MOTOMAN-MH12 OPTIONS INSTRUCTIONS

FOR OPTIONAL AIR HOSE SETTING UP/REMOVING PROCEDURES
TYPE: YR-MA1440/MH12-A** (WITH AIR HOSE FOR HANDLING (OPTION))

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

MOTOMAN INSTRUCTIONS

MOTOMAN-MH12 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: 167776-1CD
Revision: 0
MANDATORY

- MOTOMAN-MH12 OPTIONS INSTRUCTIONS FOR OPTIONAL AIR HOSE SETTING UP/REMOVING PROCEDURES is intended to explain detailed specifications and maintenance procedures of the manipulator with the drive unit of the manipulator on the center for the purpose of appropriate application of this system and maintenance procedures to the manipulator. Read through this instruction before operation.
- General items related to safety are listed in 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

To ensure safe and efficient operation at all times, be sure to follow all instructions, even if not designated as "CAUTION" and "WARNING".
Handling Air Hose Set-Up & Removal

**WARNING**

- Before operating the manipulator, check that servo power is turned OFF pressing the emergency stop buttons on the front door of the DX200 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.

*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 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 DX200.
  - 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 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 the 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 DX200</td>
<td>Manipulator cable</td>
</tr>
</tbody>
</table>
Explanation of Warning Labels

The following warning labels are attached to the manipulator. Always follow the warnings on the labels. Also, an identification label with important information is placed on the body of the manipulator. Prior to operating the manipulator, confirm the contents.

Figure 3: Warning Label Locations

**WARNING**
Do not enter robot work area.

**WARNING**
Moving parts may cause injury

**WARNING**
Do not enter robot work area.
# Table of Contents

1. Air Hose for Handling Setting-Up/Removing Procedures .............................................................. 1-1
1 Air Hose for Handling Setting-Up/Removing Procedures

• Refer to Fig.1-1 "Setting Up/Removing Procedures of Air Hose for Handling".

Set-up
1. Turn OFF the DX200 power supply.
2. Unscrew the GT-SA bolts  from the S-head  and then, remove the cover  .
3. Unscrew the GT-SA bolts  from the S-head  and then, remove the cover  .
4. For the effective operation, unscrew the GT-SA bolts  and remove the support  .
5. Unscrew the cross-recessed pan head machine screws  and remove the cover  .
6. Apply grease (Multemp PS2A) to the sliding surface of the wire protecting spring at the wire harness in the manipulator  .
7. Pass the wire harness in the manipulator  from inside of the base  to the S-head  side. When passing the wire harness, following point is to be noted.
   • Be careful that the existing air hoses or grease hoses inside the base  would not be bent.
8. Mount the cover of the wire harness in the manipulator  to the connector base  with the cross-recessed pan head machine screws  .
9. Mount the clamp  to the support  with the cross-recessed pan head machine screws  .
10. Fix the wire harness in the manipulator  , which were passed from inside of the base  to the S-head  side, to the clamp  by using the cable tie  . And then, fix the saddle  to the support  by using the hexagon socket head cap screws  . Tighten the screws with the tightening torque shown in Table 1-1.
11. Mount the support  , to which the wire harness in the manipulator  are fixed, to the S-head  with the GT-SA bolts  . Tighten the bolts with the tightening torque shown in Table 1-1.
12. Mount the support  , which was removed for the effective operation, to the S-head  with the GT-SA bolts  . Tighten the bolts with the tightening torque shown in Table 1-1.
13. Connect the joint  , which is delivered with the wire harness in the manipulator  , to the air hose of the wire harness in the manipulator  .
14. Mount the cover  to the S-head  with the GT-SA bolts  . Tighten the bolts with the tightening torque shown in Table 1-1 "Cable Parts for Handling Air Hose Check List".
15. Mount the cover  to the S-head  by using the GT-SA bolts  . Tighten the bolts with the tightening torque shown in Table 1-1.
Handling Air Hose Set-Up & Removal

**Removal**

1. Turn OFF the DX200 power supply.

2. Unscrew the GT-SA bolts ⌀ from the S-head ⌀ and remove the cover ⌀.

3. Unscrew the GT-SA bolts ⌀ from the S-head ⌀ and remove the cover ⌀.

4. Remove the joint ⌀ from the wire harness in the manipulator ⌀.

5. Unscrew the GT-SA bolts ⌀ and remove the support ⌀, to which the wire harness in the manipulator ⌀ is attached, from the S-head ⌀.

6. Cut the cable tie ⌀, which is fixing the wire harness in the manipulator ⌀ to the clamp ⌀. And then, unscrew the hexagon socket head cap screws ⌀ to remove the saddle ⌀ from the support ⌀.

7. Unscrew the cross-recessed pan head machine screws ⌀, pull the wire harness in the manipulator ⌀ from the S-head ⌀ side to the base ⌀ side, and then remove the wire harness in the manipulator ⌀.

