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

MOTOPOS INSTRUCTIONS

MOTOPOS-S250B POSITIONER INSTRUCTIONS
NX100 INSTRUCTIONS
NX100 OPERATOR'S MANUAL (for each purpose)
NX100 MAINTENANCE MANUAL

DX100 INSTRUCTIONS
DX100 OPERATOR'S MANUAL (for each purpose)
DX100 MAINTENANCE MANUAL

DX200 INSTRUCTIONS
DX200 OPERATOR'S MANUAL (for each purpose)
DX200 MAINTENANCE MANUAL

The operator’s manuals above correspond to specific usage. Make sure to use the appropriate manual.

Part Number: 170743-1CD
Revision: 0
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1 Introduction

MANDATORY

• This maintenance manual is intended to explain maintenance procedures primarily for the MOTOPOS.

• General items related to safety are listed in Chapter 1: Safety of the controller instructions. To ensure correct and safe operation, carefully read the controller 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 and maintenance 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.

NOTE

MOTOPOS-S250B is applicable for the Controller.

The description of "controller" refers to the "NX100", "DX100", or "DX200" in this manual unless otherwise specified.
Notes for Safe Operation

Read this manual carefully before installation, operation, maintenance, or inspection of the controller.

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.

**NOTE**
To ensure safe and efficient operation at all times, be sure to follow all instructions, even if not designated as "CAUTION" and "WARNING".
1 Introduction

• Before operating the positioner, check that servo power is turned OFF pressing the emergency stop buttons on the front door of the controller 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 positioner during an emergency. The positioner 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 positioner. Then turn the servo power ON.

Injury may result from unintentional or unexpected positioner motion.

*Figure 2: Release of Emergency Stop*

• Observe the following precautions when performing teaching operations within the P-point maximum envelope of the positioner:
  – View the positioner from the front whenever possible.
  – Always follow the predetermined operating procedure.
  – Keep in mind the emergency response measures against the positioner’s unexpected motion toward you.
  – Ensure that you have a safe place to retreat in case of emergency.

Improper or unintended positioner operation may result in injury.

• Confirm that no person is present in the P-point maximum envelope of the positioner and that you are in a safe location before:
  – Turning ON the power for the controller.
  – Moving the positioner 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 positioner 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 controller and the programming pendant.
Definition of Terms Used Often in This Manual

The MOTOPOS is the positioner for the YASKAWA industrial robot.

The MOTOPOS usually consists of MOTOPOS positioner unit, the controller, the controller programming pendant and the power cables.

In this manual, the equipment is defined as follows:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Definition in this Manual</th>
</tr>
</thead>
<tbody>
<tr>
<td>NX100, DX100, or DX200 Controller</td>
<td>Controller</td>
</tr>
<tr>
<td>NX100, DX100, or DX200 Programming Pendant</td>
<td>Programming Pendant</td>
</tr>
<tr>
<td>Cable between the MOTOPOS positioner and the</td>
<td>Power Cable</td>
</tr>
<tr>
<td>controller</td>
<td></td>
</tr>
</tbody>
</table>
Explanation of Warning Labels

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

Fig. 1-1: Warning Label Locations
2 Notes for Maintenance

2.1 Battery Pack Connection

The connectors (crimped contact-pin) for the battery backup are installed at the end point of the motor (BAT and OBT are marked). Connect the battery pack according to the following procedures.

1. Remove the caps attached to the battery backup connectors of the motor.
2. Connect the battery pack (HW8471030-A) with the battery backup connectors. (Under this condition, remove the encoder connector and carry out the maintenance checks.)
3. After the maintenance check, confirm that all the connectors are connected, then remove the battery pack and install the caps attached to the battery backup connectors of the motor.

Fig. 2-1: Encoder Connector Diagram

Be sure to connect the battery pack to the battery backup connector before removing the encoder connector.

Removing the encoder connector without connecting the battery back leads to disappearance of the encoder absolute data.

Do not disconnect the battery pack in the connector base.

Refer to the Fig. 2-1 “Encoder Connector Diagram” for the battery pack connection.
3 Home Position Return

3.1 Home Position Return after Motor Replacement

3.1.1 Home Position Return by Setting Teaching Point for Home Position Setting before Motor Replacement

The Controller holds the position data of the job program (hereinafter called JOB) as the pulse number from the home position of each axis. Thus, by adjusting the home position precisely, the JOB used before motor replacement can be used after the replacement without correction. This section explains how to set the Controller.

3.1.1.1 Preparation before Motor Replacement

Before motor replacement, create a standard position (hereinafter called the check-point) for home position adjustment after the replacement. The check-point must satisfy the conditions below. Furthermore, create the JOB so that the manipulator safely moves to the check-point from the standby position. (The JOB created in this manner will be hereinafter called the check-JOB.)

1. The position should not be deviated by turning the power ON or OFF, or lowering air pressure.

2. Use pointed jigs to create the position so that the deviation is easily found.
   Keep a distance as long as possible from the rotational center of the replacing axis.

