YRC1000 OPTIONS
INSTRUCTIONS
FOR MANUAL BRAKE RELEASE FUNCTION

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

MOTOMAN INSTRUCTIONS
MOTOMAN-□□□ INSTRUCTIONS
YRC1000 INSTRUCTIONS
YRC1000 OPERATOR'S MANUAL (GENERAL) (SUBJECT SPECIFIC)
YRC1000 MAINTENANCE MANUAL
YRC1000 ALARM CODES (MAJOR ALARMS) (MINOR ALARMS)

The YRC1000 operator’s manual above corresponds to specific usage. Be sure to use the appropriate manual.
The YRC1000 operator’s manual above consists of “GENERAL” and “SUBJECT SPECIFIC”.
The YRC1000 alarm codes above consists of “MAJOR ALARMS” and “MINOR ALARMS”.

Please have the following information available when contacting Yaskawa Customer Support:
• System
• Primary Application
• Software Version (Located on Programming Pendant by selecting: {Main Menu} - {System Info} - {Version})
• Robot Serial Number (Located on robot data plate)
• Robot Sales Order Number (Located on controller data plate)

Part Number: 179330-1CD
Revision: 1
DANGER

• This manual explains the manual brake release function of the YRC1000 system. Read this manual carefully and be sure to understand its contents before handling the YRC1000. Any matter, including operation, usage, measures, and an item to use, 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”.

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.

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.

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 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.

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.
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 supply 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>

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.
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>Character Keys /Symbol Keys: The keys which have characters or symbols printed on them are denoted with [ ]. ex. [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, ex. [SHIFT]+[COORD]</td>
</tr>
<tr>
<td>Displays</td>
<td>The menu displayed in the programming pendant is denoted with { }. ex. {JOB}</td>
</tr>
</tbody>
</table>

**Description of the Operation Procedure**

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

**Registered Trademark**

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

The manual brake release function allows forcible release of each motor brakes of the manipulator and external axes by programming pendant operation.

The following operating conditions have to be met before performing the manual brake release function since this function releases brakes by software, which is different from the conventional brake release by hardware.

The manual brake release is an optional function set by parameter.

1.1 Operating Conditions of Manual Brake Release

1. YRC1000 Status
   The YRC1000 has to be launched correctly.

2. Mode: Mode switch on the programming pendant
   The function can be used in all modes: Remote / Play / Teach.

3. Security Mode
   The function can be used in all modes: Operation / Editing / Management / Safety.

4. Others
   • Servo power is OFF
   • Emergency stop is OFF
     (programming pendant, YRC1000, external signals)

Fig. 1-1: Alarm Window

1 Basically, the manual brake release function is available even at alarm occurrence. However, the manual brake release function cannot be used if the communication failure between each board occurs due to a board failure, etc.

<Example>
The manual brake release cannot be performed at occurrence of the alarm 0010 as shown in fig. 1-1, since the communication with the servo board becomes unavailable.
2 Manual Brake Release Operation

1. Select [ROBOT] under the main menu, then select [MANUAL BRAKE RELEASE] under the submenu.

   – [MANUAL BRAKE RELEASE] is shown under the submenu of the main menu [ROBOT].

2. Select "YES".

   – To avoid careless operation mistake, a warning message appears when [MANUAL BRAKE RELEASE] menu is selected.
   – Select "YES" to display [MANUAL BRAKE RELEASE] window.
   – Select "NO" to return to the main menu.
3. Move a cursor to the axis of which the brake is to be released.
   - The brake is released by following the operation: Move a cursor to the axis of which the brake is to be released and press [INTERLOCK] + [SELECT] while gripping Enable switch. Then the brake status is shown.
   - The brake is locked under one of the following conditions:
     • When [SELECT] is released.
     Also, see the following ⚠️ CAUTION
     • When the emergency stop button on the programming pendant, YRC1000 or external device is pressed.
     • When Enable switch is released or gripped further.
     • When the window is switched from the Manual Brake Release window to another window.

Fig. 2-1: Manual Brake Release Window

4. Press [INTERLOCK] + [SELECT] while gripping Enable switch.

⚠️ CAUTION

- Brake can be released by pressing [INTERLOCK] + [SELECT] while gripping Enable switch.
  Note that the brake remains released even though [INTERLOCK] is released at this time.

⚠️ DANGER

- Before performing brake-release operation for a manipulator, carefully read the MOTOMAN-□□□ INSTRUCTIONS of the manipulator, and securely fix the axis whose brake will be released.
  When the brake is released, depending on the axis and its posture, the axis may fall down due to its own weight or may abruptly move upward due to the attached balancer or weight, which may result in personal injury and/or equipment damage.
If the manual brake release is performed under the following conditions, the warning message appears in the message area bottom right of the window.

In this case, the brake release cannot be performed.

- Servo power is turned ON.
- Emergency stop button on the programming pendant is pressed.
- Emergency stop button on YRC1000 is pressed.
- External emergency stop signal is input.
YRC1000 OPTIONS
INSTRUCTIONS
FOR MANUAL BRAKE RELEASE FUNCTION

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Specifications are subject to change without notice for ongoing product modifications and improvements.

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