

## 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

MANUAL NO.

**HW1484297**

Copyright © 2017 YASKAWA America, Inc.

#### Terms of Use and Copyright Notice

All rights reserved. This manual is freely available as a service to YASKAWA customers to assist in the operation of Motoman robots, related equipment and software. This manual is copyrighted property of YASKAWA and may not be sold or redistributed in any way. You are welcome to copy this document to your computer or mobile device for easy access but you may not copy the PDF files to another website, blog, cloud storage site or any other means of storing or distributing online content.

Printed in the United States of America

First Printing, 2017

YASKAWA America, Inc.  
Motoman Robotics Division  
100 Automation Way  
Miamisburg, OH 45342  
Phone: 937-847-6200

[www.motoman.com](http://www.motoman.com)



## 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](http://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 a 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.



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*



**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.

## Definition of Terms Used Often in This Manual

The MOTOMAN is the YASKAWA industrial robot product.

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

In this manual, the equipment is designated as follows:

Equipment	Manual Designation
DX200 Controller	DX200
DX200 Programming Pendant	Programming Pendant
Cable between the manipulator and the controller	Manipulator cable

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

Equipment	Manual Designation
Programming Pendant Character Keys Symbol Keys	The keys which have characters or symbols printed on them are denoted with [ ]. ex. [ENTER]
Axis Keys Number Keys	[Axis Key] and [Numeric Key] are generic names for the keys for axis operation and number input.
Keys pressed simultaneously	When two keys are to be pressed simultaneously, the keys are shown with a "+" sign between them, ex. [SHIFT]+[COORD]
Displays	The menu displayed in the programming pendant is denoted with { }. ex. {JOB}

---

## Description of the Operation Procedure

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

## Registered Trademark

In this manual, names of companies, corporations, or products are trademarks, registered trademarks, or brand names for each company or corporation. The indications of (R) and <sup>TM</sup> 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 users 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:

[techsupport@motoman.com](mailto:techsupport@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

## Table of Contents

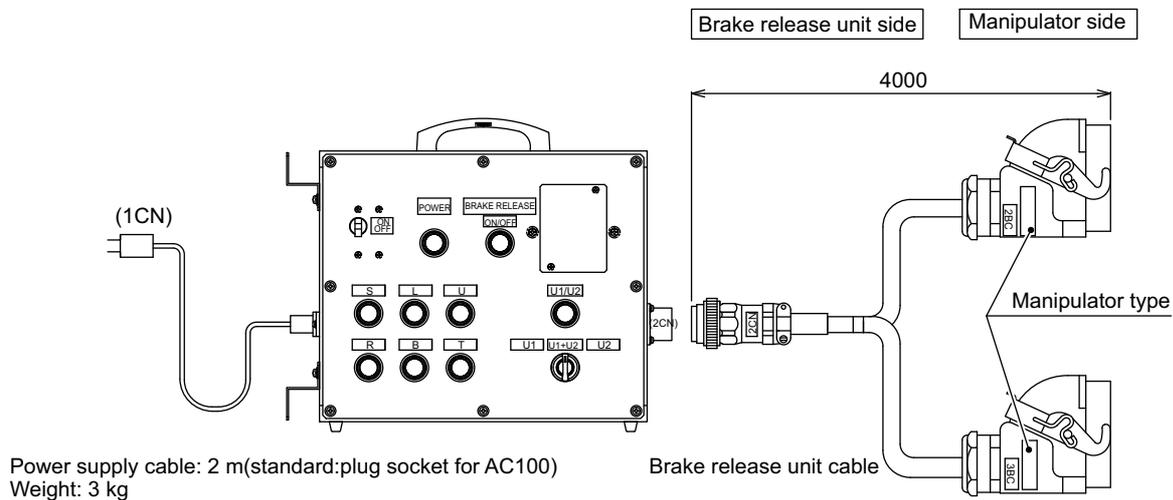
1	Product Confirmation .....	1-1
2	Installation and Wiring.....	2-1
3	Operating Method .....	3-1

