

# DX100 OPTIONS INSTRUCTIONS

**FOR BRAKE RELEASE UNIT INDEPENDENT UNIT TYPE (HANDHELD TYPE)**

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

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## MOTOMAN INSTRUCTIONS

MOTOMAN-□□□ INSTRUCTIONS  
DX100 INSTRUCTIONS  
DX100 OPERATOR'S MANUAL  
DX100 MAINTENANCE MANUAL

The DX100 operator's manual above corresponds to specific usage.  
Be sure to use the appropriate manual.

Part Number: 171769-1CD  
Revision: 0

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## MANDATORY

- This manual explains the brake release unit of the DX100 system. Read this manual carefully and be sure to understand its contents before handling the DX100.
- General items related to safety are listed in the Chapter 1: Safety of the DX100 Instructions. To ensure correct and safe operation, carefully read the DX100 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 DX100.

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.



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 DX100 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 DX100 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.
  - Keep in mind the emergency response measures against the manipulator's unexpected motion toward you.
  - 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 buttons on the front door of the DX100 and the 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*





## 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 DX100 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 DX100 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 the manipulator cables.

In this manual, the equipment is designated as follows:

Equipment	Manual Designation
DX100 Controller	DX100
DX100 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	The keys which have characters printed on them are denoted with [ ]. ex. [ENTER]
	Symbol Keys	The keys which have a symbol printed on them are not denoted with [ ] but depicted with a small picture. ex. page key  The cursor key is an exception, and a picture is not shown.
	Axis Keys Numeric Keys	“Axis Keys” and “Numeric Keys” 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 the SELECT key is pressed.

## 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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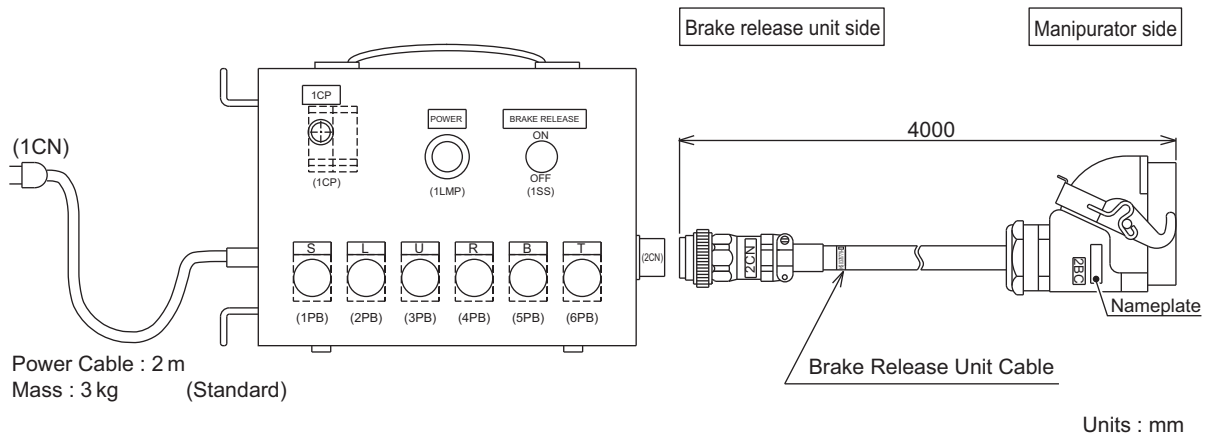


## 1 Product Confirmation

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 “Brake release unit (Independent Unit Type)”) x For each 1

Fig. 1-1: Brake release unit (Independent Unit Type)



## 2 Installation and Wiring

Connect the brake release unit cable provided, only when using the brake release unit.



### CAUTION

- Before starting connection work, confirm that the main breaker of the DX100 is turned OFF.  
Failure to observe this warning may result in electric shock or damage.
- Connect each connector securely.  
Failure to observe this warning may result in electric shock or malfunction.

