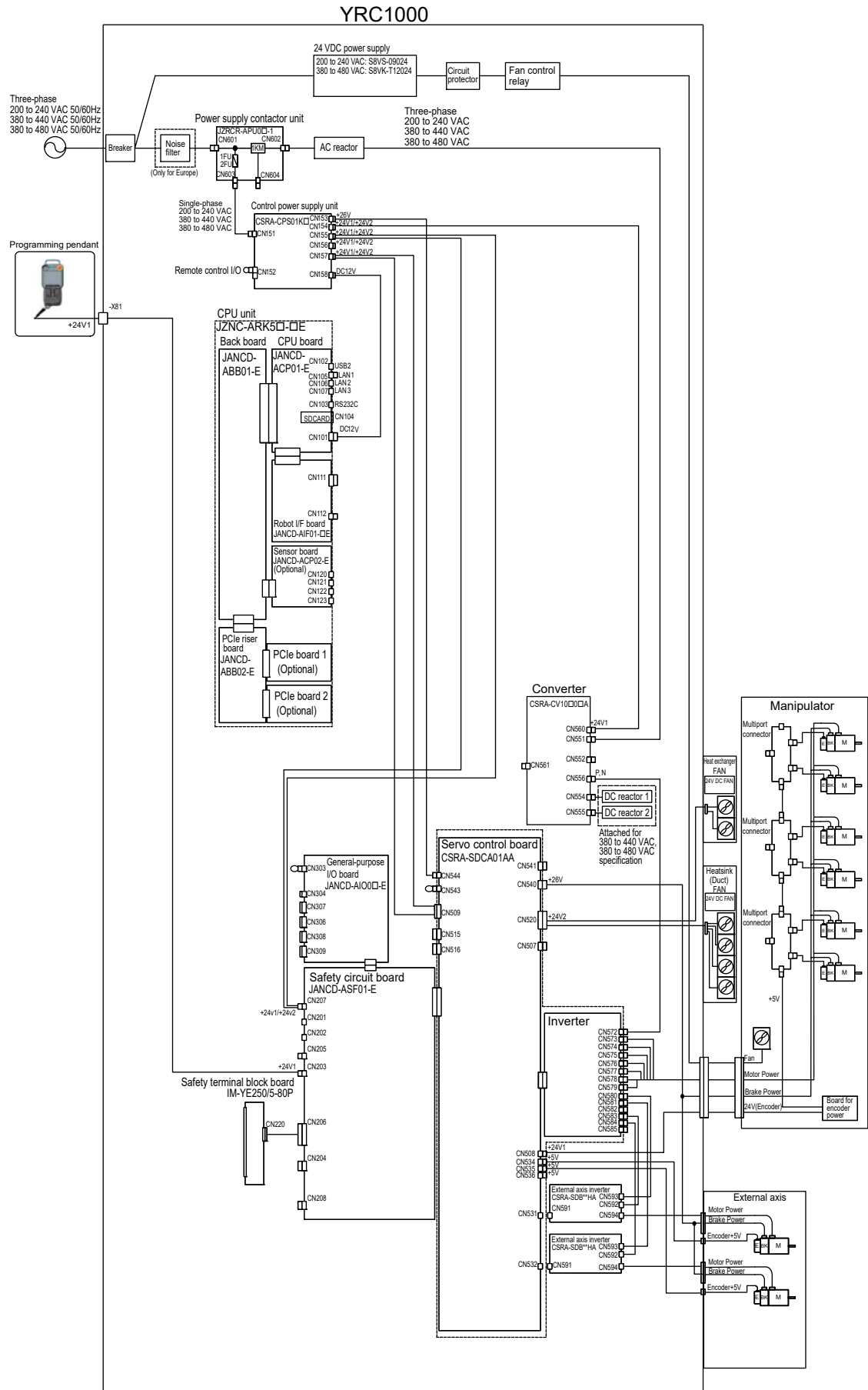
Fig. 1-3(d): Power Flow (Medium/Large-Capacity Model 2)



1 Equipment Configuration

1.2 Power Flow

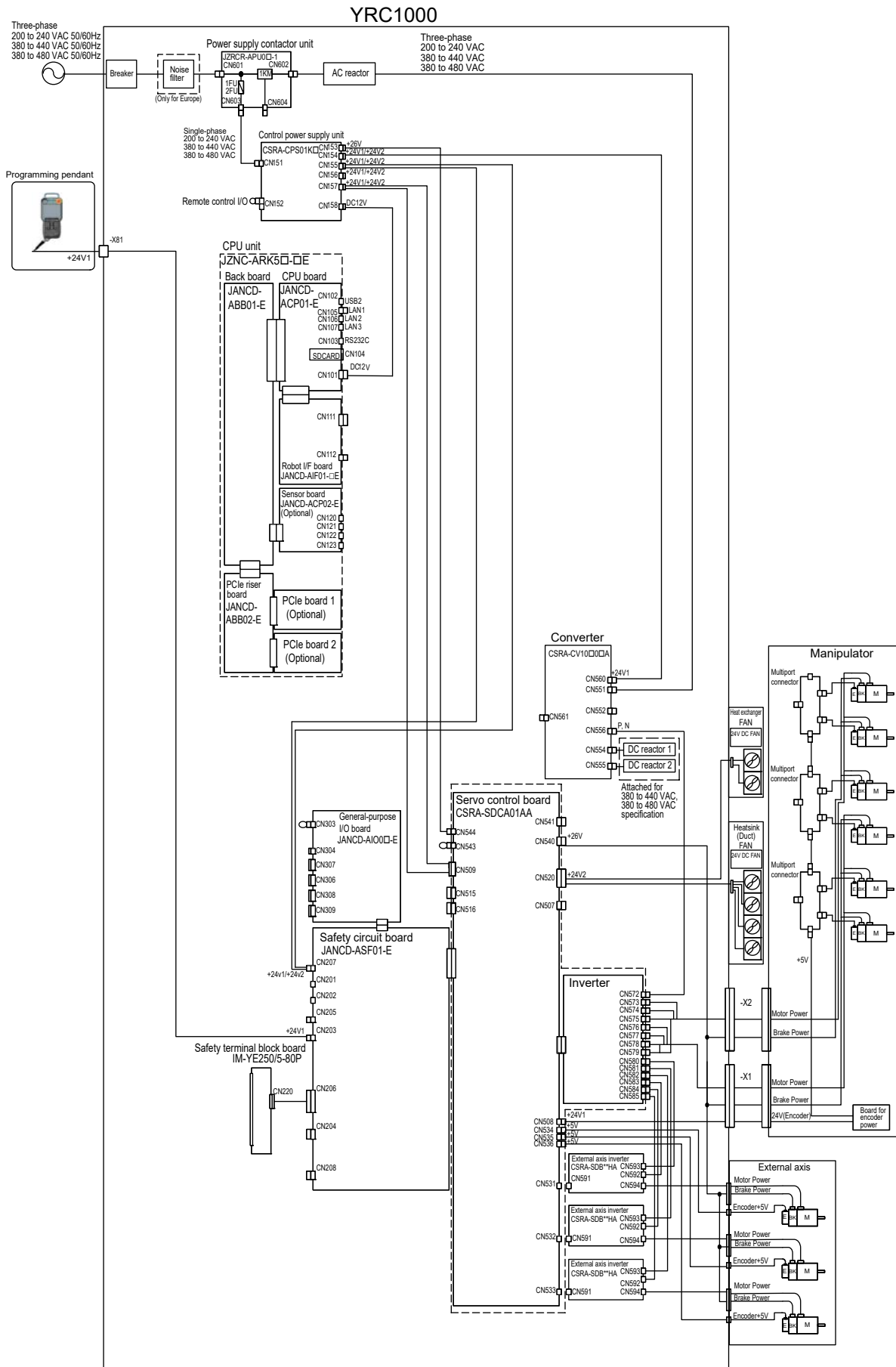
Fig. 1-3(e): Power Flow (Medium/Large-Capacity Model 3)



1 Equipment Configuration

1.2 Power Flow

Fig. 1-3(f): Power Flow (Large-Capacity Model)



1.3 Signal Flow

Fig. 1-4(a): Signal Flow (6-Axis Manipulator: Small-Capacity Model and Medium/Large-Capacity Model)

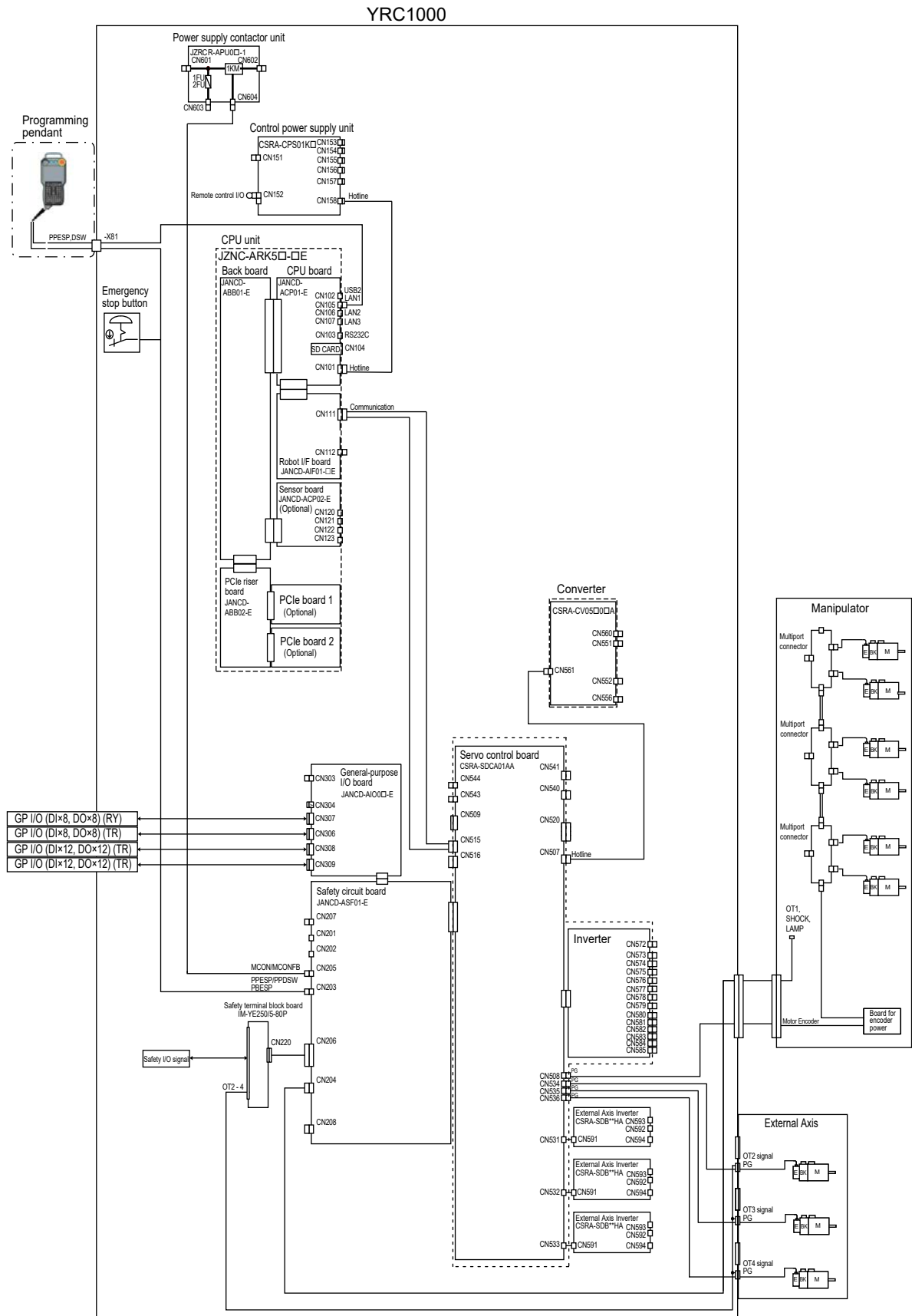
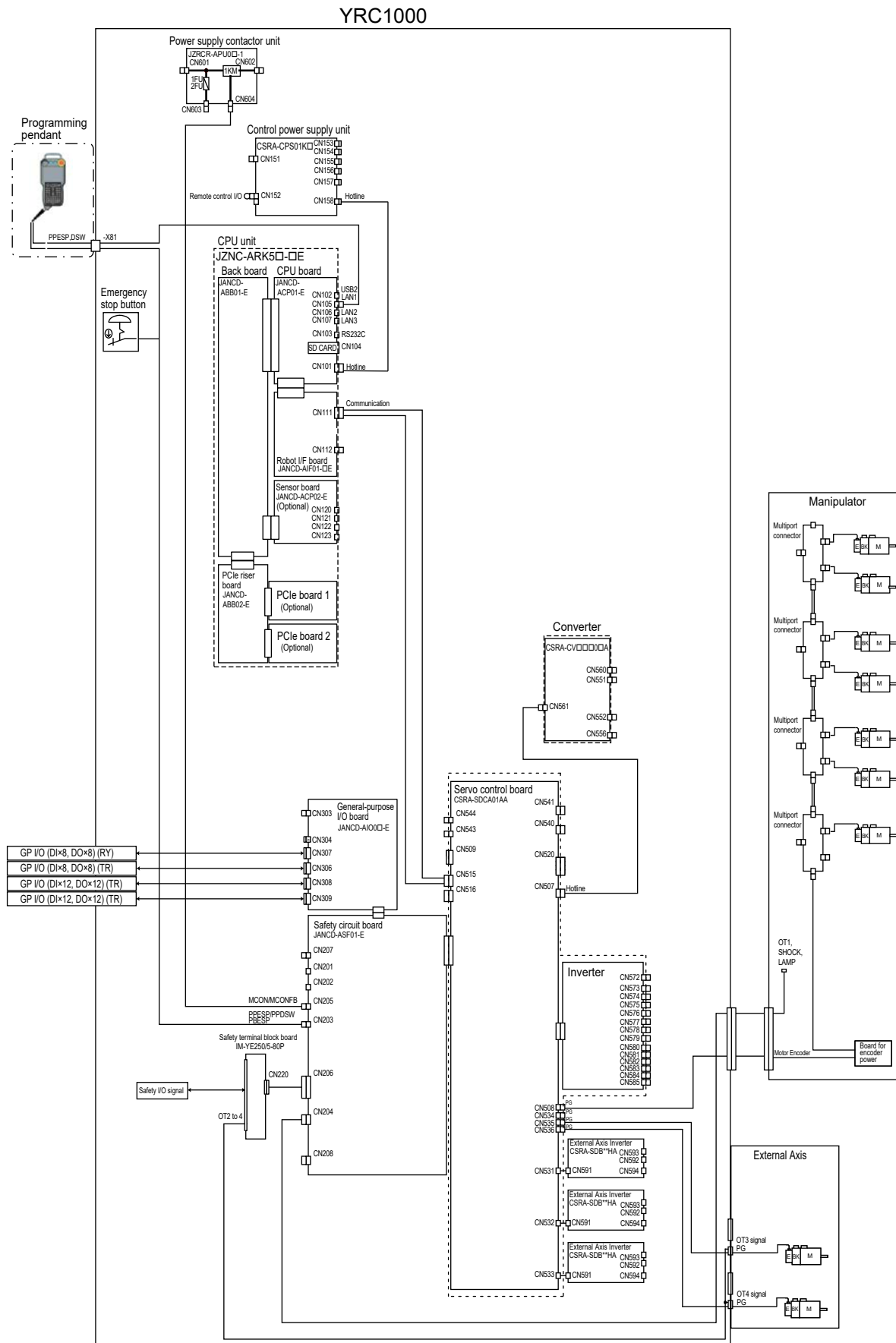


Fig. 1-4(b): Signal Flow (7-Axis Manipulator: Small-Capacity Model and Medium/Large-Capacity Model)



2 Security System

2.1 Protection Through Security Mode Settings

The YRC1000 modes setting are protected by a security system. The system allows operation and modification of settings according to operator clearance. Be sure operators have the correct level of training for each level to which they are granted access.

2.1.1 Security Mode

There are five security modes “operation mode, editing mode, management mode, safety mode and one time manage mode”. Editing mode, management mode and safety mode require a user ID. For editing mode and management mode, the user ID should be 4 or more and 16 or less characters with number(s) and symbol(s). As for safety mode, it should be 9 or more and 16 or less characters with number(s) and symbol(s).

(Significant numbers and symbols: “0 to 9”, “-”, “.”.)

Operating one time manage mode requires to enter the security code, that is issued by your YASKAWA representative.

Table 2-1: Security Mode Descriptions

Security Mode	Explanation
Operation Mode	This mode allows basic operation of the robot (stopping, starting, etc.) for people operating the robot work on the line.
Editing Mode	This mode allows the operator to teach and edit jobs and robot settings.
Management Mode	This mode allows those authorized to set up and maintain robot system: parameters, system time and modifying user IDs.
Safety Mode	This mode allows the operator to setup the safety function, and enable them to edit the files related to the safety function. When the optional function “functional safety” is valid, the security is changed to safety mode to edit some files, such as the tool file. Refer to “YRC1000 OPTIONS INSTRUCTIONS FOR FUNCTIONAL SAFETY FUNCTION (HW1483576)” for more details.
One Time Manage Mode	This mode allows to operator to maintain the mode that is higher than management mode. The loading limitation of the batch data (CMOS.BIN), the parameter batch data (ALL.PRM) and the functional definition parameter (FD.PRM) are removed.

2 Security System
2.1 Protection Through Security Mode Settings

Table 2-2: Menu & Security Mode (Sheet 1 of 4)

Main Menu	Sub Menu	Allowed Security Mode	
		DISPLAY	EDIT
JOB	JOB	Operation	Edit
	SELECT JOB	Operation	Operation
	CREATE NEW JOB ¹⁾	Edit	Edit
	MASTER JOB	Operation	Edit
	JOB CAPACITY	Operation	-
	RES. START (JOB) ¹⁾	Edit	Edit
	RES. STATUS ²⁾	Operation	-
	CYCLE	Operation	Operation
	TRASH JOB LIST ³⁾	Edit	Edit
	JOB EDIT (PLAY)	Edit	Edit
	PLAY EDIT JOB LIST	Edit	Edit
VARIABLE	BYTE	Operation	Edit
	INTEGER	Operation	Edit
	DOUBLE	Operation	Edit
	REAL	Operation	Edit
	STRING	Operation	Edit
	POSITION (ROBOT)	Operation	Edit
	POSITION (BASE)	Operation	Edit
	POSITION (ST)	Operation	Edit
	LOCAL VARIABLE	Operation	-
	FLAG	Operation	Edit
IN/OUT	EXTERNAL INPUT	Operation	Edit
	EXTERNAL OUTPUT	Operation	Edit
	GENERAL PURPOSE INPUT	Operation	Operation
	GENERAL PURPOSE OUTPUT	Operation	Operation
	SYSTEM INPUT	Operation	-
	SYSTEM OUTPUT	Operation	-
	RIN	Operation	-
	CPRIN	Operation	-
	REGISTER	Operation	Management
	AUXILIARY RELAY	Operation	-
	CONTROL INPUT	Operation	-
	PSEUDO INPUT SIG	Operation	Management
	NETWORK INPUT	Operation	-
	NETWORK OUTPUT	Operation	-
	ANALOG OUTPUT	Operation	-
	SV POWER STATUS	Operation	-
	LADDER PROGRAM	Management	Management
	I/O ALARM	Management	Management
	I/O MESSAGE	Management	Management
	TERMINAL	Operation	Edit
	I/O SIMULATION LIST	Management	Management
	SERVO ON FACTOR	Management	-
	SERVO OFF MONITOR	Operation	-

2 Security System
2.1 Protection Through Security Mode Settings

Table 2-2: Menu & Security Mode (Sheet 2 of 4)

Main Menu	Sub Menu	Allowed Security Mode	
		DISPLAY	EDIT
ROBOT	CURRENT POSITION	Operation	-
	COMMAND POSITION	Operation	-
	SERVO MONITOR	Management	-
	WORK HOME POS	Operation	Edit
	SECOND HOME POS	Operation	Edit
	DROP AMOUNT	Management	Management
	POWER ON/OFF POS	Operation	-
	TOOL	Edit	Edit
	INTERFERENCE	Management	Management
	SHOCK SENS LEVEL	Operation	Management
	USER COORDINATE	Edit	Edit
	HOME POSITION	Management	Management
	MANIPULATOR TYPE	Management	-
	ANALOG MONITOR	Management	Management
	OVERRUN&S-SENSOR ¹⁾	Operation	Operation
	LIMIT RELEASE ¹⁾	Edit	Edit
	ARM CONTROL ¹⁾	Management	Management
	SHIFT VALUE	Operation	-
	SOFTLIMIT SETTING	Management	Management
	SHOCK SEN LV.(CURRENT)	Operation	-
SYSTEM INFO	VERSION	Operation	-
	MONITORING TIME	Operation	Management
	ALARM HISTORY	Operation	Management
	I/O MSG HISTORY	Operation	Management
	USER DEFINITION MENU	Operation	Edit
	SECURITY	Operation	Operation
	CPU RESET	Operation	Edit
EX.MEMORY	LOAD	Edit	-
	SAVE	Operation	-
	VERIFY	Operation	-
	DELETE	Operation	-
	DEVICE	Operation	Operation
	FOLDER	Operation	Management
	INITIALIZE ¹⁾	Operation	-

2 Security System
2.1 Protection Through Security Mode Settings

Table 2-2: Menu & Security Mode (Sheet 3 of 4)

Main Menu	Sub Menu	Allowed Security Mode	
		DISPLAY	EDIT
PARAMETER	S1CxG	Management	Management
	S2C	Management	Management
	S3C	Management	Management
	S4C	Management	Management
	A1P	Management	Management
	A2P	Management	Management
	A3P	Management	Management
	A4P	Management	Management
	A5P	Management	Management
	A6P	Management	Management
	A7P	Management	Management
	A8P	Management	Management
	RS	Management	Management
	S1E	Management	Management
	S2E	Management	Management
	S3E	Management	Management
	S4E	Management	Management
	S5E	Management	Management
	S6E	Management	Management
	S7E	Management	Management
	S8E	Management	Management
SETUP	TEACHING COND.	Edit	Edit
	OPERATE COND.	Management	Management
	OPERATE ENABLE	Management	Management
	FUNCTION ENABLE	Management	Management
	JOG COND.	Management	Management
	PLAYBACK COND.	Management	Management
	FUNCTION COND.	Management	Management
	DISPLAY COLOR COND.	Edit	Edit
	DATE/TIME	Management	Management
	GRP COMBINATION ²⁾	Management	Management
	SET WORD	Edit	Edit
	RESERVE JOB NAME	Edit	Edit
	USER ID	Edit	Edit
	SET SPEED	Management	Management
	KEY ALLOCATION	Management	Management
	JOG KEY ALLOC.	Edit	Management
	RES. START (CNCT)	Management	Management
	AUTO BACK SET	Management	Management
	WRONG DATA LOG	Edit	Management
	ENERGY SAVING FUNCTION	Edit	Management
	ENCODER MAINTENANCE	Edit	Management
SAFETY FUNC.	M-SAFETY SIGNAL ALLOC	Operation	Management
	TIMER DELAY SET	Operation	Management
	SAFETY LOGIC CIRCUIT	Operation	Management
PM	PM (REDUCER)	Operation	Management
	INSPECTION RECORD	Operation	Management
	OPERATING STATUS	Operation	Edit
	JOB MONITOR	Operation	Edit
	STEP DIAGNOSIS	Operation	Edit
	ROBOT MONITOR	Operation	Edit

2 Security System

2.1 Protection Through Security Mode Settings

Table 2-2: Menu & Security Mode (Sheet 4 of 4)

Main Menu	Sub Menu	Allowed Security Mode	
		DISPLAY	EDIT
DISPLAY SETUP	CHANGE FONT	Operation	Operation
	CHANGE BUTTON	Operation	Operation
	INITIALIZE LAYOUT	Operation	Operation
	CHANGE WINDOW PATTERN	Operation	Operation
	TOUCH OPE. SETTING	Operation	Operation
ARC WELDING	ARC START COND.	Operation	Edit
	ARC END COND.	Operation	Edit
	ARC AUX COND.	Operation	Edit
	POWER SOURCE COND.	Operation	Edit
	ARC WELD DIAG.	Operation	Edit
	WEAVING	Operation	Edit
	ARC MONITOR	Operation	Edit
	ARC MONITOR (SAMPL)	Operation	-
	APPLI COND.	Management	Management
HANDLING	HANDLING DIAGNOSIS	Operation	Edit
SPOT WELDING	WELD DIAGNOSIS	Operation	Edit
	I/O ALLOCATION	Management	Management
	GUN CONDITION	Management	Management
	SPOT POWER SOURCE COND.	Management	Management
	APPLICATION CONDITION SETTING	Management	Management
SPOT WELDING (MOTOR GUN)	WELD DIAGNOSIS	Operation	Edit
	GUN PRESSURE	Edit	Edit
	PRESSURE	Edit	Edit
	I/O ALLOCATION	Management	Management
	GUN CONDITION	Management	Management
	CLEARANCE SETTING	Operation	Edit
	SPOT POWER SOURCE COND.	Management	Management
	TIP INSTALLATION	Operation	Management
	APPLICATION SETTING	Management	Management
GENERAL	WEAVING	Operation	Edit
	GENERAL DIAG.	Operation	Edit
COMMON TO ALL APPLICATIONS	I/O VARIABLE CUSTOMIZE	Operation	Operation

1 Displayed in teach mode only.

2 Displayed in play mode only.

3 Displayed when the job reconstruction function is valid.

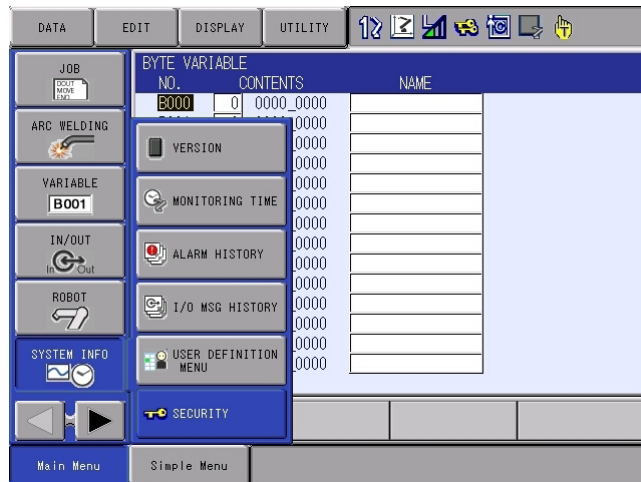
*As for the menu and security mode when the functional safety is valid, refer to "YRC1000 OPTIONS INSTRUCTIONS FOR FUNCTIONAL SAFETY FUNCTION (HW1483576)" for more details.

2 Security System

2.1 Protection Through Security Mode Settings

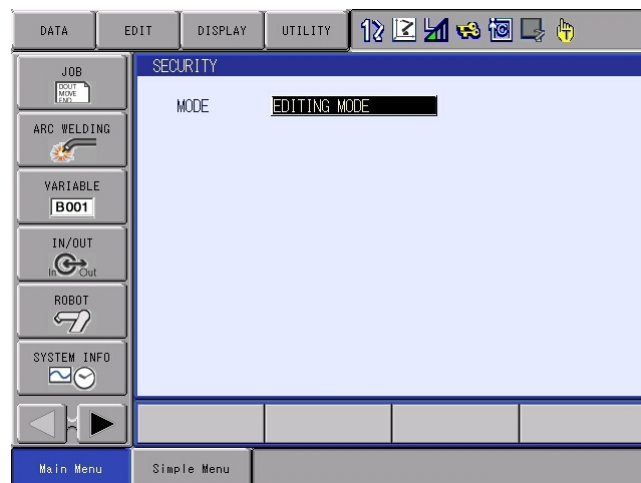
2.1.1.1 Changing the Security Mode

1. Select {SYSTEM INFO} under the main menu.
 - The sub menu appears.



Note: Icons for the main menu such as arc welding system differ depending on the system being used.

2. Select {SECURITY}.
- The selection window of security mode appears.



2 Security System

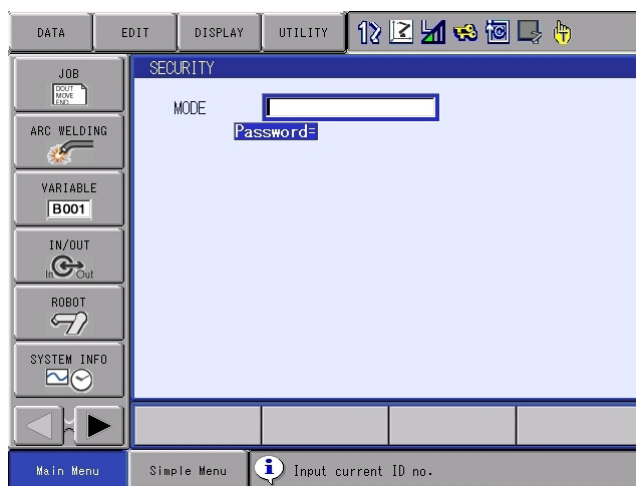
2.1 Protection Through Security Mode Settings

- Security mode can be selected from “OPERATION MODE”, “EDITING MODE”, “MANAGEMENT MODE” or “SAFETY MODE”.



3. Select the security mode to change.

- If the selected security mode is lower than the current security level, the password will be required.



4. Enter the password.

- The following user ID numbers are set as default.
Editing Mode: [0000000000000000]
Management Mode: [9999999999999999]
Safety Mode: [5555555555555555]

5. Press [ENTER].

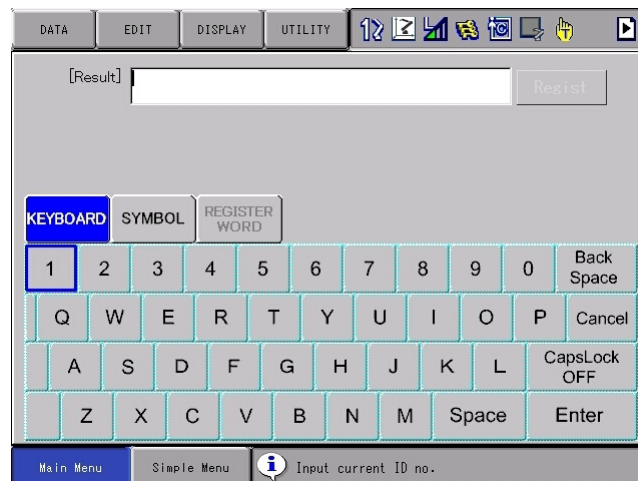
- If the password is correct, the security mode will be changed.

■ **Procedures to Change the Mode to One Time Manage Mode**

1. Change to management mode.
 - When changing to management mode, security mode can be selected from “OPERATION MODE”, “EDITING MODE”, “MANAGEMENT MODE”, “SAFETY MODE” or “ONE TIME MANAGE MODE”.



2. Select “ONE TIME MANAGE MODE”.
 - A character string input keypad is displayed. Input the one time security code, that is issued by your YASKAWA representative.
 - If the password is correct, the security mode will be changed.



2.1.2 User ID

User ID is requested when Editing Mode, Management Mode or Safety Mode is operated.

The user ID should be 4 or more and 16 or less characters with number(s) and symbol(s) for editing mode and management mode. As for safety mode, it should be 9 or more and 16 or less characters with number(s) and symbol(s).

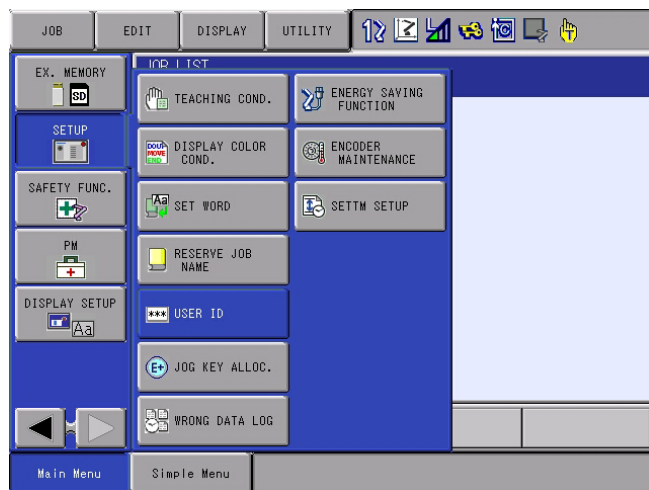
(Significant numbers and symbols: “0 to 9”, “-”, “.”.)

2.1.2.1 Changing a User ID

In order to change the user ID, the YRC1000 must be in Editing Mode, Management Mode or Safety Mode. Higher security modes can make changes the user ID of to lower security modes.

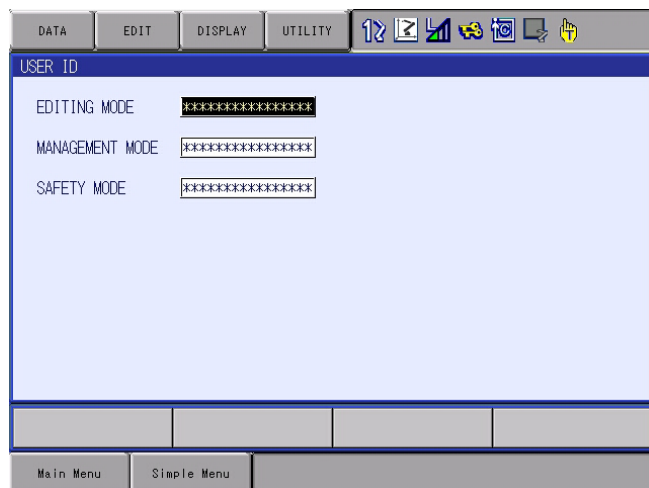
1. Select {SETUP} under the main menu.

– The sub menu appears.



2. Select {USER ID}.

– The USER ID window appears.

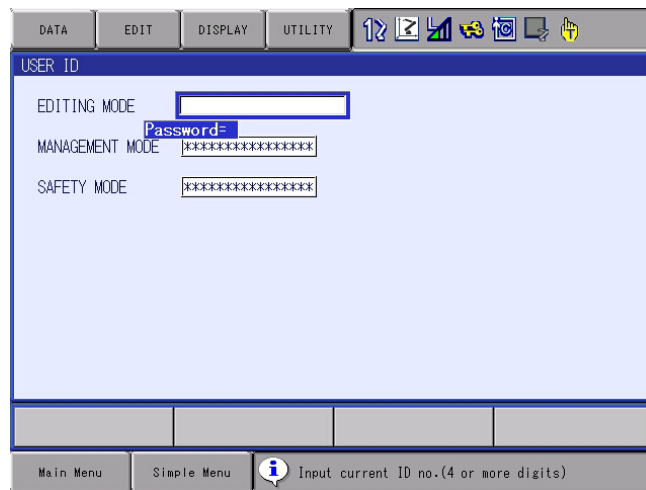


2 Security System

2.1 Protection Through Security Mode Settings

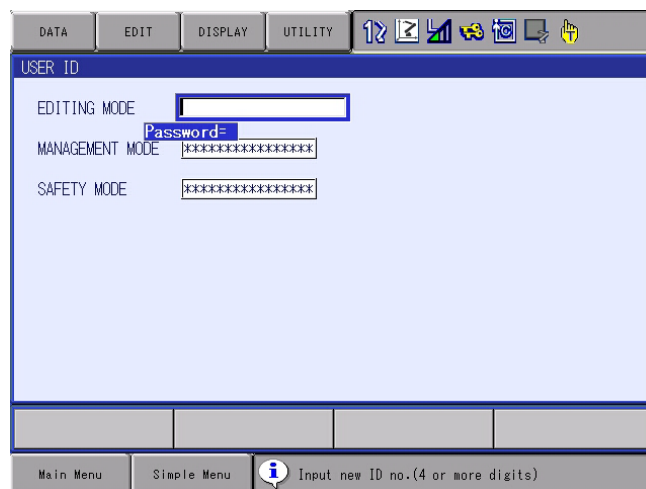
3. Select the desired ID.

- The character input line appears, and a message “Input current ID no. (4 or more digits)” appears.
(As for safety mode, 9 or more digits) Select the desired ID.



4. Input the current ID and press [ENTER].

- When the correct user ID is entered, a new ID is requested to be input. “Input new ID no.(4 or more digits)” appears.
(As for safety mode, 9 or more digits)



5. Input new ID and press [ENTER].

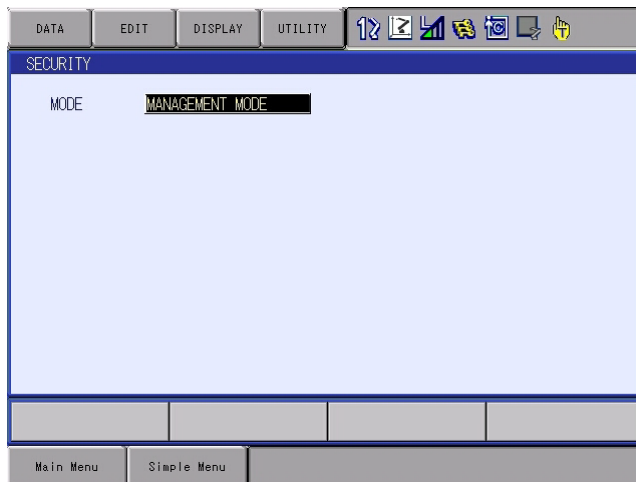
- User ID is changed.

2.1.3 Main CPU SD Card ID

To display the Main CPU SD Card ID is described below.

The main CPU SD Card ID is necessary to issue the one time security code.

1. Change the security mode to management mode.

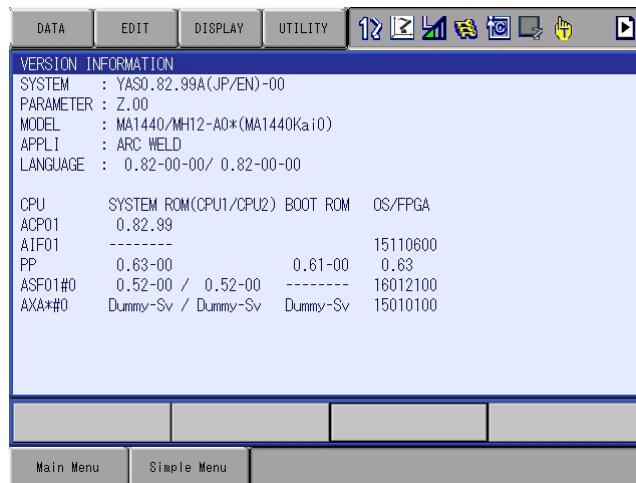


2. Select {SYSTEM INFO} in the main menu.

– The sub menu appears.

3. Select {VERSION}.

– VERSION window appears.

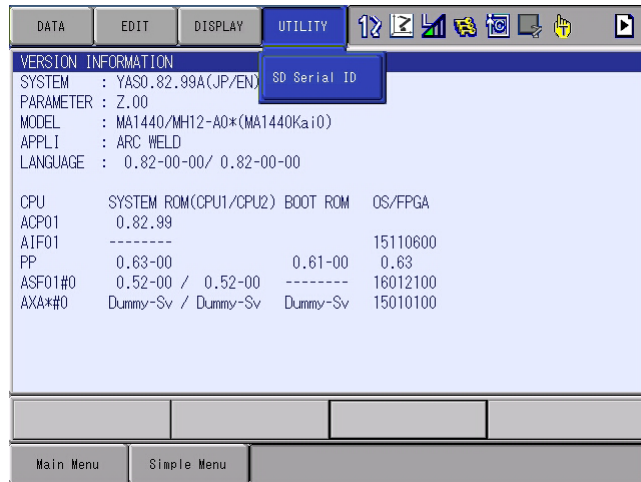


2 Security System

2.1 Protection Through Security Mode Settings

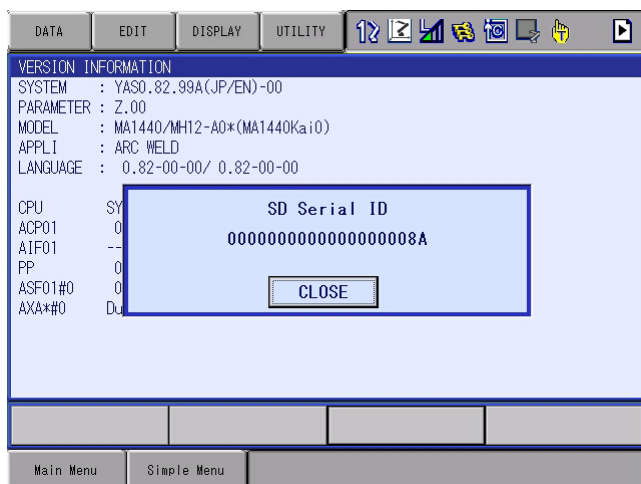
4. Select {UTILITY} under the pull-down menu.

– “SD Card ID” appears.



5. Select “SD Card ID”.

– SD Card ID dialog of the main CPU appears.



3 Inspections

3.1 Regular Inspections



CAUTION

- Do not touch the cooling fan or any other part while the power is ON.

Failure to observe this instruction may result in electric shock and/or personal injury.

Carry out the following inspections.

Failure to perform the following inspections may adversely affect the performance of YRC1000, shorten the life of YRC1000, or cause the unexpected accidents.

Inspection Equipment		Inspection Item	Inspection Frequency	Comments
YRC1000 controller		Confirm that the door is completely closed.	Daily	
		Confirm that there is no gap or damage to the sealed part.	Monthly	
Backside duct fan		Check operation	Monthly	While power ON
Emergency stop button		Check operation	Daily	While servo ON
Enable switch		Check operation	When using	In teach mode
Battery		Check the message for replacement, etc. is displayed or not.	When an alarm occurs	
Power supply		Confirm that power supply voltage is normal.	Before using	
Circuit breaker lead cables		Confirm that the lead cables are not falling out, loosening or breaking. Check the line voltage.	Before using	
YRC1000 cables		Confirm that the cables are not twisted or falling out.	Daily	
Heat exchanger	Fan	Check operation	Monthly	
	Air filter	No filter clogging and no dust	As required (at least once a month)	

3.2 YRC1000 Inspections

3.2.1 Checking If the Doors Are Firmly Closed

- The YRC1000 has a fully sealed construction, designed to keep external air containing oil mist out of the YRC1000.
Be sure to keep the YRC1000 doors fully closed at all times, even when the controller is not operating.
- When opening or closing the door for maintenance, etc., make sure to turn OFF the main power first. Use a flat-blade screwdriver to properly turn the door lock (one door lock per door).
When turning the door lock, keep pressing the door and turn the door lock clockwise to open or counter clockwise to close the door by using the flat-blade screwdriver.
When closing the door, make sure to turn the door lock counterclock-wise until the notch of the door lock becomes horizontal.

Fig. 3-1: YRC1000 Front View



3.2.2 Checking for Gaps or Damage in the Sealed Construction Section

- Open the door and check that the seal around the door is undamaged.
- Check that the inside of the YRC1000 is not stained badly. If it is, determine the cause, take measures and immediately clean it.
- Firmly lock each door and check that no excessive gaps exist around the edge of the door.

3.3 Cooling Fan and Air Filter Inspections

3.3.1 Cooling Fan Inspections

Before the Cooling Fan Inspections

In principle, the door must not be opened to prevent electric shock while power is on. However, it is required to open the door if the cooling fan must be inspected. Exercise extreme care in this case.



WARNING

- To perform this maintenance operation, the door of the YRC1000 must be opened while the power is ON.
- Since a high voltage (200 to 480 VAC) is applied inside the YRC1000, do not touch any unit in the YRC1000.

Failure to observe this instruction may result in electric shock and/or personal injury.

- Close the door of the YRC1000 immediately after completing a maintenance operation such as an inspection of the cooling fan.

Failure to observe this instruction may result in electric shock and/or personal injury.

<How to Open and Close the Door>

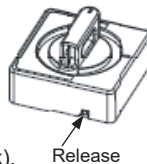
For Japan, Asia, Europe



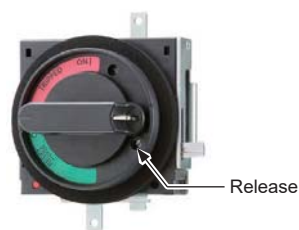
<Information from the supplier>

● Door Lock Mechanism

The door of the YRC1000 can be opened at the OFF position.
The door of the YRC1000 cannot be opened at the ON or TRIPPED position because it is locked at these positions.
Note that even at the ON or TRIPPED position, the door of the YRC1000 can be opened by pressing the release in the direction of the arrow by using a tool (3 mm wide, 1.8 mm thick).



For North America

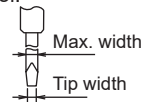


<Information from the supplier>

● Door Lock Mechanism

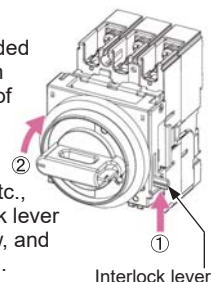
The reset-open mechanism is provided for the standard specification.
The door of the YRC1000 can be opened only when the OPEN (RESET) operation is performed.
Note that even at the ON or OFF position, the door of the YRC1000 can also be opened by turning the release by using a tool.

Size of the screwdriver to turn the release
Tip width: 4 mm, Max. width: 5 mm or less



● Safety Device

The interlock lever is provided to prevent the breaker from turning ON while the door of the YRC1000 is open.
When the breaker must be turned ON while the door is open for maintenance, etc., press and hold the interlock lever in the direction of the arrow, and turn the setting knob to ON.



3 Inspections

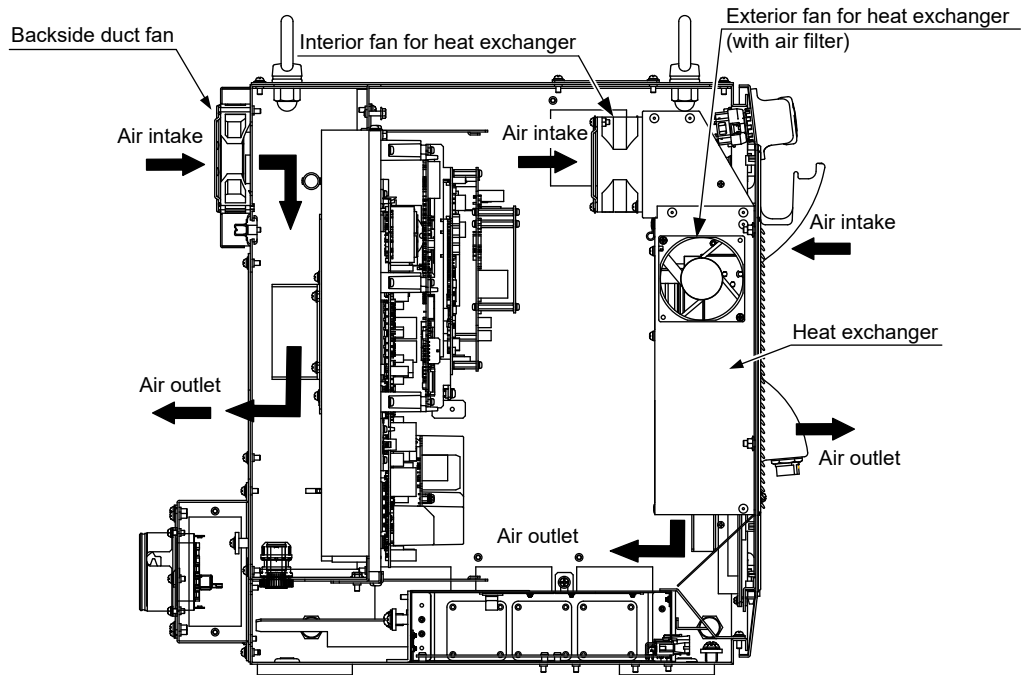
3.3 Cooling Fan and Air Filter Inspections

Inspect the cooling fans as required. A defective fan can cause the YRC1000 to malfunction because of excessive high temperatures inside if the cooling fans and the heat exchanger do not operate efficiently.

The heat exchanger normally operate while the power is turned ON, and the backside duct fan normally operate while the servo power is turned ON. Check if the fans are operating correctly by visual inspection and by feeling air moving into the air intake and from the outlet.

Visually check the exterior fan of the heat exchanger for dust. If a lot of dust is found on the fan, wipe off the dust.

Fig. 3-2: Cooling Fan Construction



NOTE

When the message of the “Cooling fan in CPS power supply stopped. Exchange fan” is displayed, it may be caused by the error occurrence at the cooling fan (CSRA-CPS01K□-FN) inside the control power supply unit (CSRA-CPS01K□).

When the message of the “Cooling fan in CPS unit stopped, replace cooling fan” is displayed, carry out an inspection and the replacement of the cooling fan in the CPS unit as soon as possible.

3.3.2 Air Filter Inspection and Cleaning Procedure

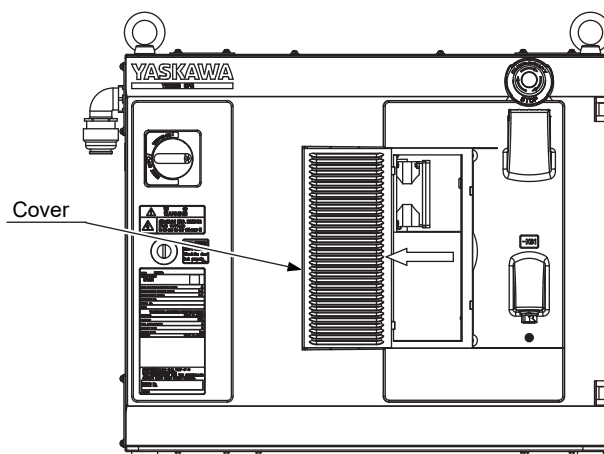


Turn OFF the power before inspecting and cleaning the air filter of the heat exchanger.

Clean the air filter of the heat exchanger by using the following procedure.

1. Slide the cover on the front door of the YRC1000 to the left to open it. (Refer to *fig. 3-3*.)
If the cover is dirty, clean the cover, including the air outlet and inlet, with an air blower. If the dust cannot be removed with the blower, use a neutral detergent to clean the cover. Dilute the neutral detergent to prevent damage to the plastic cover.

Fig. 3-3: Cover on the Front Door

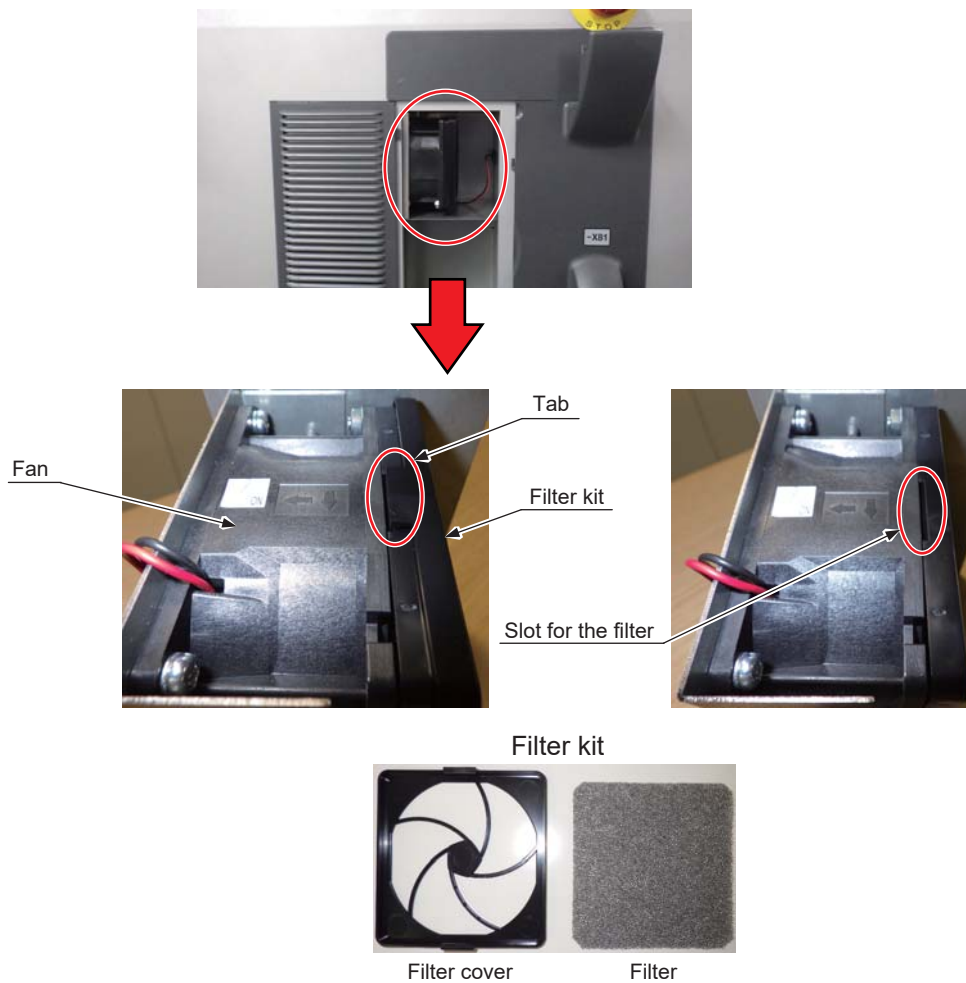


3 Inspections

3.3 Cooling Fan and Air Filter Inspections

2. Remove the filter kit by removing its tabs secured to the top and bottom of the fan body. (Refer to *fig. 3-4*.)
3. If the air filter is dirty, remove the filter from the air filter kit and clean the filter with an air blower.
If the dust cannot be removed from the filter, wash the filter with lukewarm water (about 40°C). Dry the filter completely before reattaching it to the filter kit. If the dust still cannot be removed, replace the filter.
4. Insert the tabs of the filter kit into the slots on the top and bottom of the fan to securely mount the filter kit. (Refer to *fig. 3-4*.)

Fig. 3-4: Air Filter, Air Filter Kit



5. By reversing the procedure in step 1, slide the cover to the right to close it.

3.4 Emergency Stop Button Inspections

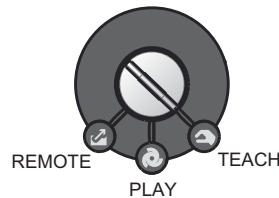
The emergency stop buttons are located on both the front door of the YRC1000 and the programming pendant. Before operating the manipulator, confirm that the servo power is OFF by pressing the emergency stop button on the front door of the YRC1000 after the servo is ON.

3.5 Enable Switch Inspections

The programming pendant is equipped with a three-position enable switch. Perform the following operation to confirm the enable switch operates.

1. Set the mode switch with key on the programming pendant to "TEACH".

Mode switch with the key



2. Press [SERVO ON READY] on the programming pendant. The [SERVO ON] lamp blinks.



Blinking

3. When the enable switch is grasped lightly, the servo power is turned ON.
When the enable switch is grasped firmly or released, the servo power is turned OFF.



If the [SERVO ON] lamp does not light in previous operation (2), check the following:

- The emergency stop button on the front door of the YRC1000 is pressed.
- The emergency stop button on the programming pendant is pressed.
- The emergency stop signal is input from external.
- A major alarm is occurring.

3.6 Battery Inspections

The YRC1000 has a battery that backs up the important program files for user data in the CMOS memory.

A battery alarm indicates when a battery has expired and must be replaced. The programming pendant display and the message “Memory battery weak” appears at the bottom of the display.

Confirm that the above mentioned message is NOT indicated when inspecting.

The way to replace the battery is described in *chapter 5.1.1.3 “Replacing the Battery”*.

3.7 Power Supply Voltage Confirmation

Check the voltage of the 1, 3, and 5 terminal of the circuit breaker (-Q1M) with an electric tester.

The specification of power supply differs depending on the type of YRC1000. Confirm the specification of power supply by referring to the rating label on the door of YRC1000.

Table 3-1: Power Supply Voltage (200 to 240 VAC Specification)

Measured Item	Terminal	Normal Value
Line voltage	Between 1 and 3, 3 and 5, 1 and 5	200 to 240 VAC (+10%, -15%)
Voltage between earth (phase-S grounding)	Between 1 and E, 5 and E	200 to 240 VAC (+10%, -15%)
	Between 3 and E	Approximately 0V

Table 3-2: Power Supply Voltage (380 to 440 VAC Specification)

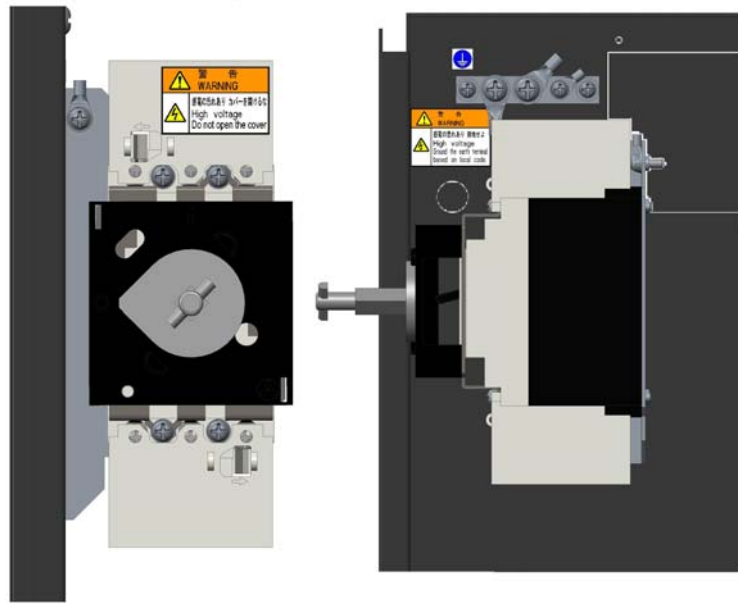
Measured Item	Terminal	Normal Value
Line voltage	Between 1 and 3, 3 and 5, 1 and 5	380 to 440 VAC (+10%, -15%)
Voltage between earth (neutral grounding)	Between 1 and E, 3 and E, 5 and E	220 to 254 VAC (+10%, -15%)

Table 3-3: Power Supply Voltage (380 to 480 VAC Specification)

Measured Item	Terminal	Normal Value
Line voltage	Between 1 and 3, 3 and 5, 1 and 5	380 to 480 VAC (+10%, -15%)
Voltage between earth (neutral grounding)	Between 1 and E, 3 and E, 5 and E	220 to 277 VAC (+10%, -15%)

3	Inspections
3.7	Power Supply Voltage Confirmation

Fig. 3-5: Circuit Breaker (-Q1M)



3.8 Open Phase Check

Table 3-4: Open Phase Check List

Check Item	Contents
Lead Cable Check	Confirm if the lead cable for the power supply is wired as shown in the following without any falling out, looseness or breaking from the connecting part.
Input Power Supply Check	Check the line voltage of the input power supply by using an electric tester. The specification of power supply differs depending on the type of YRC1000. Confirm the specification of power supply by referring to the rating label on the door of YRC1000. (Normal value: 200 to 240 VAC (+10%, -15%)) (Normal value: 380 to 440 VAC (+10%, -15%), (neutral grounding)) (Normal value: 380 to 480 VAC (+10%, -15%), (neutral grounding))
Circuit Breaker (-Q1M) Check	Turn ON the breaker and check the line voltage of "2, 4, 6" of the circuit breaker (-Q1M) by using an electric tester. If abnormal, replace the circuit breaker (-Q1M).

Fig. 3-6(a): Open Phase Diagram (Small-Capacity Model)

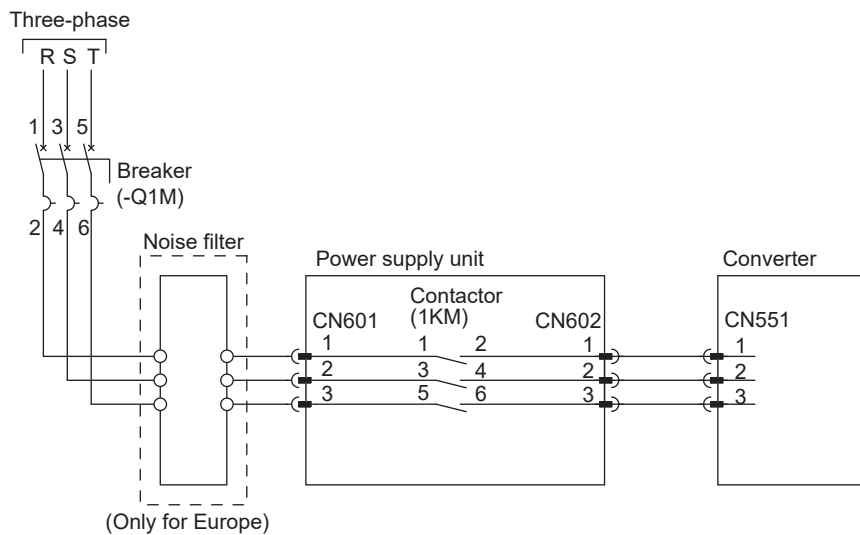
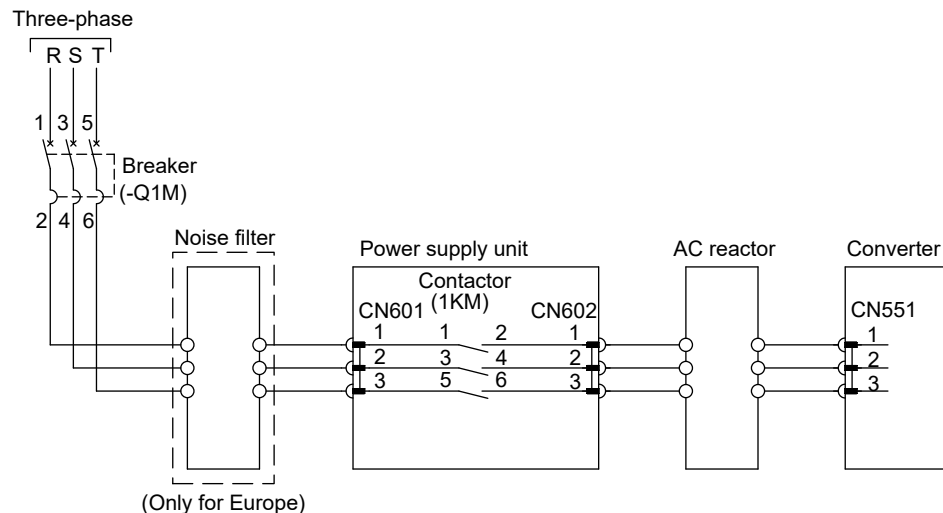


Fig. 3-7(a): Open Phase Diagram (Medium/Large-Capacity Model)



4 Preparation before Replacing Parts



DANGER

- Before operating the manipulator, make sure the servo power is turned OFF by performing the following operations. When the servo power is turned OFF, the SERVO ON LED on the programming pendant is turned OFF.
 - Press the emergency stop buttons on the front door of the YRC1000, on the programming pendant, on the external control device, etc.
 - Disconnect the safety plug of the safety fence.
(when in play mode or in remote mode)

If operation of the manipulator cannot be stopped in an emergency, personal injury and/or equipment damage may result.

- Observe the following precautions when performing a teaching operation within the manipulator's operating range:
 - Be sure to perform lockout by putting a lockout device on the safety fence when going into the area enclosed by the safety fence. In addition, the operator of the teaching operation must display the sign that the operation is being performed so that no other person closes the safety fence.
 - View the manipulator from the front whenever possible.
 - Always follow the predetermined operating procedure.
 - Always keep in mind emergency response measures against the manipulator's unexpected movement toward a person.
 - Ensure a safe place to retreat in case of emergency.

Failure to observe this instruction may cause improper or unintended movement of the manipulator, that may result in personal injury.

- Confirm that no person is present in the manipulator's operating range and that the operator is in a safe location before:
 - Turning ON the YRC1000 power
 - Moving the manipulator by using the programming pendant
 - Running the system in check mode
 - Performing automatic operations

Personal injury may result if a person enters the manipulator's operating range during operation. Immediately press an emergency stop button whenever there is a problem. The emergency stop buttons are located on the front panel of the YRC1000 and on the upper right of the programming pendant.

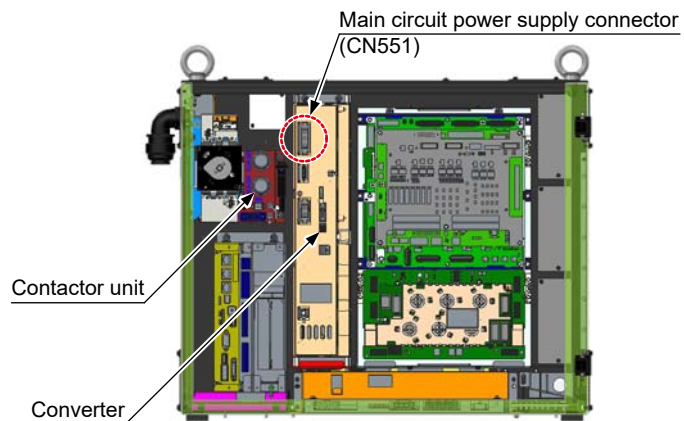
**CAUTION**

- If the primary power supply breaker in the YRC1000 has tripped, use the following procedure to troubleshoot the problem before turning the power supply ON again.
 - ① Open the door, disconnect the main circuit power supply input connector (CN551) of the converter, and then close the door. Next, turn the power supply ON again.
 - ② If the welding alarm on the contactor unit has occurred after the power supply was turned ON, the issue may be welding caused by a converter fault. Refer to chapter 5 and replace both the contactor unit and converter.

If the welding alarm on the contactor unit has not occurred, replace only the converter.

 - ③ After the components have been replaced, connect the main circuit power supply input connector (CN551) to the converter, and then turn the power supply ON again.

If the power supply to the YRC1000 is turned ON again with a method other than that described above, the devices in the YRC1000 may be damaged.



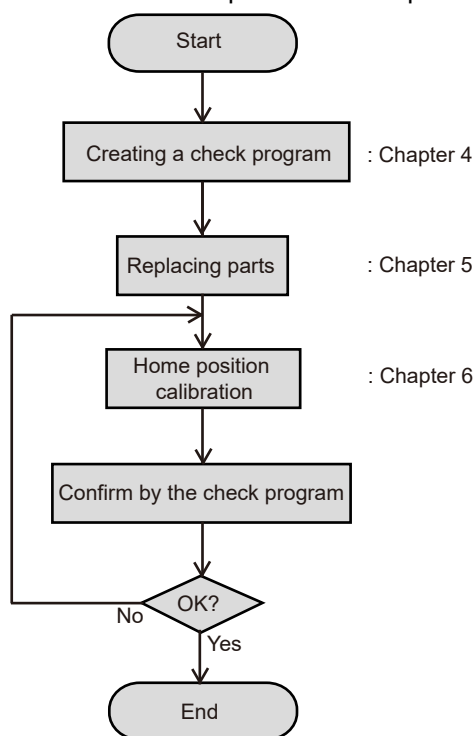


WARNING

- Perform the following inspection procedures prior to conducting manipulator teaching. If there is any problem, immediately take necessary steps to solve it, such as maintenance and repair.
 - Check for a problem in manipulator movement.
 - Check for damage to insulation and sheathing of external wires.
- Always return the programming pendant to the hook on the YRC1000 cabinet after use.

If the programming pendant is left unattended on the manipulator, on a fixture, or on the floor, etc., the Enable Switch may be activated due to surface irregularities of where it is left, and the servo power may be turned ON. If the operation of the manipulator starts, the manipulator or the tool may hit the programming pendant left unattended, that may result in personal injury and/or equipment damage.

The following flowchart shows the operations for replacing parts.



This chapter describes how to create a check program as a preparation for replacing parts. The check program is a program to check the position deviation. If positions are deviated, home position calibration is required. For the calibration, this program data is used to correct the home position data. In the following cases particularly, the home position calibration using the check program is needed. Be sure to create a check program referring to *chapter 4.1 "Creating a Check Program"*.

- Change in the combination of the manipulator and YRC1000
- Replacement of the motor or absolute encoder
- Clearing stored memory (by replacement of ACP01 board, weak battery, etc.)
- Home position deviation caused by hitting the manipulator against a workpiece, etc.

4.1 Creating a Check Program

To check position deviation whenever necessary, create a program in which a check point is taught (the job for the check point). In the job for the check point, teach two points; one as a check point and the other as the point to approach the check point. This program checks for any deviation between the tool tip position and the check point.

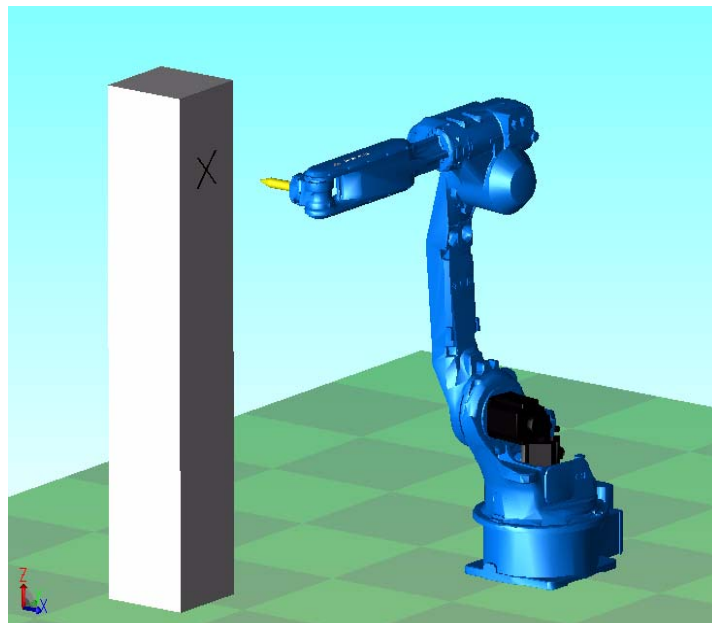
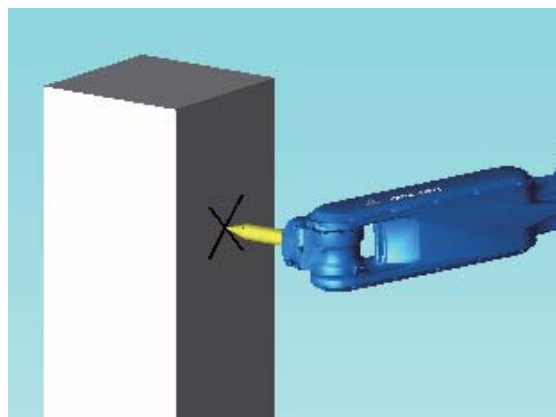


Fig. 4-1: <Enlarged View>



4.2 Advanced Preparations for Replacing the Programming Pendant

Perform the advanced preparations for replacing the programming pendant described in this section.

- **If the YRC1000 software version is YAS2.60.00-00 or later**
No advanced preparations are required.
- **If the programming pendant customization function is invalid (parameter: S2C262 = 0)**
No advanced preparations are required.
- **Cases Other than Those Listed Above**
The application software used by the programming pendant customization function must be installed when the programming pendant is replaced. The following three descriptions can be considered cases in which the programming pendant customization function is used. For each of these cases, obtain the relevant application software and check the corresponding software installation procedure. For the basic installation procedure for a programming pendant customized application, refer to chapter 7 “Installing Applications” in “YRC1000 OPTIONS INSTRUCTIONS FOR PROGRAMMING PENDANT CUSTOMIZATION FUNCTION (HW1484231)”. This manual can also be obtained from the supplier of the application software as required.
 - a) **When using an HC series manipulator**
If an HC series manipulator (e.g., HC10DT) is being used, the PFL function (collaborative operation function) is valid.
The PFL function is displayed on the screen by using the programming pendant customization function. To obtain this application software and the installation procedure, contact your YASKAWA representative.
 - b) **When using application software prepared by a System Integrator, etc.**
To obtain this application software and the installation procedure, contact the System Integrator (supplier of the application software).
 - c) **When the customer has created application software**
Ready the application software that was created by the customer and check the installation procedure as advance preparations for replacing the programming pendant.

5 Replacing Parts

5.1 Replacing YRC1000 Parts

Refer to *chapter 1.1 “Arrangement of Units and Circuit Boards”* for the arrangement of units and circuit boards.