## 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)



## 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

Manipulator type	Brake release unit cable
MH280II MH215II MH250II MPL160II MPL300II ES165RDII ES200RDII MS165/MH180 MH180-120 MS210/MH225 MC2000II MS100/MH110 MPL100II	HS1370337-□
MH400II MH600 UP400RDII	HS0371058-□
MA1440/MH12 MA2010 MH5LSII MH24	HS0371438-□
MH50II MH50II-20 MH50II-35 MH80II MS80WII	HS1370251-□
MS80EII	HS1370055-A
	HS1370058-A
	HS1370059-A
MPL80II	HS1370647-A
MPL800II	HS1370644-A
SIA20DII <sup>1)</sup>	HS1370175-A
VA1400II <sup>1)</sup>	HS1370646-A
VS100 <sup>1)</sup>	HS1370645-A
MLT1700 <sup>1)</sup>	HS1370672-A

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.

# DX200 OPTIONS INSTRUCTIONS

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

---

### HEAD OFFICE

2-1 Kurosakishiroishi, Yahatanishi-ku, Kitakyushu 806-0004, Japan  
Phone +81-93-645-7703 Fax +81-93-645-7802

YASKAWA America Inc. (Motoman Robotics Division)  
100 Automation Way, Miamisburg, OH 45342, U.S.A.  
Phone +1-937-847-6200 Fax +1-937-847-6277

YASKAWA Europe GmbH (Robotics Division)  
Yaskawastrasse 1, 85391 Allershausen, Germany  
Phone +49-8166-90-100 Fax +49-8166-90-103

YASKAWA Nordic AB  
Verkstadsгатan 2, Box 504, SE-385 25 Torsas, Sweden  
Phone +46-480-417-800 Fax +46-486-414-10

YASKAWA Electric (China) Co., Ltd.  
22F, One Corporate Avenue, No.222, Hubin Road, Huangpu District, Shanghai 200021, China  
Phone +86-21-5385-2200 Fax +86-21-5385-3299

YASKAWA SHOUGANG ROBOT Co. Ltd.  
No7 Yongchang North Road, Beijing E&T Development Area, China 100176  
Phone +86-10-6788-2858 Fax +86-10-6788-2878

YASKAWA India Private Ltd. (Robotics Division)  
#426, Udyog Vihar, Phase- IV, Gurgaon, Haryana, India  
Phone +91-124-475-8500 Fax +91-124-475-8542

YASKAWA Electric Korea Corporation  
35F, Three IFC, 10 Gukjegeumyung-ro, Yeongdeungpo-gu, Seoul, Korea 07326  
Phone +82-2-784-7844 Fax +82-2-784-8495

YASKAWA Electric Taiwan Corporation  
12F, No.207, Sec. 3, Beishin Rd., Shindian District, New Taipei City 23143, Taiwan  
Phone +886-2-8913-1333 Fax +886-2-8913-1513

YASKAWA Electric (Singapore) PTE Ltd.  
151 Lorong Chuan, #04-02A, New Tech Park, Singapore 556741  
Phone +65-6282-3003 Fax +65-6289-3003

YASKAWA Electric (Thailand) Co., Ltd.  
59, 1st-5th Floor, Flourish Building, Soi Ratchadapisek 18, Ratchadapisek Road,  
Huaykwang, Bangkok 10310, THAILAND  
Phone +66-2-017-0099 Fax +66-2-017-0199

PT. YASKAWA Electric Indonesia  
Secure Building-Gedung B Lantai Dasar & Lantai 1 Jl. Raya Protokol Halim Perdanakusuma,  
Jakarta 13610, Indonesia  
Phone +62-21-2982-6470 Fax +62-21-2982-6741

---

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

# YASKAWA

MANUAL NO.

# HW1484297