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.

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. The representatives are listed on the back cover. 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 the YRC1000.

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.

At any rate, be sure to follow these important items.

**NOTE**

To ensure safe and efficient operation at all times, be sure to follow all instructions, even if not designated as “DANGER”, “WARNING” and “CAUTION”.
• 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 the play mode or in the 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, which 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, which 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 the 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 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. In addition, in case the operation of the manipulator starts, the manipulator or the tool may hit the programming pendant left unattended, which 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.

     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.
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.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Manual Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>YRC1000 controller</td>
<td>YRC1000</td>
</tr>
<tr>
<td>YRC1000 programming pendant</td>
<td>Programming pendant</td>
</tr>
<tr>
<td>Cable between the manipulator and the controller</td>
<td>Manipulator cable</td>
</tr>
</tbody>
</table>
Descriptions of the programming pendant keys, buttons, and displays are shown as follows:

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

![Diagram of Programming Pendant]

Start button*, Hold button*, Mode switch*, REMOTE, PLAY, TEACH, Emergency stop button, Page key, Coordinate key, Axes keys, Shift key, Enter key. *The button/switch names are denoted as symbols.
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 the [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.

- 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:

- **Collision hazard label**
- **Crush hazard label**

For Europe:

- **Internal Breaker**
- **Ground terminal**

View A: Ground terminal

The manipulator and the controller should have the same order number:

**Order No.**

NJ4014-1
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

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) ....................... 5-13
      5.1.1.3  Replacing the Battery ........................................................................ 5-18
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
      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
# Contents

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  
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
Contents

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 .............................................................................. 9-13
9.1.5 Concurrent I/O ....................................................................................................... 9-18
9.1.6 Maintenance Mode .............................................................................................. 9-19

9.2 Particular Error Message ................................................................................................. 9-21

9.2.1 Message .................................................................................................................... 9-21

9.2.1.1 Fatal Error ........................................................................................................ 9-21
9.2.1.2 Application Transaction Error ........................................................................ 9-22
9.2.1.3 Other Errors .................................................................................................... 9-23

9.2.2 When the Error Is Indicated .................................................................................... 9-24

9.2.2.1 Fatal Error ........................................................................................................ 9-24
9.2.2.2 Application Transaction Error ........................................................................ 9-24
9.2.2.3 Other Errors .................................................................................................... 9-24

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
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

xv
## Contents

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

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
  12.1.2 Applicable Version ............................................................................................12-1

12.2 Program Upload Procedure ...........................................................................................12-2
  12.2.1 Preparation of SD Card ....................................................................................12-2
  12.2.1.1 Uploading ............................................................................................12-2

12.3 Restoration Procedure 1 (Writing the Program).............................................................12-4
  12.3.1 Determining Failure of SD Card........................................................................12-4
  12.3.2 Preparation of SD Card for ACP01 .................................................................12-4
  12.3.3 Preparation of SD Card for Wiring the Program ...............................................12-4
  12.3.4 Writing the System Program.............................................................................12-5

12.4 Restoration Procedure 2 (Loading the Batch Data).......................................................12-6
  12.4.1 When the Batch Data Is “CMOS.BIN”...............................................................12-6
  12.4.2 When the Batch Data Is “CMOSBK.BIN”.........................................................12-8

12.5 In Case of the SD Card Failure....................................................................................12-10
  12.5.1 Preparation of SD Card for ACP01 ....................................................................12-10
  12.5.2 Program Upload..............................................................................................12-10
  12.5.3 Backup the Batch Data ...................................................................................12-10

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
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 which 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)

<table>
<thead>
<tr>
<th>YRC1000</th>
<th>Major manipulator type</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Japan</td>
<td></td>
</tr>
<tr>
<td>ERAR-1000-06VX8-A00</td>
<td>GP7</td>
</tr>
<tr>
<td></td>
<td>AR900</td>
</tr>
<tr>
<td></td>
<td>GP8</td>
</tr>
<tr>
<td></td>
<td>AR700</td>
</tr>
<tr>
<td>ERAR-1000-06VXH25-A00</td>
<td>GP12</td>
</tr>
<tr>
<td></td>
<td>AR1440</td>
</tr>
<tr>
<td></td>
<td>GP25</td>
</tr>
<tr>
<td></td>
<td>AR1730</td>
</tr>
<tr>
<td></td>
<td>GP25-12</td>
</tr>
<tr>
<td></td>
<td>AR2010</td>
</tr>
</tbody>
</table>
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)

<table>
<thead>
<tr>
<th>YRC1000</th>
<th>Major manipulator type</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Japan</td>
<td></td>
</tr>
<tr>
<td>ERAR-1000-07VXHE6-A00</td>
<td>AR1440E</td>
</tr>
</tbody>
</table>
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)

<table>
<thead>
<tr>
<th>YRC1000 For Japan</th>
<th>Major manipulator type</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERAR-1000-06VXHL20-A00</td>
<td>GP20HL, AR3120</td>
</tr>
</tbody>
</table>
1. Equipment Configuration
1.1 Arrangement of Units and Circuit Boards

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

<table>
<thead>
<tr>
<th>YRC1000</th>
<th>Major manipulator type</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Japan</td>
<td></td>
</tr>
<tr>
<td>ERAR-1000-07VX8110-A00</td>
<td>GP110B</td>
</tr>
<tr>
<td></td>
<td>SP100B</td>
</tr>
</tbody>
</table>
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)*

<table>
<thead>
<tr>
<th>Inside Controller</th>
<th>Inside Controller</th>
<th>Door</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back view</td>
<td>Front view</td>
<td>Inside view</td>
</tr>
</tbody>
</table>

**Diagram Labels:**
- CPU unit: JZNC-ARK5D-DE
- Power supply contactor unit: JZRCR-APU60D-1
- Breaker
- AC reactor: SR-40A (or UZBC-B 40A)
- Converter: CSRA-CV10A02A
- Inverter unit: CSRA-SDA30H01A
- Control power supply unit: CSRA-CPS01KD
- Fan control relay: LY2N-D2 DC24V
- Power supply for manipulator fan: S8VS-09024
- Safety terminal block board: JANCD-ASF01-E
- General-purpose I/O board: JANCD-AI00D-E
- Emergency stop button
- Heat exchanger: YCMST-3D0DC
- Safety circuit board

**YRC1000 For Japan**

<table>
<thead>
<tr>
<th>Major manipulator type</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERAR-1000-06VRF130-A00</td>
</tr>
<tr>
<td>PH130RF</td>
</tr>
<tr>
<td>PH130F</td>
</tr>
<tr>
<td>PL500</td>
</tr>
</tbody>
</table>
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)

<table>
<thead>
<tr>
<th>YRC1000</th>
<th>For Asia</th>
<th>For North America</th>
<th>For Europe</th>
<th>Major manipulator type</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERAR-1000-06VX8-A10</td>
<td>ERAR-1000-06VX8-B15</td>
<td>ERAR-1000-06VX8-E10</td>
<td>GP7</td>
<td></td>
</tr>
</tbody>
</table>

For Asia
- ERAR-1000-06VX8-A10
- ERAR-1000-06VXH25-A10

For North America
- ERAR-1000-06VX8-B15
- ERAR-1000-06VXH25-B15

For Europe
- ERAR-1000-06VX8-E10
- ERAR-1000-06VXH25-E10

For Asia
- GP7
- AR900
- GP8
- AR700

For North America
- GP12
- AR1440
- GP25
- AR1730
- GP25-12
- AR2010
Fig. 1-2(b): Configuration for 380 to 440 VAC or 380 to 480 VAC Specification (Small-Capacity Model 2)

- Backside duct fan: 09225VE-24P-CA-02
- Breaker
- Power supply contactor unit: JZRCR-APU0
- Converter: CSRA-SDA
- Inverter unit: CSRA-CV05D01A
- Single-axis amplifier: CSRA-SDB
- Emergency stop button
- Heat exchanger: TCMSY-3CdDC
- Safety terminal block board: IM-YE250/5-80P-JP
- Control power supply unit: CSRA-CPS01K
- CPU unit: JZNC-ARK5-DE
- DC reactor: 85R-15014A
- Regenerative resistor: SMVK500W 260J/RO A6687
- Safety circuit board: JANCD-ASF01-E
- General-purpose I/O board: JANCD-AIO01-E
- Single-axis amplifier: CSRA-SDB
- Emergency stop button
- Heat exchanger: TCMSY-3CdDC
- Safety terminal block board: IM-YE250/5-80P-JP
- Control power supply unit: CSRA-CPS01K
- CPU unit: JZNC-ARK5-DE
- DC reactor: 85R-15014A
- Regenerative resistor: SMVK500W 260J/RO A6687
- Safety circuit board: JANCD-ASF01-E
- General-purpose I/O board: JANCD-AIO01-E

### YRC1000

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<th>Major manipulator type</th>
<th>For Asia</th>
<th>For North America</th>
<th>For Europe</th>
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<tr>
<td>ART1440E</td>
<td>ERAR-1000-07VXHE6-A10</td>
<td>ERAR-1000-07VXHE6-B15</td>
<td>ERAR-1000-07VXHE6-E10</td>
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</table>
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)

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<th>YRC1000</th>
<th>Major manipulator type</th>
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<tr>
<td>ERAR-1000-06VXHL20-A10</td>
<td>ERAR-1000-06VXHL20-B15</td>
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<tr>
<td>ERAR-1000-06VX280-A10</td>
<td>ERAR-1000-06VX280-B15</td>
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<tr>
<td>ERAR-1000-06VX600-A10</td>
<td>ERAR-1000-06VX600-B15</td>
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<tr>
<td></td>
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</tr>
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</tr>
</tbody>
</table>

Legend:
- Backside duct fan: 09225VE-24P-CA-02
- Power supply contactor unit: JZRCR-APU0-1
- AC reactor: SP-23A (or UZBC-8 23A)
- Converter: CSRA-CV10003A
- Inverter unit: CSRA-SDA□□H0A
- Safety circuit board: JANCD-ASF01-E
- General-purpose I/O board: JANCD-A000-E
- Emergency stop button: IM-YE250/5-80P-JP
- Heat exchanger: TCMSY-3C0DC
- Safety terminal block board: YRC1000 Major manipulator type

For Asia
- ERAR-1000-06VXHL20-A10
- ERAR-1000-06VX280-A10
- ERAR-1000-06VX600-A10

For North America
- ERAR-1000-06VXHL20-B15
- ERAR-1000-06VX280-B15
- ERAR-1000-06VX600-B15

For Europe
- ERAR-1000-06VXHL20-E10
- ERAR-1000-06VX280-E10
- ERAR-1000-06VX600-E10
- GP20HL
- GP50
- GP400
- GP600
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)

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<tr>
<th>Inside Controller</th>
<th>Inside Controller</th>
<th>Door</th>
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</thead>
<tbody>
<tr>
<td>Back View</td>
<td>Front View</td>
<td>Inside View</td>
</tr>
</tbody>
</table>

- **Backside duct fan:** 09225VE-24P-CA-02
- **Power supply contactor unit:** JZRCR-APU006-1
- **Breaker:**
- **AC reactor:** PI-E2002-0213
- **DC reactor:** SR-23A (or UZSC-8 23A)
- **CPU unit:** JZNC-ARK5DE
- **Control power supply unit:** CSRA-CP501KD
- **Converter:** CSRA-CV10003A
- **Inverter unit:** CSRA-SDAD010A
- **Single-axis amplifier:** CSRA-SDA010A
- **Emergency stop button:** (not installed for North American spec. nor for European spec.)
- **Safety terminal block board:** JANCD-ASF01-E
- **General-purpose I/O board:** JANCD-AIO010-E
- **Backside duct fan:**
- **Heat exchanger:**
- **TCMSY-300DC**
- **Inverter unit:**
- **CPU unit:**
- **Control power supply unit:**
- **Converter:**
- **Inverter unit:**
- **Single-axis amplifier:**
- **Power supply contactor unit:**
- **Power supply contactor unit:**
- **Breaker:**

<table>
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<th>Major manipulator type</th>
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<td>For Asia</td>
<td>For North America</td>
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<td>ERAR-1000-07VXB110-A10</td>
<td>ERAR-1000-07VXB110-B15</td>
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<td>GP110B</td>
<td>GP110B</td>
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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)

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<td>For North America</td>
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</table>
| 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

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

Fig. 1-3(a): Power Flow (Small-Capacity Model 1)
1 Equipment Configuration
1.2 Power Flow

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

YRC1000
1.3 Signal Flow

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

YRC1000
1 Equipment Configuration
1.3 Signal Flow

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 the editing mode and the management mode, the user ID should be 4 or more and 16 or less characters with number(s) and symbol(s). As for the 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 the one time manage mode requires to enter the security code, which is issued by YASKAWA sales representative.

Table 2-1: Security Mode Descriptions

<table>
<thead>
<tr>
<th>Security Mode</th>
<th>Explanation</th>
</tr>
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<tbody>
<tr>
<td>Operation Mode</td>
<td>This mode allows basic operation of the robot (stopping, starting, etc.) for people operating the robot work on the line.</td>
</tr>
<tr>
<td>Editing Mode</td>
<td>This mode allows the operator to teach and edit jobs and robot settings.</td>
</tr>
<tr>
<td>Management Mode</td>
<td>This mode allows those authorized to set up and maintain robot system: parameters, system time and modifying user IDs.</td>
</tr>
<tr>
<td>Safety Mode</td>
<td>This mode allows the operator to setup the safety function, and able to edit the files related to the safety function. When the optional function &quot;functional safety&quot; is valid, the security is changed to the safety mode to edit the some files, such as the tool file. Refer to &quot;YRC1000 OPTIONS INSTRUCTIONS FOR FUNCTIONAL SAFETY FUNCTION (HW1483576)&quot; for more details.</td>
</tr>
<tr>
<td>One Time Manage Mode</td>
<td>This mode allows to operator to maintain the mode which is higher than the 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.</td>
</tr>
</tbody>
</table>
### Table 2-2: Menu & Security Mode (Sheet 1 of 4)

<table>
<thead>
<tr>
<th>Main Menu</th>
<th>Sub Menu</th>
<th>Allowed Security Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DISPLAY</td>
<td>EDIT</td>
</tr>
<tr>
<td>JOB</td>
<td>Operation</td>
<td>Edit</td>
</tr>
<tr>
<td>SELECT JOB</td>
<td>Operation</td>
<td>Operation</td>
</tr>
<tr>
<td>CREATE NEW JOB(^1)</td>
<td>Edit</td>
<td>Edit</td>
</tr>
<tr>
<td>MASTER JOB</td>
<td>Operation</td>
<td>Edit</td>
</tr>
<tr>
<td>JOB CAPACITY</td>
<td>Operation</td>
<td>-</td>
</tr>
<tr>
<td>RES. START (JOB)(^1)</td>
<td>Edit</td>
<td>Edit</td>
</tr>
<tr>
<td>RES. STATUS(^2)</td>
<td>Operation</td>
<td>-</td>
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<tr>
<td>CYCLE</td>
<td>Operation</td>
<td>Operation</td>
</tr>
<tr>
<td>TRASH JOB LIST(^3)</td>
<td>Edit</td>
<td>Edit</td>
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<tr>
<td>JOB EDIT (PLAY)</td>
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<td>Edit</td>
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<td>VARIABLE</td>
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<td>STRING</td>
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<td>POSITION (BASE)</td>
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<td>IN/OUT</td>
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<tr>
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<td>GENERAL PURPOSE INPUT</td>
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<td>GENERAL PURPOSE OUTPUT</td>
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<tr>
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<td>CONTROL INPUT</td>
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<td>PSEUDO INPUT SIG</td>
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<td>SV POWER STATUS</td>
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<td>LADDER PROGRAM</td>
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<td>I/O ALARM</td>
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<td>SERVO ON FACTOR</td>
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<td>SERVO OFF MONITOR</td>
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### Table 2-2: Menu & Security Mode (Sheet 2 of 4)

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## 2 Security System

### 2.1 Protection Through Security Mode Settings

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<tr>
<td>SETUP</td>
<td>TEACHING COND.</td>
<td>Edit Edit Edit</td>
</tr>
<tr>
<td></td>
<td>OPERATE COND.</td>
<td>Management Management</td>
</tr>
<tr>
<td></td>
<td>OPERATE ENABLE</td>
<td>Management Management</td>
</tr>
<tr>
<td></td>
<td>FUNCTION ENABLE</td>
<td>Management Management</td>
</tr>
<tr>
<td></td>
<td>JOG COND.</td>
<td>Management Management</td>
</tr>
<tr>
<td></td>
<td>PLAYBACK COND.</td>
<td>Management Management</td>
</tr>
<tr>
<td></td>
<td>FUNCTION COND.</td>
<td>Management Management</td>
</tr>
<tr>
<td></td>
<td>DISPLAY COLOR COND.</td>
<td>Edit Edit Edit</td>
</tr>
<tr>
<td></td>
<td>DATE/TIME</td>
<td>Management Management</td>
</tr>
<tr>
<td></td>
<td>GRP COMBINATION2)</td>
<td>Management Management</td>
</tr>
<tr>
<td></td>
<td>SET WORD</td>
<td>Edit Edit</td>
</tr>
<tr>
<td></td>
<td>RESERVE JOB NAME</td>
<td>Edit Edit</td>
</tr>
<tr>
<td></td>
<td>USER ID</td>
<td>Edit Edit</td>
</tr>
<tr>
<td></td>
<td>SET SPEED</td>
<td>Management Management</td>
</tr>
<tr>
<td></td>
<td>KEY ALLOCATION</td>
<td>Management Management</td>
</tr>
<tr>
<td></td>
<td>JOG KEY ALLOC.</td>
<td>Edit Management</td>
</tr>
<tr>
<td></td>
<td>RES. START (CNCT)</td>
<td>Management Management</td>
</tr>
<tr>
<td></td>
<td>AUTO BACK SET</td>
<td>Management Management</td>
</tr>
<tr>
<td></td>
<td>WRONG DATA LOG</td>
<td>Edit Management</td>
</tr>
<tr>
<td></td>
<td>ENERGY SAVING FUNCTION</td>
<td>Edit Management</td>
</tr>
<tr>
<td></td>
<td>ENCODER MAINTENANCE</td>
<td>Edit Management</td>
</tr>
<tr>
<td>SAFETY FUNC.</td>
<td>M-SAFETY SIGNAL ALLOC</td>
<td>Operation Management</td>
</tr>
<tr>
<td></td>
<td>TIMER DELAY SET</td>
<td>Operation Management</td>
</tr>
<tr>
<td></td>
<td>SAFETY LOGIC CIRCUIT</td>
<td>Operation Management</td>
</tr>
<tr>
<td>PM</td>
<td>PM (REDUCER)</td>
<td>Operation Management</td>
</tr>
<tr>
<td></td>
<td>INSPECTION RECORD</td>
<td>Operation Management</td>
</tr>
<tr>
<td></td>
<td>OPERATING STATUS</td>
<td>Operation Edit</td>
</tr>
<tr>
<td></td>
<td>JOB MONITOR</td>
<td>Operation Edit</td>
</tr>
<tr>
<td></td>
<td>STEP DIAGNOSIS</td>
<td>Operation Edit</td>
</tr>
<tr>
<td></td>
<td>ROBOT MONITOR</td>
<td>Operation Edit</td>
</tr>
</tbody>
</table>

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

### 2.1 Protection Through Security Mode Settings

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

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

1. Displayed in the teach mode only.
2. Displayed in the play mode only.
3. Displayed when the job reconstruction function is valid.