Prepare the following recommended tools for maintenance:

- Phillips screwdriver: large, medium, small size
(recommended length of the medium-size Phillips screwdriver: 500 mm)
(When replacing the fan of the heat exchanger, prepare a small-size Phillips screwdriver with a shaft diameter of 4 mm or less (number: 0))
- Flathead screwdriver: large, medium, small size
- Nipper, combination pliers, needle nose pliers

If the controller type is ERAR-1000-06VRF130-A00, also prepare the following tool:

- Flathead screwdriver: medium size (recommended length: 250 mm)

If the controller type is ERAR-1000-06VRF130-A10, B15, E10, also prepare the following tools:

- Flathead screwdriver: medium size (recommended length: 250 mm)
- Phillips screwdriver: small size (recommended shaft diameter: 4.0 mm)



WARNING

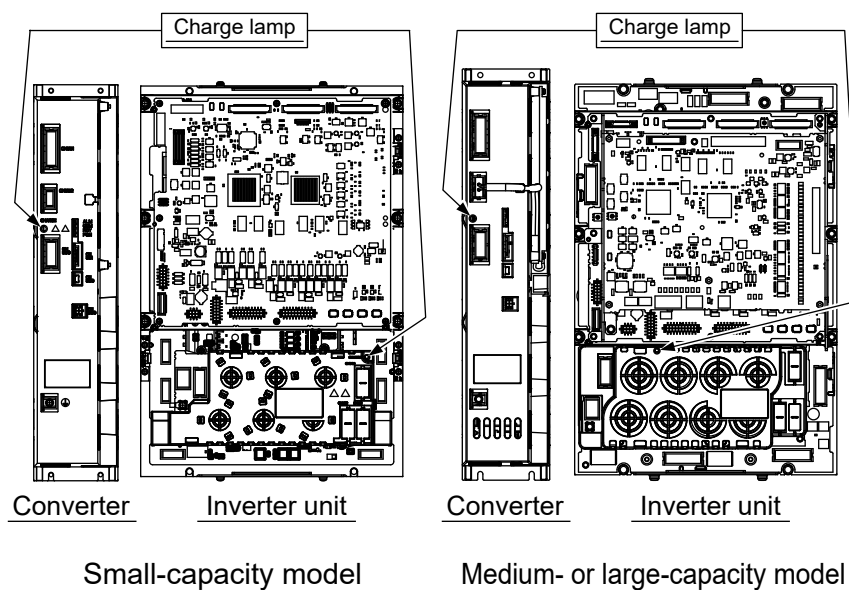
- Make sure to turn OFF the power supply before opening the door of the YRC1000.

Failure to observe this instruction may result in electric shock.

- After turning OFF the power supply, wait at least 5 minutes before replacing a unit or a circuit board. Do not touch any terminal during this period. In addition, confirm that the charge lamps (orange LED) on the converter and the inverter unit are turned OFF. (*)

Failure to observe this instruction may result in electric shock and/or personal injury due to residual voltage in the capacitor.

(*) If the charge lamp does not turn OFF for a long time, abnormal power shutdown (such as breaker off or power outage during servo ON) may have occurred. Discharge can be performed by turning ON the main power supply switch while the primary power supply is being supplied. Confirm that the charge lamp is turned OFF, and then turn OFF the main power supply switch.





WARNING

- To prevent anyone from inadvertently turning ON the power supply during maintenance and inspection, display a warning sign such as “DO NOT TURN ON THE POWER” at the primary power supply (at the knife switch, or at the circuit breaker, etc.) and at the YRC1000 and related controllers, and use proper lockout/tagout.

Failure to observe this instruction may result in electric shock and/or personal injury.

- After completing the replacement of parts, confirm that no problem is found in the manipulator and peripheral devices and no person is present in the manipulator's operating range. After that, start operating the manipulator.
- After installing the manipulator, replacing parts, modifying the taught job, or modifying the robot system by changing the tool or a peripheral device, etc., make sure to perform the first operation of the manipulator at low speed, and confirm that there is no abnormal noise, abnormal vibration, or abnormal operation. If an error occurs, immediately turn OFF the YRC1000 power supply and inform the safety manager of the error.
- When entering the area enclosed by the safety fences, confirm that there is no source of danger around. If it is necessary to enter the area enclosed by the safety fences while any source of danger exists, pay careful attention to the surroundings and enter the area with due care.
- If it is necessary to perform a maintenance operation or to enter the manipulator's operating range while the power is ON, make sure that another operator stays near the YRC1000 and is able to immediately press the emergency stop button in case of emergency.



CAUTION

- Do not touch the regeneration resistors. They are very hot.

Failure to observe this instruction may result in burn injuries.

- After completing the maintenance, make sure to confirm that no industrial tool, etc. is left inside the YRC1000 and that the door of the YRC1000 is securely closed.

Failure to observe this instruction may result in electric shock and/or personal injury.

- Make sure to use recommended spare parts only. If parts not recommended by YASKAWA are used, product performance cannot be guaranteed and mechanical failure and/or fire may result.
- If the light in the operator's working space is not bright enough, provide the space with appropriate lighting.

NOTICE

Refer to *chapter 1.1 “Arrangement of Units and Circuit Boards”* for the arrangement of Units and Circuit boards.

Discharge static electricity from the body of the operator before replacing parts.

It is required to remove the screws or disconnect the cables for replacing parts. Be careful not to lose the screws.

Although the tag that shows the connection position is attached to the cable, take a note of the connection position before disconnecting the cables to connect the cables correctly.



- When replacing parts, do not touch the electronic components, patterns, card edge contact parts, contact of the connector, etc. on the printed circuit board. If you inadvertently touch any of them, wipe off dust, dirt, or other foreign matters with a clean cloth.
- When storing spare parts, do not unpack them. Dust, dirt, or other foreign matters may adhere to the connecting parts (contacts of connectors, card edges, etc.) of the spare parts if unpacked.
- Make a backup of the data in advance in case a unit or circuit board is accidentally damaged during replacement and the data is erased. For the procedure to back up the data, refer to chapter 9 “System Backup” in “YRC1000 INSTRUCTIONS (RE-CTO-A221)”.

5.1.1 Replacing Parts of the CPU Unit

CPU unit (JZNC-ARK5□ -□ E) is consisted of the various circuit boards, the back board (JANCD-ABB01-E), the riser board (JANCD-ABB02-E), the robot I/F circuit board (JANCD-AIF01-□ E) and the CPU board (JANCD-ACP01-E). (Refer to *fig. 5-1* and *fig. 5-2*.)

Robot I/F board is a daughter board connected to the CPU board. (Refer to *fig. 5-2*.)

Fig. 5-1: CPU Unit

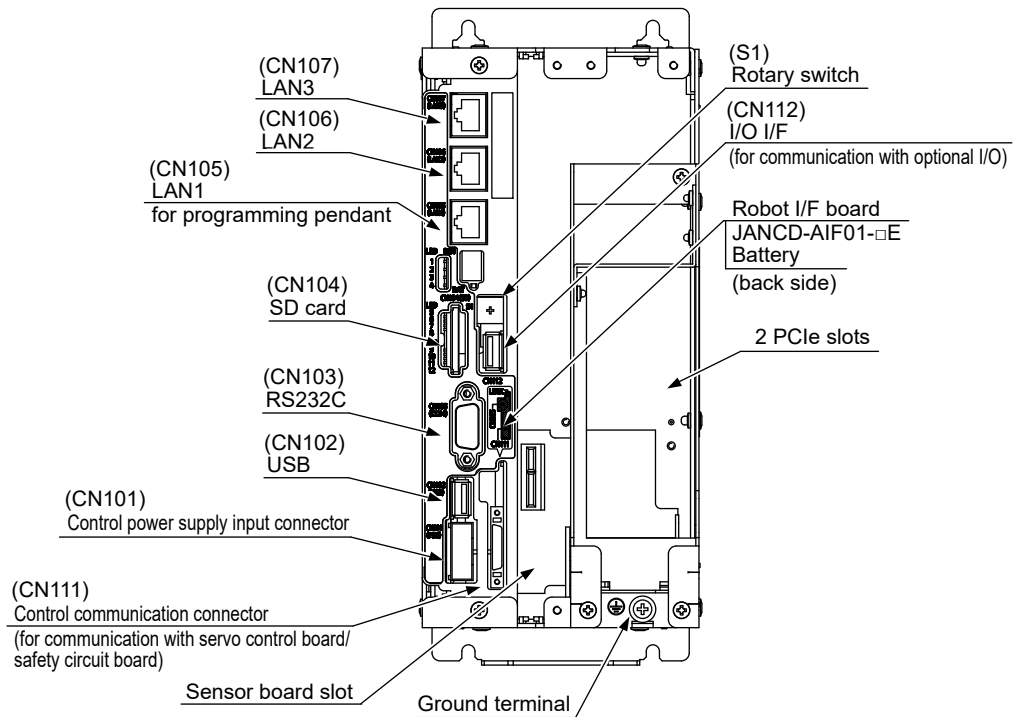
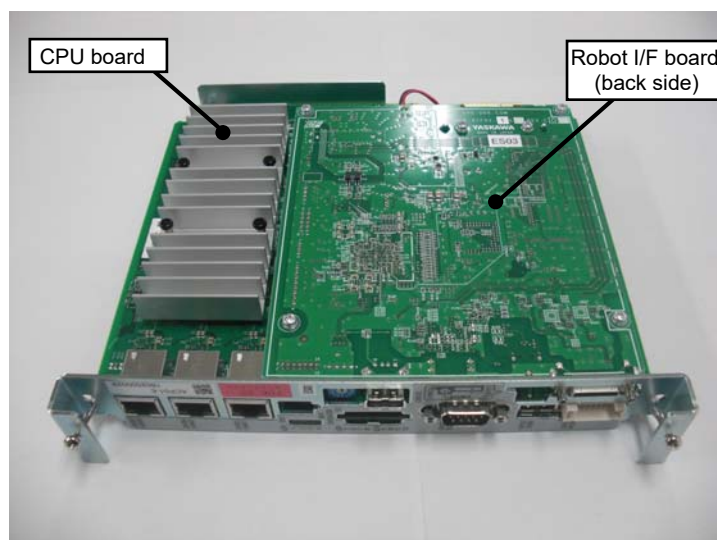


Fig. 5-2: Robot I/F Board and CPU Board (Removed from Unit)



5.1.1.1 Replacing the CPU Board (JANCD-ACP01-E)



WARNING

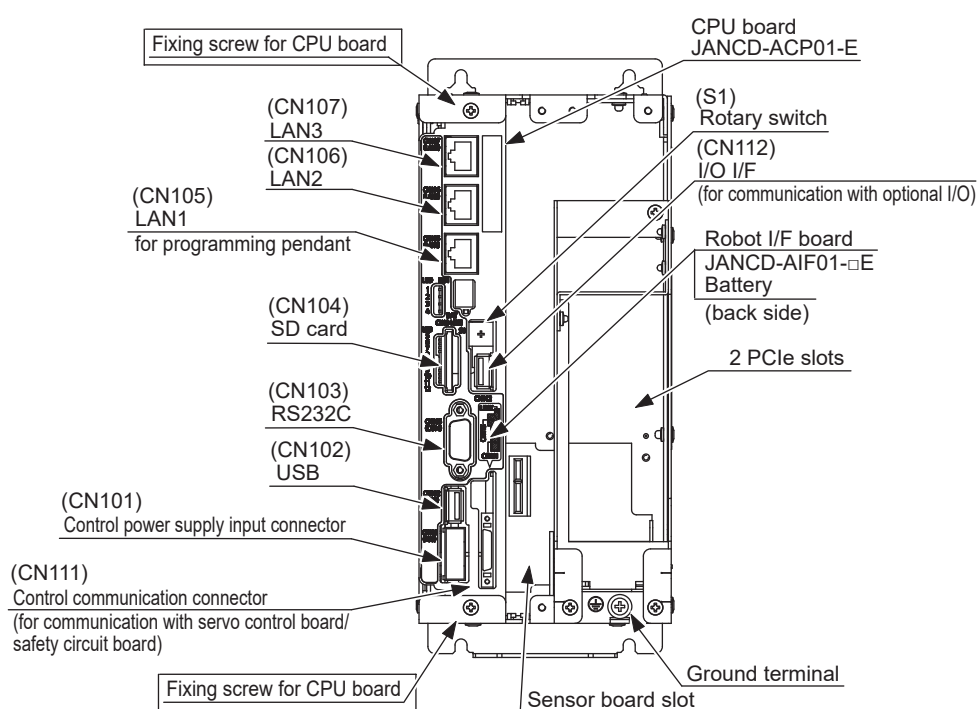
- Turn OFF the power before replacing a circuit board.
- After turning OFF the power supply, wait at least 5 minutes before the replacement operation. In addition, confirm that the charge lamps (orange LED) on the converter and the inverter unit are turned OFF. (*)

Failure to observe this instruction may result in electric shock and/or personal injury due to residual voltage in the capacitor.

NOTE

- When replacing parts, do not touch the electronic components, patterns, card edge contact parts, contact of the connector, etc. on the printed circuit board. If you inadvertently touch any of them, wipe off dust, dirt, or other foreign matters with a clean cloth.
- When storing spare parts, do not unpack them. Dust, dirt, or other foreign matters may adhere to the connecting parts (contacts of connectors, card edges, etc.) of the spare parts if unpacked.
- When replacing the CPU board, remove it together with the robot I/F board. The job data, parameters, and other information are saved on the robot I/F board. Make a backup of the data before replacing the CPU board in case the robot I/F board data is erased. For the procedure to back up the data, refer to chapter 9 "System Backup" in "YRC1000 INSTRUCTIONS (RE-CTO-A221)".

Fig. 5-3: CPU Unit (Replacement)



■ **Replacement Procedure**

1. Disconnect the cables connected to the CPU board and robot I/F board below. (Refer to *fig. 5-3*.)
 - ① Control communication connector (CN111)
 - ② Control power supply input connector (CN101)
 - ③ LAN1 for programming pendant connector (CN105)Disconnect the cable below if an optional function is added.
 - ④ USB connector (CN102)
 - ⑤ RS232C connector (CN103)
 - ⑥ LAN2 connector (CN106)
 - ⑦ LAN3 connector (CN107)
 - ⑧ I/O I/F connector (CN112)
2. Remove the screws fixing the CPU board from upper and lower side. (2 places)
3. Pull out the circuit board from the rack.
4. Remove the SD card from the connector (CN104) and insert the SD card into the new CPU board.

The SD card connector is push-in/push-out system. The SD card can be inserted/removed by push-in/push-out operation.
5. Remove the screws fixing the robot I/F board. (4 places) (Refer to *fig. 5-4*.)

The robot I/F board is connected to the connector (CNA) and the CPU board connector (CN12). Pull the robot I/F board straight up slowly and remove it from the CPU board. (Refer to *fig. 5-5*.)

5 Replacing Parts
5.1 Replacing YRC1000 Parts

Fig. 5-4: Robot I/F Board and CPU Board (Removed from Rack)

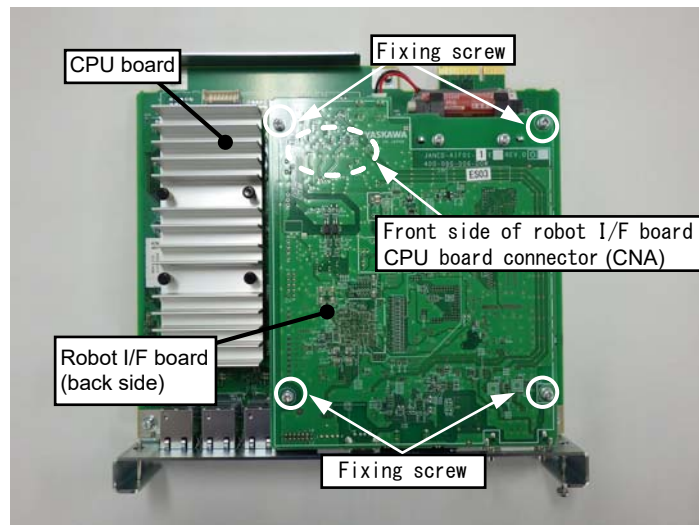
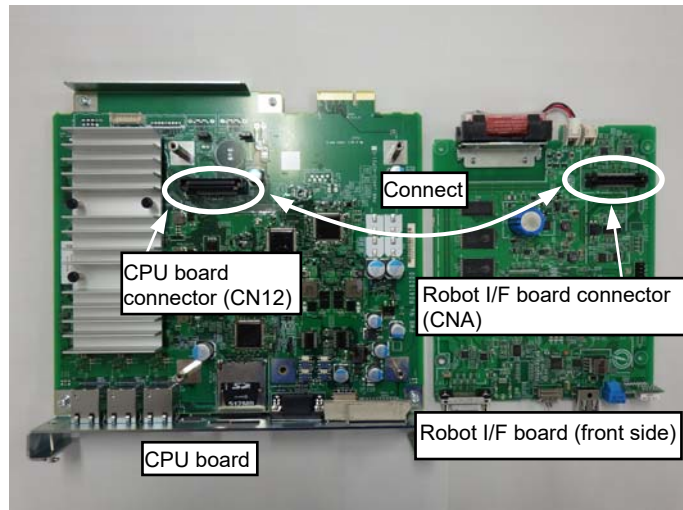


Fig. 5-5: Connecting CPU Board and Robot I/F Board



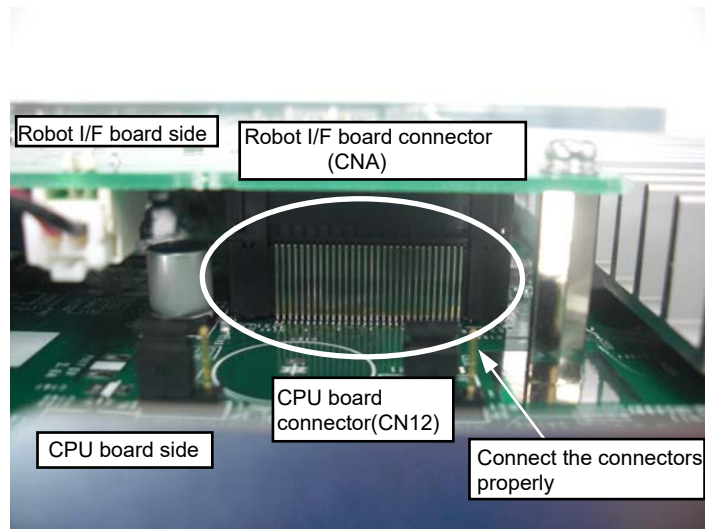
Maxell batteries will be replaced with the above Toshiba batteries due to discontinuation of production.
Toshiba batteries can also be used for maintenance or replacement.

5 Replacing Parts
5.1 Replacing YRC1000 Parts

6. Attach the robot I/F board onto the new CPU board by connecting the robot I/F board connector (CNA) to the new CPU board connector (CN12). (Refer to *fig. 5-5*)

When connecting these connectors of the boards, first adjust the position of the robot I/F board by positioning the fixing-screw holes of the robot I/F board onto the screw holes of hexagonal threaded spacers on the CPU board. And then, slowly press the robot I/F board onto the CPU board. If the positions of the robot I/F board and the CPU board are not adjusted properly and if the robot I/F board is forced into the CPU board, connectors may be damaged. Thus, when connecting these connectors, make sure to look at the boards from the side to adjust the positions properly. (Refer to *fig. 5-6*)

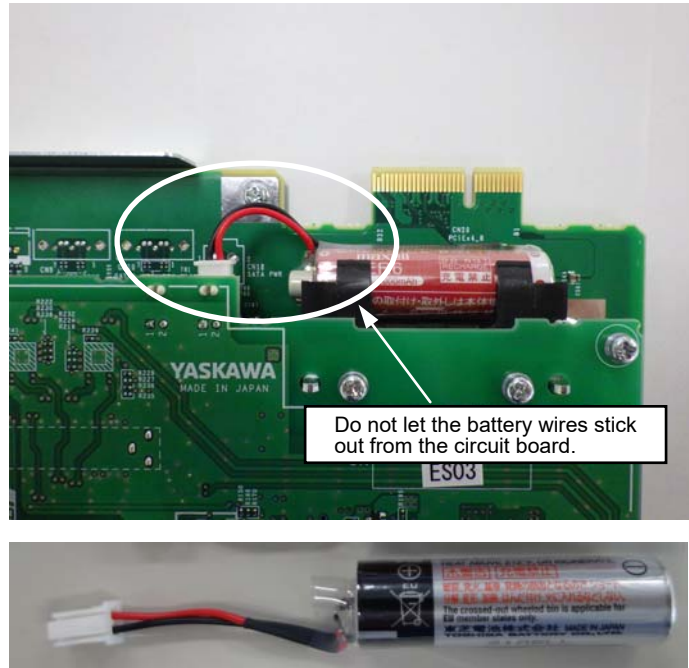
Fig. 5-6: Details for Connecting Connectors



5 Replacing Parts
5.1 Replacing YRC1000 Parts

7. Confirm that the battery wires are not sticking out from the CPU board before mounting the CPU board on the rack. If the battery wires are sticking out when mounting the CPU board, the battery wires may get caught in the backboard of the rack, that may result in equipment damage such as a broken wire. (Refer to *fig. 5-7*.)

Fig. 5-7: Notes on Battery Wires (before Replacement)



Maxell batteries will be replaced with the above Toshiba batteries due to discontinuation of production.
Toshiba batteries can also be used for maintenance or replacement.

8. Mount the new CPU board on the original position. (Refer to *fig. 5-8*.)

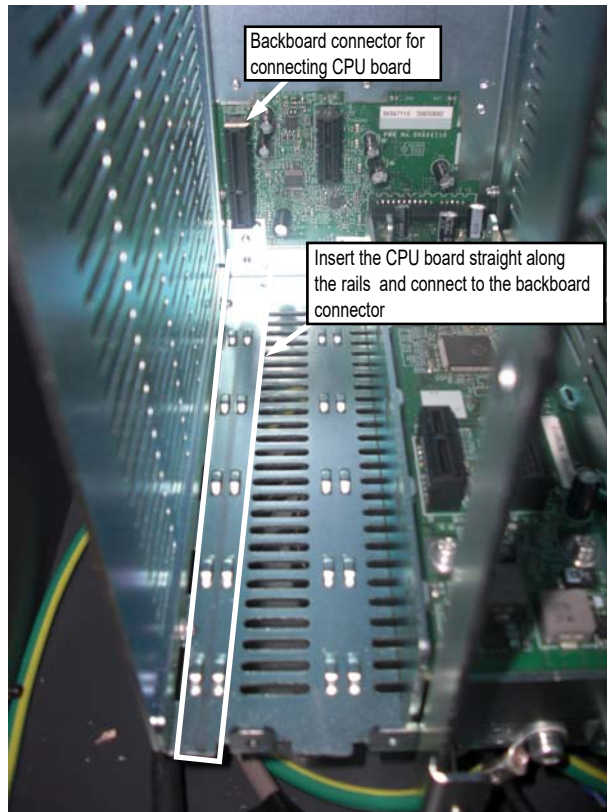


Fit the side of the CPU board in the upper and lower rails that are on the left side in the rack. Then insert the CPU board straight along the rails and connect to the backboard connector.

If force the CPU board into the backboard connector while the CPU board deviates from the rails, it may result in damage to the CPU board. If the CPU board stuck in the rails, pull out the CPU board and confirm not to damage to it. Then insert the CPU board again.

5 Replacing Parts
5.1 Replacing YRC1000 Parts

Fig. 5-8: Mounting on Rack



9. Tighten the screws fixing the CPU board from upper and lower side (2 places) and fix to the rack.
10. Connect all cables are disconnected in step 1.

5 Replacing Parts

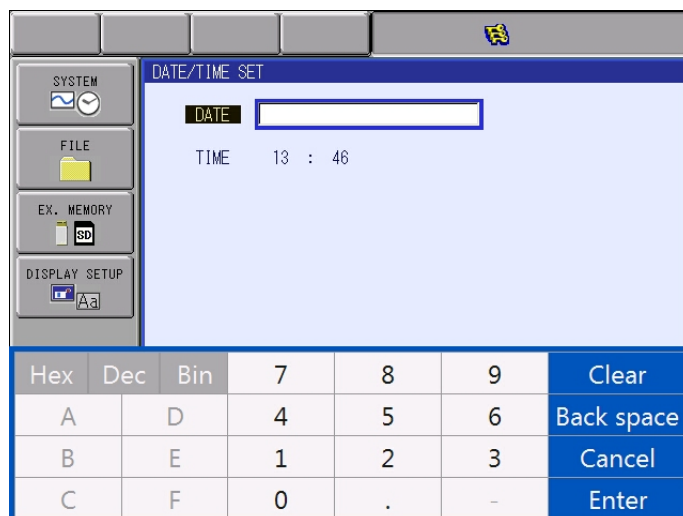
5.1 Replacing YRC1000 Parts

11. Turn ON the YRC1000 while pressing down [MAIN MENU] to start maintenance mode after replacing the CPU board (JANCD-ACP01-E). Set the date and time after changing the security mode to management mode.

- (1) Select {SYSTEM} – {SETUP} – {DATE/TIME}.
– The DATE/TIME window appears.



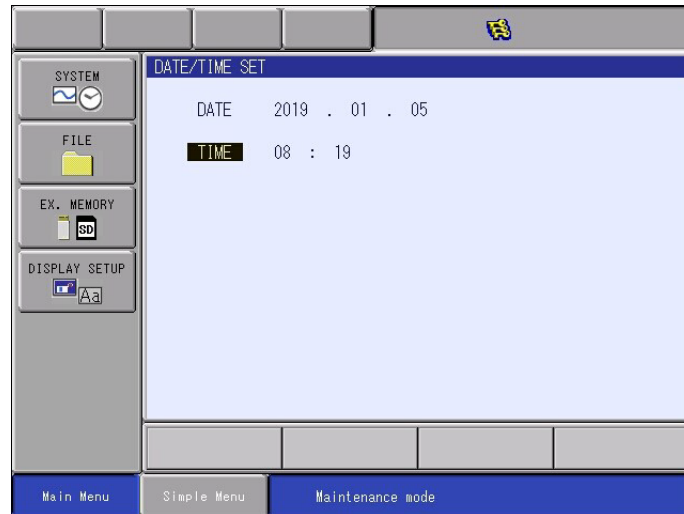
- (2) Select {DATE} or {TIME}.
– Numbers can now be entered.



- (3) Input date or time.
– Input "2019.01.05" if the date is January 5, 2019.
Input "08.19" if the time is eight nineteen (8:19 am).

5 Replacing Parts
5.1 Replacing YRC1000 Parts

- (4) Press [ENTER].
– The date or time changes.



- (5) Press [ENTER] again.
– Date and time settings are completed if the following screen appears.



12. Turn OFF the power of the YRC1000.

5.1.1.2 Replacing the Robot I/F Board (JZNCD-AIF01-□E)



WARNING

- Turn OFF the power before replacing a circuit board.
- After turning OFF the power supply, wait at least 5 minutes before the replacement operation. In addition, confirm that the charge lamps (orange LED) on the converter and the inverter unit are turned OFF. (*)

Failure to observe this instruction may result in electric shock and/or personal injury due to residual voltage in the capacitor.



- Be sure to back up robot data before replacing the circuit board since the robot I/F circuit board contains important data such as robot jobs and parameters.
- There are two memory sizes to the robot I/F circuit board: 2 MB and 4 MB.
- Before the board is replaced, turn ON the YRC1000 while pressing down [MAIN MENU] to start maintenance mode and check the used memory size and the mounted memory size.

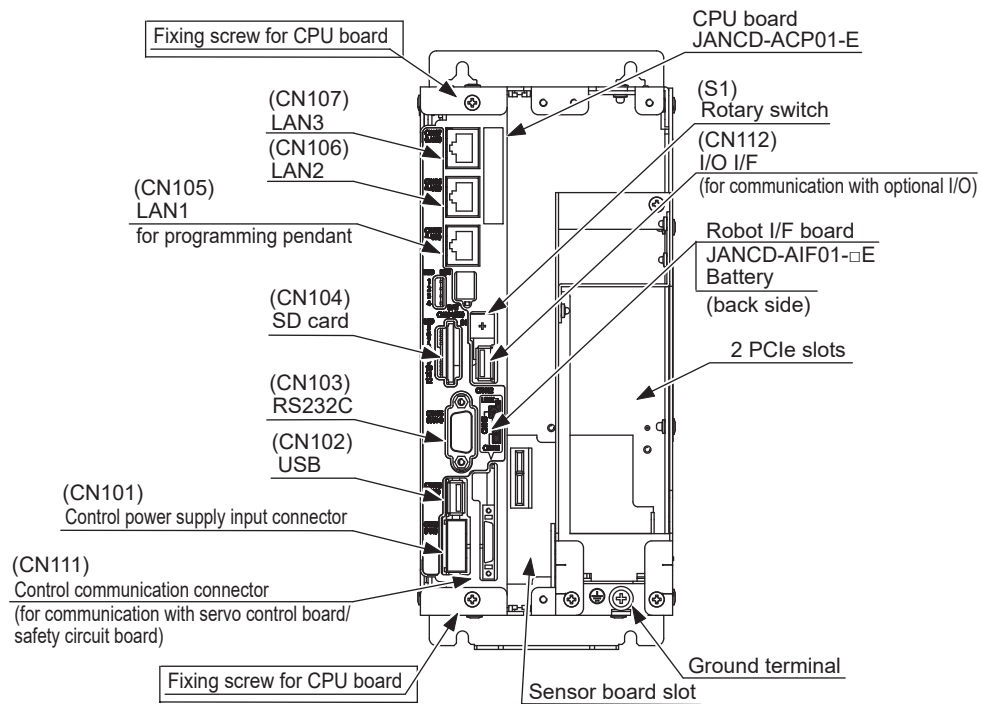
Normal : JANCD-AIF01-1E (memory size: 2MB)

Optional : JANCD-AIF01-2E (memory size: 4MB)

JANCD-AIF01-3E (memory size: 4MB,
communication I/F included)

- When replacing parts, do not touch the electronic components, patterns, card edge contact parts, contact of the connector, etc. on the printed circuit board.
If you inadvertently touch any of them, wipe off dust, dirt, or other foreign matters with a clean cloth.
- When storing spare parts, do not unpack them. Dust, dirt, or other foreign matters may adhere to the connecting parts (contacts of connectors, card edges, etc.) of the spare parts if unpacked.
- Be sure to load the backup data that is saved before replacing the circuit board after replacing the robot I/F circuit board.

Fig. 5-9: CPU Unit (Replacement)



■ Replacement Procedure

- Back up the robot data before replacement.
Insert a SD card for backup to the SD card slot of programming pendant, and turn ON the YRC1000 while pressing down [MAIN MENU] to start maintenance mode.
Select {EX.MEMORY} ⇒ {SAVE} ⇒ "BATCH CMOS" to save the CMOS data.
Refer to "YRC1000 INSTRUCTIONS (RE-CTO-A221)" for details on how to backup.
- Turn OFF the power after making backup.
- Disconnect the following cables connected to the CPU unit and Robot I/F board. (Refer to fig. 5-9.)

① Control communication connector	(CN111)
② Control power supply input connector	(CN101)
③ LAN1 for programming pendant connector	(CN105)

 Connect the cable below if an optional function is added.

④ USB connector	(CN102)
⑤ RS232C connector	(CN103)
⑥ LAN2 connector	(CN106)
⑦ LAN3 connector	(CN107)
⑧ I/O I/F connector	(CN112)
- Remove the screws fixing the CPU board from upper and lower side (2 places) and pull out the circuit board from the rack.
- Remove the screws fixing the robot I/F board. (4 places)
(Refer to fig. 5-10.)
The robot I/F board is connected to the connector (CNA) and the CPU board connector (CN12). Pull the robot I/F board straight up slowly and remove it from the CPU board. (Refer to fig. 5-11.)

5 Replacing Parts
5.1 Replacing YRC1000 Parts

Fig. 5-10: Robot I/F Board and CPU Board (Removed from Rack)

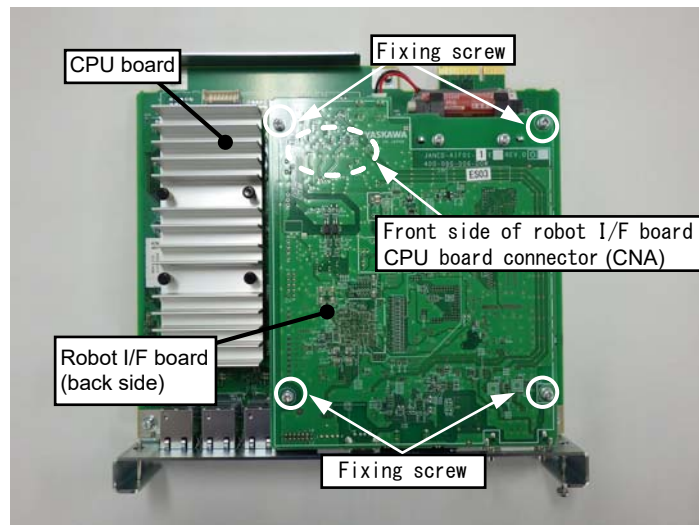
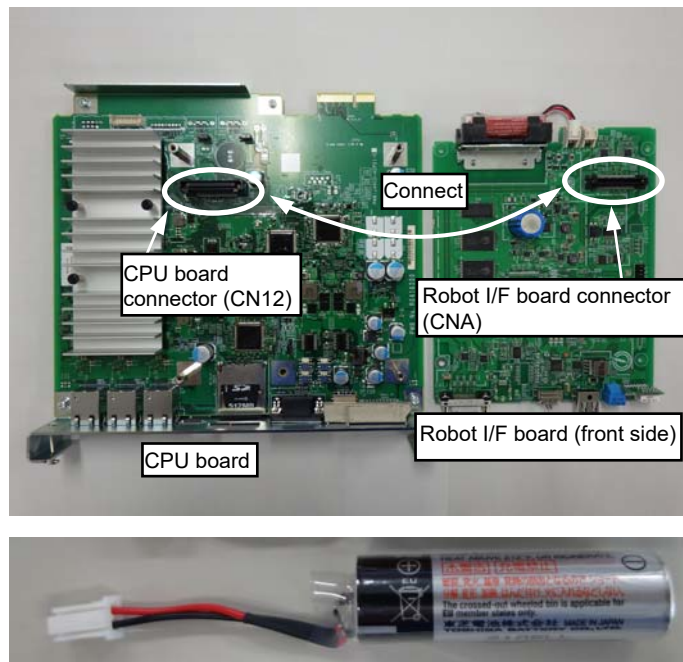


Fig. 5-11: Connecting CPU Board and Robot I/F Board



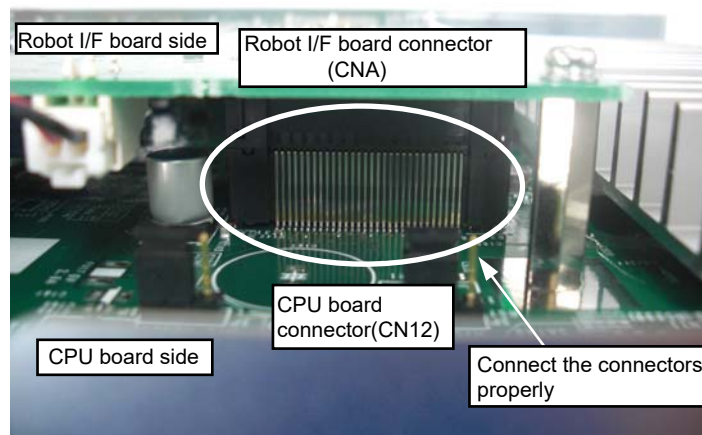
Maxell batteries will be replaced with the above Toshiba batteries due to discontinuation of production.
Toshiba batteries can also be used for maintenance or replacement.

5 Replacing Parts
5.1 Replacing YRC1000 Parts

6. Confirm that the setting of the rotary switch (S1) of the new robot I/F board is the same as that of the old robot I/F board.
7. Attach the new robot I/F board onto the CPU board by connecting the new robot I/F board connector (CNA) to the CPU board connector (CN12). (Refer to *fig. 5-11*)

When connecting these connectors of the boards, first adjust the position of the robot I/F board by positioning the fixing-screw holes on the back of the robot I/F board onto the screw holes of hexagonal threaded spacers on the CPU board. And then, slowly press the robot I/F board onto the CPU board. If the positions of the robot I/F board and the CPU board are not adjusted properly and if the robot I/F board is forced into the CPU board, connectors may be damaged. Thus, when connecting these connectors, make sure to look at the boards from the side to adjust the positions properly. (Refer to *fig. 5-12*)

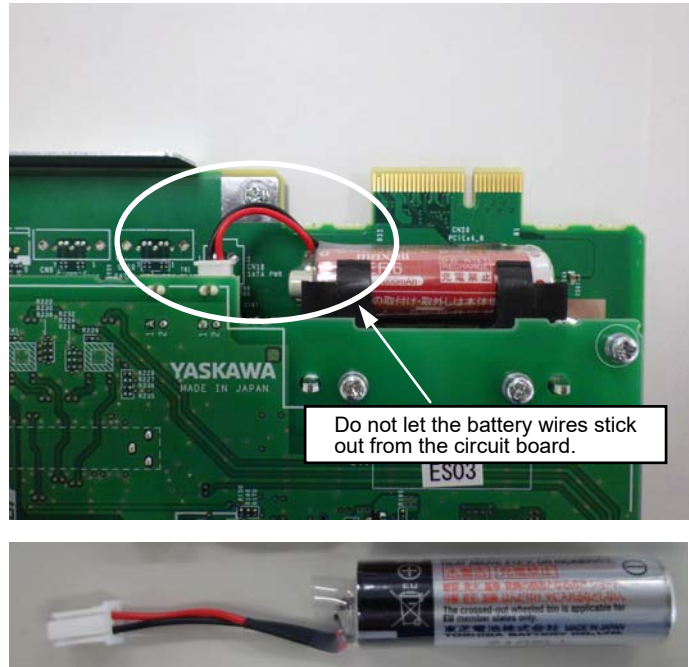
Fig. 5-12: Details for Connecting Connectors



5 Replacing Parts
5.1 Replacing YRC1000 Parts

8. Confirm that the battery wires are not sticking out from the CPU board before mounting the CPU board on the rack. If the battery wires are sticking out when mounting the CPU board, the battery wires may get caught in the backboard of the rack, that may result in equipment damage such as a broken wire. (Refer to *fig. 5-13*.)

Fig. 5-13: Notes on Battery Wires



Maxell batteries will be replaced with the above Toshiba batteries due to discontinuation of production.
Toshiba batteries can also be used for maintenance or replacement.

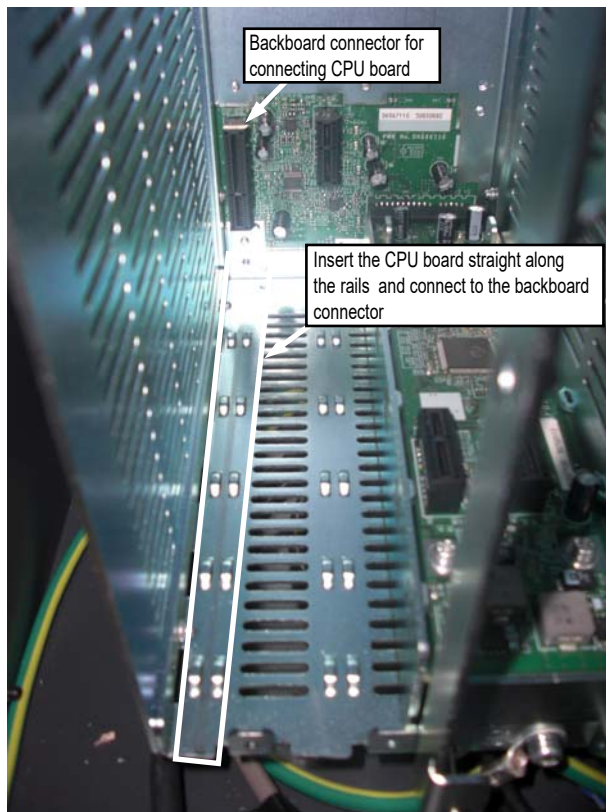
9. Mount the CPU board on the original position. (Refer to *fig. 5-14*.)



Fit the side of the CPU board in the upper and lower rails that are on the left side in the rack. Then insert the CPU board straight along the rails and connect to the backboard connector.

If force the CPU board into the backboard connector while the CPU board deviates from the rails, it may result in damage to the CPU board. If the CPU board stuck in the rails, pull out the CPU board and confirm not to damage to it. Then insert the CPU board again.

Fig. 5-14: Mounting on Rack



10. Tighten the screws fixing the CPU board from upper and lower side (2 places) and fix to the rack.
11. Connect all cables are disconnected in step 1.
12. Turn ON the YRC1000 while pressing down [MAIN MENU] to start maintenance mode, after replacing the robot I/F circuit board (JANCD-AIF01-□E). Load the backup data that is saved before replacing the circuit board after changing the security to management mode.
13. Perform the procedure described in the chapter 8.26.17.2 "Safety Circuit Board FLASH ROM Data Erase and Reset" in YRC1000 INSTRUCTIONS (RE-CTO-A221).
14. Turn OFF the power of the YRC1000.

5.1.1.3 Replacing the Battery

The battery must be replaced as soon as the message “Memory battery weak” appears at the programming pendant display. (within 30 days after the message appears)

To prevent loss of data, keep the breaker turned ON until just before starting the replacement of the battery.



WARNING

- Turn OFF the power before replacing a circuit board.
- After turning OFF the power supply, wait at least 5 minutes before the replacement operation. In addition, confirm that the charge lamps (orange LED) on the converter and the inverter unit are turned OFF. (*)

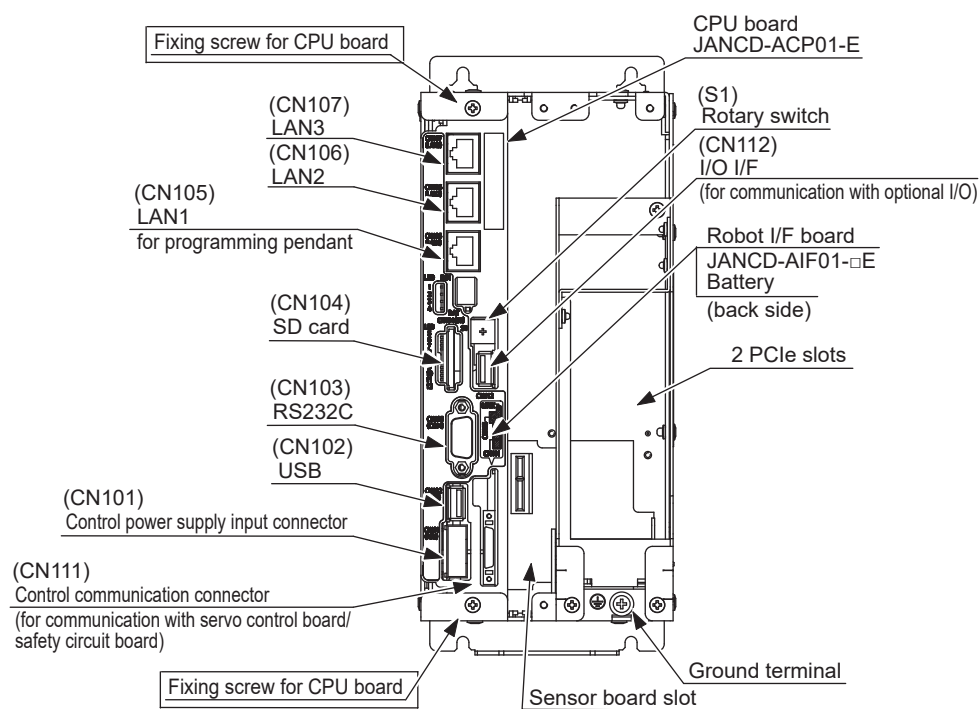
Failure to observe this instruction may result in electric shock and/or personal injury due to residual voltage in the capacitor.



- Although the CMOS memory is backed up by super capacitor, the battery must be replaced as soon as the message “Memory battery weak” appears. (within 30 days after the message appears)
Keep the breaker turned ON until just before starting the replacement of the battery. The super capacitor provides backup power for 16 hours when powered for 30 minutes (at a surrounding temperature of 25°C). However, replace the battery as soon as possible after the breaker is turned OFF.
- Make a backup of the data before replacing the battery in case the data is erased during replacement. For the procedure to back up the data, refer to chapter 9 “System Backup” in “YRC1000 INSTRUCTIONS (RE-CTO-A221)”.
- When replacing parts, do not touch the electronic components, patterns, card edge contact parts, contact of the connector, etc. on the printed circuit board.
If you inadvertently touch any of them, wipe off dust, dirt, or other foreign matters with a clean cloth.

5 Replacing Parts
5.1 Replacing YRC1000 Parts

Fig. 5-15: CPU Unit (Replacement)



■ **Replacement Procedure**

1. Disconnect the following cables connected to the CPU unit and Robot I/F board. (Refer to *fig. 5-15*.)

- ① Control communication connector (CN111)
- ② Control power supply input connector (CN101)
- ③ LAN1 for programming pendant connector (CN105)

Disconnect the cable below if an optional function is added.

- ④ USB connector (CN102)
- ⑤ RS232C connector (CN103)
- ⑥ LAN2 connector (CN106)
- ⑦ LAN3 connector (CN107)
- ⑧ I/O I/F connector (CN112)

2. Remove the screws fixing the CPU board from upper and lower side. (2 places)

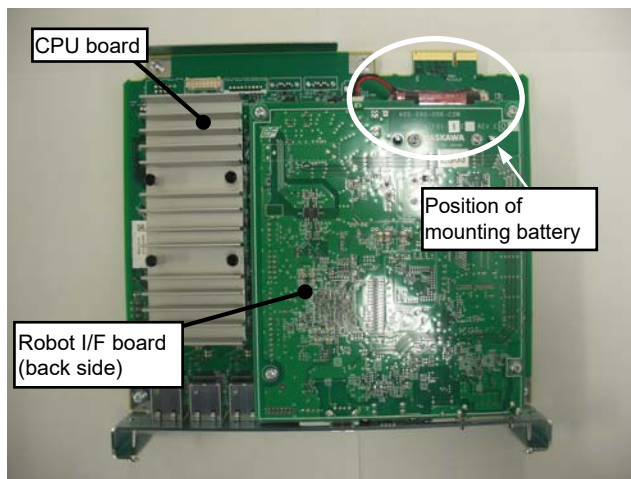
3. Pull out the circuit board from the rack.

4. Check the position of battery and battery connectors. (Refer to *fig. 5-16* and *fig. 5-17*.)

This procedure is for the first replacement of battery.

From the second replacement, the connector (CN114) or the connector (CN115) is not connected to the battery. Then connect the new battery to the disconnected connector.

Fig. 5-16: Robot I/F Board and CPU Board

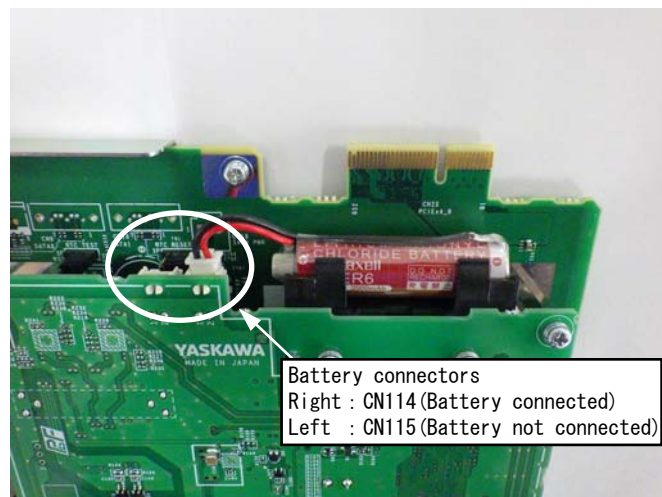


Maxell batteries will be replaced with the above Toshiba batteries due to discontinuation of production.

Toshiba batteries can also be used for maintenance or replacement.

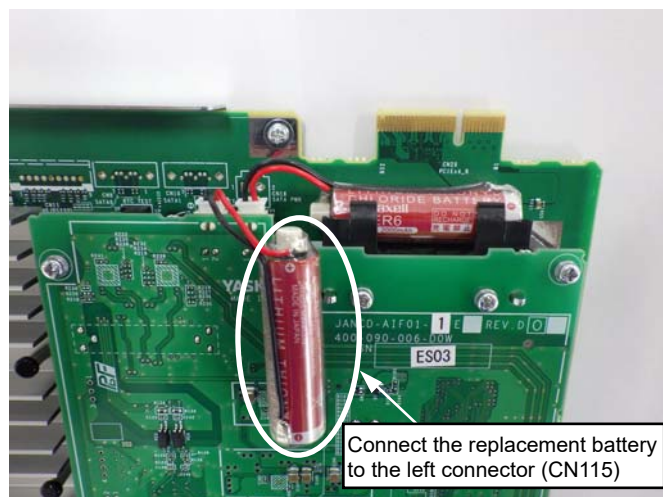
5 Replacing Parts
5.1 Replacing YRC1000 Parts

Fig. 5-17: Battery Connecting 1



5. Keep the old battery connecting and connect the new battery to the connector (CN115) (left side). (Refer to *fig. 5-18*.)

Fig. 5-18: Battery Connecting 2

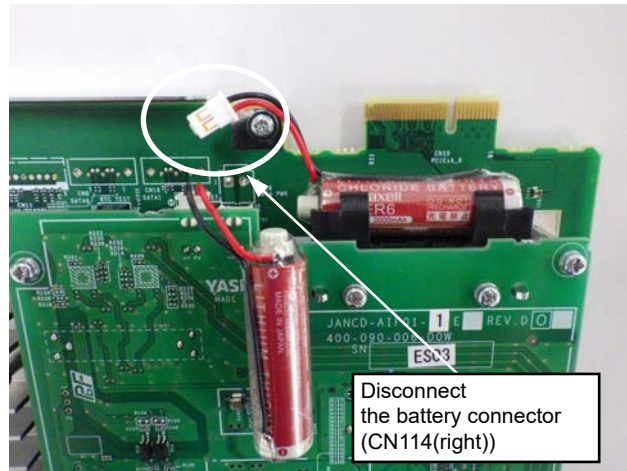


Maxell batteries will be replaced with the above Toshiba batteries due to discontinuation of production.
Toshiba batteries can also be used for maintenance or replacement.

5 Replacing Parts
5.1 Replacing YRC1000 Parts

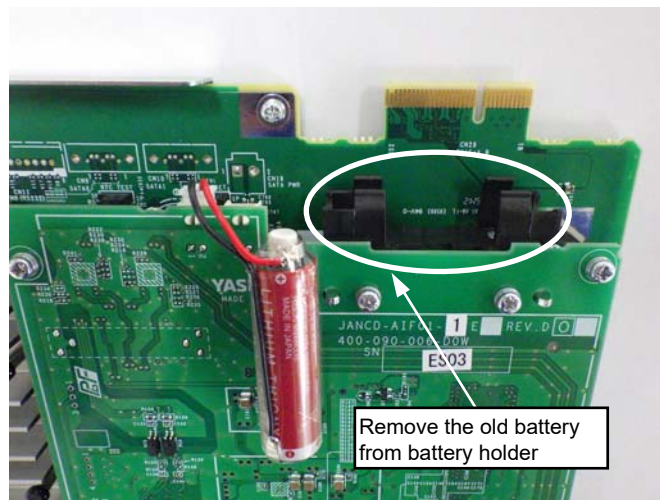
6. Disconnect the connector that is connected to the old battery (CN114) (right side). (Refer to *fig. 5-19*.)

Fig. 5-19: Battery Connecting 3



7. Remove the old battery from the battery holder. (Refer to *fig. 5-20*.)

Fig. 5-20: Battery Connecting 4



Maxell batteries will be replaced with the above Toshiba batteries due to discontinuation of production.
Toshiba batteries can also be used for maintenance or replacement.

5 Replacing Parts
5.1 Replacing YRC1000 Parts

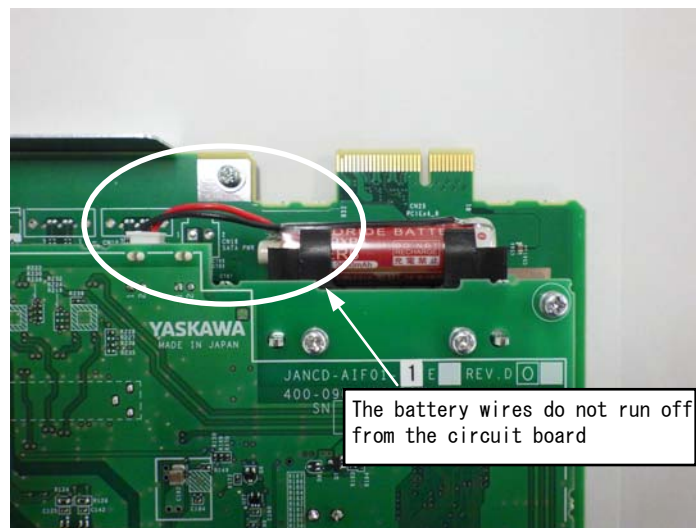
8. Mount the new battery on the battery holder. (Refer to *fig. 5-21*.)

Fig. 5-21: Battery Connecting 5



9. Confirm not to run off the battery wires from the CPU board before mounting the CPU board on the rack. If the CPU board is mounted with the battery wires running off, the battery wires get caught in the backboard of rack and it may result in damage to equipment such as a breaking of wire.
(Refer to *fig. 5-22*.)

Fig. 5-22: Notes for Battery Wires (after Replacement)



Maxell batteries will be replaced with the above Toshiba batteries due to discontinuation of production.
Toshiba batteries can also be used for maintenance or replacement.

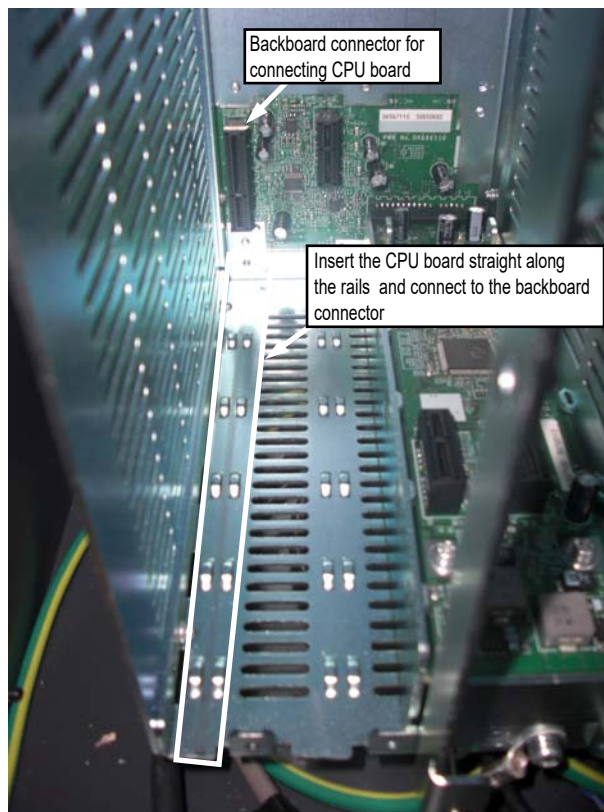
10. Mount the CPU board on the original position. (Refer to *fig. 5-23*.)



Fit the side of the CPU board in the upper and lower rails that are on the left side in the rack. Then insert the CPU board straight along the rails and connect to the backboard connector.

If force the CPU board into the backboard connector while the CPU board deviates from the rails, it may result in damage to the CPU board. If the CPU board stuck in the rails, pull out the CPU board and confirm not to damage to it. Then insert the CPU board again.

Fig. 5-23: Mounting on Rack



11. Tighten the screws fixing the CPU board from upper and lower side (2 places) and fix to the rack.

12. Connect all cables are disconnected in step 1.

5.1.1.4 Replacing the SD Card



WARNING

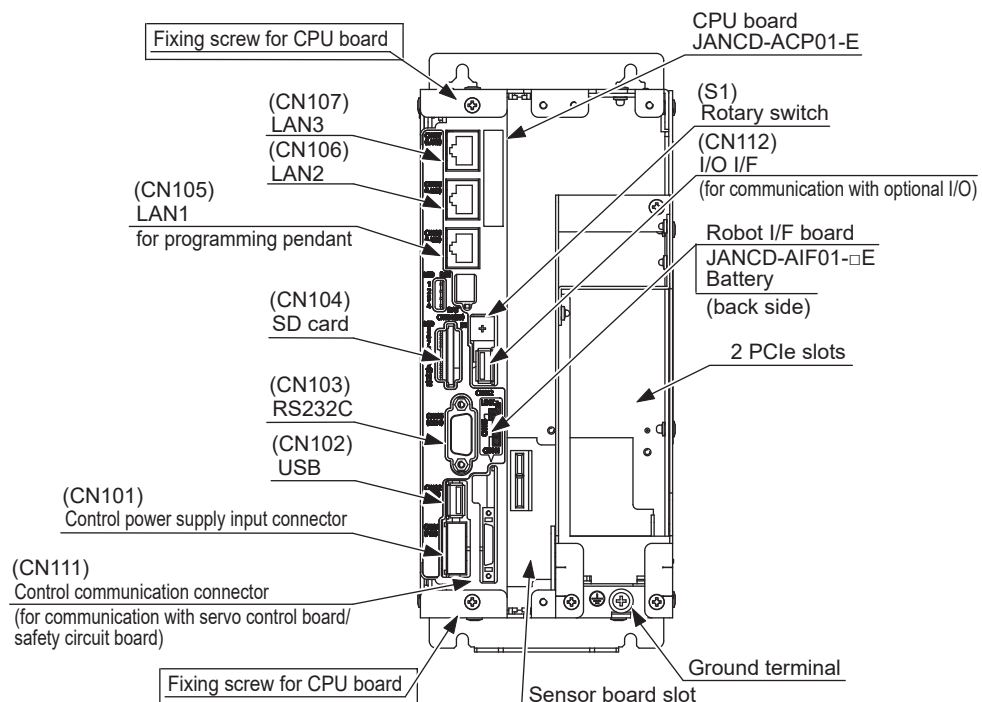
- Turn OFF the power before replacing an SD card.
- After turning OFF the power supply, wait at least 5 minutes before the replacement operation. In addition, confirm that the charge lamps (orange LED) on the converter and the inverter unit are turned OFF. (*)

Failure to observe this instruction may result in electric shock and/or personal injury due to residual voltage in the capacitor.



- Back up the data on the SD card before replacement when possible because the SD card stores the data on JOB and FILE/GENERAL DATA, etc.
- When replacing parts, do not touch the electronic components, patterns, card edge contact parts, contact of the connector, etc. on the printed circuit board. If you inadvertently touch any of them, wipe off dust, dirt, or other foreign matters with a clean cloth.
- When storing spare parts, do not unpack them. Dust, dirt, or other foreign matters may adhere to the connecting parts (contacts of connectors, card edges, etc.) of the spare parts if unpacked.
- In case of an SD card failure, prepare the items described *chapter 12.6 "In Case of the SD Card Failure"* in advance.

Fig. 5-24: CPU Unit



■ **Replacement Procedure**

Perform the subsequent work only if the SD card is judged as having failed by referring to *chapter 12.3.1 “Determining Failure of SD Card”*.

1. Prepare the SD card by referring to *chapter 12.3.2 “Preparation of SD Card for ACP01”*.

When the SD card has been prepared, eject the SD card in the SD card slot (CN104) and insert the SD card for the ACP01 that was prepared.

The SD card fits in the card slot in one direction only. As shown in the following photo, insert the SD card with the label pointing to the right side.



The SD card slot uses a push-push mechanism. Push the SD card slowly into the SD card slot until a click is heard to lock it. This concludes inserting the SD card.

To eject the SD card, push in the SD card a small amount. The SD card is unlocked when a click is heard. Slowly pull back your finger and the SD card is pushed out by a spring.



5	Replacing Parts
5.1	Replacing YRC1000 Parts

The write protect switch (Lock) is found on the left side of the front surface of the SD card. Confirm that this switch is not set to the Lock side before using the SD card. The system does not operate correctly if this switch is set to the Lock side.

2. Perform the work starting from *chapter 12.3.3 "Preparation of SD Card for Wiring the Program"* and complete the work in *chapter 12.3 "Restoration Procedure 1 (Writing the Program)"*.
3. Perform the work in *chapter 12.4 "Restoration Procedure 2 (Loading the Batch Data)"*.
4. If the MotoPlus function is valid, perform the work in *chapter 12.5 "Restoration Procedure 3 (Loading Other Data (Installation))"*.

5.1.2 Replacing the General-Purpose I/O Board (JANCD-AIO0□-E)



WARNING

- Turn OFF the power before replacing a circuit board.
- After turning OFF the power supply, wait at least 5 minutes before the replacement operation. In addition, confirm that the charge lamps (orange LED) on the converter and the inverter unit are turned OFF. (*)

Failure to observe this instruction may result in electric shock and/or personal injury due to residual voltage in the capacitor.

The general-purpose I/O board is mounted on the upper part of the inverter unit. (Refer to *fig. 5-25*.)

Fig. 5-25: Configuration of Inverter Unit 1

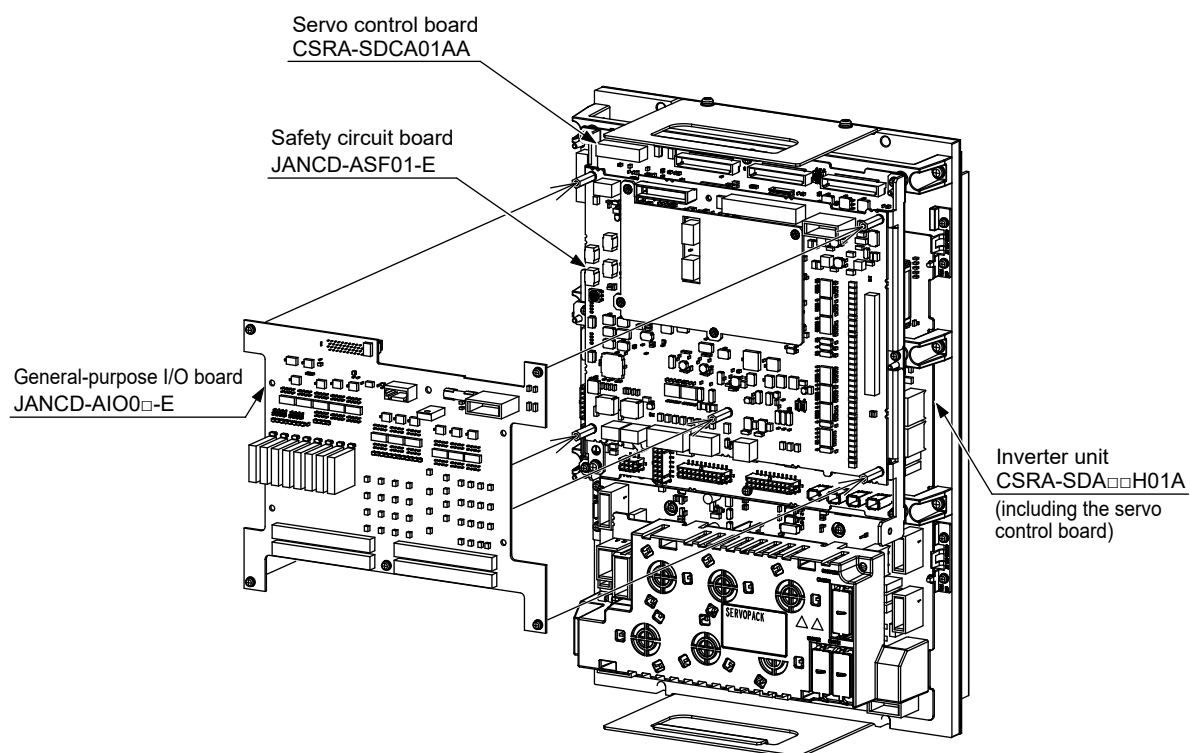
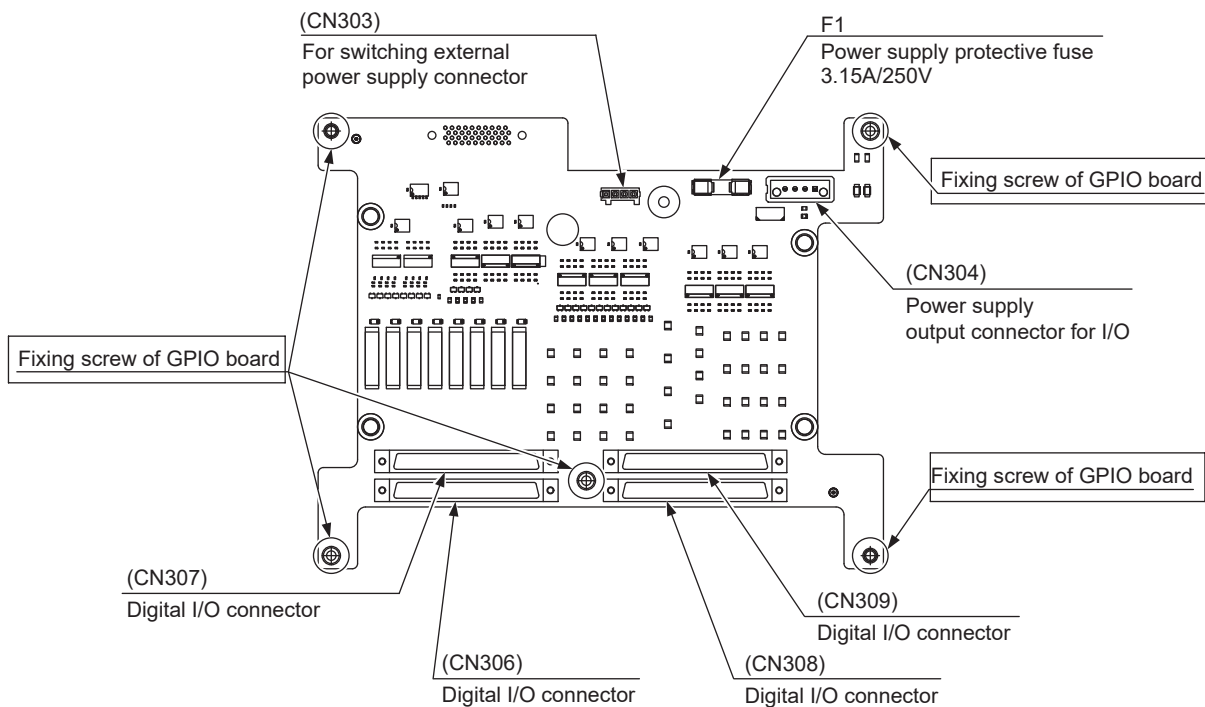


Fig. 5-26: General-Purpose I/O Board (JANCD-AIO0□-E)



■ Replacement Procedure

1. Disconnect the following connector connected to the general-purpose I/O board. (Refer to *fig. 5-26*.)
 - ① Digital I/O connector (CN306 to CN309)
(Optional)
2. Remove the screws fixing the general-purpose I/O board.
(5 places)
3. The general-purpose I/O board is connected to the connector (CNAX) and the connector (CNAX) of the safety circuit board (JANCD-ASF01-E) that is under the general-purpose I/O board.
Pull the general-purpose I/O board straight up slowly and remove it from the safety circuit board. (Refer to *fig. 5-27* and *fig. 5-28*.)

Fig. 5-27: General-Purpose I/O Board (Both Sides)

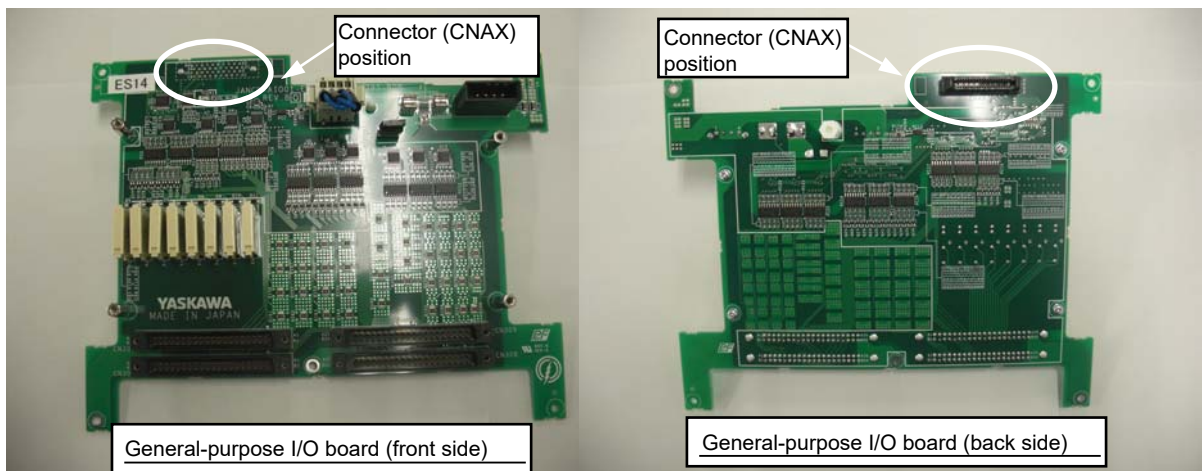
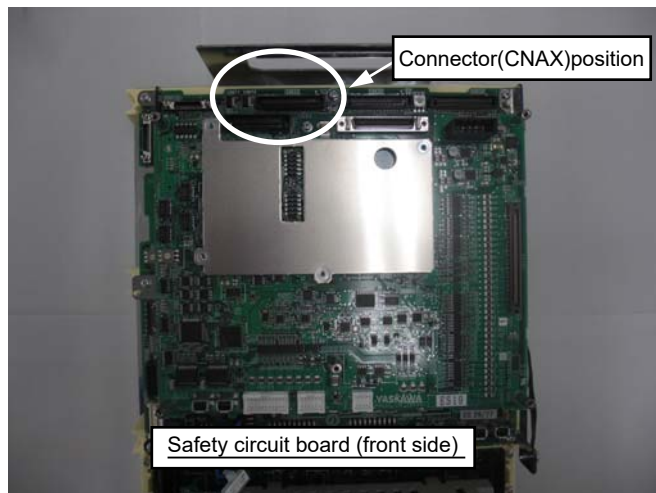


Fig. 5-28: Safety Circuit Board



4. Connect the new general-purpose I/O board connector (CNAX) to the safety circuit board connector (CNAX). Then attach the new general-purpose I/O board to the safety circuit board.
(Refer to *fig. 5-27* and *fig. 5-28*.)
Adjust the position of the screw holes on the front side of general-purpose I/O board and the position of the screw holes of hexagonal threaded spacer on the safety circuit board. Then insert the general-purpose I/O board into the safety circuit board slowly.
If force the general-purpose I/O board into the safety circuit board while the connection position deviates, it may cause damage to the connectors. Look from the side and adjust the connection position when connecting.
5. Tighten the screws fixing the general-purpose I/O board. (5 places)
6. Connect all cables are disconnected in step 1.

5.1.3 Replacing the Safety Circuit Board (JANCD-ASF01-E)



WARNING

- Turn OFF the power before replacing a circuit board.
- After turning OFF the power supply, wait at least 5 minutes before the replacement operation. In addition, confirm that the charge lamps (orange LED) on the converter and the inverter unit are turned OFF. (*)

Failure to observe this instruction may result in electric shock and/or personal injury due to residual voltage in the capacitor.



Refer to *chapter 5.5 “Confirming Revision Number of YRC1000 Replacement Circuit Board”* and confirm the version compatibility of the replacement circuit board with the system software before replacing the circuit board.

The safety circuit board is mounted under the general -purpose I/O board.
(Refer to *fig. 5-29*.)

Remove the general -purpose I/O board before replacement of the safety circuit board.

(Refer to replacement procedure in *chapter 5.1.2 “Replacing the General-Purpose I/O Board (JANCD-AIO0□-E)”*.)

Perform the following procedure after removing the general purpose I/O board.

