

DX100 OPTIONS INSTRUCTIONS

FOR EXTERNAL AXIS BATTERY REPLACEMENT
(FOR EUROPEAN AND NORTH AMERICAN STANDARDS)

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

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: 157864-1CD
Revision: 0





MANDATORY

- This manual explains the external axis replacement procedure 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 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.

DX100

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 “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.



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 pressing the emergency stop buttons on the front door of the DX100 and the programming pendant. 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



- Observe the following precautions when performing teaching operations within the P-point maximum envelope of the manipulator:
 - 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.

- 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 power for the DX100.
 - 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.

DX100



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 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 supply 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

DX100

Descriptions of the programming pendant, 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 Number Keys	“Axis Keys” and “Number 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, 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.

DX100

Contents

1	Battery Replacement Procedure	1-1
1.1	Purpose	1-1
1.2	Preparation	1-1
1.3	Battery Replacement Procedure	1-2

1 Battery Replacement Procedure

1.1 Purpose

The external axis motor backs up the position data in the encoder, however there is a possibility of the data in the encoder being lost due to deterioration or the battery reaching the end of its life. For this reason, it is necessary to periodically replace the battery.

This manual describes the procedure for replacing the battery of the external axis motor.

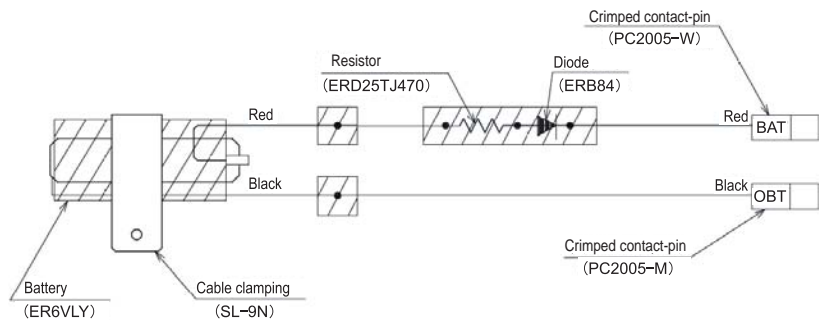
1.2 Preparation

Prepare the tool and parts of a following table before the battery replacement.

Table 1-1: Tool and Parts

Name	Quantity	Remarks
Driver(+)	1	
Battery	2	Battery for motor connection and new replacement (refer to fig. 1-1 "Battery")

Fig. 1-1: Battery



1.3 Battery Replacement Procedure

Perform the following procedure to replace battery.

1. Turn OFF the DX100 main power.
2. Connect a backup battery to the motor to be replaced. Failure to do this may result in the motor encoder data being lost. Regarding the connection points for the backup battery, refer to *fig. 1-2 "Connection point of battery terminal for motors and battery (large motor)"* and *fig. 1-3 "Connection point of battery terminal for motors and battery (small motor)"* at page 1-3.



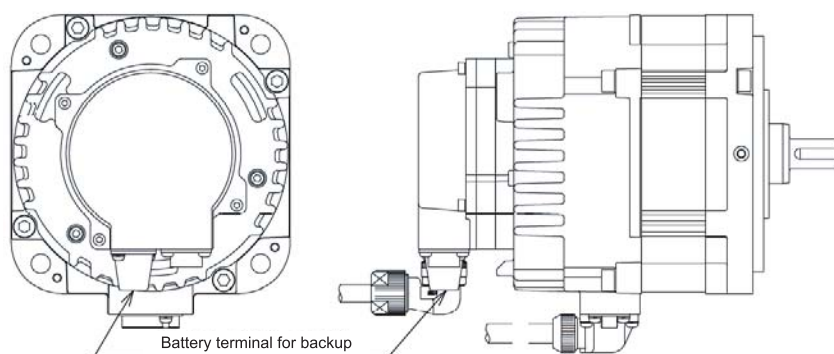
CAUTION

When inserting the battery, be careful of the direction in which the connection terminals are inserted. The connections are shown in *table 1-2 "Connection of battery terminal for motor and battery (large motor)"*.

