DX200 OPTIONS
INSTRUCTIONS

MLT1700 CORRESPONDENCE FOR INDEPENDENT TYPE BRAKE
RELEASE UNIT (HANDY TYPE: HB1371413-A)

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.

Part Number: 179371-1CD
Revision: 0
MANDATORY

- This manual explains the brake release unit of the DX200 system. 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.
We suggest that you obtain and review a copy of the ANSI/RIA National Safety Standard for Industrial Robots and Robot Systems (ANSI/RIA R15.06-2012). You can obtain this document from the Robotic Industries Association (RIA) at the following address:

Robotic Industries Association
900 Victors Way
P.O. Box 3724
Ann Arbor, Michigan 48106
TEL: (734) 994-6088
FAX: (734) 994-3338
www.roboticsonline.com

Ultimately, well-trained personnel are the best safeguard against accidents and damage that can result from improper operation of the equipment. The customer is responsible for providing adequately trained personnel to operate, program, and maintain the equipment. NEVER ALLOW UNTRAINED PERSONNEL TO OPERATE, PROGRAM, OR REPAIR THE EQUIPMENT!

We recommend approved YASKAWA training courses for all personnel involved with the operation, programming, or repair of the equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.
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 “DANGER”, “WARNING”, “CAUTION”, “MANDATORY”, or “PROHIBITED”.

**DANGER**
Indicates an imminent hazardous situation which, if not avoided, could result in death or serious injury to personnel.

**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 “DANGER”, “WARNING” and “CAUTION”.
**WARNING**

- 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 are problems. The emergency stop buttons are located on the right of the front door of the DX200 and the programming pendant.

- Observe the following precautions when performing teaching operations within the P-point maximum envelope of the manipulator:
  - Be sure to use a lockout device to the safeguarding when going inside. Also, display the sign that the operation is being performed inside the safeguarding and make sure no one closes the safeguarding.
  - 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.

- Before operating the manipulator, check that servo power is turned OFF when the emergency stop button on the programming pendant (and the front door of the DX200) is 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.

*Fig. : 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.

*Fig. : Release of Emergency Stop*
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>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>

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 Keys</td>
<td>Character Keys</td>
</tr>
<tr>
<td></td>
<td>Symbol Keys</td>
</tr>
<tr>
<td></td>
<td>The keys which have characters or symbols printed on them are denoted with [ ]. ex. [ENTER]</td>
</tr>
<tr>
<td>Axis Keys</td>
<td>[Axis Key] and [Numeric Key] are generic names for the keys for axis operation and number input.</td>
</tr>
<tr>
<td>Number Keys</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>Keys pressed simultaneously</td>
<td></td>
</tr>
<tr>
<td>Displays</td>
<td>The menu displayed in the programming pendant is denoted with { }. ex. {JOB}</td>
</tr>
</tbody>
</table>

CAUTION

- Perform the following inspection procedures prior to conducting manipulator teaching. If problems are found, repair them immediately, and be sure that all other necessary processing has been performed.
  - Check for problems in manipulator movement.
  - Check for damage to insulation and sheathing of external wires.
- Always return the programming pendant to the hook on the DX200 cabinet after use.

The programming pendant can be damaged if it is left in the manipulator’s work area, on the floor, or near fixtures.

• Read and understand the Explanation of the Warning Labels in the DX200 Instructions before operating the manipulator.
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.
Safeguarding Tips

All operators, programmers, maintenance personnel, supervisors, and anyone working near the system must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. General safeguarding tips are as follows:

• Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation of this equipment, the operator's manuals, the system equipment, and options and accessories should be permitted to operate this equipment.

• Improper connections can damage the equipment. All connections must be made within the standard voltage and current ratings of the equipment.

• The system must be placed in Emergency Stop (E-Stop) mode whenever it is not in use.

• In accordance with ANSI/RIA R15.06-2012, section 4.2.5, Sources of Energy, use lockout/tagout procedures during equipment maintenance. Refer also to Section 1910.147 (29CFR, Part 1910), Occupational Safety and Health Standards for General Industry (OSHA).

Mechanical Safety Devices

The safe operation of this equipment is ultimately the user's responsibility. The conditions under which the equipment will be operated safely should be reviewed by the user. The user must be aware of the various national codes, ANSI/RIA R15.06-2012 safety standards, and other local codes that may pertain to the installation and use of this equipment.

Additional safety measures for personnel and equipment may be required depending on system installation, operation, and/or location. The following safety equipment is provided as standard:

• Safety barriers
• Door interlocks
• Emergency stop palm buttons located on operator station

Check all safety equipment frequently for proper operation. Repair or replace any non-functioning safety equipment immediately.
Programming, Operation, and Maintenance Safety

All operators, programmers, maintenance personnel, supervisors, and anyone working near the system must become familiar with the operation of this equipment. Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation, manuals, electrical design, and equipment interconnections of this equipment should be permitted to program, or maintain the system. All personnel involved with the operation of the equipment must understand potential dangers of operation.