Fig. 5-29: Configuration of Inverter Unit 2

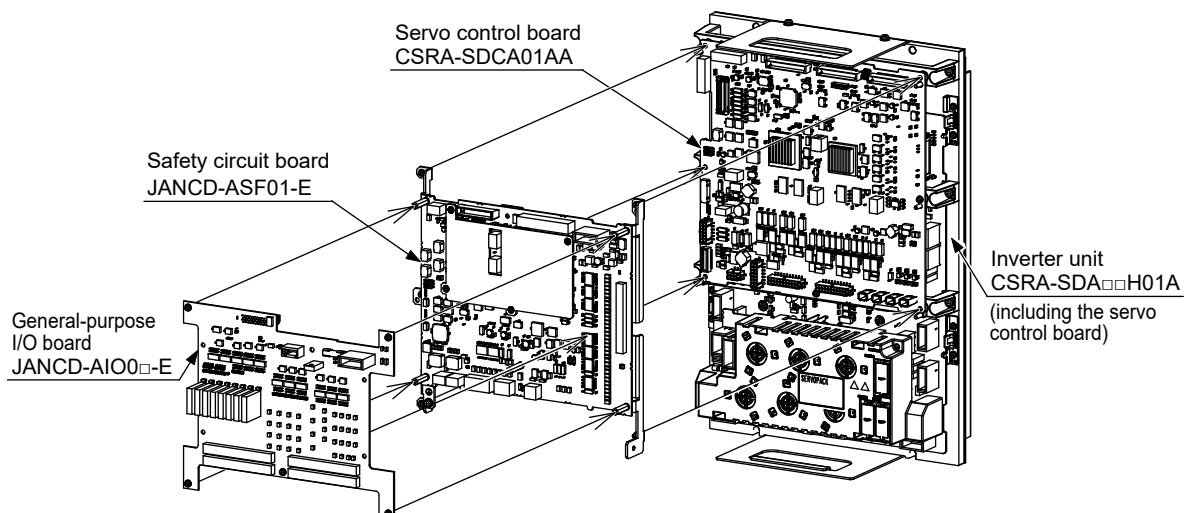
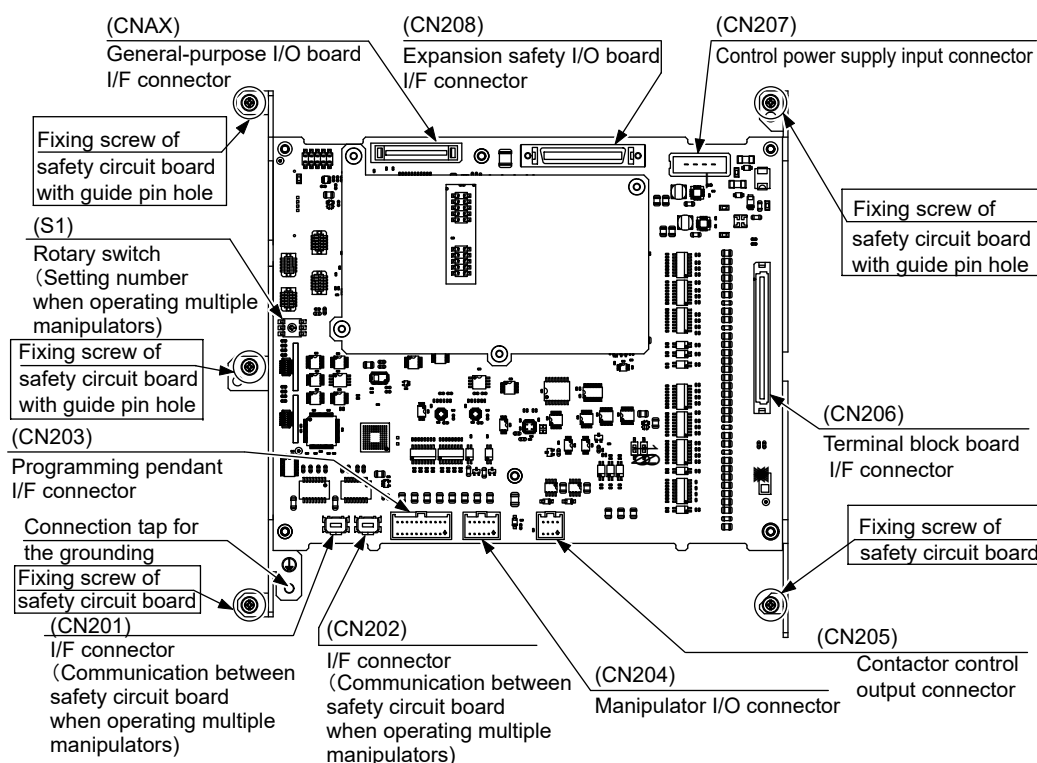


Fig. 5-30: Safety Circuit Board (JANCD-ASF01-E)



■ Replacement Procedure

1. Disconnect the following connector connected to the safety circuit board. (Refer to *fig. 5-30*.)

- | | |
|--|--------------------------|
| ① Programming pendant I/F connector | (CN203) |
| ② Manipulator I/O connector | (CN204) |
| ③ Contactor control output connector | (CN205) |
| ④ Terminal block board I/F connector | (CN206) |
| ⑤ Control power supply input connector | (CN207) |
| ⑥ Ground wire | (The tap of metal frame) |

The following connectors are optional. Disconnect them if they are connected.

- | | |
|--|---------|
| ⑦ I/F connector | (CN201) |
| ⑧ I/F connector | (CN202) |
| ⑨ Expansion safety I/O board I/F connector | (CN208) |

2. Remove the screws fixing the safety circuit board. (5 places)
3. The safety circuit board is connected to the connector (CNBX) and the connector (CNBX) of the servo control board (CSRA-SDCA01AA) that is under the safety circuit board.
Pull the safety circuit board straight up slowly and remove it from the servo control board. (Refer to *fig. 5-31* and *fig. 5-32*.)

Fig. 5-31: Safety Circuit Board (Both Sides)

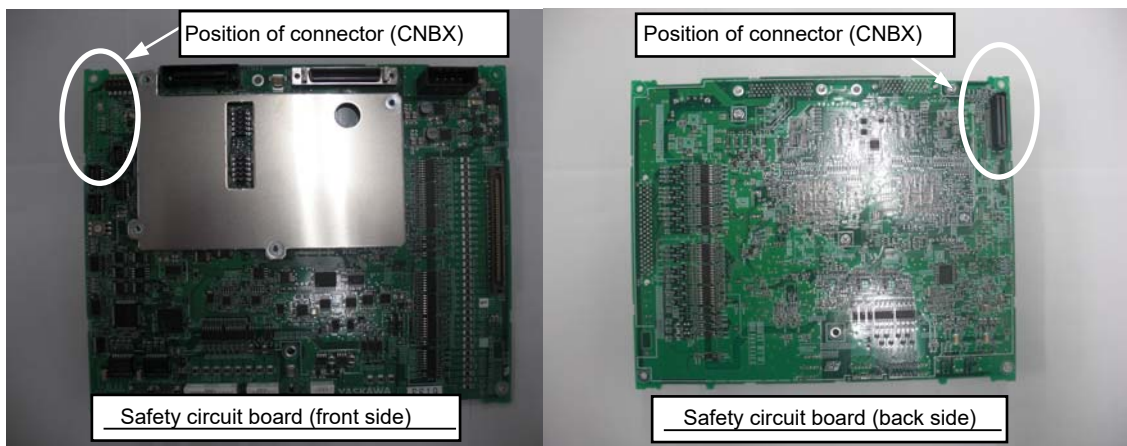
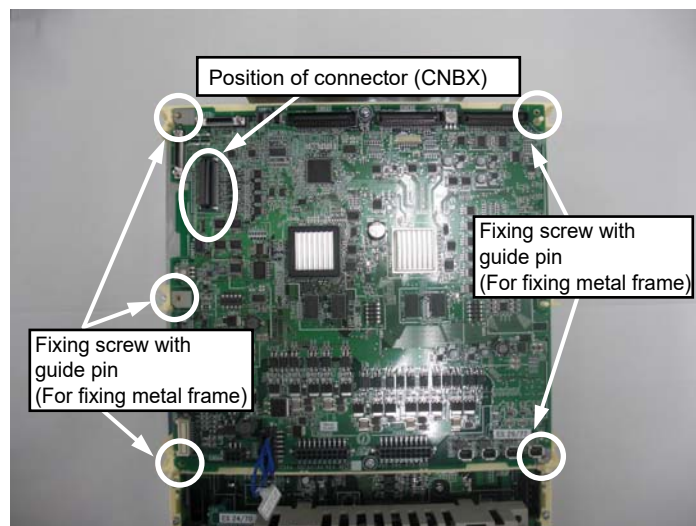


Fig. 5-32: Servo Control Board



4. Confirm that the setting of the rotary switch (S1) of the new safety circuit board is the same as that of the old safety circuit board.
5. Connect the new safety circuit board connector (CNBX) to the servo control board connector (CNBX). Then attach the new safety circuit board to the servo control board. (Refer to *fig. 5-31*, *fig. 5-32*.) Adjust the position of screw holes on safety circuit board and the position of screw holes on servo control board. Then insert the safety circuit board into the servo control board slowly.
If force the safety circuit board into the servo control board while the connection position deviates, it may cause damage to the connectors. Look from the side and adjust the connection position when connecting.
6. Tighten the screws fixing the safety circuit board. (5 places)
7. Mount the general-purpose I/O board. Then connect all cables that are disconnected in step 1 and cables that are disconnected from the general-purpose I/O board.
Refer to replacement procedure in *chapter 5.1.2 "Replacing the General-Purpose I/O Board (JANCD-AIO0□-E)"* for the general-purpose I/O board.

5 Replacing Parts
5.1 Replacing YRC1000 Parts

8. Turn ON the YRC1000 while pressing down [MAIN MENU] to start maintenance mode and change security mode to safety mode.
9. Perform the procedure described in "Safety Circuit Board FLASH ROM Data Erase and Reset" in chapter 8.26 of "YRC1000 INSTRUCTIONS (RE-CTO-A221)".
10. Turn OFF the power of the YRC1000.



If the EtherNet/IP Safety function or the DeviceNet Safety function is being used, the "Safety Network Number" is written on the safety board.

When the safety board is replaced, write the "Safety Network Number" to the safety board after completing the above procedure. Write this data with the engineering tool for the PLC that serves as the master for safety communication. To write this data, refer to the instructions for the engineering tool and the following instructions.

- "YRC1000 OPTIONS INSTRUCTIONS FOR EtherNet/IP SAFETY FUNCTION (FOR STANDARD LAN PORT) (HW1483562)"
- "YRC1000 OPTIONS INSTRUCTIONS FOR DeviceNet Safety FUNCTION (HW1483416)"

If the data is not written to the safety board, alarm 4911 "SAFETY FIELD BUS NOT ESTABLISHED" [18] occurs and EtherNet/IP Safety communication or DeviceNet Safety communication cannot be performed.

5.1.4 Replacing the Inverter Unit (CSRA-SDA□□H01A)



WARNING

- Turn OFF the power before replacing a circuit board.
- After turning OFF the power supply, wait at least 5 minutes before the replacement operation. In addition, confirm that the charge lamps (orange LED) on the converter and the inverter unit are turned OFF. (*)

Failure to observe this instruction may result in electric shock and/or personal injury due to residual voltage in the capacitor.



Refer to chapter 5.5 "Confirming Revision Number of YRC1000 Replacement Circuit Board" and confirm the version compatibility of the replacement circuit board with the system software before replacing the circuit board.

Remove the inverter unit including the general-purpose I/O board and the safety circuit board to replace the inverter unit. (Refer to fig. 5-33.)

5 Replacing Parts

5.1 Replacing YRC1000 Parts

Fig. 5-33: Configuration of Inverter Unit 3

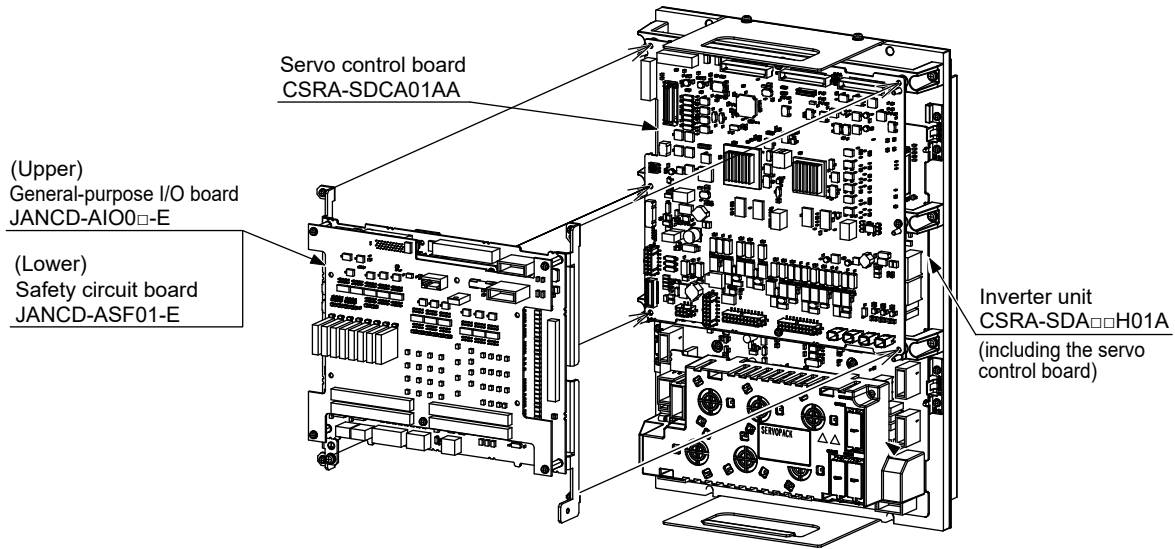
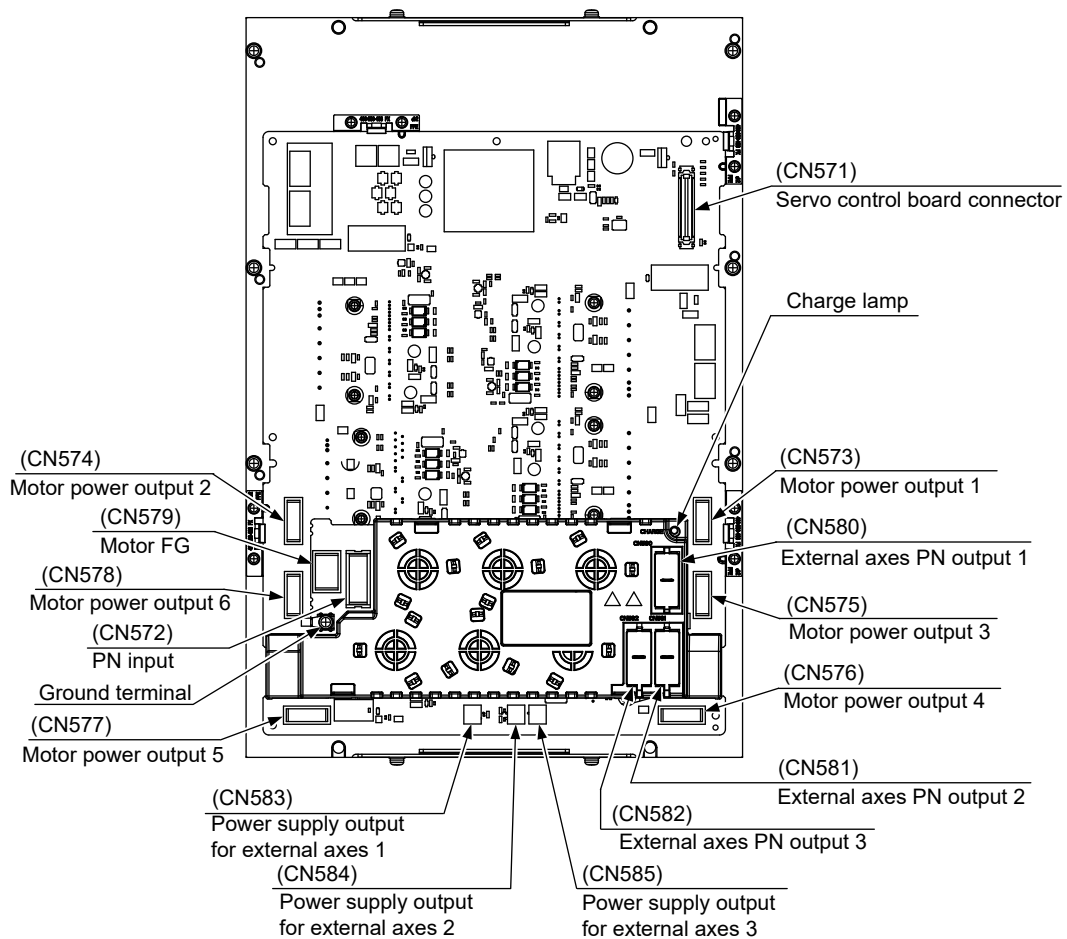
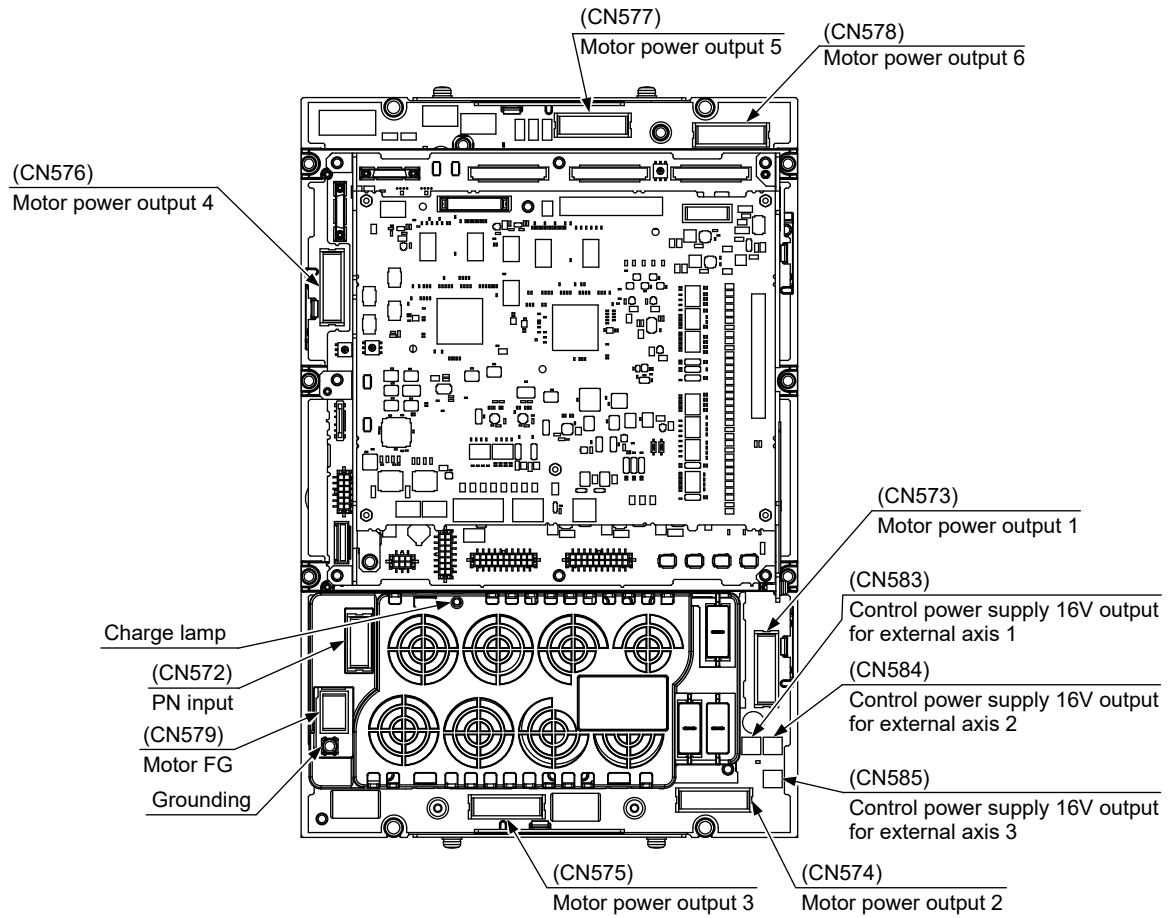


Fig. 5-34(a): Inverter Unit (Small-Capacity Model)



5 Replacing Parts
5.1 Replacing YRC1000 Parts

Fig. 5-34(b): Inverter Unit (Medium/Large-Capacity Model)



■ **Replacement Procedure**

1. Refer to *chapter 5.1.2 “Replacing the General-Purpose I/O Board (JANCD-AIO0□-E)”* and *chapter 5.1.3 “Replacing the Safety Circuit Board (JANCD-ASF01-E)”*. Disconnect all the connectors connected to the general-purpose I/O board, the safety circuit board, and the inverter unit.
(Refer to *fig. 5-34(a)*.)

Servo control board

- | | |
|--|---------|
| ① Converter I/F control connector | (CN507) |
| ② Encoder signal 1 connector | (CN508) |
| ③ Control power supply input connector | (CN509) |
| ④ Control communication connector | (CN515) |
| ⑤ Fan power supply connector | (CN520) |
| ⑥ Brake I/F connector | (CN540) |
| ⑦ Brake power supply input connector | (CN544) |

Inverter

- | | |
|----------------------------------|---------|
| ① PN input connector | (CN572) |
| ② Motor FG connector | (CN579) |
| ③ Ground terminal | |
| ④ Motor power output 1 connector | (CN573) |
| ⑤ Motor power output 2 connector | (CN574) |
| ⑥ Motor power output 3 connector | (CN575) |
| ⑦ Motor power output 4 connector | (CN576) |
| ⑧ Motor power output 5 connector | (CN577) |
| ⑨ Motor power output 6 connector | (CN578) |

Disconnect the following connector if an external axis or an option is connected.

(The following is the example of the specification with 3 external axes.)

Servo control board

- | | |
|---|---------|
| ① External axis 1 inverter I/F connector | (CN531) |
| ② External axis 2 inverter I/F connector | (CN532) |
| ③ External axis 3 inverter I/F connector | (CN533) |
| ④ Encoder signal 2 connector | (CN534) |
| ⑤ Encoder signal 3 connector | (CN535) |
| ⑥ Encoder signal 4 connector | (CN536) |
| ⑦ Manual brake-release unit I/F connector | (CN541) |
| ⑧ Control communication connector | (CN516) |

Inverter

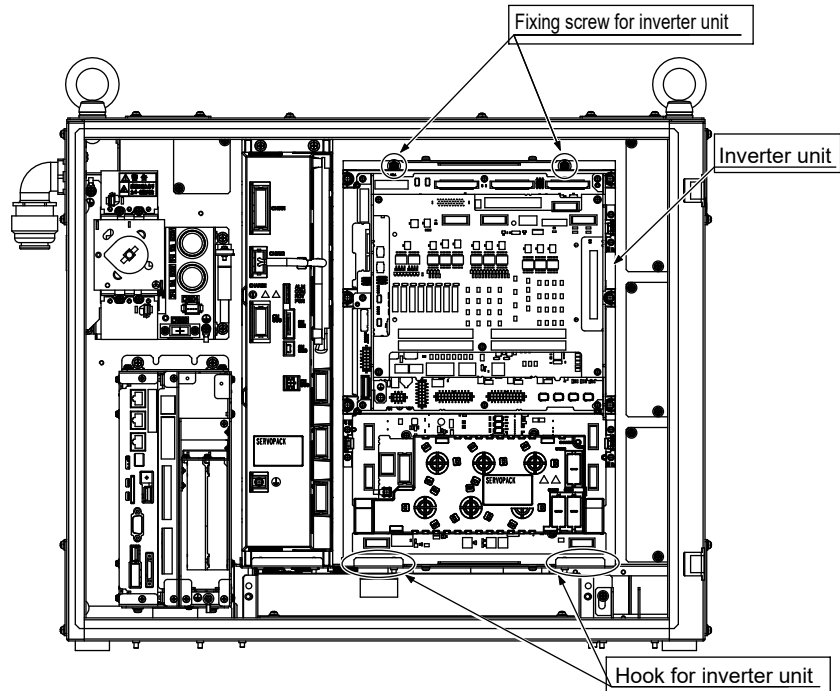
- | | |
|---|---------|
| ① External axis PN output 1 connector | (CN580) |
| ② External axis PN output 2 connector | (CN581) |
| ③ External axis PN output 3 connector | (CN582) |
| ④ Control power supply output for external axis 1 connector | (CN583) |
| ⑤ Control power supply output for external axis 2 connector | (CN584) |
| ⑥ Control power supply output for external axis 3 connector | (CN585) |

5 Replacing Parts

5.1 Replacing YRC1000 Parts

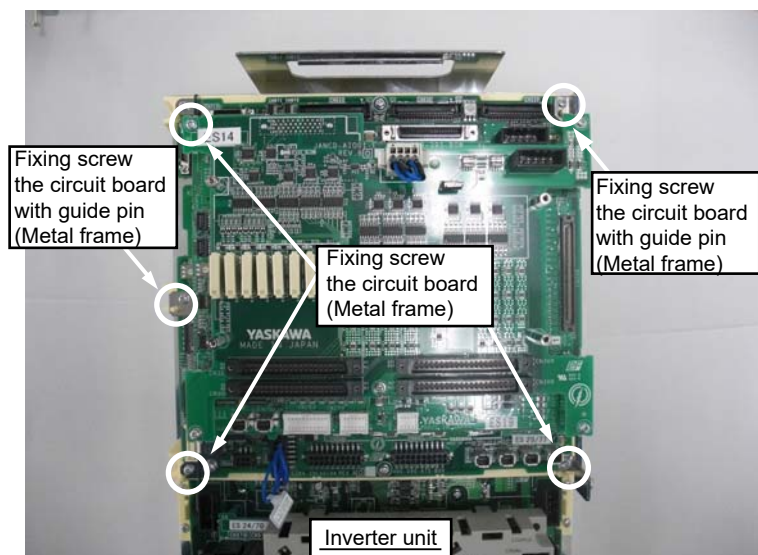
2. Unscrew the screws fixing the inverter unit from upper side (2 places) and remove the inverter unit from YRC1000. (Refer to *fig. 5-35*.)
The lower side of inverter unit is hooked to the metal frame, so lift the inverter unit slightly and pull off when removing.

Fig. 5-35: Inside of Inverter Unit



3. Remove the screws fixing the metal frame on which the general-purpose I/O board and the safety control board are mounted. (5 places) (Refer to *fig. 5-36*.)

Fig. 5-36: Inverter Unit 1



5 Replacing Parts
5.1 Replacing YRC1000 Parts

4. The servo control board is connected to the connector (CNBX) of safety circuit board and the connector (CNBX) of servo control board (CSRA-SDCA01AA) that is under the safety circuit board. Pull the general-purpose I/O board and the safety control board with the metal frame straight up slowly and remove them from the servo control board. (Refer to *fig. 5-36*, *fig. 5-37*, and *fig. 5-38*.)

Fig. 5-37: Inverter Unit 2

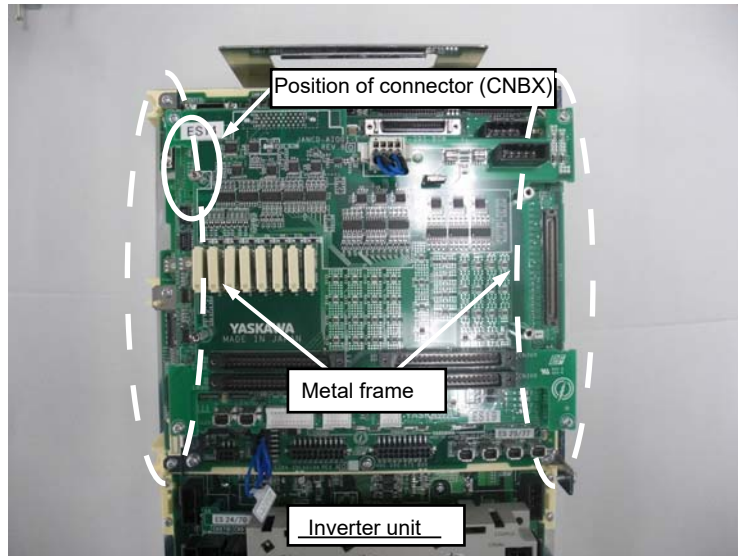


Fig. 5-38: General-Purpose I/O Board and Safety Circuit Board

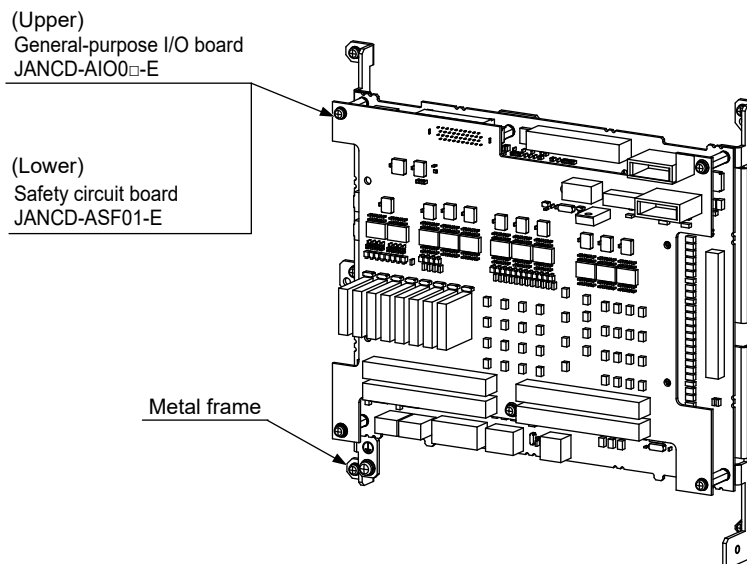
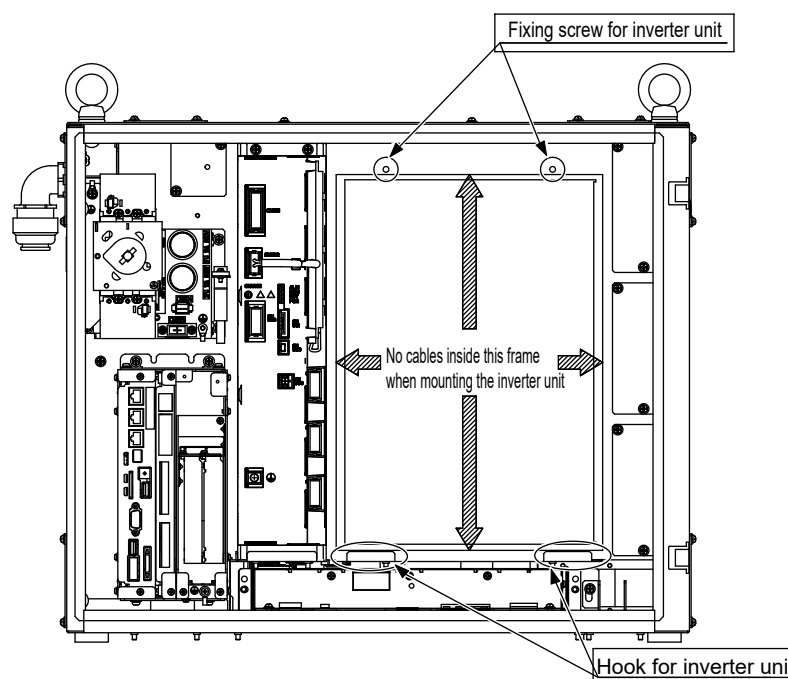


Fig. 5-39: Mounting Position of Inverter Unit



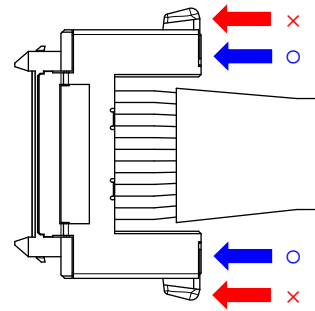
5. Confirm that the settings of the rotary switches (S1) and (S2) of the new servo control board are the same as those of the old servo control board.
6. Mount the general-purpose I/O board and the safety board which are removed in step 4 on the servo control board. Connect the safety circuit board connector (CNBX) to the servo control board connector (CNBX). Then mount the servo control board on the safety circuit board.
Adjust the position of the screw holes on the metal frame and the position of the screw holes on the servo control board. Then insert the safety circuit board into the servo control board slowly.
(Refer to *fig. 5-37* and *fig. 5-38*.)
If force the safety circuit board into the servo control board while the connection position deviates, it may cause damage to the connectors. Look from the side and adjust the connection position when connecting.
7. Tighten the screws fixing the metal frame. (5 places)
(Refer to *fig. 5-36*.)
8. Be careful not to get caught the wires in the inverter unit when mounting the inverter unit on YRC1000. Mount the inverter unit on the inverter unit hooks that are on the lower part of YRC1000 and tighten the screws fixing the inverter unit from upper side (2 places). (Refer to *fig. 5-39*.)
9. Connect all the cables that are disconnected in step 1 and cables that are disconnected from the general-purpose I/O board and the safety circuit board.
Refer to *chapter 5.1.2 "Replacing the General-Purpose I/O Board (JANCD-AIO0□-E)"* and *chapter 5.1.3 "Replacing the Safety Circuit Board (JANCD-ASF01-E)"*.

When inserting the converter I/F control connector (CN507), use the main body of the connector to push the connector into place, not the latches.

NOTE



The latches (×) may become damaged if they are pushed too hard.



5.1.5 Replacing the Converter (CSRA-CV□□□□□□)

Two types of converters are available depending on the input voltage specification.

Before replacement, make sure to check the type of the converter currently used.

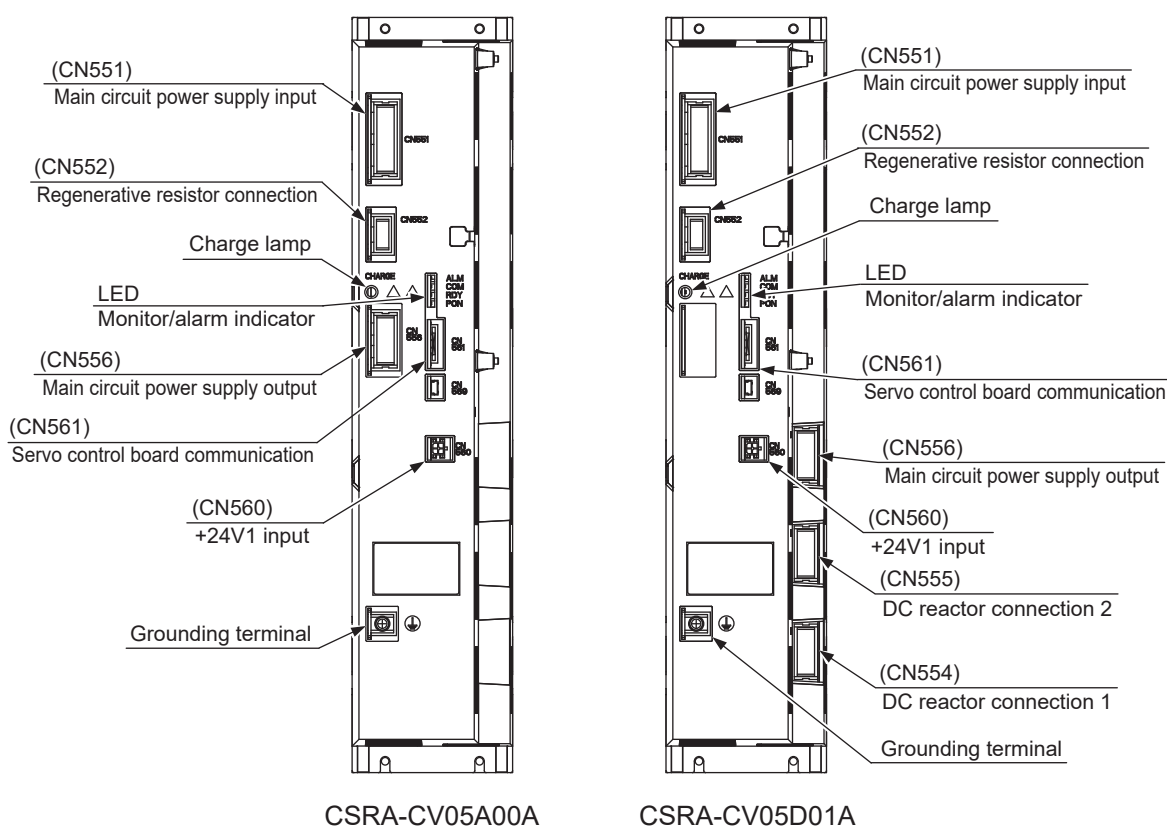


WARNING

- Turn OFF the power before replacing a circuit board.
- After turning OFF the power supply, wait at least 5 minutes before the replacement operation. In addition, confirm that the charge lamps (orange LED) on the converter and the inverter unit are turned OFF. (*)

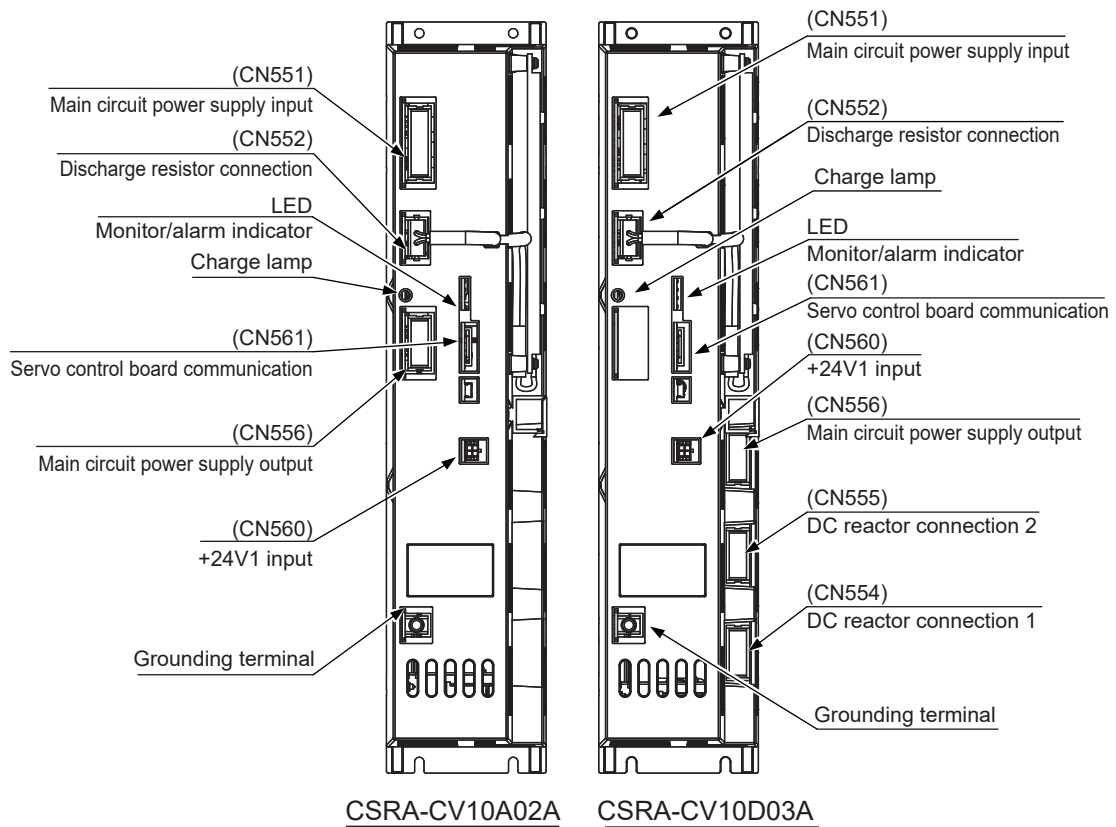
Failure to observe this instruction may result in electric shock and/or personal injury due to residual voltage in the capacitor.

Fig. 5-40(a): Converter (Removed) (Small-Capacity Model)



5 Replacing Parts
5.1 Replacing YRC1000 Parts

Fig. 5-40(b): Converter (Removed) (Medium/Large-Capacity Model)



■ **Replacement Procedure**

1. Ensure that the charge lamp of converter (orange LED) is OFF. (*)
Then disconnect the following connectors that are connected to the converter. (Refer to *fig. 5-40(a)*.)

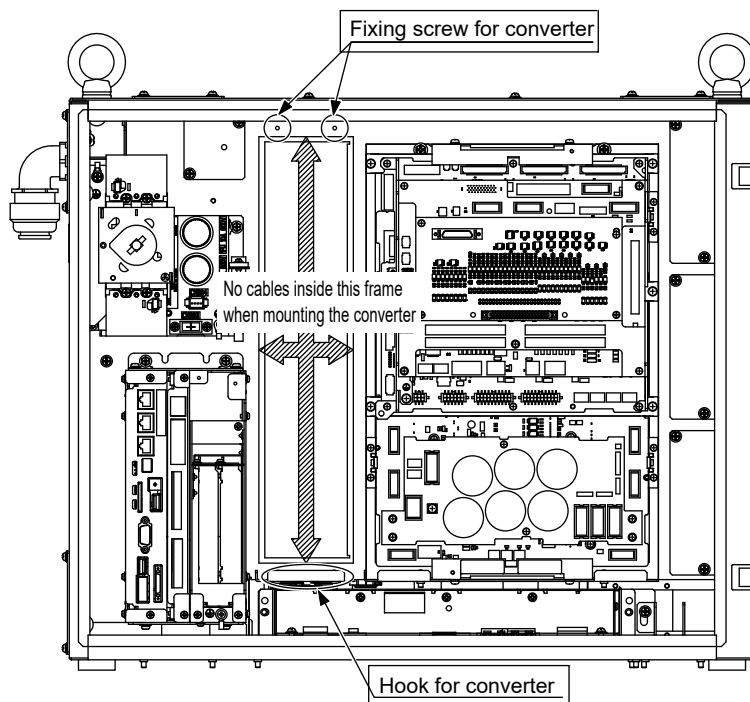
- | | |
|---|---------|
| ① Main circuit power supply input connector | (CN551) |
| ② Regenerative resistor connection connector | (CN552) |
| ③ Main circuit power supply output connector | (CN556) |
| ④ Servo control board communication connector | (CN561) |
| ⑤ +24V1 input connector | (CN560) |
| ⑥ Ground wire | |

When using the converter CSRA-CV05D01A or CSRA-CV10D03A, remove the following connectors.

- | | |
|-------------------------------------|---------|
| ① DC reactor connection 1 connector | (CN554) |
| ② DC reactor connection 2 connector | (CN555) |

2. Remove the 2 screws fixing the upper part of the converter.
3. Hold the lower part of the converter, and pull out the converter while lifting it up.

Fig. 5-41: Mounting Position of Converter



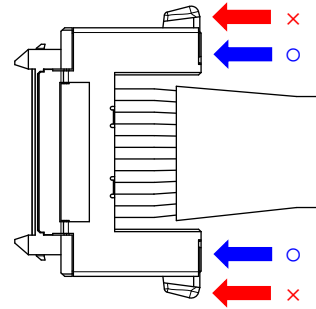
4. Be careful not to get caught the wires in the converter when mounting the converter on YRC1000. Mount the converter on the hook for the converter that is on the lower part of YRC1000 and tighten the screws fixing the upper part of the converter (2 places). (Refer to *fig. 5-41*.)
5. Connect the connectors that are disconnected in step1. Ensure that the ground wire is connected.

When inserting the servo control board communication connector (CN561), use the main body of the connector to push the connector into place, not the latches.

NOTE



The latches (×) may become damaged if they are pushed too hard.



5.1.6 Replacing the Power Supply Contactor Unit (JZRCR-APU0□-1)

Remove the converter to replace the power supply contactor unit.

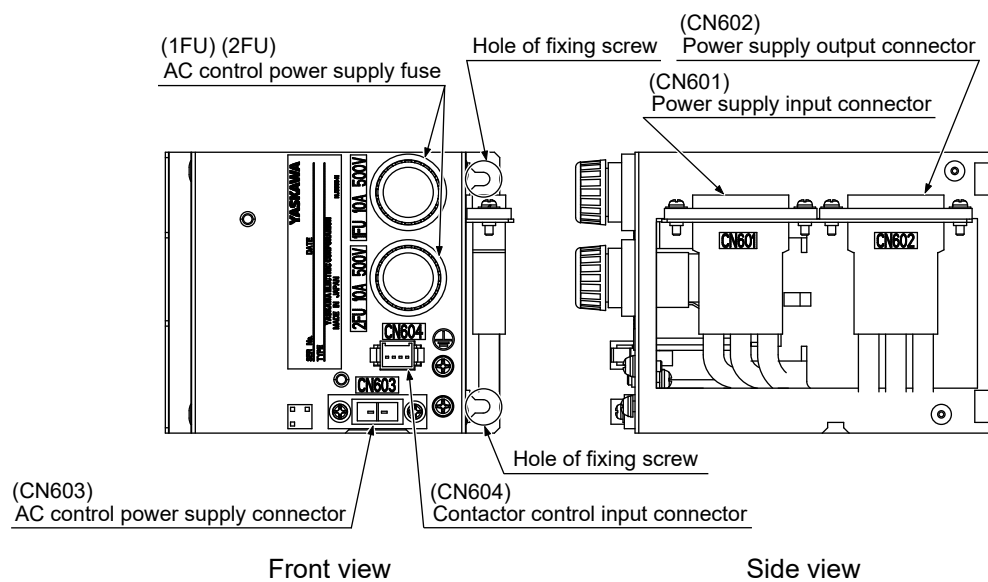


WARNING

- Turn OFF the power before replacing a circuit board.
- After turning OFF the power supply, wait at least 5 minutes before the replacement operation. In addition, confirm that the charge lamps (orange LED) on the converter and the inverter unit are turned OFF. (*)

Failure to observe this instruction may result in electric shock and/or personal injury due to residual voltage in the capacitor.

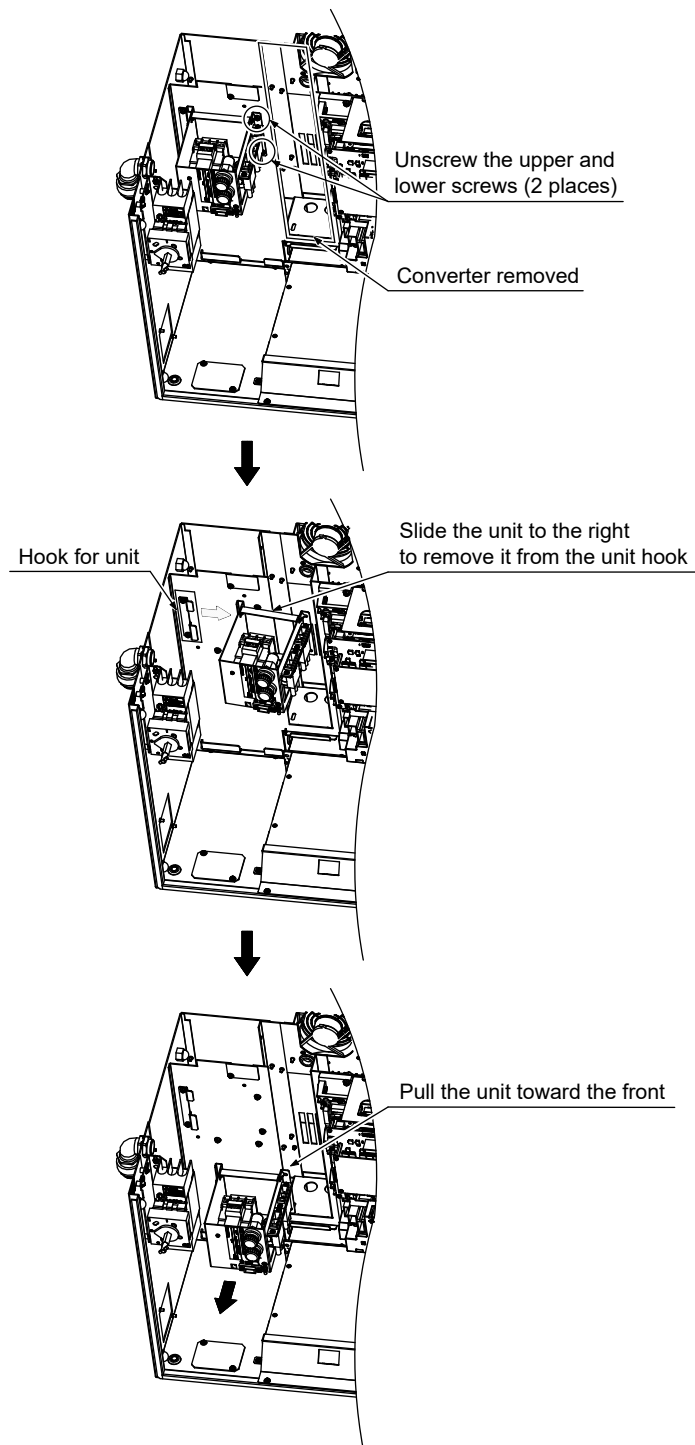
Fig. 5-42: Power Supply Contactor Unit



■ Replacement Procedure

1. Remove the converter on the right next to the power supply contactor unit before replacing the power supply contactor unit. (Refer to *chapter 5.1.5 "Replacing the Converter (CSRA-CV□□□□□□)"*.) Then disconnect the following connectors and the ground wire connected to the power supply contactor unit. (Refer to *fig. 5-42*.)
 - ① Power supply input connector (CN601)
 - ② Power supply output connector (CN602)
 - ③ AC control power supply connector (CN603)
 - ④ Contactor control input connector (CN604)
 - ⑤ Ground wire
2. Loosen the upper and lower side screws (2 places) fixing the power supply contactor unit and slide the power supply contactor unit to the right to remove it. (Refer to *fig. 5-43*.)

Fig. 5-43: Removing Power Supply Contactor Unit



3. Mount the new power supply contactor unit and tighten the upper and lower screws on the right side to fix the power supply contactor unit. Perform the reverse order of removal procedure when mounting. (Refer to *fig. 5-43*.)
4. Connect the connectors that are disconnected in step1. Confirm that the ground wire is securely connected. For the mounting the converter and wiring, refer to *chapter 5.1.5* .

5.1.7 Replacing the Control Power Supply Unit (CSRA-CPS01K□)

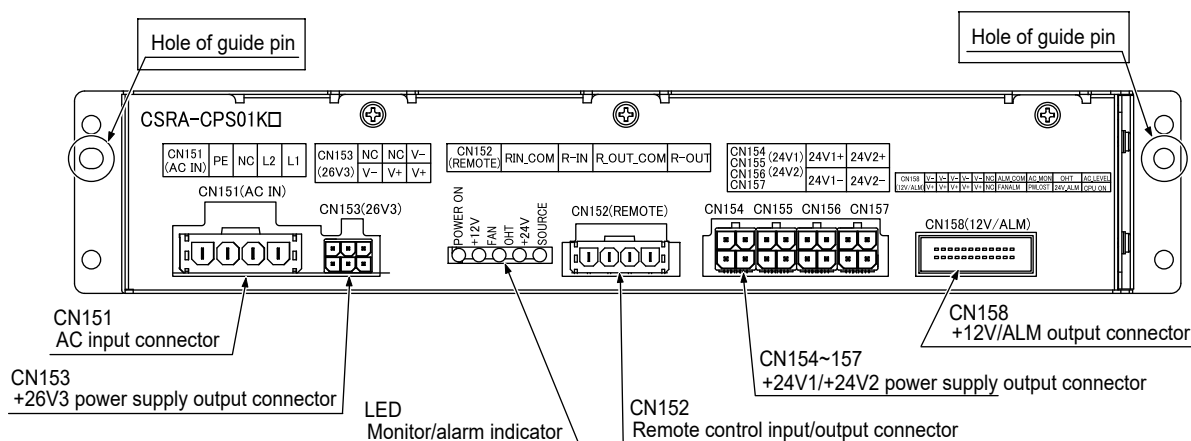


WARNING

- Turn OFF the power before replacing a circuit board.
- After turning OFF the power supply, wait at least 5 minutes before the replacement operation. In addition, confirm that the charge lamps (orange LED) on the converter and the inverter unit are turned OFF. (*)

Failure to observe this instruction may result in electric shock and/or personal injury due to residual voltage in the capacitor.

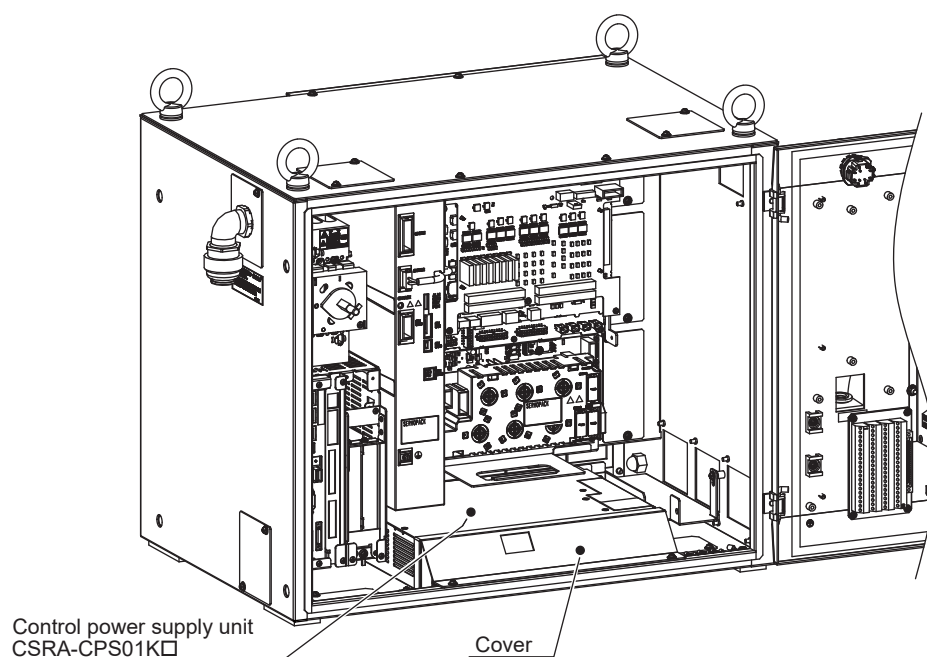
Fig. 5-44: Control Power Supply Unit



■ Replacement Procedure

1. The control power supply unit is mounted on the bottom of YRC1000. (Refer to fig. 5-45.)

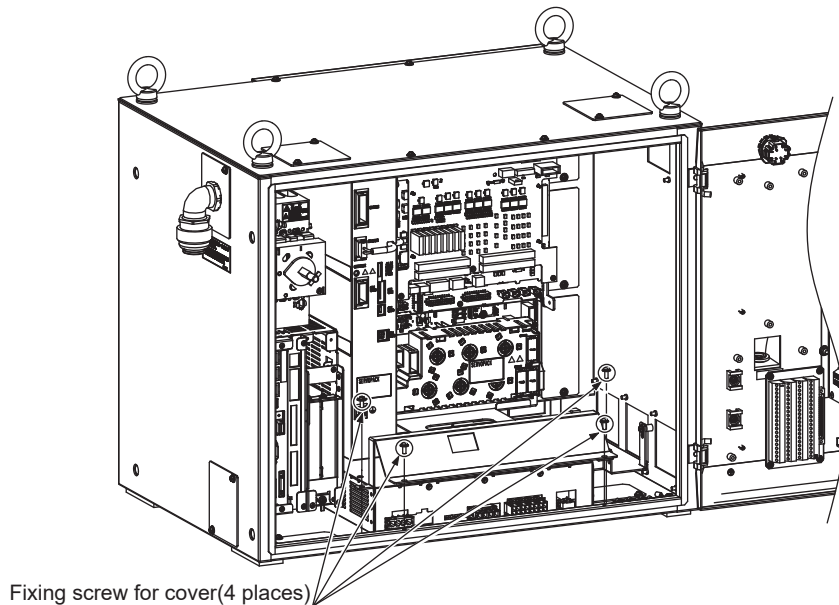
Fig. 5-45: Position of Control Power Supply Unit



5 Replacing Parts
5.1 Replacing YRC1000 Parts

2. Remove the screws fixing the front cover of control power supply unit (4 places). Then remove the cover. (Refer to fig. 5-46.)

Fig. 5-46: Removing Control Power Supply Unit Cover

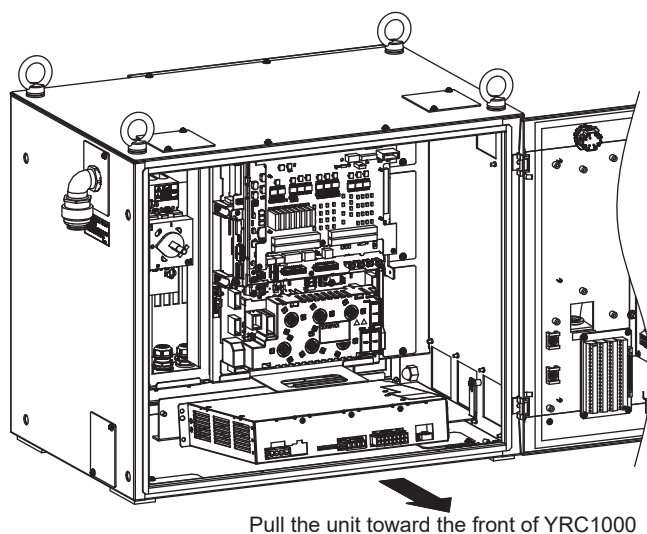


3. Disconnect the following connectors connected to the control power supply unit.
- ① AC power supply input connector (CN151)
 - ② +26V3 power supply output connector (CN153)
 - ③ +24V1/+24V2 power supply output connector (CN154/CN155/CN157)
 - ④ +12V power supply output/ALM output connector (CN158)
- Disconnect the following cable if it is connected depending on the specification.
- ⑤ Remote control input/output connector (CN152)
 - ⑥ +24V1/+24V2 power supply output connector (CN156)

5 Replacing Parts
5.1 Replacing YRC1000 Parts

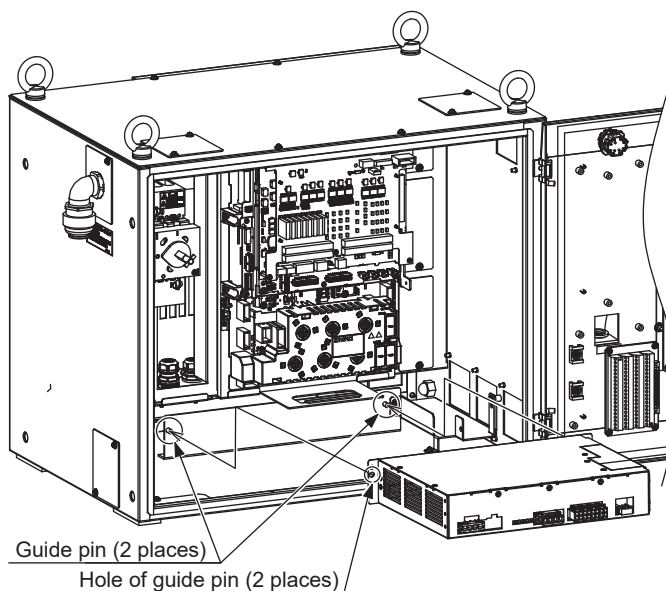
4. Pull the control power supply unit toward the front of YRC1000 to remove it. (Refer to *fig. 5-47*.)

Fig. 5-47: Removing Control Power Supply Unit 1



5. Mount the new control power supply unit. (Refer to *fig. 5-48*.)
There are two guide pins on the lower part of YRC1000. Insert the control power supply unit into the guide pins and mount it as the figure below. After mounting the control power supply unit, connect the connectors that are disconnected in step 3 and mount the cover.

Fig. 5-48: Removing Control Power Supply Unit 2



5.1.8 Replacing Fuses

5.1.8.1 Power Supply Contactor Unit

The types of fuses on the power supply contactor unit (JZRCR-APU0□-1) are as follows.

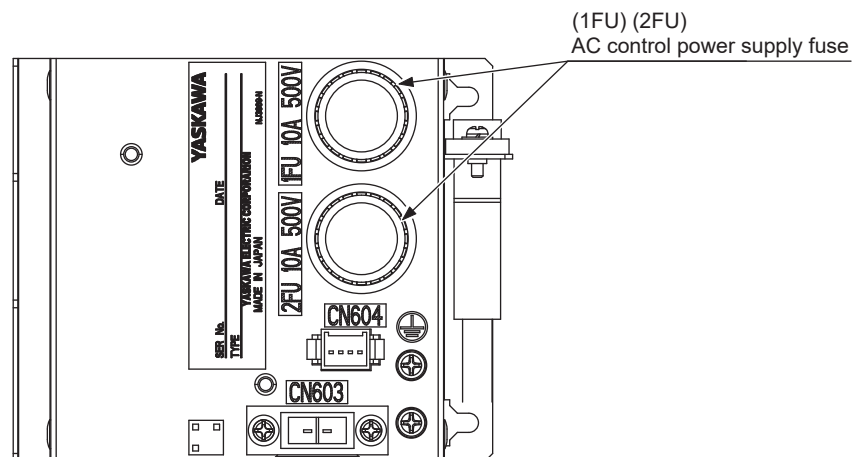


If the fuse seems to be blown, be sure to investigate its cause, or blown again after the replacement.

Parts No.	Fuse Name	Specification	Power supply contactor unit
1FU, 2FU	AC Control power supply protective fuse	FNQ-10 10A, 500VAC time delay fuse (BUSSMANN)	JZRCR-APU01-1 (for Japan, Asia and Europe)
		SC-10 10A, 600VAC time delay fuse (BUSSMANN)	JZRCR-APU03-1 (for North America)

If the fuse is blown, replace it with the same type of fuse (supplied or spare parts).

Fig. 5-49: Replacement Fuses of Power Supply Contactor Unit (JZRCR-APU0□-1)



5.1.8.2 General-Purpose I/O Board

The types of fuses on general-purpose I/O board (JANCD-AIO0□-E) are as follows.



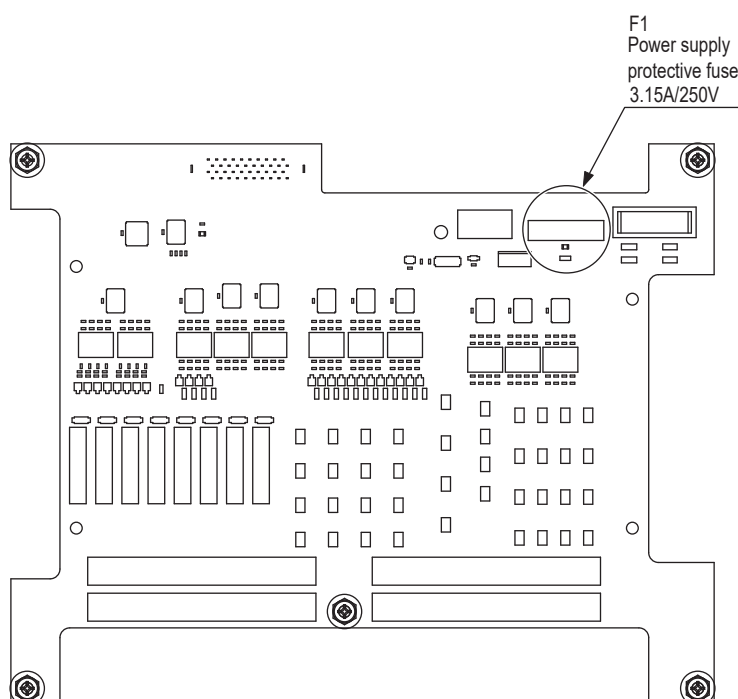
If the fuse seems to be blown, be sure to investigate its cause, or blown again after the replacement.

Parts No.	Fuse Name	Specification
F1	24VDC fuse for I/O	02173.15P, 250V, 3.15A Rapid cut fuse (LITTEL)

If the fuse is blown, replace it with the same type of fuse (supplied or spare parts).

The fuse can be removed easily by fixing the fuse with a cable tie.

Fig. 5-50: Replacement Fuses of General-Purpose I/O Board (JANCD-AIO0□-E)



5.1.8.3 Servo Control Board

The types of fuses on servo control board (CSRA-SDCA01AA) are as follows.

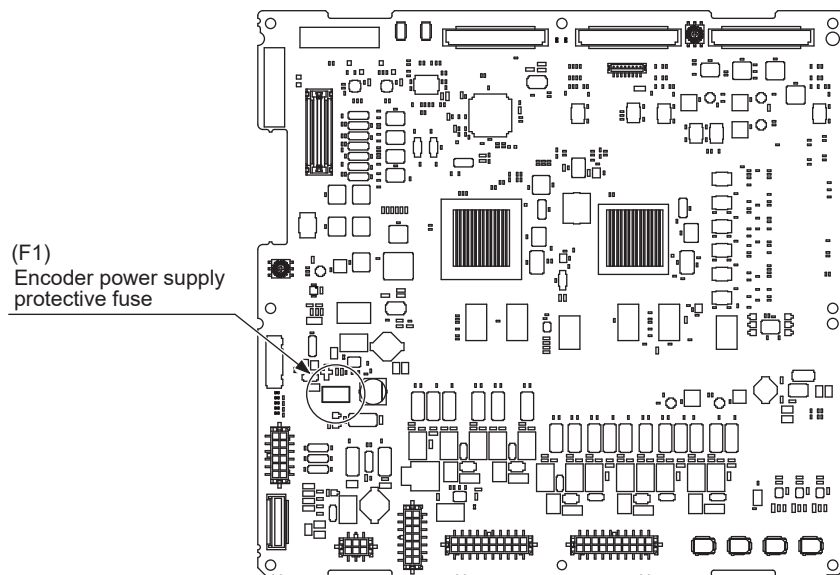


If the fuse seems to be blown, be sure to investigate its cause, or blown again after the replacement.

Parts No.	Name	Specification
F1	Encoder power supply protective fuse	HM10 250V, 1A (Daito Communication Apparatus Co., Ltd.)

If the fuse is blown, replace it with the same type of fuse (supplied or spare parts).

Fig. 5-51: Replacement Fuses of Servo Control Board



Remove the general-purpose I/O board (JANCD-AIO0 □ -E) and the safety circuit board (JANCD-ASF01-E) before replacing the fuse of servo control board. (Refer to *chapter 5.1.3 “Replacing the Safety Circuit Board (JANCD-ASF01-E)”*.)

After replacement, mount the general-purpose I/O board and the safety circuit board back. (Refer to *chapter 5.1.3* .)

5.1.9 Replacing Backside Duct Fan



Turn OFF the power before replacing the fan.

■ Replacement Procedure

1. Remove the screws securing the cover (4 places). (Refer to *fig. 5-52*.)
2. Disconnect the relay connector on which the device code of the fan is marked. (Refer to *fig. 5-53*.)
3. Remove the screws securing the fan (2 places). (Refer to *fig. 5-53*.)
4. Remove the fan from YRC1000.
5. Mount a new fan to YRC1000.
6. Tighten the screws (2 places) to secure the new fan. (Refer to *fig. 5-53*.)
7. Connect the removed harness to the fan. (Refer to *fig. 5-53*.)
8. Mount the cover and tighten the screws securing the cover (4 places). (Refer to *fig. 5-52*.)
Be careful not to get the harness caught when mounting the cover.

Fig. 5-52: Backside Duct Fan 1

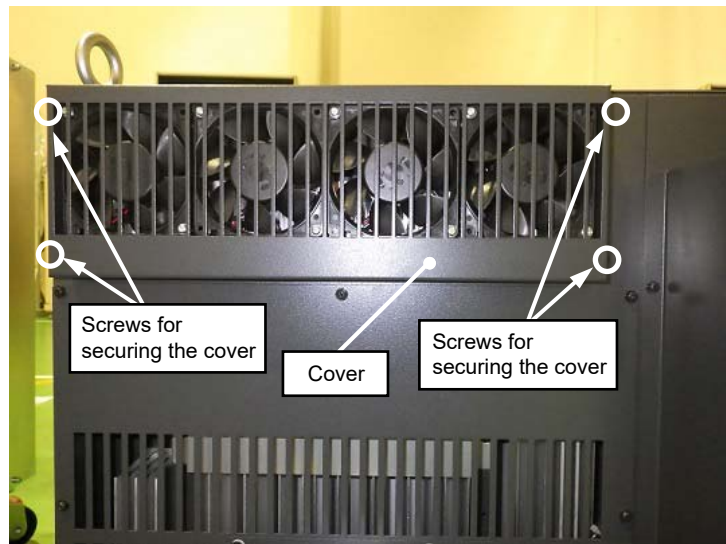
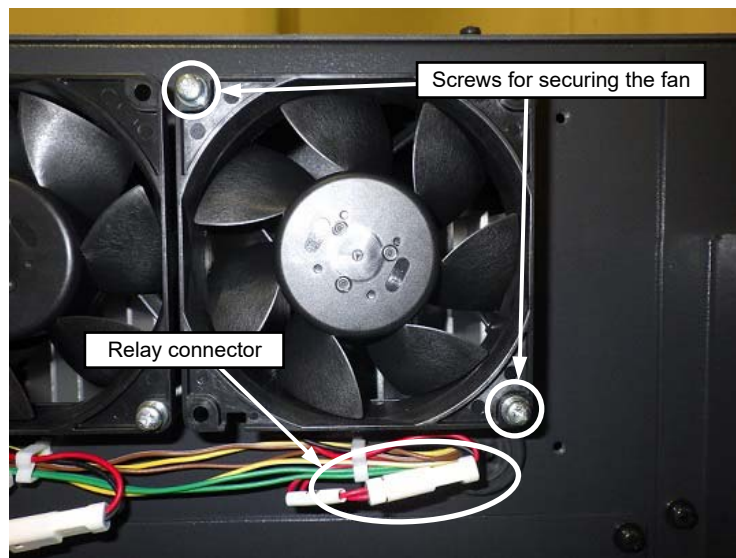


Fig. 5-53: Backside Duct Fan 2



5.1.10 Replacing the Air Filter of the Heat Exchanger

If dust cannot be removed from the air filter, replace the filter by using the following procedure.

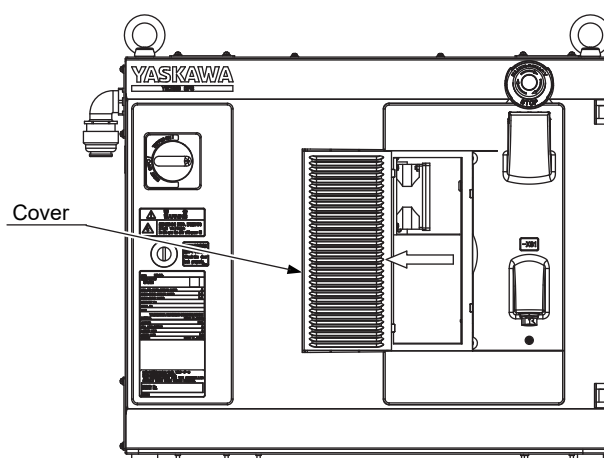


Turn OFF the power before replacing the air filter.