Table 1-2: Connection of battery terminal for motor and battery (large motor)

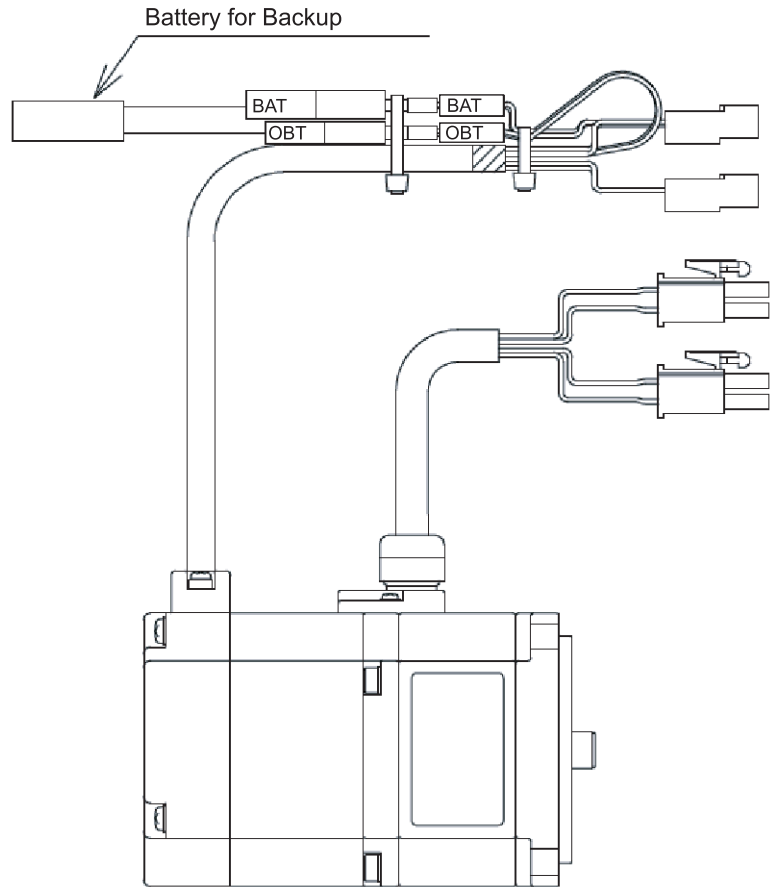
Motor side	Battery side (Marker tube)
PC-2005M	BAT
PC-2005F	0BT

Fig. 1-2: Connection point of battery terminal for motors and battery (large motor)



Remove the four cover screws to gain access to the battery connection wiring. Connect this wiring to the backup battery.

Fig. 1-3: Connection point of battery terminal for motors and battery (small motor)



Wires for battery connection is outside the motor.
 Connect this wiring to the motor battery.

- Remove the battery fixing base from the rear of the controller. Regarding the position of the battery fixing base, refer to *fig. 1-4 "Location of the battery fixing base (back of the controller)"* at page 1-4.

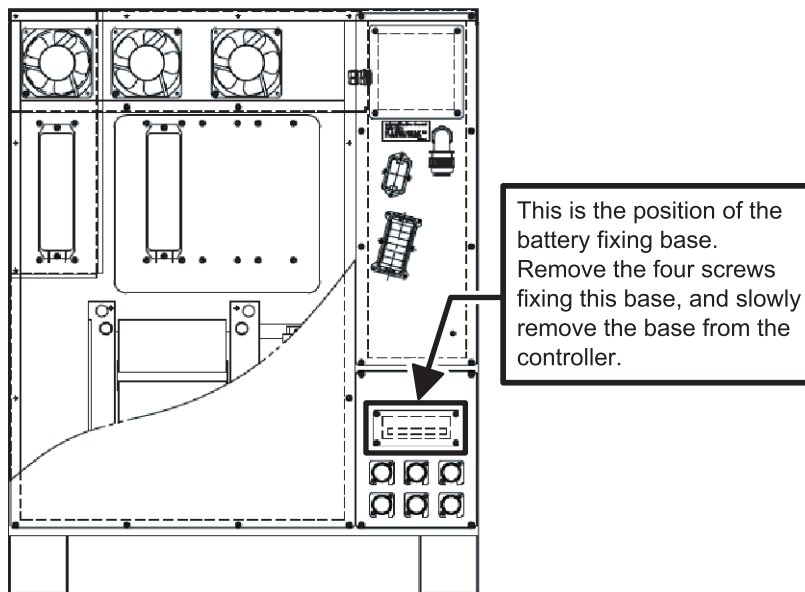


CAUTION

When removing the battery fixing base from the controller, remove it slowly.