*As for the menu and the security mode when the functional safety is valid, refer to “YRC1000 OPTIONS INSTRUCTIONS FOR FUNCTIONAL SAFETY FUNCTION (HW1483576)” for more details.
2.1 Protection Through Security Mode Settings

2.1.1 Changing the Security Mode

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

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

Note: Icons for the main menu such as arc welding system differ depending on the system being used.
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.
2 Security System
2.1 Protection Through Security Mode Settings

### Procedures to Change the Mode to the One Time Management Mode

1. Change to the management mode.
   - When changing to the 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, which is issued by YASKAWA sales 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 the editing mode and the management mode. As for the 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.
3. Select the desired ID.

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

   – User ID is changed.
2.1 Protection Through Security Mode Settings

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 the management mode.

![Security Mode Change](image)

2. Select {SYSTEM INFO} in the main menu.
   - The sub menu appears.
3. Select {VERSION}.
   - VERSION window appears.
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.

<table>
<thead>
<tr>
<th>Inspection Equipment</th>
<th>Inspection Item</th>
<th>Inspection Frequency</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>YRC1000 controller</td>
<td>Confirm that the door is completely closed.</td>
<td>Daily</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Confirm that no gap or damage to the sealed part.</td>
<td>Monthly</td>
<td></td>
</tr>
<tr>
<td>Backside duct fan</td>
<td>Check operation</td>
<td>Monthly</td>
<td>While power ON</td>
</tr>
<tr>
<td>Emergency stop button</td>
<td>Check operation</td>
<td>Daily</td>
<td>While servo ON</td>
</tr>
<tr>
<td>Enable switch</td>
<td>Check operation</td>
<td>When using</td>
<td>In teach mode</td>
</tr>
<tr>
<td>Battery</td>
<td>Check the message for replacement, etc. is displayed or not.</td>
<td>When an alarm occurs</td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>Confirm that power supply voltage is normal.</td>
<td>Before using</td>
<td></td>
</tr>
<tr>
<td>Circuit breaker lead cables</td>
<td>Confirm that the lead cables are not falling out, loosing or breaking. Check the line voltage.</td>
<td>Before using</td>
<td></td>
</tr>
<tr>
<td>YRC1000 cables</td>
<td>Confirm that the cables are not twisted or falling out.</td>
<td>Daily</td>
<td></td>
</tr>
<tr>
<td>Heat exchanger</td>
<td>Fan Check operation</td>
<td>Monthly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Air filter No filter clogging and no dust</td>
<td>As required (at least once a month)</td>
<td></td>
</tr>
</tbody>
</table>
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 counterclockwise to close the door by using the flat-blade screwdriver. When closing the door, make sure to turn the door lock counterclockwise until the notch of the door lock becomes horizontal.

![YRC1000 Front View](image)

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

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).

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.

For North America

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.

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.
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 tuned 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.

**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-CPS01KA-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 Cooling Fan and Air Filter Inspections

### 3.3.2 Air Filter Inspection and Cleaning Procedure

**NOTE** 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*
3.3 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.)

5. By reversing the procedure in the 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”.


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.

Mode switch with the key

![Mode switch with the key]

Press [SERVO ON READY]

![Press SERVO ON READY]

Blinking SERVO ON

![Blinking SERVO ON]
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.

Please 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 1, 3, 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)**

<table>
<thead>
<tr>
<th>Measured Item</th>
<th>Terminal</th>
<th>Normal Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line voltage</td>
<td>Between 1 and 3, 3 and 5, 1 and 5</td>
<td>200 to 240 VAC (+10%, -15%)</td>
</tr>
<tr>
<td>Voltage between earth</td>
<td>Between 1 and E, 5 and E</td>
<td>200 to 240 VAC (+10%, -15%)</td>
</tr>
<tr>
<td>(phase-S grounding)</td>
<td>Between 3 and E</td>
<td>Approximately 0V</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Measured Item</th>
<th>Terminal</th>
<th>Normal Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line voltage</td>
<td>Between 1 and 3, 3 and 5, 1 and 5</td>
<td>380 to 440 VAC (+10%, -15%)</td>
</tr>
<tr>
<td>Voltage between earth</td>
<td>Between 1 and E, 3 and E, 5 and E</td>
<td>220 to 254 VAC (+10%, -15%)</td>
</tr>
<tr>
<td>(neutral grounding)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Measured Item</th>
<th>Terminal</th>
<th>Normal Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line voltage</td>
<td>Between 1 and 3, 3 and 5, 1 and 5</td>
<td>380 to 480 VAC (+10%, -15%)</td>
</tr>
<tr>
<td>Voltage between earth</td>
<td>Between 1 and E, 3 and E, 5 and E</td>
<td>220 to 277 VAC (+10%, -15%)</td>
</tr>
<tr>
<td>(neutral grounding)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Check Item</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead Cable Check</td>
<td>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.</td>
</tr>
<tr>
<td>Input Power Supply Check</td>
<td>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))</td>
</tr>
<tr>
<td>Circuit Breaker (-Q1M) Check</td>
<td>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).</td>
</tr>
</tbody>
</table>

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 the play mode or in the 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, which 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 the 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 right of the programming pendant.
4 Preparation before Replacing Parts

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.
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”.

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. In addition, in case the operation of the manipulator starts, the manipulator or the tool may hit the programming pendant left unattended, which may result in personal injury and/or equipment damage.
4 Preparation before Replacing Parts
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>
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)
- 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. In this case, 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.

Small-capacity model

Medium- or large-capacity model
5.1 Replacing YRC1000 Parts

**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.
5 Replacing Parts
5.1 Replacing YRC1000 Parts

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 which shows the connection position is attached the cable, please 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.
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](image)

![Fig. 5-2: Robot I/F Board and CPU Board (Removed from Unit)](image)
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.
5. Replacing Parts
5.1 Replacing YRC1000 Parts

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.)
     - Control communication connector (CN111)
     - Control power supply input connector (CN101)
     - LAN1 for programming pendant connector (CN105)
     Please disconnect the cable below if an optional function is added.
     - USB connector (CN102)
     - RS232C/422 connector (CN103)
     - LAN2 connector (CN106)
     - LAN3 connector (CN107)
     - 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 /IF Board and CPU Board (Removed from Rack)

Fig. 5-5: Connecting CPU Board and Robot /IF Board
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

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, which may result in equipment damage such as a broken wire. (Refer to fig. 5-7.)

Fig. 5-7: Notes on Battery Wires (before Replacement)
5. Replacing Parts
5.1 Replacing YRC1000 Parts

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

![Fig. 5-8: Mounting on Rack](image)

**NOTE**

Fit the side of the CPU board in the upper and lower rails which 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.

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.
11. Start the system in the maintenance mode after replacing the CPU board (JANCD-ACP01-E). Set the date and time after changing the security mode to the maintenance 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.

**NOTE**

- 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.
- Check the used memory size and the mounted memory size in maintenance mode before replacing the robot I/F circuit board.

Normal  : JANCD-AIF01-1E (memory size: 2MB)
Optional : JANCD-AIF01-2E (memory size: 4MB)

JANCD-AIF01-2E (memory size: 4MB, communication I/F included)

- There are some versions which require maker mode operations after replacing the robot I/F circuit board.
- Contact your YASKAWA representative for maker mode operations.
- 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 which is saved before replacing the circuit board after replacing the robot I/F circuit board.
Reverting Parts
5.1 Replacing YRC1000 Parts

Replacement Procedure

1. Back up the robot data before replacement. Insert a SD card for backup to the SD card slot of programming pendant, and start the system in 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.

2. Turn OFF the power after making backup.

3. Disconnect the following cables connected to the CPU unit and Robot I/F board. (Refer to fig. 5-9.)

- Control communication connector (CN111)
- Control power supply input connector (CN101)
- LAN1 for programming pendant connector (CN105)
- USB connector (CN102)
- RS232C/422 connector (CN103)
- LAN2 connector (CN106)
- LAN3 connector (CN107)
- I/O I/F connector (CN112)

Please disconnect the cable below if an optional function is added.

4. Remove the screws fixing the CPU board from upper and lower side (2 places) and pull out the circuit board from the rack.

5. 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 /IF Board and CPU Board (Removed from Rack)**

![Image of Robot /IF Board and CPU Board (Removed from Rack)]

- CPU board
- Fixing screw
- Front side of robot /IF board
- CPU board connector (CNA)
- Robot /IF board
- Fixing screw

**Fig. 5-11: Connecting CPU Board and Robot /IF Board**

![Image of Connecting CPU Board and Robot /IF Board]

- CPU board connector (CN12)
- Robot /IF board connector (CNA)
- Robot /IF board (front side)
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*

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, which may result in equipment damage such as a broken wire. (Refer to fig. 5-13.)

*Fig. 5-13: Notes on Battery Wires*
9. Mount the CPU board on the original position. (Refer to fig. 5-14.)

![Fig. 5-14: Mounting on Rack](image)

**NOTE**

Fit the side of the CPU board in the upper and lower rails which 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.

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. Start the system in the maintenance mode, after replacing the robot I/F circuit board (JANCD-AIF01-□E). Load the backup data which is saved before replacing the circuit board after changing the security to the management mode.


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.

**NOTE**

- 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.
- 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)
5 Replacing Parts
5.1 Replacing YRC1000 Parts

**Replacement Procedure**

1. Disconnect the following cables connected to the CPU unit and Robot I/F board. (Refer to fig. 5-15.)
   - Control communication connector (CN111)
   - Control power supply input connector (CN101)
   - LAN1 for programming pendant connector (CN105)
   - Please disconnect the cable below if an optional function is added.
     - USB connector (CN102)
     - RS232C/422 connector (CN103)
     - LAN2 connector (CN106)
     - LAN3 connector (CN107)
     - 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*

*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

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

Fig. 5-19: Battery Connecting 3
5. Replacing Parts
5.1 Replacing YRC1000 Parts

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

Fig. 5-20: Battery Connecting 4

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)**
5. Replacing Parts
5.1 Replacing YRC1000 Parts

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 which 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.
5.1.2 Replacing the General-Purpose I/O Board (JANCD-AIO□-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. 5-24.)

*Fig. 5-24: Configuration of Inverter Unit 1*
5 Replacing Parts
5.1 Replacing YRC1000 Parts

Replacement Procedure

1. Disconnect the following connector connected to the general-purpose I/O board. (Refer to fig. 5-25.)
   - 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) which 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. 5-26 and fig. 5-27.)
5 Replacing Parts
5.1 Replacing YRC1000 Parts

Fig. 5-26: General-Purpose I/O Board (Both Sides)

Fig. 5-27: 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. 5-26 and fig. 5-27.)
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. Please 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.

The safety circuit board is mounted under the general-purpose I/O board. (Refer to fig. 5-28.)
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)”.)
Please perform the following procedure after removing the general-purpose I/O board.

*Fig. 5-28: Configuration of Inverter Unit 2*
5 Replacing Parts
5.1 Replacing YRC1000 Parts

Fig. 5-29: Safety Circuit Board (JANCD-ASF01-E)

- **Replacement Procedure**
  1. Disconnect the following connector connected to the safety circuit board. (Refer to fig. 5-29.)
     - Programming pendant I/F connector (CN203)
     - Manipulator I/O connector (CN204)
     - Contactor control output connector (CN205)
     - Terminal block board I/F connector (CN206)
     - Control power supply input connector (CN207)
     - Ground wire (The tap of metal frame)
   The following connectors are optional. Disconnect them if they are connected.
     - I/F connector (CN201)
     - I/F connector (CN202)
     - 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) which 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. 5-30 and fig. 5-31.)
5 Replacing Parts
5.1 Replacing YRC1000 Parts

Fig. 5-30: Safety Circuit Board (Both Sides)

Fig. 5-31: 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. 5-30, fig. 5-31.) 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. Please 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 which are disconnected in step 1 and cables which 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.
5.1.4 Replacing the Inverter Unit (CSRA-SD□□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.

Remove the inverter unit including the general-purpose I/O board and the safety circuit board to replace the inverter unit. (Refer to fig. 5-32.)

*Fig. 5-32: Configuration of Inverter Unit 3*
5 Replacing Parts
5.1 Replacing YRC1000 Parts

Fig. 5-33(a): Inverter Unit (Small-Capacity Model)
5 Replacing Parts
5.1 Replacing YRC1000 Parts

Fig. 5-33(b): Inverter Unit (Medium/Large-Capacity Model)
5 Replacing Parts
5.1 Replacing YRC1000 Parts

**Replacement Procedure**

1. Refer to chapter 5.1.2 “Replacing the General-Purpose I/O Board (JANCD-AI00□-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. 5-33(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)
5.1 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. 5-34.) The lower side of inverter unit is hooked to the metal frame, so lift the inverter unit slightly and pull off when removing.

*Fig. 5-34: 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. 5-35.)

*Fig. 5-35: Inverter Unit 1*
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) which 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. 5-35, fig. 5-36, and fig. 5-37.)

Fig. 5-36: Inverter Unit 2

Fig. 5-37: General-Purpose I/O Board and Safety Circuit Board
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. 5-36 and fig. 5-37.) If force the safety circuit board into the servo control board while the connection position deviates, it may cause damage to the connectors. Please look from the side and adjust the connection position when connecting.

7. Tighten the screws fixing the metal frame. (5 places) (Refer to fig. 5-35.)

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 which are on the lower part of YRC1000 and tighten the screws fixing the inverter unit from upper side (2 places). (Refer to fig. 5-38.)

9. Connect all the cables which are disconnected in step 1 and cables which 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-AI00□-E)” and chapter 5.1.3 “Replacing the Safety Circuit Board (JANCD-ASF01-E)”.

No cables inside this frame when mounting the inverter unit

Fixing screw for inverter unit

Hook for inverter unit

No cables inside this frame when mounting the inverter unit
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. 5-39(a): Converter (Removed) (Small-Capacity Model)*

- (CN551) Main circuit power supply input
- (CN552) Regenerative resistor connection
- Charge lamp
- LED Monitor/alarm indicator
- (CN556) Main circuit power supply output
- (CN561) Servo control board communication
- (CN560) +24V1 input
- Grounding terminal

**CSRA-CV05A00A**

**CSRA-CV05D01A**
5 Replacing Parts
5.1 Replacing YRC1000 Parts

Fig. 5-39(b): Converter (Removed) (Medium/Large-Capacity Model)

(CN551) Main circuit power supply input
(CN552) Discharge resistor connection
LED
Monitor/alarm indicator
Charge lamp
(CN561) Servo control board communication
(CN556) Main circuit power supply output
(CN560) +24V1 input
Grounding terminal

(CN551) Main circuit power supply input
(CN552) Discharge resistor connection
LED
Monitor/alarm indicator (CN561)
Servo control board communication (CN560)
+24V1 input (CN556)
Main circuit power supply output
(CN555) DC reactor connection 2
(CN554) DC reactor connection 1
Grounding terminal

CSRA-CV10A02A CSRA-CV10D03A
5. Replacing Parts
5.1 Replacing YRC1000 Parts

Replacement Procedure
1. Ensure that the charge lamp of converter (orange LED) is OFF. (*)
   Then disconnect the following connectors which are connected to the converter. (Refer to fig. 5-39(a).)
   - Main circuit power supply input connector (CN551)
   - Regenerative resistor connection connector (CN552)
   - Main circuit power supply output connector (CN556)
   - Servo control board communication connector (CN561)
   - +24V1 input connector (CN560)
   - Ground wire

   When using the converter CSRA-CV05D01A or CSRA-CV10D03A, remove the following connectors.
   - DC reactor connection 1 connector (CN554)
   - 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. 5-40: 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 which is on the lower part of YRC1000 and tighten the screws fixing the upper part of the converter (2 places). (Refer to fig. 5-40.)

5. Connect the connectors which are disconnected in step 1. Ensure that the ground wire is connected.
5.1.6 Replacing the Power Supply Contactor Unit (JZCRCR-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.

---

**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. 5-41.)

   - Power supply input connector (CN601)
   - Power supply output connector (CN602)
   - AC control power supply connector (CN603)
   - Contactor control input connector (CN604)
   - 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. 5-42.)
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. 5-42.)

4. Connect the connectors which are disconnected in step 1. 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.

---

**Replacement Procedure**

1. The control power supply unit is mounted on the bottom of YRC1000. (Refer to fig. 5-44.)

---

**Fig. 5-43: Control Power Supply Unit**

**Fig. 5-44: 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. 5-45.)

*Fig. 5-45: 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)
   5. Remote control input/output connector (CN152)
   6. +24V1/+24V2 power supply output connector (CN156)

Disconnect the following cable if it is connected depending on the specification.
4. Pull the control power supply unit toward the front of YRC1000 to remove it. (Refer to fig. 5-46.)

*Fig. 5-46: Removing Control Power Supply Unit 1*

5. Mount the new control power supply unit. (Refer to fig. 5-47.)
   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 which are disconnected in step 3 and mount the cover.

*Fig. 5-47: 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.