■ Replacement Procedure

1. Slide the front cover of the YRC1000 to the left to open it.
(Refer to *fig. 5-54*.)

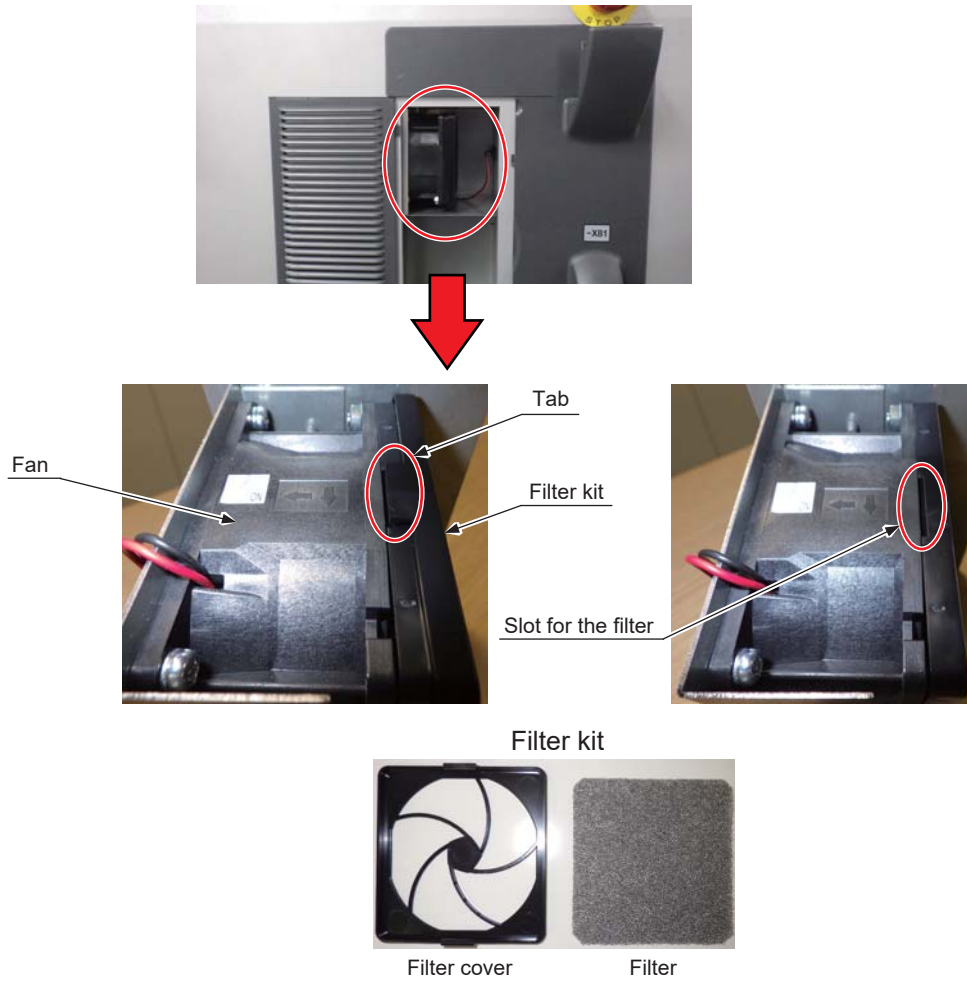
Fig. 5-54: Front Cover



5 Replacing Parts
5.1 Replacing YRC1000 Parts

2. Remove the air filter kit by removing its tabs secured to the top and bottom of the fan body. (Refer to *fig. 5-55*.)
3. To replace only the air filter, remove the air filter from the air filter kit, and replace it with a new air filter.
4. Insert the tabs of the new air filter kit into the slots on the top and bottom of the fan to securely mount the air filter kit. (Refer to *fig. 5-55*.)

Fig. 5-55: Air Filter, Air Filter Kit



5. By reversing the procedure in step 1, slide the cover to the right to close it.

5.1.11 Replacing the Fan of the Heat Exchanger



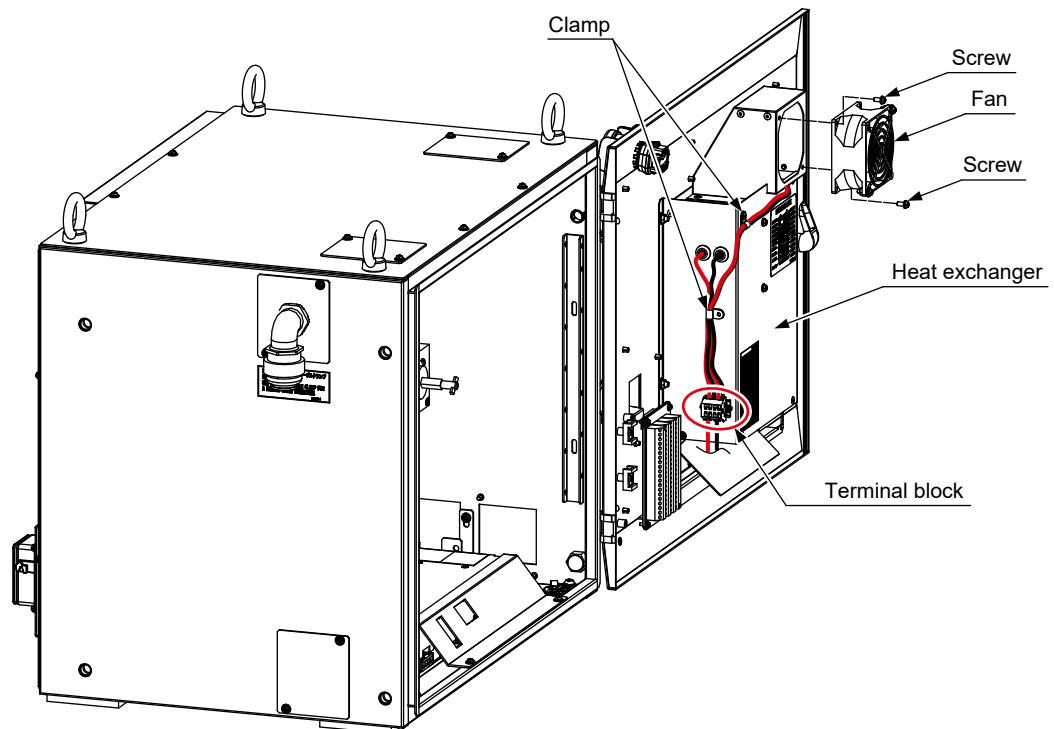
Turn OFF the power before replacing the fan.

5.1.11.1 Replacing the Interior Fan

■ Replacement Procedure

1. Open the front door of the YRC1000.
By using a flathead screwdriver (small), press the levers of the terminal block on the heat exchanger, and remove the power cables (red/black) for the fan that are connected to the terminal block. Remove the screws (2 places) securing the fan, and then remove the fan together with the fan guard. (Refer to *fig. 5-56*.)

Fig. 5-56: Heat Exchanger



2. From the removed fan, remove the screws and nuts (2 places) securing the fan guard, and remove the fan guard. (Refer to *fig. 5-56*.) Be careful not to lose the nuts when removing the screws.

Fig. 5-57: Fan Guard



5 Replacing Parts
5.1 Replacing YRC1000 Parts

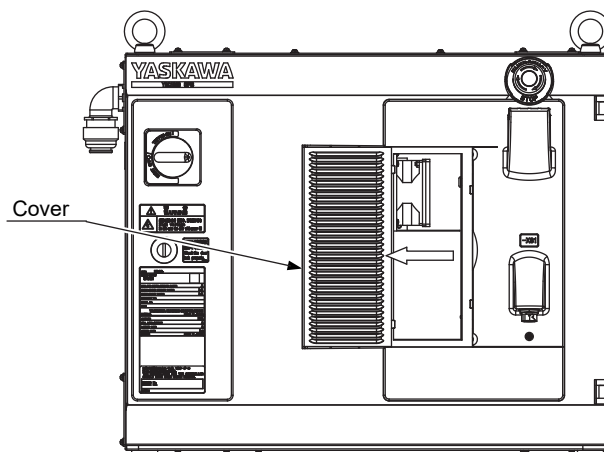
3. Mount the fan guard removed in step 2 onto a new fan.
Pay attention to the direction of the fan rotation when mounting the fan guard. Make sure to mount the fan equipped with the fan guard in the way that the rating label on the fan faces to the heat exchanger side. (Make sure that the fan rotates in the direction in which the air blown by the fan goes from the fan into the heat exchanger.)
4. By reversing the procedure in step 1, mount the fan to the heat exchanger.
Pass the power cables for the fan through the clamps. By using a flathead screwdriver (small), press the levers of the terminal block, and connect the red cable to the terminal 1 and the black cable to the terminal 2.

5.1.11.2 Replacing the Exterior Fan

■ **Replacement Procedure**

1. Slide the front cover of the YRC1000 to the left to open it.
(Refer to *fig. 5-58*.)

Fig. 5-58: Front Cover



2. Open the front door of the YRC1000.
By using a flathead screwdriver (small), press the levers of the terminal block on the heat exchanger, and remove the power cables (red/black) for the fan that is connected to the terminal block.
3. Remove the screws (2 places) securing the fan kit, and then remove the fan kit including the fan base and the filter kit. (Refer to *fig. 5-59* and *fig. 5-60*.)

Fig. 5-59: Heat Exchanger

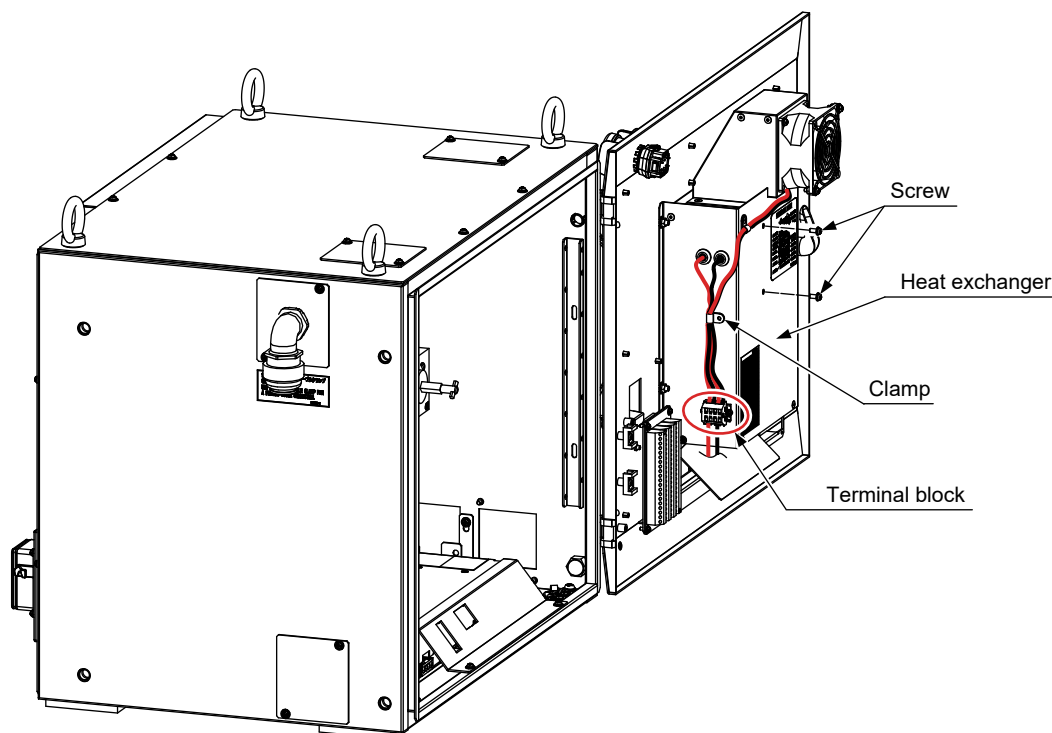
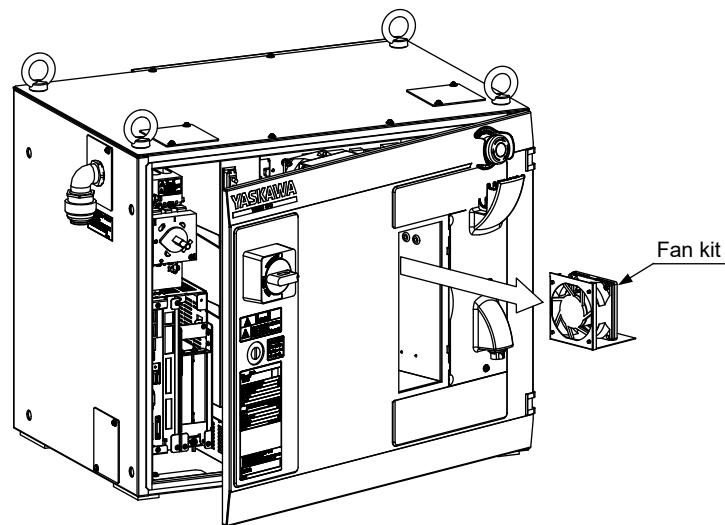
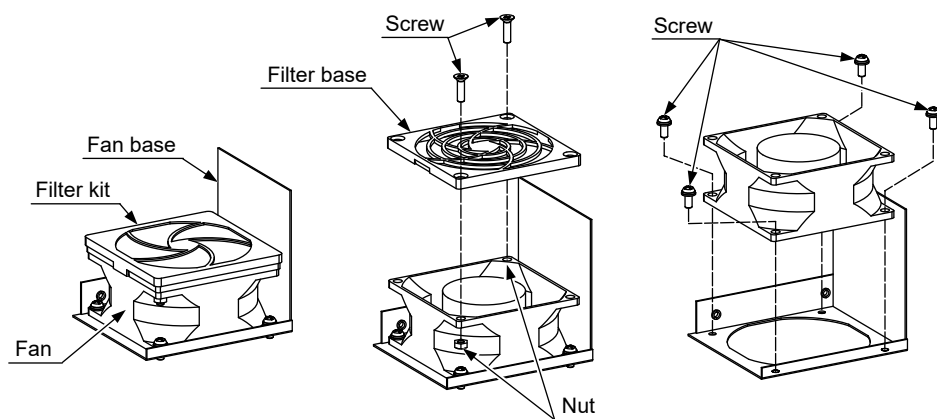


Fig. 5-60: Exterior Fan



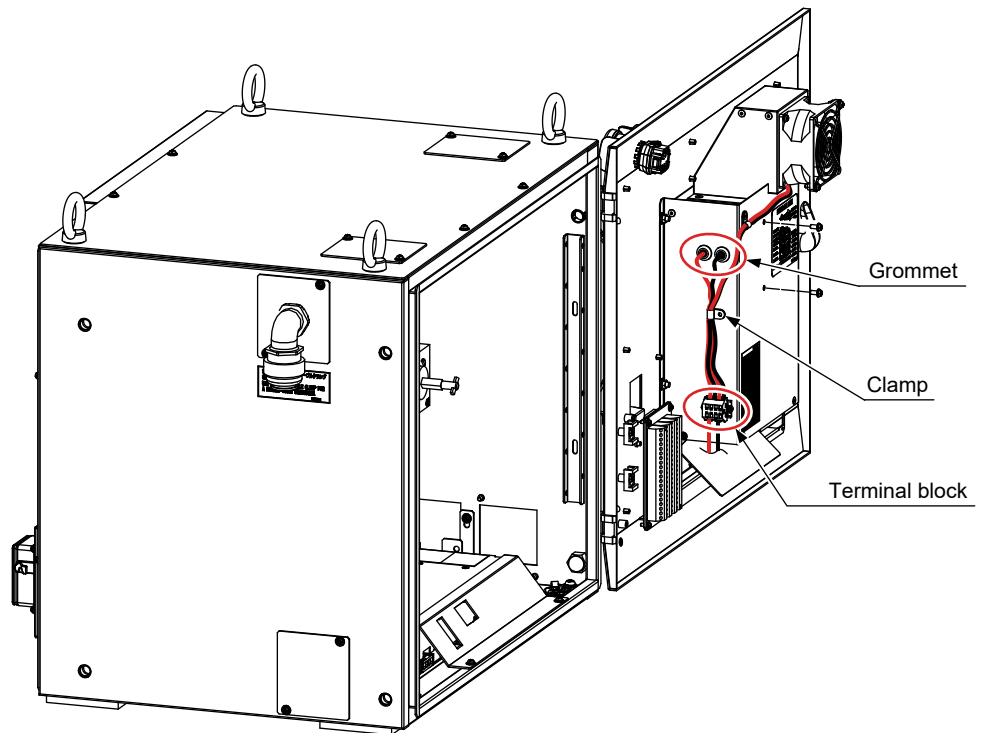
4. Remove the filter kit from the removed fan kit.
(Refer to *chapter 5.1.10 "Replacing the Air Filter of the Heat Exchanger"*) (Refer to *fig. 5-61.*)
5. From the fan body, remove the filter base secured with the countersunk screws and nuts (2 places).
Be careful not to lose the nuts when removing the screws.
(Refer to *fig. 5-61.*)
6. Remove the screws (4 places) securing the fan, and then remove the fan from the fan base. (Refer to *fig. 5-61.*)

Fig. 5-61: Fan Kit



7. Mount a new fan by reversing the above-mentioned steps, in the order of 6, 5, 4, and 3. Pay attention to the direction of the fan rotation when mounting the fan. Make sure to mount the fan in the way that the rating label on the fan faces to the pipes in the heat exchanger.
(Make sure that the fan rotates in the direction in which the air from the fan blows toward the pipes.)
When mounting the fan kit, make sure to prevent the power cables for the fan from getting caught in the fan kit. (Failure to observe this instruction may result in a ground fault.)
8. Pass the power cables for the fan through the grommets into the YRC1000. And then, pass the power cables through the clamps. By using a flathead screwdriver (small), press the levers of the terminal block, and connect the red cable to the terminal 1 and the black cable to the terminal 2. (Refer to *fig. 5-62.*)

Fig. 5-62: Heat Exchanger



5.1.12 Replacing the Filter and the Filter Kit of the Heat Exchanger

5.1.12.1 TCMSY-312DC

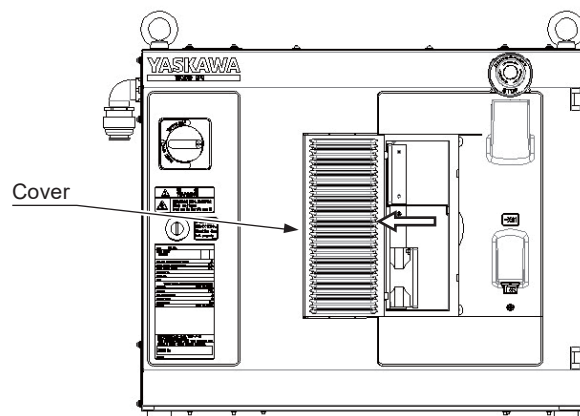


Turn OFF the power before replacing the filter and/or the filter kit.

■ Replacement Procedure

1. Slide the front cover of the YRC1000 to the left to open it.
(Refer to *fig. 5-63 "Front Cover"* .)

Fig. 5-63: Front Cover

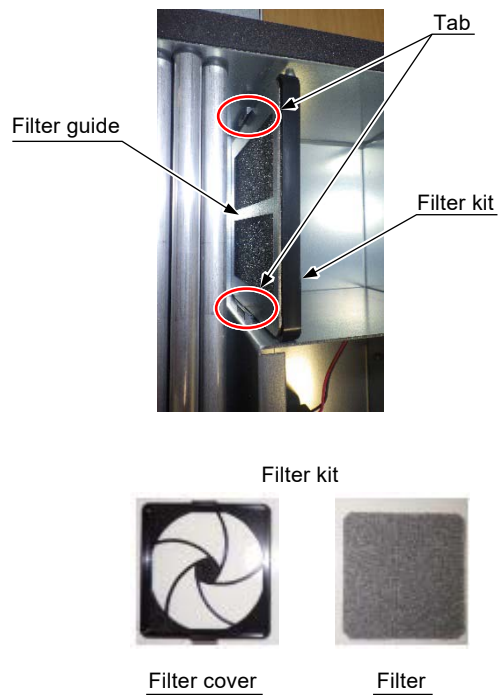


2. Slide and remove the filter kit that is attached to the top and bottom of the filter guide with tabs.
(Refer to *fig. 5-64 "Filter and Filter Kit"* .)
3. To replace only the filter, remove the filter from the filter kit, and replace it with a new filter.

5 Replacing Parts
5.1 Replacing YRC1000 Parts

4. Hook the tabs of the new filter kit on the top and bottom of the filter guide, then slide and insert the filter kit.

Fig. 5-64: Filter and Filter Kit



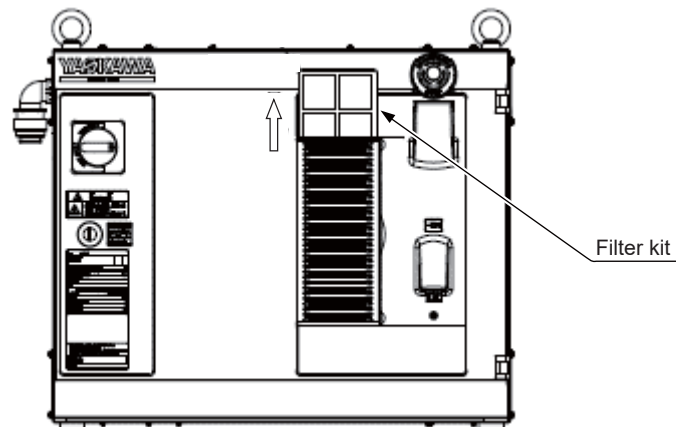
5. By reversing the procedure in step 1, slide the cover to the right to close it.

NOTE Turn OFF the power before replacing the filter and/or the filter kit.

■ **Replacement Procedure**

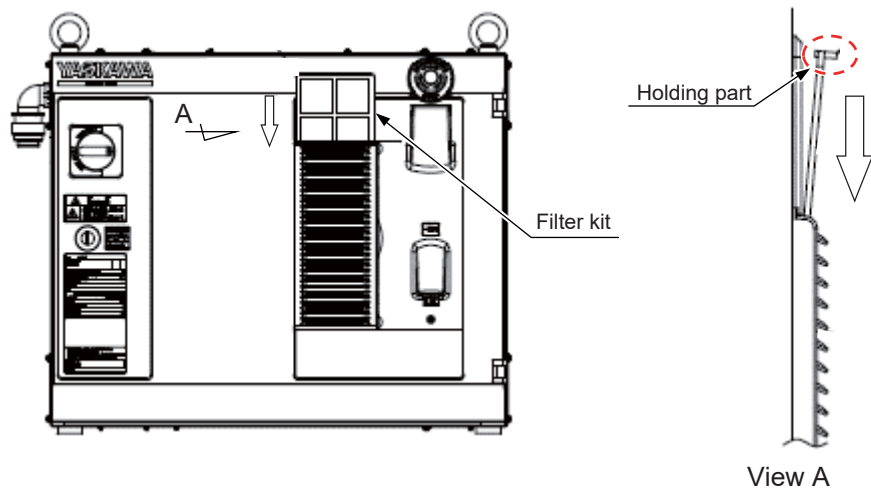
1. Remove the filter kit that is inserted into the upper part of the front cover of the YRC1000.
(Refer to fig. 5-65 "Removing a Filter Kit")

Fig. 5-65: Removing a Filter Kit



2. By reversing the procedure in step 1, insert the new filter kit into the upper part of the front cover of the YRC1000.
Be sure to insert the filter with the longer protruding piece facing outward.
(Refer to fig. 5-66 "Inserting a Filter Kit")

Fig. 5-66: Inserting a Filter Kit



5.1.13 Replacing the Fan of the Heat Exchanger



WARNING

- Turn OFF the power before replacing the fan.
- After turning OFF the power supply, wait at least 5 minutes before the replacement operation. In addition, confirm that the charge lamps (orange LED) on the converter and the inverter unit are turned OFF.

Failure to observe this instruction may result in electric shock and/or personal injury due to residual voltage in the capacitor.

5.1.13.1 Replacing the Interior Fan *Common to each heat exchanger

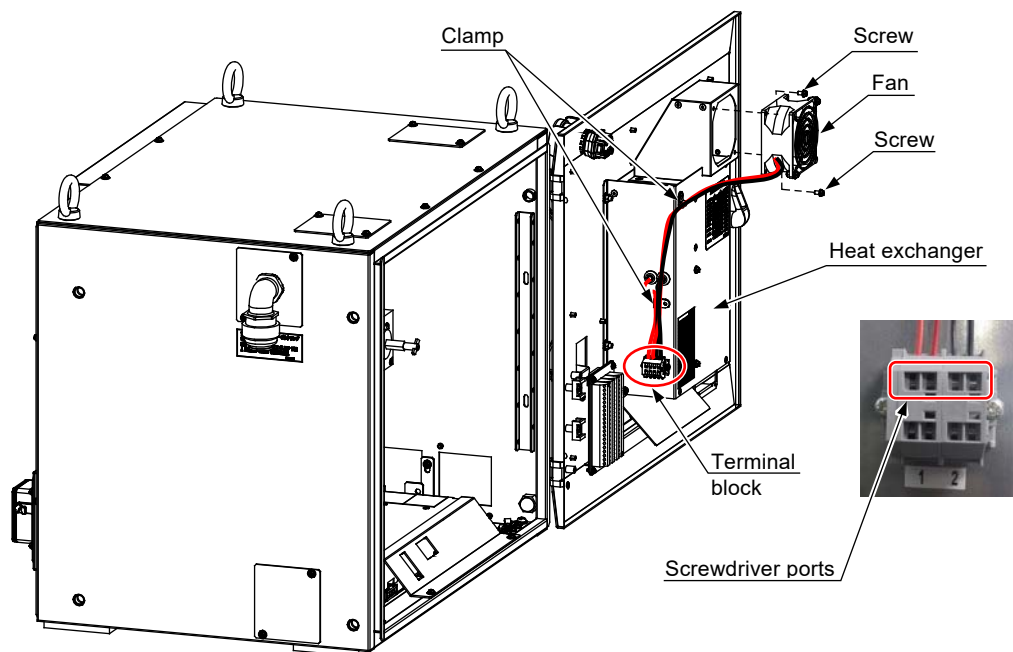
■ Replacement Procedure

1. Open the front door of the YRC1000.

By using a flathead screwdriver (small), press the levers of the terminal block (No.1 and 2) on the heat exchanger, and remove each power cable (red and black) for the inner fan that is connected to the terminal block.

Remove the screws (2 places) securing the fan, and then remove the fan together with the fan guard. (Refer to *fig. 5-67 "Heat Exchanger"*.)

Fig. 5-67: Heat Exchanger

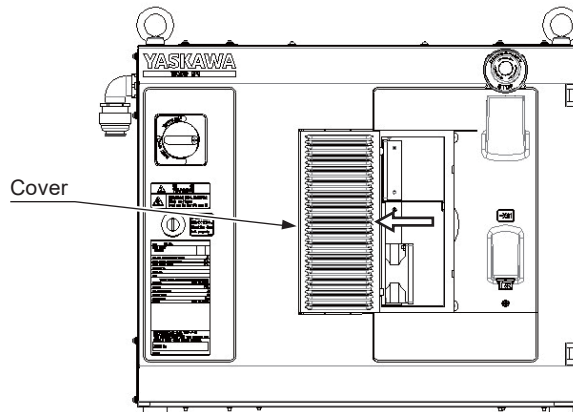


5.1.13.2 Replacing the Exterior Fan (TCMSY-312DC)

■ **Replacement Procedure**

1. Slide the front cover of the YRC1000 to the left to open it.
(Refer to *fig. 5-70 "Front Cover"*.)

Fig. 5-70: Front Cover



2. Open the front door of the YRC1000.
By using a flathead screwdriver (small), press the levers of the terminal block (No.1 and 2) on the heat exchanger, and remove each power cable (red and black) for the exterior fan that is connected to the terminal block.
3. Remove the screws (2 places) securing the fan kit, and then remove the fan kit including the fan base. (Refer to *fig. 5-71 "Heat Exchanger"* and *fig. 5-72 "Exterior Fan"*.)

Fig. 5-71: Heat Exchanger

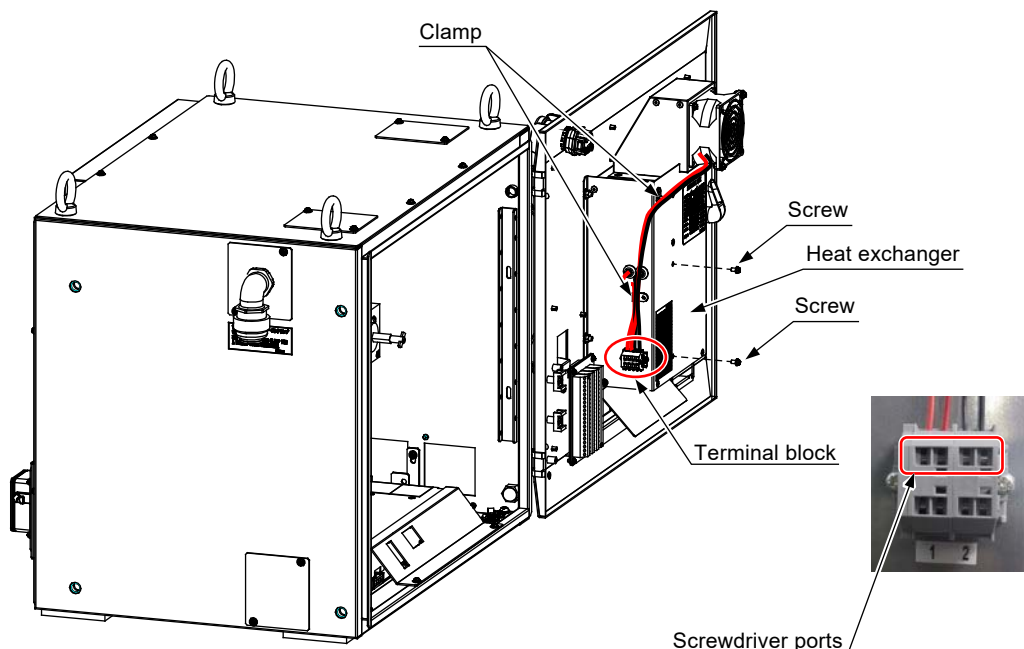
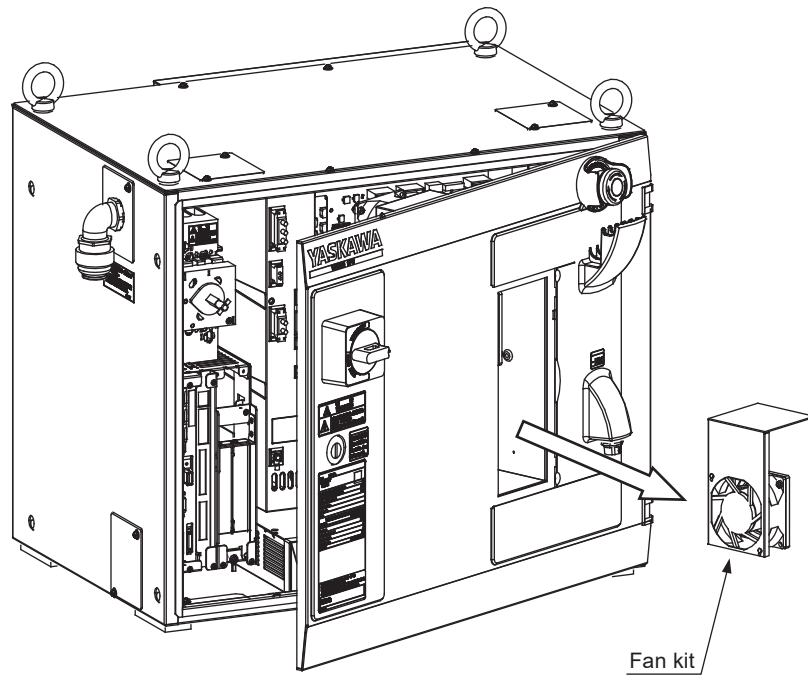
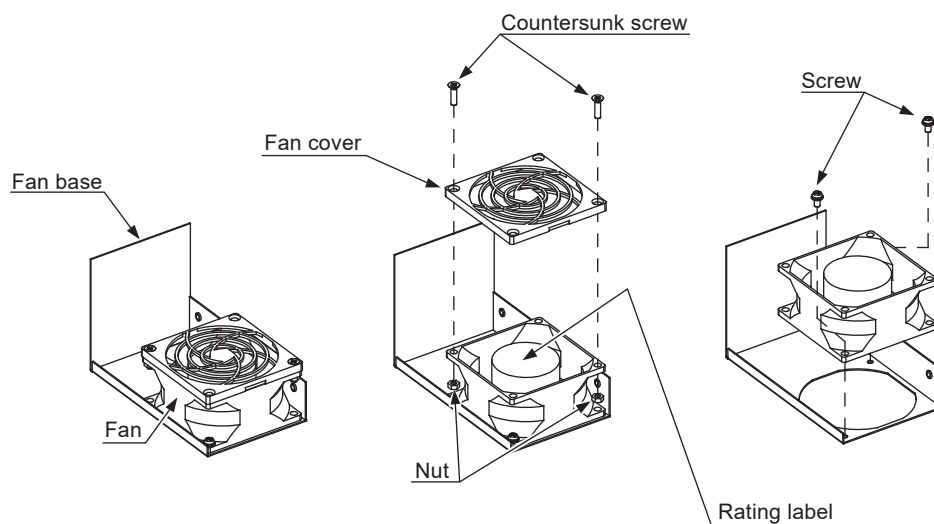


Fig. 5-72: Exterior Fan



4. Remove the fan cover from the removed fan kit.
(Refer to *fig. 5-73 "Fan Kit"*.)
5. From the fan body, remove the fan cover secured with the countersunk screws and nuts (2 places).
Be careful not to lose the nuts when removing the screws.
(Refer to *fig. 5-73.*)
6. Remove the screws (2 places) securing the fan, and then remove the fan from the fan base. (Refer to *fig. 5-73.*)

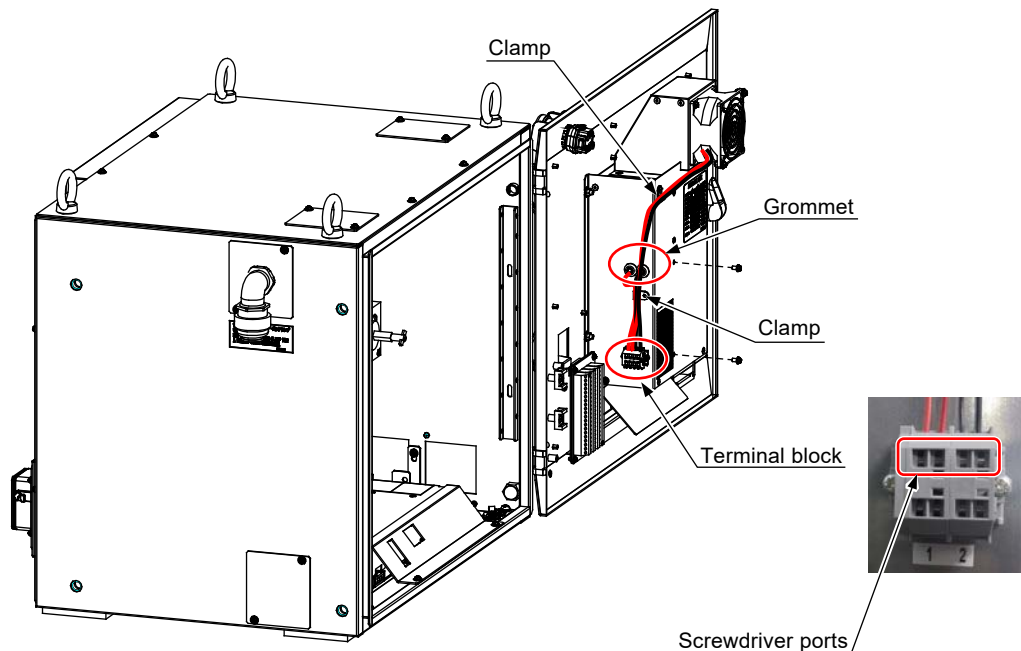
Fig. 5-73: Fan Kit



5 Replacing Parts
5.1 Replacing YRC1000 Parts

7. Mount a new fan by reversing the above-mentioned steps, in the order of 6, 5, 4, and 3. Pay attention to the direction of the fan rotation when mounting the fan. Make sure to mount the fan in the way that the rating label on the fan faces to the fan cover side.
(Refer to *fig. 5-69 "Fan Body"* and *fig. 5-73 "Fan Kit"*.)
(Make sure that the fan rotates in the direction in which the air from the fan blows toward the fan cover.)
When mounting the fan kit, make sure to prevent the power cables for the fan from getting caught in the fan kit. (Failure to observe this instruction may result in a ground fault.)
8. Pass the power cables for the fan through the grommets into the YRC1000. And then, pass the power cables through the clamps. By using a flathead screwdriver (small), press the levers of the terminal block, and connect the power cables (red and black) to the terminal block (No. 1 and 2). (Refer to *fig. 5-74 "Heat Exchanger"*.)

Fig. 5-74: Heat Exchanger



5 Replacing Parts
5.1 Replacing YRC1000 Parts

5. From the fan body, remove the fan guard secured with screws and nuts (2 places).
Be careful not to lose the nuts when removing the screws.
(Refer to *fig. 5-75 "Fan Kit (TCMSY-320DC)"* and *fig. 5-76 "Fan Kit (TCMSY-322DC)"*.)
6. Remove the screws (4 places) securing the fan, and then remove the fan from the fan base. (Refer to *fig. 5-75* and *fig. 5-76*.)
7. Mount a new fan by reversing the above-mentioned steps, in the order of 6, 5, 4, and 3. Pay attention to the direction of the fan rotation when mounting the fan. Make sure to mount the fan in the way that the rating label on the fan faces to the fan guard side.
(Refer to *fig. 5-69 "Fan Body"* and *fig. 5-75* and *fig. 5-76*.)
(Make sure that the fan rotates in the direction in which the air from the fan blows toward the fan guard.)
When mounting the fan kit, make sure to prevent the power cables for the fan from getting caught in the fan kit. (Failure to observe this instruction may result in a ground fault.)
8. Pass the power cables for the fan through the grommets into the YRC1000. And then, pass the power cables through the clamps. By using a flathead screwdriver (small), press the levers of the terminal block, and connect the power cables (red and black) to the terminal block (No. 1 and 2). (Refer to *fig. 5-74 "Heat Exchanger"*.)

5.1.14 Replacing the Power Supply for the Manipulator Fan



The power supply for the manipulator fan is installed only in the ERAR-1000-06VRF130-□□□ type controllers.

■ Replacement Procedure

1. Insert the flathead screwdriver (medium size, recommended length: 250 mm) under the power supply for the manipulator fan installed in the right-hand corner in the controller.



2. At the bottom of the power supply for the manipulator fan, the tab to secure the power supply is provided. Press down the tab by using the flathead screwdriver inserted in step 1.

Type of controller	ERAR-1000-06VRF130-A00	ERAR-1000-06VRF130-A10 ERAR-1000-06VRF130-B15 ERAR-1000-06VRF130-E10
Type of the power supply for the manipulator fan	S8VS-09024	S8VK-T12024
Location of the securing tab		

5 Replacing Parts
5.1 Replacing YRC1000 Parts

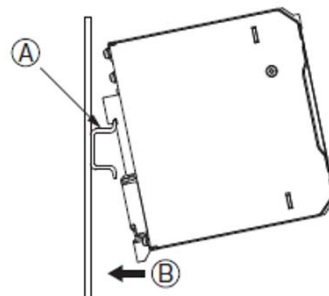
3. While pressing down the securing tab, pull out the power supply for the manipulator fan.



4. Remove the wires from the power supply for the manipulator fan, and then replace the power supply with a new one.
When the controller type is ERAR-1000-06VRF130-A10, B15, or E10, use the Phillips screwdriver (small size, recommended shaft diameter: 4.0 mm) to loosen the screws of the terminals. The letters on the connection terminals differ depending on the controller type as shown below.

- When the controller type is ERAR-1000-06VRF130-A00:
 - (1) AC power supply input terminal (L)
 - (2) AC power supply input terminal (N)
 - (3) Ground terminal
 - (4) DC power supply output terminal (+V)
 - (5) DC power supply output terminal (-V)
- When the controller type is ERAR-1000-06VRF130-A10, B15, or E10:
 - (1) AC power supply input terminal (+L1)
 - (2) AC power supply input terminal (-L2)
 - (3) Ground terminal
 - (4) DC power supply output terminal (+)
 - (5) DC power supply output terminal (-)

5. Connect the wires removed in step 4. to the new power supply.
6. While pressing down the securing tab of the new power supply, put it on the edge of the rail on the back of the controller as shown in A below. Press the power supply in the direction of B below, and pull up the tab to lock the power supply.



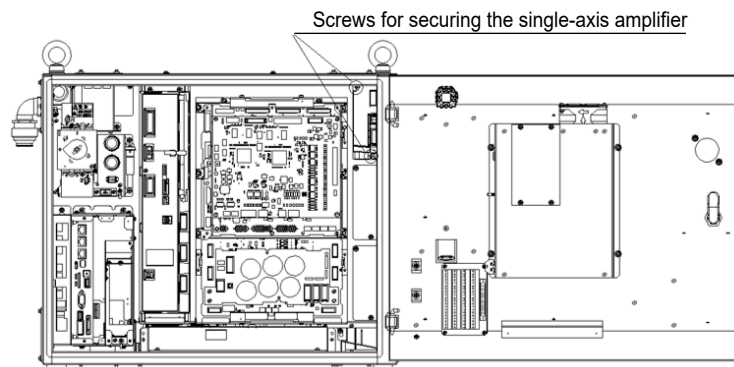
5.1.15 Replacing the Single-Axis Amplifier (CSRA-SDB□□HA)



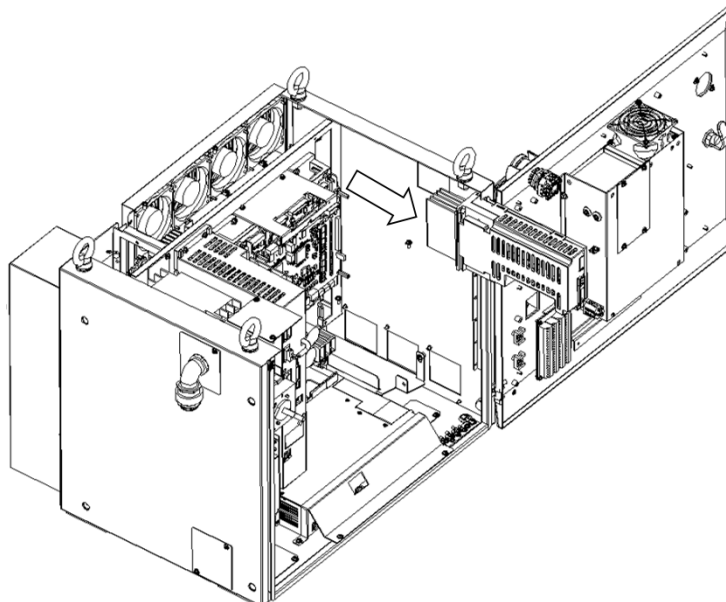
The single-axis amplifier is a component to control the 7-axis robots and the external axes.

■ Replacement Procedure

1. Disconnect the following connectors and ground wire connected to the single-axis amplifier:
 - (1) PWM signal input connector (CN591)
 - (2) Control power supply input connector (CN592)
 - (3) PN input connector (CN593)
 - (4) Motor power output connector (CN594)
 - (5) Ground terminal
2. Remove the screws securing the single-axis amplifier (2 places).



3. Pull out and replace the single-axis amplifier.



4. Mount a new single-axis amplifier by reversing the procedure of removal, and then secure it by using the screws.
5. Connect the connectors disconnected in step 1.
Also, confirm that the ground wire is securely connected.

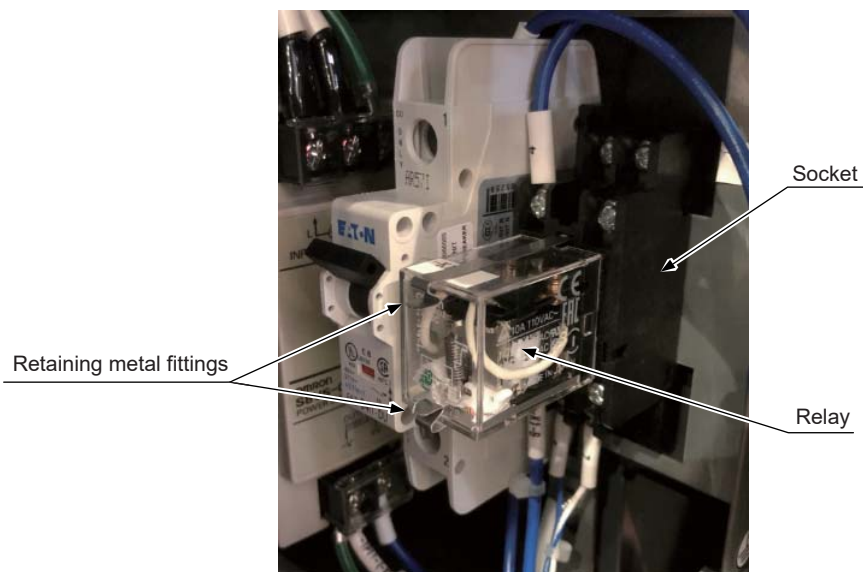
5.1.16 Replacing the Fan Control Relay



The fan control relay is installed only in the ERAR-1000-06VRF130-□□□ type controllers.

■ Replacement Procedure

1. Move the retaining metal fittings for the fan control relay installed in the far right in the controller so that the relay will not get caught by the fittings.



2. Pull out the relay from the socket.
3. Insert a new relay into the socket.
4. Fix the relay with the retaining metal fittings so that the relay will not fall off from the socket.

5.1.17 Replacing the Programming Pendant

The software for the programming pendant is written to the programming pendant. The YRC1000 does not operate normally unless this software and the main CPU board software are the specified combination of versions. Therefore, if the software versions are not the specified combination, the programming pendant software is automatically updated when the pendant is first connected to enable normal operation.



- When the programming pendant is replaced, make sure to turn OFF the power of the YRC1000 first.
- Do not connect or disconnect the programming pendant cable when the power of the YRC1000 is ON.
- Do not turn OFF the power of the YRC1000 when the programming pendant software is being automatically upgraded.

For connecting and disconnecting the programming pendant, refer to “Connecting the Programming Pendant” in chapter 4.3 of “YRC1000 INSTRUCTIONS (RE-CTO-A221)”.

- When disconnecting the programming pendant cable, turn the lock mechanism at the end of the cable to unlock it.
- After the programming pendant is replaced, confirm that the lock mechanism functions and the cable is correctly connected.
- After the programming pendant is replaced, turn ON the power of the YRC1000. The automatic version upgrade function runs if the programming pendant and the CPU board software are not the specified combination of versions. When the automatic version upgrade function is finished, the normal startup screen is displayed on the programming pendant. Confirm that the programming pendant operates normally. For details on the automatic version upgrade function, refer to chapter 10 “Upgrade Function” in “YRC1000 INSTRUCTIONS (RE-CTO-A221)”.
- After the normal operation of the programming pendant is confirmed, perform the work in *chapter 5.1.17.1 “Installing Advanced Preparation Data”* shown below if required.

5.1.17.1 Installing Advanced Preparation Data

If the advanced preparation in *chapter 4.2 “Advanced Preparations for Replacing the Programming Pendant”* is required, install the programming pendant customized application software.

For the installation procedure for the programming pendant customized application software, contact the supplier of the application software. For application software created by the customer, refer to chapter 7 “Installing Applications” in “YRC1000 OPTIONS INSTRUCTIONS FOR PROGRAMMING PENDANT CUSTOMIZATION FUNCTION (HW1484231)”.



If display operations related to the programming pendant customization function are performed without installing the application software on a system that requires programming pendant customized application software, nothing is displayed on the programming pendant or error 0113 “Overlap APPs can't be started at the same time.” is displayed.

5.1.18 Replacing the Control Power Supply Unit Fans (CSRA-CPS01KB-FN)



WARNING

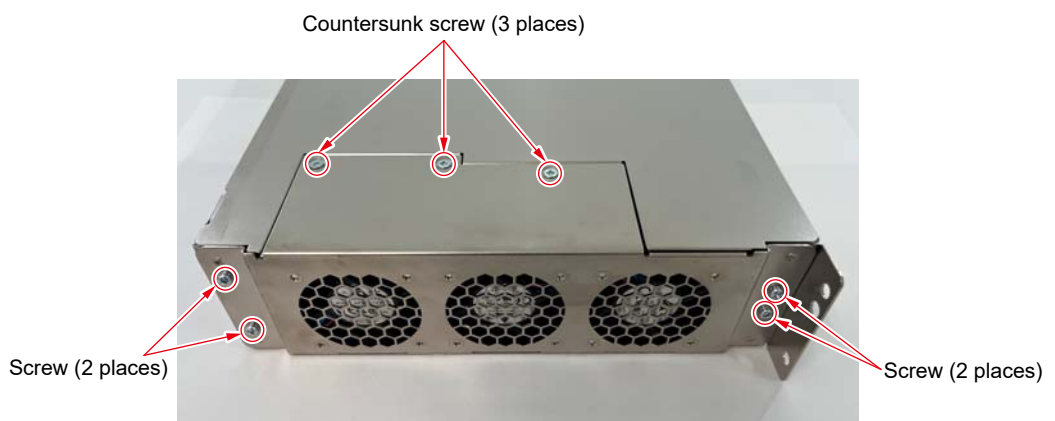
- Turn OFF the power before replacing the fan.
- After turning OFF the power supply, wait at least 5 minutes before the replacement operation. In addition, confirm that the charge lamps (orange LED) on the converter and the inverter unit are turned OFF.

Failure to observe this instruction may result in electric shock and/or personal injury due to residual voltage in the capacitor.

■ Replacement Procedure

1. To replace the control power supply unit fans, first remove the control power supply unit (CSRA-CPS01K□). For the procedure to remove the control power supply unit, refer to *chapter 5.1.7 “Replacing the Control Power Supply Unit (CSRA-CPS01K□)”*.
2. Remove the screws that mount the control power supply unit fans (7 places) from the removed control power supply unit. (Refer to *fig. 5-77*.)

Fig. 5-77: Removing the Fixing Screws for the Control Power Supply Unit Fans

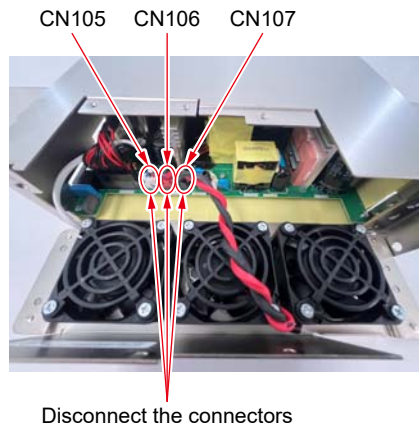


3. Disconnect the following connectors that are connected to the circuit board inside the control power supply unit. (Refer to *fig. 5-78*.)
 - (1) Control power supply unit fan connector 1 (CN105)
 - (2) Control power supply unit fan connector 2 (CN106)
 - (3) Control power supply unit fan connector 3 (CN107)

Remove the control power supply unit fans after the connectors are disconnected.

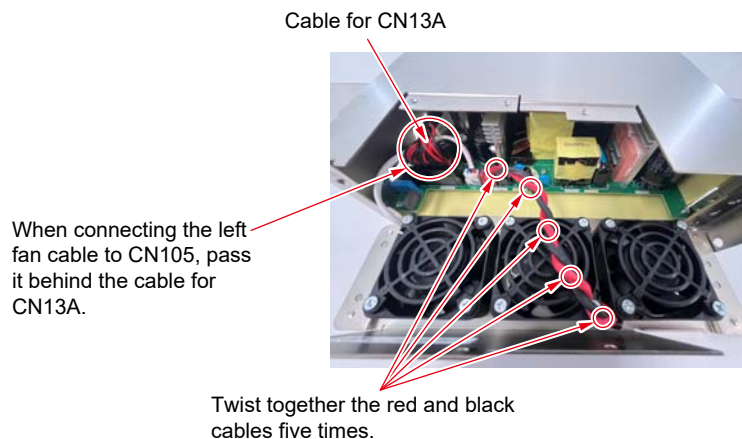
5 Replacing Parts
5.1 Replacing YRC1000 Parts

Fig. 5-78: Disconnecting the Control Power Supply Unit Fan Connectors



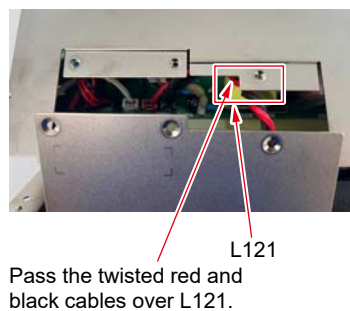
4. Twist together the red and black cables five times on the newly prepared control power supply unit fans.
Connect the cables from the control power supply unit fans to the connectors on the circuit board inside the control power supply unit.
Connect each cable to the connector with the same color. (Refer to *fig. 5-79.*)

Fig. 5-79: Installing the Control Power Supply Unit Fans (1)



5. When reattaching the control power supply unit fans to the control power supply unit, pass the twisted red and black cables over the inductor L121. (Refer to *fig. 5-80.*)

Fig. 5-80: Installing the Control Power Supply Unit Fans (2)

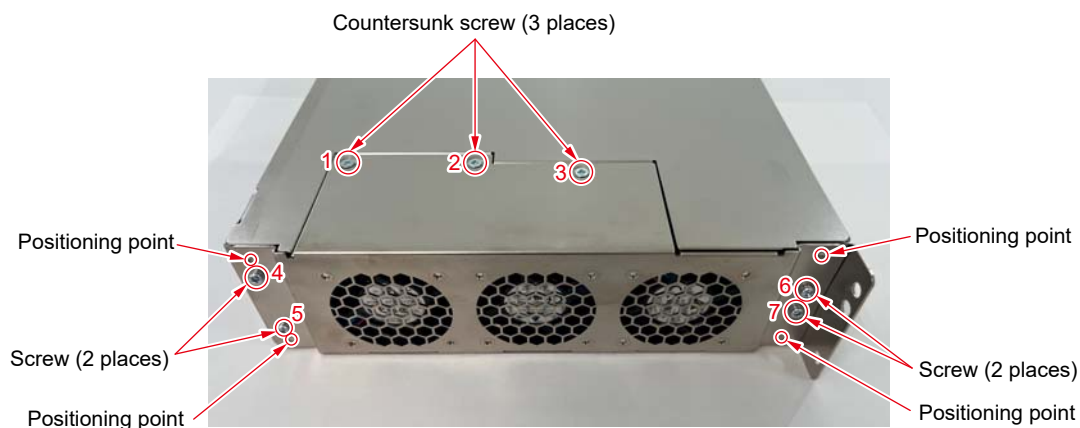


5 Replacing Parts
5.1 Replacing YRC1000 Parts

6. Fix the control power supply unit fans with screws (7 places). Fasten the screws in the following order. (Refer to *fig. 5-81*.) (Screw tightening torque: 3.0 to 6.0 kgf·cm)

- (1) Line up the positioning points on the fan case and the cover of the control power supply unit.
- (2) Fasten screws #4 and #7.
- (3) Fasten screws #5 and #6.
- (4) Fasten screws #1, #2, and #3.

Fig. 5-81: Installing the Control Power Supply Unit Fans (3)



7. Mount the control power supply unit with replaced fans to the YRC1000.

For the procedure to mount the control power supply unit, refer to *chapter 5.1.7 "Replacing the Control Power Supply Unit (CSRA-CPS01K□)"*.

5.2 YRC1000 Parts List



For the YRC1000 type that is not described in this manual, refer to the YRC1000 supplementary instructions.

Table 5-1(a): YRC1000 Parts List (Small-Capacity Model)

No.	Name	Model	Comment
1	Inverter unit	1)	
	Servo control board	CSRA-SDCA01AA	
2	Single-axis amplifier	2)	
3	Control power supply unit	CSRA-CPS01KB 3)	
4	Converter	CSRA-CV05A00A	For 200 to 240 VAC input (for Japan)
		CSRA-CV05D01A	For 380 to 480 VAC input (for Asia, North America and Europe)
5	CPU unit	JZNC-ARK51-1E	When the robot I/F board is JANCD-AIF01-1E
		JZNC-ARK51-2E	When the robot I/F board is JANCD-AIF01-2E
	CPU rack	JZNC-ARK01-E	
		CPU board	JANCD-ACP01-E
		Back board	JANCD-ABB01-E
		Riser board	JANCD-ABB02-E
	Robot I/F board	JANCD-AIF01-1E	Standard
		JANCD-AIF01-2E	Optional (memory expansion)
6	Safety circuit board	JANCD-ASF01-E	
7	Safety terminal block board	IM-YE250/5-80P	
8	General-purpose I/O board	JANCD-AIO01-E	NPN Specification (Standard for Japan, Asia and North America)
		JANCD-AIO02-E	PNP Specification (Standard for Europe)
9	Power supply contactor unit	JZRCR-APU01-1	For Japan, Asia and Europe
		JZRCR-APU03-1	For North America
10	Heat exchanger	TCMSY-310DC or TCMSY-320DC 4)	
	Exterior fan	08038RA-24Q-GA-04	
	Interior fan	08038RA-24Q-EA-02	
	Filter kit	GRM80-30 or MM850-0811A 5)	
11	Backside duct fan	09225VE-24P-CA-02	
12	Power supply contactor unit fuse	FNQ-10 10 A, 500 VAC	Time delay fuse (for Japan, Asia and Europe)
		SC-10 10 A, 600 VAC	Time delay fuse (for North America)
	General-purpose I/O board fuse	02173.15P 3.15 A, 250 V	Rapid cut fuse
	Servo control board fuse	HM10	Micro fuse
13	Battery	ER6BD_WK77P 3.6V or ER6VC131 3.6V	

1 The type of inverter unit differs depending on the YRC1000 type.

For details, refer to table 5-2(a) "Type of Inverter Unit List".

2 The type of single-axis amplifier differs depending on the manipulators model.

For details, refer to table 5-2(a).

5 Replacing Parts
5.2 YRC1000 Parts List

- 3 Changed to CSRA-CPS01KB from CSRA-CPS01KA in controllers manufactured from October 28, 2019.
4 Changed model to TCMSY-320DC after October 1, 2019.
5 Changed model to MM850-0811A after October 1, 2019.

Table 5-1(b): YRC1000 Parts List (Medium/Large-Capacity Model)

No.	Name	Model	Comment
1	Inverter unit	1)	
	Servo control board	CSRA-SDCA01AA	
2	Single-axis amplifier	2)	
3	Control power supply unit	CSRA-CPS01KB ³⁾	
4	Converter	CSRA-CV10A02A	For 200 to 240 VAC input (for Japan)
		CSRA-CV10D03A	For 380 to 480 VAC input (for Asia, North America and Europe)
5	CPU unit	JZNC-ARK51-1E	When the robot I/F board is JANCD-AIF01-1E
		JZNC-ARK51-2E	When the robot I/F board is JANCD-AIF01-2E
	CPU rack	JZNC-ARK01-E	
	CPU board	JANCD-ACP01-E	
	Back board	JANCD-ABB01-E	
	Riser board	JANCD-ABB02-E	PCIe/PCIe slot
	Robot I/F board	JANCD-AIF01-1E	Standard
		JANCD-AIF01-2E	Optional (memory expansion)
6	Safety circuit board	JANCD-ASF01-E	
7	Safety terminal block board	IM-YE250/5-80P	
8	General-purpose I/O board	JANCD-AIO01-E	NPN Specification (Standard for Japan, Asia and North America)
		JANCD-AIO02-E	PNP Specification (Standard for Europe)
9	Power supply contactor unit	JZRCR-APU01-1	For Japan, Asia and Europe
		JZRCR-APU03-1	For North America
10	Heat exchanger	TCMSY-310DC or TCMSY-312DC ⁴⁾ or TCMSY-322DC ⁵⁾	
	Exterior fan	08038RA-24Q-GA-04	
	Interior fan	08038RA-24Q-EA-02	
	Filter kit	GRM80-30 or MM850-0811A ⁶⁾	
11	Backside duct fan	09225VE-24P-CA-02	
12	Power supply contactor unit fuse	FNQ-10 10 A, 500 VAC	Time delay fuse (for Japan, Asia and Europe)
		SC-10 10 A, 600 VAC	Time delay fuse (for North America)
	General-purpose I/O board fuse	02173.15P 3.15 A, 250 V	Rapid cut fuse
	Servo control board fuse	HM10	Micro fuse
13	Battery	ER6BD_WK77P 3.6V or ER6VC131 3.6V	
14	Power supply for manipulator fan ⁷⁾	S8VS-09024	For 200 to 240 VAC input (for Japan)
		S8VK-T12024	For 380 to 480 VAC input (for Asia, North America and Europe)
15	Fan control relay ⁷⁾	LY2N-D2 DC24V	

1 The type of inverter unit differs depending on the YRC1000 type.
For details, refer to table 5-2(b) "Type of Inverter Unit List".

5 Replacing Parts
5.2 YRC1000 Parts List

- 2 The type of single-axis amplifier differs depending on the manipulators model.
For details, refer to *table 5-2(b)*.
- 3 Changed to CSRA-CPS01KB from CSRA-CPS01KA in controllers manufactured from October 28, 2019.
- 4 Changed model to TCMSY-312DC after July 2, 2018.
- 5 Changed model to TCMSY-322DC after October 1, 2019.
- 6 Changed model to MM850-0811A after October 1, 2019.
- 7 The power supply for the manipulator fan and fan control relay are installed only in the ERAR-1000-06VRF130-□□□ type controllers.

Table 5-2(a): Type of Inverter Unit List

Type of the YRC1000	Type of inverter unit	Single-axis amplifier
ERAR-1000-06VX8-□□□	CSRA-SDA01H01A	None
ERAR-1000-06VXH25-□□□	CSRA-SDA02H01A	None
ERAR-1000-07VXHE6-□□□	CSRA-SDA02H01A	CSRA-SDB21HA

Table 5-2(b): Type of Inverter Unit List

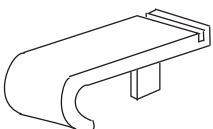
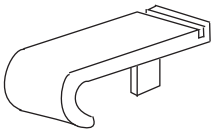
Type of the YRC1000	Type of inverter unit	Single-axis amplifier
ERAR-1000-06VXHL20-□□□	CSRA-SDA12H01A	None
ERAR-1000-06VX280-□□□	CSRA-SDA11H01A	None
ERAR-1000-06VRF130-□□□		
ERAR-1000-06VX600-□□□		
ERAR-1000-07VXB110-□□□	CSRA-SDA11H01A	CSRA-SDB71HA

5.3 Supplied Parts List

The supplied parts of YRC1000 are as follows.

Parts No.1 to 3 are used for fuse for replacement and No. 4 to 6 used as a tool for connected the I/O.

Table 5-3: Supplied Parts List

No.	Parts Name	Dimensions	Pcs.	Model	Application
1	10 A fuse		2	FNQ-10 10 A, 500 VAC (BUSSMANN)	JZRCR-APU01-1 (1FU, 2FU)
				SC-10 10 A, 600 VAC (BUSSMANN)	JZRCR-APU03-1 (1FU, 2FU)
2	Glass-tube fuse		1	02173.15P 3.15 A, 250 V (LITTEL)	JANCD-AIO0□-E(F1)
3	Micro fuse		1	HM10 1.0 A 250 V (Daito Communication Apparatus Co., Ltd.)	CSRA-SDCA01AA(F1)
4	WAGO connector wiring tool		2	231-131 (WAGO Company of Japan, Ltd.)	CSRA-CPS01K□-CN152
5	WAGO connector wiring tool		1	734-230 (WAGO Company of Japan, Ltd.)	JANCD-AIO0□-E-CN303
6	WAGO terminal block wiring tool		1	210-119SB (WAGO Company of Japan, Ltd.)	IM-YE250/5-80P

5.4 Recommended Spare Parts

It is recommended that the following parts and components be kept in stock as spare parts for the YRC1000. The spare parts list for the YRC1000 is shown below.

To buy the spare parts that are ranked B or C, inform the manufacturing number (or order number) of YRC1000 to YASKAWA representative.

Make sure to use our recommended spare parts. If using spare parts from anyone other than YASKAWA, product performance cannot be guaranteed, and damage to equipment or fire may occur.

The spare parts are ranked as follows:

- Rank A: Expendable and frequently replaced parts
- Rank B: Parts for which replacement may be necessary as a result of frequent operation
- Rank C: Drive unit



For replacing parts in Rank B or Rank C, contact your YASKAWA representative.



For the YRC1000 type that is not described in this manual, refer to the YRC1000 supplementary instructions.

Table 5-4: Correspondence Table of Recommended Spare Parts

Type of the YRC1000	Major manipulator type	Recommended spare parts
ERAR-1000-06VX8-□□□	GP7/AR900 GP8/AR700	<i>table 5-5</i>
ERAR-1000-06VXH25-□□□	GP10/GP12/AR1440 GP25/AR1730 GP25-12/AR2010	<i>table 5-6</i>
ERAR-1000-07VXHE6-□□□	AR1440E	<i>table 5-7</i>
ERAR-1000-06VXHL20-□□□	GP20HL/AR3120	<i>table 5-8</i>
ERAR-1000-06VX280-□□□	GP50 GP35L GP88/SP80 GP110/SP100 SP130 GP180/SP165 GP180-120/SP165-105 GP200S GP215 GP225/SP210 GP250/SP235 GP280 GP280L GP165R/SP150R GP200R/SP185R SP110H SP180H SP180H-110 SP225H GP360 ME1000	<i>table 5-9</i>
ERAR-1000-06VXG250-□□□	GG250	
ERAR-1000-06VX600-□□□	GP400 GP600 GP400R	
ERAR-1000-07VXB110-□□□	GP110B/SP100B	<i>table 5-10</i>
ERAR-1000-06VRF130-□□□	PH130RF PH130F PL500	<i>table 5-11</i>

5 Replacing Parts
5.4 Recommended Spare Parts

Table 5-5: Recommended Spare Parts List of YRC1000 for ERAR-1000-06VX8-□□□

Rank	Parts No.	Name	Type	Manufacturer	Qty.	Qty. per Unit	Remarks
A	1	Battery	ER6BD_WK77P 3.6V or ER6VC131 3.6V	Maxell, Ltd. TOSHIBA CORPORATION	1	1	
A	2	Filter for heat exchanger	HB20 ¹⁾	Maruyasu Industries Co., Ltd.	1	1	
A	3	Filter kit for heat exchanger	GRM80-30 ¹⁾ MM850-0811A ²⁾	Maruyasu Industries Co., Ltd.	1	1	
A	4	Exterior fan for heat exchanger	08038RA-24Q-GA-04	Minebea Co., Ltd.	1	1	
A	5	Interior fan for heat exchanger	08038RA-24Q-EA-02	Minebea Co., Ltd.	1	1	
A	6	Backside duct fan	09225VE-24P-CA-02	Minebea Co., Ltd.	4	4	
A	7	Control power supply unit fan	CSRA-CPS01KB-FN	YASKAWA Electric Corporation	1	1	
A	8	DC24V fuse for I/O	02173.15P 3.15 A, 250 V	LITTEL	1	1	
A	9	AC control power supply fuse	FNQ-10 10 A, 500 VAC	BUSSMAN	2	2	For Japan, Asia and Europe
			SC-10 10 A, 600 VAC				For North America
A	10	Encoder power supply fuse	HM10 1 A, 250 V	Daito Communication Apparatus Co., Ltd.	1	1	
B	11	CPU board	JANCD-ACP01-E	YASKAWA Electric Corporation	1	1	
B	12	Robot I/F board	JANCD-AIF01-□E	YASKAWA Electric Corporation	1	1	
B	13	Safety circuit board	JANCD-ASF01-E	YASKAWA Electric Corporation	1	1	
B	14	General-purpose I/O board	JANCD-AIO0□-E	YASKAWA Electric Corporation	1	1	
C	15	Converter	CSRA-CV05□0□A	YASKAWA Electric Corporation	1	1	
C	16	Inverter unit	CSRA-SDA01H01A	YASKAWA Electric Corporation	1	1	With the servo control board (CSRA-SDCA01AA)
C	17	CPU rack	JZNC-ARK01-E	YASKAWA Electric Corporation	1	1	
C	18	Power supply contactor unit	JZRCCR-APU01-1	YASKAWA Electric Corporation	1	1	For Japan, Asia and Europe
			JZRCCR-APU03-1				For North America

5 Replacing Parts
5.4 Recommended Spare Parts

Table 5-5: Recommended Spare Parts List of YRC1000 for ERAR-1000-06VX8-□□□

Rank	Parts No.	Name	Type	Manufacturer	Qty.	Qty. per Unit	Remarks
C	19	Control power supply unit	CSRA-CPS01KB	YASKAWA Electric Corporation	1	1	
C	20	Programming pendant	JZRCR-APP01-1	YASKAWA Electric Corporation	1	1	With cable (8 m)
B	21	SD CARD for CPU board	NSD6-512MH (A01SDI-YE	HAGIWARA Solutions	1	1	Purchase the SD card as "SD CARD memory for Controller" from YASKAWA. ³⁾

1 For heat exchanger TCMSY-310DC or TCMSY-312DC

2 For heat exchanger TCMSY-320DC or TCMSY-322DC

3 This SD card has been specially processed for booting the controller. A SD card purchased from another company and the normal recommended SD card (for use in the programming pendant) cannot be used in the controller.

5 Replacing Parts
5.4 Recommended Spare Parts

Table 5-6: Recommended Spare Parts List of YRC1000 for ERAR-1000-06VXH25-□□□

Rank	Parts No.	Name	Type	Manufacturer	Qty.	Qty. per Unit	Remarks
A	1	Battery	ER6BD_WK77P 3.6V or ER6VC131 3.6V	Maxell, Ltd. TOSHIBA CORPORATION	1	1	
A	2	Filter for heat exchanger	HB20 ¹⁾	Maruyasu Industries Co., Ltd.	1	1	
A	3	Filter kit for heat exchanger	GRM80-30 ¹⁾ MM850-0811A ²⁾	Maruyasu Industries Co., Ltd.	1	1	
A	4	Exterior fan for heat exchanger	08038RA-24Q-GA-04	Minebea Co., Ltd.	1	1	
A	5	Interior fan for heat exchanger	08038RA-24Q-EA-02	Minebea Co., Ltd.	1	1	
A	6	Backside duct fan	09225VE-24P-CA-02	Minebea Co., Ltd.	4	4	
A	7	Control power supply unit fan	CSRA-CPS01KB-FN	YASKAWA Electric Corporation	1	1	
A	8	DC24V fuse for I/O	02173.15P 3.15 A, 250 V	LITTEL	1	1	
A	9	AC control power supply fuse	FNQ-10 10 A, 500 VAC	BUSSMAN	2	2	For Japan, Asia and Europe
			SC-10 10 A, 600 VAC				For North America
A	10	Encoder power supply fuse	HM10 1 A, 250 V	Daito Communication Apparatus Co., Ltd.	1	1	
B	11	CPU board	JANCD-ACP01-E	YASKAWA Electric Corporation	1	1	
B	12	Robot I/F board	JANCD-AIF01-□E	YASKAWA Electric Corporation	1	1	
B	13	Safety circuit board	JANCD-ASF01-E	YASKAWA Electric Corporation	1	1	
B	14	General-purpose I/O board	JANCD-AIO0□-E	YASKAWA Electric Corporation	1	1	
C	15	Converter	CSRA-CV05□0□A	YASKAWA Electric Corporation	1	1	
C	16	Inverter unit	CSRA-SDA02H01A	YASKAWA Electric Corporation	1	1	With the servo control board (CSRA-SDCA01AA)
C	17	CPU rack	JZNC-ARK01-E	YASKAWA Electric Corporation	1	1	
C	18	Power supply contactor unit	JZRCCR-APU01-1	YASKAWA Electric Corporation	1	1	For Japan, Asia and Europe
			JZRCCR-APU03-1				For North America

5 Replacing Parts
5.4 Recommended Spare Parts

Table 5-6: Recommended Spare Parts List of YRC1000 for ERAR-1000-06VXH25-□□□

Rank	Parts No.	Name	Type	Manufacturer	Qty.	Qty. per Unit	Remarks
C	19	Control power supply unit	CSRA-CPS01KB	YASKAWA Electric Corporation	1	1	
C	20	Programming pendant	JZRCR-APP01-1	YASKAWA Electric Corporation	1	1	With cable (8 m)
B	21	SD CARD for CPU board	NSD6-512MH (A01SDI-YE	HAGIWARA Solutions	1	1	Purchase the SD card as "SD CARD memory for Controller" from YASKAWA. ³⁾

1 For heat exchanger TCMSY-310DC or TCMSY-312DC

2 For heat exchanger TCMSY-320DC or TCMSY-322DC

3 This SD card has been specially processed for booting the controller. A SD card purchased from another company and the normal recommended SD card (for use in the programming pendant) cannot be used in the controller.