8. Mount the cover ⌀ to the connector base ⌀ with the cross-recessed pan head machine screws ⌀.

9. Mount the cover ⌀ to the S-head ⌀ with the GT-SA bolts ⌀. Tighten the bolts with the tightening torque shown in Table 1-1.

10. Mount the cover ⌀ to the S-head ⌀ with the GT-SA bolts ⌀. Tighten the bolts with the tightening torque shown in Table 1-1.
# Table 1-1: Cable Parts for Handling Air Hose Check List

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Qty</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>S-head HW1100499-1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>②</td>
<td>GT-SA Bolt M6 (length: 15 mm)</td>
<td>8</td>
<td>Tightening Torque 10 N•m</td>
</tr>
<tr>
<td>③</td>
<td>Cover HW1303255-1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>④</td>
<td>GT-SA Bolt M6 (length: 15 mm)</td>
<td>7</td>
<td>Tightening Torque 10 N•m</td>
</tr>
<tr>
<td>⑤</td>
<td>Cover HW1303255-1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑥</td>
<td>GT-SA Bolt M6 (length: 15 mm)</td>
<td>2</td>
<td>Tightening Torque 10 N•m</td>
</tr>
<tr>
<td>⑦</td>
<td>Support HW0414670-2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑧</td>
<td>Cross-Recessed Pan Head Machine Screw M4 (length: 10 mm)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>⑨</td>
<td>Cover HW0415042-1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑩</td>
<td>Wire Harness in Manipulator HW1470806-A</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑪</td>
<td>Base HW1100498-1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑫</td>
<td>Connector Base HW0314612-1</td>
<td>1</td>
<td>Delivered with the wire harness in manipulator HW1470806-A</td>
</tr>
<tr>
<td>⑬</td>
<td>Support HW0414670-1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑭</td>
<td>Clamp TA1-S10</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑮</td>
<td>Cross-Recessed Pan Head Machine Screw M5 (length: 8 mm)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑯</td>
<td>Cable Tie T50R</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑰</td>
<td>Saddle CD12</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑱</td>
<td>Hexagon Socket Head Cap Screw M5 (length: 8 mm) Conical Spring Washer 2H-5</td>
<td>2 each</td>
<td>Tightening Torque 6.0 N•m</td>
</tr>
<tr>
<td>⑲</td>
<td>GT-SA Bolt M6 (length: 15 mm)</td>
<td>2</td>
<td>Tightening Torque 10 N•m</td>
</tr>
<tr>
<td>⑳</td>
<td>Joint KQL10-00</td>
<td>1</td>
<td>Delivered with the wire harness in manipulator HW1470730-A</td>
</tr>
<tr>
<td>㉑</td>
<td>Wire Harness in Manipulator HW1171418-A</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Fig. 1-1: Setting Up/Removing Procedures of Air Hose for Handling

1. Handling Air Hose Set-Up & Removal
2. Air Hose for Handling Setting-Up/Removing Procedures
3. 167776-1CD
4. HW1482460
5. 11/12
6. 11/12
MOTOMAN-MH12 OPTIONS INSTRUCTIONS

FOR OPTIONAL CABLE SETTING UP/REMOVING PROCEDURES

HEAD OFFICE
2-1 Kurosakishiroishi, Yahatanishi-ku, Kitakyushu 806-0004, Japan
Phone  +81-93-645-7745      Fax  +81-93-645-7746

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

YASKAWA Nordic AB
Box 504 Verkadsgatan 2, PO Box 504 SE-385 25 Torsås, Sweden
Phone  +46-480-417-800      Fax  +46-480-414-10

YASKAWA Europe GmbH  Robotics Div.
Yaskawastrasse 1, 85391 Allershausen, Germany
Phone  +49-8166-80-0      Fax  +49-8166-80-103

YASKAWA Electric Korea Co., Ltd
9F, KYOBO Securities Bldg., 26-4, Yeoido-Dong Yeoungueungpo-ku, Seoul, Korea
Phone  +82-2-784-7844      Fax  +82-2-784-8495

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 Rachadaphisek Road,
Huaykwang Bangkok, 10320, Thailand
Phone  +66-2-693-2200      Fax  +66-2-693-4200

YASKAWA Shougang Robot Co., Ltd.
1015. Boxuen Rd. Maluzhen, Jiading District, Shanghai, China
Phone  +86-21-5950-3521      Fax  +86-21-3878-0651

YASKAWA ELECTRIC CHINA Co., Ltd.
12F Carlton Building, No. 21-42 Huanghe Road, Shanghai 200003, China
Phone  +86-21-5385-2200      Fax  +86-21-5385-3299

YASKAWA Robotics India Ltd.
#425, Udoyog Vihar, Phase- IV, Gurgaon, Haryana, India
Phone  +91-124-475-8500      Fax  +91-124-475-8542

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