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

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

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

*Fig. 5-48: 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.

NOTE

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

<table>
<thead>
<tr>
<th>Parts No.</th>
<th>Fuse Name</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>24VDC fuse for I/O</td>
<td>02173.15P, 250V, 3.15A Rapid cut fuse (LITTEL)</td>
</tr>
</tbody>
</table>

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. 5-49: 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.

NOTE

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

<table>
<thead>
<tr>
<th>Parts No.</th>
<th>Name</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>Encoder power supply</td>
<td>HM10 250V, 1A (Daito Communication Apparatus Co., Ltd.)</td>
</tr>
<tr>
<td></td>
<td>protective fuse</td>
<td></td>
</tr>
</tbody>
</table>

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

Fig. 5-50: Replacement Fuses of Servo Control Board

Please remove the general-purpose I/O board (JANCD-AIO□□□□□□□□□□-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

**NOTE**

Turn OFF the power before replacing the fan.

**Replacement Procedure**

1. Remove the screws securing the cover (4 places). (Refer to fig. 5-51.)
2. Disconnect the relay connector on which the device code of the fan is marked. (Refer to fig. 5-52.)
3. Remove the screws securing the fan (2 places). (Refer to fig. 5-52.)
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. 5-52.)
7. Connect the removed harness to the fan. (Refer to fig. 5-52.)
8. Mount the cover and tighten the screws securing the cover (4 places). (Refer to fig. 5-51.)
   Be careful not to get the harness caught when mounting the cover.

*Fig. 5-51: Backside Duct Fan 1*
5 Replacing Parts
5.1 Replacing YRC1000 Parts

Fig. 5-52: 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.

**NOTE**

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. 5-53.)

*Fig. 5-53: 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. 5-54.)

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. 5-54.)

Fig. 5-54: Air Filter, Air Filter Kit

5. By reversing the procedure in the step 1, slide the cover to the right to close it.
5.11 Replacing the Fan of the Heat Exchanger

5.11.1 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 which 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. 5-55.)

*Fig. 5-55: 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. 5-56: Fan Guard*

**NOTE**

Turn OFF the power before replacing the fan.
3. Mount the fan guard removed in the 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 the 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. 5-57*.)

   *Fig. 5-57: 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 which are 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. 5-58*  
   and *fig. 5-59.*)

   *Fig. 5-58: Heat Exchanger*
5. Replacing Parts

5.1 Replacing YRC1000 Parts

Fig. 5-59: 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. 5-60.)

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. 5-60.)

6. Remove the screws (4 places) securing the fan, and then remove the fan from the fan base. (Refer to fig. 5-60.)

Fig. 5-60: 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. 5-61.)
5 Replacing Parts
5.1 Replacing YRC1000 Parts

Fig. 5-61: Heat Exchanger
5.1.12 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 the step 1.

<table>
<thead>
<tr>
<th>Type of controller</th>
<th>ERAR-1000-06VRF130-A00</th>
<th>ERAR-1000-06VRF130-A10</th>
<th>ERAR-1000-06VRF130-B15</th>
<th>ERAR-1000-06VRF130-E10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of the power supply for the manipulator fan</td>
<td>S8VS-09024</td>
<td>S8VK-T12024</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location of the securing tab</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 the 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.
5.1.13 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 the step 1. Also, confirm that the ground wire is securely connected.
5.1.14 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.
5.2 YRC1000 Parts List

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

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Model</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inverter unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Servo control board</td>
<td>CSRA-SDCA01AA</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Single-axis amplifier</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Control power supply unit</td>
<td>CSRA-CPS01KB ³</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Converter</td>
<td>CSRA-CV05A00A</td>
<td>For 200 to 240 VAC input (for Japan)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CSRA-CV05D01A</td>
<td>For 380 to 480 VAC input (for Asia, North America and Europe)</td>
</tr>
<tr>
<td>5</td>
<td>CPU unit</td>
<td>JZNC-ARK01-E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CPU board</td>
<td>JANCD-ACP01-E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Back board</td>
<td>JANCD-ABB01-E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Riser board</td>
<td>JANCD-ABB02-E</td>
<td>PCIe/PCle slot</td>
</tr>
<tr>
<td>6</td>
<td>Robot I/F board</td>
<td>JANCD-AIF01-1E</td>
<td>Standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JANCD-AIF01-2E</td>
<td>Optional (memory expansion)</td>
</tr>
<tr>
<td>7</td>
<td>Safety circuit board</td>
<td>JZNC-ASF01-E</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Safety terminal block board</td>
<td>IM-YE250/5-80P</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>General-purpose I/O board</td>
<td>JZNC-AIO01-E</td>
<td>NPN Specification (Standard for Japan, Asia and North America)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JANCD-AIO02-E</td>
<td>PNP Specification (Standard for Europe)</td>
</tr>
<tr>
<td>10</td>
<td>Power supply contactor unit</td>
<td>JZRCR-APU01-1</td>
<td>For Japan, Asia and Europe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JZRCR-APU03-1</td>
<td>For North America</td>
</tr>
<tr>
<td>11</td>
<td>Heat exchanger</td>
<td>TCMSY-310DC or TCMSY-320DC ⁴</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exterior fan</td>
<td>08038RA-24Q-GA-04</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interior fan</td>
<td>08038RA-24Q-EA-02</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Filter kit</td>
<td>GRM80-30 or MM850-0811A ⁵</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Backside duct fan</td>
<td>09225VE-24P-CA-02</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Power supply contactor unit fuse</td>
<td>FNQ-10 10 A, 500 VAC</td>
<td>Time delay fuse (for Japan, Asia and Europe)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SC-10 10 A, 600 VAC</td>
<td>Time delay fuse (for North America)</td>
</tr>
<tr>
<td></td>
<td>General-purpose I/O board fuse</td>
<td>02173.15P 3.15 A, 250 V</td>
<td>Rapid cut fuse</td>
</tr>
<tr>
<td></td>
<td>Servo control board fuse</td>
<td>HM10</td>
<td>Micro fuse</td>
</tr>
<tr>
<td>14</td>
<td>Battery</td>
<td>ER6BD_WK77P 3.6V</td>
<td></td>
</tr>
</tbody>
</table>

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).
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)

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Model</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inverter unit 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Servo control board</td>
<td>CSRA-SDCA01AA</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Single-axis amplifier 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Control power supply unit 3)</td>
<td>CSRA-CPS01KB</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Converter</td>
<td>CSRA-CV10A02A (for Japan)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CSRA-CV10D03A (for Asia, North America and Europe)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>CPU unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CPU board</td>
<td>JANCD-ACP01-E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Back board</td>
<td>JANCD-ABB01-E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Riser board</td>
<td>JANCD-ABB02-E</td>
<td>PCIe/PCIe slot</td>
</tr>
<tr>
<td>6</td>
<td>Robot I/F board</td>
<td>JANCD-AIF01-1E</td>
<td>Standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JANCD-AIF01-2E</td>
<td>Optional (memory expansion)</td>
</tr>
<tr>
<td>7</td>
<td>Safety circuit board</td>
<td>JANCD-ASF01-E</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Safety terminal block board</td>
<td>IM-YE250/5-80P</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>General-purpose I/O board 9)</td>
<td>JANCD-AIO01-E (NPN Specification)</td>
<td>Standard for Japan, Asia and North America</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JANCD-AIO02-E (PNP Specification)</td>
<td>Standard for Europe</td>
</tr>
<tr>
<td>10</td>
<td>Power supply contactor unit 10)</td>
<td>JZRCR-APU01-1</td>
<td>For Japan, Asia and Europe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JZRCR-APU03-1</td>
<td>For North America</td>
</tr>
<tr>
<td>11</td>
<td>Heat exchanger</td>
<td>TCMSY-310DC or TCMSY-312DC 4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>or TCMSY-322DC 5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exterior fan 6)</td>
<td>08038RA-24Q-GA-04</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interior fan 7)</td>
<td>08038RA-24Q-EA-02</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Filter kit 8)</td>
<td>GRM80-30 or MM850-0811A 6)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Backside duct fan</td>
<td>09225VE-24P-CA-02</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Power supply contactor unit 10)</td>
<td>FNQ-10 10 A, 500 VAC</td>
<td>Time delay fuse (for Japan, Asia and Europe)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SC-10 10 A, 600 VAC</td>
<td>Time delay fuse (for North America)</td>
</tr>
<tr>
<td></td>
<td>General-purpose I/O board 9)</td>
<td>02173.15P 3.15 A, 250 V</td>
<td>Rapid cut fuse</td>
</tr>
<tr>
<td></td>
<td>Servo control board fuse 11)</td>
<td>HM10</td>
<td>Micro fuse</td>
</tr>
<tr>
<td>14</td>
<td>Battery</td>
<td>ER6BD_WK77P 3.6V</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Power supply for manipulator fan 11)</td>
<td>SBVS-09024</td>
<td>For 200 to 240 VAC input (for Japan)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SBVK-T12024</td>
<td>For 380 to 480 VAC input (for Asia, North America and Europe)</td>
</tr>
<tr>
<td>16</td>
<td>Fan control relay 11)</td>
<td>LY2N-D2 DC24V</td>
<td></td>
</tr>
</tbody>
</table>

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”.
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

<table>
<thead>
<tr>
<th>Type of the YRC1000</th>
<th>Type of inverter unit</th>
<th>Single-axis amplifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERAR-1000-06VX8-□□□</td>
<td>CSRA-SDA01H01A</td>
<td>None</td>
</tr>
<tr>
<td>ERAR-1000-06VXH25-□□□</td>
<td>CSRA-SDA02H01A</td>
<td>None</td>
</tr>
<tr>
<td>ERAR-1000-07VXHE6-□□□</td>
<td>CSRA-SDA02H01A</td>
<td>CSRA-SDB21HA</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Type of the YRC1000</th>
<th>Type of inverter unit</th>
<th>Single-axis amplifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERAR-1000-06VXHL20-□□□</td>
<td>CSRA-SDA12H01A</td>
<td>None</td>
</tr>
<tr>
<td>ERAR-1000-06VX280-□□□</td>
<td>CSRA-SDA11H01A</td>
<td>None</td>
</tr>
<tr>
<td>ERAR-1000-06VRF130-□□□</td>
<td>CSRA-SDA11H01A</td>
<td>CSRA-SDB71HA</td>
</tr>
<tr>
<td>ERAR-1000-06VX600-□□□</td>
<td>CSRA-SDA11H01A</td>
<td>CSRA-SDB71HA</td>
</tr>
</tbody>
</table>
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>
<thead>
<tr>
<th>No.</th>
<th>Parts Name</th>
<th>Dimensions</th>
<th>Pcs.</th>
<th>Model</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10 A fuse</td>
<td></td>
<td>2</td>
<td>FNQ-10 10 A, 500 VAC (BUSSMANN)</td>
<td>JZRCR-APU01-1 (1FU, 2FU)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SC-10 10 A, 600 VAC (BUSSMANN)</td>
<td>JZRCR-APU03-1 (1FU, 2FU)</td>
</tr>
<tr>
<td>2</td>
<td>Glass-tube fuse</td>
<td></td>
<td>1</td>
<td>02173.15P, 3.15 A, 250 V (LITTEL)</td>
<td>JANCD-AIO0:-E(F1)</td>
</tr>
<tr>
<td>3</td>
<td>Micro fuse</td>
<td></td>
<td>1</td>
<td>HM10 1.0 A 250 V (Daito Communication Apparatus Co., Ltd.)</td>
<td>CSRA-SDCA01AA(F1)</td>
</tr>
<tr>
<td>4</td>
<td>WAGO connector</td>
<td>2</td>
<td>2</td>
<td>231-131 (WAGO Company of Japan, Ltd.)</td>
<td>CSRA-CPS01K:-CN152</td>
</tr>
<tr>
<td></td>
<td>wiring tool</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>WAGO connector</td>
<td>1</td>
<td>1</td>
<td>734-230 (WAGO Company of Japan, Ltd.)</td>
<td>JANCD-AI00:-E-CN303</td>
</tr>
<tr>
<td></td>
<td>wiring tool</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>WAGO terminal block</td>
<td>1</td>
<td>1</td>
<td>210-119SB (WAGO Company of Japan, Ltd.)</td>
<td>IM-YE250/5-80P</td>
</tr>
</tbody>
</table>
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 which are ranked B or C, inform the manufacturing number (or order number) of YRC1000 to YASKAWA representative.

Please make sure to use our recommended spare parts. In case use spare parts from any other than YASKAWA, it may cause that product performance can not be guaranteed, damage to equipment or fire.

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

**NOTE**

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

**SUPPLEMENT**

For the YRC1000 type which is not described in this manual, refer to the YRC1000 supplementary instructions.
### Table 5-4: Correspondence Table of Recommended Spare Parts

<table>
<thead>
<tr>
<th>Type of the YRC1000</th>
<th>Major manipulator type</th>
<th>Recommended spare parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERAR-1000-06VX8-□□□</td>
<td>GP7/AR900</td>
<td>table 5-5</td>
</tr>
<tr>
<td></td>
<td>GP8/AR700</td>
<td></td>
</tr>
<tr>
<td>ERAR-1000-06VXH25-□□</td>
<td>GP12/AR1440</td>
<td>table 5-6</td>
</tr>
<tr>
<td></td>
<td>GP25/AR1730</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GP25-12/AR2010</td>
<td></td>
</tr>
<tr>
<td>ERAR-1000-07VXHE6-□□□</td>
<td>AR1440E</td>
<td>table 5-7</td>
</tr>
<tr>
<td>ERAR-1000-06VXL20-□□□</td>
<td>GP200HL/AR3120</td>
<td>table 5-8</td>
</tr>
<tr>
<td>ERAR-1000-06VX280-□□</td>
<td>GP50</td>
<td>table 5-9</td>
</tr>
<tr>
<td></td>
<td>GP35L</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GP88/SP80</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GP110/SP100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SP130</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GP180/SP165</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GP180-120/SP165-105</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GP200S</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GP215</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GP225/SP210</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GP250/SP235</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GP280</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GP165R/SP150R</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GP200R/SP185R</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SP110H</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SP180H</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SP180H-110</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SP225H</td>
<td></td>
</tr>
<tr>
<td>ERAR-1000-06VX600-□□□</td>
<td>GP400</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GP600</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GP400R</td>
<td></td>
</tr>
<tr>
<td>ERAR-1000-07VXB110-□□</td>
<td>GP110B/SP100B</td>
<td>table 5-10</td>
</tr>
<tr>
<td>ERAR-1000-06VRF130-□□</td>
<td>PH130RF</td>
<td>table 5-11</td>
</tr>
<tr>
<td></td>
<td>PH130F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PL500</td>
<td></td>
</tr>
</tbody>
</table>
Table 5-5: Recommended Spare Parts List of YRC1000 for ERAR-1000-06VX8-□□□

<table>
<thead>
<tr>
<th>Rank</th>
<th>Parts No.</th>
<th>Name</th>
<th>Type</th>
<th>Manufacturer</th>
<th>Qty. per Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 1</td>
<td>Battery</td>
<td>ER6BD_WK77P 3.6 V</td>
<td>Hitachi Maxell, Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A 2</td>
<td>Filter for heat exchanger</td>
<td>HB20</td>
<td>Maruyasu Industries Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A 3</td>
<td>Filter kit for heat exchanger</td>
<td>GRM80-30</td>
<td>Maruyasu Industries Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A 4</td>
<td>Exterior fan for heat exchanger</td>
<td>08038RA-24Q-GA-04</td>
<td>Minebea Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A 5</td>
<td>Interior fan for heat exchanger</td>
<td>08038RA-24Q-EA-02</td>
<td>Minebea Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A 6</td>
<td>Backside duct fan</td>
<td>09225VE-24P-CA-02</td>
<td>Minebea Co., Ltd.</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>A 7</td>
<td>Control power supply unit fan</td>
<td>CSRA-CPS01KA-FN</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A 8</td>
<td>DC24V fuse for I/O</td>
<td>02173.15P 3.15 A, 250 V</td>
<td>LITTEL</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A 9</td>
<td>AC control power supply fuse</td>
<td>FNQ-10 10 A, 500 V</td>
<td>BUSSMAN</td>
<td>2</td>
<td>2</td>
<td>For Japan, Asia and Europe, For North America</td>
</tr>
<tr>
<td>A 10</td>
<td>Encoder power supply fuse</td>
<td>HM10 1 A, 250 V</td>
<td>Daito Communication Apparatus Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 11</td>
<td>CPU board</td>
<td>JANCD-ACP01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 12</td>
<td>Robot I/F board</td>
<td>JANCD-AIF01-□□□E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 13</td>
<td>Safety circuit board</td>
<td>JANCD-ASF01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 14</td>
<td>General-purpose I/O board</td>
<td>JANCD-AIO0□□□□-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 15</td>
<td>Converter</td>
<td>CSRA-CV05□□□□-□□□A</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>With the servo control board (CSRA-SDCA01AA)</td>
</tr>
<tr>
<td>C 16</td>
<td>Inverter unit</td>
<td>CSRA-SDA01H01A</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 17</td>
<td>CPU unit</td>
<td>JZNC-ARK01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 18</td>
<td>Power supply contactor unit</td>
<td>JZRCR-APU01-1</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>For Japan, Asia and Europe, For North America</td>
</tr>
<tr>
<td>C 19</td>
<td>Control power supply unit</td>
<td>CSRA-CPS01KB</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 20</td>
<td>Programming pendant</td>
<td>JZRCR-APP01-1</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>With cable (8 m)</td>
</tr>
</tbody>
</table>
### Recommended Spare Parts List of YRC1000 for ERAR-1000-06VXH25-□□□