Table 5-7: Recommended Spare Parts List of YRC1000 for ERAR-1000-07VXHE6-□□□

Rank	Parts No.	Name	Type	Manufacturer	Qty.	Qty. per Unit	Remarks
A	1	Battery	ER6BD_WK77P 3.6V or ER6VC131 3.6V	Maxell, Ltd. TOSHIBA CORPORATION	1	1	
A	2	Filter for heat exchanger	HB20 ¹⁾	Maruyasu Industries Co., Ltd.	1	1	
A	3	Filter kit for heat exchanger	GRM80-30 ¹⁾ MM850-0811A ²⁾	Maruyasu Industries Co., Ltd.	1	1	
A	4	Exterior fan for heat exchanger	08038RA-24Q-GA-04	Minebea Co., Ltd.	1	1	
A	5	Interior fan for heat exchanger	08038RA-24Q-EA-02	Minebea Co., Ltd.	1	1	
A	6	Backside duct fan	09225VE-24P-CA-02	Minebea Co., Ltd.	4	4	
A	7	Control power supply unit fan	CSRA-CPS01KB-FN	YASKAWA Electric Corporation	1	1	
A	8	DC24V fuse for I/O	02173.15P 3.15 A, 250 V	LITTEL	1	1	
A	9	AC control power supply fuse	FNQ-10 10 A, 500 VAC	BUSSMAN	2	2	For Japan, Asia and Europe
			SC-10 10 A, 600 VAC				For North America
A	10	Encoder power supply fuse	HM10 1 A, 250 V	Daito Communication Apparatus Co., Ltd.	1	1	
B	11	CPU board	JANCD-ACP01-E	YASKAWA Electric Corporation	1	1	
B	12	Robot I/F board	JANCD-AIF01-□E	YASKAWA Electric Corporation	1	1	
B	13	Safety circuit board	JANCD-ASF01-E	YASKAWA Electric Corporation	1	1	

5 Replacing Parts
5.4 Recommended Spare Parts

Table 5-7: Recommended Spare Parts List of YRC1000 for ERAR-1000-07VXHE6-□□□

Rank	Parts No.	Name	Type	Manufacturer	Qty.	Qty. per Unit	Remarks
B	14	General-purpose I/O board	JANCD-AIO0□-E	YASKAWA Electric Corporation	1	1	
C	15	Converter	CSRA-CV05□0□A	YASKAWA Electric Corporation	1	1	
C	16	Inverter unit	CSRA-SDA02H01A	YASKAWA Electric Corporation	1	1	With the servo control board (CSRA-SDCA01AA)
C	17	Single-axis amplifier	CSRA-SDB21HA	YASKAWA Electric Corporation	1	1	
C	18	CPU rack	JZNC-ARK01-E	YASKAWA Electric Corporation	1	1	
C	19	Power supply contactor unit	JZRRCR-APU01-1	YASKAWA Electric Corporation	1	1	For Japan, Asia and Europe
			JZRRCR-APU03-1				For North America
C	20	Control power supply unit	CSRA-CPS01KB	YASKAWA Electric Corporation	1	1	
C	21	Programming pendant	JZRRCR-APP01-1	YASKAWA Electric Corporation	1	1	With cable (8 m)
B	22	SD CARD for CPU board	NSD6-512MH (A01SDI-YE	HAGIWARA Solutions	1	1	Purchase the SD card as "SD CARD memory for Controller" from YASKAWA. ³⁾

1 For heat exchanger TCMSY-310DC or TCMSY-312DC

2 For heat exchanger TCMSY-320DC or TCMSY-322DC

3 This SD card has been specially processed for booting the controller. A SD card purchased from another company and the normal recommended SD card (for use in the programming pendant) cannot be used in the controller.

Table 5-8: Recommended Spare Parts List of YRC1000 for ERAR-1000-06VXHL20-□□□

Rank	Parts No.	Name	Type	Manufacturer	Qty.	Qty. per Unit	Remarks
A	1	Battery	ER6BD_WK77P 3.6V or ER6VC131 3.6V	Maxell, Ltd. TOSHIBA CORPORATION	1	1	
A	2	Filter for heat exchanger	HB20 ¹⁾	Maruyasu Industries Co., Ltd.	1	1	
A	3	Filter kit for heat exchanger	GRM80-30 ¹⁾ MM850-0811A ²⁾	Maruyasu Industries Co., Ltd.	1	1	
A	4	Exterior fan for heat exchanger	08038RA-24Q-GA-04	Minebea Co., Ltd.	1	1	
A	5	Interior fan for heat exchanger	08038RA-24Q-EA-02	Minebea Co., Ltd.	1	1	
A	6	Backside duct fan	09225VE-24P-CA-02	Minebea Co., Ltd.	4	4	
A	7	Control power supply unit fan	CSRA-CPS01KB-FN	YASKAWA Electric Corporation	1	1	
A	8	DC24V fuse for I/O	02173.15P 3.15 A, 250 V	LITTEL	1	1	

5 Replacing Parts
5.4 Recommended Spare Parts

Table 5-8: Recommended Spare Parts List of YRC1000 for ERAR-1000-06VXHL20-□□□

Rank	Parts No.	Name	Type	Manufacturer	Qty.	Qty. per Unit	Remarks
A	9	AC control power supply fuse	FNQ-10 10 A, 500 VAC	BUSSMAN	2	2	For Japan, Asia and Europe
			SC-10 10 A, 600 VAC				For North America
A	10	Encoder power supply fuse	HM10 1 A, 250 V	Daito Communication Apparatus Co., Ltd.	1	1	
B	11	CPU board	JANCD-ACP01-E	YASKAWA Electric Corporation	1	1	
B	12	Robot I/F board	JANCD-AIF01-□E	YASKAWA Electric Corporation	1	1	
B	13	Safety circuit board	JANCD-ASF01-E	YASKAWA Electric Corporation	1	1	
B	14	General-purpose I/O board	JANCD-AIO0□-E	YASKAWA Electric Corporation	1	1	
C	15	Converter	CSRA-CV10□0□A	YASKAWA Electric Corporation	1	1	
C	16	Inverter unit	CSRA-SDA12H01A	YASKAWA Electric Corporation	1	1	With the servo control board (CSRA-SDCA01AA)
C	17	CPU rack	JZNC-ARK01-E	YASKAWA Electric Corporation	1	1	
C	18	Power supply contactor unit	JZRRCR-APU01-1	YASKAWA Electric Corporation	1	1	For Japan, Asia and Europe
			JZRRCR-APU03-1				For North America
C	19	Control power supply unit	CSRA-CPS01KB	YASKAWA Electric Corporation	1	1	
C	20	Programming pendant	JZRRCR-APP01-1	YASKAWA Electric Corporation	1	1	With cable (8 m)
B	21	SD CARD for CPU board	NSD6-512MH (A01SDI-YE	HAGIWARA Solutions	1	1	Purchase the SD card as “SD CARD memory for Controller” from YASKAWA. ³⁾

1 For heat exchanger TCMSY-310DC or TCMSY-312DC

2 For heat exchanger TCMSY-320DC or TCMSY-322DC

3 This SD card has been specially processed for booting the controller. A SD card purchased from another company and the normal recommended SD card (for use in the programming pendant) cannot be used in the controller.

5 Replacing Parts
5.4 Recommended Spare Parts

Table 5-9: Recommended Spare Parts List of YRC1000 for ERAR-1000-06VX280-□□□, ERAR-1000-06VX600-□□□

Rank	Parts No.	Name	Type	Manufacturer	Qty.	Qty. per Unit	Remarks
A	1	Battery	ER6BD_WK77P 3.6V or ER6VC131 3.6V	Maxell, Ltd. TOSHIBA CORPORATION	1	1	
A	2	Filter for heat exchanger	HB20 ¹⁾	Maruyasu Industries Co., Ltd.	1	1	
A	3	Filter kit for heat exchanger	GRM80-30 ¹⁾ MM850-0811A ²⁾	Maruyasu Industries Co., Ltd.	1	1	
A	4	Exterior fan for heat exchanger	08038RA-24Q-GA-04	Minebea Co., Ltd.	1	1	
A	5	Interior fan for heat exchanger	08038RA-24Q-EA-02	Minebea Co., Ltd.	1	1	
A	6	Backside duct fan	09225VE-24P-CA-02	Minebea Co., Ltd.	4	4	
A	7	Control power supply unit fan	CSRA-CPS01KB-FN	YASKAWA Electric Corporation	1	1	
A	8	DC24V fuse for I/O	02173.15P 3.15 A, 250 V	LITTEL	1	1	
A	9	AC control power supply fuse	FNQ-10 10 A, 500 VAC	BUSSMAN	2	2	For Japan, Asia and Europe
			SC-10 10 A, 600 VAC				For North America
A	10	Encoder power supply fuse	HM10 1 A, 250 V	Daito Communication Apparatus Co., Ltd.	1	1	
B	11	CPU board	JANCD-ACP01-E	YASKAWA Electric Corporation	1	1	
B	12	Robot I/F board	JANCD-AIF01-□E	YASKAWA Electric Corporation	1	1	
B	13	Safety circuit board	JANCD-ASF01-E	YASKAWA Electric Corporation	1	1	
B	14	General-purpose I/O board	JANCD-AIO0□-E	YASKAWA Electric Corporation	1	1	
C	15	Converter	CSRA-CV10□0□A	YASKAWA Electric Corporation	1	1	
C	16	Inverter unit	CSRA-SDA11H01A	YASKAWA Electric Corporation	1	1	With the servo control board (CSRA-SDCA01AA)
C	17	CPU rack	JZNC-ARK01-E	YASKAWA Electric Corporation	1	1	
C	18	Power supply contactor unit	JZRCCR-APU01-1	YASKAWA Electric Corporation	1	1	For Japan, Asia and Europe
			JZRCCR-APU03-1				For North America

5 Replacing Parts
5.4 Recommended Spare Parts

Table 5-9: Recommended Spare Parts List of YRC1000 for ERAR-1000-06VX280-□□□, ERAR-1000-06VX600-□□□

Rank	Parts No.	Name	Type	Manufacturer	Qty.	Qty. per Unit	Remarks
C	19	Control power supply unit	CSRA-CPS01KB	YASKAWA Electric Corporation	1	1	
C	20	Programming pendant	JZRCR-APP01-1	YASKAWA Electric Corporation	1	1	With cable (8 m)
B	21	SD CARD for CPU board	NSD6-512MH (A01SDI-YE	HAGIWARA Solutions	1	1	Purchase the SD card as "SD CARD memory for Controller" from YASKAWA. ³⁾

1 For heat exchanger TCMSY-310DC or TCMSY-312DC

2 For heat exchanger TCMSY-320DC or TCMSY-322DC

3 This SD card has been specially processed for booting the controller. A SD card purchased from another company and the normal recommended SD card (for use in the programming pendant) cannot be used in the controller.

Table 5-10: Recommended Spare Parts List of YRC1000 for ERAR-1000-07VXB110-□□□

Rank	Parts No.	Name	Type	Manufacturer	Qty.	Qty. per Unit	Remarks
A	1	Battery	ER6BD_WK77P 3.6V or ER6VC131 3.6V	Maxell, Ltd. TOSHIBA CORPORATION	1	1	
A	2	Filter for heat exchanger	HB20 ¹⁾	Maruyasu Industries Co., Ltd.	1	1	
A	3	Filter kit for heat exchanger	GRM80-30 ¹⁾ MM850-0811A ²⁾	Maruyasu Industries Co., Ltd.	1	1	
A	4	Exterior fan for heat exchanger	08038RA-24Q-GA-04	Minebea Co., Ltd.	1	1	
A	5	Interior fan for heat exchanger	08038RA-24Q-EA-02	Minebea Co., Ltd.	1	1	
A	6	Backside duct fan	09225VE-24P-CA-02	Minebea Co., Ltd.	4	4	
A	7	Control power supply unit fan	CSRA-CPS01KB-FN	YASKAWA Electric Corporation	1	1	
A	8	DC24V fuse for I/O	02173.15P 3.15 A, 250 V	LITTEL	1	1	
A	9	AC control power supply fuse	FNQ-10 10 A, 500 VAC	BUSSMAN	2	2	For Japan, Asia and Europe
			SC-10 10 A, 600 VAC				For North America
A	10	Encoder power supply fuse	HM10 1 A, 250 V	Daito Communication Apparatus Co., Ltd.	1	1	
B	11	CPU board	JANCD-ACP01-E	YASKAWA Electric Corporation	1	1	
B	12	Robot I/F board	JANCD-AIF01-□E	YASKAWA Electric Corporation	1	1	
B	13	Safety circuit board	JANCD-ASF01-E	YASKAWA Electric Corporation	1	1	
B	14	General-purpose I/O board	JANCD-AIO0□-E	YASKAWA Electric Corporation	1	1	

5 Replacing Parts
5.4 Recommended Spare Parts

Table 5-10: Recommended Spare Parts List of YRC1000 for ERAR-1000-07VXB110-□□□

Rank	Parts No.	Name	Type	Manufacturer	Qty.	Qty. per Unit	Remarks
C	15	Converter	CSRA-CV10□0□A	YASKAWA Electric Corporation	1	1	
C	16	Inverter unit	CSRA-SDA11H01A	YASKAWA Electric Corporation	1	1	With the servo control board (CSRA-SDCA01AA) For the L-, E-, U-, R-, B-, T-axes
C	17	Single-axis amplifier	CSRA-SDB71HA	YASKAWA Electric Corporation	1	1	For the S-axis
C	18	CPU rack	JZNC-ARK01-E	YASKAWA Electric Corporation	1	1	
C	19	Power supply contactor unit	JZRRCR-APU01-1	YASKAWA Electric Corporation	1	1	For Japan, Asia and Europe
			JZRRCR-APU03-1				For North America
C	20	Control power supply unit	CSRA-CPS01KB	YASKAWA Electric Corporation	1	1	
C	21	Programming pendant	JZRRCR-APP01-1	YASKAWA Electric Corporation	1	1	With cable (8 m)
B	22	SD CARD for CPU board	NSD6-512MH (A01SDI-YE	HAGIWARA Solutions	1	1	Purchase the SD card as "SD CARD memory for Controller" from YASKAWA. ³⁾

1 For heat exchanger TCMSY-310DC or TCMSY-312DC

2 For heat exchanger TCMSY-320DC or TCMSY-322DC

3 This SD card has been specially processed for booting the controller. A SD card purchased from another company and the normal recommended SD card (for use in the programming pendant) cannot be used in the controller.

Table 5-11: Recommended Spare Parts List of YRC1000 for ERAR-1000-06VRF130-□□□

Rank	Parts No.	Name	Type	Manufacturer	Qty.	Qty. per Unit	Remarks
A	1	Battery	ER6BD_WK77P 3.6V or ER6VC131 3.6V	Maxell, Ltd. TOSHIBA CORPORATION	1	1	
A	2	Filter for heat exchanger	HB20 ¹⁾	Maruyasu Industries Co., Ltd.	1	1	
A	3	Filter kit for heat exchanger	GRM80-30 ¹⁾ MM850-0811A ²⁾	Maruyasu Industries Co., Ltd.	1	1	
A	4	Exterior fan for heat exchanger	08038RA-24Q-GA-04	Minebea Co., Ltd.	1	1	
A	5	Interior fan for heat exchanger	08038RA-24Q-EA-02	Minebea Co., Ltd.	1	1	
A	6	Backside duct fan	09225VE-24P-CA-02	Minebea Co., Ltd.	4	4	
A	7	Control power supply unit fan	CSRA-CPS01KB-FN	YASKAWA Electric Corporation	1	1	
A	8	DC24V fuse for I/O	02173.15P 3.15 A, 250 V	LITTEL	1	1	

5 Replacing Parts
5.4 Recommended Spare Parts

Table 5-11: Recommended Spare Parts List of YRC1000 for ERAR-1000-06VRF130-□□□

Rank	Parts No.	Name	Type	Manufacturer	Qty.	Qty. per Unit	Remarks
A	9	AC control power supply fuse	FNQ-10 10 A, 500 VAC	BUSSMAN	2	2	For Japan, Asia and Europe
			SC-10 10 A, 600 VAC				For North America
A	10	Encoder power supply fuse	HM10 1 A, 250 V	Daito Communication Apparatus Co., Ltd.	1	1	
B	11	CPU board	JANCD-ACP01-E	YASKAWA Electric Corporation	1	1	
B	12	Robot I/F board	JANCD-AIF01-□E	YASKAWA Electric Corporation	1	1	
B	13	Safety circuit board	JANCD-ASF01-E	YASKAWA Electric Corporation	1	1	
B	14	General-purpose I/O board	JANCD-AIO0□-E	YASKAWA Electric Corporation	1	1	
B	15	Fan control relay	LY2N-D2 DC24V	OMRON	1	1	
C	16	Converter	CSRA-CV10□0□A	YASKAWA Electric Corporation	1	1	
C	17	Inverter unit	CSRA-SDA11H01A	YASKAWA Electric Corporation	1	1	With the servo control board (CSRA-SDCA01AA)
C	18	CPU rack	JZNC-ARK01-E	YASKAWA Electric Corporation	1	1	
C	19	Power supply contactor unit	JZRCR-APU01-1	YASKAWA Electric Corporation	1	1	For Japan, Asia and Europe
			JZRCR-APU03-1				For North America
C	20	Control power supply unit	CSRA-CPS01KB	YASKAWA Electric Corporation	1	1	
C	21	Power supply for manipulator fan	S8VS-09024	OMRON	1	1	For 200 to 240 VAC input (for Japan)
			S8VK-T12024	OMRON	1	1	For 380 to 480 VAC input (for Asia, North America and Europe)
C	22	Programming pendant	JZRCR-APP01-1	YASKAWA Electric Corporation	1	1	With cable (8 m)
B	23	SD CARD for CPU board	NSD6-512MH (A01SDI-YE	HAGIWARA Solutions	1	1	Purchase the SD card as "SD CARD memory for Controller" from YASKAWA. ³⁾

1 For heat exchanger TCMSY-310DC or TCMSY-312DC

2 For heat exchanger TCMSY-320DC or TCMSY-322DC

3 This SD card has been specially processed for booting the controller. A SD card purchased from another company and the normal recommended SD card (for use in the programming pendant) cannot be used in the controller.

5.5 Confirming Revision Number of YRC1000 Replacement Circuit Board

It is necessary to upgrade the system software depending on the revision number of replacement circuit board.

Check the revision numbers of the circuit board currently used and replacement circuit board. If the numbers are different, confirm that the revision number of the replacement circuit board is compatible with the system software currently used by referring to the following table before replacing the circuit board.

• JANCD-ASF01-E

System Software	Requirements	JANCD-ASF01-E Earlier than Rev.B27	JANCD-ASF01-E Rev.B27 or later
YAS3.05.00-00 or earlier	- The version is YAS. - The last two digits are "-00".	Can be used.	Cannot be used. (The alarm 0020 will occur.)
YAS3.10.00-00 or later	- The version is YAS. - The last two digits are "-00".	Can be used.	Can be used.

• CSRA-SDCA01AA

System Software	Requirements	CSRA-SDCA01AA Earlier than Rev.E17	CSRA-SDCA01AA Rev.E17 or later
YAS3.05.00-00 or earlier	- The version is YAS. - The last two digits are "-00".	Can be used.	Cannot be used. (The alarm 0020 will occur.)
YAS3.10.00-00 or later	- The version is YAS. - The last two digits are "-00".	Can be used.	Can be used.

• JANCD-ABB03□-E (Option riser board: PCI/PCI slot)

System Software	Requirements	JANCD-ABB03-E	JANCD-ABB03B-E
YAS4.51.01-00 or earlier	- The version is YAS. - The last two digits are "-00".	Can be used.	Cannot be used. (The alarm 0320 will occur.)
YAS4.60.00-00 or later	- The version is YAS. - The last two digits are "-00".	Can be used.	Can be used.

• JANCD-ABB04□-E (Option riser board: PCI/PCIe slot)

System Software	Requirements	JANCD-ABB04-E	JANCD-ABB04B-E
YAS4.51.01-00 or earlier	- The version is YAS. - The last two digits are "-00".	Can be used.	Cannot be used. (The alarm 0320 will occur.)
YAS4.60.00-00 or later	- The version is YAS. - The last two digits are "-00".	Can be used.	Can be used.



Check the revision number of the circuit board currently used. Contact your YASKAWA representative for the following cases.

1. The head of the system software version is not “YAS” or the last two digits are not “-00”.
2. The system software version meets the condition 1 above and the revision number of the JANCD-ASF01-E is earlier than Rev.B27.
3. The system software version meets the condition 1 above and the revision number of the CSRA-SDCA01AA is earlier than Rev.E17.

6 Operations after Replacing Parts



DANGER

- Before operating the manipulator, make sure the servo power is turned OFF by performing the following operations. When the servo power is turned OFF, the SERVO ON LED on the programming pendant is turned OFF.
 - Press the emergency stop buttons on the front door of the YRC1000, on the programming pendant, on the external control device, etc.
 - Disconnect the safety plug of the safety fence. (when in play mode or in remote mode)

If operation of the manipulator cannot be stopped in an emergency, personal injury and/or equipment damage may result.

- Observe the following precautions when performing a teaching operation within the manipulator's operating range:
 - Be sure to perform lockout by putting a lockout device on the safety fence when going into the area enclosed by the safety fence. In addition, the operator of the teaching operation must display the sign that the operation is being performed so that no other person closes the safety fence.
 - View the manipulator from the front whenever possible.
 - Always follow the predetermined operating procedure.
 - Always keep in mind emergency response measures against the manipulator's unexpected movement toward a person.
 - Ensure a safe place to retreat in case of emergency.

Failure to observe this instruction may cause improper or unintended movement of the manipulator, that may result in personal injury.

- Confirm that no person is present in the manipulator's operating range and that the operator is in a safe location before:
 - Turning ON the YRC1000 power
 - Moving the manipulator by using the programming pendant
 - Running the system in check mode
 - Performing automatic operations

Personal injury may result if a person enters the manipulator's operating range during operation. Immediately press an emergency stop button whenever there is a problem. The emergency stop buttons are located on the front panel of the YRC1000 and on the upper right of the programming pendant.



WARNING

- Perform the following inspection procedures prior to conducting manipulator teaching. If there is any problem, immediately take necessary steps to solve it, such as maintenance and repair.
 - Check for a problem in manipulator movement.
 - Check for damage to insulation and sheathing of external wires.
- Always return the programming pendant to the hook on the YRC1000 cabinet after use.

If the programming pendant is left unattended on the manipulator, on a fixture, or on the floor, etc., the Enable Switch may be activated due to surface irregularities of where it is left, and the servo power may be turned ON. If the operation of the manipulator starts, the manipulator or the tool may hit the programming pendant left unattended, that may result in personal injury and/or equipment damage.

6.1 Home Position Calibration

6.1.1 Home Position Calibration



Teaching and playback are not possible before home position calibration is complete.

In a system with two or more manipulators, the home position of all the manipulators must be calibrated before starting teaching or playback.

Set the security mode to management mode to perform home position calibration.

Home position calibration is an operation in which the home position and absolute encoder position coincide. Although this operation is performed prior to shipment at the factory, the following cases require this operation to be performed again.

- Change in the combination of the manipulator and YRC1000
- Replacement of the motor or absolute encoder
- Clearing stored memory (by replacement of AIF01 circuit board, weak battery, etc.)
- Home position deviation caused by hitting the manipulator against a workpiece, etc.

To calibrate the home position, use the axis keys to calibrate the mark for the home position on each axis so that the manipulator can take its posture for the home position. There are two operations for home position calibration:

- All the axes can be moved at the same time
- Axes can be moved individually

If the absolute data of the home position is already known, set the absolute data again after completing home position registration.

Home Position

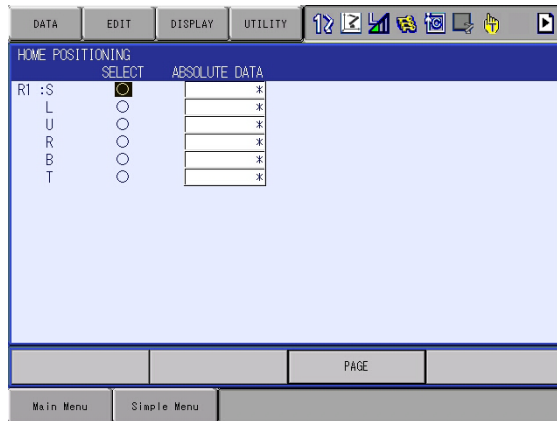


The home position is the position with the pulse value "0" for each axis. See *chapter 6.1.3 "Home Position Posture of Manipulator"*.

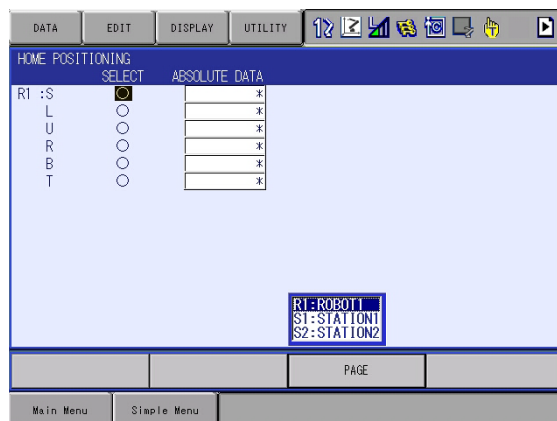
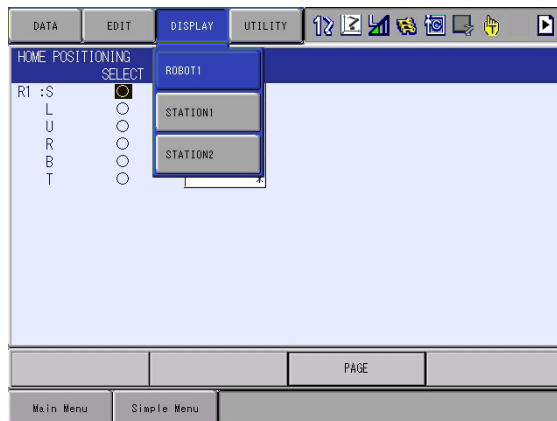
6.1.2 Calibrating Operation

6.1.2.1 Registering All Axes at One Time

1. Select {ROBOT} under the main menu.
2. Select {HOME POSITION}.
 - The HOME POSITIONING window appears.



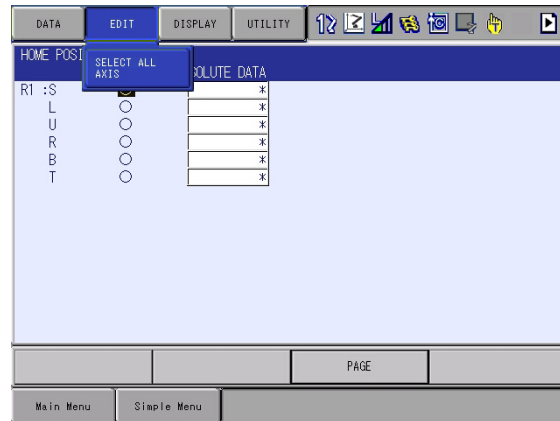
3. Select {DISPLAY} under the menu,
or select “PAGE” to display the selection window for the control group,
or press [PAGE].
 - The pull-down menu appears.



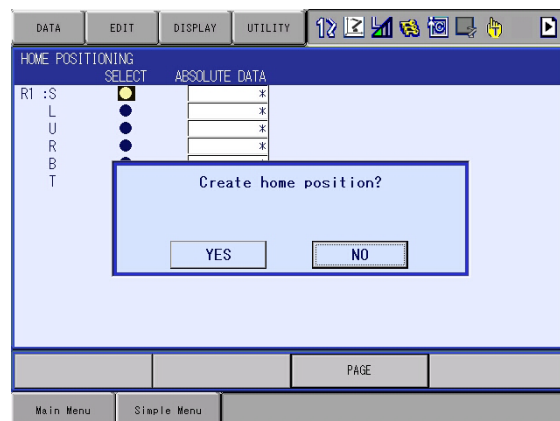
6 Operations after Replacing Parts

6.1 Home Position Calibration

4. Select the desired control group.
5. Select {EDIT} under the menu.
 - The pull-down menu appears.



6. Select {SELECT ALL AXES}.
 - The confirmation dialog box appears.



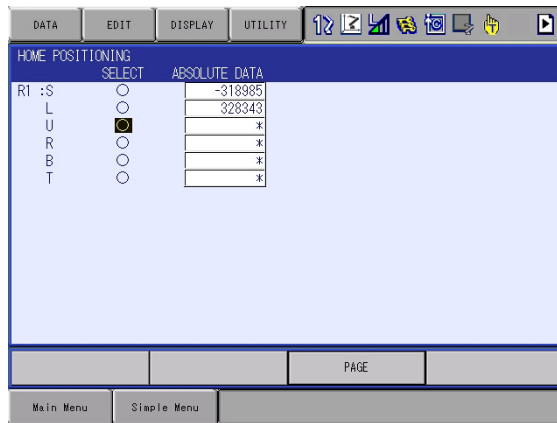
7. Select {YES}.
 - Displayed position data of all axes are registered as home position.
 - When {NO} is selected, the registration will be canceled.

6 Operations after Replacing Parts

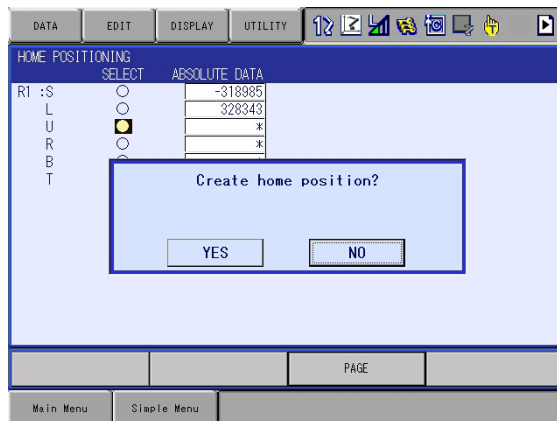
6.1 Home Position Calibration

6.1.2.2 Registering Individual Axes

1. Select {ROBOT} under the main menu.
2. Select {HOME POSITION}.
3. Select the desired control group.
 - Perform steps 3 and 4 that have been described in “Registering All Axes at One Time” to select the desired control group.
4. Select the axis to be registered.



- The confirmation dialog box appears.



5. Select {YES}.
 - Displayed position data of the axis are registered as home position. When {NO} is selected, the registration will be canceled.

6 Operations after Replacing Parts

6.1 Home Position Calibration

6.1.2.3 Changing the Absolute Data

To change the absolute data of the axis when home position calibration is completed, perform the following:

1. Select {ROBOT} under the main menu.
2. Select {HOME POSITION}.
3. Select the desired control group.
 - Perform steps 3 and 4 that have been described in “Registering All Axes at One Time” to select the desired control group
4. Select the absolute data to be registered.
 - The number can now be entered.

The screenshot shows the 'HOME POSITIONING' screen with a 'SELECT' column and an 'ABSOLUTE DATA' column. The 'R1:S' axis is selected, and the 'ABSOLUTE DATA' field is highlighted with a blue box, showing the value '-236730'. Below the main screen is a numeric keypad with columns for Hex, Dec, Bin, and digits 7, 8, 9, along with function keys: Clear, Back space, Cancel, and Enter.

Hex	Dec	Bin	7	8	9	Clear
A	D	4	5	6	Back space	
B	E	1	2	3	Cancel	
C	F	0	.	-	Enter	

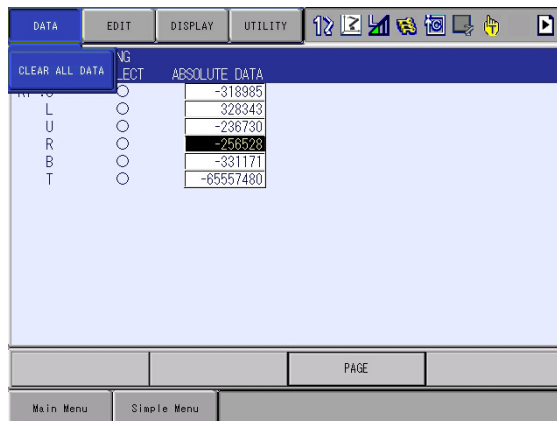
5. Enter the absolute data using the numeric keys.
6. Press [ENTER].
 - Absolute data are modified.

6 Operations after Replacing Parts

6.1 Home Position Calibration

6.1.2.4 Clearing Absolute Data

1. Select {ROBOT} under the main menu.
2. Select {HOME POSITION}.
 - Perform steps 2, 3, and 4 that have been described in “Registering All Axes at One Time” to display the HOME POSITIONING window and select the desired control group.
3. Select {DATA} under the menu.
 - The pull-down menu appears.



4. Select {CLEAR ALL DATA}.
 - The confirmation dialog box appears.

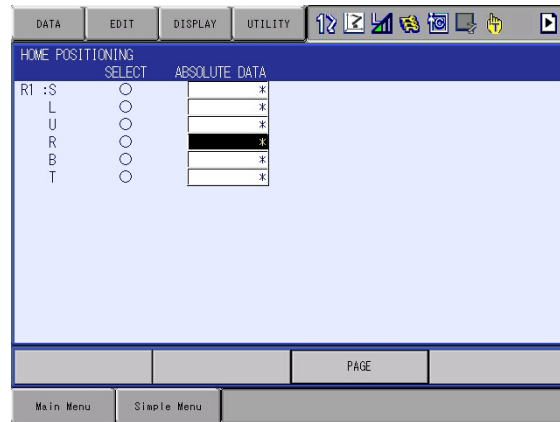


6 Operations after Replacing Parts

6.1 Home Position Calibration

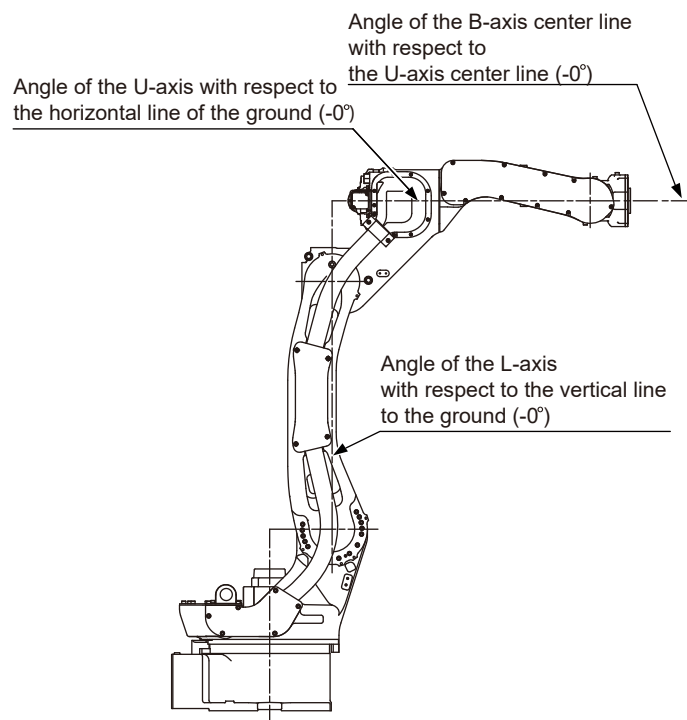
5. Select {YES}.

- The all absolute data are cleared. When {NO} is selected, the operation will be canceled.



6.1.3 Home Position Posture of Manipulator

The home position posture of a commonly used 6-axis vertically-articulated manipulator is shown below.

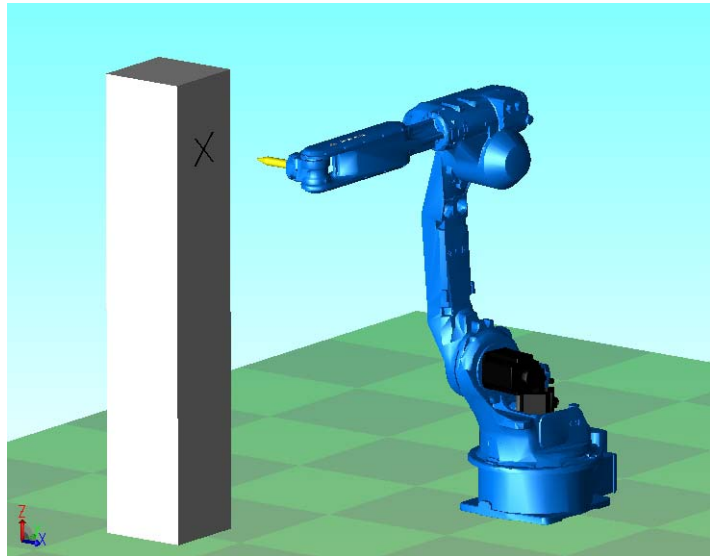


The home position posture of each manipulator differs depending on its model. Refer to the manipulator's instruction manual corresponding to the model.

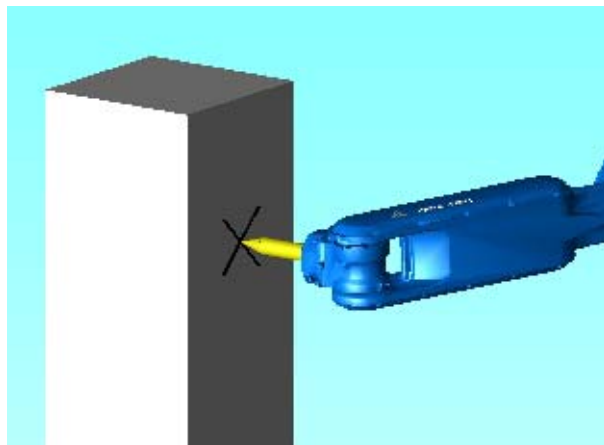
6.2 Position Deviation Check Using the Check Program

Use the check program to check if positions are deviated with the following procedure.

1. Call up the check program in which the check point is taught (the job for) and operate the manipulator at low speed.



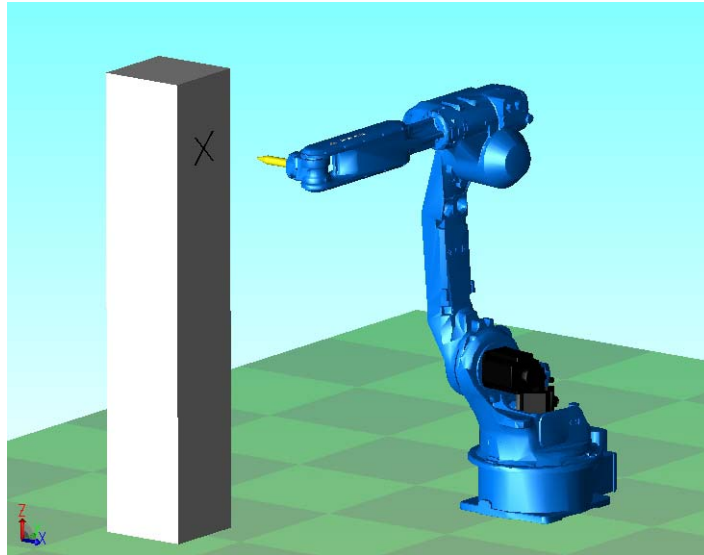
2. Check the tool tip position.
 - If it points the check point exactly as shown in the following figure, there is no deviation from the positions. Proceed to *chapter 6.4 “Setting the Second Home Position (Check Point)”*.
 - If not, there is a deviation. When the motor or encoder, etc. was replaced, move the corresponding axis only, when the stored memory was cleared or the manipulator was hit against a workpiece, move all axes, to the check point by joint motion. Then, proceed to *chapter 6.3.3 “Home Position Data Correction”*.



6.3 Checking of the Check Program

6.3.1 Motion of the Check Program

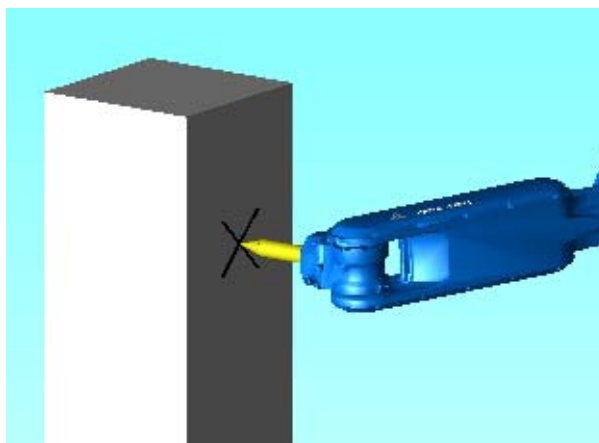
Call up the check program in which the check point is taught (the job for avoiding the position deviation) and operate the manipulator at low speed.



6.3.2 Checking of the Check Program

Check the deviation in to the check point. If the tool tip position is deviated, there is a deviation.

When the motor or encoder, etc. was replaced, move the corresponding axis only, when the stored memory was cleared or the manipulator was hit against a workpiece, move all axes, to the check point by joint motion.



6.3.3 Home Position Data Correction

When there is a deviation from the positions, correct the home position data with the following procedure.

1. Check the values of the following pulses.
 - If there is no deviation, the following two values coincide. Then, proceed to *chapter 6.4 “Setting the Second Home Position (Check Point)”*.
 - If there is a deviation, execute the following procedures to correct it.

(1) Command position pulse of the check point that was taught in advance

Displaying the Command Position Pulse

- I) Select {ROBOT} under the main menu.
- II) Select {COMMAND POSITION}.

(2) Current position pulse where the manipulator (tool tip) was moved to the check point after performing the check program

Displaying the Current Position Pulse

- I) Select {ROBOT} under the main menu.
- II) Select {CURRENT POSITION}.

2. Calculate the difference between the command position pulse and the current position pulse.

The difference pulse = Command position pulse – Current position pulse

3. On the HOME POSITIONING window, add the difference pulse value to the absolute data of the axis whose motor or encoder, etc. was replaced.
4. Modify the home position data by following the procedures described in *chapter 6.1.2.3 “Changing the Absolute Data”* in chapter 6.1.2.
5. Confirm that the command position pulse and the current position pulse coincide.
 - The home position data have been corrected.
 - Proceed to *chapter 6.4 “Setting the Second Home Position (Check Point)”*.

6.4 Setting the Second Home Position (Check Point)



DANGER

- Before operating the manipulator, make sure the servo power is turned OFF by performing the following operations. When the servo power is turned OFF, the SERVO ON LED on the programming pendant is turned OFF.
 - Press the emergency stop buttons on the front door of the YRC1000, on the programming pendant, on the external control device, etc.
 - Disconnect the safety plug of the safety fence.
(when in play mode or in remote mode)

If operation of the manipulator cannot be stopped in an emergency, personal injury and/or equipment damage may result.

- Observe the following precautions when performing a teaching operation within the manipulator's operating range:
 - Be sure to perform lockout by putting a lockout device on the safety fence when going into the area enclosed by the safety fence. In addition, the operator of the teaching operation must display the sign that the operation is being performed so that no other person closes the safety fence.
 - View the manipulator from the front whenever possible.
 - Always follow the predetermined operating procedure.
 - Always keep in mind emergency response measures against the manipulator's unexpected movement toward a person.
 - Ensure a safe place to retreat in case of emergency.

Failure to observe this instruction may cause improper or unintended movement of the manipulator, that may result in personal injury.

- Confirm that no person is present in the manipulator's operating range and that the operator is in a safe location before:
 - Turning ON the YRC1000 power
 - Moving the manipulator by using the programming pendant
 - Running the system in check mode
 - Performing automatic operations

Personal injury may result if a person enters the manipulator's operating range during operation. Immediately press an emergency stop button whenever there is a problem. The emergency stop buttons are located on the front panel of the YRC1000 and on the upper right of the programming pendant.



WARNING

- When performing the position check operation for the second home position (check point), pay careful attention to ensure the safety of the surrounding operation environment.

If the “OUT OF RANGE (ABSO DATA)” alarm occurs, an error in the encoder communication related components may be the cause of the alarm. The manipulator may move in an unexpected direction, that may result in personal injury and/or equipment damage.

- Perform the following inspection procedures prior to conducting manipulator teaching. If there is any problem, immediately take necessary steps to solve it, such as maintenance and repair.
 - Check for a problem in manipulator movement.
 - Check for damage to insulation and sheathing of external wires.
- Always return the programming pendant to the hook on the YRC1000 cabinet after use.

If the programming pendant is left unattended on the manipulator, on a fixture, or on the floor, etc., the Enable Switch may be activated due to surface irregularities of where it is left, and the servo power may be turned ON. If the operation of the manipulator starts, the manipulator or the tool may hit the programming pendant left unattended, that may result in personal injury and/or equipment damage.

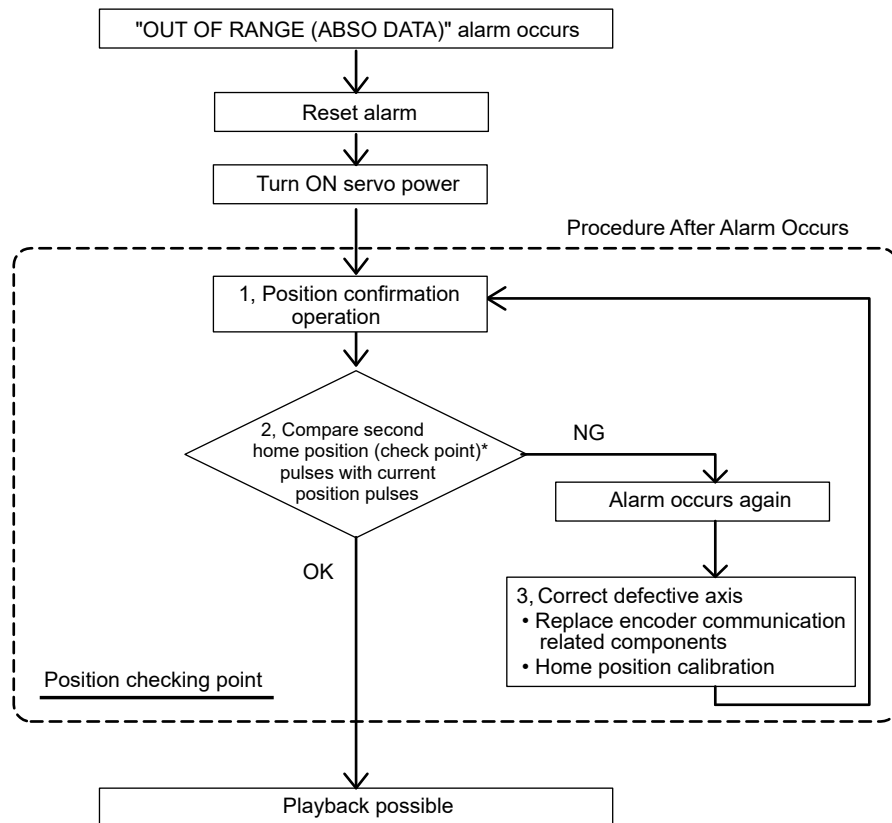
6.4.1 Purpose of Position Check Operation

If the absolute number of rotation detected at power supply ON does not match the data stored in the absolute encoder the last time the power supply was turned off, alarm 4107 “OUT OF RANGE (ABSO DATA)” is issued when the controller power is turned ON.

There are two possible causes of this alarm:

- An error was found in the encoder communication related components.
- No error was found in the encoder communication related components, but the manipulator was moved after the power supply was turned OFF.

If there is an error in the encoder communication related components, the manipulator may stall when playback is started. If the absolute data allowable range error alarm has occurred, playback and test runs will not function and the position must be checked.



1, Position Check

After the “OUT OF RANGE (ABSO DATA)” alarm occurs, move to the second home position using the axis keys and perform the position confirmation. For performing the position confirmation, refer to *chapter 6.4.3 “Procedure after the Alarm”*. Playback and test runs will not function unless “CONFIRM POSITION” is performed.

2, Pulse Difference Check

The pulse number at the second home position is compared with that at the current position. If the difference is within the allowable range, playback is enabled. If not, the alarm occurs again.

- The allowable range pulse is the number of pulses per rotation of the motor (PPR data).
- The initial value of the second home position is the home position (where all axes are at pulse 0). The second home position can be changed. For details, refer to *chapter 6.4.2 "Procedure for the Second Home Position Setting (Check Point)"*.

3, Alarm Occurrence

If the alarm occurs again, there may be an error in the encoder communication related components. Check the components. After adjusting the erroneous axis, calibrate the home position of the axis, and then check the position again.

NOTE

- Home position calibration of all the axes at the same time enables playback operations without having to check the position.
- Sometimes in a system with a manipulator that has no brake, it is possible to enable playback without position checking after the alarm occurs. **However, as a rule, always perform "CONFIRM POSITION".** Under the above special conditions, the manipulator moves as follows:

After starting, the manipulator moves at low speed (1/10 of the maximum speed) to the step indicated by the cursor.

If it is stopped and restarted during this motion, the low speed setting is retained until the step at cursor is reached. Regardless of cycle setting, the manipulator stops after the cursor step is reached.

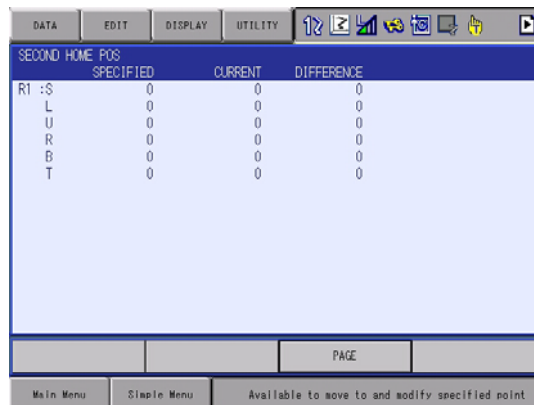
Starting the manipulator again then moves it at the programmed speed and cycle of the job.

6.4.2 Procedure for the Second Home Position Setting (Check Point)

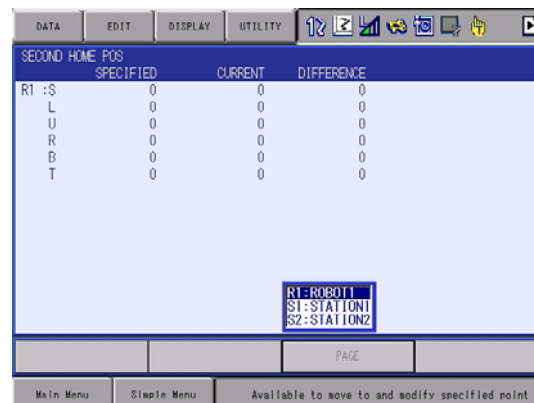
Apart from the “home position” of the manipulator, the second home position can be set up as a check point for absolute data. Use the following steps to set the specified point.

If two or more manipulators or stations are controlled by one controller, the second home position must be set for each manipulator or station.

1. Select {ROBOT} under the main menu.
2. Select {SECOND HOME POS}.
 - The SECOND HOME POS window appears.
The message “Available to move to and modify specified point” is shown.



3. Press the page key [PAGE],
or select “PAGE” to display the selection window for the control group.
 - The group axes by which the second home position is set is selected when there are two or more group axes.



4. Press the axis keys.
 - Move the manipulator to the new second home position.
5. Press [MODIFY] and [ENTER].
 - The second home position is changed.

6.4.3 Procedure after the Alarm



WARNING

- When performing the position check operation, pay careful attention to ensure the safety of the surrounding operation environment.

An error in the encoder communication related components may be the cause of the alarm. The manipulator may move in an unexpected direction, that may result in personal injury and/or equipment damage.

If the “OUT OF RANGE (ABSOLUTE DATA)” alarm occurs, perform the following.

- Reset the alarm
- Turn Servo power ON

and confirm the second home position. After the confirmation, if the encoder communication related components are found to be the cause of the alarm, perform the necessary operation, such as replacing the encoder communication related components, etc.

The robot current position data when turning main power supply OFF and ON can be confirmed in “POWER ON/OFF POS” window.



Refer to *chapter 7.7 “Position Data When Power Is Turned ON/OFF”* for details on the “POWER ON/OFF POS” window.

- Select {ROBOT} under the main menu.
- Select {SECOND HOME POS}.
 - The SECOND HOME POS window appears.

	SPECIFIED	CURRENT	DIFFERENCE
R1	0	0	0
S	0	0	0
L	0	0	0
U	0	0	0
R	0	0	0
B	0	0	0
T	0	0	0

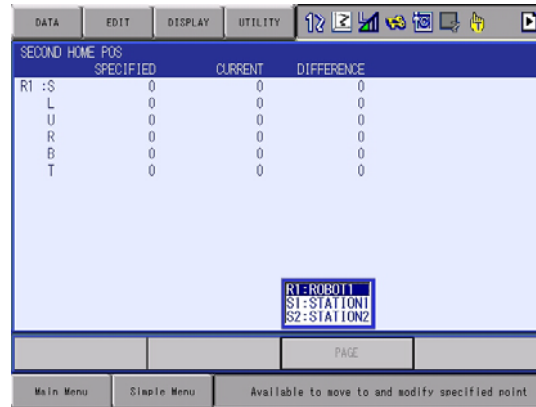
6 Operations after Replacing Parts

6.4 Setting the Second Home Position (Check Point)

3. Press the page key [PAGE].

or select "PAGE" to display the selection window for the control group.

- The group axes by which the second home position is set is selected when there are two or more group axes.



4. Press [FWD].

- TCP moves to the second home position. The robot moving speed is set as selected manual speed.

5. Select {DATA} under the menu.

6. Select {CONFIRM POSITION}.

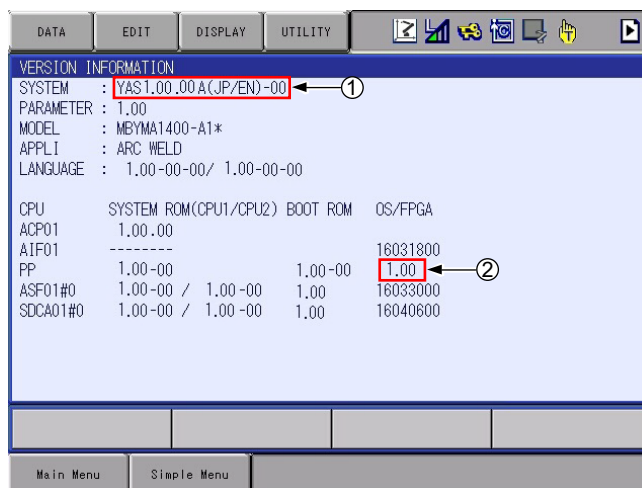
- The message "Home position checked" is shown.
Pulse data of the second home position and current pulse data are compared. If the compared error is in allowed range, playback operation can be done.
If the error is beyond the allowed range, the alarm occurs again.

7 System Diagnosis

7.1 System Version

It is possible to check the system CPU version information as follows.

1. Select {SYSTEM INFO} under the main menu.
 2. Select {VERSION}.
- The VERSION window appears.



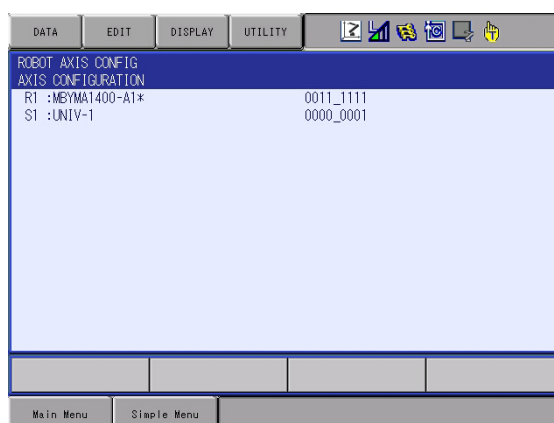
The versions listed in manuals for the YRC1000 are shown below.

- ①SYSTEM: Displays the YRC1000 system software version. Normally only this version number is listed in manuals for the YRC1000.
- ②PP(OS/FPGA): Displays the OS version of the programming pendant. This version number is listed when describing functions specific the programming pendant.

7.2 Manipulator Model

The robot type information can be checked with the next operation.

1. Select {ROBOT} under the main menu.
 2. Select {MANIPULATOR TYPE}.
- The ROBOT AXIS CONFIG window appears.



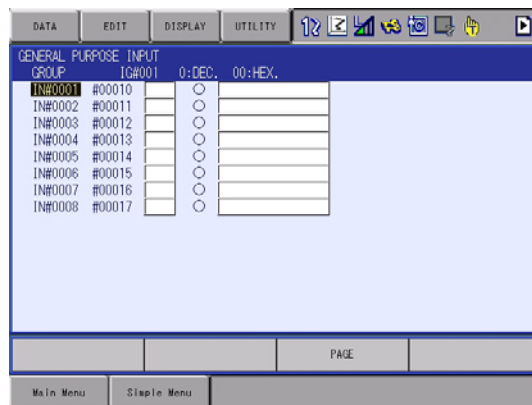
7.3 Input/Output Status

7.3.1 General-Purpose Input

The status of input signal that is referred to by input instruction of a job can be confirmed.

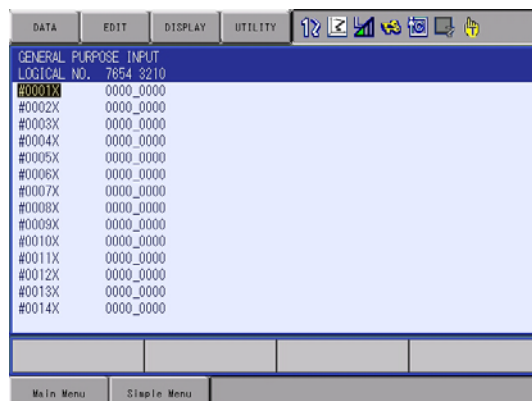
7.3.1.1 GENERAL PURPOSE Input Window

1. Select {IN/OUT} under the main menu.
2. Select {GENERAL PURPOSE INPUT}.
- The GENERAL PURPOSE INPUT window appears.



7.3.1.2 General-Purpose Simple Window

1. Select {IN/OUT} under the main menu.
2. Select {GENERAL PURPOSE INPUT}.
- The GENERAL PURPOSE INPUT window appears.
3. Select {SIMPLE} from the pull-down menu of {DISPLAY}.
- The GENERAL PURPOSE INPUT simple window appears.

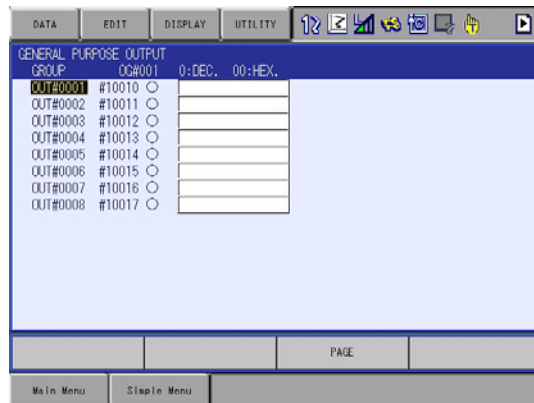


7.3.2 General-Purpose Output

The status of the output signal set by the output instruction can be confirmed and modified.

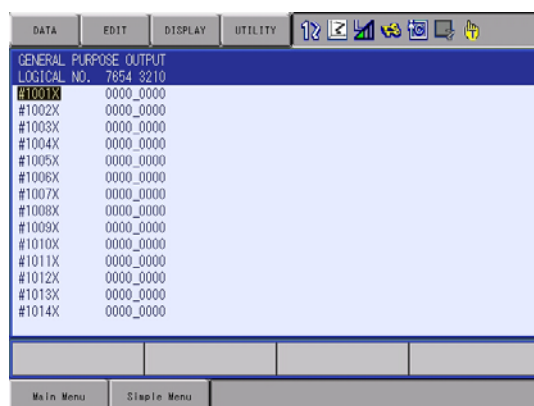
7.3.2.1 General-Purpose Output Window

1. Select {IN/OUT} under the main menu.
2. Select {GENERAL PURPOSE OUTPUT}.
 - The GENERAL PURPOSE OUTPUT window appears.



7.3.2.2 General-Purpose Output Simple Window

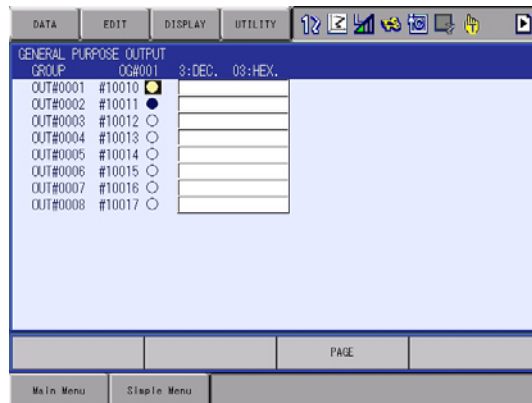
1. Select {IN/OUT} under the main menu.
2. Select {GENERAL PURPOSE OUTPUT}.
 - The GENERAL PURPOSE OUTPUT window appears.
3. Select {SIMPLE} from the pull-down menu of {DISPLAY}.
 - The GENERAL PURPOSE OUTPUT simple window appears.



7.3.2.3 Modifying the Output Status

The status of general-purpose output signal can be changed by the operation below.

1. Select the desired output signal number.
 - Select the status of the desired output signal, “○” or “●” in the GENERAL PURPOSE OUTPUT window.
2. Press [INTER LOCK] + [SELECT].
 - The status is changed. (●: ON status, ○: OFF status)

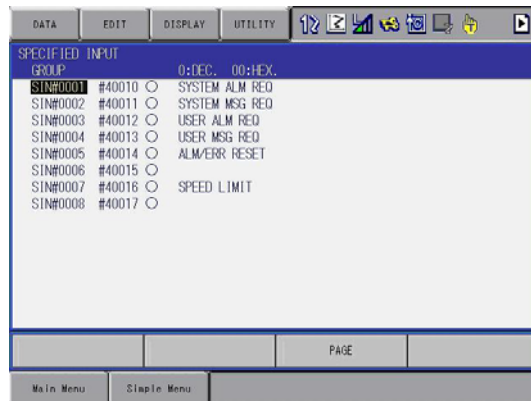


The status of general-purpose output signal can be changed only when the mode is set to teach mode.

7.3.3 Specific Input

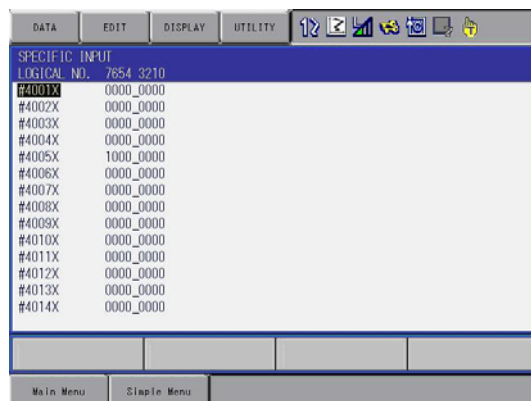
7.3.3.1 Specific Input Window

1. Select {IN/OUT} under the main menu.
2. Select {SPECIFIC INPUT}.
 - The SPECIFIED INPUT window appears.



7.3.3.2 Specific Input Simple Window

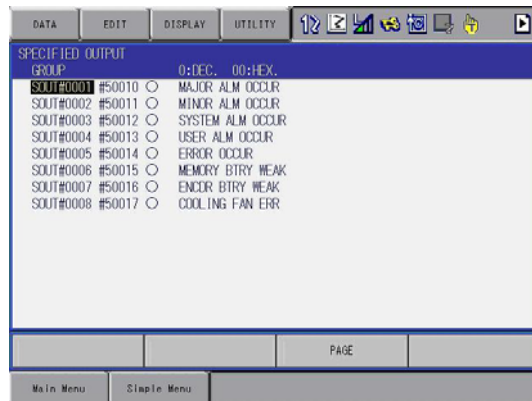
1. Select {IN/OUT} under the main menu.
2. Select {SPECIFIC INPUT}.
 - The SPECIFIED INPUT window appears.
3. Select {SIMPLE} from the pull-down menu of {DISPLAY}.
 - The SPECIFIED INPUT simple window appears.



7.3.4 Specific Output

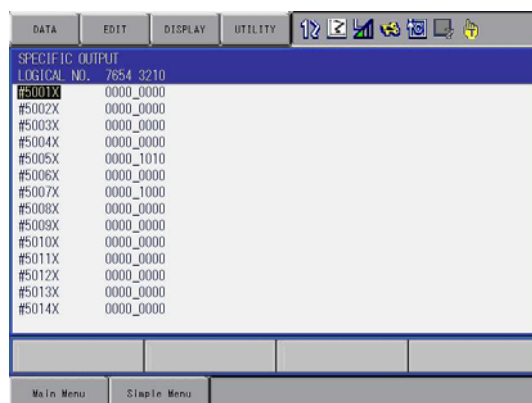
7.3.4.1 Specific Output Window

1. Select {IN/OUT} under the main menu.
2. Select {SPECIFIC OUTPUT}.
 - The SPECIFIED OUTPUT window appears.



7.3.4.2 Specific Output Simple Window

1. Select {IN/OUT} under the main menu.
2. Select {SPECIFIC OUTPUT}.
 - The SPECIFIED OUTPUT window appears.
3. Select {SIMPLE} from the pull-down menu of {DISPLAY}.
 - The SPECIFIED OUTPUT simple window appears.

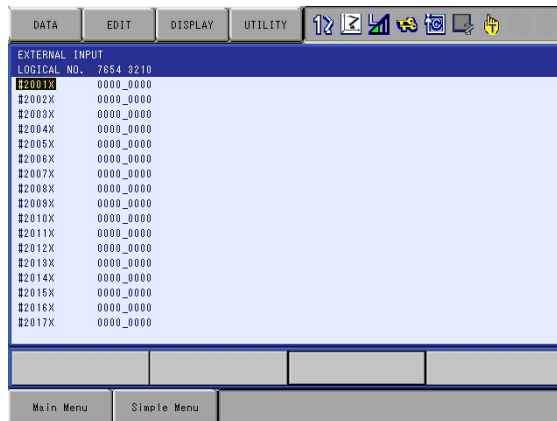


7.3.5 External Input

The status of signal that is input by an external device.

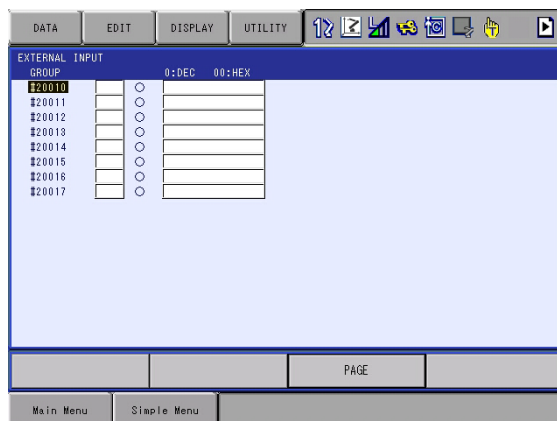
7.3.5.1 External Input Window

1. Select {IN/OUT} under the main menu.
2. Select {EXTERNAL INPUT}.
 - The EXTERNAL INPUT window appears.



7.3.5.2 External Input Detail Window

1. Select {IN/OUT} under the main menu.
2. Select {EXTERNAL INPUT}.
 - The EXTERNAL INPUT window appears.
3. Select {DETAIL} from the pull-down menu of {DISPLAY}.
 - The EXTERNAL INPUT detail window appears.

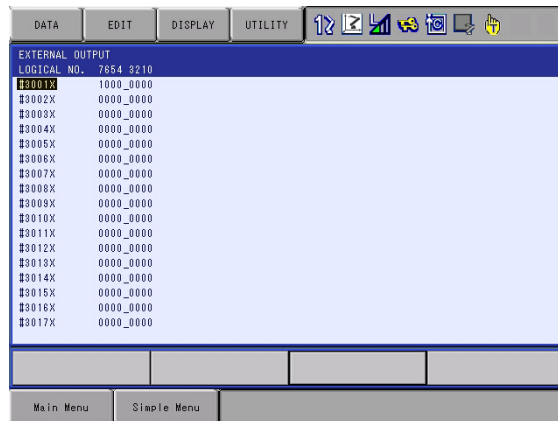


7.3.6 External Output

The status of signal that is output to an external device.

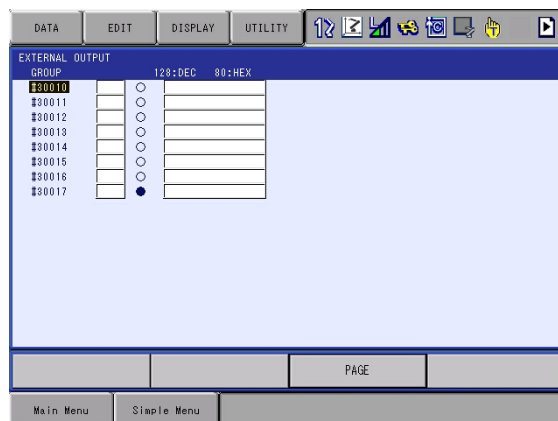
7.3.6.1 External Output Window

1. Select {IN/OUT} under the main menu.
2. Select {EXTERNAL OUTPUT}.
 - The EXTERNAL OUTPUT window appears.



7.3.6.2 External Output Detail Window

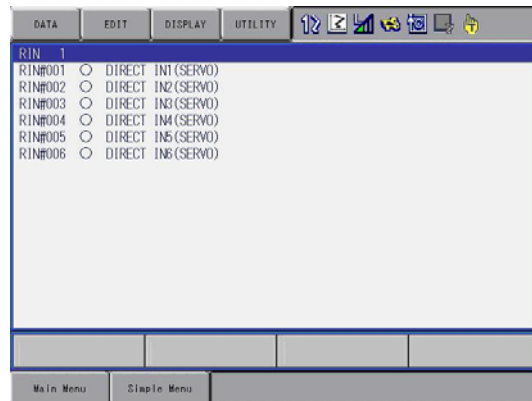
1. Select {IN/OUT} under the main menu.
2. Select {EXTERNAL OUTPUT}.
 - The EXTERNAL OUTPUT window appears.
3. Select {DETAIL} from the pull-down menu of {DISPLAY}.
 - The EXTERNAL OUTPUT detail window appears.



7.3.7 RIN Input

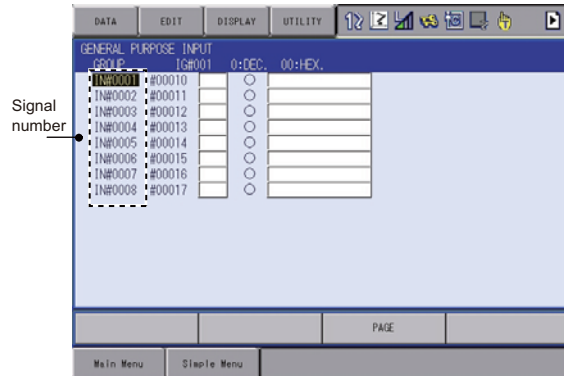
7.3.7.1 RIN Input Window

1. Select {IN/OUT} under the main menu.
2. Select {RIN}.
 - The RIN window appears.



7.3.8 Signal Number Search

A search can be made for a signal number of a general-purpose input, general-purpose output, specific input, specific output.

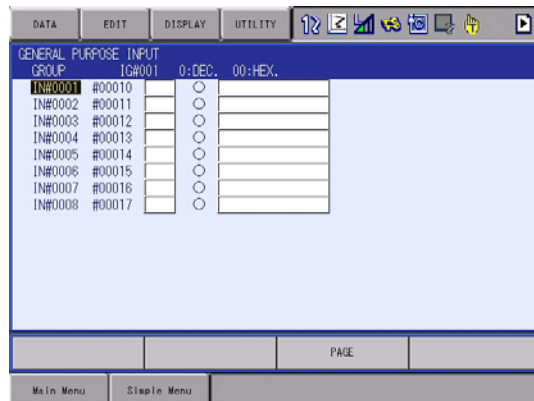


A search for the signal number can be made in the following two ways.

- Direct search on the GENERAL PURPOSE/SPECIFIED INPUT/OUTPUT window
- Search from the menu

7.3.8.1 Direct Search on the General Purpose/Specified Input/Output Window

1. Move the cursor to a signal number in the GENERAL PURPOSE/SPECIFIED INPUT/OUTPUT window, and press [SELECT].
 - Numeric values can now be entered.