- 1 Battery Replacement Procedure
- 1.3 Battery Replacement Procedure

Fig. 1-4: Location of the battery fixing base (back of the controller)

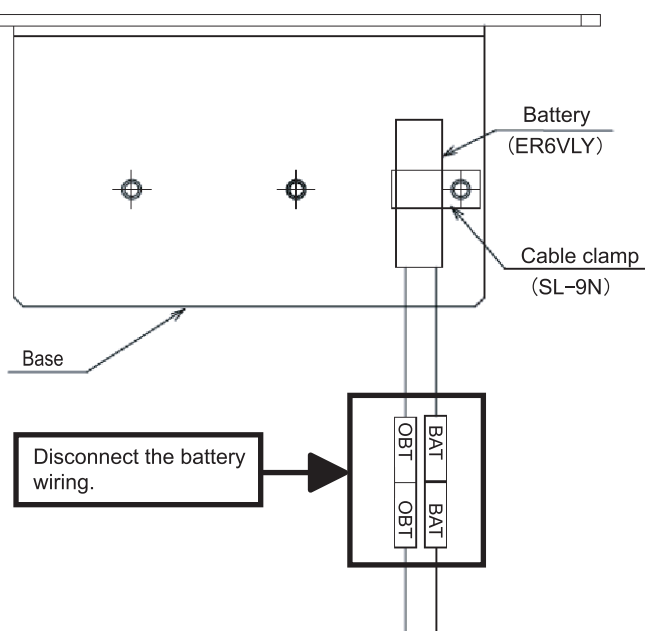


- 4. Disconnect the battery wiring. Regarding the wiring disconnection points, refer to fig. 1-5 "A battery fixed base and battery wiring".

CAUTION

If the backup battery mentioned in step 2 has not been connected, the motor encoder data may be lost.

Fig. 1-5: A battery fixed base and battery wiring



DX100

- 1 Battery Replacement Procedure
- 1.3 Battery Replacement Procedure

5. In order to remove the battery from the base, remove the cable clamp. Regarding the position of the cable clamp, refer to *fig. 1-5 "A battery fixed base and battery wiring" at page 1-4*.
6. Fix the new replacement battery to the base using the cable clamp.
7. Connect the battery wiring (refer to *fig. 1-5 "A battery fixed base and battery wiring" at page 1-4*).



CAUTION

When inserting the battery, be careful of the direction in which the connection terminals are inserted.

8. Install the base to which the battery is fixed, on the controller.
9. Disconnect the motor connection battery from the motor. This completes battery replacement work (refer to *fig. 1-2 "Connection point of battery terminal for motors and battery (large motor)" at page 1-2* and *fig. 1-3 "Connection point of battery terminal for motors and battery (small motor)" at page 1-3*).

DX100 OPTIONS INSTRUCTIONS

FOR EXTERNAL AXIS BATTERY REPLACEMENT
(FOR EUROPEAN AND NORTH AMERICAN STANDARDS)

HEAD OFFICE

2-1 Kurosaki-Shiroishi, Yahatanishi-ku, Kitakyusyu, Fukuoka, 806-0004, Japan
Phone +81-93-645-7745 Fax +81-93-645-7746

MOTOMAN INC. HEADQUARTERS

805 Liberty Lane, West Carrollton, OH 45449, U.S.A.
Phone +1-937-847-6200 Fax +1-937-847-6277

MOTOMAN ROBOTICS EUROPE AB

Franska Vagen 10, Box 4004, 390 04 Kalmar, Sweden
Phone +46-480-417800 Fax +46-480-417999

MOTOMAN ROBOTEC GmbH

Kammerfeld strasse 1, 85391 Allershausen, Germany
Phone +49-8166-90-0 Fax +49-8166-90-103

YASKAWA ELECTRIC KOREA CORPORATION

1787, Sangyeok-2 Dong, Buk-Gu, Daegu, Korea
Phone +82-53-382-7844 Fax +82-53-382-7845

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.

252/246, 4th Floor. Muang Thai-Phatra office Tower II Rechedapisek Road, Huaykwang Bangkok 10320, Thailand
Phone +66-2-693-2200 Fax +66-2-693-4200

SHOUGANG MOTOMAN ROBOT CO., LTD.

No.7, Yongchang-North Road, Beijing Economic and Technological Development Area, Beijing 100176, China
Phone +86-10-6788-2858 Fax +86-10-6788-2878

MOTOMAN MOTHERSON ROBOTICS LTD.

Plot Number 195-196, First Floor, IMT Manesar -Sector 4, Gurgaon (Haryana), Pin-122050, India
Phone +91-124-475-8500 Fax +91-124-414-8016



YASKAWA ELECTRIC CORPORATION

YASKAWA

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

© Printed in Japan April 2010 10-04

MANUAL NO.

HW0485689

13/13