<table>
<thead>
<tr>
<th>Rank</th>
<th>Parts No.</th>
<th>Name</th>
<th>Type</th>
<th>Manufacturer</th>
<th>Qty. per Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 1</td>
<td>Battery</td>
<td>ER6BD_WK77P 3.6 V</td>
<td>Hitachi Maxell, Ltd.</td>
<td>1 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 2</td>
<td>Filter for heat exchanger</td>
<td>HB20</td>
<td>Maruyasu Industries Co., Ltd.</td>
<td>1 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 3</td>
<td>Filter kit for heat exchanger</td>
<td>GRM80-30</td>
<td>Maruyasu Industries Co., Ltd.</td>
<td>1 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 4</td>
<td>Exterior fan for heat exchanger</td>
<td>08038RA-24Q-GA-04</td>
<td>Minebea Co., Ltd.</td>
<td>1 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 5</td>
<td>Interior fan for heat exchanger</td>
<td>08038RA-24Q-EA-02</td>
<td>Minebea Co., Ltd.</td>
<td>1 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 6</td>
<td>Backside duct fan</td>
<td>09225VE-24P-CA-02</td>
<td>Minebea Co., Ltd.</td>
<td>4 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 7</td>
<td>Control power supply unit fan</td>
<td>CSRA-CPS01KA-FN</td>
<td>YASKAWA Electric Corporation</td>
<td>1 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 8</td>
<td>DC24V fuse for I/O</td>
<td>02173.15P 3.15 A, 250 V</td>
<td>LITTEL</td>
<td>1 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 9</td>
<td>AC control power supply fuse</td>
<td>FNQ-10 10 A, 500 VAC</td>
<td>BUSSMAN</td>
<td>2 2</td>
<td>For Japan, Asia and Europe</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SC-10 10 A, 600 VAC</td>
<td></td>
<td></td>
<td>For North America</td>
<td></td>
</tr>
<tr>
<td>A 10</td>
<td>Encoder power supply fuse</td>
<td>HM10 1 A, 250 V</td>
<td>Daito Communication Apparatus Co., Ltd.</td>
<td>1 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 11</td>
<td>CPU board</td>
<td>JANCD-ACP01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 12</td>
<td>Robot I/F board</td>
<td>JANCD-AIF01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 13</td>
<td>Safety circuit board</td>
<td>JANCD-ASF01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 14</td>
<td>General-purpose I/O board</td>
<td>JANCD-AIO0-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 15</td>
<td>Converter</td>
<td>CSRA-CV05C0-A</td>
<td>YASKAWA Electric Corporation</td>
<td>1 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 16</td>
<td>Inverter unit</td>
<td>CSRA-SDA02H01A</td>
<td>YASKAWA Electric Corporation</td>
<td>1 1</td>
<td>With the servo control board (CSRA-SDCA01AA)</td>
<td></td>
</tr>
<tr>
<td>C 17</td>
<td>CPU unit</td>
<td>JZNC-ARK01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 18</td>
<td>Power supply contactor unit</td>
<td>JZRCR-APU01-1</td>
<td>YASKAWA Electric Corporation</td>
<td>1 1</td>
<td>For Japan, Asia and Europe</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>JZRCR-APU03-1</td>
<td>YASKAWA Electric Corporation</td>
<td></td>
<td>For North America</td>
<td></td>
</tr>
<tr>
<td>C 19</td>
<td>Control power supply unit</td>
<td>CSRA-CPS01KB</td>
<td>YASKAWA Electric Corporation</td>
<td>1 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 20</td>
<td>Programming pendant</td>
<td>JZRCR-APP01-1</td>
<td>YASKAWA Electric Corporation</td>
<td>1 1</td>
<td>With cable (8 m)</td>
<td></td>
</tr>
</tbody>
</table>
### Table 5-7: Recommended Spare Parts List of YRC1000 for ERAR-1000-07VXHE6-□□□

<table>
<thead>
<tr>
<th>Rank</th>
<th>Parts No.</th>
<th>Name</th>
<th>Type</th>
<th>Manufacturer</th>
<th>Qty.</th>
<th>Qty. per Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 1</td>
<td>Battery</td>
<td>ER6BD_WK77P 3.6 V</td>
<td>Hitachi Maxell, Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 2</td>
<td>Filter for heat exchanger</td>
<td>HB20</td>
<td>Maruyasu Industries Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 3</td>
<td>Filter kit for heat exchanger</td>
<td>GRM80-30</td>
<td>Maruyasu Industries Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 4</td>
<td>Exterior fan for heat exchanger</td>
<td>08038RA-24Q-GA-04</td>
<td>Minebea Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 5</td>
<td>Interior fan for heat exchanger</td>
<td>08038RA-24Q-EA-02</td>
<td>Minebea Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 6</td>
<td>Backside duct fan</td>
<td>09225VE-24P-CA-02</td>
<td>Minebea Co., Ltd.</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 7</td>
<td>Control power supply unit fan</td>
<td>CSRA-CPS01KA-FN</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 8</td>
<td>DC24V fuse for I/O</td>
<td>02173.15P 3.15 A, 250 V</td>
<td>LITTEL</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 9</td>
<td>AC control power supply fuse</td>
<td>FNQ-10 10 A, 500 VAC</td>
<td>BUSSMAN</td>
<td>2</td>
<td>2</td>
<td>For Japan, Asia and Europe For North America</td>
<td></td>
</tr>
<tr>
<td>A 10</td>
<td>Encoder power supply fuse</td>
<td>HM10 1 A, 250 V</td>
<td>Daito Communication Apparatus Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 11</td>
<td>CPU board</td>
<td>JANCD-ACP01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 12</td>
<td>Robot I/F board</td>
<td>JANCD-AIF01-□□□E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
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<tr>
<td>B 13</td>
<td>Safety circuit board</td>
<td>JANCD-ASF01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 14</td>
<td>General-purpose I/O board</td>
<td>JANCD-AIO0□□□E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 15</td>
<td>Converter</td>
<td>CSRA-CV05□□□A</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>C 16</td>
<td>Inverter unit</td>
<td>CSRA-SDA02H01A</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>With the servo control board (CSRA-SDCA01AA)</td>
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</tr>
<tr>
<td>C 17</td>
<td>Single-axis amplifier</td>
<td>CSRA-SDB21HA</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 18</td>
<td>CPU unit</td>
<td>JZNC-ARK01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 19</td>
<td>Power supply contactor unit</td>
<td>JZRCR-APU01-1 JZRCR-APU03-1</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>For Japan, Asia and Europe For North America</td>
<td></td>
</tr>
<tr>
<td>C 20</td>
<td>Control power supply unit</td>
<td>CSRA-CPS01KB</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 21</td>
<td>Programming pendant</td>
<td>JZRCR-APP01-1</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>With cable (8 m)</td>
<td></td>
</tr>
</tbody>
</table>
### Recommended Spare Parts List of YRC1000 for ERAR-1000-06VXHL20-

<table>
<thead>
<tr>
<th>Rank</th>
<th>Parts No.</th>
<th>Name</th>
<th>Type</th>
<th>Manufacturer</th>
<th>Qty.</th>
<th>Qty. per Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 1</td>
<td>Battery</td>
<td>ER6BD_WK77P 3.6 V</td>
<td>Hitachi Maxell, Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 2</td>
<td>Filter for heat exchanger</td>
<td>HB20</td>
<td>Maruyasu Industries Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 3</td>
<td>Filter kit for heat exchanger</td>
<td>GRM80-30</td>
<td>Maruyasu Industries Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 4</td>
<td>Exterior fan for heat exchanger</td>
<td>08038RA-24Q-GA-04</td>
<td>Minebea Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 5</td>
<td>Interior fan for heat exchanger</td>
<td>08038RA-24Q-EA-02</td>
<td>Minebea Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 6</td>
<td>Backside duct fan</td>
<td>09225VE-24P-CA-02</td>
<td>Minebea Co., Ltd.</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 7</td>
<td>Control power supply unit fan</td>
<td>CSRA-CPS01KA-FN</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 8</td>
<td>DC24V fuse for I/O</td>
<td>02173.15P 3.15 A, 250 V</td>
<td>LITTEL</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 9</td>
<td>AC control power supply fuse</td>
<td>FNQ-10 10 A, 500 VAC</td>
<td>BUSSMAN</td>
<td>2</td>
<td>2</td>
<td>For Japan, Asia and Europe For North America</td>
<td></td>
</tr>
<tr>
<td>A 10</td>
<td>Encoder power supply fuse</td>
<td>HM10 1 A, 250 V</td>
<td>Daito Communication Apparatus Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 11</td>
<td>CPU board</td>
<td>JANCD-ACP01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 12</td>
<td>Robot I/F board</td>
<td>JANCD-AIF01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 13</td>
<td>Safety circuit board</td>
<td>JANCD-ASF01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 14</td>
<td>General-purpose I/O board</td>
<td>JANCD-AIO00-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 15</td>
<td>Converter</td>
<td>CSRA-CV1000-0A</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>With the servo control board (CSRA-SDCA01EA)</td>
<td></td>
</tr>
<tr>
<td>C 16</td>
<td>Inverter unit</td>
<td>CSRA-SDA12H01A</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 17</td>
<td>CPU unit</td>
<td>JZNC-ARK01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 18</td>
<td>Power supply contactor unit</td>
<td>JZRCR-APU01-1</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>For Japan, Asia and Europe For North America</td>
<td></td>
</tr>
<tr>
<td>C 19</td>
<td>Control power supply unit</td>
<td>CSRA-CPS01KB</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 20</td>
<td>Programming pendant</td>
<td>JZRCR-APP01-1</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>With cable (8 m)</td>
<td></td>
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### Table 5-9: Recommended Spare Parts List of YRC1000 for ERAR-1000-06VX280-□□□, ERAR-1000-06VX600-□□□

<table>
<thead>
<tr>
<th>Rank</th>
<th>Parts No.</th>
<th>Name</th>
<th>Type</th>
<th>Manufacturer</th>
<th>Qty.</th>
<th>Qty. per Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>Battery</td>
<td>ER6BD_WK77P 3.6 V</td>
<td>Hitachi Maxell, Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>2</td>
<td>Filter for heat exchanger</td>
<td>HB20</td>
<td>Maruyasu Industries Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>3</td>
<td>Filter kit for heat exchanger</td>
<td>GRM80-30</td>
<td>Maruyasu Industries Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>4</td>
<td>Exterior fan for heat exchanger</td>
<td>08038RA-24Q-GA-04</td>
<td>Minebea Co., Ltd.</td>
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<td>1</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>5</td>
<td>Interior fan for heat exchanger</td>
<td>08038RA-24Q-EA-02</td>
<td>Minebea Co., Ltd.</td>
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<td>1</td>
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</tr>
<tr>
<td>A</td>
<td>6</td>
<td>Backside duct fan</td>
<td>09225VE-24P-CA-02</td>
<td>Minebea Co., Ltd.</td>
<td>4</td>
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<tr>
<td>A</td>
<td>7</td>
<td>Control power supply unit fan</td>
<td>CSRA-CPS01KA-FN</td>
<td>YASKAWA Electric Corporation</td>
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<td>1</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>8</td>
<td>DC24V fuse for I/O</td>
<td>02173.15P 3.15 A, 250 V</td>
<td>LITTEL</td>
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</tr>
<tr>
<td>A</td>
<td>9</td>
<td>AC control power supply fuse</td>
<td>FNQ-10 10 A, 500 VAC</td>
<td>BUSSMAN</td>
<td>2</td>
<td>2</td>
<td>For Japan, Asia and Europe</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SC-10 10 A, 600 VAC</td>
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<td></td>
<td></td>
<td>For North America</td>
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<tr>
<td>A</td>
<td>10</td>
<td>Encoder power supply fuse</td>
<td>HM10 1 A, 250 V</td>
<td>Daito Communication Apparatus Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>11</td>
<td>CPU board</td>
<td>JANCD-ACP01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
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<tr>
<td>B</td>
<td>12</td>
<td>Robot I/F board</td>
<td>JANCD-AIF01-□□□</td>
<td>YASKAWA Electric Corporation</td>
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<td></td>
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<tr>
<td>B</td>
<td>13</td>
<td>Safety circuit board</td>
<td>JANCD-ASF01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>14</td>
<td>General-purpose I/O board</td>
<td>JANCD-AIO0□□□</td>
<td>YASKAWA Electric Corporation</td>
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<td>1</td>
<td></td>
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<tr>
<td>C</td>
<td>15</td>
<td>Converter</td>
<td>CSRA-CV10□□□□</td>
<td>YASKAWA Electric Corporation</td>
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</tr>
<tr>
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<td>16</td>
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<td>YASKAWA Electric Corporation</td>
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<td>1</td>
<td>With the servo control board (CSRA-SDCA01AA)</td>
</tr>
<tr>
<td>C</td>
<td>17</td>
<td>CPU unit</td>
<td>JZNC-ARK01-E</td>
<td>YASKAWA Electric Corporation</td>
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<td>1</td>
<td></td>
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<tr>
<td>C</td>
<td>18</td>
<td>Power supply contactor unit</td>
<td>JZRCR-APU01-1</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>For Japan, Asia and Europe</td>
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<td></td>
<td></td>
<td>JZRCR-APU03-1</td>
<td>For North America</td>
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<tr>
<td>C</td>
<td>19</td>
<td>Control power supply unit</td>
<td>CSRA-CPS01KB</td>
<td>YASKAWA Electric Corporation</td>
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<td>1</td>
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</tr>
<tr>
<td>C</td>
<td>20</td>
<td>Programming pendant</td>
<td>JZRCR-APP01-1</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>With cable (8 m)</td>
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# 5 Replacing Parts

## 5.4 Recommended Spare Parts

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

<table>
<thead>
<tr>
<th>Rank</th>
<th>Parts No.</th>
<th>Name</th>
<th>Type</th>
<th>Manufacturer</th>
<th>Qty.</th>
<th>Qty. per Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 1</td>
<td>Battery</td>
<td>ER6BD_WK77P 3.6 V</td>
<td>Hitachi Maxell, Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 2</td>
<td>Filter for heat exchanger</td>
<td>HB20</td>
<td>Maruyasu Industries Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 3</td>
<td>Filter kit for heat exchanger</td>
<td>GRM80-30</td>
<td>Maruyasu Industries Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 4</td>
<td>Exterior fan for heat exchanger</td>
<td>08038RA-24Q-GA-04</td>
<td>Minebea Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 5</td>
<td>Interior fan for heat exchanger</td>
<td>08038RA-24Q-EA-02</td>
<td>Minebea Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 6</td>
<td>Backside duct fan</td>
<td>09225VE-24P-CA-02</td>
<td>Minebea Co., Ltd.</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 7</td>
<td>Control power supply unit fan</td>
<td>CSRA-CPS01KA-FN</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 8</td>
<td>DC24V fuse for I/O</td>
<td>02173.15P 3.15 A, 250 V</td>
<td>LITTEL</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 9</td>
<td>AC control power supply fuse</td>
<td>FNQ-10 10 A, 500 VAC</td>
<td>BUSSMAN</td>
<td>2</td>
<td>2</td>
<td>For Japan, Asia and Europe</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SC-10 10 A, 600 VAC</td>
<td></td>
<td></td>
<td></td>
<td>For North America</td>
<td></td>
</tr>
<tr>
<td>A 10</td>
<td>Encoder power supply fuse</td>
<td>HM10 1 A, 250 V</td>
<td>Daito Communication Apparatus Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 11</td>
<td>CPU board</td>
<td>JANCD-ACP01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 12</td>
<td>Robot I/F board</td>
<td>JANCD-AIF01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 13</td>
<td>Safety circuit board</td>
<td>JANCD-ASF01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 14</td>
<td>General-purpose I/O board</td>
<td>JANCD-AIO0-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 15</td>
<td>Converter</td>
<td>CSRA-CV10-□:□-A</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 16</td>
<td>Inverter unit</td>
<td>CSRA-SDA11H01A</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>With the servo control board (CSRA-SDCA01AA) For the L-, E-, U-, R-, B-, T-axes</td>
<td></td>
</tr>
<tr>
<td>C 17</td>
<td>Single-axis amplifier</td>
<td>CSRA-SDB71HA</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>For the S-axis</td>
<td></td>
</tr>
<tr>
<td>C 18</td>
<td>CPU unit</td>
<td>JZNC-ARK01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 19</td>
<td>Power supply contactor unit</td>
<td>JZRCR-APU01-1</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>For Japan, Asia and Europe For North America</td>
<td></td>
</tr>
<tr>
<td>C 20</td>
<td>Control power supply unit</td>
<td>JZRCR-APU03-1</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 21</td>
<td>Programming pendant</td>
<td>JZRCR-APP01-1</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>With cable (8 m)</td>
<td></td>
</tr>
</tbody>
</table>
### Table 5-11: Recommended Spare Parts List of YRC1000 for ERAR-1000-06VRF130-

<table>
<thead>
<tr>
<th>Rank</th>
<th>Parts No.</th>
<th>Name</th>
<th>Type</th>
<th>Manufacturer</th>
<th>Qty.</th>
<th>Qty. per Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>Battery</td>
<td>ER6BD_WK77P 3.6 V</td>
<td>Hitachi Maxell, Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>2</td>
<td>Filter for heat exchanger</td>
<td>HB20</td>
<td>Maruyasu Industries Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>3</td>
<td>Filter kit for heat exchanger</td>
<td>GRM80-30</td>
<td>Maruyasu Industries Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>4</td>
<td>Exterior fan for heat exchanger</td>
<td>08038RA-24Q-GA-04</td>
<td>Minebea Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>5</td>
<td>Interior fan for heat exchanger</td>
<td>08038RA-24Q-EA-02</td>
<td>Minebea Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>6</td>
<td>Backside duct fan</td>
<td>09225VE-24P-CA-02</td>
<td>Minebea Co., Ltd.</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>7</td>
<td>Control power supply unit fan</td>
<td>CSRA-CPS01KA-FN</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>8</td>
<td>DC24V fuse for I/O</td>
<td>02173.15P 3.15 A, 250 V</td>
<td>LITTEL</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>9</td>
<td>AC control power supply fuse</td>
<td>FNQ-10 10 A, 500 VAC</td>
<td>BUSSMAN</td>
<td>2</td>
<td>2</td>
<td>For Japan, Asia and Europe For North America</td>
</tr>
<tr>
<td>A</td>
<td>10</td>
<td>Encoder power supply fuse</td>
<td>HM10 1 A, 250 V</td>
<td>Daito Communication Apparatus Co., Ltd.</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>11</td>
<td>CPU board</td>
<td>JANCD-ACP01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>12</td>
<td>Robot I/F board</td>
<td>JANCD-AIF01-□□E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>13</td>
<td>Safety circuit board</td>
<td>JANCD-ASF01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>14</td>
<td>General-purpose I/O board</td>
<td>JANCD-AIO0□□-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
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<tr>
<td>B</td>
<td>15</td>
<td>Fan control relay</td>
<td>LY2N-D2 DC24V</td>
<td>OMRON</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>16</td>
<td>Converter</td>
<td>CSRA-CV10□□□□A</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>17</td>
<td>Inverter unit</td>
<td>CSRA-SDA11H01A</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>With the servo control board (CSRA-SDCA01AA)</td>
</tr>
<tr>
<td>C</td>
<td>18</td>
<td>CPU unit</td>
<td>JZNC-ARK01-E</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>19</td>
<td>Power supply contactor unit</td>
<td>JZRCR-APU01-1</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>For Japan, Asia and Europe For North America</td>
</tr>
<tr>
<td>C</td>
<td>20</td>
<td>Control power supply unit</td>
<td>CSRA-CPS01KB</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Table 5-11: Recommended Spare Parts List of YRC1000 for ERAR-1000-06VRF130-□□□

<table>
<thead>
<tr>
<th>Rank</th>
<th>Parts No.</th>
<th>Name</th>
<th>Type</th>
<th>Manufacturer</th>
<th>Qty.</th>
<th>Qty. per Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>21</td>
<td>Power supply for manipulator fan</td>
<td>S8VS-09024</td>
<td>OMRON</td>
<td>1</td>
<td>1</td>
<td>For 200 to 240 VAC input (for Japan)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S8VK-T12024</td>
<td>OMRON</td>
<td>1</td>
<td>1</td>
<td>For 380 to 480 VAC input (for Asia, North America and Europe)</td>
</tr>
<tr>
<td>C</td>
<td>22</td>
<td>Programming pendant</td>
<td>JZRCR-APP01-1</td>
<td>YASKAWA Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>With cable (8 m)</td>
</tr>
</tbody>
</table>
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 the play mode or in the 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, which 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 the 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 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. In addition, in case the operation of the manipulator starts, the manipulator or the tool may hit the programming pendant left unattended, which may result in personal injury and/or equipment damage.
6 Operations after Replacing Parts
6.1 Home Position Calibration

6.1 Home Position Calibration

**NOTE**

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 the 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”.