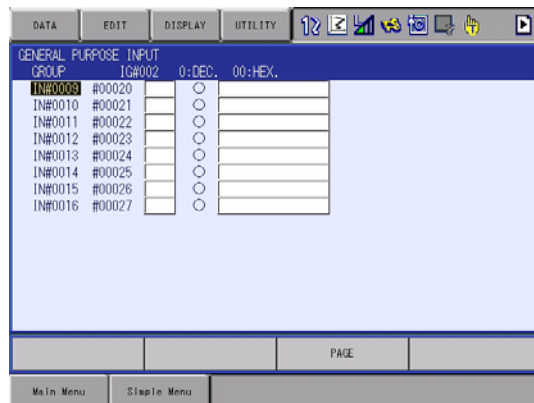


2. Enter the signal number to be searched.
 - Type the signal number in the number input line.

7 System Diagnosis

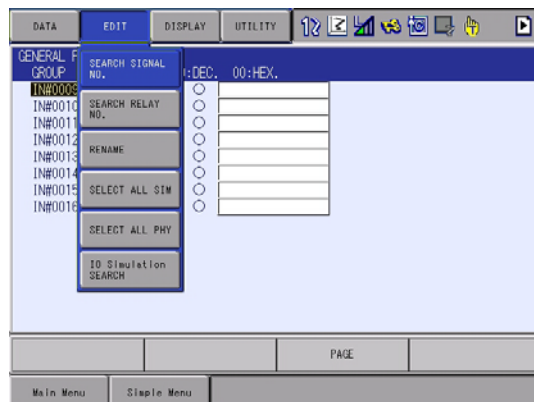
7.3 Input/Output Status

3. Press [ENTER] to start the search.
 - The page where the signal number exists appears.



7.3.8.2 Search from the Menu

1. Select {EDIT} under the menu in the GENERAL PURPOSE/SPECIFIED INPUT/OUTPUT window.
 - The pull-down menu appears.



7 System Diagnosis

7.3 Input/Output Status

2. Select {SEARCH SIGNAL NO.}.
 - Numeric values can now be entered.

The screenshot shows a software window titled 'GENERAL PURPOSE INPUT'. It has a menu bar with 'DATA', 'EDIT', 'DISPLAY', and 'UTILITY'. Below the menu bar, there is a header area with 'GROUP', 'IG#002', '0:DEC.', and '00:HEX.'. The main area contains a list of input signals with checkboxes and a numeric keypad. The list of signals is as follows:

GROUP	Signal	IN#	Value
	#00020		
IN#0010	#00021		
IN#0011	#00022		
IN#0012	#00023		
IN#0013	#00024		
IN#0014	#00025		
IN#0015	#00026		
IN#0016	#00027		

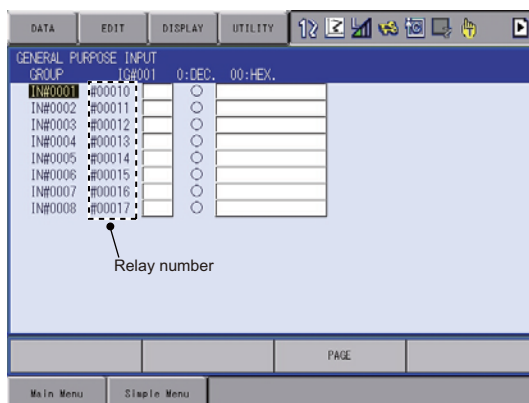
Below the list is a numeric keypad with the following layout:

Hex	Dec	Bin	7	8	9	Clear
A	D	4	4	5	6	Back space
B	E	1	1	2	3	Cancel
C	F	0	.	.	.	Enter

3. Enter the signal number to be searched.
 - Type the signal number in the number input line.
4. Press [ENTER] to start the search.
 - The page where the signal number exists appears.

7.3.9 Relay Number Search

A search can be made for a relay number of a general-purpose input, general-purpose output, specific input, specific output, external input and external output.

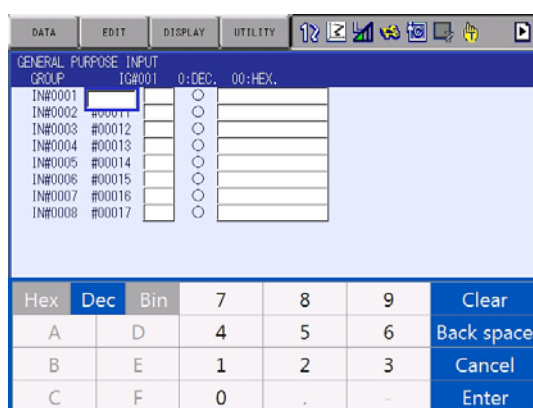


A search for the relay number can be made in the following two ways.

- Direct search on the GENERAL PURPOSE/SPECIFIED/EXTERNAL INPUT/OUTPUT window
- Search from the menu

7.3.9.1 Direct Search on the General Purpose/Specified Input/Output Window

1. Move the cursor to a relay number in the GENERAL PURPOSE/SPECIFIED/EXTERNAL INPUT/OUTPUT window, and press [SELECT].
 - Numeric values can now be entered.

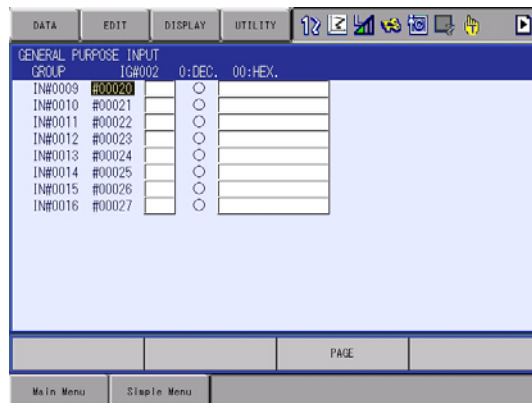


2. Enter the relay number to be searched.
 - Type the relay number in the number input line.

7 System Diagnosis

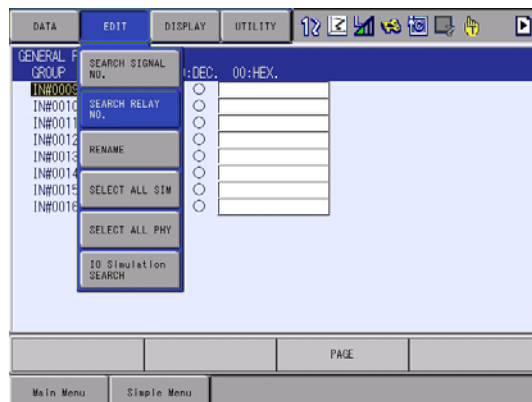
7.3 Input/Output Status

3. Press [ENTER] to start the search.
 - The page where the relay number exists appears.



7.3.9.2 Search from the Menu

1. Select {EDIT} under the menu in the GENERAL PURPOSE/SPECIFIED/EXTERNAL INPUT/OUTPUT window.
 - The pull-down menu appears.



7 System Diagnosis

7.3 Input/Output Status

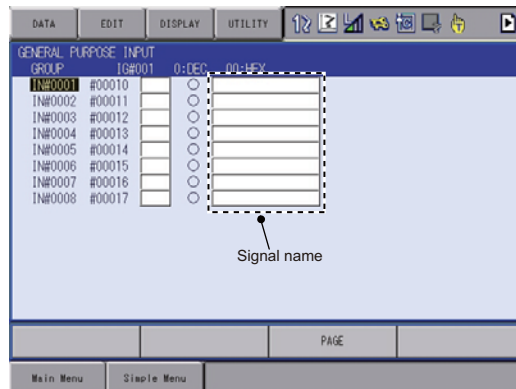
2. Select {SEARCH RELAY SIGNAL NO.}.
 - Numeric values can now be entered.

The screenshot shows a software interface for system diagnosis. The main window is titled 'GENERAL PURPOSE INPUT'. It has a menu bar with 'DATA', 'EDIT', 'DISPLAY', and 'UTILITY'. Below the menu bar, there's a header area with 'GROUP', 'IC#002', and '0:DEC, 00:HEX'. The main area contains a list of input channels: IN#0009, IN#0010, IN#0011, IN#0012, IN#0013, IN#0014, IN#0015, and IN#0016. Each channel has a corresponding address: #00021, #00022, #00023, #00024, #00025, #00026, and #00027. To the right of the list, there are radio buttons for selecting the input type. At the bottom, there's a numeric keypad with columns for Hex, Dec, Bin, and digits 7, 8, 9. The keypad includes buttons for Clear, Back space, Cancel, and Enter.

3. Enter the relay number to be searched.
 - Type the relay number in the number input line.
4. Press [ENTER] to start the search.
 - The page where the relay number exists appears.

7.3.10 Modification of the Signal Name

The name of the general-purpose/external input or output signal can be modified.

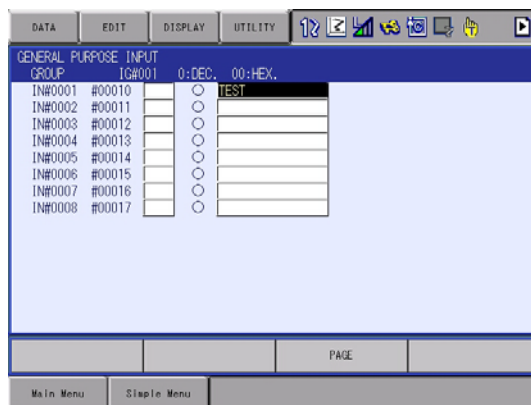


The name can be modified in the following two ways.

- Direct modification on the GENERAL PURPOSE/EXTERNAL INPUT/OUTPUT window.
- Modification from the menu

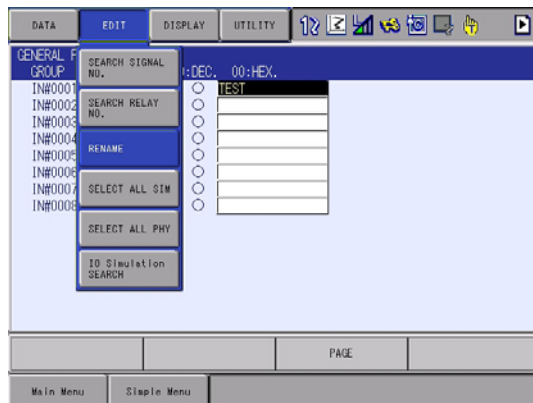
7.3.10.1 Direct Modification on the General Purpose/Specified Input/Output Window

1. Move the cursor to the signal name to be modified in the GENERAL PURPOSE/EXTERNAL INPUT/OUTPUT window, and press [SELECT].
 - The window for character input appears.
2. Enter the signal name.
3. Press [ENTER].
 - New signal name is registered.

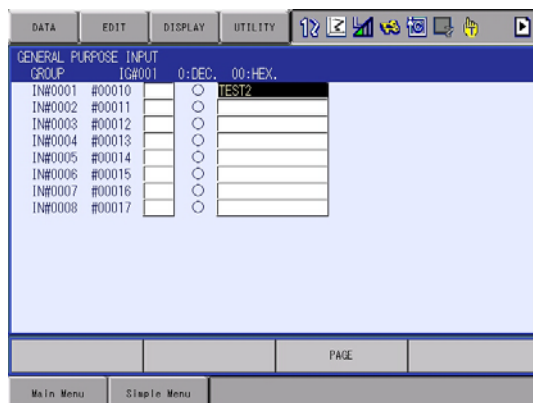


7.3.10.2 Modification from the Menu

1. Move the cursor to the signal name to be modified in the GENERAL PURPOSE/EXTERNAL INPUT/OUTPUT window.
2. Select {EDIT} under the menu.
 - The pull-down menu appears.



3. Select {RENAME}.
 - The window for character input appears.
4. Enter the signal name.
5. Press [ENTER].
 - New signal name is registered.

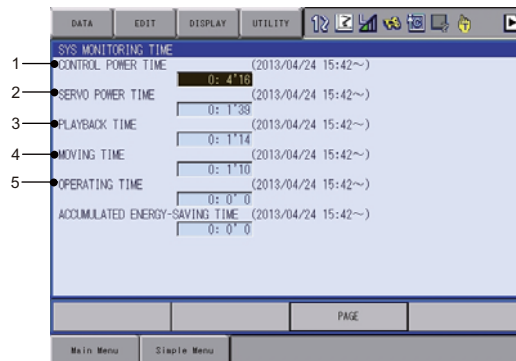


7.4 System Monitoring Time Display

7.4.1 System Monitoring Time Display Window

The status of system operation, e.g. power ON time, can be checked.

1. Select {SYSTEM INFO}.
2. Select {MONITORING TIME}.
 - The SYS MONITORING TIME window appears.



1, CONTROL POWER TIME

Display the cumulative time for which the main power supply has been turned ON and the time when the cumulative time is initialized.

2, SERVO POWER TIME

Display the cumulative time for which the servo power supply has been turned ON and the time when the cumulative time is initialized.

3, PLAYBACK TIME

Display the cumulative time for which the manipulator has been in the playback status and the time when the cumulative time is initialized.

4, MOVING TIME

Display the cumulative time for which the manipulator has been in motion and the time when the cumulative time is initialized.

5, OPERATING TIME

Display the cumulative time for operating and the time when the cumulative time is initialized. For example, for spot welding application, it displays the cumulative time spent in spot welding. For handling application, it displays the cumulative time spent in handling.

6, ACCUMULATED ENERGY-SAVING TIME

Display the cumulative time for which the manipulator has been in the energy-saving status and the time when the cumulative time is initialized.

The values of the cumulative time and the time when the cumulative time is initialized are equal to the values of the same items in {ENERGY SAVING FUNCTION} of {SETUP} under the main menu.

7.4.2 Individual Window of the System Monitoring Time Display

If the [PAGE] key is pressed, or "PAGE" is selected to display the selection window for the system monitoring time display, the servo power time, playback time, moving time, and each-application operating time by each control group are individually displayed.



The total time of each control group here is not always the same as the time in the SYS MONITORING TIME window because these windows show time as seen from the individual control group.

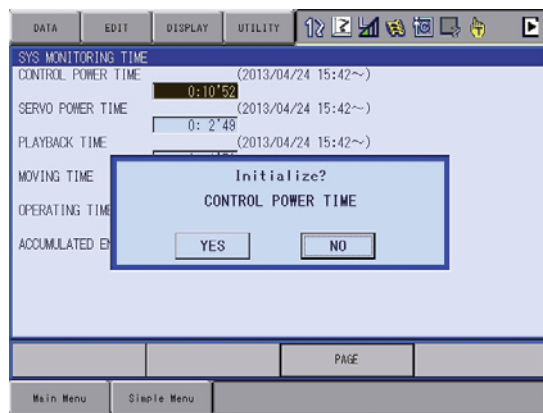
7.4.3 Initializing the System Monitoring Time Display

The control power time, the servo power time, the playback time, the moving time, the operating time and the accumulated energy-saving time can be initialized by the following procedure when the security mode is management mode or higher.

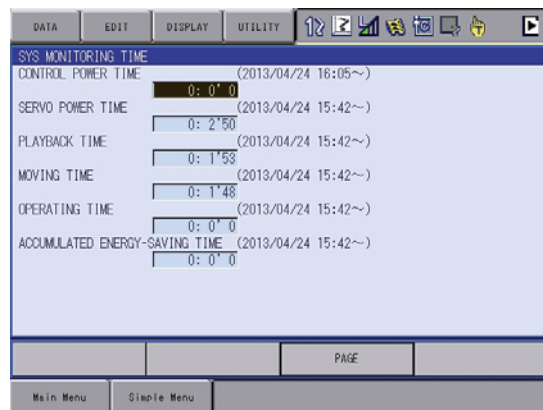
The control power time, the servo power time, the playback time, the moving time and the operating time can be initialized in either the system monitoring time display or the individual display.

The accumulated energy-saving time can be initialized only in the system monitoring time display.

1. Select the time to be initialized.
 - The confirmation dialog box appears.



2. Select {YES}.
 - The cumulative time value at the cursor line is reset to 0, and a new time measurement begins.
And, the current time when the cumulative time is initialized is shown on the window.



CONTROL POWER TIME, SERVO POWER TIME, PLAYBACK TIME, MOVING TIME AND OPERATING TIME can be initialized when the parameter corresponding with each time is 1.



S2C415...CONTROL POWER TIME

S2C416...SERVO POWER TIME

S2C417...PLAYBACK TIME

S2C418...MOVING TIME

S2C419...OPERATING TIME

7.5 Alarm History

7.5.1 Alarm History Window

The history of alarm occurrence can be checked on the alarm history window.

The alarm history window includes five types: MAJOR ALARM, MINOR ALARM, USER ALARM (SYSTEM), USER ALARM (USER), and OFF-LINE ALARM. On each of the alarm history windows, the alarm code, date, time, mode, and alarm detail are listed.

1. Select {SYSTEM INFO} under the main menu.
2. Select {ALARM HISTORY}.
- The alarm history window appears.

MINOR ALARM				
CODE	DATE	CLOCK	MODE	TASK#
001 4440	2015/10/22	17:08:27	TEACH	TASK#0
002 4440	2015/10/22	15:57:20	TEACH	TASK#0
003 4980	2015/10/22	14:43:17	TEACH	TASK#0
004 4980	2015/10/22	14:43:09	TEACH	TASK#0
005 4103	2015/10/22	13:54:00	PLAY	
006 4440	2015/10/22	13:46:15	TEACH	TASK#0
007 4980	2015/10/21	20:46:50	TEACH	TASK#0
008 4980	2015/10/21	20:45:34	TEACH	TASK#0
009 4980	2015/10/21	20:45:14	TEACH	TASK#0
010 4315	2015/10/21	19:45:49	TEACH	SV#1
011 4513	2015/10/21	18:11:34	TEACH	TASK#0

DESTINATION PULSE LIMIT
[R1:MIN SLURBT]
J:WORK L:0001 S:0001 RUN

DETAIL PAGE
Main Menu Simple Menu

3. Press [PAGE] to switch the window.
Or select {PAGE} in the lower part of the window.
- The window is switched every time [PAGE] is pressed in the following order.
{MAJOR ALARM}, {MINOR ALARM}, {USER ALARM (SYSTEM)}, {USER ALARM (USER)}, {OFF-LINE ALARM}.

MINOR ALARM				
CODE	DATE	CLOCK	MODE	TASK#
001 4440	2015/10/22	17:08:27	TEACH	TASK#0
002 4440	2015/10/22	15:57:20	TEACH	TASK#0
003 4980	2015/10/22	14:43:17	TEACH	TASK#0
004 4980	2015/10/22	14:43:09	TEACH	TASK#0
005 4103	2015/10/22	13:54:00	PLAY	
006 4440	2015/10/22	13:46:15	TEACH	TASK#0
007 4980	2015/10/21	20:46:50	TEACH	TASK#0
008 4980	2015/10/21	20:45:34	TEACH	TASK#0
009 4980	2015/10/21	20:45:14	TEACH	TASK#0
010 4315	2015/10/21	19:45:49	TEACH	SV#1
011 4513	2015/10/21	18:11:34	TEACH	TASK#0

DESTINATION PULSE LIMIT
[R1:MIN SLURBT]
J:WORK

DETAIL PAGE
Main Menu Simple Menu

MAJOR ALARM
MINOR ALARM
USER ALARM(SYSTEM)
USER ALARM(USER)
OFF-LINE ALARM

7.5.2 Change the Listing Order of Alarm History

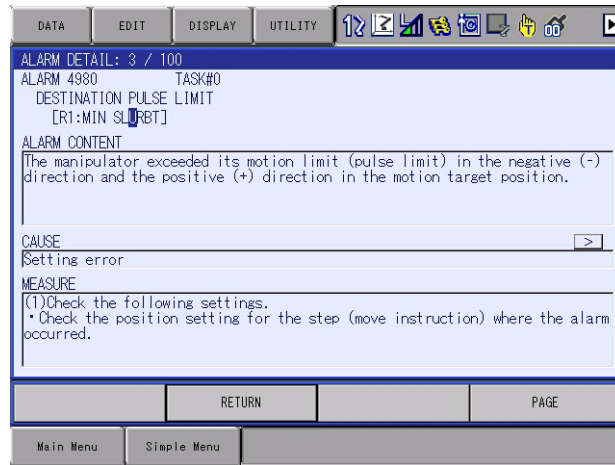
The listing order of the alarm history can be changed as follows:

1. Select either {REGISTRATION ORDER} or {NUMERICAL ORDER} under the pull-down menu {EDIT}.
 - REGISTRATION ORDER: The alarm history is shown in chronological order (descending order) of the alarm occurrence.
 - NUMERICAL ORDER: The alarm history is shown in the ascending order of the alarm code numbers.
- If the power supply of the controller is turned OFF and then ON, the listing order returns to REGISTRATION ORDER.

DATA		EDIT	DISPLAY	UTILITY	
MINOR ALA	CODE	*REGISTRATION ORDER	LOCK	MODE	
001	4440		08:27	TEACH	TASK#0
002	4440		57:20	TEACH	TASK#0
003	4980	NUMERICAL ORDER	43:17	TEACH	TASK#0
004	4980	2015/10/22	14:43:09	TEACH	TASK#0
005	4103	2015/10/22	13:54:00	PLAY	
006	4440	2015/10/22	13:46:15	TEACH	TASK#0
007	4980	2015/10/21	20:46:50	TEACH	TASK#0
008	4980	2015/10/21	20:45:34	TEACH	TASK#0
009	4980	2015/10/21	20:45:14	TEACH	TASK#0
010	4315	2015/10/21	19:45:49	TEACH	SV#1
011	4513	2015/10/21	18:11:34	TEACH	TASK#0
DESTINATION PULSE LIMIT					
[R1:MIN SLURBT]					
J:WORK			L:0001 S:0001 RUN		
DETAIL		PAGE			
Main Menu		Simple Menu			

7.5.3 Alarm History Detailed Information Window

Press [SELECT] under the alarm history window to show the ALARM DETAIL window and check the description and cause of, and the countermeasure against the alarm where the cursor is located.

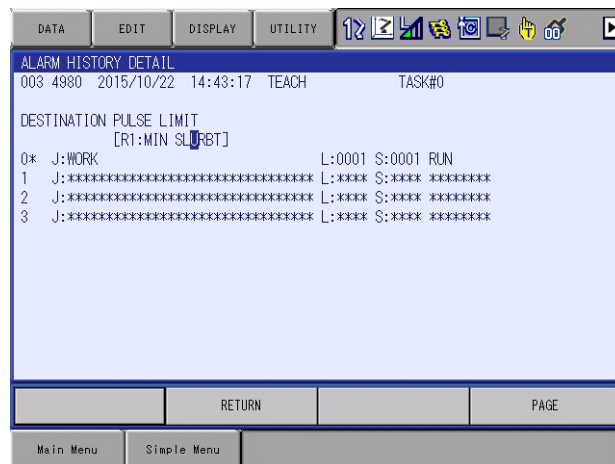


When the Independent Control Function (optional) is activated, the {DETAIL} button is shown in the lower part of the alarm history window. For the detailed information of the alarm where the cursor is located, press {DETAIL} to show the status of the job in each task (job name, line number, step number and status) when the alarm occurs. The task numbers are shown in the left part of the window. If the alarm occurred in a specific task, an asterisk is added next to the task number. Press [Back] to return to the alarm history window.

0: master task

1 to 15: subtask 1 to 15

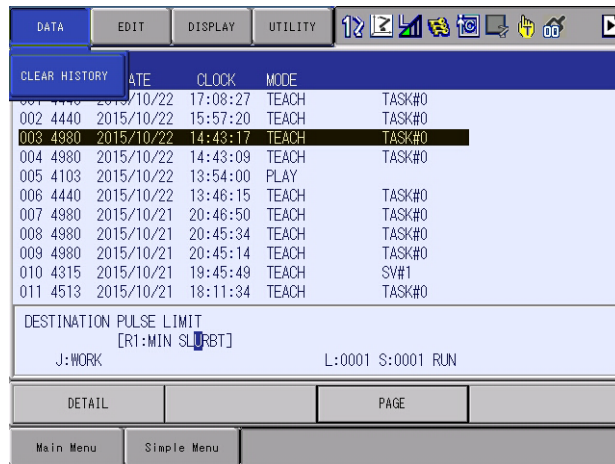
- Only the task numbers usable in the system are displayed.



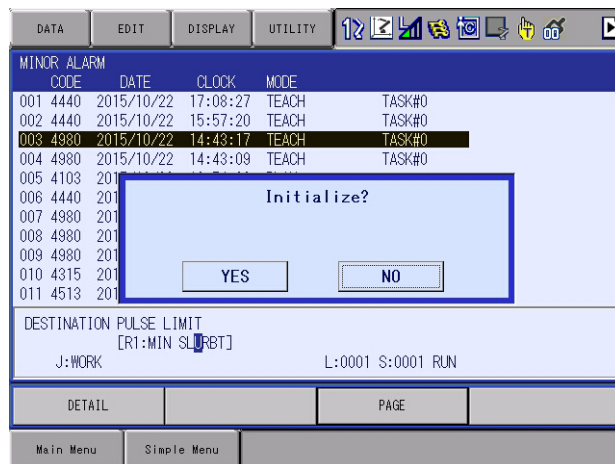
7.5.4 Clearing the Alarm History

The history of the minor alarms and the user alarms (system and user) can be cleared.

1. Display the alarm history window to be cleared.
2. Select {DATA} under the menu.
 - The pull-down menu "CLEAR HISTORY" appears.



3. Select {CLEAR HISTORY}.
- The confirmation dialog box appears.



4. Select {YES}.
- The alarm history displayed is reset.

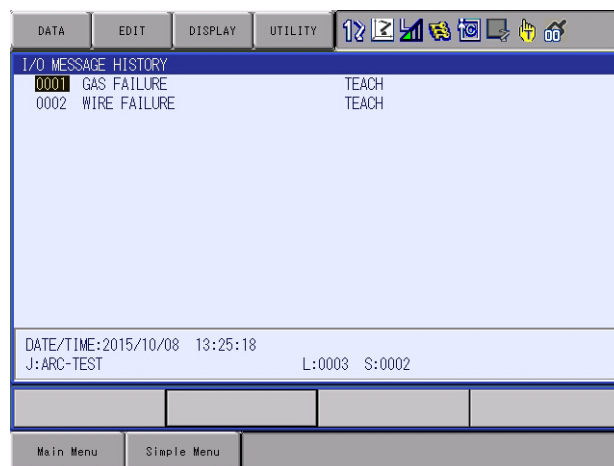
7.6 I/O Message History

7.6.1 I/O Message History Window

The I/O message history can be confirmed in the I/O MESSAGE HISTORY window.

The I/O MESSAGE HISTORY window shows the date and time, the job name, the line number, the step number and the mode of the I/O message that appeared on the window.

1. Select {SYSTEM INFO} under the main menu.
2. Select {I/O MSG HISTORY}
 - The I/O MESSAGE HISTORY window appears.



Press [SELECT], and numeric values can now be entered. Input the history number, and press [ENTER]. The search for the input history number begins, and the I/O message that appeared on the window is displayed.

7.6.1.1 Search

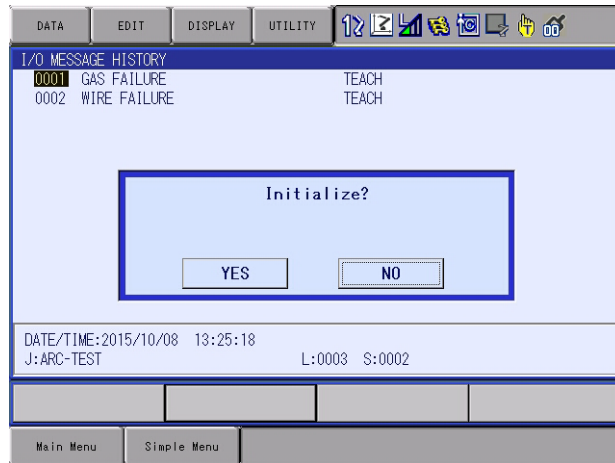
Use the following operation to search for the I/O message history.

1. Select {EDIT} under the menu.
2. Select {SEARCH}.
 - The character input line appears.
3. Enter the history No.
4. Press [ENTER].
 - The search for the input history number begins, and the I/O message is displayed.

7.6.2 Clearing the I/O Message History

Use the following operation to clear the I/O message history.

1. Select {DATA} under the menu.
2. Select {CLEAR HISTORY}.
 - The confirmation dialog box appears.



3. Select {YES}.
 - The displayed I/O message history is cleared.



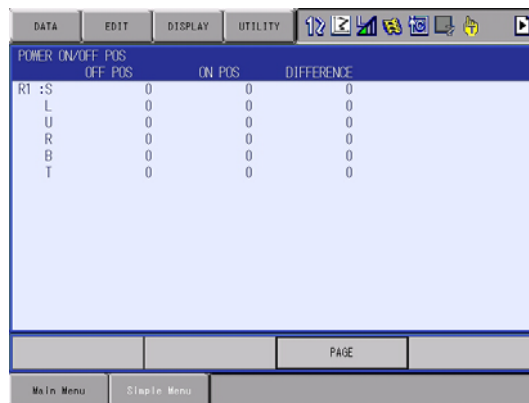
Initializing the history becomes valid when the security mode is higher than the management mode.

7.7 Position Data When Power Is Turned ON/OFF

7.7.1 Power ON/OFF Position Window

The Power ON/OFF position window shows the position of the manipulator when power was turned OFF the last time, the current position of the manipulator when power was later turned ON, and the amount of difference between the two positions. When alarm 4107, "OUT OF RANGE (ABSO DATA)" occurs, the error value of the faulty axes can be verified in this window.

1. Select {ROBOT} under the main menu.
2. Select {POWER ON/OFF POS}.
 - The POWER ON/OFF POSITION window appears.

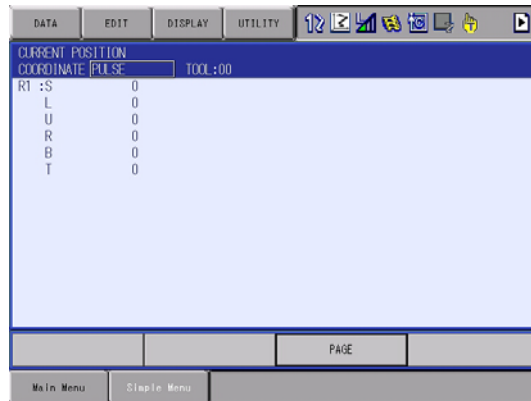


POWER ON/OFF POS	OFF POS	ON POS	DIFFERENCE
R1 :S	0	0	0
L	0	0	0
U	0	0	0
R	0	0	0
B	0	0	0
T	0	0	0

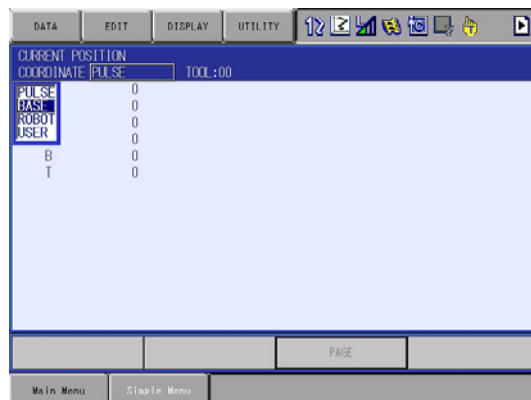
7.8 Current Position

7.8.1 Current Position Window

1. Select {ROBOT} under the main menu.
2. Select {CURRENT POSITION} under the sub menu.
 - The CURRENT POSITION window appears.



3. Select the types of coordinates to be displayed.
 - The pull-down menu appears.



4. Select the desired coordinate system.
 - The type of coordinates being displayed is changed.



7.9 Servo Monitoring

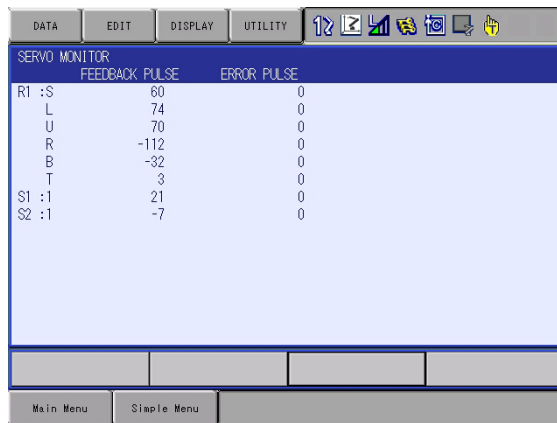
7.9.1 Servo Monitor Window

The servo monitor window shows the servo-related data of each axis.

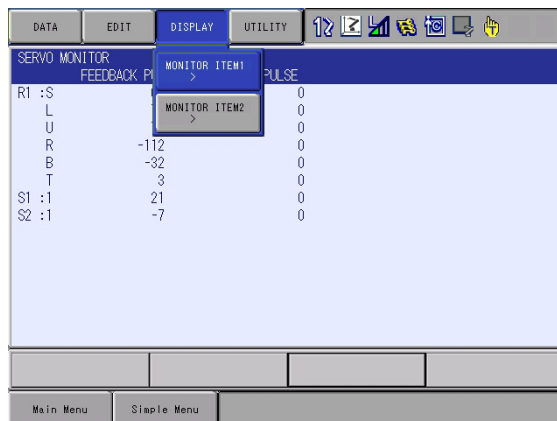
Monitor Items	Description
FEEDBACK PULSE	Feedback position (actual position) of each axis "0" at the home position
ERROR PULSE	Difference between the command position and the feedback position of each axis
SPEED DEVIATION	Difference between the command speed and the feedback speed of each axis
SPEED INST	Speed reference of each axis
FEEDBACK SPEED	Feedback speed (actual speed) of each axis
TORQUE SPEC	Torque reference of each axis
MAX. TORQUE	Keeps the maximum value of the torque reference of each axis. "0" when the maximum torque is cleared or the control power supply is turned ON or OFF
ENCODER ROTATE SUM	Accumulated number of encoder rotation when the control power supply of each axis is turned ON
IN 1 TURN POSITION	Position after one rotation of the encoder when the control power supply of each axis is turned ON
MOTOR ABSOLUTE	Absolute value of the motor is calculated by adding the position in one rotation to the sum of the accumulated rotations when the control power supply of each axis is turned ON.
ENCODER TEMPERATURE	The temperature of each axis (°C)

7.9.1.1 Changing the Monitor Items

1. Set the security mode to management mode.
2. Select {ROBOT} under the main menu.
3. Select {SERVO MONITOR}.
 - The SERVO MONITOR window appears.



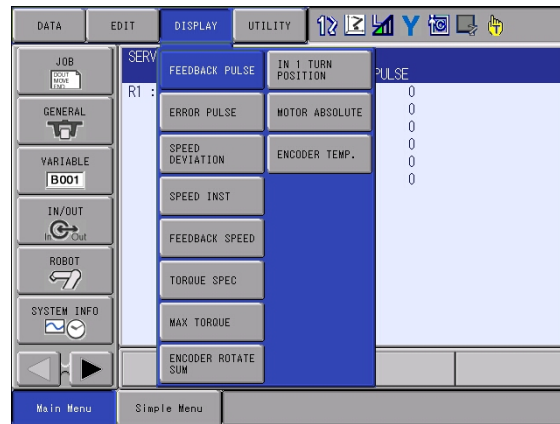
4. Select {DISPLAY} under the menu.
 - The pull-down menu appears.
 - MONITOR ITEM 1 is the data on the left, and MONITOR ITEM 2 is the data on the right



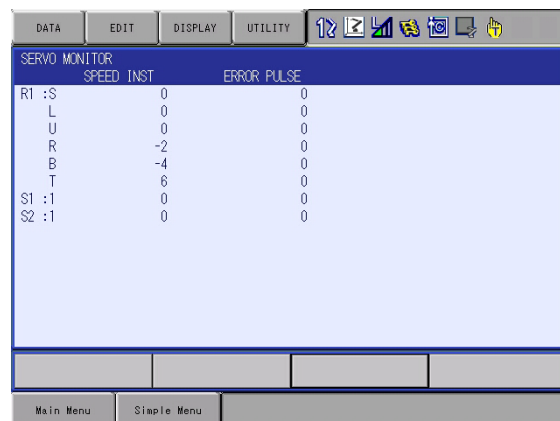
7 System Diagnosis

7.9 Servo Monitoring

5. Select MONITOR ITEM 1 or 2, and view the sub-menu choices by the cursor key.
 - The sub-menu choices display.



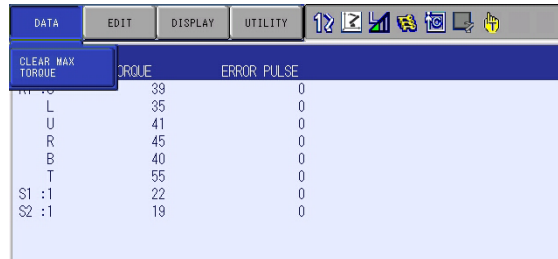
6. Select a menu.
 - The type of monitor-related information is changed.



7.9.1.2 Clearing Maximum Torque Data

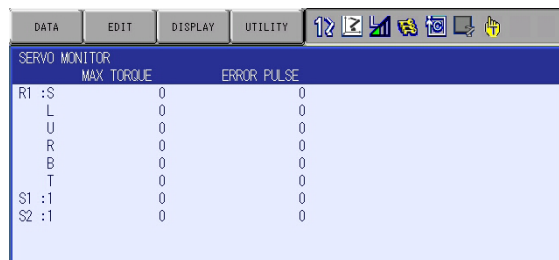
The data for the maximum torque can be cleared when the maximum torque-related information is being displayed.

1. Select {DATA} under the menu.
 - The clear max torque window appears



CLEAR MAX TORQUE	TORQUE	ERROR PULSE
R1 :S	39	0
L	35	0
U	41	0
R	45	0
B	40	0
T	55	0
S1 :1	22	0
S2 :1	19	0

2. Select {MAX. TORQUE}.
 - The maximum torque data is cleared.



SERVO MONITOR	MAX TORQUE	ERROR PULSE
R1 :S	0	0
L	0	0
U	0	0
R	0	0
B	0	0
T	0	0
S1 :1	0	0
S2 :1	0	0

7.10 State of the Robot Drop Tolerance Error

7.10.1 Check the Robot Drop Tolerance

When a servo to the robot is turned off, the robot holds its position by the holding brake. If not holding its position, the YRC1000 checks if the drop value of the pulse is within the range when the servo is turned off from the turned on status.

Checking the drop value of the pulse is not performed when the robot is operating. The YRC1000 checks the value when turn on the servo again from the stopped state (it is a stopped state while waiting for the input during the timer in the playback).

7.10.2 Display of the Drop Value Number Window

Confirm the state of the times of the drop, tolerance and check on this window.

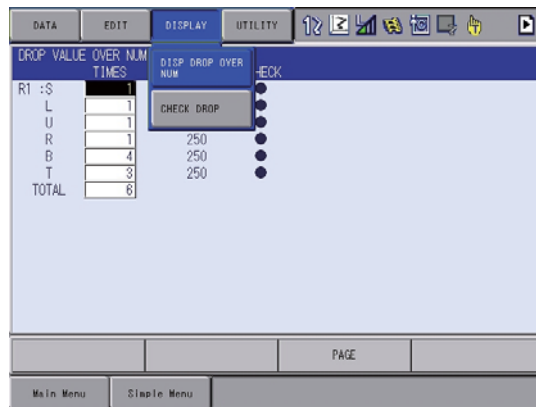
1. Select {ROBOT} in the main menu.
 2. Select {DROP VALUE}.
- The DROP VALUE OVER NUM window appears.

DROP VALUE	OVER NUM	TIMES	TOLERANCE	CHECK
R1 :S		1	500	●
L		1	500	●
U		1	500	●
R		1	250	●
B		4	250	●
T		3	250	●
TOTAL		6		

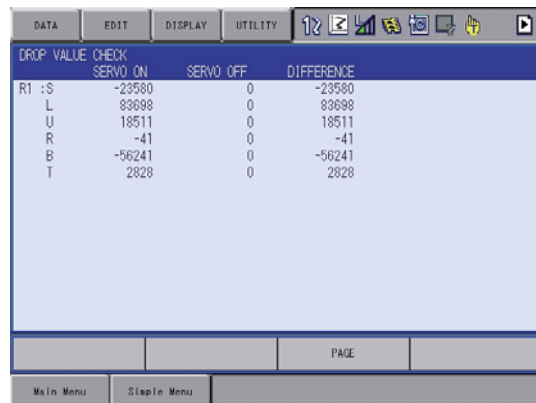
7.10.3 Display of the Drop Value Check Window

The position value of the manipulator where the servo was turned off (shown as SERVO ON on the screen), the position value of the manipulator where the servo is turned on (shown as SERVO OFF on the screen), and the difference value from these positions above are displayed in this window.

1. Select {DISPLAY} in the menu.
 - The pull-down menu appears.
 - Select {CHECK DROP} to display the DROP VALUE CHECK window.



2. Select {DROP VALUE CHECK}.
 - The DROP VALUE CHECK window appears.



7.10.4 Clear the Times of the Drop Value Number

Clear the number by the following operation.

1. Occurring times of each axis
 - Move the cursor over the axis to be deleted, and press {SELECT}.
The number of occurrence times is deleted.
2. Occurring times of the all axes
 - Move the cursor over the TOTAL, and press {SELECT}.
The number of occurrence times are deleted.

	DROP VALUE	OVER NUM	TIMES	TOLERANCE	CHECK
R1 :S			0	500	●
L			0	500	●
U			0	500	●
R			0	250	●
B			0	250	●
T			0	250	●
TOTAL			0		

8 Alarm

8.1 Outline of Alarm

When an alarm of level 0 to 3 (major alarm) occurs, the servo power supply is turned OFF.

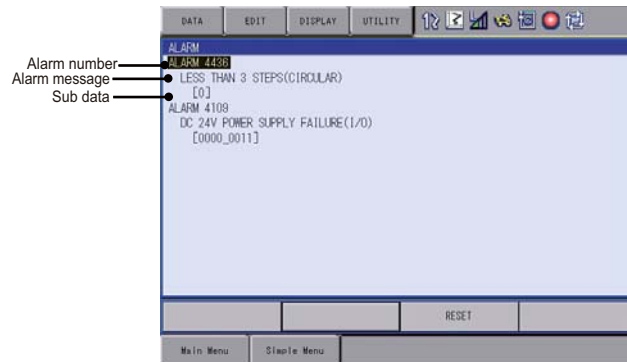
Table 8-1: Alarm Code Classification

Alarm Code	Alarm Level	Alarm Reset Method
0□□□	Level 0 (Major alarm) (Off line alarm: Initial diagnosis/ Hardware diagnosis alarm)	It is not possible to reset by "RESET" under the ALARM window or the system input signal (Alarm reset). Turn OFF the main power supply and correct the cause of the alarm. Then turn ON the main power supply again.
1□□□ to 3□□□	Level 1 to 3 (Major alarm)	It is not possible to reset by "RESET" under the ALARM window or the system input signal (Alarm reset). Turn OFF the main power supply and correct the cause of the alarm. Then turn ON the main power supply again.
4□□□ to 8□□□	Level 4 to 8 (Minor alarm)	After correcting the cause, it is possible to reset by "RESET" under the ALARM window or the system input signal (Alarm reset).
9□□□	Level 9 (Minor alarm) (I/O alarm)	After correcting the cause for which the system input signal for the system or user alarm request turns ON, it is possible to reset by "RESET" under the ALARM window or the system input signal (Alarm reset).

8.2 Alarm Display

8.2.1 Displaying and Releasing Alarm

If an alarm occurs during operation, the manipulator stops immediately and the ALARM window appears on the programming pendant indicating that the machine was stopped by an alarm.



If more than one alarm occurs simultaneously, all the alarms are displayed.

Scroll the viewing area with the cursor key to view the alarm that is not currently displayed on the viewing area.

The following operations are available in the alarm status: window change, mode change, alarm reset, and emergency stop. If the window is changed to another window during alarm occurrence, the ALARM window can be shown again by selecting {SYSTEM INFO} under the main menu and then selecting {ALARM}.

8.2.1.1 Releasing Alarms

Alarms are classified by minor and major alarms.

- Minor Alarms

Select "RESET" on the ALARM window to release alarms.

Or, turn ON the specific signal "ALARM RESET" when using an external input signal (specific input).

- Major Alarms

If a severe alarm such as hardware failure occurs, servo power is automatically shut OFF and the manipulator stops. Turn OFF the main power supply, remove the cause of the alarm, and then turn ON the power supply again.

8.2.2 Special Alarm Display

(1) Sub Data

Sub data such as data for the axis where the alarm occurred, may also be displayed for some alarms.

- Decimal data
Without signs: 0 to 65535
With signs: -32768 to 32767
- Binary data
The alarm occurrence data becomes "1."
With 8 bits: 0000_0001
With 16 bits: 00000001_00000001
- Axis data
The axis where the alarm occurred is highlighted.
With robot axis: Robots 1 to 8 [S **L** U R B T]
With base axis: Base 1 to 8 [**1** 2 3]
With station axis: Stations 1 to 24 [1 **2** 3]
- XYZ coordinate data
The coordinates where the alarm occurred are highlighted.
[**X** Y Z]
[X Y Z **T**_x T_y T_z]
- 123 data
The data for which the alarm occurred is highlighted.
[**1** 2 3]
- Control group data
The control group where the alarm occurred is highlighted.
[**R**₁ R2 S1 S2 S3]

(2) Multiple SERVOPACK System

In a system using more than one SERVOPACK, the number of the SERVOPACK where the alarm occurred is also displayed. The S1 switch of the SDCA01AA circuit board shows the SERVOPACK number.

SV#1: SERVOPACK 1 (SDCA01AA circuit board S1 switch: 0)

SV#2: SERVOPACK 2 (SDCA01AA circuit board S1 switch: 1)

SV#3: SERVOPACK 3 (SDCA01AA circuit board S1 switch: 2)

SV#4: SERVOPACK 4 (SDCA01AA circuit board S1 switch: 3)

(3) Independent Control Function (Optional)

In the independent control function (multi-task job), the tasks that were being done when the alarm occurred are also displayed.

TASK#0: Master-task job

TASK#1: Sub-task1 job (SUB1)

TASK#2: Sub-task2 job (SUB2)

TASK#3: Sub-task3 job (SUB3)

TASK#4: Sub-task4 job (SUB4)

TASK#5: Sub-task5 job (SUB5)

TASK#6: Sub-task6 job (SUB6)

TASK#7: Sub-task7 job (SUB7)

TASK#8: Sub-task8 job (SUB8)

TASK#9: Sub-task9 job (SUB9)

TASK#10: Sub-task10 job (SUB10)

TASK#11: Sub-task11 job (SUB11)

TASK#12: Sub-task12 job (SUB12)

TASK#13: Sub-task13 job (SUB13)

TASK#14: Sub-task14 job (SUB14)

TASK#15: Sub-task15 job (SUB15)

8.3 Display of Alarm Details

Alarm details displaying function indicates the alarm contents breakdown on the alarm window.

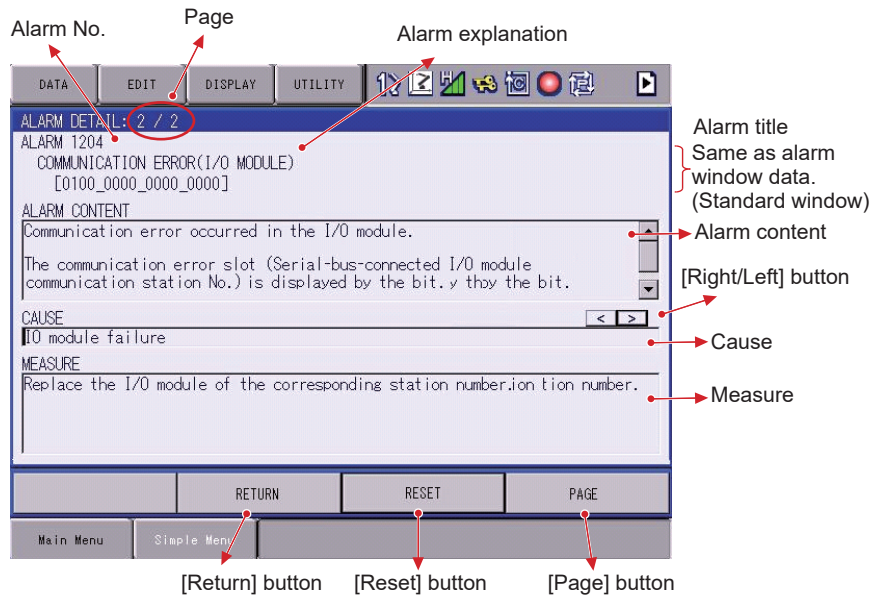
Press [Select] key after moving the cursor to the subject alarm on the alarm window to display its “content”, “cause” and “measure”.

Skip displaying the alarm window to directly display this breakdown window is possible by specifying the parameter when an alarm occurs.

8.3.1 Parameter

S2C406 Alarm Details Direct Display 0: Invalid / 1: Valid

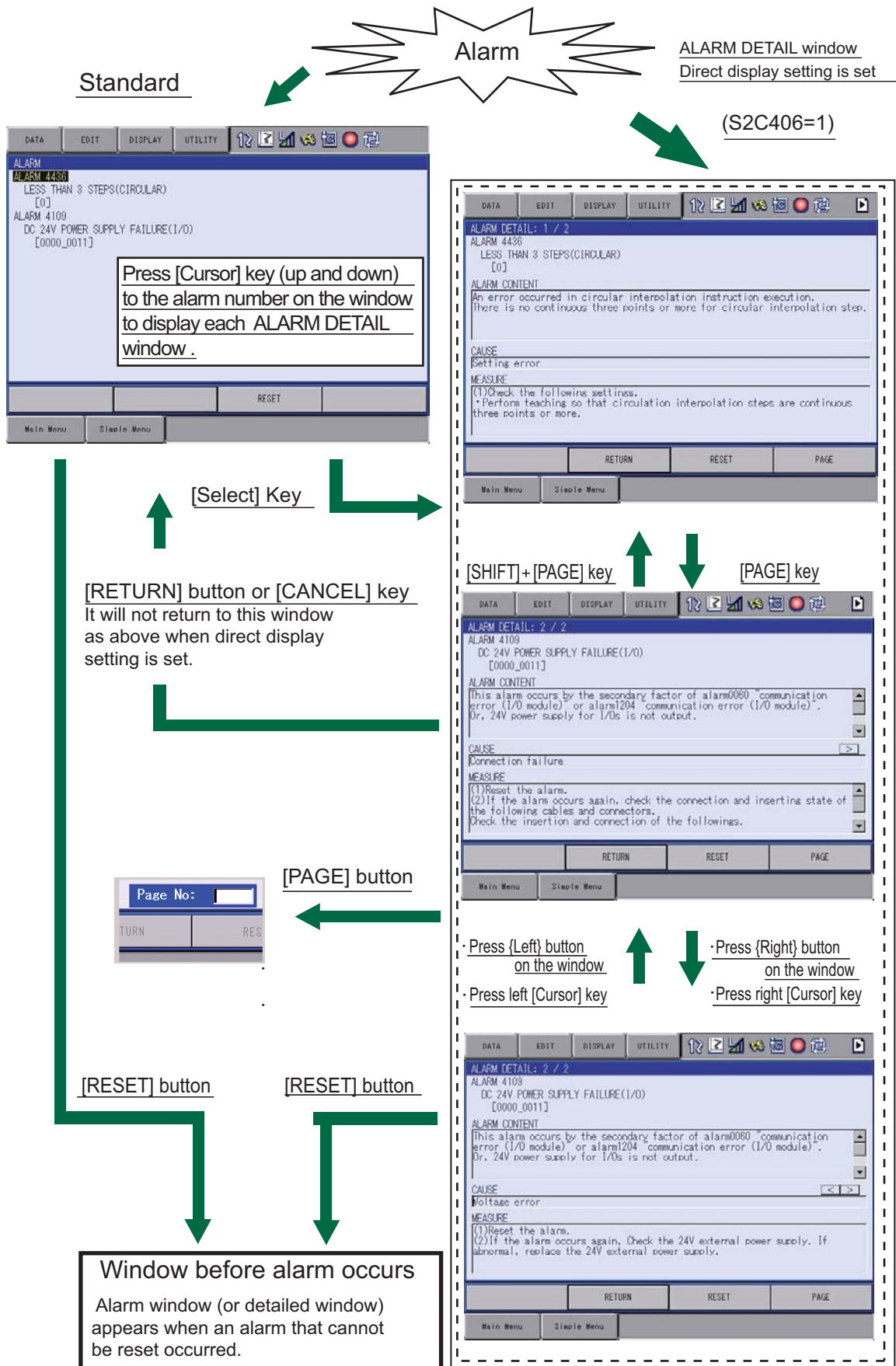
8.3.2 Display of Alarm Detail Window



- **Page**
Displays
the page number of the alarm whose detail window is currently displayed /
the total alarm number occurred coincidentally.
- **Alarm No.**
Displays the alarm number with decimal 4 digit.
- **Sub data**
Displays the sub code number defined to each alarm.
- **Alarm content**
Displays the content of the alarm.

- **[Right/Left] button**
This button appears when there can be several “cause”s and “measure”s to one alarm. Press this to right/left ward to alternate the “cause” and the “measure”.
- **Cause**
Displays the cause of an alarm.
- **Measure**
Displays the recovery method from the alarming state.
- **[Return] button**
Press this button to return to the standard ALARM window.
- **[Reset] button**
Press this button to reset the alarm.
- **[Page] button**
Press this button to display the page number inputting area.
This area appears when several alarms occur at a time.

8.3.3 Transition of Alarm Detail Window



8.4 Alarm Message List

NOTICE

- To handle the system control circuit board "JANCD-AIF**-*", personnel must be appropriately skilled in maintenance mode operation.
- The JANCD-AIF**-* backs up very important file data for the user program with a battery. Careless operation may delete registered data.
Before handling the JANCD-AIF**-* for any remedies, consult your YASKAWA representative.

- For the Alarm No.0000 to 0999, refer to "Alarm Number(0000 to 0999)" in "YRC1000 ALARM CODES (MAJOR ALARMS)".
- For the Alarm No.1000 to 3999, refer to "Alarm Number(1000 to 3999)" in "YRC1000 ALARM CODES (MAJOR ALARMS)".
- For the Alarm No.4000 to 4999, refer to "Alarm Number(4000 to 4999)" in "YRC1000 ALARM CODES (MINOR ALARMS)".

9 Error

9.1 Error Message

Error warns the operator not to advance to the next operation caused by a wrong operation or the access method when using the programming pendant or an external equipment (computer, PLC, etc.).

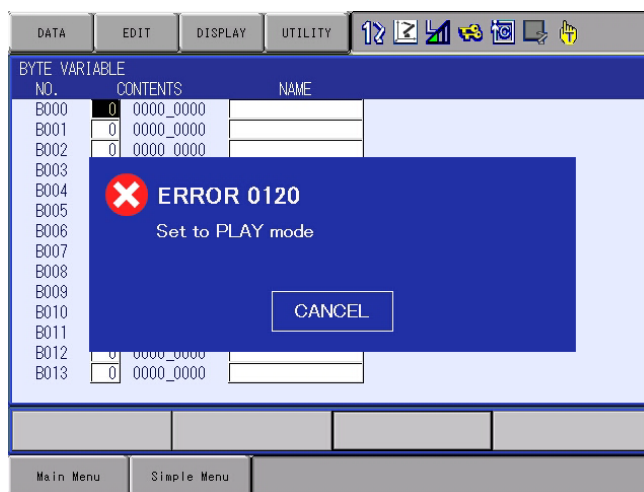
When an error occurs, confirm the content of the error then release the error.

To release the error, perform either of the following operations:

- Press [CANCEL] on programming pendant.
- Input alarm/error reset signal (system input).
- Select {CANCEL} of error dialog box.



An error is different from an alarm because it does not stop the robot even if it occurred while the robot was operated (during playback).



9.1.1 System and General Operation

Error No.	Data	Error Message	Contents
10	-	Turn off servo power and perform corrective action	It cannot be operated while servo power supply is ON.
20	-	Depress TEACH	Out of specified operation mode
30	-	Illegal setting for number of variables	Parameter setting error
31	-	Illegal setting for number of variable-names	
32	-	Illegal setting for number of SUB task.	
40	-	Undefined robot position variables	Position variable cannot be used.
50	-	Depress MODIFY	
60	-	Undefined points (ORG, XX, XY)	Not registered user coordinates basic 3 points (ORG, XX, XY)
70	-	Program and current tool different	The tool number registered with teaching position data does not match the tool number selected at the programing pendant.
80	-	Same position in the 3 points	
90	-	Set robot exactly to taught position	
100	-	On overrun recovery status	
110	-	Turn ON servo power	
120	-	Set to PLAY mode	
130	-	No start using external signal	
140	-	No start using P.P.	
180	-	TEACH mode select signal ON	
190	-	Set variable number	
200	-	Defined group axis	
210	-	Undefined coordinated robots	
212	-	Cannot register at this combination	
230	-	While releasing soft limit	
240	-	Undefined robot	
270	-	Undefined gun condition file	
280	-	Lack of number of I/O points	
290	-	Cannot set same No.	
300	-	Undefined user frame	

9 Error
9.1 Error Message

Error No.	Data	Error Message	Contents
310	-	Cannot register Master JOB	
320	-	Cannot operate CHECK-RUN	
330	-	Cannot operate MACHINE LOCK	
340	-	Cannot operate Master JOB	
341	-	Cannot be called up Master JOB	Master JOB cannot be called up while the brake is released manually.
350	-	Cannot initialize	
380	-	Position not checked	Second home position was not checked.
383	-	Select joint coordinate system and perform forward operation	
384	*	Coasting value setting of Ex-axis is not completed.	
	xxx		The coasting value unsetting group of the external axes.
390	-	Can specify servo off by safety relay	
410	-	Time could not be measured	Time could not be measured for TRT function.
420	-	Incorrect number of taught points	The number of the taught points for tool calibration is incorrect.
430	-	Register start reserved JOB	
460	-	Excess time for measuring	
500	-	Undefined robot calibration data	
510	-	Undefined axis	
520	-	Cannot select two coordinated combination	
530	-	Start reservation mode	
550	-	Start reserved JOB change prohibit is set	
560	-	Cannot teach position while soft limit released	
590	-	Register group axis combination	[SYNCHRO] was pressed for coordinated job that was not registered as group.
600	-	Out of setting data range	
610	-	Cannot use the user coordinate	
620	-	Select JOB (robot)	
650	-	Incorrect measured data	
660	-	Wrong data type of position variable	
680	-	Defined data	

9 Error
9.1 Error Message

Error No.	Data	Error Message	Contents
	XXX		File no.
700	-	Wrong CMOS memory board type	
710	-	Canceled pelletizing shift value	
720	-	Defined name	
721	-	It is already registered for IN/OUT signal name.	
722	-	It is already registered for Variable name.	
723	-	It is already registered for Local variable name.	
724	-	The existing names cannot be overwritten	
740	-	This name cannot be defined	
741	-	This name cannot delete	The name cannot be deleted while alias function is valid.
742	-	The string cannot start with a '/'.	
760	-	Error in start condition set	
770	-	During robot or station operation	
800	-	The gun of designation is not connected	
801	-	The group axis of designation is not connection	
810	-	Servo power supply is limited	
820	-	Modification range over	
930	-	Undefined conveyor calibration data	
940	-	Dry spot input signal is ON	
950	-	Adjustment stroke is negative	
960	-	I/O axis mode requesting	
970	-	ERRSVCPU signal error	
971	-	ERRCPU signal error	
980	-	TIMER DATA TRANSMISSION ERROR	

9.1.2 Editing

Error No.	Data	Error Message	Contents
1010	-	EDIT LOCK mode	
1011	-	EDIT LOCK is set for this line.	
1012	-	This line is defined as a comment.	
1020	-	Enter correct value	
1030	-	Unauthorized ID No.	
1050	-	Enter correct date	
1060	-	Enter correct clock	
1061	-	Enter correct time	The input time value is not correct.
1062	-	Values over 0 are not acceptable. Move to OPERATING TIME screen to set the values over 0.	The value other than "0" cannot be input.
1063	-	Enter 500000 or less value for 'HHHHHH'.	The value for the time is too big.
1070	-	Enter an ID number in 4 or more figures	
1071	-	Enter an ID number in 9 or more figures	
1080	-	Negative value can't be set	
1090	-	Enter correct value (START-END signal no)	
1130	-	Cannot register variable name in this job any more.	
1140	-	No input signals are set.	
1141	-	Overlapped input signals exist.	
1142	-	Overlapped output signals exist.	
1143	-	The signal that cannot be used is set up.	
1150	*	There are abnormal values in the file.	
	1		FILE NO.
	2		FILE SET STATUS
	3		FILE VALID CONDITION
	4		ALARM SET
	5		STOP METHOD
	6		Control GROUP
	7		Robot range limit: MONITOR TARGET
	8		Robot range limit: COORDINATE
	9		Robot range limit: SHAPE TYPE
	10		Range combination: INPUT FILE1, INPUT FILE2 and OUTPUT FILE
	11		Range combination: LOGIC

9 Error
9.1 Error Message

Error No.	Data	Error Message	Contents
1151	*	Check the numeric value settings.	
	1		Axis range limit: the valid axis can be set by maximum < minimum.
	2		Robot range limit: set the "Z UPPER < Z LOWER" when the creating method is the prism.
	4		Robot range limit: set the same coordinate at the two vertices of the plane monitoring.
1152	*	The set values are out of range.	
	1		Axis range limit: maximum value and minimum value
	2		Axis speed monitor: speed
	3		Axis speed monitor: acceptable range
	4		Speed limit: limit speed (Robot)
	5		Speed limit: limit speed (Station)
	6		Speed limit: detection delay time
	7		Speed limit: acceptable range
	8		Robot range limit: used point number
	9		Robot range limit: X and Y coordinates
	10		Robot range limit: Z coordinate
	11		Approach warning buzzer: buzzer occurring distance
	12		Approach warning buzzer: universal output number
	13		Tool angle monitor: reference angle
	14		Tool angle monitor: limit angle
	16		Tool change monitor: tool number
	17		Tool change monitor: detection delay time
1160	*	The selected control group cannot be applied to functional safety.	
	2		The target group of the group change
	3		The target group of the gun change
	4		The group with the endless axis
	5		The group with the speed control axis
	6		The group with unsetting of the current position set up parameter
	7		The group with unsetting of the approximation model
	8		The group is not the monitoring target of the functional safety.
	9		The group with the functional safety monitoring invalid axis
1161	*	The axis that cannot be applied to functional safety exist.	

9 Error
9.1 Error Message

Error No.	Data	Error Message	Contents
	10 to 17		The axis motion range limit and the axis speed monitor are valid, and the axes are endless axes (10+axis number).
	20 to 27		The axis motion range limit and the axis speed monitor are valid, and the axes are speed control axes (20+axis number).
	30 to 37		The axis motion range limit and the axis speed monitor are valid, and the axes are functional safety monitoring invalid axes (30+axis number).
1162	*	The axis to which coasting distance is not set cannot be set to VALID.	
	0 to 7		The coasting values are not set when the axis is valid (axis number).
1163	*	The group to which coasting distance is not set cannot be set to VALID.	
1170	*	Range cannot be configured with this setting.	
	1		Invalid robot range limit file number
	2		Inequality of the neighboring lines in the initial and terminal node
	3		There is the same point at the specified vertex.
	4		Lack of the setting vertex number
	5		The setting range lines are interfering each other.
	8		Inappropriate height setting
	9		Detected the non-convex range
	12		The exceeded number of the vertices
	13		Failure to create the data for the monitoring the outside of the range.
	14		Failure to create the plane surface range.
1180	-	Same file cannot be set.	
1181	-	The specified output file is under monitoring.	
1182	-	Monitor type differs between INPUT1 and INPUT2.	
1183	-	Coord type differs between INPUT1 and INPUT2.	
1184	-	The height in Z-direction differs between INPUT1 and INPUT2.	
1185	*	Range combination cannot be performed.	
	1		Inappropriate specified combination
	2		The exceeded number of the point of the intersection
	3		Failure to combine the range "AND"
	4		Failure to combine the range "OR"

9 Error
9.1 Error Message

Error No.	Data	Error Message	Contents
1186	-	The combination use of the files where plane monitoring is set is not permitted.	
1190	-	Cannot modify this parameter.	
1191	-	Axis range limit function is temporally disabled.	
1192	-	Robot range limit function is temporally disabled.	
1194	-	Tool range limit function is temporally disable.	
1195	*	The tool No. must be the same as the registered tool No.	
	xxx		The control group for the operation target.
1196	-	Select "Functional safety Board FLASH Reset".	
1223	-	The specified output value already exists.	
1600	-	A confirmation position is not set.	

9.1.3 Job Defined Data

Error No.	Data	Error Message	Contents
2010	-	Incorrect character	
2020	-	Name not entered	
2030	-	Undefined JOB name	
2040	-	Defined JOB name	
2050	-	Address not found	
2070	-	Set robot exactly to taught position	
2080	-	Press INSERT or MODIFY	
2090	-	Only modifying move instruction possible	
2100	-	JOB cannot be edited.	
2110	-	Over soft limit	
2111	-	Over soft limit. Adjust center position or pulse width.	
2120	-	Cannot insert/alter/delete with servo off	
2150	-	Inserting is not possible from this point	
2160	-	Cannot modify or delete this position	
2170	-	Press INSERT to record same step as previous step	
2180	-	Cannot insert data	
2210	-	Illegal data setting	
2220	-	Display edit instruction	A modification ([MODIFY][ENTER]) was performed when the MOV* instruction at the job cursor differed from the MOV* instruction in the input buffer line. (Example) - Job cursor was outside the MOV* instruction. - Either the MOV* instruction at the job cursor or the MOV* instruction in the input buffer line is a MOV* instruction that specifies a position variable.
2240	-	Excessive instruction equation	
2250	-	Unmatched number of parentheses in equation	
2251	-	Unmatched number of parentheses in conditional expression.	

9 Error
9.1 Error Message

Error No.	Data	Error Message	Contents
2260	-	Wrong group axis selection	
2270	-	Cannot insert any more instruction in JOB	
2272	-	Cut/ copy failed. Specify the effective range of instruction.	
2280	*	JOB memory is full	
	1		Lack of position file memories
	2		Lack of JOB registering memories
	3		Lack of instruction file memories
	4		Lack of memory pool
	5		Lack of pass condition file for multi-layer
	128		The instruction exceeded the maximum size
2290	-	Undefined master JOB	
2291	*	Undefined SUB Master JOB	
	1		Sub-master 1
	2		Sub-master 2
	3		Sub-master 3
	4		Sub-master 4
	5		Sub-master 5
	6		Sub-master 6
	7		Sub-master 7
	8		Sub-master 8
2292	-	Undefined MASTER START JOB	
2293	*	Undefined SUB START JOB	
	1		Sub-master 1
	2		Sub-master 2
	3		Sub-master 3
	4		Sub-master 4
	5		Sub-master 5
	6		Sub-master 6
	7		Sub-master 7
	8		Sub-master 8
2300	-	Cannot teach JOB without group-axis specification	
2310	*	Same label exists	
	XXX		Line no.
2340	-	Editing data not found	
2360	-	Cannot create editing area	

9 Error
9.1 Error Message

Error No.	Data	Error Message	Contents
2370	-	Cannot cut/copy NOP and END instructions	
2371	-	EDIT LOCK/COMMENT functions cannot be applied to NOP and END.	
2372	-	This line cannot be defined as a comment.	
2390	-	Wrong group axis selection	
2400	-	Cannot move in cut & paste editing	
2430	-	Reverse data not found	
2440	-	Move C-and W-axis to basic position	Laser cutting
2450	-	Relative JOB not permitted	
2470	-	Wrong JOB type	
2480	-	Wrong JOB coordinates setting	
2500	-	Cannot convert the JOB	
2501	-	Cannot convert positions as macro arguments	
2510	-	Cannot correct position in the JOB	
2520	-	Enter JOB name	
2530	-	Illegal step number	
2540	-	Enter step number	
2550	-	Duplicated step number	
2551	-	Duplicated line number	
2560	-	Cannot correct steps of position variables and REFP	
2570	-	The step does not contain speed	
2580	-	The step does not contain PL/CONT	
2590	-	Soft limit range over	
2600	-	Cannot teach position in concurrent JOB	
2610	-	Wrong JOB kind	
2620	-	Cannot correct play speed in the JOB	
2630	-	Conveyor position not reset	
2640	-	Incorrect JOB name	
2650	-	Defined JOB name	
2670	-	Undefined target JOB	

9 Error
9.1 Error Message

Error No.	Data	Error Message	Contents
2710	-	Relative job can't be shifted with pulse type	
2730	-	Cannot use robot macro JOB	
2740	-	Cannot use concurrent macro JOB	
2750	-	Cannot use JOB with group-axis specification	
2760	-	Cannot insert/modify/delete for group axis detachment	
2761	-	Cannot insert/modify/delete for axis detachment	
2762	-	This operation is not allowed, for axes detachment has been set.	
2763	-	Cannot modify, for axes detachment has been set.	
2764	-	Cannot insert/modify/delete, for axes detachment has been set.	
2770	-	The job includes instructions that cannot execute reverse paste	
2780	-	Arithmetic error	
2790	-	Step exceeding operation range.	
2822	-	Cannot copy job during jog operation.	
2823	-	Cannot copy, cut and paste during jog operation.	
2870	-	Maximum pressure is not set.	The maximum pressure for the gun condition file is not defined.
2871	-	Pulse value and stroke value are not set correctly.	The gun condition file pulse and stroke are not properly defined.
2872	-	Torque value and pressure value are not set correctly.	The gun condition file torque and pressure are not properly defined.
2880	-	This group name cannot be changed.	
2881	-	Same group name exists.	
2882	-	It's not appropriate group name.	
2890	-	Max stroke range over.	
2891	-	1st Pulse value is not set correctly.	
2892	-	1st Stroke value is not set correctly.	
2893	-	1st Torque value is not set correctly.	
2894	-	1st Pressure value is not set correctly.	
2895	-	Max Pressurization power exceeding a set range.	
2896	*	Pulse value exceeding a set range.	
	xxx		Pulse number
2897	*	Stroke value exceeding a set range.	
	xxx		Stroke number

9 Error
9.1 Error Message

Error No.	Data	Error Message	Contents
2898	*	Torque value exceeding a set range.	
	xxx		Torque number
2899	*	Pressure value exceeding a set range.	
	xxx		Pressure number

9.1.4 External Memory Equipment

Error No.	Data	Error Message	Contents
3021	-	SD card not inserted into SD card slot (PP)	
3022	-	USB media not inserted	
3040	-	File not saved on the media	
3050	-	File saved on the media	
3060	-	Out of memory on the media	
3070	-	Number of files on the media	
3080	-	I/O error on the media	
3090	*	Transmission error with the media	
	1		Framing error
	2		Overrun error
	3		Parity error
	4		Data code error
	5		Data read error
	6		Data write error
	7		Data time out
	8		Serial I/O error
	9		Error other than described above
3100	-	Total checksum error	When the security is in management mode or safety mode, the CMOS.BIN file saved with other controllers cannot be loaded.
			The memory size incorporated in the JZNCD-AIF01-□E board is different from the memory size of the JZNCD-AIF01-□E board used when saved the CMOS.BIN file.
			The CMOS.BIN file is broken or cannot be saved properly.
3110	-	Syntax error	
3120	*	HEX code error	
	1		Specification error of data decode
	2		Specification error of EOF record
	3		Record type error
	4		Total check error of record
3130	-	Verify error	
3140	-	Wrong pseudo instruction	

9 Error
9.1 Error Message

Error No.	Data	Error Message	Contents
3150	*	Concurrent I/O record error	
	1		Format error
	2		Ladder program is too long
	3		Exceed the range of the data
	4		Specification error of channel No.
	5		Specification error of relay No.
	6		Timer value error
	7		Specification error of timer No
3160	-	Cannot load illegal system data	
3170	*	Condition file data error	
	1		Format error
	2		Specified file No. is omitted
	3		Specified tool No. is omitted
	4		User file is not registered.
3190	*	Error in JOB data record	
	1		Record on the number of position data (NPOS) is wrong for the format.
	2		Record on the user coordinate No. (USER) is wrong for the format.
	3		Record on the tool No. (TOOL) is wrong for the format.
	4		Record on the position data section is wrong for the format.
	5		Record on the robot type of XYZ data (RCONF) is wrong for the format.
	6		Date (DATE) record is wrong for the format.
	7		Comment (COMM) record is wrong for the format.
	8		Record on the JOB attribute data (ATTR) is wrong for the format.
	9		Control group (GROUP) record is wrong for the format.
	10		Local variable (LVARs) record is wrong for the format.
	11		JOB argument (JARGS) record is wrong for the format.
	12		Record on the teaching coordinates for relative job (FRAME) is wrong for the format.
	13		Position data coordinates do not match relative job coordinates.
3200	-	NOP or END instruction not found	
3210	-	Position No. storage area not found	

Error No.	Data	Error Message	Contents
3220	*	Syntax error in instruction data	
	2		Interior control error
	3		Undefined instruction/tag
	4		Instruction/tag shortage
	5		Disuse instruction/tag
	6		Sub instruction
	7		No instruction
	8		Invalid instruction
	9		Invalid tag
	10		Invalid character
	11		Undefined intermediate code
	12		Intermediate code shortage
	13		Syntax stack overflow
	14		Syntax stack underflow
	15		Array type tag uncompleted Tag [ARRAY]
	16		Element type tag uncompleted Tag [ELEMENT]
	17		Macro JOB unregistered
	18		Input format error
	19		Data size over
	20		MIN value over
	21		MAX value over
	22		Operation expression error
	23		Job call argument setting error
	24		Macro job call argument setting error
	25		Position vector setting error
	26		System error
	27		Soft key designate error
	28		Numerical input buffer overflow
	29		Real type data precision error
	30		Element format error
	35		BOOL TYPE data error
	36		CHAR data error
	37		BYTETYPE, BINARY / HEXADECIMAL BYTE TYPE data error
	38		INTEGER TYPE, DECIMAL WORD TYPE data error
	39		BINARY/HEXADECIMAL WORD TYPE data error
	40		DOUBLE PRECISION INTEGER TYPE, DECIMAL DWORD TYPE data error
	41		BINARY/HEXADECIMAL WORD TYPE data error
	42		REAL TYPE data error
	43		LADDER SPECIAL TYPE data error

9 Error
9.1 Error Message

Error No.	Data	Error Message	Contents
	44		JCL text
	45		Invalid text
	46		LABEL NAME data error
	47		JOB NAME data error
	48		STRING data error
	49		COMMENT data error
	51		The job contains the instructions that exceeded the maximum size
	58		Invalid instruction/tag detection
3230	-	Syntax not matched	
3231	-	Controller type is not matched.	
3240	-	Undefined application	
3250	-	Cannot load this file	
3251	-	Cannot SAVE/LOAD the job that has more than 512 aliases.	
3260	-	Excess input data	
3270	-	Cannot verify this file	
3280	-	Wrong welding condition (STANDARD/ENHANCED)	
3290	-	Serial port not defined	
3300	-	Serial port being used	
3310	-	Protocol being used	
3340	-	Illegal number of multi-layer data	
3350	-	Not enough memory	
3360	-	Invalid folder	
3370	-	Incorrect folder name	
3450	-	Cannot load macro JOB at current security mode	Load in management mode.
3460	*	Cannot backup the media	
	1		Insufficient media memory.
	2		Unable to access media.
3461	-	Failed to delete the system backup file.	
3462	-	Data accessed with other functions.	
3470	-	Database not found	
3480	-	Database access error	
3490	-	Same database exists	
3500	-	Check the media insertion	
3501	-	Check the media insertion	
3510	-	Cannot delete folder. Check attribute and inside file	
3520	-	Same folder exists	

9 Error
9.1 Error Message

Error No.	Data	Error Message	Contents
3530	-	Cannot load at current security mode	
3550	-	Under automatic backup operation. Operate after the backup is completed.	
3551	-	Under automatic backup operation. Operate "SORT FILE" after the backup is completed.	
3560	-	Failed in sorting backup file	
3570	-	Actuator data transmission error	
3580	-	Under backup file access. Operate after the access is completed.	
3581	-	Under backup file access. Operate "SORT FILE" after the access is completed.	
3600	-	system configuration data not matched	
3610	-	Excessive path	
3620	-	Excess folders	
3680	-	Cannot load the file while running time chart.	
3700	-	Cannot register the blade thickness of tip dresser.	