- Inspect the equipment to be sure no potentially hazardous conditions exist. Be sure the area is clean and free of water, oil, debris, etc.
- Be sure that all safeguards are in place. Check all safety equipment for proper operation. Repair or replace any non-functioning safety equipment immediately.
- Check the E-Stop button on the operator station for proper operation before programming. The equipment must be placed in Emergency Stop (E-Stop) mode whenever it is not in use.
- Back up all programs and jobs onto suitable media before program changes are made. To avoid loss of information, programs, or jobs, a backup must always be made before any service procedures are done and before any changes are made to options, accessories, or equipment.
- Any modifications to the controller unit can cause severe personal injury or death, as well as damage to the robot! Do not make any modifications to the controller unit. Making any changes without the written permission from YASKAWA will void the warranty.
- Some operations require a standard passwords and some require special passwords.
- The equipment allows modifications of the software for maximum performance. Care must be taken when making these modifications. All modifications made to the software will change the way the equipment operates and can cause severe personal injury or death, as well as damage parts of the system. Double check all modifications under every mode of operation to ensure that the changes have not created hazards or dangerous situations.
- This equipment has multiple sources of electrical supply. Electrical interconnections are made between the controller and other equipment. Disconnect and lockout/tagout all electrical circuits before making any modifications or connections.
- Do not perform any maintenance procedures before reading and understanding the proper procedures in the appropriate manual.
- Use proper replacement parts.
- Improper connections can damage the equipment. All connections must be made within the standard voltage and current ratings of the equipment.
Maintenance Safety

Turn the power OFF and disconnect and lockout/tagout all electrical circuits before making any modifications or connections.

Perform only the maintenance described in this manual. Maintenance other than specified in this manual should be performed only by YASKAWA-trained, qualified personnel.

Summary of Warning Information

This manual is provided to help users establish safe conditions for operating the equipment. Specific considerations and precautions are also described in the manual, but appear in the form of Dangers, Warnings, Cautions, and Notes.

It is important that users operate the equipment in accordance with this instruction manual and any additional information which may be provided by YASKAWA. Address any questions regarding the safe and proper operation of the equipment to YASKAWA Customer Support.
Customer Support Information

If you need assistance with any aspect of your Independent Type Brake Release Unit system, please contact YASKAWA Customer Support at the following 24-hour telephone number:

(937) 847-3200

For routine technical inquiries, you can also contact YASKAWA Customer Support at the following e-mail address:

technical.support@motoman.com

When using e-mail to contact YASKAWA Customer Support, please provide a detailed description of your issue, along with complete contact information. Please allow approximately 24 to 36 hours for a response to your inquiry.

Please use e-mail for routine inquiries only. If you have an urgent or emergency need for service, replacement parts, or information, you must contact YASKAWA Customer Support at the telephone number shown above.

Please have the following information ready before you call Customer Support:

- System: Independent Type Brake Release Unit
- Primary Application: ___________________________
- Controller: DX200
- Software Version: Access this information on the Programming Pendant’s LCD display screen by selecting {MAIN MENU} - {SYSTEM INFO} - {VERSION}
- Robot Serial Number: Located on the robot data plate
- Robot Sales Order Number: Located on the DX200 controller data plate
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1 Product Confirmation

Confirm the contents of the delivery when the product arrives.

- Brake Release Unit (refer to Fig. 1-1 “Brake Release Unit (independent unit type)”) x 1
- Brake Release Unit Cable (refer to Fig. 1-1) x 1

Fig. 1-1: Brake Release Unit (independent unit type)

Power supply cable: 2 m (standard: plug socket for AC100)
Weight: 3 kg
2 Installation and Wiring

Only when using the brake release unit, connect it with the attachment cable for brake release unit.

## CAUTION

- Check to be sure that the main breaker of the DX200 is turned OFF before connecting the cable. Electric shock or equipment damage may result.
- Connect each connector firmly. Electric shock or wrong operation may result.

### Connection procedure

1. Prepare the brake release unit cable corresponding to the manipulator whose brake is to be released. For the correspondence of the manipulator with the brake release unit cable, refer to Table 2-1 “The correspondence table”.
2. Confirm that the main breaker of the DX200 is turned OFF.
3. Remove the power supply connector (power line) on the manipulator side.
4. Connect the connector (2CN) of the brake release unit cable to the brake release unit connector (2CN). Before connecting the cable connector of the manipulator side to the manipulator power supply connector, check each notation on the connector and the manipulator is the same.
5. Insert the plug 1CN of the brake release unit into the socket for AC100 V (with ground terminal).