6-3
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 which 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.
6.1.2.3 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 which 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.
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 which 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.

**Angle of the U-axis with respect to the horizontal line of the ground (-0°)**

**Angle of the L-axis with respect to the vertical line to the ground (-0°)**

**Angle of the B-axis center line with respect to the U-axis center line (-0°)**

**NOTE**

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 Operations after Replacing Parts
6.3 Checking of the Check Program

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 which 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 the play mode or in the 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, which 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 the 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 right of the programming pendant.
6 Operations after Replacing Parts
6.4 Setting the Second Home Position (Check Point)

**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. In this case, the manipulator may move in an unexpected direction, which 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. In addition, in case the operation of the manipulator starts, the manipulator or the tool may hit the programming pendant left unattended, which 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.

- 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”.

NOTE
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 Setting the Second Home Position (Check Point)

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.

   ![SECOND HOME POS Window]

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.

   ![Page Selection Window]

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. In this case, the manipulator may move in an unexpected direction, which may result in personal injury and/or equipment damage.

If the "OUT OF RANGE (ABSO DATA)" alarm occurs, perform the followings

- 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.

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

7.2 Manipulator Model

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 which 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, “O” or “●” in the GENERAL PURPOSE OUTPUT window.

2. Press [INTER LOCK] + [SELECT].
   – The status is changed. (●: ON status, O: OFF status)

   ![GENERAL PURPOSE OUTPUT Window]

   **NOTE**
   The status of general-purpose output signal can be changed only when the mode is set to the 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 which 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 which 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.
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.
2. Select {SEARCH SIGNAL NO.}.
   – Numeric values can now be entered.

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 System Diagnosis
7.3 Input/Output Status

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

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.

- 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 System Monitoring Time Display

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.

NOTE

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 System Monitoring Time Display

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 following procedure when the security mode is the 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.

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.
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.

![Alarm History Table]

<table>
<thead>
<tr>
<th>No</th>
<th>Code</th>
<th>Date</th>
<th>Time</th>
<th>Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>4440</td>
<td>2016/10/22</td>
<td>10:30</td>
<td>TEACH</td>
<td>OK</td>
</tr>
<tr>
<td>002</td>
<td>4440</td>
<td>2016/10/22</td>
<td>10:20</td>
<td>TEACH</td>
<td>OK</td>
</tr>
<tr>
<td>003</td>
<td>3600</td>
<td>2016/10/22</td>
<td>10:00</td>
<td>TEACH</td>
<td>OK</td>
</tr>
<tr>
<td>004</td>
<td>4000</td>
<td>2016/10/22</td>
<td>9:40</td>
<td>TEACH</td>
<td>OK</td>
</tr>
<tr>
<td>005</td>
<td>4100</td>
<td>2016/10/22</td>
<td>9:30</td>
<td>PLAY</td>
<td>OK</td>
</tr>
<tr>
<td>006</td>
<td>4440</td>
<td>2016/10/22</td>
<td>9:20</td>
<td>TEACH</td>
<td>OK</td>
</tr>
<tr>
<td>007</td>
<td>4000</td>
<td>2016/10/22</td>
<td>9:00</td>
<td>TEACH</td>
<td>OK</td>
</tr>
<tr>
<td>008</td>
<td>4000</td>
<td>2016/10/21</td>
<td>20:45</td>
<td>TEACH</td>
<td>OK</td>
</tr>
<tr>
<td>009</td>
<td>4000</td>
<td>2016/10/21</td>
<td>20:35</td>
<td>TEACH</td>
<td>OK</td>
</tr>
<tr>
<td>010</td>
<td>4100</td>
<td>2016/10/21</td>
<td>20:25</td>
<td>TEACH</td>
<td>OK</td>
</tr>
<tr>
<td>011</td>
<td>4100</td>
<td>2016/10/21</td>
<td>20:15</td>
<td>TEACH</td>
<td>OK</td>
</tr>
<tr>
<td>012</td>
<td>4000</td>
<td>2016/10/21</td>
<td>20:05</td>
<td>TEACH</td>
<td>OK</td>
</tr>
</tbody>
</table>

Note: The table shows a sample of alarm history. The actual table may vary based on the controller's configuration.
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 Alarm History

### 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 which 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 System Diagnosis
7.6 I/O Message History

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.
   
   ![Confirmation Dialog Box]

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

---

**NOTE**

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.
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.

   ![Current Position Window](image)

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

   ![Current Position Window with Selections](image)

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

   ![Current Position Window with Selected Coordinate](image)
7.9 Servo Monitoring

7.9.1 Servo Monitor Window

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

<table>
<thead>
<tr>
<th>Monitor Items</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEEDBACK PULSE</td>
<td>Feedback position (actual position) of each axis</td>
</tr>
<tr>
<td>ERROR PULSE</td>
<td>Difference between the command position and the feedback position of each axis</td>
</tr>
<tr>
<td>SPEED DEVIATION</td>
<td>Difference between the command speed and the feedback speed of each axis</td>
</tr>
<tr>
<td>SPEED INST</td>
<td>Speed reference of each axis</td>
</tr>
<tr>
<td>FEEDBACK SPEED</td>
<td>Feedback speed (actual speed) of each axis</td>
</tr>
<tr>
<td>TORQUE SPEC</td>
<td>Torque reference of each axis</td>
</tr>
<tr>
<td>MAX. TORQUE</td>
<td>Keeps the maximum value of the torque reference of each axis.</td>
</tr>
<tr>
<td>ENCODER ROTATE SUM</td>
<td>Accumulated number of encoder rotation when the control power supply of each axis is turned ON</td>
</tr>
<tr>
<td>IN 1 TURN POSITION</td>
<td>Position after one rotation of the encoder when the control power supply of each axis is turned ON</td>
</tr>
<tr>
<td>MOTOR ABSOLUTE</td>
<td>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.</td>
</tr>
<tr>
<td>ENCODER TEMPERATURE</td>
<td>The temperature of the each axis (°C)</td>
</tr>
</tbody>
</table>
7 System Diagnosis
7.9 Servo Monitoring

7.9.1.1 Changing the Monitor Items

1. Set the security mode to the 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.
5. Select MONITOR ITEM 1 or 2, and view the sub-menu choices by the cursor key.
   – The sub-menu choices appear.

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

2. Select \{MAX. TORQUE\}.
   - The maximum torque data is cleared.
7 System Diagnosis
7.10 State of the Robot Drop Tolerance Error

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. However, in case of 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.
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 following operation.

1. Occurring times of the 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.
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*

<table>
<thead>
<tr>
<th>Alarm Code</th>
<th>Alarm Level</th>
<th>Alarm Reset Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Level 0 (Major alarm) (Off line alarm: Initial diagnosis/ Hardware diagnosis alarm)</td>
<td>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.</td>
</tr>
<tr>
<td>1 to 3</td>
<td>Level 1 to 3 (Major alarm)</td>
<td>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.</td>
</tr>
<tr>
<td>4 to 8</td>
<td>Level 4 to 8 (Minor alarm)</td>
<td>After correcting the cause, it is possible to reset by “RESET” under the ALARM window or the system input signal (Alarm reset).</td>
</tr>
<tr>
<td>9</td>
<td>Level 9 (Minor alarm) (I/O alarm)</td>
<td>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).</td>
</tr>
</tbody>
</table>
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.
  - [ R1 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.
8 Alarm
8.3 Display of Alarm Details

- **[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.

- **[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 Display of Alarm Details

8.3.3 Transition of Alarm Detail Window

Press [Cursor] key (up and down) to the alarm number on the window to display each ALARM DETAIL window.

[Select] Key

[RETURN] button or [CANCEL] key
It will not return to this window as above when direct display setting is set.

[PAGE] button

[RESET] button

Window before alarm occurs
Alarm window (or detailed window) appears when an alarm which cannot be reset occurred.
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 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.

NOTE
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

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

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

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

<table>
<thead>
<tr>
<th>Error No.</th>
<th>Data</th>
<th>Error Message</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1010</td>
<td>-</td>
<td>EDIT LOCK mode</td>
<td></td>
</tr>
<tr>
<td>1011</td>
<td>-</td>
<td>EDIT LOCK is set for this line.</td>
<td></td>
</tr>
<tr>
<td>1012</td>
<td>-</td>
<td>This line is defined as a comment.</td>
<td></td>
</tr>
<tr>
<td>1020</td>
<td>-</td>
<td>Enter correct value</td>
<td></td>
</tr>
<tr>
<td>1030</td>
<td>-</td>
<td>Unauthorized ID No.</td>
<td></td>
</tr>
<tr>
<td>1050</td>
<td>-</td>
<td>Enter correct date</td>
<td></td>
</tr>
<tr>
<td>1060</td>
<td>-</td>
<td>Enter correct clock</td>
<td></td>
</tr>
<tr>
<td>1061</td>
<td>-</td>
<td>Enter correct time</td>
<td>The input time value is not correct.</td>
</tr>
<tr>
<td>1062</td>
<td>-</td>
<td>Values over 0 are not acceptable. Move to OPERATING TIME screen to set the values over 0.</td>
<td>The value other than “0” cannot be input.</td>
</tr>
<tr>
<td>1063</td>
<td>-</td>
<td>Enter 500000 or less value for “HHHHHH”.</td>
<td>The value for the time is too big.</td>
</tr>
<tr>
<td>1070</td>
<td>-</td>
<td>Enter an ID number in 4 or more figures</td>
<td></td>
</tr>
<tr>
<td>1071</td>
<td>-</td>
<td>Enter an ID number in 9 or more figures</td>
<td></td>
</tr>
<tr>
<td>1080</td>
<td>-</td>
<td>Negative value can’t be set</td>
<td></td>
</tr>
<tr>
<td>1090</td>
<td>-</td>
<td>Enter correct value (START-END signal no)</td>
<td></td>
</tr>
<tr>
<td>1130</td>
<td>-</td>
<td>Cannot register variable name in this job any more.</td>
<td></td>
</tr>
<tr>
<td>1140</td>
<td>-</td>
<td>No input signals are set.</td>
<td></td>
</tr>
<tr>
<td>1141</td>
<td>-</td>
<td>Overlapped input signals exist.</td>
<td></td>
</tr>
<tr>
<td>1142</td>
<td>-</td>
<td>Overlapped output signals exist.</td>
<td></td>
</tr>
<tr>
<td>1143</td>
<td>-</td>
<td>The signal which cannot be used is set up.</td>
<td></td>
</tr>
<tr>
<td>1150</td>
<td>*</td>
<td>There are abnormal values in the file.</td>
<td></td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Error No.</th>
<th>Data</th>
<th>Error Message</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 to 17</td>
<td></td>
<td>The axis motion range limit and the axis speed monitor are valid, and the axes are endless axes (10+axis number).</td>
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<tr>
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<td>The axis motion range limit and the axis speed monitor are valid, and the axes are speed control axes (20+axis number).</td>
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<td>The axis motion range limit and the axis speed monitor are valid, and the axes are functional safety monitoring invalid axes (30+axis number).</td>
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<td>1162</td>
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<td>The axis to which coasting distance is not set cannot be set to VALID.</td>
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<tr>
<td>0 to 7</td>
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<td>The coasting values are not set when the axis is valid (axis number).</td>
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<tr>
<td>1163</td>
<td>*</td>
<td>The group to which coasting distance is not set cannot be set to VALID.</td>
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<tr>
<td>1170</td>
<td>*</td>
<td>Range cannot be configured with this setting.</td>
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<tr>
<td>1</td>
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<td>Invalid robot range limit file number</td>
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<td>Inequality of the neighboring lines in the initial and terminal node</td>
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<td></td>
<td>There is the same point at the specified vertex.</td>
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<td></td>
<td>Lack of the setting vertex number</td>
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<td></td>
<td>The setting range lines are interfering each other.</td>
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<td></td>
<td>Inappropriate height setting</td>
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<td></td>
<td>Detected the non-convex range</td>
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<td>12</td>
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<td>The exceeded number of the vertices</td>
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<td></td>
<td>Failure to create the data for the monitoring the outside of the range.</td>
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<td>14</td>
<td></td>
<td>Failure to create the plane surface range.</td>
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<tr>
<td>1180</td>
<td>-</td>
<td>Same file cannot be set.</td>
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<tr>
<td>1181</td>
<td>-</td>
<td>The specified output file is under monitoring.</td>
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<tr>
<td>1182</td>
<td>-</td>
<td>Monitor type differs between INPUT1 and INPUT2.</td>
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</tr>
<tr>
<td>1183</td>
<td>-</td>
<td>Coord type differs between INPUT1 and INPUT2.</td>
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</tr>
<tr>
<td>1184</td>
<td>-</td>
<td>The height in Z-direction differs between INPUT1 and INPUT2.</td>
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</tr>
<tr>
<td>1185</td>
<td>*</td>
<td>Range combination cannot be performed.</td>
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</tr>
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<td>1</td>
<td></td>
<td>Inappropriate specified combination</td>
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</tr>
<tr>
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<td>The exceeded number of the point of the intersection</td>
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<tr>
<td>3</td>
<td></td>
<td>Failure to combine the range “AND”</td>
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<tr>
<td>4</td>
<td></td>
<td>Failure to combine the range “OR”</td>
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</tr>
<tr>
<td>Error No.</td>
<td>Data</td>
<td>Error Message</td>
<td>Contents</td>
</tr>
<tr>
<td>----------</td>
<td>------</td>
<td>---------------</td>
<td>----------</td>
</tr>
<tr>
<td>1186</td>
<td>-</td>
<td>The combination use of the files where plane monitoring is set is not permitted.</td>
<td></td>
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<tr>
<td>1190</td>
<td>-</td>
<td>Cannot modify this parameter.</td>
<td></td>
</tr>
<tr>
<td>1191</td>
<td>-</td>
<td>Axis range limit function is temporally disabled.</td>
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</tr>
<tr>
<td>1192</td>
<td>-</td>
<td>Robot range limit function is temporally disabled.</td>
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</tr>
<tr>
<td>1194</td>
<td>-</td>
<td>Tool range limit function is temporally disable.</td>
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<tr>
<td>1195</td>
<td>*</td>
<td>The tool No. must be the same as the registered tool No.</td>
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<tr>
<td></td>
<td></td>
<td>xxx</td>
<td>The control group for the operation target.</td>
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<tr>
<td>1196</td>
<td>-</td>
<td>Select &quot;Functional safety Board FLASH Reset&quot;.</td>
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<tr>
<td>1223</td>
<td>-</td>
<td>The specified output value already exists.</td>
<td></td>
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<tr>
<td>1600</td>
<td>-</td>
<td>A confirmation position is not set.</td>
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</tr>
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</table>
# Error Message

## 9.1.3 Job Defined Data

<table>
<thead>
<tr>
<th>Error No.</th>
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<tbody>
<tr>
<td>2010</td>
<td>-</td>
<td>Incorrect character</td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>-</td>
<td>Name not entered</td>
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</tr>
<tr>
<td>2030</td>
<td>-</td>
<td>Undefined JOB name</td>
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</tr>
<tr>
<td>2040</td>
<td>-</td>
<td>Defined JOB name</td>
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</tr>
<tr>
<td>2050</td>
<td>-</td>
<td>Address not found</td>
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<tr>
<td>2070</td>
<td>-</td>
<td>Set robot exactly to taught position</td>
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<tr>
<td>2080</td>
<td>-</td>
<td>Press INSERT or MODIFY</td>
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</tr>
<tr>
<td>2090</td>
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<td>Only modifying move instruction possible</td>
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<tr>
<td>2100</td>
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<td>JOB cannot be edited.</td>
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<tr>
<td>2110</td>
<td>-</td>
<td>Over soft limit</td>
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<tr>
<td>2111</td>
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<td>Over soft limit. Adjust center position or pulse width.</td>
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<tr>
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<td>Cannot insert/alter/delete with servo off</td>
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<tr>
<td>2150</td>
<td>-</td>
<td>Inserting is not possible from this point</td>
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</tr>
<tr>
<td>2160</td>
<td>-</td>
<td>Cannot modify or delete this position</td>
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<td>-</td>
<td>Press INSERT to record same step as previous step</td>
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<td>2180</td>
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<td>Cannot insert data</td>
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<td>-</td>
<td>Illegal data setting</td>
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<td>2220</td>
<td>-</td>
<td>Display edit instruction</td>
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<td>2240</td>
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<td>Excessive instruction equation</td>
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<td>Unmatched number of parentheses in equation</td>
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<tr>
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<td>Unmatched number of parentheses in conditional expression.</td>
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<tr>
<td>2260</td>
<td>-</td>
<td>Wrong group axis selection</td>
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</tr>
<tr>
<td>2270</td>
<td>-</td>
<td>Cannot insert any more instruction in JOB</td>
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</tr>
<tr>
<td>2272</td>
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<td>Cut/ copy failed. Specify the effective range of instruction.</td>
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<tr>
<td>2280</td>
<td>*</td>
<td>JOB memory is full</td>
<td>Lack of position file memories</td>
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</table>