9.1.5 Concurrent I/O

Error No.	Data	Error Message	Contents
4010	*	Illegal relay No.	
	XXX		Line no.
4030	*	Illegal instruction	
	XXX		Line no.
4040	*	Relay/register No. duplicated in OUT/ GOUT or arithmetic instruction	Multiple outputs are instructed to the relay or register.
	XXX		Line no.
4050	*	The relay is not used	
	XXX		Line no.
4060	*	Excess STR [-NOT] instructions	
	XXX		Line no.
4070	*	Excess AND [OR] STR instructions	
	XXX		Line no.
4080	*	Syntax error in CRT instructions	
	XXX		Line no.
4090	*	Enter STR [-NOT] at head of block	Need STR [-NOT]
	XXX		Line no.
4120	-	Concurrent I/O memory is full	Exceeds memory capacity (10000 steps)
4130	-	END instruction not found	END instruction not found
4140	-	Wrong ladder program	Position and number of PART instruction are wrong.
4150	*	Wrong use of GSTR, GOUT commands	GSTR and GOUT is not used together.
	XXX		Line no.
4190	-	Ladder program not found	
4220	-	Excess TMR/CNT or arithmetic instructions	More than 100 TMR, CNT or arithmetic instruction used
4230	-	Syntax error in TMR/CNT instructions	
5212	-	EXDSW signal is OFF. (Safety Logical Circuit)	

9.1.6 Maintenance Mode

Error No.	Data	Error Message	Contents
8011	-	Choose the input of overrun	
8012	-	Equipment data file reading error	
8021	-	YIU Unit not found	
8030	-	Too many boards (DEVICENET(MASTER))	
8031	-	Too many boards (MSC01B)	
8033	-	Too many boards	
8034	-	Too many channels	
8035	-	Invalid configuration	
8040	-	Memory error (ControlNet output condition)	
8041	-	Memory error (UNIWIRE CONNECT DAT	
8042	-	Memory error (IP Network Configuration data)	
8050	-	Robot model is not registered	
8051	-	Select model	
8060	-	Cannot get UNIWIRE connection data	
8070	-	DHCP is already set to use for another item	
8071	-	DNS is already set to use for another item	
8072	-	DHCP is not set to use	
8073	-	DNS is not set to use	
8074	-	Device Information not found	
8080	-	Nonsupport function	
8205	-	ENABLE Unit over	
8206	-	FLASH access error	
8210	-	IO module configuration is not modified	

9 Error
9.1 Error Message

Error No.	Data	Error Message	Contents
8211	-	OPTION BOARD or IO MODULE SETUP is not completed.	The setting information of OPTION BOARD and the related parameter value do not match. Turn ON the YRC1000 while pressing down [MAIN MENU] to start maintenance mode and set up as follows: {OPTION BOARD} ->{IO MODULE} ->{EXTERNAL IO SETUP} .
8212	-	Cannot change setting (Function conflict	
8213	-	Check EXTERNAL IO setup	
8216	-	Cannot change setting. Check the setting of control group.	Invalid the settings of the high speed spot welding or re-examine the control group configuration by referring to "Chapter 9.13. High Spot Welding Function" in "YRC1000 OPERATOR'S MANUAL FOR SPOT WELDING USING MOTOR GUN" (Manual No.RE-CSO-A054).
8217	-	Cannot change setting. Check the setting of spot high speed spec.	Invalid the settings of the high speed spot welding or re-examine the control group configuration by referring to "Chapter 9.123 High Spot Welding Function" in "YRC1000 OPERATOR'S MANUAL FOR SPOT WELDING USING MOTOR GUN" (Manual No.RE-CSO-A054).
8250	-	Setting group is duplicated that has been set in the axes detachment function.	
8251	-	Setting group is duplicated that has been set in the robot detachment function.	

9.2 Particular Error Message

Apart from ordinary alarms or errors, some may display an error box message on the programming pendant. This message is displayed, when the system of the programming pendant becomes unauthorized.

9.2.1 Message

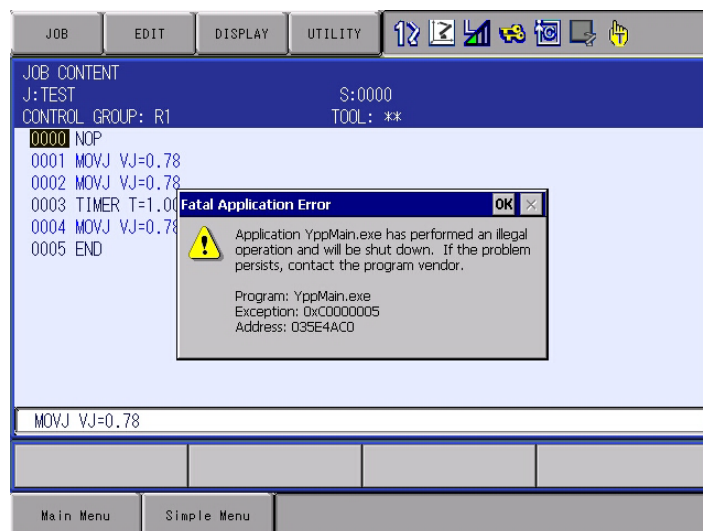
9.2.1.1 Fatal Error

This message is displayed when the fatal error occurs.

The message is “Fatal application Error” although the content of the message box varies depending on the occurrence status.

The programming pendant becomes either of the following states

1. The window becomes inoperable.
2. The window clears and blue background appears.



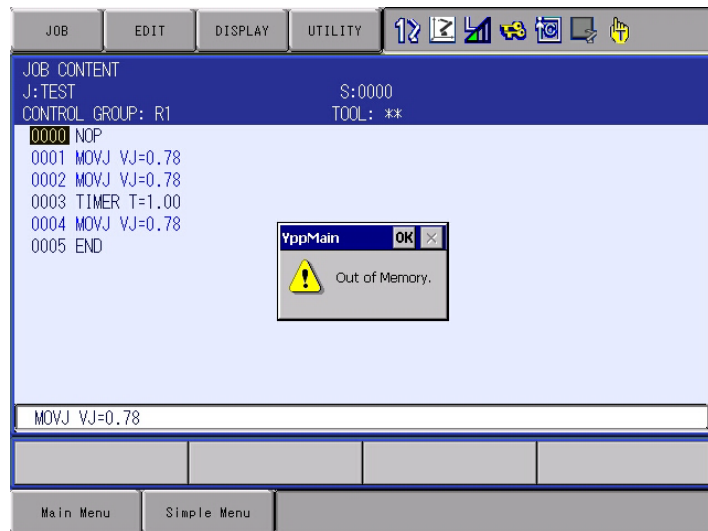
9 Error

9.2 Particular Error Message

9.2.1.2 Application Transaction Error

This message is displayed when the system or the software of the programming pendant becomes unauthorized due to unexpected transaction or failure in software transaction, etc.

The message in the message box varies depending on the occurrence status.



The following are the messages possible to occur.

Message	Meaning
syntax error	There is an unauthorized part in internal processing description.
expression too complex (stack overflow)	Internal stack has overflowed.
function nesting depth exceeded	Nesting of internal processing is unauthorized.
bad radix	The cardinal number used is unauthorized.
divide by 0	Memory is running out.
out of memory	Memory is insufficient.
argument list does not match a function	The internal processing of the pendant program is unauthorized.
register is not available	Specified an unavailable system data.

The programming pendant becomes either of the following states

1. The window becomes inoperable.
2. Press [OK] button to clear the message box and it becomes operable.

9	Error
9.2	Particular Error Message

9.2.1.3 Other Errors

Other errors than mentioned above, some can trigger the message box. In these cases, the title of the box can be “Ypp” or “YPPMain”.

9.2.2 When the Error Is Indicated

9.2.2.1 Fatal Error

Programming pendant becomes inoperable when this message appears. Restart the system.

9.2.2.2 Application Transaction Error

It is possible to keep the operation after pressing [OK] button to clear the message box. The system might be unstable. Restart the system if the window becomes inoperable.

9.2.2.3 Other Errors

Most of the cases when an error occurs, it is possible to keep the operation after pressing [OK] button to clear the message box. Restart the system if the window becomes inoperable.

Sometimes the message appears due to a specific operation although unstable state of the programming pendant is the main cause of the error in most cases.

If the pendant becomes inoperable after the message due to a specific operation invariably, report the displayed message to your YASKAWA representative.

10 Job Data Simplified Restoration Function

10.1 Outline

There are some cases where the data in file system becomes inconsistent status if the controller power is turned off during edit operation.

If this data inconsistent status is neglected, the following data errors (inconsistent status) might occur in rare cases.

This Job data simplified restoration function checks the inconsistent status of the file and restore the data error status of the file system.

[Inconsistent status]

inconsistent chain status between position data and instruction file

- (1) Overlapped chain with same position data
- (2) Unregistered position data is chained with instruction file
- (3) Registered position data is not chained

10.2 Job Data Restoration

10.2.1 How to Check Job Data Inconsistent Status

* "FILE" in WRONG DATA LOG screen corresponds to the following data.

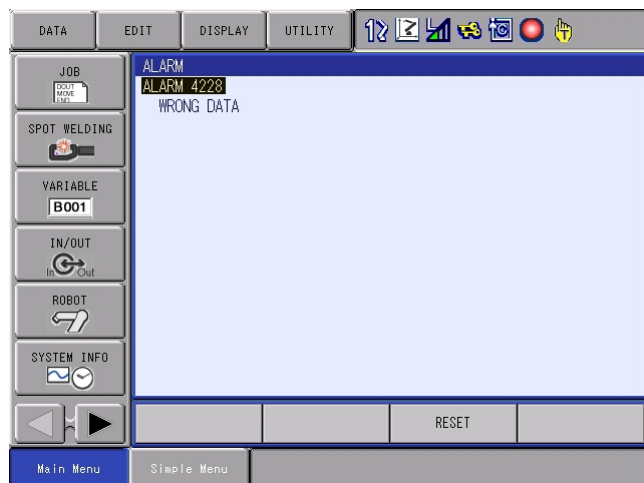
- (1) Job data
- (2) User coordinate data (UFRAME)
- (3) Robot calibration file (RBCAL)
- (4) Edit buffer (-CUTBUF)



- Execute Job data restoration in management mode or higher.
- Operation mode and editing mode permit monitoring only.

1. Detect data error

– ALARM screen appears.



2. Press {SYSTEM INFO} under main menu and select {SECURITY}



10 Job Data Simplified Restoration Function

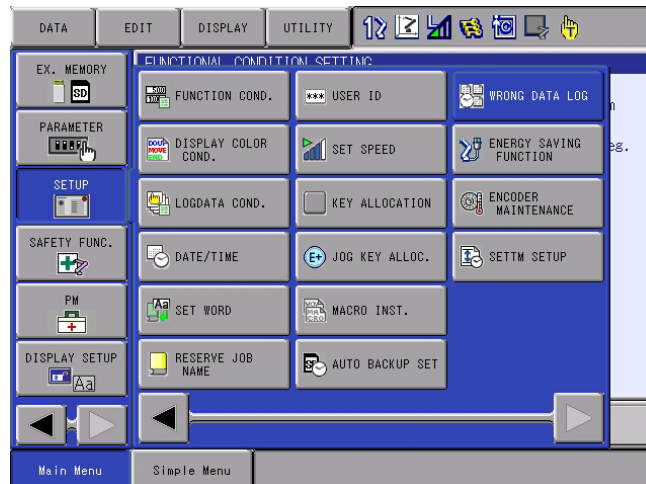
10.2 Job Data Restoration

3. Select "MANAGEMENT MODE"

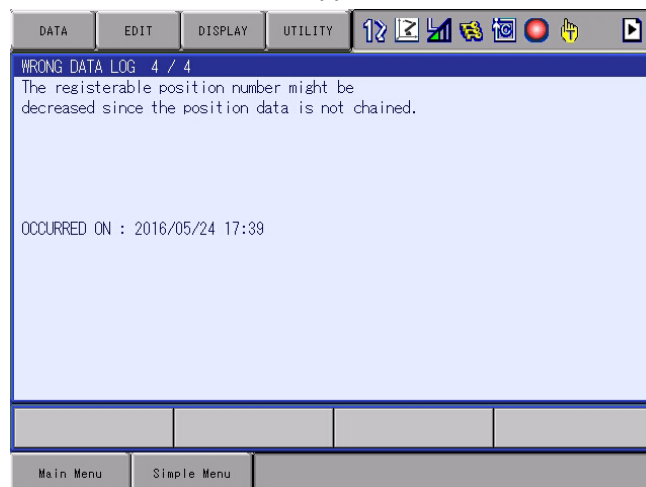


- Input password to switch the mode to Management mode.

4. Press {SETUP} under main menu and select {WRONG DATA LOG}



- WRONG DATA LOG screen appears.

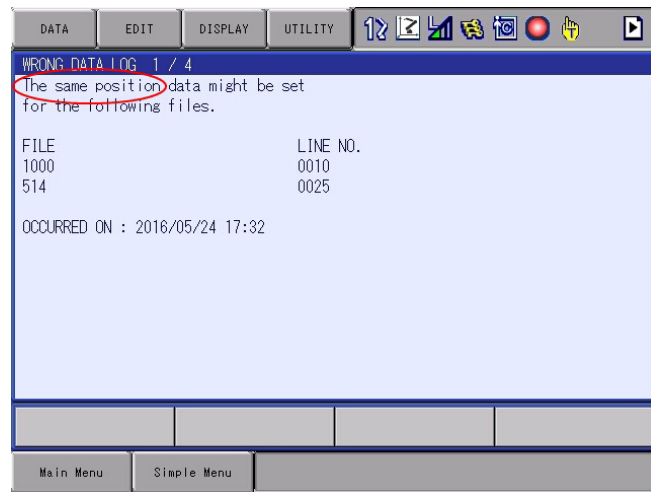


5. Check the details of data inconsistency

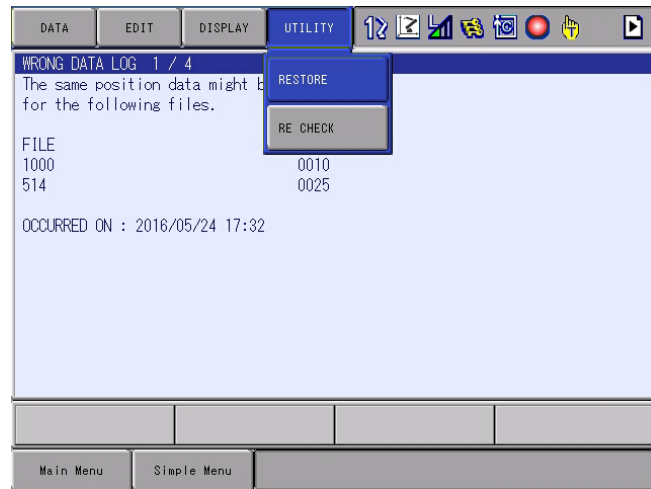
- Check the error contents, then execute restoration following chapter 10.2.2 "Job Data Restoration Method".

10.2.2 Job Data Restoration Method

10.2.2.1 In Case Same Position Data Is Chained



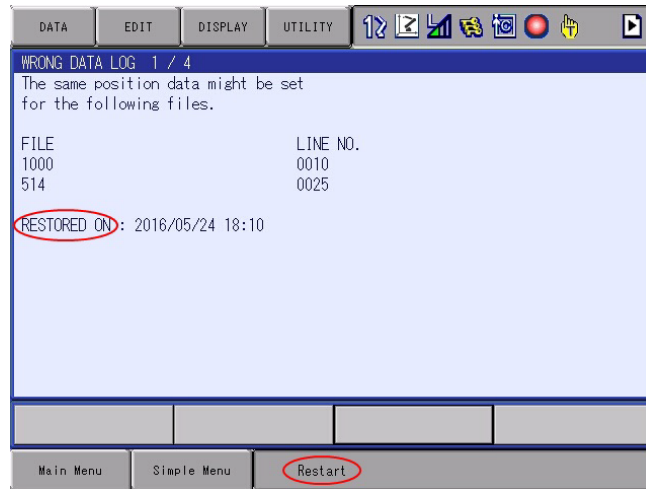
1. Press {UTILITY} to select {RESTORE}
 - Press {RESTORE} to reset the overlapped position data chain.



10 Job Data Simplified Restoration Function

10.2 Job Data Restoration

- The indication changes from “OCCURRED ON” to “RESTORED ON”.



* If fail in the restoration

- If the indication doesn't change from “OCCURRED ON” to “RESTORED ON”, refer to *chapter 10.3 “If Fail in Simplified Restoration”*.

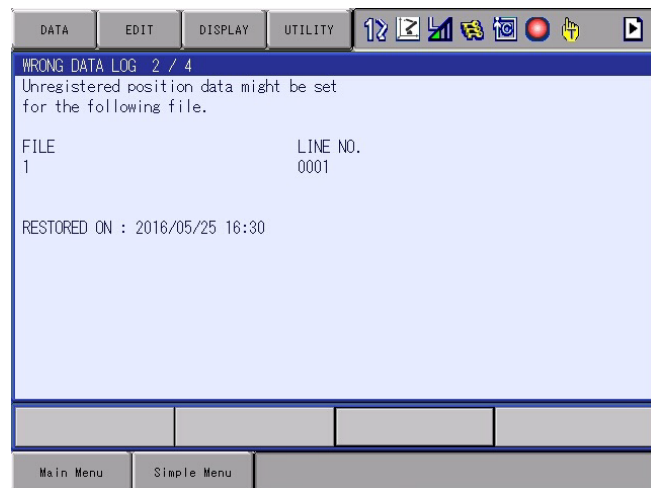
2. Start up the system again

- After the restoration, the system must be started up again.
Turn the control power OFF/ON and then execute the following checking operation.

3. Press {SETUP} under main menu and select {WRONG DATA LOG}

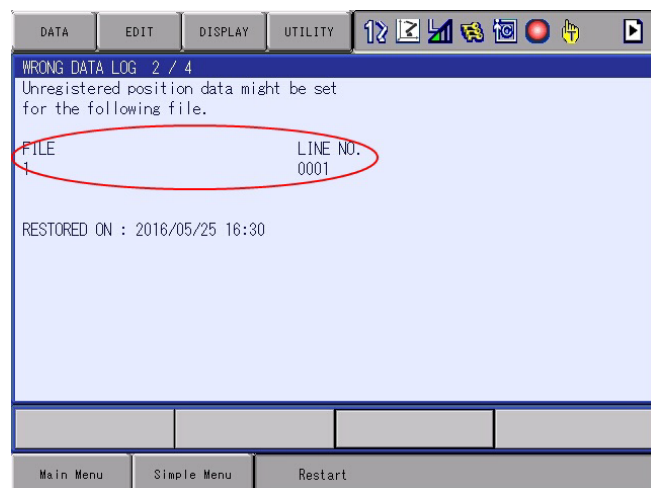


- WRONG DATA LOG screen appears.

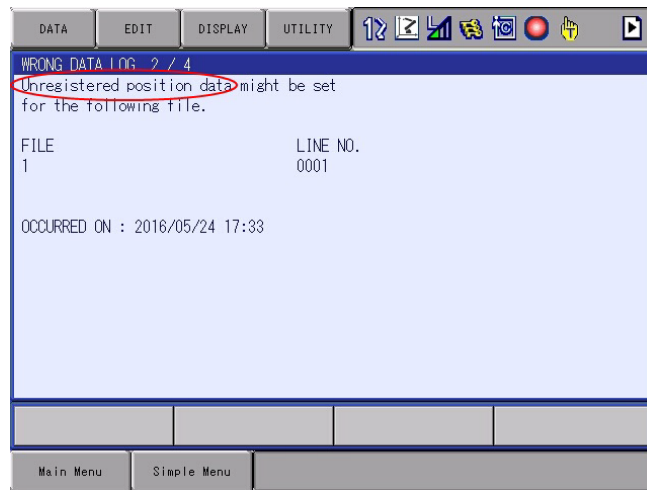


4. Check the position

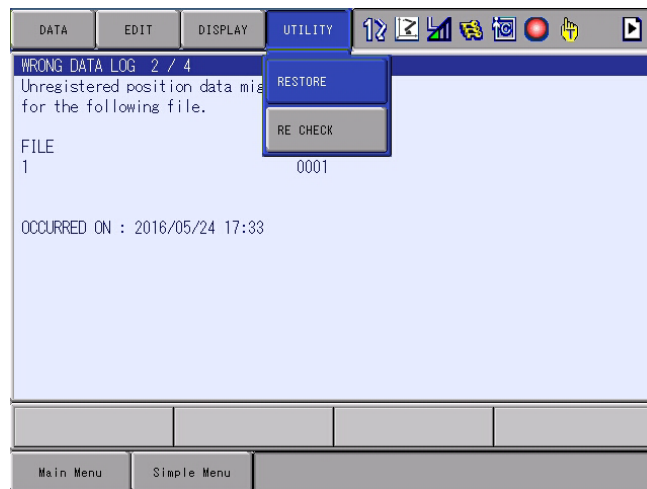
- Check the position of two lines indicated in the screen.



10.2.2.2 In Case Not-Registered Position Data Is Chained



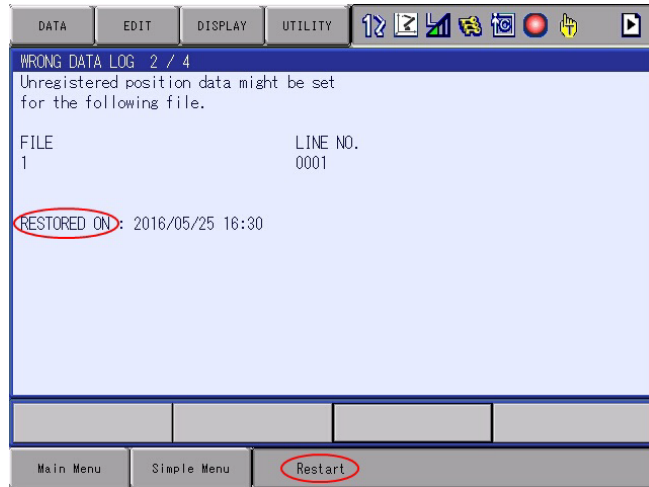
1. Press {UTILITY} and select {RESTORE}
 - Press the {RESTORE} button to register the position of the file indicated in the WRONG DATA LOG screen tentatively, that enables you to register the position again.



10 Job Data Simplified Restoration Function

10.2 Job Data Restoration

- The indication changes from “OCCURRED ON” to “REGISTERED ON”.



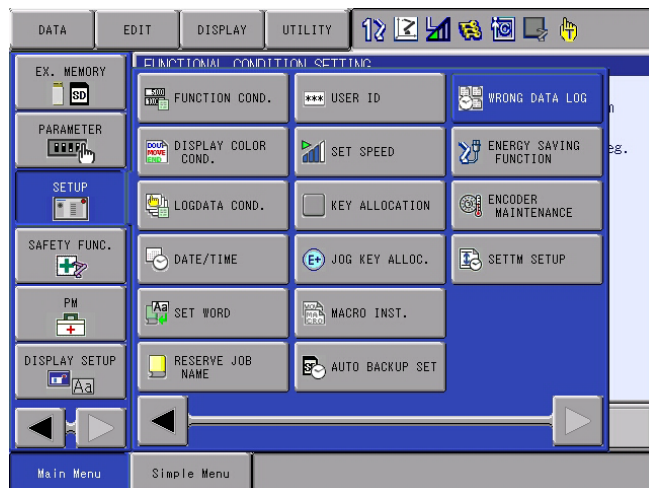
* If fail in the restoration

- If the indication doesn't change from “OCCURRED ON” to “RESTORED ON”, refer to *chapter 10.3 “If Fail in Simplified Restoration”*.

2. Start up the system again

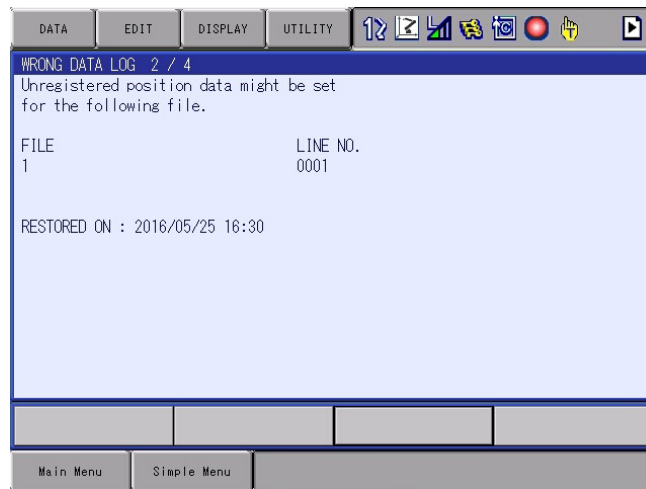
- After the restoration, the system must be started up again.
Turn the control power OFF/ON and then execute the following checking operation.

3. Press {SETUP} under main menu and select {WRONG DATA LOG}



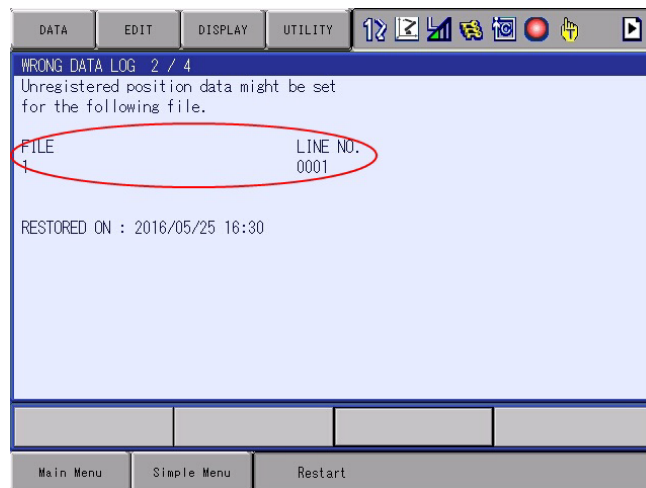
10 Job Data Simplified Restoration Function
10.2 Job Data Restoration

– WRONG DATA LOG appears.

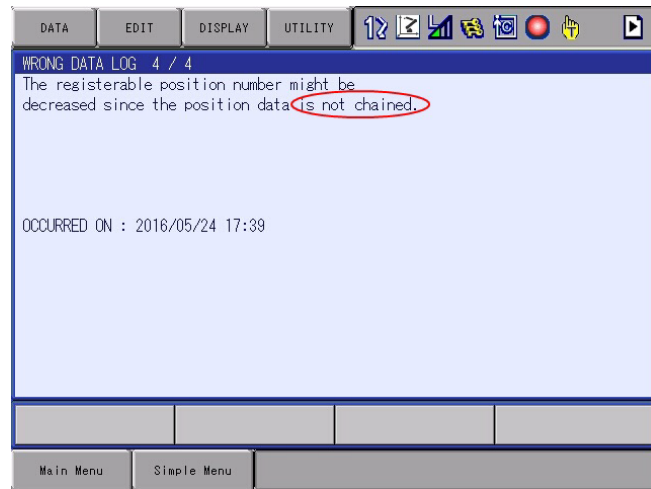


4. Register teaching position again

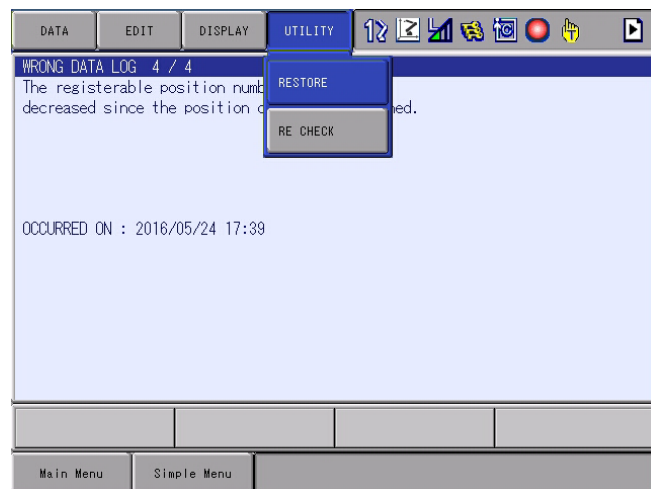
– Register the position data of the file in the screen again.



10.2.2.3 In Case Not-Chained Position Data Exists

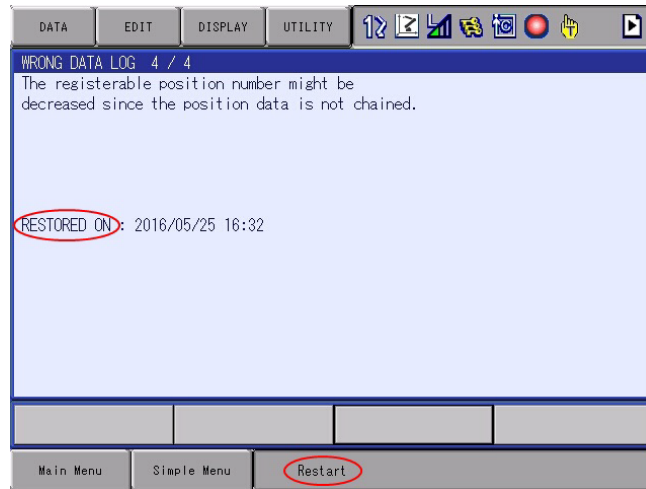


1. Press {UTILITY} and select {RESTORE}
 - Press {RESTORE} to correct the chain.



10 Job Data Simplified Restoration Function
10.2 Job Data Restoration

- The indication changes from “OCCURRED ON” to “REGISTERED ON”.



* If fail in the restoration

- If the indication doesn't change from “OCCURRED ON” to “REGISTERED ON”, refer to *chapter 10.3 “If Fail in Simplified Restoration”*.

* Start up the system again

- After the restoration, the system must be started up again. Turn the control power OFF/ON.

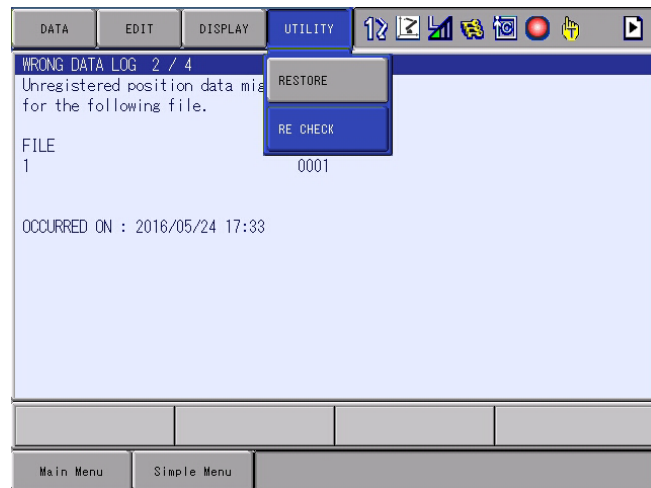
10.3 If Fail in Simplified Restoration

Execute the following procedure if failing in the restoration by Job data simplified restoration method.

10.3.1 Rechecking Job Data

1. Select {RE CHECK} under {UTILITY}

– Press {RE CHECK}



2. Restoration is completed.

– * Proceed to the next operation *chapter 10.3.2 “If Data Inconsistency Alarm Occurs Again”* if the alarm occurs again after this operation.

10.3.2 If Data Inconsistency Alarm Occurs Again

Execute the following procedure if the data inconsistency alarm occurs again even after rechecking Job data following *chapter 10.3 “If Fail in Simplified Restoration”*.

1. Re-register the position data after deleting the data of the file indicated in WRONG DATA LOG screen.
Refer to *chapter 10.2.2 “Job Data Restoration Method”* for checking operation after registration. (See the operations after procedure 2 “Start up the system again”.)

2. Execute the following procedures if the position data cannot be deleted or re-registered with the operation indicated above.

- (1) Save Job data and User Coordinate file and Robot Calibration.
*Delete the position data of the file indicated in WRONG DATA LOG screen if the following error occurs while saving.

ERROR: 0040 Undefined robot position variable

* Refer to “Saving Data” in chapter 7.3 of “YRC1000 GENERAL OPERATOR'S MANUAL (RE-CSO-A051)” for details.

- (2) Turn ON the YRC1000 while pressing down [MAIN MENU] to start maintenance mode and initialize the job area.
*Refer to “Initializing Job File” in chapter 8.18 of “YRC1000 INSTRUCTIONS (RE-CTO-A221)” for details.

- (3) Load the data saved in the procedure 1.
* Refer to “Loading Data” in chapter 7.3 of “YRC1000 GENERAL OPERATOR'S MANUAL (RE-CSO-A051)” for details.

- (4) Check the motion of the manipulator after loading.
* Refer to the procedure from procedure “2. Start up the system again.” in *chapter 10.2 “Job Data Restoration”*.

10.4 Related Parameters

Parameter	Meaning	Setting value	Initial value
S2C303	Data inconsistency check specification	0:Valid 1:Invalid	0
S2C304	Inconsistency detection method in play mode	0:Warning 1:Stop with alarm	0

10.5 Specific Output Signal

The following signal outputs the status of data inconsistency occurrence.

Output signal	Meaning
50696	Indicate the data inconsistency occurrence

11 LED Indicator on Circuit Board

Before the check of a LED indications

In principle, the door must not be opened to prevent electric shock while power is on. However, it is required to open the door to check the LED display for maintenance. Special attention needed to open the door.



WARNING

- To perform this maintenance operation, the door of the YRC1000 must be opened while the power is ON.
- Since a high voltage (200 to 480 VAC) is applied inside the YRC1000, do not touch any unit in the YRC1000.

Failure to observe this instruction may result in electric shock and/or personal injury.

- Close the door of the YRC1000 immediately after completing a maintenance operation such as an inspection of the LED.

Failure to observe this instruction may result in electric shock and/or personal injury.

<How to Open and Close the Door>

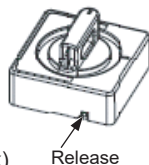
For Japan, Asia, Europe



<Information from the supplier>

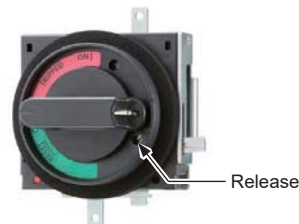
● Door Lock Mechanism

The door of the YRC1000 can be opened at the OFF position.
The door of the YRC1000 cannot be opened at the ON or TRIPPED position because it is locked at these positions.
Note that even at the ON or TRIPPED position, the door of the YRC1000 can be opened by pressing the release in the direction of the arrow by using a tool (3 mm wide, 1.8 mm thick).



Release

For North America

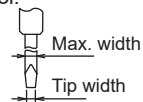


<Information from the supplier>

● Door Lock Mechanism

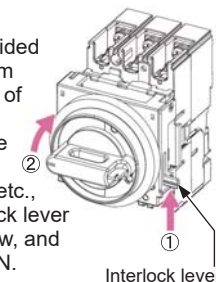
The reset-open mechanism is provided for the standard specification.
The door of the YRC1000 can be opened only when the OPEN (RESET) operation is performed.
Note that even at the ON or OFF position, the door of the YRC1000 can also be opened by turning the release by using a tool.

Size of the screwdriver to turn the release
Tip width: 4 mm, Max. width: 5 mm or less



● Safety Device

The interlock lever is provided to prevent the breaker from turning ON while the door of the YRC1000 is open.
When the breaker must be turned ON while the door is open for maintenance, etc., press and hold the interlock lever in the direction of the arrow, and turn the setting knob to ON.

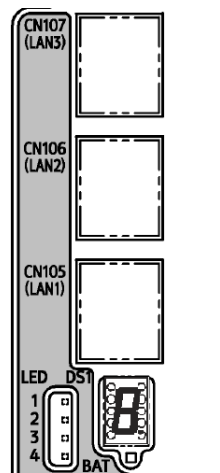


Interlock lever

11.1 LED Indicator on ACP 01 Circuit Board

The LED indicators: LED1 on the ACP01 circuit board show the statuses as in the following table.

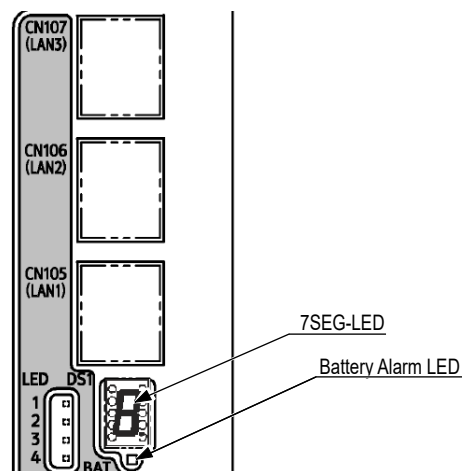
LED1	Status
OFF	The BIOS initialization not completed/ Before OS boot starts
ON	The BIOS initialization completed/ OS boot starts



11.2 LED Indicator on CPU Board

The 7-segment LED indicator and battery alarm LED lamp are located on the CPU board (JANCD-ACP01-E).

See chapter 11.3 “The 7 SEG-LED Indicator” for details displayed by the 7-segment LED indicator. The battery alarm LED lamp is lit when the battery runs out. See chapter 5.1.1.3 “Replacing the Battery”.



11.3 The 7 SEG-LED Indicator

The following tables show the operating statuses for JANCD-ACP01-E. The operating statuses are indicated by 7 SEG-LED.

Table 11-1: **[Normal Indication]**

Status	YRC1000
	ACP01
Right after applying the power	All 7-SEG indicators light up. ('8' + '.' light up.)
During the start-up process	Counts up from '0' toward 'd'.
After starting up normally	'd' + '.' blink every one second.

Table 11-2: **[Error Indication]**

Status	YRC1000
	ACP01
Normal alarm occurrence	'd' + '.' blink every one second.
Fatal alarm occurrence	The error cause and the address where the error has occurred are indicated by 7 SEG-LED. (See the indication spec 1.)

Indication Spec 1	E.g.: [-] → [0] → [2] → [0] → [0] →	: Error cause
	[.] → [-] → [0] → [0] → [0] → [0] → [F] → [F] → [0] → [4] is repeated	: Occurrence address

11.3.0.1 The 7 SEG-LED Indicator Status (1-Digit Indication) of Each Unit at Error Occurrence

ACP01	
All Lit	The power has been turned ON.
0	The booting program has started.
1	The system program has started. (Starts up initialization of various kinds.)
2	Starts verifying the existence of other circuit boards. (Verifies the start-up of the booting program.)
3	Starts the system program transmission.
4	Sends the request of the system program start-up.
5	Starts verifying the existence of other circuit boards. (Verifies the start-up of the system program.)
6	Acquires hardware information, etc. of other circuit boards. (Verifies the IO board status, servo IF, and so on.)
7	Starts the CMOS data transmission.
8	Sends the pre-online request.
9	Waits for CERF communication synchronization.
A	
B	Sends the start-up request of on-line system.
C	The on-line system has started. (Starts up the initialization task.)
D	Processes the YRC1000 setup completion. (Servo ON enabled)
E	Alarm occurs at the YRC1000 setup.
F	The maintenance system is starting up.
P	Communications interrupted between ACP01 and the programming pendant.
U	Updating system software through network.

11.3.0.2 The 7 SEG-LED Indicator Status (4-Digit Indication) of Each Unit at Error Occurrence

ACP01	
0000	Arithmetic error
0001	Debug
0002	NMI
0003	Breakpoint
0004	Overflow
0005	Out of BOUND
0006	Invalid operation code
0007	Device disabled
0008	Double fault
0009	Coprocessor segment overrun
000A	Invalid TSS
000B	Segment absence
000C	Stack segment fault
000D	General protection exception
000E	Page fault
000F	
0010	Floating point error
0011	Alignment check
0012	Machine check
0013	SIMD floating point exception
0014	
0015	
0016	
0017	
0018	
0019	
001A	
001B	
001C	
001D	
001E	
001F	
0900	WDT error

11.4 LED Indicator

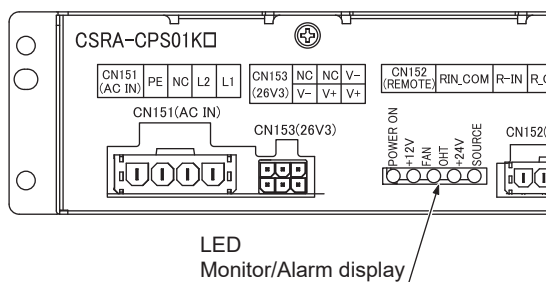
The following tables show the operating statuses for CSRA-SDCA01AA/
JANCD-ASF01-E.

Table 11-3: [Normal indication]

Status	YRC1000	
	SDCA01AA	ASF01
Right after applying the power	All indicators light up.	All indicators light up.
During the start-up process	{Normal status} : RUN (green) light up *Lighting the LED changes according to the activation process. {Detected error} : ALM (red) blink	{Normal status} : D5, D9(green) blink *Lighting the LED changes according to the activation process. {Detected error} : D8, D12 (red) blink
After starting up normally	{Normal status} : RUN (green) blink {Detected an alarm} : ALM (red) blink	{Normal status} : D5,D9 (green) blink {Detected minor alarm} : D8, D12(red) blink {Detected major alarm} : D8, D12 (red) light up

11.5 LED Indicator of the Control Power Supply Unit

The LED indicates the operation statuses of the control power supply unit (CSRA-CPS01K□).



DISPLAY	Color	Status
POWER ON	White	Lights with +12V output (Power supply status: being output)
+12V	Red	Lights with +12V low-voltage/over-current (ON when abnormal)
FAN	Red	Lights when an error occurs with the fan inside the control power supply unit (Error with the fan inside the control power supply unit)
OHT	Red	Lights when the temperature inside the control power supply unit exceeds the allowable maximum temperature during operation. If the temperature keeps rising, the power supply will be cut off. (Abnormal temperature inside the control power supply unit)
+24V	Red	Lights with +24V or +26V low-voltage/over-current (ON when abnormal)
SOURCE	White	Lights with power supply input. Lights out when internal live part completes discharge. (Power supply status: being input)

12 Program Upload Function

12.1 About Program Upload Function

The system program of the YRC1000 can be saved into the SD card inserted to the programming pendant using this program upload function.

This enables restoring the system easily and quickly, even in the case of a failure in the SD card of the main CPU board (ACP01), by writing the system program and the batch data of the YRC1000 saved previously.

12.1.1 When the System Program Is Required

The system program has been stored in the SD card removable from ACP01 in the YRC1000. This enables using the SD card without interruption even if ACP01 is replaced for its failure.

For an SD card failure, the existing system program needs to be written into the new one. This function enables saving the existing system program to write it into the new one from the YRC1000.

NOTICE

Prepare two SD cards for the restoration of the YRC1000.

- The write protect switch is found on the left side of the front surface of the SD card (normally labeled "Lock"). Confirm that this switch is set to OFF before using the SD card. The system does not operate correctly if this switch is set to ON (the locked state).
- For saving the system program
(It is used for writing the program when restoration)
This is for saving the system program from the YRC1000 by the program uploading operation. This SD card can also be used for writing the batch data. Prepare our recommended SD card. For more details on recommended SD cards, refer to "9.1.2 Device" in "YRC1000 INSTRUCTIONS".
- For ACP01
This SD card is to be inserted to ACP01. Prepare the one inserted to the ACP01, that was shipped as a spare-part, or the one shipped exclusively for ACP01 (it needs a special treatment for start-up, and thus our standard recommended SD cards are unavailable).

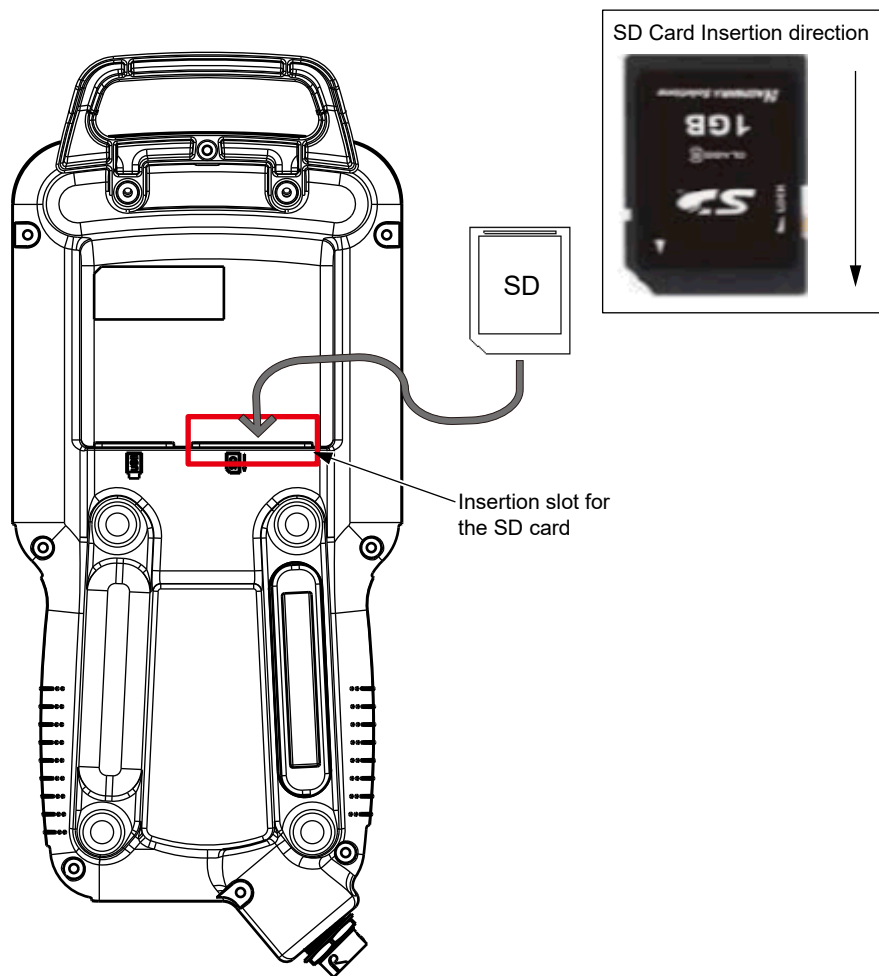
12.2 Program Upload Procedure

Upload the program as shown below.

12.2.1 Preparation of SD Card

Prepare the SD card with sufficient capacity (200MByte or more) for saving the system program and perform the following procedures.

1. Connect the SD card to a PC.
2. Use Explorer, etc. to delete all the data in the SD card.
3. Remove the SD card from the PC and insert it to the SD card slot on the programming pendant.



Back Side of Programming Pendant

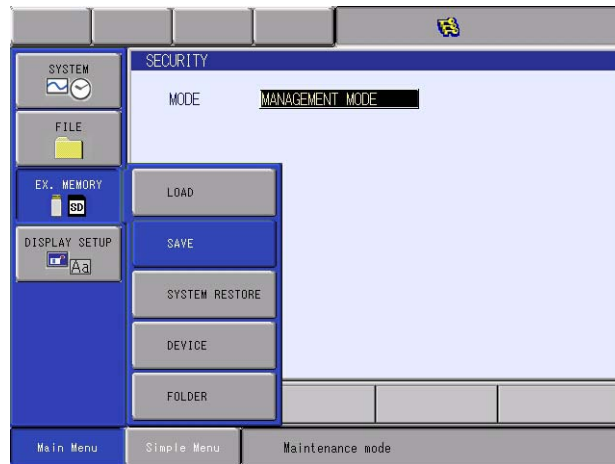
12 Program Upload Function

12.2 Program Upload Procedure

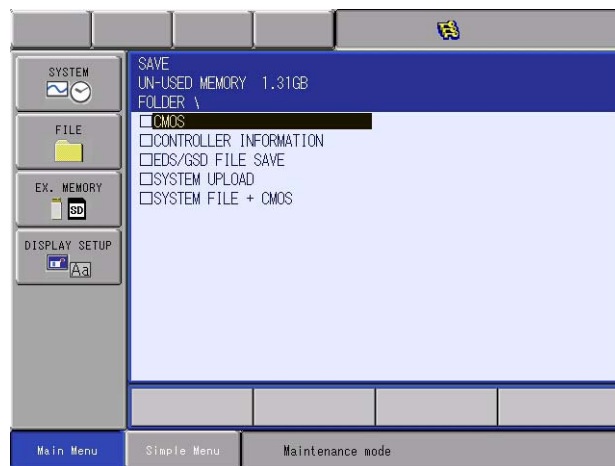
12.2.1.1 Uploading

Upload the program as shown below.

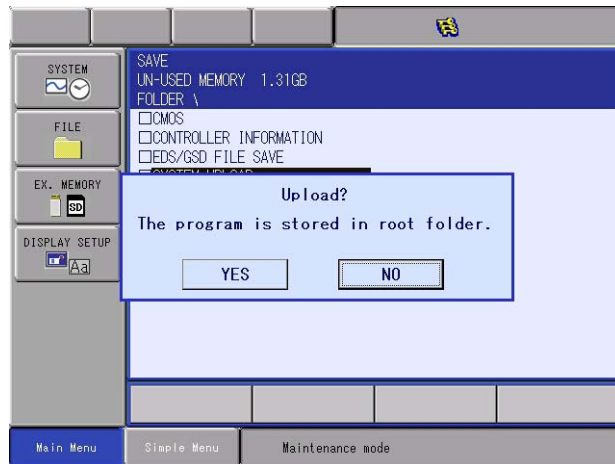
1. Turn ON the YRC1000 while pressing down [MAIN MENU].
 - The maintenance mode starts.
2. Set the security mode to management mode
3. Select {EX. MEMORY} under the main menu.
 - The sub menu displays.



4. Select {SAVE}.
 - The save window appears.



5. Select {SYSTEM UPLOAD}.
- The confirmation dialog box appears.



6. Select {YES}.
- Program upload starts.
 - When the message “Program uploading. Don't turn the power off.” on the human interface display area clears, uploading is completed.

For restoration, be sure to retain the SD card with the uploaded program after the above mentioned procedures.

12.3 Restoration Procedure 1 (Writing the Program)

First, check whether the SD card of the main CPU board (ACP01) needs replacing. If needed, replace the SD card and perform the procedures *chapter 12.3 “Restoration Procedure 1 (Writing the Program)”* through *chapter 12.5 “Restoration Procedure 3 (Loading Other Data (Installation))”*.

NOTICE

After the SD card of ACP01 is replaced, the YRC1000 and the manipulator cannot be operated correctly unless the correct system program is written-in and the batch data is loaded or initialized in maintenance mode. To ensure correct and safe operation, take notice of this matter before operation.

12.3.1 Determining Failure of SD Card

If all of the following conditions are met, the SD card is diagnosed as out of order.

- Power is correctly supplied to each board in the YRC1000.
- The programming pendant and ACP01 are correctly connected.
- The programming pendant remains displaying the initial window (an image of a robot on the screen) even one minute after the YRC1000 is turned ON and the 7SEG LEDs of the main CPU board (ACP01) remain lit.
- Nothing is changed regarding the conditions above after ACP01 is replaced.

For the conditions above, perform the following.

12.3.2 Preparation of SD Card for ACP01

Prepare the SD card for ACP01.

Prepare the one inserted to the ACP01, that was shipped as a spare-part, or the one shipped exclusively for ACP01 (it needs a special treatment for start-up, and thus our standard recommended SD cards are unavailable).

Insert this SD card to ACP01. For the specific location to install the SD card and precautions during installation, refer to *chapter 5.1.1.4 “Replacing the SD Card”*.

12.3.3 Preparation of SD Card for Wiring the Program

Insert the SD card uploaded in *chapter 12.2 “Program Upload Procedure”* to the SD card slot on the programming pendant.

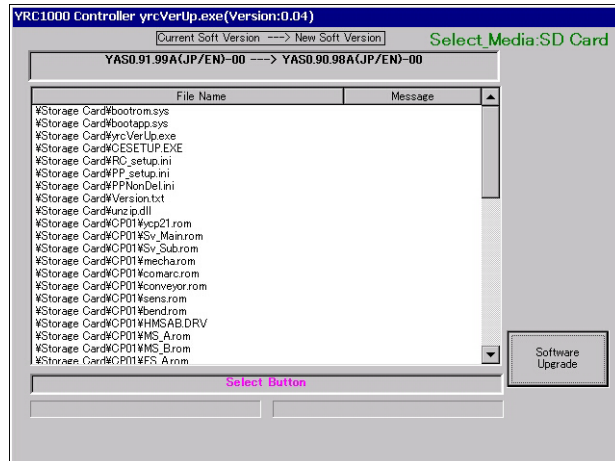
12 Program Upload Function

12.3 Restoration Procedure 1 (Writing the Program)

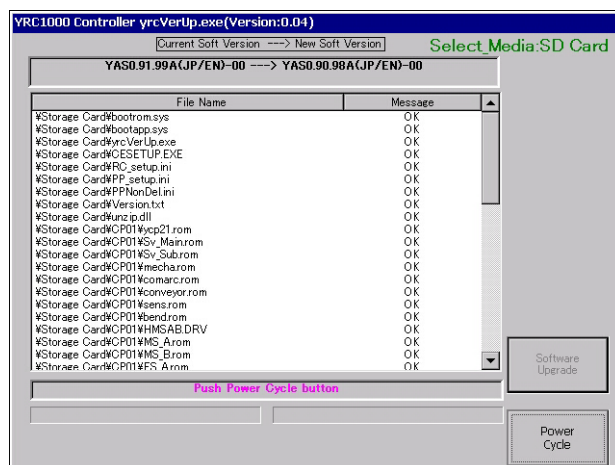
12.3.4 Writing the System Program

Write the system program as shown below.

1. Turn ON the YRC1000 while pressing down the [INTERLOCK] + [8] + [SELECT].
 - The upgrade tool starts.



2. Select {Software Upgrade}.
 - Start upgrade.
 - When the message “Turn off controller power supply” appears at the bottom of the window, upgrade is completed.



12.4 Restoration Procedure 2 (Loading the Batch Data)

After finish writing of the system program, load the batch data previously saved (saved when the SD card was correctly operating). The batch data include "CMOS.BIN" and "CMOSBK.BIN" (or "CMOSBK???.BIN: ?? represents a number"). Write any of these data into the SD card, insert it to the SD card slot on the programming pendant, and then perform the following.

Use our recommended SD card (the SD card for saving the system program is also available).

NOTICE

Before operation, understand well that the data in the YRC1000 is replaced with the batch data in the SD card when loading the batch data.

Check that the data wrote into the YRC1000 is the same as before after restoring the system. In addition, call the master job and check that the current position of the robot is safe before starting the robot.

The YRC1000 has the loading limitation of the batch data. When load the batch data, if the SD card of the main CPU board(ACP01) is different from the one when saved the batch data, the batch data cannot be loaded in management mode or safety mode. (The batch data can be loaded in management mode or safety mode only if the SD card of the main CPU board (ACP01) was not replaced or if the main CPU board (ACP01) and robot I/F board (AIF01) were not replaced with system software version YAS4.41.00A-00 or later.)

When restoring the SD card of the main CPU board (ACP01), if the batch data cannot be loaded in management mode or safety mode, load the batch data in one time manage mode.

For one time manage mode, refer to chapter 7.1 "Protection Through Security Mode Settings" in "YRC1000 INSTRUCTIONS" and contact your YASKAWA representative.

12.4.1 When the Batch Data Is "CMOS.BIN"

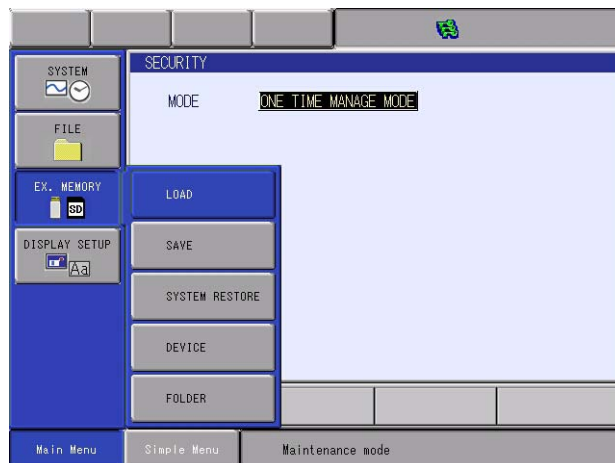
When the batch data is "CMOS.BIN", write the data as shown below.

1. Turn ON the YRC1000 while pressing down [MAIN MENU].
 - The maintenance mode starts.
2. Set the security mode to one time manage mode.
3. Select {EX. MEMORY} under the main menu.

12 Program Upload Function

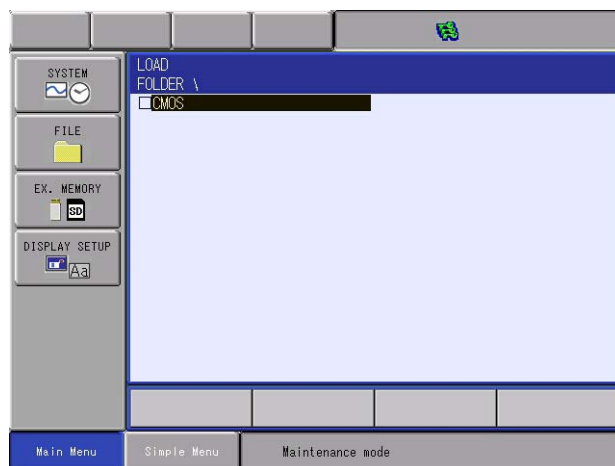
12.4 Restoration Procedure 2 (Loading the Batch Data)

- The sub menu appears.



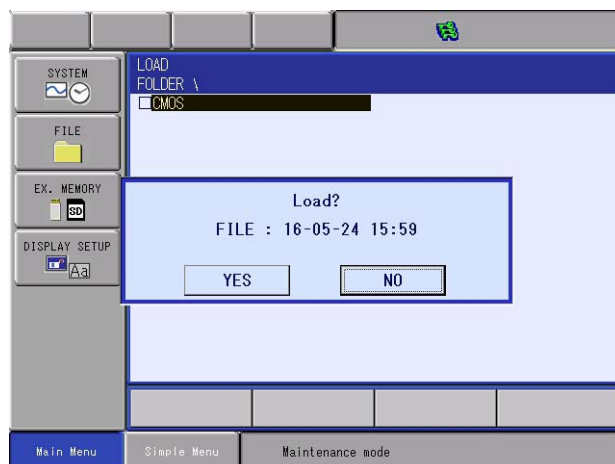
4. Select {LOAD}.

- The load window appears.



5. Select {CMOS}.

- The confirmation dialog box appears.



12 Program Upload Function

12.4 Restoration Procedure 2 (Loading the Batch Data)

6. Select {YES}.

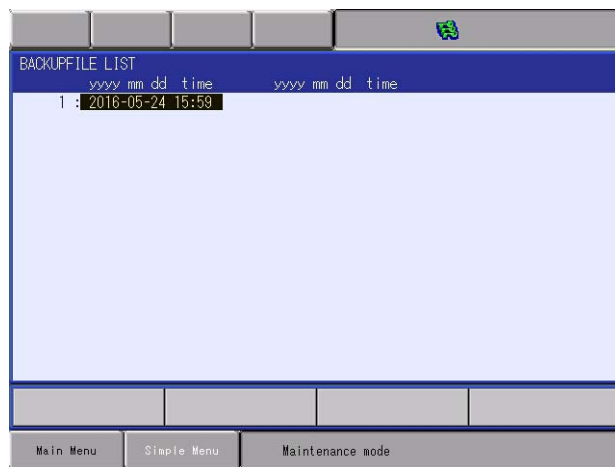
- Loading starts and internal data of the YRC1000 is updated by CMOS.BIN file in the SD card.
- When the message "Loading system data. Don't turn the power off." on the human interface display area clears, loading is completed.

When the data has finished loading, perform a safety board FLASH reset. For the specific procedure to perform a safety board FLASH reset and other information, refer to "Reset Safety Circuit Board FLASH Data" in chapter 8.18 of "YRC1000 INSTRUCTIONS (RE-CTO-A221)".

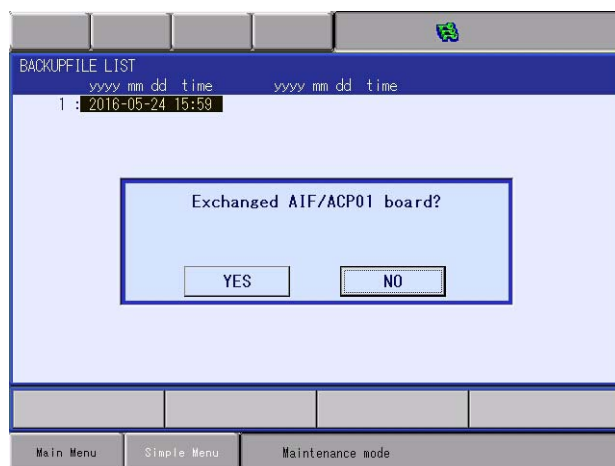
12.4.2 When the Batch Data Is “CMOSBK.BIN”

When the batch data is “CMOSBK.BIN (or “CMOSBK???.BIN: ?? represents a number”)”, write the data as shown below.

1. Turn ON the YRC1000 while pressing down [MAIN MENU].
 - The maintenance mode starts.
2. Set the security mode to one time manage mode.
3. Select {EX. MEMORY} under the main menu.
 - The sub menu appears.
4. Select {SYSTEM RESTORATION}.
 - The backup file list window appears.



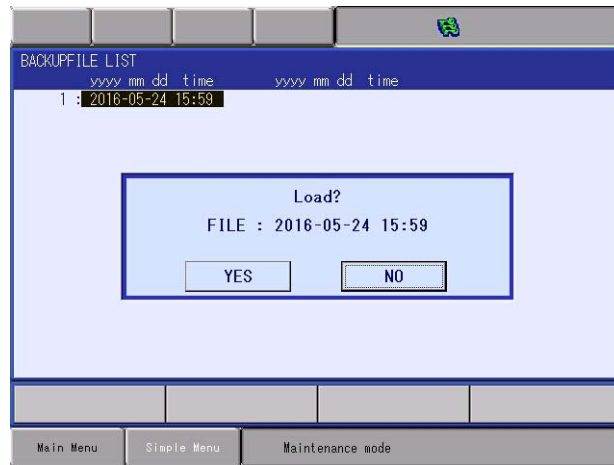
5. Select a date of a file to be backed-up.
 - The confirmation dialogue box to confirm whether the board has been replaced or not appears.



- Select {YES} to initialize “SYS MONITORING TIME”.
- Select {NO} to keep “SYS MONITORING TIME” unchanged.

12 Program Upload Function
12.4 Restoration Procedure 2 (Loading the Batch Data)

6. Select {YES} or {NO}.
- The confirmation dialog box for execution appears.



7. Select {YES}.
- Internal data of the YRC1000 is updated by CMOS.BIN file in the SD card.
 - When the message "Loading system data. Don't turn the power off." on the human interface display area clears, loading is completed.

When the data has finished loading, perform a safety board FLASH reset. For the specific procedure to perform a safety board FLASH reset and other information, refer to "Reset Safety Circuit Board FLASH Data" in chapter 8.18 of "YRC1000 INSTRUCTIONS (RE-CTO-A221)".

12.5 Restoration Procedure 3 (Loading Other Data (Installation))

If the MotoPlus function is valid, perform the following work.

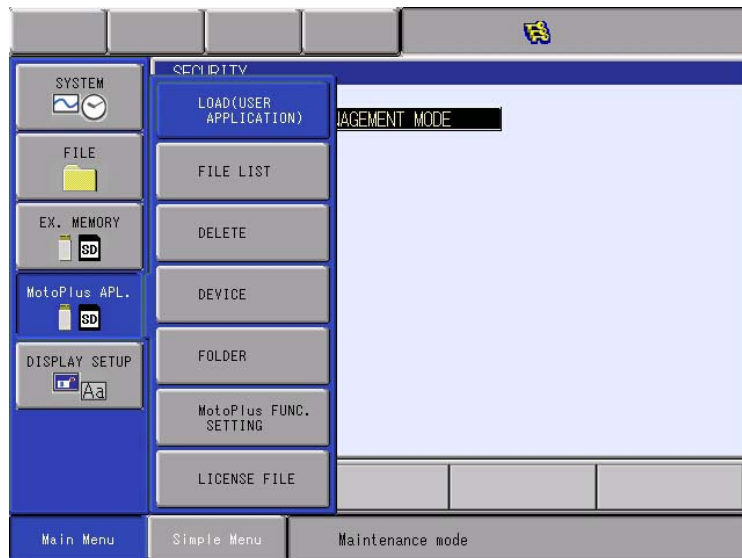
After the work in *chapter 12.4 “Restoration Procedure 2 (Loading the Batch Data)”* is finished, turn ON the DX200 while pressing [Main Menu] to start maintenance mode and install the saved MotoPlus app.

12.5.1 Installation of Application Program in Maintenance Mode

1. Load function

Load the application program and install it by following the instructions below.

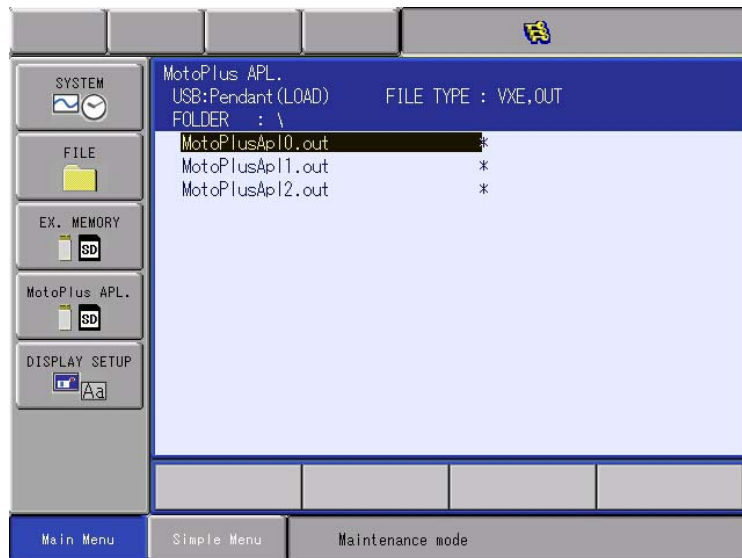
- (1) Set the security mode to MANAGEMENT MODE. Select the main menu {MotoPlus APL.}. Then {LOAD (USER APPLICATION)}, {FILE LIST}, {DELETE}, {DEVICE}, {FOLDER}, and {MotoPlus FUNC. SETTING} display as submenus.



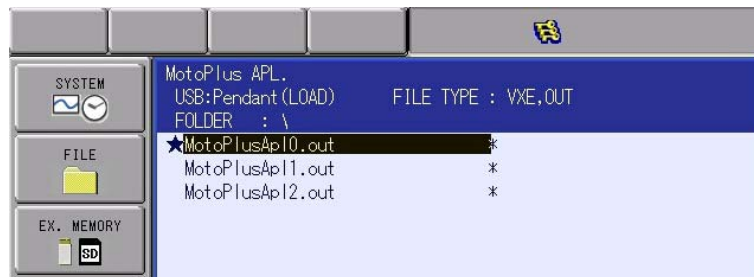
- (2) Specify the file location.
Select an appropriate file location with the sub-menus {DEVICE (to select SD/USB)} and {FOLDER (to select the folder that has the application program)}.

(3) Select and load a file.

