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

**MOTOMAN INSTRUCTIONS**

- MOTOMAN-□□□ INSTRUCTIONS
- DX200 INSTRUCTIONS
- DX200 OPERATOR’S MANUAL (for each purpose)
- DX200 MAINTENANCE MANUAL

The DX200 operator’s manual above corresponds to specific usage. Be sure to use the appropriate manual.
MANDATORY

- This manual explains the manual brake release function of DX200. Read this manual carefully and be sure to understand its contents before handling the DX200.
- General items related to safety are listed in the Chapter 1: Safety of the DX200 Instructions. To ensure correct and safe operation, carefully read the DX200 Instructions before reading this manual.

CAUTION

- Some drawings in this manual are shown with the protective covers or shields removed for clarity. Be sure all covers and shields are replaced before operating this product.
- 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.
- YASKAWA is not responsible for incidents arising from unauthorized modification of its products. Unauthorized modification voids your product’s warranty.
Notes for Safe Operation

Read this manual carefully before installation, operation, maintenance, or inspection of the DX200.

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

**WARNING**

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to personnel.

**CAUTION**

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury to personnel and damage to equipment. It may also be used to alert against unsafe practices.

**MANDATORY**

Always be sure to follow explicitly the items listed under this heading.

**PROHIBITED**

Must never be performed.

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 “CAUTION” and “WARNING.”
WARNING

• Before operating the manipulator, check that servo power is turned OFF when the emergency stop buttons on the front door of the DX200 and programming pendant are pressed. When the servo power is turned OFF, the SERVO ON LED on the programming pendant is turned OFF.

Injury or damage to machinery may result if the emergency stop circuit cannot stop the manipulator during an emergency. The manipulator should not be used if the emergency stop buttons do not function.

Figure 1: Emergency Stop Button

• Once the emergency stop button is released, clear the cell of all items which could interfere with the operation of the manipulator. Then turn the servo power ON.

Injury may result from unintentional or unexpected manipulator motion.

Figure 2: Release of Emergency Stop

• Observe the following precautions when performing teaching operations within P-point maximum envelope of the manipulator:
  – View the manipulator from the front whenever possible.
  – Always follow the predetermined operating procedure.
  – Ensure that you have a safe place to retreat in case of emergency.

Improper or unintended manipulator operation may result in injury.

• Confirm that no person is present in the P-point maximum envelope of the manipulator and that you are in a safe location before:
  – Turning ON the DX200 power.
  – Moving the manipulator with the programming pendant.
  – Running the system in the check mode.
  – Performing automatic operations.

• Injury may result if anyone enters the P-point maximum envelope of the manipulator during operation. Always press an emergency stop button immediately if there is a problem. The emergency stop buttons are located on the right of the front door of the DX200 and the programming pendant.
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>DX200 Controller</td>
<td>DX200</td>
</tr>
<tr>
<td>DX200 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>
Manual Brake Release

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 its symbol printed on them are denoted with [ ]. ex. [ENTER]</td>
</tr>
<tr>
<td>Ax[is 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 the SELECT key 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 ™ are omitted.
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3 Warning Message Display............................................................................................................. 3-1
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. DX200 Status
   The DX200 has to be launched correctly\(^1\).

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.

4. Others
   - Servo power is OFF
   - Emergency stop is OFF
     (programming pendant, DX200, 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 boards (YCP21, EAXA21, YIF21, YSF21, YSF22) occurs due to board failure, etc.

<Example>
The manual brake release cannot be performed at occurrence of the alarm 0060 as shown in Figure 1-1, since the communication with the board YSF21 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, DX200 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.
3 Warning Message Display

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 DX200 is pressed.
• External emergency stop signal is input.
DX200 OPTIONS
INSTRUCTIONS
FOR MANUAL BRAKE RELEASE FUNCTION

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