2 Lack of position file memories
<table>
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<tr>
<th>Error No.</th>
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<td>Lack of instruction file memories</td>
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<td>Lack of memory pool</td>
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<td>Lack of pass condition file for multi layer</td>
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<td>The instruction exceeded the maximum size</td>
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<td>2290</td>
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<td>Undefined MASTER START JOB</td>
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<td>Cannot teach JOB without group-axis specification</td>
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<td>Cannot create editing area</td>
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<td>Cannot cut/copy NOP and END instructions</td>
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<td>EDIT LOCK/COMMENT functions cannot be applied to NOP and END.</td>
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<td>This line cannot be defined as a comment.</td>
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<tr>
<td>2390</td>
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<td>Wrong group axis selection</td>
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### Error Message

<table>
<thead>
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<td>-</td>
<td>Move C-and W-axis to basic position</td>
<td>Laser cutting</td>
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<td>2450</td>
<td>-</td>
<td>Relative JOB not permitted</td>
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<td>2470</td>
<td>-</td>
<td>Wrong JOB type</td>
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<td>Wrong JOB coordinates setting</td>
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<td>Cannot convert the JOB</td>
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<td>Cannot convert positions as macro arguments</td>
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<td>Cannot correct position in the JOB</td>
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<td>Enter JOB name</td>
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<td>Illegal step number</td>
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<td>Enter step number</td>
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<td>Duplicated step number</td>
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<td>Cannot correct steps of position variables and REFP</td>
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<td>The step does not contain speed</td>
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<td>The step does not contain PL/CONT</td>
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<td>Soft limit range over</td>
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<td>Cannot teach position in concurrent JOB</td>
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<td>Conveyor position not reset</td>
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<td>Defined JOB name</td>
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<td>Relative job can’t be shifted with pulse type</td>
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<td>-</td>
<td>Cannot use robot macro JOB</td>
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</tr>
<tr>
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<td>-</td>
<td>Cannot use concurrent macro JOB</td>
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<td>-</td>
<td>Cannot use JOB with group-axis specification</td>
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</tr>
<tr>
<td>Error No.</td>
<td>Data</td>
<td>Error Message</td>
<td>Contents</td>
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<tr>
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<td>------</td>
<td>---------------</td>
<td>----------</td>
</tr>
<tr>
<td>2760</td>
<td>-</td>
<td>Cannot insert/modify/delete for group axis detachment</td>
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</tr>
<tr>
<td>2761</td>
<td>-</td>
<td>Cannot insert/modify/delete for axis detachment</td>
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</tr>
<tr>
<td>2762</td>
<td>-</td>
<td>This operation is not allowed, for axes detachment has been set.</td>
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</tr>
<tr>
<td>2763</td>
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<td>Cannot modify, for axes detachment has been set.</td>
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</tr>
<tr>
<td>2764</td>
<td>-</td>
<td>Cannot insert/modify/delete, for axes detachment has been set.</td>
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</tr>
<tr>
<td>2770</td>
<td>-</td>
<td>The job includes instructions that cannot execute reverse paste</td>
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<tr>
<td>2780</td>
<td>-</td>
<td>Arithmetic error</td>
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<td>-</td>
<td>Step exceeding operation range.</td>
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<tr>
<td>2822</td>
<td>-</td>
<td>Cannot copy job during jog operation.</td>
<td></td>
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<tr>
<td>2823</td>
<td>-</td>
<td>Cannot copy, cut and paste during jog operation.</td>
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<tr>
<td>2870</td>
<td>-</td>
<td>Maximum pressure is not set.</td>
<td>The maximum pressure for the gun condition file is not defined.</td>
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<tr>
<td>2871</td>
<td>-</td>
<td>Pulse value and stroke value are not set correctly.</td>
<td>The gun condition file pulse and stroke are not properly defined.</td>
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<tr>
<td>2872</td>
<td>-</td>
<td>Torque value and pressure value are not set correctly.</td>
<td>The gun condition file torque and pressure are not properly defined.</td>
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<td>-</td>
<td>This group name cannot be changed.</td>
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<td>Same group name exists.</td>
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<td>-</td>
<td>It's not appropriate group name.</td>
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<td>Max stroke range over.</td>
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<td>-</td>
<td>1st Pulse value is not set correctly.</td>
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<td>1st Stroke value is not set correctly.</td>
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<td>-</td>
<td>1st Torque value is not set correctly.</td>
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<td>-</td>
<td>1st Pressure value is not set correctly.</td>
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<td>Max Pressurization power exceeding a set range.</td>
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<td>2896</td>
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<td>Pulse value exceeding a set range.</td>
<td>Pulse number</td>
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<td>2897</td>
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<td>Stroke value exceeding a set range.</td>
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<td>2899</td>
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### 9.1.4 External Memory Equipment

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<td>SD card not inserted into SD card slot (PP)</td>
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<td>-</td>
<td>USB media not inserted</td>
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<td>File not saved on the media</td>
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<td>-</td>
<td>File saved on the media</td>
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<td>Out of memory on the media</td>
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<td>Number of files on the media</td>
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<td>3080</td>
<td>-</td>
<td>I/O error on the media</td>
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<td>*</td>
<td>Transmission error with the media</td>
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<td>Framing error</td>
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<td>Overrun error</td>
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<td>Parity error</td>
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<td></td>
<td>Data code error</td>
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<td>5</td>
<td></td>
<td>Data read error</td>
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<td>6</td>
<td></td>
<td>Data write error</td>
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<td>7</td>
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<td>Data time out</td>
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<td></td>
<td>Serial I/O error</td>
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<td>9</td>
<td></td>
<td>Error other than described above</td>
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<tr>
<td>3100</td>
<td>-</td>
<td>Total checksum error</td>
<td>When the security is in management mode or safety mode, the CMOS.BIN file saved with other controllers can not be loaded.</td>
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<tr>
<td></td>
<td></td>
<td>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.</td>
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<td>The CMOS.BIN file is broken or not be saved properly.</td>
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<td>3110</td>
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<td>Syntax error</td>
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<td>Specification error of EOF record</td>
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<td>3</td>
<td></td>
<td>Record type error</td>
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<td>Total check error of record</td>
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<td>3130</td>
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<td>Verify error</td>
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<tr>
<td>3140</td>
<td>-</td>
<td>Wrong pseudo instruction</td>
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### 9.1 Error Message

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<tr>
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<td>Concurrent I/O record error</td>
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<td>Format error</td>
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<td>2</td>
<td>Ladder program is too long</td>
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<td>3</td>
<td>Exceed the range of the data</td>
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<td>Specification error of channel No.</td>
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<td>Specification error of relay No.</td>
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<td>6</td>
<td>Timer value error</td>
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<td>7</td>
<td>Specification error of timer No</td>
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<td>3160</td>
<td>-</td>
<td>Cannot load illegal system data</td>
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<tr>
<td>3170</td>
<td>*</td>
<td>Condition file data error</td>
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<td>1</td>
<td>Format error</td>
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<tr>
<td></td>
<td>2</td>
<td>Specified file No. is omitted</td>
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</tr>
<tr>
<td></td>
<td>3</td>
<td>Specified tool No. is omitted</td>
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<td>4</td>
<td>User file is not registered.</td>
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<tr>
<td>3190</td>
<td>*</td>
<td>Error in JOB data record</td>
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<td>Record on the number of position data (NPOS) is wrong for the format.</td>
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<td>Record on the user coordinate No. (USER) is wrong for the format.</td>
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<td>3</td>
<td>Record on the tool No. (TOOL) is wrong for the format.</td>
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<td>4</td>
<td>Record on the position data section is wrong for the format.</td>
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<td>5</td>
<td>Record on the robot type of XYZ data (RCONF) is wrong for the format.</td>
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<td>6</td>
<td>Date (DATE) record is wrong for the format.</td>
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<td>7</td>
<td>Comment (COMM) record is wrong for the format.</td>
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<td>8</td>
<td>Record on the JOB attribute data (ATTR) is wrong for the format.</td>
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<td>9</td>
<td>Control group (GROUP) record is wrong for the format.</td>
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<td>10</td>
<td>Local variable (LVARS) record is wrong for the format.</td>
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<td>11</td>
<td>JOB argument (JARGS) record is wrong for the format.</td>
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<td>12</td>
<td>Record on the teaching coordinates for relative job (FRAME) is wrong for the format.</td>
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<td>Position data coordinates do not match relative job coordinates.</td>
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<td>3200</td>
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<td>NOP or END instruction not found</td>
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</tr>
<tr>
<td>3210</td>
<td>-</td>
<td>Position No. storage area not found</td>
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### Error No. Data Error Message Contents

<table>
<thead>
<tr>
<th>Error No.</th>
<th>Data</th>
<th>Error Message</th>
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<td>3220</td>
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<td>Syntax error in instruction data</td>
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<tr>
<td>2</td>
<td></td>
<td>Interior control error</td>
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<tr>
<td>3</td>
<td></td>
<td>Undefined instruction/tag</td>
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<tr>
<td>4</td>
<td></td>
<td>Instruction/tag shortage</td>
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<td>Disuse instruction/tag</td>
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<tr>
<td>6</td>
<td></td>
<td>Sub instruction</td>
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<td>No instruction</td>
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<td></td>
<td>Invalid instruction</td>
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<td></td>
<td>Invalid tag</td>
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<tr>
<td>10</td>
<td></td>
<td>Invalid character</td>
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<td></td>
<td>Undefined intermediate code</td>
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<td>Intermediate code shortage</td>
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<td></td>
<td>Syntax stack overflow</td>
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<td>Array type tag uncompleted Tag [ARRAY]</td>
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<td>Element type tag uncompleted Tag [ELEMENT]</td>
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<td>Macro JOB unregistered</td>
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<tr>
<td>18</td>
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<td>Input format error</td>
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<td>Data size over</td>
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<td>20</td>
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<td>MIN value over</td>
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<tr>
<td>21</td>
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<td>MAX value over</td>
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<td>22</td>
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<td>Operation expression error</td>
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<td>23</td>
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<td>Job call argument setting error</td>
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<td>Macro job call argument setting error</td>
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<td>25</td>
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<td>Position vector setting error</td>
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<td>26</td>
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<td>System error</td>
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<td>Soft key designate error</td>
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<td>Numerical input buffer overflow</td>
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<td>Real type data precision error</td>
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<td>BYTETYPE, BINARY / HEXADECIMAL BYTE TYPE data error</td>
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<td>INTEGER TYPE, DECIMAL WORD TYPE data error</td>
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<td>BINARY/HEXADECIMAL WORD TYPE data error</td>
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## Error Message

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<td>JOB NAME data error</td>
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<td>STRING data error</td>
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<td>COMMENT data error</td>
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<td>The job contains the instructions which exceeded the maximum size</td>
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<td>Invalid instruction/tag detection</td>
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<td>Syntax not matched</td>
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<td>Controller type is not matched</td>
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<td>Undefined application</td>
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<td>Cannot load this file</td>
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<td>Cannot SAVE/LOAD the job which has more than 512 aliases.</td>
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<td>Excess input data</td>
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<td>Cannot verify this file</td>
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<td>Wrong welding condition (STANDARD/ENHANCED)</td>
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<td>Serial port not defined</td>
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<td>Serial port being used</td>
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<td>3310</td>
<td></td>
<td>Protocol being used</td>
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<td>Illegal number of multi layer data</td>
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<td>Not enough memory</td>
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<td>Invalid folder</td>
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<td>Incorrect folder name</td>
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<td>Cannot load macro JOB at current security mode</td>
<td>Load in management mode.</td>
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<td>* Cannot backup the media</td>
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<td></td>
<td>Failed to delete the system backup file.</td>
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<td>Data accessed with other functions.</td>
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<td>Database not found</td>
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<td>Database access error</td>
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<td>Same database exists</td>
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<td>Check the media insertion</td>
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<td>Check the media insertion</td>
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<td>Cannot delete folder. Check attribute and inside file</td>
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<tr>
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<td>Same folder exists</td>
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## 9 Error
### 9.1 Error Message

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<thead>
<tr>
<th>Error No.</th>
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<td>Cannot load at current security mode</td>
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<td>3550</td>
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<td>Under automatic backup operation. Operate after the backup is completed.</td>
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<tr>
<td>3551</td>
<td>-</td>
<td>Under automatic backup operation. Operate &quot;SORT FILE&quot; after the backup is completed.</td>
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<td>Failed in sorting backup file</td>
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<td>-</td>
<td>Actuator data transmission error</td>
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<td>Under backup file access. Operate after the access is completed.</td>
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<tr>
<td>3581</td>
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<td>Under backup file access. Operate &quot;SORT FILE&quot; after the access is completed.</td>
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<td>System configuration data not matched</td>
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<td>3610</td>
<td>-</td>
<td>Excessive path</td>
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<td>Excess folders</td>
<td></td>
</tr>
<tr>
<td>3680</td>
<td>-</td>
<td>Cannot load the file while running time chart.</td>
<td></td>
</tr>
<tr>
<td>3700</td>
<td>-</td>
<td>Cannot register the blade thickness of tip dresser.</td>
<td></td>
</tr>
</tbody>
</table>
### 9.1.5 Concurrent I/O

<table>
<thead>
<tr>
<th>Error No.</th>
<th>Data</th>
<th>Error Message</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>4010</td>
<td>*</td>
<td>Illegal relay No.</td>
<td>Line no.</td>
</tr>
<tr>
<td>4030</td>
<td>*</td>
<td>Illegal instruction</td>
<td>Line no.</td>
</tr>
<tr>
<td>4040</td>
<td>*</td>
<td>Relay/register No. duplicated in OUT/ GOUT or arithmetic instruction</td>
<td>Multiple outputs are instructed to the relay or register.</td>
</tr>
<tr>
<td>4050</td>
<td>*</td>
<td>The relay is not used</td>
<td>Line no.</td>
</tr>
<tr>
<td>4060</td>
<td>*</td>
<td>Excess STR-[NOT] instructions</td>
<td>Line no.</td>
</tr>
<tr>
<td>4070</td>
<td>*</td>
<td>Excess AND [OR] STR instructions</td>
<td>Line no.</td>
</tr>
<tr>
<td>4080</td>
<td>*</td>
<td>Syntax error in CRT instructions</td>
<td>Line no.</td>
</tr>
<tr>
<td>4090</td>
<td>*</td>
<td>Enter STR [-NOT] at head of block</td>
<td>Need STR [-NOT]</td>
</tr>
<tr>
<td>4120</td>
<td>-</td>
<td>Concurrent I/O memory is full</td>
<td>Exceeds memory capacity (10000 steps)</td>
</tr>
<tr>
<td>4130</td>
<td>-</td>
<td>END instruction not found</td>
<td>END instruction not found</td>
</tr>
<tr>
<td>4140</td>
<td>-</td>
<td>Wrong ladder program</td>
<td>Position and number of PART instruction are wrong.</td>
</tr>
<tr>
<td>4150</td>
<td>*</td>
<td>Wrong use of GSTR, GOUT commands</td>
<td>GSTR and GOUT is not used together.</td>
</tr>
<tr>
<td>4190</td>
<td>-</td>
<td>Ladder program not found</td>
<td>Line no.</td>
</tr>
<tr>
<td>4220</td>
<td>-</td>
<td>Excess TMR/CNT or arithmetic instructions</td>
<td>More than 100 TMR, CNT or arithmetic instruction used</td>
</tr>
<tr>
<td>4230</td>
<td>-</td>
<td>Syntax error in TMR/CNT instructions</td>
<td></td>
</tr>
<tr>
<td>5212</td>
<td>-</td>
<td>EXDSW signal is OFF. (Safety Logical Circuit)</td>
<td></td>
</tr>
</tbody>
</table>
### 9.1.6 Maintenance Mode

<table>
<thead>
<tr>
<th>Error No.</th>
<th>Data</th>
<th>Error Message</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>8011</td>
<td>-</td>
<td>Choose the input of overrun</td>
<td></td>
</tr>
<tr>
<td>8012</td>
<td>-</td>
<td>Equipment data file reading error</td>
<td></td>
</tr>
<tr>
<td>8021</td>
<td>-</td>
<td>YIU Unit not found</td>
<td></td>
</tr>
<tr>
<td>8030</td>
<td>-</td>
<td>Too many boards (DEVICENET(MASTER))</td>
<td></td>
</tr>
<tr>
<td>8031</td>
<td>-</td>
<td>Too many boards (MSC01B)</td>
<td></td>
</tr>
<tr>
<td>8033</td>
<td>-</td>
<td>Too many boards</td>
<td></td>
</tr>
<tr>
<td>8034</td>
<td>-</td>
<td>Too many channels</td>
<td></td>
</tr>
<tr>
<td>8035</td>
<td>-</td>
<td>Invalid configuration</td>
<td></td>
</tr>
<tr>
<td>8040</td>
<td>-</td>
<td>Memory error (ControlNet output condition)</td>
<td></td>
</tr>
<tr>
<td>8041</td>
<td>-</td>
<td>Memory error (UNIWIRE CONNECT DAT)</td>
<td></td>
</tr>
<tr>
<td>8042</td>
<td>-</td>
<td>Memory error (IP Network Configuration data)</td>
<td></td>
</tr>
<tr>
<td>8050</td>
<td>-</td>
<td>Robot model is not registered</td>
<td></td>
</tr>
<tr>
<td>8051</td>
<td>-</td>
<td>Select model</td>
<td></td>
</tr>
<tr>
<td>8060</td>
<td>-</td>
<td>Cannot get UNIWIRE connection data</td>
<td></td>
</tr>
<tr>
<td>8070</td>
<td>-</td>
<td>DHCP is already set to use for another item</td>
<td></td>
</tr>
<tr>
<td>8071</td>
<td>-</td>
<td>DNS is already set to use for another item</td>
<td></td>
</tr>
<tr>
<td>8072</td>
<td>-</td>
<td>DHCP is not set to use</td>
<td></td>
</tr>
<tr>
<td>8073</td>
<td>-</td>
<td>DNS is not set to use</td>
<td></td>
</tr>
<tr>
<td>8074</td>
<td>-</td>
<td>Device Information not found</td>
<td></td>
</tr>
<tr>
<td>8080</td>
<td>-</td>
<td>Non support function</td>
<td></td>
</tr>
<tr>
<td>8205</td>
<td>-</td>
<td>ENABLE Unit over</td>
<td></td>
</tr>
<tr>
<td>8206</td>
<td>-</td>
<td>FLASH access error</td>
<td></td>
</tr>
<tr>
<td>8210</td>
<td>-</td>
<td>IO module configuration is not modified</td>
<td></td>
</tr>
<tr>
<td>8211</td>
<td>-</td>
<td>OPTION BOARD or MODULE SETUP is not completed.</td>
<td>The setting information of OPTION BOARD and the related parameter value do not match. Start the system in maintenance mode and set up as follows: {OPTION BOARD} -&gt;{IO MODULE} -&gt;{EXTERNAL IO} .</td>
</tr>
</tbody>
</table>
### Error Message

<table>
<thead>
<tr>
<th>Error No.</th>
<th>Data</th>
<th>Error Message</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>8212</td>
<td>-</td>
<td>Cannot change setting (Function conflict)</td>
<td></td>
</tr>
<tr>
<td>8213</td>
<td>-</td>
<td>Check EXTERNAL IO setup</td>
<td></td>
</tr>
<tr>
<td>8216</td>
<td>-</td>
<td>Cannot change setting. Check the setting of control group.</td>
<td>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).</td>
</tr>
<tr>
<td>8217</td>
<td>-</td>
<td>Cannot change setting. Check the setting of spot high speed spec.</td>
<td>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).</td>
</tr>
<tr>
<td>8250</td>
<td>-</td>
<td>Setting group is duplicated that has been set in the axes detachment function.</td>
<td></td>
</tr>
<tr>
<td>8251</td>
<td>-</td>
<td>Setting group is duplicated that has been set in the robot detachment function.</td>
<td></td>
</tr>
</tbody>
</table>
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 following states
1. The window becomes inoperable.
2. The window disappears and blue background appears.
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.