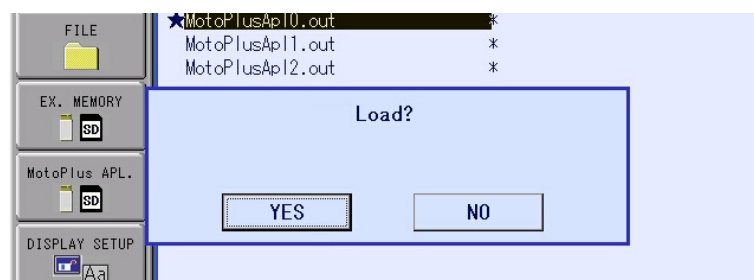
- Select the submenu {LOAD (USER APPLICATION)}. Then, "*.out" files in the specified folder display as shown below.



- Move the cursor and press [SELECT]. Then, the selection indicator "★" appears on the left of the application file name. Press [SELECT] again to clear "★".



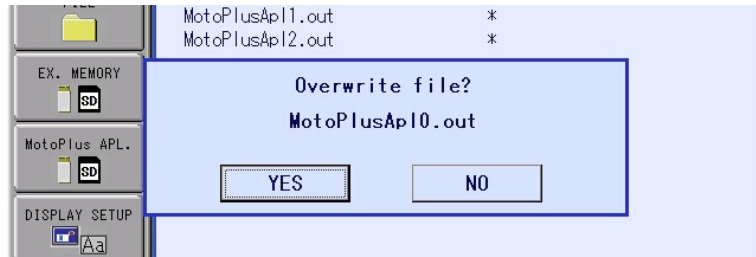
- Press [ENTER], then the following confirmation dialog box appears.



12 Program Upload Function

12.5 Restoration Procedure 3 (Loading Other Data (Installation))

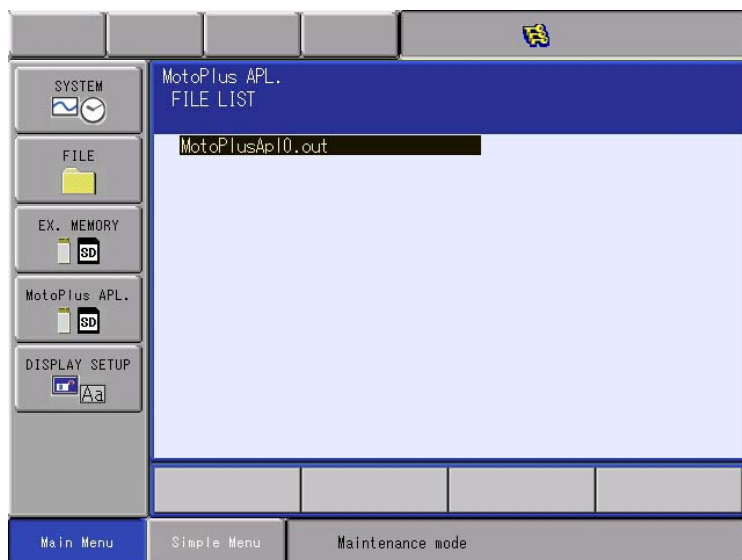
- When {YES} is selected and the selected application file contains the file that already exists in the YRC1000, the following confirmation dialog box appears. Select “YES” to load.



Error 3640 occurs if an attempt is made to load *.out in excess of the limit.

2. List

Select the submenu {FILE LIST}. Then, the list of the application files that are already loaded in the YRC1000 appears.



3. Deletion of application program

By the submenu {DELETE}, the application file that already exists in the YRC1000 can be deleted.

- (1) Move the cursor and press [SELECT]. Then, the selection indicator “★” appears on the left of the application file name. Press [SELECT] again to clear “★”.



12 Program Upload Function

12.5 Restoration Procedure 3 (Loading Other Data (Installation))

- (2) Press [ENTER], then the following confirmation dialog box appears.



12.6 In Case of the SD Card Failure

Prepare as follows for the SD card failure.

NOTICE

Prepare for the SD card failure for the quick and easy restoration of the YRC1000.

12.6.1 Preparation of SD Card for ACP01

Prepare the SD card for ACP01.

Prepare the one inserted to the ACP01, that was shipped as a spare-part, or the one shipped exclusively for ACP01 (it needs a special treatment for start-up, and thus our standard recommended SD cards are unavailable).

12.6.2 Program Upload

Save the system program of the YRC1000 into the SD card following the procedures mentioned in *chapter 12.2 "Program Upload Procedure"*. Be sure to retain the SD card for system restoration.

12.6.3 Backup the Batch Data

Backup the batch data by following the procedures mentioned in "9.2 Backup by CMOS.BIN" or "9.3 Automatic Backup Function" in "YRC1000 INSTRUCTIONS". Be sure to retain backed-UP data.

12.6.4 Saving the MotoPlus Application

If the MotoPlus function is valid, save the MotoPlus application that was provided from the supplier of the MotoPlus application.

The application cannot be uploaded from the YRC1000.

If the MotoPlus application is not provided from the supplier, check the information on how to obtain the MotoPlus application by referring to the application manuals.

12.6.5 Saving the Programming Pendant Customized Application

If the programming pendant customization function is valid, save the application software provided from the supplier of the programming pendant customized application.

The application cannot be uploaded from the YRC1000.

If the programming pendant customized application is not provided from the supplier, check the information on how to obtain the programming pendant customized application by referring to the application manuals.

13 Trouble Shooting When Alarm Is Not Displayed

When YRC1000 does not start and any alarm is not displayed, turn ON and OFF the power of YRC1000 controller.

When the condition doesn't change even after turning ON and OFF the YRC1000, follow the steps below.



WARNING

- To check the LED indicator of each unit, it is necessary to open the door of the YRC1000 while the power is ON. Do not touch any component in the YRC1000 when checking the LED indicator.

Failure to observe this instruction may result in electric shock.

The data of robot controller is stored in the SD card of ACP01 circuit board and the memory of I/F circuit board (AIF).

Screen status of programming pendant	7SEG LED for CPU board (ACP01)	Assumed status	Cause	Remedy
 The screen does not become bright and nothing is displayed.	Lights OFF	The control power is not provided from the control power supply unit.	Power supply failure	When the white LED of control power supply unit SOURCE is OFF, check the following. -For the primary power supply voltage, make sure that the voltage is not dropped and there is no open phase. -Make sure that the breaker is not tripped. -Make sure that the following connectors are connected properly and there is no wiring error (disconnection). (1)APU-CN601, CN602, CN603 (2)CPS-CN151 -Make sure that the fuses of the APU power ON unit(1FU,2FU) are not melted. If the fuse is melted, replace after conducting the following investigation (refer to *6). (1)Check that the cable between APU-CN603 and CPS-CN151 is not ground fault or short-circuited. (2)If there is nothing wrong with the cable between APU-CN603 and CPS-CN151, replace the control power supply unit.(refer to *3)
			Cable failure	-When the white LED of the control power supply unit SOURCE is ON, make sure that the following connectors are connected properly and there is no wiring error (disconnection). (1)CPS-CN152, CN155, CN158 (2)ACP-CN101 (3)ASF01-CN203, CN207 -Check whether the control power supply is not turned OFF by the external REMOTE signal. -Make sure that the red LED (12V) in the control power supply unit is OFF. When it is ON, make sure that there is no wiring error (ground fault or short circuit because of the wire damage) for the following connectors. (1)CPS-CN158 (2)ACP-CN101
		The control power supply unit is out of order.	control power supply unit failure	Check that all the red LEDs [+12V][+24V][FAN][OHT] of control power supply unit are OFF. If these LEDs are OFF, replace the control power supply unit. (refer to *3)

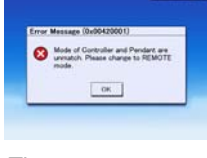
Screen status of programming pendant	7SEG LED for CPU board (ACP01)	Assumed status	Cause	Remedy
		The robot I/F board (AIF) is out of order.	AIF board failure	-Turn the power OFF then back ON. -If the error occurs again, remove all the boards installed in the CPU rack and reinstall them. -If the error occurs again though reinstall them, replace the AIF board. After replacing the board, load the CMOS.BIN file saved before the error occurs or the CMOSBK.BIN file saved in the automatic backup function in maintenance mode.
 The screen does not become bright and nothing is displayed.	‘P’	The programming pendant is out of order or malfunctions.	Programming pendant failure	-Turn the power OFF then back ON. -If the error occurs again, replace the programming pendant.
		The power supply is not provided from the control power supply unit to the programming pendant.	Cable failure	-Make sure that the cable between programming pendant and YRC1000 and the following connectors are connected properly and there is no wiring error (disconnection). (1)CPS-CN155 (2)ASF01-CN203, CN207 -After confirming the above and if there is no error, make sure that the red LED (24V) in the control power supply unit is OFF. When it is ON, make sure that there is no wiring error (ground fault or short circuit because of the wire damage) on the following connectors. (1)CPS-CN154, CN155, CN156, CN157 (2)ASF01-CN203, CN207 (3)SDCA-CN509 (4)CV-CN560 (5)-X81(Pendant cable)
		The JANCD-ASF01-E board is out of order.	ASF01 board failure	If the LEDs [+24V1][+24V2] of the JANCD-ASF01-E board are OFF, the JANCD-ASF01-E board is out of order. Replace the JANCD-ASF01-E board. (refer to *5)

Screen status of programming pendant	7SEG LED for CPU board (ACP01)	Assumed status	Cause	Remedy
 The screen remains unchanged from the above, or changes to the following screen in about 6 minutes.  The message "Controller <-> Pendant Connection Failed" is displayed.	Lights OFF	The power supply is not provided from the control power supply unit to the CPU unit.	Cable failure	Make sure that the following connectors are connected properly and there is no wiring error (disconnection). (1) CPS-CN158 (2) ACP-CN101
		The robot I/F board (AIF) is out of order or malfunctions.	AIF board failure	-Turn the power OFF then back ON. -If the error occurs again, remove all the boards installed in the CPU rack and reinstall them. -If the error occurs again though reinstall them, replace the AIF board. After replacing the board, load the CMOS.BIN file saved before the error occurs or the CMOSBK.BIN file saved in the automatic backup function in maintenance mode. (refer to *4)

Screen status of programming pendant	7SEG LED for CPU board (ACP01)	Assumed status		Cause	Remedy
 The screen remains unchanged from the above, or changes to the following screen in about 6 minutes.  The message "Controller <-> Pendant Connection Failed" is displayed.	All the LEDs ON ('8'+'.' ON)	LED1 for ACP01 is OFF.	ACP01 board is out of order or malfunctions.	ACP01 board failure	-Turn the power OFF then back ON. -If the error occurs again, remove all the boards installed in the CPU rack and reinstall them. -If the error occurs again though reinstall them, replace the ACP01 board. After replacing the board, remove the SD card inserted into the old ACP01 board and insert it into the new ACP01 board. (refer to *2) -If the error occurs again though reinstall them, replace the AIF board. After replacing the board, load the CMOS.BIN file saved before the error occurs or the CMOSBK.BIN file saved in the automatic backup function in maintenance mode.
			The optional circuit board or ACP02 circuit board inserted into the PCI slot of CPU rack is out of order or malfunctions.	Optional circuit board or ACP02 board failure	-Turn the power OFF then back ON. -If the error occurs again, remove the optional circuit board or ACP02 board installed in the CPU rack and reinstall them. -If the error occurs again though reinstall them, replace the optional circuit board or ACP02 board installed in CPU rack.
			The CPU rack (backboard) is out of order.	CPU rack failure	-Turn the power OFF then back ON. -If the error occurs again, replace the CPU rack (backboard). (refer to *10)

Screen status of programming pendant	7SEG LED for CPU board (ACP01)	Assumed status		Cause	Remedy
 The screen remains unchanged from the above, or changes to the following screen in about 6 minutes.  The message "Controller <-> Pendant Connection Failed" is displayed.	All the LEDs ON ('8'+'.' ON)	LED1 for ACP01 is ON.	The ACP01 board malfunctions.	ACP01 board failure	-Turn the power OFF then back ON. -If the error occurs again, remove all the boards installed in the CPU rack and reinstall them. -If the error occurs again though reinstall them, replace the ACP01 board. After replacing the board, remove the SD card inserted into the old ACP01 board and insert it into the new ACP01 board. (refer to *2)
			The system program cannot be read properly from the SD card in the ACP01 board.	SD card (inserted into ACP01 board) failure	-Turn the power OFF then back ON. -If the error occurs again, remove the SD card from the ACP01 board and reinstall it. -If the error occurs again though reinstall them, replace the SD card of ACP01 board. (refer to *8)
			The robot I/F board (AIF) is out of order or malfunctions.	AIF board failure	-Turn the power OFF then back ON. -If the error occurs again, remove all the boards installed in CPU rack and reinstall them. -If the error occurs again though reinstall them, replace the AIF board. After replacing the board, load the CMOS.BIN file saved before the error occurs or the CMOSBK.BIN file saved in the automatic backup function in maintenance mode. (refer to *4)

Screen status of programming pendant	7SEG LED for CPU board (ACP01)	Assumed status	Cause	Remedy
 The screen remains unchanged from the above, or changes to the following screen in about 6 minutes.  The message "Controller <-> Pendant Connection Failed" is displayed.	'0' or '1'	The ACP01 board is out of order or malfunctions.	ACP01 board failure	-Turn the power OFF then back ON. -If the error occurs again, remove all the boards installed in the CPU rack and reinstall them. -If the error occurs again though reinstall them, replace the ACP01 board. After replacing the board, remove the SD card inserted into the old ACP01 board and insert it into the new ACP01 board. (refer to *2)
		The system program cannot be read properly from the SD card in the ACP01 board.	SD card (inserted into ACP01 board) failure	-Turn the power OFF then back ON. -If the error occurs again, remove the SD card from the ACP01 board and reinstall it. -If the error occurs again, replace the SD card of ACP01 board. After replacing the card, load the CMOS.BIN file saved before the error occurs or the CMOSBK.BIN file saved in the automatic backup function in maintenance mode. (refer to *8)
		The specified data cannot be read properly from the SD card in the ACP01 board or an invalid value is specified.	SD card (inserted into ACP01 board) failure	-Turn the power OFF then back ON. -If the error occurs again, remove the SD card from the ACP01 board and reinstall it. -If the error occurs again, replace the SD card of ACP01 board. After replacing the card, load the CMOS.BIN file saved before the error occurs or the CMOSBK.BIN file saved in the automatic backup function in maintenance mode. (refer to *8)
		The robot I/F board (AIF) is out of order or malfunctions.	AIF board failure	-Turn the power OFF then back ON. -If the error occurs again, remove all the boards installed in the CPU rack and reinstall them. -If the error occurs again though reinstall them, replace the AIF board. After replacing the board, load the CMOS.BIN file saved before the error occurs or the CMOSBK.BIN file saved in the automatic backup function in maintenance mode. (refer to *4)
		The CPU rack (backboard) is out of order.	CPU rack failure	-Turn the power OFF then back ON. -If the error occurs again, replace the CPU rack (backboard). (refer to *10)

Screen status of programming pendant	7SEG LED for CPU board (ACP01)	Assumed status	Cause	Remedy
 The screen remains unchanged from the above, or changes to the following screen in about 6 minutes.	‘P’	A communication error has occurred between the ACP01 board and the programming pendant.	Cable failure	-Turn the power OFF then back ON. -Check the connection and insertion status of the following cables and connectors. (1)The looseness of the programming pendant connector and confirmation by touch. (2)The cable between the ACP01 board (CN105) and the programming pendant (3)The Ethernet cable of ACP01 board (CN105) (4)The connector of ACP01 board (CN105)
 The message "Controller <-> Pendant Connection Failed" is displayed.		The programming pendant is out of order or malfunctions.	Programming pendant failure	-Turn the power OFF then back ON. -If the error occurs again, replace the programming pendant.
		The communication IC of ACP01 board or its peripheral circuit is out of order.	ACP01 board failure	-Turn the power OFF then back ON. -If the error occurs again, remove all the boards installed in the CPU rack and reinstall them. -If the error occurs again though reinstall them, replace the ACP01 board. After replacing the board, remove the SD card inserted into the old ACP01 board and insert it into the new ACP01 board. (refer to *2)
		The robot I/F board (AIF) is out of order or malfunctions.	AIF board failure	-Turn the power OFF then back ON. -If the error occurs again, remove all the boards installed in the CPU rack and reinstall them. -If the error occurs again though reinstall them, replace the AIF board. After replacing the board, load the CMOS.BIN file saved before the error occurs or the CMOSBK.BIN file saved in the automatic backup function in maintenance mode. (refer to *4)
 The message "Mode of Controller and Pendant are unmatched. Change to (TEACH/PLAY/REMOTE) mode." is displayed.	‘P’	The mode key information held when a communication error occurred and the mode key information of the current programming pendant are unmatched.	Mode key operation of the programming pendant after a communication error occurred	-Change the mode key of the programming pendant to the mode that is displayed on the error message. Press the OK button, and then press the Connect button on the programming pendant startup screen.

Screen status of programming pendant	7SEG LED for CPU board (ACP01)	Assumed status	Cause	Remedy
 WindowsCE screen	'P'	The programming pendant is out of order or malfunctions.	IP address or subnet mask specification failure	The IP address or subnet mask of programming pendant may be wrong. Confirm and specify the IP address or subnet mask. The following are the confirmation procedure. (1)Turn ON the power while pressing "interlock+9+select". (2)After bleeping, leave hand. (3)After the message "Start was canceled" is displayed, press the OK button at the upper right. (4)Touch the lower left of screen with the pen to display the task bar and select START. (5)After the start menu is displayed, select [Settings] → [Control Panel] → [Network and Dial-up Connections] → [SMSC911X17]. (6)IP address specification screen is displayed and then confirm the following are set. IP Address 10. 0. 0. 4. Subnet Mask 255.255.255. 0 Default Gateway . . . Also, confirm that Specify an IP address is checked..
			Data failure	The file stored in the programming pendant is not in the specified area. Perform "chapter3 Programming Pendant Setup" of the YRC1000 SETUP PROCEDURE MANUAL. Use the setup data that was created with the procedure in <i>chapter 12 "Program Upload Function"</i> . If there is no setup data or the YRC1000 SETUP PROCEDURE MANUAL is missing, contact your YASKAWA representative.
Controller<-> Pendant Connection Failed.		A communication error has occurred between the ACP01 board and the programming pendant.	Cable failure	-Turn the power OFF then back ON. -Check the connection and insertion status of the following cables and connectors. (1)The looseness of the programming pendant connector and confirmation by touch. (2)The cable between the ACP01 board (CN105) and the programming pendant (3)The Ethernet cable of ACP01 board (CN105) (4)The connector of ACP01 board (CN105)
		The programming pendant is out of order or malfunctions.	Programming pendant failure	-Turn the power OFF then back ON. -If the error occurs again, replace the programming pendant.

Screen status of programming pendant	7SEG LED for CPU board (ACP01)	Assumed status	Cause	Remedy
Controller<-> Pendant Connection Failed.	'P'	The programming pendant is out of order or malfunctions.	Programming pendant broken	The programming pendant may not be operating correctly because the file stored in the programming pendant is not in the specified area. Perform chapter 3 "Programming Pendant Setup" of the YRC1000 SETUP PROCEDURE MANUAL. Use the setup data that was created with the procedure in <i>chapter 12 "Program Upload Function"</i> . If there is no setup data or the YRC1000 SETUP PROCEDURE MANUAL is missing, contact your YASKAWA representative. If the failure occurs again, replace the programming pendant.
		The communication IC of ACP01 board or its peripheral circuit is out of order.	ACP01 board failure	-Turn the power OFF then back ON. -If the error occurs again, remove all the boards installed in the CPU rack and reinstall them. -If the error occurs again though reinstall them, replace the ACP01 board. After replacing the board, remove the SD card inserted into the old ACP01 board and insert it into the new ACP01 board. (refer to *2)
		The specified data cannot be read properly from the SD card in the ACP01 board or an invalid value is specified.	SD card (inserted into ACP01 board) failure	-Turn the power OFF then back ON. -If the error occurs again, remove the SD card from the ACP01 board, and then reinstall it. -If the error occurs again after reinstalling it, replace the SD card of the ACP01 board.
		The robot I/F board (AIF) is out of order or malfunctions.	AIF board failure	(1) Turn the power OFF then back ON. (2) If the error occurs again, remove all the boards installed in CPU rack and reinstall them. (3) If the error occurs again though reinstall them, replace the AIF board. After replacing the board, load the CMOS.BIN file saved before the error occurs or the CMOSBK.BIN file saved in the automatic backup function in maintenance mode. (refer to *4)
		The programming pendant is out of order or malfunctions.	OS (written in the programming pendant) failure	(1) Turn the power OFF then back ON. (2) If the error occurs again, write the YRC1000 OS (WindowsCE) to the programming pendant For the writing procedure, refer to "chapter3 Programming Pendant Setup" of the YRC1000 SETUP PROCEDURE MANUAL.
Pendant main application start failed.		The programming pendant is out of order or malfunctions.	OS (written in the programming pendant) failure	(1) Turn the power OFF then back ON. (2) If the error occurs again, write the YRC1000 OS (WindowsCE) to the programming pendant For the writing procedure, refer to "chapter3 Programming Pendant Setup" of the YRC1000 SETUP PROCEDURE MANUAL.

Screen status of programming pendant	7SEG LED for CPU board (ACP01)	Assumed status	Cause	Remedy
Software upgrade failed. Turn the YRC1000 power OFF and then ON.	'1'	Creating the media for upgrade is failed.	SD card (created for upgrade) failure	(1) Turn the power OFF then back ON. (2) If the error occurs again, perform the following procedure. A) Delete files in the SD card. B) Perform "chapter 2.2 Preparing SD card/USB for Upgrade" of the YRC1000 UPGRADE PROCEDURE MANUAL. C) Perform the upgrade operation. If the error occurs again though, replace the SD card.
			USB memory (created for upgrade) failure	(1) Turn the power OFF then back ON. (2) If the error occurs again, perform the following procedure. A) Delete files in the SD card. B) Perform "chapter 2.2 Preparing SD card/USB for Upgrade" of the YRC1000 UPGRADE PROCEDURE MANUAL C) Perform the upgrade operation. If the error occurs again though, replace the SD card.

Screen status of programming pendant	7SEG LED for CPU board (ACP01)	Assumed status	Cause	Remedy
Auto upgrade failed.	'P'	There is no file necessary for the programming pendant or it is out of order.	Programming pendant failure	(1) Turn the power OFF then back ON. (2) If the error occurs again, perform "chapter3 Programming Pendant Setup" of the YRC1000 SETUP PROCEDURE MANUAL.
Controller <-> pendant communication has been cut off.		A communication error has occurred between the ACP01 board and the programming pendant.	Cable failure	-Turn the power OFF then back ON. -Check the connection and insertion status of the following cables and connectors. (1)The looseness of the programming pendant connector and confirmation by touch. (2)The cable between the ACP01 board (CN105) and the programming pendant (3)The Ethernet cable of ACP01 board (CN105) (4)The connector of ACP01 board (CN105)
Controller <-> Pendant disconnect. Start reconnect.		A communication error has occurred between the ACP01 board and the programming pendant.	Cable failure	-If the programming pendant does not start up properly after reconnection, turn the power OFF then back ON. -If the error occurs again, check the connection and insertion status of the following cables and connectors. (1)The looseness of the programming pendant connector and confirmation by touch. (2)The cable between the ACP01 board (CN105) and the programming pendant (3)The Ethernet cable of ACP01 board (CN105) (4)The connector of ACP01 board (CN105)
YE_ApplInstall.exe or unzip.dll file isn't found.	'1'		SD card or USB memory (created to install PP customized application) failure	Perform "chapter 8.3 Installation" of OPTIONS INSTRUCTIONS FOR PROGRAMMING PENDANT CUSTOMIZATION FUNCTION.

Screen status of programming pendant	7SEG LED for CPU board (ACP01)	Assumed status	Cause	Remedy
 Character strings are displayed on the white screen and remain unchanged for 5 minutes or longer.	Either of '2' - '9', 'b' and 'C'	The ACP01 board is out of order or malfunctions.	ACP01 board failure	-Turn the power OFF then back ON. -If the error occurs again, remove all the boards installed in the CPU rack and reinstall them. -If the error occurs again though reinstall them, replace the ACP01 board. After replacing the board, remove the SD card inserted into the old ACP01 board and insert it into the new ACP01 board. (refer to *2)
		The system program of SD card that is inserted into ACP01 board cannot be read properly.	SD card (inserted into ACP01 board) failure	-Turn the power OFF then back ON. -If the error occurs again, remove the SD card from the ACP01 board and reinstall it. -If the error occurs again, replace the SD card of ACP01 board. After replacing it, load the CMOS.BIN file saved before the error occurs or CMOSBK.BIN file saved in the automatic backup function in maintenance mode. (refer to *8)
		The specified data cannot be read properly from the SD card in the ACP01 board or an invalid value is specified.	SD card (inserted into ACP01 board) failure	-Turn the power OFF then back ON. -If the error occurs again, remove the SD card from the ACP01 board and reinstall it. -If the error occurs again, replace the SD card of ACP01 board. After replacing it, load the CMOS.BIN file saved before the error occurs or CMOSBK.BIN file saved in the automatic backup function in maintenance mode. (refer to *8)
		The robot I/F board (AIF) is out of order or malfunctions.	AIF board failure	-Turn the power OFF then back ON. -If the error occurs again, remove the AIF board from the CPU rack and reinstall it. -If the error occurs again though reinstall them, replace the AIF board. After replacing the board, load the CMOS.BIN file saved before the error occurs or the CMOSBK.BIN file saved in the automatic backup function in the maintenance mode. (refer to *4)

Screen status of programming pendant	7SEG LED for CPU board (ACP01)	Assumed status	Cause	Remedy
 Character strings are displayed on the white screen and remain unchanged for 5 minutes or longer.	Either of '2' - '9', 'b' and 'C'	The programming pendant is out of order or malfunctions.	Programming pendant failure	-Turn the power OFF then back ON. -If the error occurs again, replace the programming pendant.
		The board or the ACP02 board inserted into the PCI slot of CPU rack is out of order or malfunctions.	Optional circuit board or ACP02 board failure	-Turn the power OFF then back ON. -If the error occurs again, remove the optional circuit board installed in the CPU rack or the ACP02 board and reinstall it. -If the error occurs again though reinstall it, replace the optional circuit board installed in the CPU rack or the ACP02 board.
		The CPU rack (backboard) is out of order.	CPU rack failure	-Turn the power OFF then back ON. -If the error occurs again, replace the CPU rack (backboard). (refer to *10)
	'E' or 'F'	The specified data cannot be read properly from the SD card in the ACP01 board or an invalid value is specified.	SD card (inserted into the ACP01 board) failure	Turn the power OFF then back ON. -If the error occurs again, remove the SD card from the ACP01 board and reinstall it. -If the error occurs again, replace the SD card of ACP01 board. After replacing it, load the CMOS.BIN file saved before the error occurs or CMOSBK.BIN file saved in the automatic backup function in maintenance mode. (refer to *8)
		The robot I/F board (AIF) is out of order or malfunctions.	AIF board failure	-Turn the power OFF then back ON. -If the error occurs again, remove the AIF board from the CPU rack and reinstall it. -If the error occurs again though reinstall them, replace the AIF board. After replacing the board, load the CMOS.BIN file saved before the error occurs or the CMOSBK.BIN file saved in the automatic backup function in maintenance mode. (refer to *4)
		The programming pendant is out of order or malfunctions.	Programming pendant failure	-Turn the power OFF then back ON. -If the error occurs again, replace the programming pendant.

Screen status of programming pendant	7SEG LED for CPU board (ACP01)	Assumed status	Cause	Remedy
 Character strings are displayed on the white screen and remain unchanged for 5 minutes or longer.	'P'	A communication error has occurred between the ACP01 board and the programming pendant.	Cable failure	-Turn the power OFF then back ON. -Check the connection and insertion status of the following cables and connectors. (1)The looseness of the programming pendant connector and confirmation by touch. (2)The cable between the ACP01 board (CN105) and the programming pendant (3)The Ethernet cable of ACP01 board (CN105) (4)The connector of ACP01 board (CN105)
		The programming pendant is out of order or malfunctions.	Programming pendant failure	-Turn the power OFF then back ON. -If the error occurs again, replace the programming pendant.
		The communication IC of ACP01 board or its peripheral circuit is out of order.	ACP01 board failure	-Turn the power OFF then back ON. -If the error occurs again, remove all the boards installed in CPU rack and reinstall them. -If the error occurs again though reinstall them, replace the ACP01 board. After replacing the board, remove the SD card inserted into the old ACP01 board and insert it into the new ACP01 board. (refer to *2)

Screen status of programming pendant	7SEG LED for CPU board (ACP01)	Assumed status		Cause	Remedy
 When the power is turned ON, the maintenance mode starts though the mode is not selected and the alarm "Memory battery weak" is displayed."	'F'	The data in the robot I/F board (AIF01) is invalid value.	The battery malfunctions.	Battery failure	-Turn the power OFF then back ON. -Check the connection and insertion status of the AIF board (CN114/BAT) connector. -When the LED of the AIF board (BAT) is ON, replace the battery. After replacing the battery, load the CMOS.BIN file saved before the error occurs or the CMOSBK.BIN file saved in the automatic backup function in maintenance mode. (refer to *1)
			The IC storing the data is out of order.	AIF board failure	-Turn the power OFF then back ON. -If the error occurs again, remove the AIF board from the CPU rack and reinstall it. -If the error occurs again though reinstall them, replace the AIF board. After replacing the board, load the CMOS.BIN file saved before the error occurs or the CMOSBK.BIN file saved in the automatic backup function in maintenance mode. (refer to *4)
 When the power is turned ON, the maintenance mode starts though the mode is not selected.		The robot I/F board (AIF) is out of order or malfunctions.		AIF board failure	-Turn the power OFF then back ON. -If the error occurs again, remove the AIF board from the CPU rack and reinstall it. -If the error occurs again though reinstall them, replace the AIF board. After replacing the board, load the CMOS.BIN file saved before the error occurs or the CMOSBK.BIN file saved in the automatic backup function in maintenance mode. (refer to *4)
		The SD card data in the ACP01 board is invalid value.		SD card (inserted into the ACP01 board) failure	-Turn the power OFF then back ON. -If the error occurs again, remove the SD card from the ACP01 board and reinstall it. -If the error occurs again, replace the SD card of ACP01 board. After replacing it, load the CMOS.BIN file saved before the error occurs or CMOSBK.BIN file saved in the automatic backup function in maintenance mode. (refer to *8)

*1: Replacing the battery

For the replacement procedure, refer to *chapter 5.1.1.3 "Replacing the Battery"*.

*2: Replacing the ACP01 board

For the replacement procedure, refer to *chapter 5.1.1.1 "Replacing the CPU Board (JANCD-ACP01-E)"*.

*3: Replacing the control power supply unit

For the replacement procedure, refer to *chapter 5.1.7 "Replacing the Control Power Supply Unit (CSRA-CPS01K□)"*.

*4: Replacing the robot I/F board (AIF)

For the replacement procedure, refer to *chapter 5.1.1.2 “Replacing the Robot I/F Board (JZNCD-AIF01-□E)”* .

*5: Replacing the safety circuit board

For the replacement procedure, refer to *chapter 5.1.3 “Replacing the Safety Circuit Board (JANCD-ASF01-E)”* .

*6: Replacing the fuse of the power supply contactor unit (APU)

For the replacement procedure, refer to *chapter 5.1.8.1 “Power Supply Contactor Unit”* .

*8: Replacing the SD card of the ACP01 board

For the replacement procedure, refer to *chapter 5.1.1.4 “Replacing the SD Card”* .

*9: CMOS.BIN load or CMOSBK.BIN load

When load the CMOS.BIN file to restore, refer to *chapter 9.2.2*

“CMOS.BIN Load” of the YRC1000 INSTRUCTIONS.

When load the CMOSBK.BIN file saved in the automatic backup function to restore, refer to *chapter 9.4 “Loading the Backup Data from the SD card”* of the YRC1000 INSTRUCTIONS.

*10: Replacing the CPU rack

Replace it in the following procedure.

1. Turn OFF the power of the YRC1000.
2. Remove all wires from the CPU rack. For details, refer to *chapter 5.1.1 “Replacing Parts of the CPU Unit”* .
3. Remove the screws fixed in the CPU rack.
4. Replace the CPU rack with a new one.
5. Fix the screws firmly to the CPU rack.
6. Install all the wires removed at the above procedure 2.
7. Set the rotary switch and short pins on each circuit board in the CPU rack to the same value as the old board.



Be sure to back up the data after changing the setting or teaching in case the board is out of order. For the backup procedure, refer to *chapter 9 “System Backup”* of the YRC1000 INSTRUCTIONS.

14 Troubleshooting a Communication Error between the CPU Board and the Servo Control Board

If a communication error occurs between the CPU board and the servo control board, or the CPU board and the safety circuit board, the alarm of the board related to the communication error occurs. Especially in the robot coordinate system that uses multiple boards such as the servo control board or the safety circuit board, many alarms may occur, and it may take time to identify the real cause. Therefore, enabling the following parameters will make recovery operation easier.

This function is available in the version YAS2.80.00A-00 or later.

Parameter	Contents	Setting value
S2C1503	Alarm display processing improvement function	1

CPU board : ACP01-E

Servo control board : SDCA01

Robot interface board : AIF01-□E

Safety board : ASF01-E

■ AL-0999

PCI-e communication error [board type]

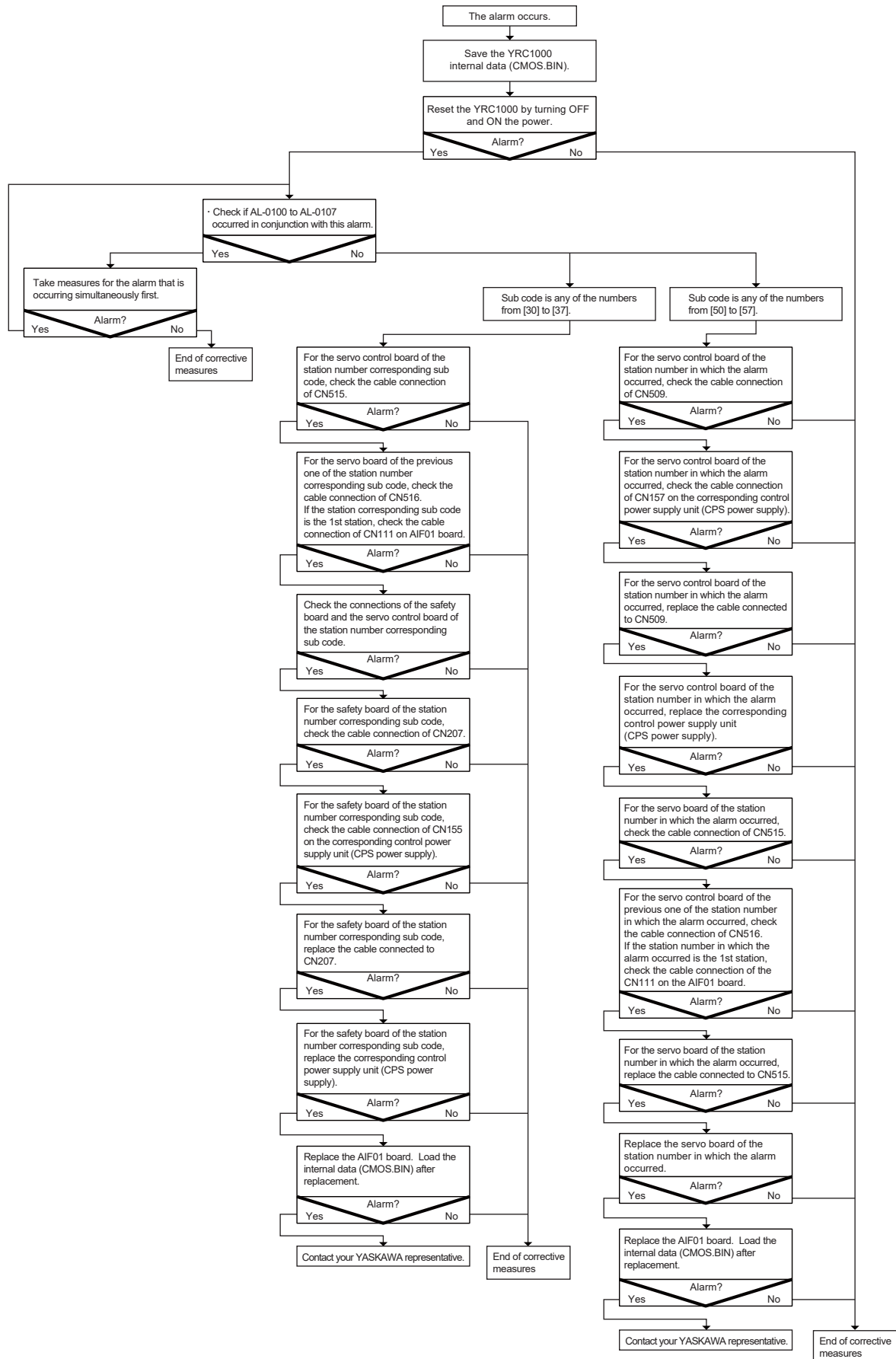
The YRC1000 software mutually monitors that the PCI-e communication between the CPU board and the servo control board, or the CPU board and the safety board is performed correctly, however, this alarm occurs if an error of watchdog data is detected on the CPU board side.

Sub Code: A Station Number of the Safety Board or the Servo Control Board is Output.

[30] - [37]: 1st - 8th of the safety board

[50] - [57]: 1st - 8th of the servo control board

14 Troubleshooting a Communication Error between the CPU Board and the Servo Control Board



■ **AL-0100 / AL-0101 / AL-0102 / AL-0103 / AL-0104 / AL-0105 / AL-0106 / AL-0107**

Communication Error between CPU Board and Servo Control Board (SDCA01) [Cause]

The YRC1000 software mutually monitors that the PCI-e communication between the CPU board and the servo control board is performed correctly, however, this alarm occurs if an error of communication data is detected on the CPU board side.

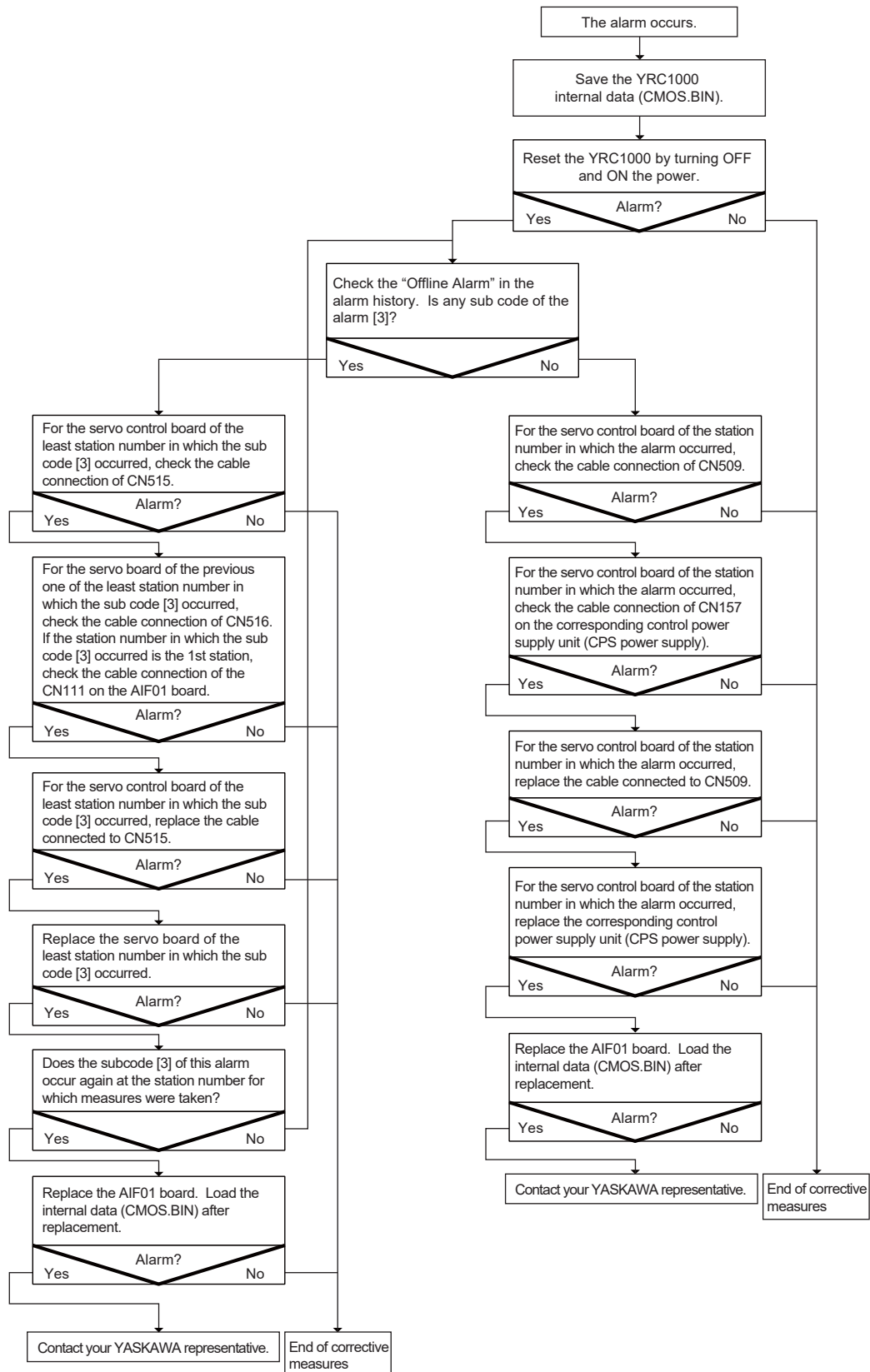
The least significant digit of the alarm signifies the station number of the servo control board. Therefore, AL-0100 is the 1st station of the servo control board, AL-0101 is the 2nd station of the servo control board, ..., and AL-0107 is the 8th station of the servo control board.

Sub Code: Error Cause Data No.

[1]: Counter value received from the servo control board is invalid.

[3]: Counter value cannot be received from the servo control board.

14 Troubleshooting a Communication Error between the CPU Board and the Servo Control Board



14	Troubleshooting a Communication Error between the CPU Board and the Servo Control Board
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■ **AL-0110**

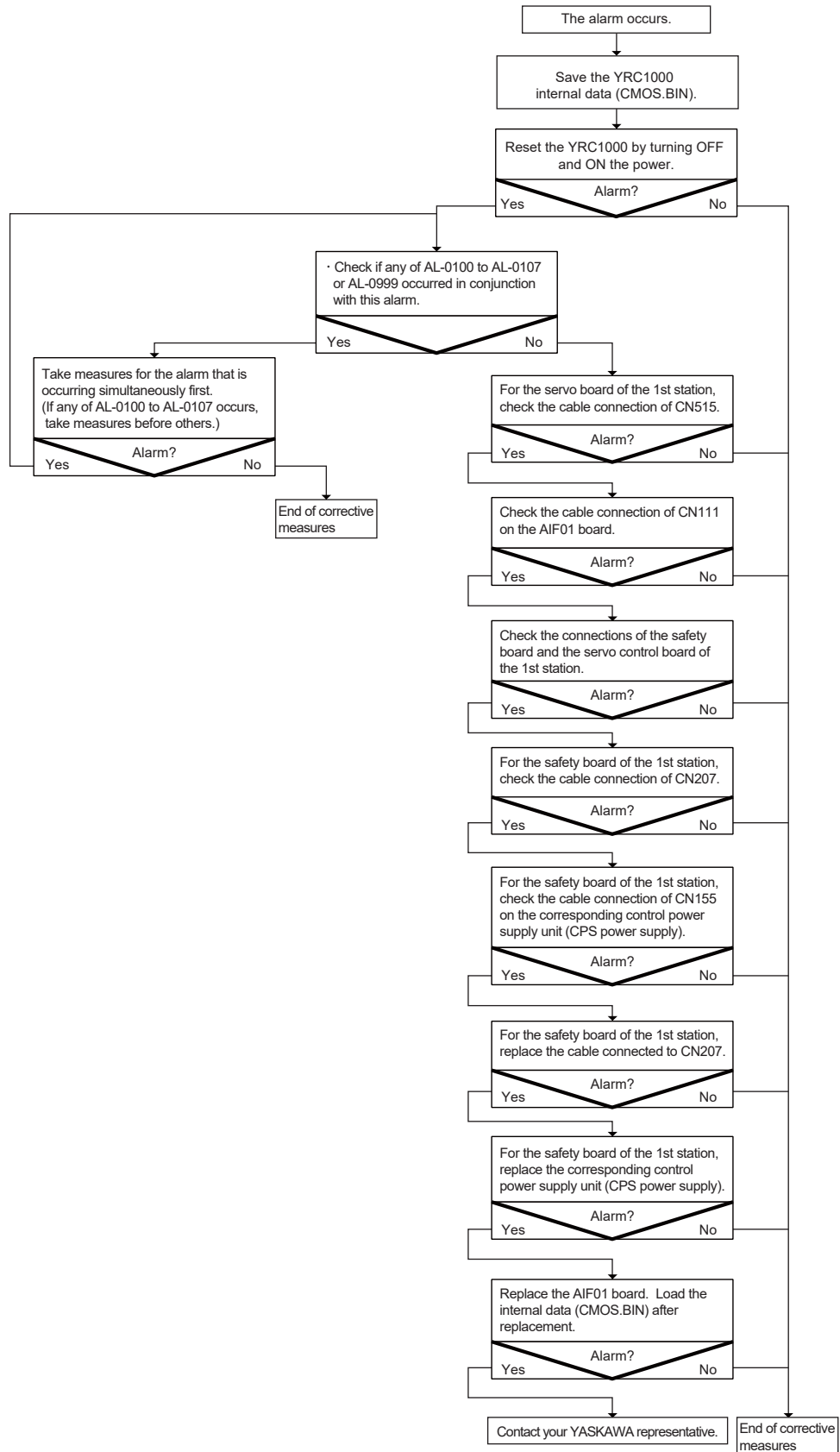
Communication Error (ASF) [Cause]

The YRC1000 software mutually monitors that the PCI-e communication between the CPU board and the 1st station of the safety board is performed correctly, however, this alarm occurs if an error of communication data is detected on the CPU board side.

Sub Code: Error Cause Data No.

[1]: Counter value received from the safety board does not change for a certain period of time.

14 Troubleshooting a Communication Error between the CPU Board and the Servo Control Board



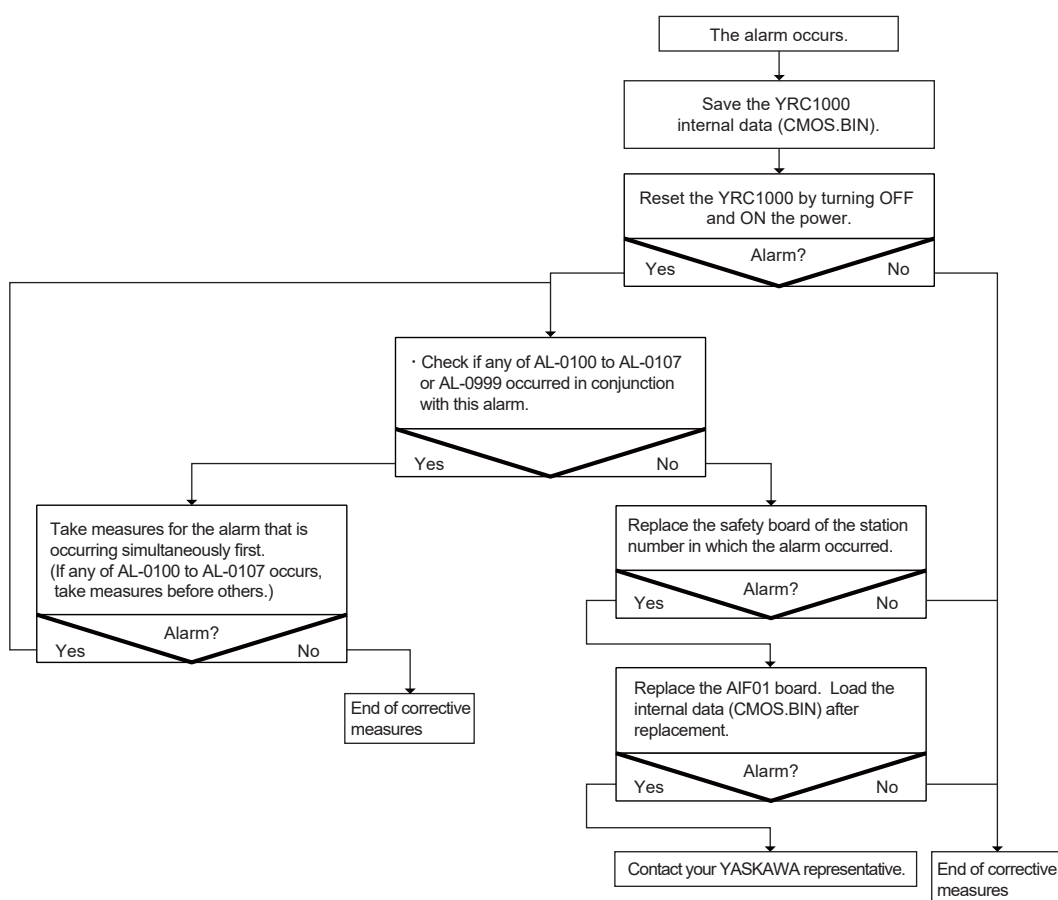
■ **AL-0920 / AL-0921 / AL-0922 / AL-0923 / AL-0924 / AL-0925 / AL-0926 / AL-0927**

Watchdog Timer Error (MSF#*)

This alarm occurs if an error of the watchdog is detected in the YRC1000. If this alarm occurs, the control of the safety board stops, and the YRC1000 can safely stop the system.

The least significant digit of the alarm signifies the station number of the safety board. Therefore, AL-0920 is the 1st station of the safety board, AL-0921 is the 2nd station of the safety board, ..., and AL-0927 is the 8th station of the safety board.

Sub Code: None



■ **AL-0980 / AL-0981 / AL-0982 / AL-0983 / AL-0984 / AL-0985 / AL-0986 / AL-0987**

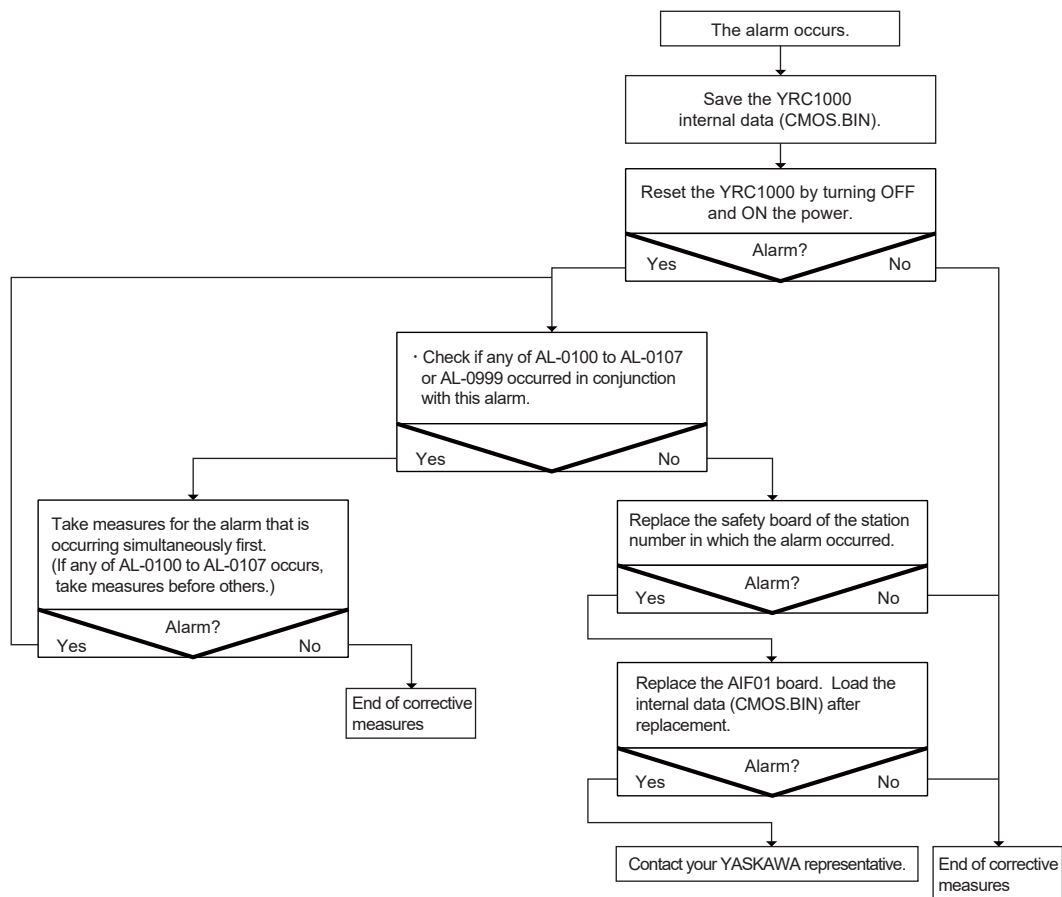
Watchdog Timer Error (FSF#*)

This alarm occurs if an error of the watchdog is detected in the YRC1000. If this alarm occurs, the control of the safety board stops, and the YRC1000 can safely stop the system.

The least significant digit of the alarm signifies the station number of the safety board. Therefore, AL-0980 is the 1st station of the safety board, AL-0981 is the 2nd station of the safety board, ..., and AL-0987 is the 8th station of the safety board.

This alarm occurs only when the optional function “functional safety function” is valid.

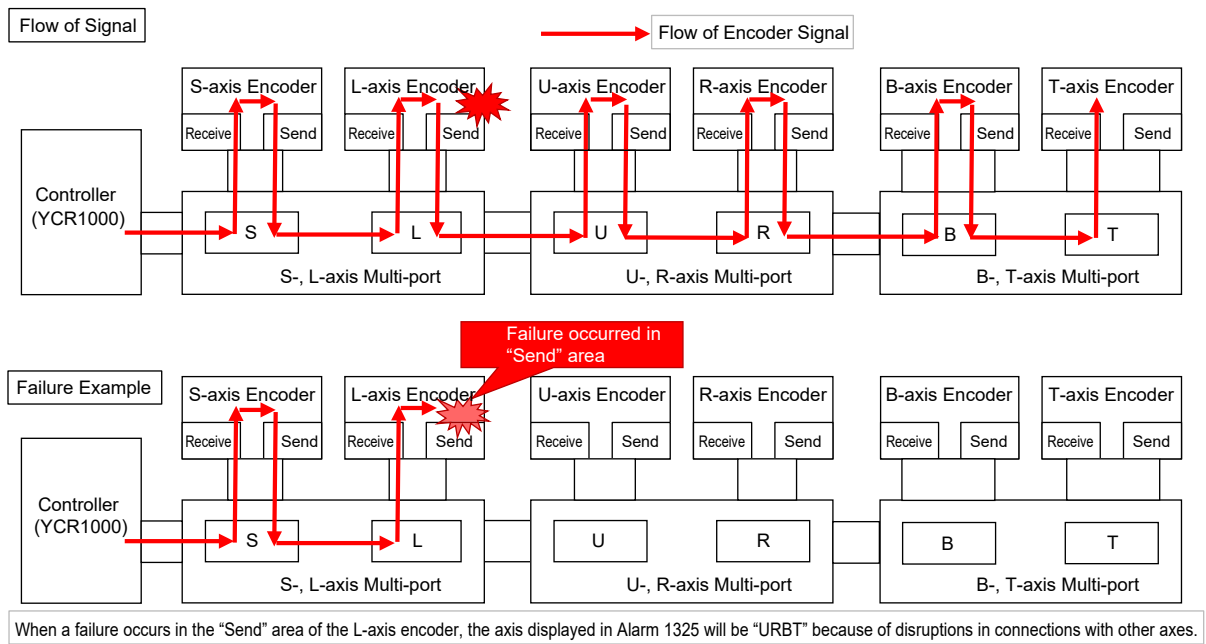
Sub Code: None



15 Procedures When Alarm 1325 and 1377 Occur

The encoder detects the position of each axis motor of YRC1000 using the communication method shown in the following figure. Since the encoder signal passes through the encoders of each axis, a failure may have occurred at an axis before the axis displayed depending on the area where the encoder failed. For example, when a failure occurs in the "Send" area of the L-axis encoder, communications with U-, R-, B-, and T-axis are lost. Even though the "URBT"-axes is displayed on the Alarm 1325 Communication Error (Encoder), the failure occurred in the L-axis.

Fig. 15-1: Flow of YRC1000 Encoder Signal



Follow the procedures in the table below if Alarm 1325 or Alarm 1377 occurs.

This table shows the displayed axes vertically. Confirmation items are shown horizontally.

In this table, the numbers indicate the recommended order for procedures. This order is determined based on the most likely cause of failure and ease of replacement.

Table 15-1: Order of Procedures when Alarm 1325 or 1377 Occur (1 of 4 sheet)

Alarm		Confirmation Item				
1325	1377	①	②	③	④	⑤
Displayed Axis	Displayed Axis	Cables and connectors between the controller and manipulator (Encoder power supply board, manipulator cable)	S-, L-axis Multi-port	Cables and connectors between S-axis encoder and S-, L-axis multi-port	S-axis Encoder	Cables and connectors between L-axis encoder and S-, L-axis multi-port
SLURBT	S	1	2	3	4	
LURBT	L		4	5	3	1
URBT	U					5
RBT	R					
BT	B					
T	T					

Table 15-1: Order of Procedures when Alarm 1325 or 1377 Occur (2 of 4 sheet)

Alarm		Confirmation Item				
1325	1377	⑥	⑦	⑧	⑨	⑩
Displayed Axis	Displayed Axis	L-axis Encoder	Cables and connectors between S-, L-axis multi-port and U-, R-axis multi-port	U-, R-axis Multi-port	Cables and connectors between U-axis encoder and U-, R-axis multi-port	U-axis Encoder
SLURBT	S					
LURBT	L	2				
URBT	U	6	1	4	2	3
RBT	R			4	5	3
BT	B					
T	T					

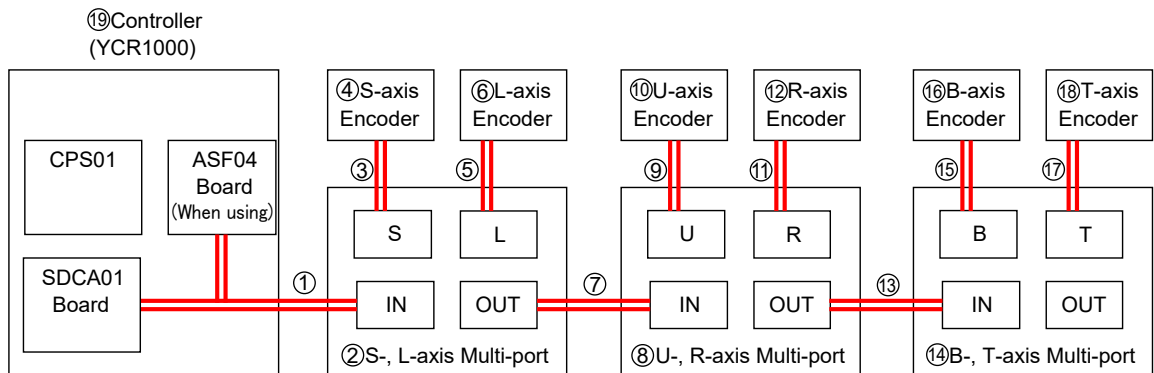
Table 15-1: Order of Procedures when Alarm 1325 or 1377 Occur (3 of 4 sheet)

Alarm		Confirmation Item				
1325	1377	⑪	⑫	⑬	⑭	⑮
Axis Display	Axis Display	Cables and connectors between R-axis encoder and U-, R-axis multi-port	R-axis Encoder	Cables and connectors between U-, R-axis multi-port and B-, T-axis multi-port	B-, T-axis Multi-port	Cables and connectors between B-axis encoder and B-, T-axis multi-port
SLURBT	S					
LURBT	L					
URBT	U					
RBT	R	1	2			
BT	B	5	6	1	4	2
T	T				4	5

Table 15-1: Order of Procedures when Alarm 1325 or 1377 Occur (4 of 4 sheet)

Alarm		Confirmation Item				
1325	1377	⑯	⑰	⑱	⑲	① ③ ⑤ ⑦ ⑨ ⑪ ⑬ ⑮ ⑰
Axis Display	Axis Display	B-axis Encoder	Cables and connectors between T-axis encoder and B-, T-axis multi-port	T-axis Encoder	Boards in YRC1000 • SDCA01 board • CPS01 • ASF04 board (When using)	+5V line ground fault or short circuit
SLURBT	S				6	5
LURBT	L				6	
URBT	U				7	
RBT	R				6	
BT	B	3			7	
T	T	3	1	2	6	

Fig. 15-2: Encoder Configuration Diagram



Numerics

10 A fuse	5-86
24VDC fuse for I/O.....	5-54
7 SEG-LED indicator	11-3

A

absolute data allowable range error alarm	6-15
AC control power supply fuse.....	5-89, 5-91, 5-92, 5-94, 5-95, 5-96, 5-98
AC Control power supply protective fuse	5-53
Alarm	8-1
ALARM HISTORY	2-3
Alarm History	7-22
Alarm History Window	7-22
Alarm level	8-1
ANALOG MONITOR	2-3
ARC WELDING	2-5
ARM CONTROL	2-3
AUTO BACK SET	2-4
Axis data	8-3

B

backside duct fan	3-4, 5-83, 5-84, 5-89, 5-91, 5-92, 5-93, 5-95, 5-96, 5-97
Backside duct fan and fan for the heat exchanger inspection	3-1
Battery	5-83, 5-84
battery	5-89, 5-91, 5-92, 5-93, 5-95, 5-96, 5-97
Battery inspection	3-1
Battery inspections.....	3-8
Binary data.....	8-3
BYTE	2-2

C

Calibrating operation	6-4
Changing a User ID.....	2-9
Changing the Absolute Data	6-7
Changing the monitor items	7-31
Changing the security mode.....	2-6
Circuit Breaker (QF1) Check	3-10
Circuit breaker inspection	3-1
Clearing Absolute Data.....	6-8
Clearing the alarm history	7-25
Clearing the I/O message history.....	7-27
CMOSBK.BIN.....	12-10
COMMAND POSITION	2-3
COMMAND TO ALL APPLICATIONS	2-5
Concurrent I/O	9-19
Control group data	8-3
control power supply unit	5-83, 5-84, 5-90, 5-92, 5-93, 5-94, 5-96, 5-97, 5-98
control power supply unit fan.....	5-89, 5-91, 5-92, 5-93, 5-95, 5-96, 5-97
converter.....	5-83, 5-84, 5-89, 5-91, 5-93, 5-94, 5-95, 5-97, 5-98
Cooling fan inspections	3-3

Index

CPU board	5-83, 5-84, 5-89, 5-91, 5-92, 5-94, 5-95, 5-96, 5-98
CPU unit	5-83, 5-84, 5-89, 5-91, 5-93, 5-94, 5-95, 5-97, 5-98
CREATE NEW JOB	2-2
Creating a check program	4-4
CURRENT POSITION	2-3
Current Position	7-29
Current Position Window	7-29
CYCLE	2-2

D

DATE/TIME	2-4
DC24V fuse for I/O	5-89, 5-91, 5-92, 5-93, 5-95, 5-96, 5-97
Decimal data	8-3
DELETE	2-3
DEVICE	2-3
DISPLAY COLOR COND.	2-4
Display of alarm details	8-5
Display of the drop value check window	7-35
DISPLAY SETUP	2-5
Displaying and releasing alarm	8-2
DOUBLE	2-2
DROP AMOUNT	2-3

E

Editing Mode	2-1
Emergency stop button inspection	3-1
Emergency stop button inspections	3-7
Enable switch inspection	3-1
Enable switch inspections	3-7
ENCODER MAINTENANCE	2-4
encoder power supply fuse	5-89, 5-91, 5-92, 5-94, 5-95, 5-96, 5-98
ENCODER ROTATE SUM	7-30
ENCODER TEMPERATURE	7-30
ENERGY SAVING FUNCTION	2-4
Equipment Configuration	1-1
Error	9-1
Error message	9-1
ERROR PULSE	7-30
EX.MEMORY	2-3
exterior fan for heat exchanger	5-89, 5-91, 5-92, 5-93, 5-95, 5-96, 5-97
External Input Detail Window	7-7
External Input Window	7-7
External memory equipment	9-14
External Output Detail Window	7-8
External Output Window	7-8

F

fan control relay	5-98
FEEDBACK PULSE	7-30
FEEDBACK SPEED	7-30
filter for heat exchanger	5-89, 5-91, 5-92, 5-93, 5-95, 5-96, 5-97
filter kit for heat exchanger	5-89, 5-91, 5-92, 5-93, 5-95, 5-96, 5-97

Index

FOLDER	2-3
FUNCTION COND.	2-4
FUNCTION ENABLE.....	2-4

G

GENERAL.....	2-5
General-purpose I/O board	5-54
general-purpose I/O board .. 5-83, 5-84, 5-89, 5-91, 5-93, 5-94, 5-95, 5-96, 5-98	
general-purpose I/O board fuse.....	5-83, 5-84
glass-tube fuse	5-86
GRP COMBINATION	2-4

H

HANDLING	2-5
heat exchanger.....	5-83, 5-84
Heat exchanger filter inspection	3-1
HOME POSITION	2-3
Home position	6-3
Home position calibration.....	6-3
Home position data correction	6-12

I

I/O message history	7-26
I/O message history window	7-26
I/O MSG HISTORY	2-3
IN 1 TURN POSITION.....	7-30
IN/OUT	2-2
Independent control function (optional)	8-4
Individual Window of the System Monitoring Time Display	7-19
INITIALIZE	2-3
Initializing the System Monitoring Time Display.....	7-20
Input power supply check	3-10
Input/Output Status	7-2
Inspections.....	3-1
INTEGER.....	2-2
INTERFERENCE	2-3
interior fan for heat exchanger..... 5-89, 5-91, 5-92, 5-93, 5-95, 5-96, 5-97	
inverter unit	5-83, 5-84, 5-89, 5-91, 5-93, 5-94, 5-95, 5-97, 5-98

J

JOB	2-2
JOB CAPACITY.....	2-2
Job data simplified restoration function	10-1
Job defined data	9-9
JOB EDIT (PLAY)	2-2
JOG COND.	2-4
JOG KEY ALLOC.....	2-4

Index

K

KEY ALLOCATION.....	2-4
---------------------	-----

L

Lead cable check.....	3-10
Lead cables inspection.....	3-1
LED indicator	11-6
LED indicator on ACP01 board	11-2
LED indicator on circuit board	11-1
LED indicator on robot I/F circuit board	11-2
LIMIT RELEASE	2-3
line voltage	3-8
LOAD	2-3
LOCAL VARIABLE	2-2

M

Main CPU SD Card ID	2-11
Maintenance mode	9-20
Major alarm.....	8-1
Management Mode.....	2-1
Manipulator model	7-1
Manipulator position posture of manipulator	6-9
MANIPULATOR TYPE	2-3
MASTER JOB	2-2
MAX. TORQUE	7-30
micro fuse.....	5-86
Minor alarm.....	8-1
mode switch.....	3-7
Modification of the Signal Name.....	7-16
Modifying the output status	7-4
MONITORING TIME	2-3
MOTOR ABSOLUTE	7-30
M-SAFETY SIGNAL ALLOC	2-4
Multiple SERVOPACK system	8-3

O

One time manage mode	2-1
One time management mode.....	2-8
Open phase check.....	3-10
OPERATE COND.	2-4
OPERATE ENABLE.....	2-4
Operation Mode.....	2-1
Outline of alarm	8-1
OVERRUN&S-SENSOR	2-3

P

PALY EDIT JOB LIST	2-2
--------------------------	-----

Index

PARAMETER.....	2-4
Particular error message	9-22
PLAYBACK COND.....	2-4
PM	2-4
POSITION (BASE).....	2-2
POSITION (ROBOT)	2-2
POSITION (ST)	2-2
position data when power is turned ON/OFF	7-28
Position deviation check using the check program	6-10
Power flow	1-11
POWER ON/OFF POS.....	2-3
Power ON/OFF position window.....	7-28
Power supply contactor unit	5-53
power supply contactor unit	5-83, 5-84, 5-89, 5-91, 5-93, 5-94, 5-95, 5-97, 5-98
power supply contactor unit fuse	5-83, 5-84
power supply for manipulator fan	5-98
Power supply inspection	3-1
Power supply voltage confirmation	3-8
Preparation before replacing parts	4-1
Procedure after the alarm	6-18
Program upload function.....	12-1
Program upload procedure	12-2
programming pendant	5-90, 5-92, 5-93, 5-94, 5-96, 5-97, 5-98

R

REAL.....	2-2
Rechecking job data.....	10-12
Recommended spare parts	5-87
Registering Individual axes	6-6
regular inspections.....	3-1
Relay number search	7-13
Replacing parts.....	5-1
Replacing parts of the CPU unit	5-5
Replacing the battery	5-20
Replacing the CPU board	5-6
Replacing the interior circulation fan	5-56
Replacing the Robot I/F Board	5-14, 5-27
RES. START (CNCT).....	2-4
RES. START (JOB).....	2-2
RES. STATUS	2-2
RESERVE JOB NAME	2-4
Restoration procedure 1	12-5
Restoration procedure 2	12-7
RIN input.....	7-9
RIN input window	7-9
ROBOT	2-3
robot I/F board	5-83, 5-84, 5-89, 5-91, 5-92, 5-94, 5-95, 5-96, 5-98

S

safety circuit board.....	5-83, 5-84, 5-89, 5-91, 5-92, 5-94, 5-95, 5-96, 5-98
SAFETY FUNC.....	2-4
SAFETY LOGIC CIRCUIT	2-4
Safety mode	2-1
safety terminal block board	5-83, 5-84
SAVE.....	2-3

Index

SECOND HOME POS	2-3
SECURITY	2-3
Security mode	2-1
Security system	2-1
SELECT JOB	2-2
servo control board fuse	5-83, 5-84
SERVO MONITOR	2-3
Servo monitor window	7-30
Servo monitoring	7-30
SERVO ON	3-7
SERVO ON READY	3-7
SET SPEED	2-4
SET WORD	2-4
Setting the second home position	6-13
SETUP	2-4
SHIFT VALUE	2-3
SHOCK SEN LV.(CURRENT)	2-3
SHOCK SENS LEVEL	2-3
Signal flow	1-18
Signal number search	7-10
single-axis amplifier	5-84, 5-97
SOFTLIMIT SETTING	2-3
Special alarm display	8-3
Specific Input	7-5
Specific Input Simple Window	7-5
Specific Input Window	7-5
Specific Output	7-6
Specific Output Simple Window	7-6
Specific Output Window	7-6
SPEED DEVIATION	7-30
SPEED INST	7-30
SPOT WELDING	2-5
SPOT WELDING (MOTOR GUN)	2-5
STRING	2-2
Supplied parts list	5-86
System diagnosis	7-1
SYSTEM INFO	2-3
System Monitoring Time Display	7-18
System Monitoring Time Display Window	7-18
system version	7-1

T

TEACHING COND	2-4
The state of the robot drop tolerance error	7-34
TIMER DELAY SET	2-4
TOOL	2-3
TORQUE SPEC	7-30
TRASH JOB LIST	2-2
Trouble shooting when alarm is not displayed	13-1

U

USER COORDINATE	2-3
USER DIFFINITION MENU	2-3
USER ID	2-4
User ID	2-9

Index

V

VARIABLE	2-2
VERIFY	2-3
VERSION.....	2-3
Voltage between earth (neutral grounding)	3-8
Voltage between earth (phase-S grounding).....	3-8

W

WAGO connector wiring tool	5-86
WAGO terminal block wiring tool	5-86
WORK HOME POS.....	2-3
Writing the system program	12-6
WRONG DATA LOG	2-4

X

XYZ coordinate data	8-3
---------------------------	-----

Y

YRC1000 cables inspection	3-1
YRC1000 controller inspection	3-1
YRC1000 Front View.....	3-2
YRC1000 parts list.....	5-83, 5-84

YRC1000

MAINTENANCE MANUAL

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