#### Connection method

1. Check if the DX100 main breaker is turned OFF.
2. Disconnect the power feed connector (power line) on the manipulator side.
3. Connect the brake release unit cable to the manipulator main unit and to the brake release unit in accordance with the description of the connector.
  - For the various combinations of robot types and cables used, refer to *Table 2-1 "Comparison table"*.
4. Connect the power outlet plug 1CN on the brake release unit to a 100V<sub>AC</sub> power outlet (with ground terminal).

Table 2-1: Comparison table (Sheet 1 of 2)

Robot Type	Brake Release Unit Cable	Brake Release Unit	Note
MH5	HS0371438-□	HE0301921-A	For 2BC
MH6			
HP20D			
MA1400			
MA1900			
ES165D	HS1370011-□	HE0301921-A	For 2BC
ES200D			
ES280D			
MS120			
UP350D	HS1370011-□	HE0301921-A	For 3BC
MH215			
MH165			
MH200			
MH250			
ES165RD	HS1370011-□	HE0301921-A	For 3BC
ES200RD			

Table 2-1: Comparison table (Sheet 2 of 2)

Robot Type	Brake Release Unit Cable	Brake Release Unit	Note
UP120ED-165	HS1370011-□	HE0301921-A	For 3BC
NMC2000			
ES165D	HS1370012-□	HE0301921-A	For 3BC
ES200D			
SIA20D	HS1370175-□	HE0301921-A	For 2BC
SGMRV-13ANA-YR11	HS1370176-□	HE0301921-A	For external axis motor
SGMRV-20ANA-YR11			
SGMRV-30ANA-YR11			
SGMRV-37ANA-YR11			
SGMRV-44ANA-YR11			
SGMRV-55ANA-YR11			
NC locator			
MS80	HS1370251-□	HE0301921-A	For 2BC
MH50			
MS80W			
MH80			
MS80E	HS1370058-□	HE0301921-A	For S-, L-, U-axis motor
MS80E	HS1370059-□	HE0301921-A	For B-, T-axis, and E-, R-axis motor
MFL2200D	HS1370244-□	HE0301921-A	
EPL160	HS1370334-□	HE0301921-A	For 2BC
EPL300			
EPL500			
MPL100			
MPL160			
MPL300			
MPL500			
MPL800			
EP4000D			
EPH4000D			
EP4000D	HS1370336-□	HE0301921-A	For 24V <sub>DC</sub> power source of R-, B-, T-axis for 6BC
EPH4000D			

Note: For EP4000D and EPH4000D, the brake voltage depends on the axes.

Therefore, the dedicated brake release units and cables are needed.

### 3 Operating Procedure



#### CAUTION

- Before changing the connections of the brake release unit cable, set the circuit protector 1CP to OFF.

If the numbers do not match, manipulators may not perform as expected and cause injury or damage.

- Make sure to exercise caution in the manipulator motion when the brake is released.

The manipulator may move under its own weight when the brake is released, resulting in injury or damage.

- Make sure to release only one axis brake at a time.

Releasing more than one axis brake may cause an unexpected manipulator movement. Make sure to exercise caution in the manipulator motion when unavoidably releasing more than one axis brake.

Failure to observe this caution may result in injury or damage due to malfunction.

- After the end of the above work, be sure to set the "BRAKE RELEASE" switch and the circuit protector 1CP to OFF.

If the numbers do not match, manipulators may not perform as expected and cause injury or damage.

The brake release unit is to be operated in the following procedure.

1. Check if the DX100 main breaker is turned OFF.
2. Set the Circuit protector 1CP of the brake release unit to ON.  
(The "Power" lamp will light up.)
3. The state which turned ON the "BRAKE RELEASE" switch (1SS), and the brake of the relevant axis is released while the button is being pressed.
4. To end brake releasing work, set the button for the shaft which releases the brake, and also the "BRAKE RELEASE" switch (1SS) to OFF.
5. After the end of the above work, set the circuit protector 1CP to OFF.  
(The "Power" lamp will go out.)

# DX100 OPTIONS INSTRUCTIONS

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