Followings are the messages possible to occur.

<table>
<thead>
<tr>
<th>Message</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>syntax error</td>
<td>There is an unauthorized part in internal processing description.</td>
</tr>
<tr>
<td>expression too complex (stack overflow)</td>
<td>Internal stack has overflowed.</td>
</tr>
<tr>
<td>function nesting depth exceeded</td>
<td>Nesting of internal processing is unauthorized.</td>
</tr>
<tr>
<td>bad radix</td>
<td>The cardinal number used is unauthorized.</td>
</tr>
<tr>
<td>divide by 0</td>
<td>Memory is running out.</td>
</tr>
<tr>
<td>out of memory</td>
<td>Memory is insufficient.</td>
</tr>
<tr>
<td>argument list does not match a function</td>
<td>The internal processing of the pendant program is unauthorized.</td>
</tr>
<tr>
<td>register is not available</td>
<td>Specified an unavailable system data.</td>
</tr>
</tbody>
</table>

The programming pendant becomes either of following states
1. The window becomes inoperable.
2. Press [OK] button to disappear the message box and it becomes operable.
9.2.1.3 Other Errors

Other errors than mentioned above, some can trigger the message box. In these cases, the tile of the box can be “Ypp” or “YPPMain”.
9.2 Particular Error Message

9.2.2 When the Error Is Indicated

9.2.2.1 Fatal Error

Programming pendant becomes inoperable when this message appears. Please restart the system.

9.2.2.2 Application Transaction Error

It is possible to keep the operation after pressing [OK] button to disappear the message box. However, in this case, the system might be instable. Please 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 disappear the message box. Please 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, please 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)

1. Detect data error
   – ALARM screen appears.

2. Press {SYSTEM INFO} under main menu and select {SECURITY}.
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.
– 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}
10 Job Data Simplified Restoration Function

10.2 Job Data Restoration

- WRONG DATA LOG screen appears.

4. Check the position

- Check the position of two lines indicated in the screen.
10 Job Data Simplified Restoration Function

10.2 Job Data Restoration

10.2.2 In Case Not-Registered Position Data Is Chained

1. Press (UTILITY) and select (RESTORE)

   - Press (RESTORE) button to register the position of the file indicated in WRONG DATA LOG screen tentatively, which enables to register position again.
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}
10.2 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 "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.
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 in case 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) Initialize Job area in maintenance mode.
       *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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Setting value</th>
<th>Initial value</th>
</tr>
</thead>
<tbody>
<tr>
<td>S2C303</td>
<td>Data inconsistency check specification</td>
<td>0:Valid 1:Invalid</td>
<td>0</td>
</tr>
<tr>
<td>S2C304</td>
<td>Inconsistency detection method in play mode</td>
<td>0:Warning 1:Stop with alarm</td>
<td>0</td>
</tr>
</tbody>
</table>

10.5 Specific Output Signal

The following signal outputs the status of data inconsistency occurrence.

<table>
<thead>
<tr>
<th>Output signal</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>50696</td>
<td>Indicate the data inconsistency occurrence</td>
</tr>
</tbody>
</table>
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**

**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).

**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.

---

**For North America**

**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
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.

<table>
<thead>
<tr>
<th>LED1</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>The BIOS initialization not completed/ Before OS boot starts</td>
</tr>
<tr>
<td>ON</td>
<td>The BIOS initialization completed/ OS boot starts</td>
</tr>
</tbody>
</table>

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”.

![Diagram of LED indicators on ACP 01 Circuit Board and CPU Board]
11.3 The 7 SEG-LED Indicator

The following tables show the operating statues for JANCD-ACP01-E. The operating statuses are indicated by 7 SEG-LED.

**Table 11-1: [Normal Indication]**

<table>
<thead>
<tr>
<th>Status</th>
<th>YRC1000</th>
<th>ACP01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right after applying the power</td>
<td>All 7-SEG indicators light up. ('8' + '.' light up.)</td>
<td></td>
</tr>
<tr>
<td>During the start-up process</td>
<td>Counts up from 'O' toward 'd'.</td>
<td></td>
</tr>
<tr>
<td>After starting up normally</td>
<td>'d' + '.' blink every one second.</td>
<td></td>
</tr>
</tbody>
</table>

**Table 11-2: [Error Indication]**

<table>
<thead>
<tr>
<th>Status</th>
<th>YRC1000</th>
<th>ACP01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal alarm occurrence</td>
<td>'d + .' blink every one second.</td>
<td></td>
</tr>
<tr>
<td>Fatal alarm occurrence</td>
<td>The error cause and the address where the error has occurred are indicated by 7 SEG-LED. (See the indication spec 1.)</td>
<td></td>
</tr>
</tbody>
</table>

**Indication Spec 1**

E.g.: 

```
[-] → [0] → [2] → [0] → [0] → : Error cause
```

```
[-] → [0] → [0] → [0] → [0] → [F] → [F] : Occurrence
```

```
[F0] → [4] is repeated | address
```
### 11.3.0.1 The 7 SEG-LED Indicator Status (1-Digit Indication) of Each Unit at Error Occurrence

<table>
<thead>
<tr>
<th>7 SEG-LED Indicator Status (1-Digit Indication) of Each Unit at Error Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACP01</strong></td>
</tr>
<tr>
<td>All Lit                                                                         The power has been turned ON.</td>
</tr>
<tr>
<td>0  The booting program has started.</td>
</tr>
<tr>
<td>1  The system program has started. (Starts up initialization of various kinds.)</td>
</tr>
<tr>
<td>2  Starts verifying the existence of other circuit boards. (Verifies the start-up of the booting program.)</td>
</tr>
<tr>
<td>3  Starts the system program transmission.</td>
</tr>
<tr>
<td>4  Sends the request of the system program start-up.</td>
</tr>
<tr>
<td>5  Starts verifying the existence of other circuit boards. (Verifies the start-up of the system program.)</td>
</tr>
<tr>
<td>6  Acquires hardware information, etc. of other circuit boards. (Verifies the IO board status, servo IF, and so on.)</td>
</tr>
<tr>
<td>7  Starts the CMOS data transmission.</td>
</tr>
<tr>
<td>8  Sends the pre-online request.</td>
</tr>
<tr>
<td>9  Waits for CERF communication synchronization.</td>
</tr>
<tr>
<td>A  Sends the start-up request of on-line system.</td>
</tr>
<tr>
<td>B  The on-line system has started. (Starts up the initialization task.)</td>
</tr>
<tr>
<td>C  Processes the YRC1000 setup completion. (Servo ON enabled)</td>
</tr>
<tr>
<td>D  Alarm occurs at the YRC1000 setup.</td>
</tr>
<tr>
<td>E  The maintenance system is starting up.</td>
</tr>
<tr>
<td>F  Communications interrupted between ACP01 and the programming pendant.</td>
</tr>
<tr>
<td>U  Updating system software through network.</td>
</tr>
</tbody>
</table>
## The 7 SEG-LED Indicator Status (4-Digit Indication) of Each Unit at Error Occurrence

<table>
<thead>
<tr>
<th>ACP01</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>Arithmetic error</td>
</tr>
<tr>
<td>0001</td>
<td>Debug</td>
</tr>
<tr>
<td>0002</td>
<td>NMI</td>
</tr>
<tr>
<td>0003</td>
<td>Breakpoint</td>
</tr>
<tr>
<td>0004</td>
<td>Overflow</td>
</tr>
<tr>
<td>0005</td>
<td>Out of BOUND</td>
</tr>
<tr>
<td>0006</td>
<td>Invalid operation code</td>
</tr>
<tr>
<td>0007</td>
<td>Device disabled</td>
</tr>
<tr>
<td>0008</td>
<td>Double fault</td>
</tr>
<tr>
<td>0009</td>
<td>Coprocessor segment overrun</td>
</tr>
<tr>
<td>000A</td>
<td>Invalid TSS</td>
</tr>
<tr>
<td>000B</td>
<td>Segment absence</td>
</tr>
<tr>
<td>000C</td>
<td>Stack segment fault</td>
</tr>
<tr>
<td>000D</td>
<td>General protection exception</td>
</tr>
<tr>
<td>000E</td>
<td>Page fault</td>
</tr>
<tr>
<td>000F</td>
<td>Floating point error</td>
</tr>
<tr>
<td>0010</td>
<td>Alignment check</td>
</tr>
<tr>
<td>0011</td>
<td>Machine check</td>
</tr>
<tr>
<td>0012</td>
<td>SIMD floating point exception</td>
</tr>
<tr>
<td>0013</td>
<td></td>
</tr>
<tr>
<td>0014</td>
<td></td>
</tr>
<tr>
<td>0015</td>
<td></td>
</tr>
<tr>
<td>0016</td>
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<td>0017</td>
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<td>0018</td>
<td></td>
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<tr>
<td>0019</td>
<td></td>
</tr>
<tr>
<td>001A</td>
<td></td>
</tr>
<tr>
<td>001B</td>
<td></td>
</tr>
<tr>
<td>001C</td>
<td></td>
</tr>
<tr>
<td>001D</td>
<td></td>
</tr>
<tr>
<td>001E</td>
<td></td>
</tr>
<tr>
<td>001F</td>
<td></td>
</tr>
<tr>
<td>0900</td>
<td>WDT error</td>
</tr>
</tbody>
</table>
11.4 LED Indicator

The following tables show the operating statues for CSRA-SDCA01AA/JANCD-ASF01-E.

**Table 11-3: [Normal indication]**

<table>
<thead>
<tr>
<th>Status</th>
<th>YRC1000</th>
<th>SDCA01AA</th>
<th>ASF01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right after applying the power</td>
<td>All indicators light up.</td>
<td>All indicators light up.</td>
<td></td>
</tr>
<tr>
<td>During the start-up process</td>
<td>(Normal status) : RUN (green) light up</td>
<td>(Normal status) : D5, D9(green) blink</td>
<td>Lighting the LED changes according to the activation process.</td>
</tr>
<tr>
<td></td>
<td><em>Lighting the LED changes according to the activation process.</em></td>
<td>(Detected error) : D8, D12 (red) blink</td>
<td>(Detected error) : D8, D12 (red) blink</td>
</tr>
<tr>
<td>After starting up normally</td>
<td>(Normal status) : RUN (green) blink</td>
<td>(Normal status) : D5,D9 (green) blink</td>
<td>(Detected minor alarm) : D8, D12(red) blink</td>
</tr>
<tr>
<td></td>
<td>(Detected an alarm) : ALM (red) blink</td>
<td>(Detected major alarm) : D8, D12 (red) light up</td>
<td></td>
</tr>
</tbody>
</table>
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.

However, in the case of a 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 for the case like this.

12.1.2 Applicable Version

**NOTICE**

Prepare two SD cards for the restoration of the YRC1000.

- 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. Please 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, which 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.

12.2.1.1 Uploading

Upload the program as shown below.

1. Turn ON the YRC1000 while pressing down the [MAIN MENU].
   – The maintenance mode starts.
2. Set the security mode to the management mode
3. Select {EX. MEMORY} under the main menu.
   – The sub menu appears.

![Image of the sub menu interface showing EX. MEMORY selected]
4. Select {SAVE}.
   – The save window appears.

   ![Save Window Image]

5. Select {SYSTEM UPLOAD}.
   – The confirmation dialog box appears.

   ![Confirmation Dialog Image]

6. Select {YES}.
   – Program upload starts.
   – When the message “Program uploading. Don’t turn the power off.” on the human interface display area disappears, uploading is completed.

For the case of restoration, be sure to retain the SD card with the uploaded program after 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 mentioned in chapter 12 “Program Upload Function” and chapter 12.4 “Restoration Procedure 2 (Loading the Batch Data)”.

**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 the maintenance mode. To ensure correct and safe operation, please 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 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, which 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.

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.
12.3.4 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 Program Upload Function
12.4 Restoration Procedure 2 (Loading the Batch Data)

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, please 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 can not be loaded in the management mode or safety mode. (If the SD card of the main CPU board(ACP01) is the identical, the batch data can be loaded in management mode or safety mode.)

When restore the SD card of the main CPU board(ACP01), load the batch data in the one time manage mode.

For the one time manage mode, refer to “chapter7.1 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 the [MAIN MENU].
   - The maintenance mode starts.
2. Set the security mode to the one time manage mode.
3. Select (EX. MEMORY) under the main menu.
   - The sub menu appears.
12 Program Upload Function
12.4 Restoration Procedure 2 (Loading the Batch Data)

4. Select {LOAD}.
   – The load window appears.

5. Select {CMOS}.
   – The confirmation dialog box appears.

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 disappears, loading is completed.
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 the [MAIN MENU].
   – The maintenance mode starts.
2. Set the security mode to the 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 initializes “SYS MONITORING TIME”.
   – Select {NO} to keep “SYS MONITORING TIME” unchanged.
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 disappears, loading is completed.
12.5 In Case of the SD Card Failure

Prepare as follows for the SD card failure.

**NOTICE**

Please prepare for the SD card failure for the quick and easy restoration of the YRC1000.

12.5.1 Preparation of SD Card for ACP01

Prepare the SD card for ACP01.

Prepare the one inserted to the ACP01, which 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).

12.5.2 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.

12.5.3 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.
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).

<table>
<thead>
<tr>
<th>Screen status of programming pendant</th>
<th>7SEG LED for CPU board (ACP01)</th>
<th>Assumed status</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| 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 followings  
- 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 fuses of the APU power ON unit (1FU, 2FU) are not melt.  
  When the fuse is melt, replace after checking the cause. (refer to *6)  
- Make sure that the following connectors are connected properly and there is no wiring error (disconnection).  
  1) APU-CN601, CN602, CN603  
  2) CPS-CN151 |
| The screen does not become bright and nothing is displayed. |                                  | 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) |
|                                     |                                  | 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 the maintenance mode. |
### Trouble Shooting When Alarm Is Not Displayed

<table>
<thead>
<tr>
<th>Screen status of programming pendant</th>
<th>7SEG LED for CPU board (ACP01)</th>
<th>Assumed status</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| 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 screen remains unchanged from the above, or changes to the following screen in about 6 minutes. | | 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 shortcircuit 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 message "Controller <-> Pendant Connection Failed" is displayed. | | 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) |
| 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 the maintenance mode. (refer to *4) |
### Trouble Shooting When Alarm Is Not Displayed

<table>
<thead>
<tr>
<th>Screen status of programming pendant</th>
<th>7SEG LED for CPU board (ACP01)</th>
<th>Assumed status</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>The screen remains unchanged from the above, or changes to the following screen in about 6 minutes.</td>
<td>All the LEDs ON (‘8’+'.' ON) LED1 for ACP01 is OFF.</td>
<td>ACP01 board is out of order or malfunctions.</td>
<td>ACP01 board failure</td>
<td>- 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 the maintenance mode.</td>
</tr>
<tr>
<td>The optional circuit board or ACP02 circuit board inserted into the PCI slot of CPU rack is out of order or malfunctions.</td>
<td>Optional circuit board or ACP02 board failure</td>
<td></td>
<td></td>
<td>- 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.</td>
</tr>
<tr>
<td>The CPU rack (backboard) is out of order.</td>
<td>CPU rack failure</td>
<td></td>
<td></td>
<td>- Turn the power OFF then back ON. - If the error occurs again, replace the CPU rack (backboard). (refer to ‘10’)</td>
</tr>
</tbody>
</table>
### Screen status of programming pendant

<table>
<thead>
<tr>
<th>7SEG LED for CPU board (ACP01)</th>
<th>Assumed status</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| All the LEDs ON (‘8’::. ON)     | LED1 for ACP01 is ON. | The ACP01 board malfunctions. | - 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 the maintenance mode. (refer to *4) |
### Screen status of programming pendant

#### 7SEG LED for CPU board (ACP01)

<table>
<thead>
<tr>
<th>Assumed status</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| '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 the 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 the 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 the 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) |

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.
### Troubleshooting When Alarm Is Not Displayed

<table>
<thead>
<tr>
<th>Screen status of programming pendant</th>
<th>7SEG LED for CPU board (ACP01)</th>
<th>Assumed status</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| '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 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 the maintenance mode. (refer to *4) |
|                                     |                                | The mode key information held when a communication error occurred and the mode key information of the current programming pendant are unmatch. | Mode key operation of the programming pendant after a communication error occurred | - Change the mode key of the programming pendant to the mode which is displayed on the error message. Press the OK button, and then press the Connect button on the programming pendant startup screen. |

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.