This brake release unit supports the input voltage from AC 100 V to 240 V. The attached power supply cable is for AC 100 V power plug socket. When using this brake release unit at other than AC100 V, prepare the power supply cable which corresponds to the use voltage.
### Table 2-1: The correspondence table

<table>
<thead>
<tr>
<th>Manipulator type</th>
<th>Brake release unit cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>MH280II</td>
<td>HS1370337-□</td>
</tr>
<tr>
<td>MH215II</td>
<td></td>
</tr>
<tr>
<td>MH250II</td>
<td></td>
</tr>
<tr>
<td>MPL160II</td>
<td></td>
</tr>
<tr>
<td>MPL300II</td>
<td></td>
</tr>
<tr>
<td>ES165RDII</td>
<td></td>
</tr>
<tr>
<td>ES200RDII</td>
<td></td>
</tr>
<tr>
<td>MS165/MH180</td>
<td></td>
</tr>
<tr>
<td>MH180-120</td>
<td></td>
</tr>
<tr>
<td>MS210/MH225</td>
<td></td>
</tr>
<tr>
<td>MC2000II</td>
<td></td>
</tr>
<tr>
<td>MS100/MH110</td>
<td></td>
</tr>
<tr>
<td>MPL100II</td>
<td></td>
</tr>
<tr>
<td>MH400II</td>
<td>HS0371058-□</td>
</tr>
<tr>
<td>MH600</td>
<td></td>
</tr>
<tr>
<td>UP400RDII</td>
<td></td>
</tr>
<tr>
<td>MA1440/MH12</td>
<td>HS0371438-□</td>
</tr>
<tr>
<td>MA2010</td>
<td></td>
</tr>
<tr>
<td>MH5LSII</td>
<td></td>
</tr>
<tr>
<td>MH24</td>
<td></td>
</tr>
<tr>
<td>MH500II</td>
<td>HS1370251-□</td>
</tr>
<tr>
<td>MH500II-20</td>
<td></td>
</tr>
<tr>
<td>MH500II-35</td>
<td></td>
</tr>
<tr>
<td>MH800II</td>
<td></td>
</tr>
<tr>
<td>MS80WII</td>
<td></td>
</tr>
<tr>
<td>MS80EII</td>
<td>HS1370055-A</td>
</tr>
<tr>
<td></td>
<td>HS1370058-A</td>
</tr>
<tr>
<td></td>
<td>HS1370059-A</td>
</tr>
<tr>
<td>MPL80II</td>
<td>HS1370647-A</td>
</tr>
<tr>
<td>MPL800II</td>
<td>HS1370644-A</td>
</tr>
<tr>
<td>SIA20DII(^1)</td>
<td>HS1370175-A</td>
</tr>
<tr>
<td>VA1400II(^1)</td>
<td>HS1370646-A</td>
</tr>
<tr>
<td>VS100(^1)</td>
<td>HS1370645-A</td>
</tr>
<tr>
<td>MLT1700(^1)</td>
<td>HS1370672-A</td>
</tr>
</tbody>
</table>

\(^1\) For the seven axis or the U1 and U2 axes of MLT1700, the brake release is performed by the inching operation.
3 Operating Method

**WARNING**

- 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 or 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.

- Before rewiring the brake release unit cable, turn OFF the circuit protector 1CP.

Personal injury or equipment damage may result due to the wrong operation.

- Release the brake of only one axis at one brake-release operation.

If the brakes of two or more axes must be released simultaneously out of necessity, pay careful attention to ensure the safety of the surrounding operation environment because the manipulator's arm may move in an unexpected way. Failure to observe this instruction may result in personal injury and/or equipment damage.

- After the operation, be sure to turn OFF the circuit protector 1CP.

Personal injury or equipment damage may result due to the wrong operation.

1. Turn OFF the DX200 when using the brake release unit.
2. Remove power cable from the connector on the manipulator.
3. Connect the connector (2CN) of the brake release unit cable to the brake release unit connector (2CN).
   Confirm the letters marked on the cable and the manipulator side.
   Connect the manipulator side connector (2BC) of the brake release unit cable to the manipulator power supply connector (2BC).
   Connect the manipulator side connector (3BC) of the brake release unit cable to the manipulator power supply connector (3BC).
4. Connect the connector (1CN) of the brake release unit cable to the power plug socket for AC 100 V to AC 240 V.
5. Turn ON the “1CP” circuit protector on the brake release unit.
   Confirm the “POWER” lamp lights up.
   Press the “BRAKE RELEASE” switch.
6. Press the button of the axis whose brake to be released.
   For the S, L, U, R, B, and T button, the brake can be released while the button is pressed. When the U1 or U2 button is pressed, the brake of the axis selected with a select switch (2SS) is released for a certain period of time. Performing the brake release for two or more axes by pressing the S, L, U, R, B, T, U1, and U2 buttons simultaneously is dangerous. Be sure to release the brake of only one axis at one brake-release operation.
7. After the operation, turn OFF the circuit protector 1CP.