The controller is out of order or malfunctions.

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 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 the maintenance mode. (refer to *4)

The mode key information held when a communication error occurred and the mode key information of the current programming pendant are unmatch.

Mode key operation of the programming pendant after a communication error occurred
- Change the mode key of the programming pendant to the mode which is displayed on the error message. Press the OK button, and then press the Connect button on the programming pendant startup screen.
### 13-8 Trouble Shooting When Alarm Is Not Displayed

<table>
<thead>
<tr>
<th>Screen status of programming pendant</th>
<th>7SEG LED for CPU board (ACP01)</th>
<th>Assumed status</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| 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 followings 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 followings are set.  
IP Address: 10.0.0.4  
Subnet Mask: 255.255.255.0  
Default Gateway: .
Also, confirm that Specify an IP address is ticked. |
| Data failure                        |                                |                |       |        |
| Controller<->Pendant Connection Failed. | A communication error has occurred between the ACP01 board and the programming pendant. | Cable failure | -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. |        |
<table>
<thead>
<tr>
<th>Screen status of programming pendant</th>
<th>Assumed status</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| Controller<->Pendant Connection Failed. | 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 the maintenance mode. (refer to *4) |
| 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. |
<table>
<thead>
<tr>
<th>Screen status of programming pendant</th>
<th>7SEG LED for CPU board (ACP01)</th>
<th>Assumed status</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software upgrade failed. Turn the YRC1000 power OFF and then ON.</td>
<td>'1'</td>
<td>Creating the media for upgrade is failed.</td>
<td>SD card (created for upgrade) failure</td>
<td>(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.</td>
</tr>
<tr>
<td>USB memory (created for upgrade) failure</td>
<td></td>
<td></td>
<td></td>
<td>(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.</td>
</tr>
<tr>
<td>Screen status of programming pendant</td>
<td>7SEG LED for CPU board (ACP01)</td>
<td>Assumed status</td>
<td>Cause</td>
<td>Remedy</td>
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<tr>
<td>Auto upgrade failed.</td>
<td>'P'</td>
<td>There is no file necessary for the programming pendant or it is out of order.</td>
<td>Programming pendant failure</td>
<td>(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.</td>
</tr>
<tr>
<td>Controller &lt;-&gt; pendant communication has been cut off.</td>
<td></td>
<td>A communication error has occurred between the ACP01 board and the programming pendant.</td>
<td>Cable failure</td>
<td>-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)</td>
</tr>
<tr>
<td>Controller &lt;-&gt; Pendant disconnect. Start reconnect.</td>
<td></td>
<td>A communication error has occurred between the ACP01 board and the programming pendant.</td>
<td>Cable failure</td>
<td>-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)</td>
</tr>
<tr>
<td>YE_AppInstall.exe or unzip.dll file isn’t found.</td>
<td></td>
<td>SD card or USB memory (created to install PP customized application) failure</td>
<td>Perform “chapter 8.3 Installation” of OPTIONS INSTRUCTIONS FOR PROGRAMMING PENDANT CUSTOMIZATION FUNCTION.</td>
<td></td>
</tr>
</tbody>
</table>
### Screen status of programming pendant

<table>
<thead>
<tr>
<th>7SEG LED for CPU board (ACP01)</th>
<th>Assumed status</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| 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 which is inserted into ACP01 board can not 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 the 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 the 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)**

<table>
<thead>
<tr>
<th>Character strings</th>
<th>Assumed status</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| 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 the 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) |
| | 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. |
<table>
<thead>
<tr>
<th>Screen status of programming pendant</th>
<th>7SEG LED for CPU board (ACP01)</th>
<th>Assumed status</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| 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 | | |
| 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**

<table>
<thead>
<tr>
<th>7SEG LED for CPU board (ACP01)</th>
<th>Assumed status</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>F'</td>
<td>The data in the robot I/F board (AIF01) is invalid value.</td>
<td>The battery malfunctions.</td>
<td>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 the maintenance mode. (refer to *1)</td>
</tr>
<tr>
<td></td>
<td>The IC storing the data is out of order.</td>
<td>AIF board failure</td>
<td>- 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)</td>
</tr>
<tr>
<td></td>
<td>The robot I/F board (AIF) is out of order or malfunctions.</td>
<td>AIF board failure</td>
<td>- 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)</td>
</tr>
<tr>
<td></td>
<td>The SD card data in the ACP01 board is invalid value.</td>
<td>SD card (inserted into the ACP01 board) failure</td>
<td>- 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 the maintenance mode. (refer to *8)</td>
</tr>
</tbody>
</table>

*1: Replacing the battery
For the replacement procedure, refer to chapter 5.1.1.3 “Replacing the Battery” of the YRC1000 MAINTENANCE MANUAL.

*2: Replacing the ACP01 board
For the replacement procedure, refer to chapter 5.1.1.1 “Replacing the CPU Board (JANCD-ACP01-E)” of the YRC1000 MAINTENANCE MANUAL.

*3: Replacing the control power supply unit
For the replacement procedure, refer to chapter 5.1.7 “Replacing the Control Power Supply Unit (CSRA-CPS01KE)” of the YRC1000 MAINTENANCE MANUAL.
13 Trouble Shooting When Alarm Is Not Displayed

*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)” of the YRC1000 MAINTENANCE MANUAL.

*5: Replacing the safety circuit board
For the replacement procedure, refer to chapter 5.1.3 “Replacing the Safety Circuit Board (JANCD-ASF01-E)” of the YRC1000 MAINTENANCE MANUAL.

*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” of the YRC1000 MAINTENANCE MANUAL.

*8: Replacing the SD card of the ACP01 board
Replace it in the following procedure.
1. Prepare the SD card of the same version.
   Prepare the SD card written the same version of the software as the currently used SD card.
2. Remove the current SD card from the ACP01 board.
3. Install the new SD card into the ACP01 board.
4. Load the backup data.
   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.

*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” of the YRC1000 MAINTENANCE MANUAL.
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 which 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Contents</th>
<th>Setting value</th>
</tr>
</thead>
<tbody>
<tr>
<td>S2C1503</td>
<td>Alarm display processing improvement function</td>
<td>1</td>
</tr>
</tbody>
</table>

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
Troubleshooting a Communication Error between the CPU Board and the Servo Control Board

1. The alarm occurs.
2. Save the YRC1000 internal data (CMOS.BIN).
3. Reset the YRC1000 by turning OFF and ON the power.
4. Take measures for the alarm that is occurring simultaneously first.
5. Check if AL-0100 to AL-0107 occurred in conjunction with this alarm.
6. Sub code is any of the numbers from [30] to [37].
7. For the servo control board of the station number corresponding sub code, check the cable connection of CN515.
8. If the station number in which the alarm occurred is the 1st station, check the cable connection of CN111 on AIF01 board.
9. For the servo control board of the station number in which the alarm occurred, check the cable connection of CN157 on the corresponding control power supply unit (CPS power supply).
10. Replace the AIF01 board. Load the internal data (CMOS.BIN) after replacement.
11. Contact your YASKAWA representatives.

End of corrective measures

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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**

**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.
Troubleshooting a Communication Error between the CPU Board and the Servo Control Board

1. The alarm occurs.

2. Save the YRC1000 internal data (CMOS.BIN).

3. Reset the YRC1000 by turning OFF and ON the power.

   - Alarm?
     - Yes
     - No

4. Check the “Offline Alarm” in the alarm history. Is any sub code of the alarm [3]?

   - Yes
   - No

5. For the servo control board of the least station number in which the sub code [3] occurred, check the cable connection of CN515.

   - Alarm?
     - Yes
     - No

6. For the servo control board of the previous one of the least station number in which the sub code [3] occurred, check the cable connection of CN516.

   - Alarm?
     - Yes
     - No

7. If the station number in which the sub code [3] occurred is the 1st station, check the cable connection of the CN111 on the AIF01 board.

8. For the servo control board of the least station number in which the sub code [3] occurred, replace the cable connected to CN515.

9. Replace the servo board of the least station number in which the sub code [3] occurred.

   - Alarm?
     - Yes
     - No

10. Replace the AIF01 board. Load the internal data (CMOS.BIN) after replacement.

    - Alarm?
      - Yes
      - No

11. Contact your YASKAWA representatives. End of corrective measures

   - Yes
   - No
14 Troubleshooting a Communication Error between the CPU Board and the Servo Control Board

- **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.
Take measures for the alarm that is occurring simultaneously first.

(If any of AL-0100 to AL-0107 occurs, take measures before others.)

End of corrective measures

Check if any of AL-0100 to AL-0107 or AL-0999 occurred in conjunction with this alarm.

For the servo board of the 1st station, check the cable connection of CN515.

Check the cable connection of CN111 on the AIF01 board.

Check the connections of the safety board and the servo control board of the 1st station.

For the safety board of the 1st station, check the cable connection of CN155 on the corresponding control power supply unit (CPS power supply).

For the safety board of the 1st station, replace the cable connected to CN207.

For the safety board of the 1st station, replace the corresponding control power supply unit (CPS power supply).

Replace the AIF01 board. Load the internal data (CMOS.BIN) after replacement.

Contact your YASKAWA representatives.

The alarm occurs.

Save the YRC1000 internal data (CMOS.BIN).

Reset the YRC1000 by turning OFF and ON the power.

Yes

Alarm?

No

No

Yes

Alarm?

No

Alarm?

Yes

Alarm?

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Yes

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Alarm?
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

The alarm occurs.

- Check if any of AL-0100 to AL-0107 or AL-0999 occurred in conjunction with this alarm.

Replace the AIF01 board. Load the internal data (CMOS.BIN) after replacement.

Contact your YASKAWA representatives.

End of corrective measures
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
Index

Numerics

10 A fuse .......................................................... 5-65
24VDC fuse for I/O ........................................... 5-47
7 SEG-LED indicator ........................................ 11-3

A

absolute data allowable range error alarm ................. 6-15
AC control power supply fuse .............. 5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74
AC Control power supply protective fuse .................. 5-46
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, 5-62, 5-63, 5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74
Backside duct fan and fan for the heat exchanger inspection ....... 3-1
Battery ................................................................. 5-62, 5-63
battery .......................................................... 5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74
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 .................................................. 12-8
COMMAND POSITION ......................................... 2-3
COMMAND TO ALL APPLICATIONS ..................... 2-5
Concurrent I/O ................................................. 9-18
Control group data ............................................. 8-3
ccontrol power supply unit ................................ 5-62, 5-63, 5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74
ccontrol power supply unit fan ......................... 5-62, 5-63, 5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74
cooling fan inspections ..................................... 3-3

Index-1
Index

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU board</td>
<td>5-62, 5-63, 5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74</td>
</tr>
<tr>
<td>CPU unit</td>
<td>5-62, 5-63, 5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74</td>
</tr>
<tr>
<td>CREATE NEW JOB</td>
<td>2-2</td>
</tr>
<tr>
<td>Creating a check program</td>
<td>4-4</td>
</tr>
<tr>
<td>CURRENT POSITION</td>
<td>2-3</td>
</tr>
<tr>
<td>Current Position Window</td>
<td>7-29</td>
</tr>
<tr>
<td>Current Position Window</td>
<td>7-29</td>
</tr>
<tr>
<td>CYCLE</td>
<td>2-2</td>
</tr>
</tbody>
</table>

D

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE/TIME</td>
<td>2-4</td>
</tr>
<tr>
<td>DC24V fuse for I/O</td>
<td>5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74</td>
</tr>
<tr>
<td>Decimal data</td>
<td>8-3</td>
</tr>
<tr>
<td>DELETE</td>
<td>2-3</td>
</tr>
<tr>
<td>DEVICE</td>
<td>2-3</td>
</tr>
<tr>
<td>DISPLAY COLOR COND.</td>
<td>2-4</td>
</tr>
<tr>
<td>Display of alarm details</td>
<td>8-5</td>
</tr>
<tr>
<td>Display of the drop value check window</td>
<td>7-35</td>
</tr>
<tr>
<td>DISPLAY SETUP</td>
<td>2-5</td>
</tr>
<tr>
<td>Displaying and releasing alarm</td>
<td>9-2</td>
</tr>
<tr>
<td>DOUBLE</td>
<td>2-2</td>
</tr>
<tr>
<td>DROP AMOUNT</td>
<td>2-3</td>
</tr>
</tbody>
</table>

E

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Editing Mode</td>
<td>2-1</td>
</tr>
<tr>
<td>Emergency stop button inspection</td>
<td>3-1</td>
</tr>
<tr>
<td>Emergency stop button inspections</td>
<td>3-7</td>
</tr>
<tr>
<td>Enable switch inspection</td>
<td>3-1</td>
</tr>
<tr>
<td>Enable switch inspections</td>
<td>3-7</td>
</tr>
<tr>
<td>ENCODER MAINTENANCE</td>
<td>2-4</td>
</tr>
<tr>
<td>encoder power supply fuse</td>
<td>5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74</td>
</tr>
<tr>
<td>ENCODER ROTATE SUM</td>
<td>7-30</td>
</tr>
<tr>
<td>ENCODER TEMPERATURE</td>
<td>7-30</td>
</tr>
<tr>
<td>ENERGY SAVING FUNCTION</td>
<td>2-4</td>
</tr>
<tr>
<td>Equipment Configuration</td>
<td>1-1</td>
</tr>
<tr>
<td>Error</td>
<td>9-1</td>
</tr>
<tr>
<td>Error message</td>
<td>9-1</td>
</tr>
<tr>
<td>ERROR PULSE</td>
<td>7-30</td>
</tr>
<tr>
<td>EX MEMORY</td>
<td>2-3</td>
</tr>
<tr>
<td>exterior fan for heat exchanger</td>
<td>5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74</td>
</tr>
<tr>
<td>External Input Detail Window</td>
<td>7-7</td>
</tr>
<tr>
<td>External Input Window</td>
<td>7-7</td>
</tr>
<tr>
<td>External memory equipment</td>
<td>9-13</td>
</tr>
<tr>
<td>External Output Detail Window</td>
<td>7-8</td>
</tr>
<tr>
<td>External Output Window</td>
<td>7-8</td>
</tr>
</tbody>
</table>

F

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>fan control relay</td>
<td>5-74</td>
</tr>
<tr>
<td>FEEDBACK PULSE</td>
<td>7-30</td>
</tr>
<tr>
<td>FEEDBACK SPEED</td>
<td>7-30</td>
</tr>
<tr>
<td>filter for heat exchanger</td>
<td>5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74</td>
</tr>
<tr>
<td>filter kit for heat exchanger</td>
<td>5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74</td>
</tr>
</tbody>
</table>

Index-2
Index

FOLDER .............................................................................................. 2-3
FUNCTION COND. ............................................................................. 2-4
FUNCTION ENABLE ............................................................................ 2-4

G

GENERAL ............................................................................................ 2-5
General-purpose I/O board ........................................................... 5-47
general-purpose I/O board .......................................................... 5-62, 5-63, 5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74
genral-purpose I/O board fuse .......................................................... 5-62, 5-63
glass-tube fuse ........................................................................... 5-65
GRP COMBINATION ........................................................................ 2-4

H

HANDLING ......................................................................................... 2-5
heat exchanger ............................................................................... 5-62, 5-63
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 ....................................................... 5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74
inverter unit ................................................................................. 5-62, 5-63, 5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74

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
JOB COND. ....................................................................................... 2-4
JOB KEY ALLOC. ............................................................................. 2-4

Index-3
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 ......................................................... 9-19
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 ........................................................................ 5-65
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 ................................................................. 9-21
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 .......................................................... 5-46
power supply contactor unit ............................................................ 5-62, 5-63, 5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74
power supply contactor unit fuse ......................................................... 5-62, 5-63
power supply for manipulator fan .................................................. 5-75
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 ............................................................... 5-69, 5-69, 5-70, 5-71, 5-72, 5-73, 5-75

\[R\]

REAL .............................................................................................................. 2-2
Rechecking job data ................................................................. 10-12
Recommended spare parts ............................................................... 5-66
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 ............................................................................. 5-18
Replacing the CPU board ..................................................................... 5-6
Replacing the interior circulation fan .................................................. 5-49
Replacing the Robot I/F Board ............................................................ 5-13
RES. START (CNCT) ................................................................................. 2-4
RES. START (JOB) .................................................................................. 2-2
RES. STATUS ............................................................................................ 2-2
RESERVE JOB NAME .......................................................................... 2-4
Restoration procedure 1 ................................................................. 12-4
Restoration procedure 2 ................................................................. 12-6
RIN input ................................................................................................ 7-9
RIN input window ................................................................................. 7-9
ROBOT ........................................................................................................... 2-3
robot I/F board ...................................................................................... 5-62, 5-63, 5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74

\[S\]
safety circuit board ............................................................... 5-62, 5-63, 5-68, 5-69, 5-70, 5-71, 5-72, 5-73, 5-74
SAFETY FUNC ......................................................................................... 2-4
SAFETY LOGIC CIRCUIT ........................................................................ 2-4
Safety mode ............................................................................................. 2-1
safety terminal block board .............................................................. 5-62, 5-63
SAVE ............................................................................................................. 2-3

Index-5
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..................................................... 5-62, 5-63
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 .......................................................... 5-63, 5-73
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 ............................................................. 5-65
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 .............................................................................. 5-65
WAGO terminal block wiring tool ................................................................. 5-65
WORK HOME POS .......................................................................................... 2-3
Writing the system program ............................................................................. 12-5
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 .................................................................................................. 5-62, 5-63