• The check-point cannot be created unless each axis operates. Thus, the check-point cannot be created if the axis does not move because of failure. Therefore, it is recommended to create the check-point for each axis under normal operating conditions.

Perform calibration and set the MOTOPOS position in one of the following cases:

• The combination of the MOTOPOS and the control unit is changed.
• The motor or absolute encoder is replaced.
• Stored memory is cleared.
• The home position is deviated by hitting the MOTOPOS against a workpiece, etc.
• The main parts of the speed reducer, etc. are replaced or disassembled and reassembled.

When performing calibration, be sure to satisfy the following conditions:

• No external force is applied to the MOTOPOS.
3 Home Position Return
3.1 Home Position Return after Motor Replacement

Next, check the home position of the axis whose motor will be replaced. Refer to the position screen, and move the axis to the 0-pulse position, the home position. Then, check the position of the home position mark (as shown in the figure below). If it is deviated, adjust it.

*Fig. 3-1: Home Position Mark (Home Position)*

- **Home Position Adjustment**
  
  After motor replacement, move the axis to the position of the home position mark. Perform the home position calibration only to the axis whose motor was replaced.

  *(For more information, refer to “CONTROLLER INSTRUCTIONS”)*

  Move the axis to the check-point by the check-JOB. (Be careful when moving the axis so that the manipulator does not interfere with jigs.) Move only the axis whose motor was replaced to correct the deviation from the check-point created before calibration.

  Display the position screen (COMMAND POSITION).

  Determine the deviation amount (the difference between the current value and the command value), and then move the replaced axis to the pulse position equivalent to the deviation amount using the position screen.

  At this position, perform the home position calibration only for the axis whose motor was replaced.

  *(For more information, refer to “CONTROLLER INSTRUCTIONS”)*

  Move the axis again to the check-point by the check-JOB. Check if the axis is at the check-point created before the operation. (If it is deviated, repeat the adjustment procedures.)

  Perform an operation check by using the JOB used before motor replacement. If no problem is found, write down the modified home position data (ABSO data) and the date in the label on the inside of the Controller.
4 Grease Replenishment/Exchange

4.1 Rotation Axis Speed Reducer

Fig. 4-1: Rotation Axis Speed Reducer Diagram

4.1.1 Grease Replenishment

(Refer to Fig. 4-1 “Rotation Axis Speed Reducer Diagram”.)

1. Remove the plug from the grease exhaust port To.

   **NOTE**

   If grease is added with the plug on, the grease will go inside the motor and may damage it. Never fail to remove the plug before the grease injection.

2. Inject grease into the grease inlet Ti.
   - Grease type: VIGO Grease RE No.0
   - Amount of grease: approx. 500 cc
   - Air supply pressure of grease pump: 0.3 MPa or less
   - Grease injection rate: 8 g/s or less

3. Move the rotary axis for a few minutes to discharge the excess grease from the grease exhaust port To.

4. Wipe the grease exhaust port To with a cloth and reinstall the plug. Tighten the plug with a tightening torque of 5 N•m (0.5 kgf•m) (Apply the ThreeBond 1206C to the thread part of the plug.)
4.1.2 Grease Exchange

(Refer to Fig. 4-1 “Rotation Axis Speed Reducer Diagram”.)

1. Remove the plug from the grease exhaust port To.

2. Inject grease into the grease inlet Ti.
   - Grease type: VIGO Grease RE No.0
   - Amount of grease: approx. 1250cc
   - Air supply pressure of grease pump: 0.3 MPa or less
   - Grease injection rate: 8 g/s or less

3. The grease replacement is completed when new grease appears in the grease exhaust port To. The new grease can be distinguished from the old grease by color.

4. Move the rotary axis for a few minutes to discharge the excess grease from the grease exhaust port To.

5. Wipe the grease exhaust port To with a cloth and reinstall the plug.
   Tighten the plug with a tightening torque of 5 N•m (0.5 kgf•m)
   (Apply the ThreeBond 1206C to the thread part of the plug.)

If grease is added with the plug on, the grease will go inside the motor and may damage it.
Never fail to remove the plug before the grease injection.
5  Disassembly/Reassembly of the Motor

5.1  Disassembly and Reassembly of Rotary Motor

Refer to Fig. 5-1 “Disassembly & Reassembly of the Rotation Axis Motor”.

- When replacing a motor, the backup battery does not need to be connected.
- Remove old sealing bond on each part completely before reassembly.

Disassembly
1. Turn OFF the MOTOPOS controller power supply.
2. Unscrew the cross head APS bolts and remove the cover.
3. Connect the backup battery.
   (Refer to Chapter 2 “Notes for Maintenance”.)
4. Remove the MS connector (signal, power) from the rotation axis motor.
5. Unscrew the hexagon socket head cap screws, and then remove the rotation axis motor from the frame.
6. Remove the hexagon socket head cap screw, then remove the washer, the gear, the key, and the washer from the rotation axis motor.

Reassembly
1. Mount the washer, the key, the gear and the washer to the rotation axis motor.
   Apply Loctite 242 to the thread part of the hexagon socket head cap screw, and then tighten them with the tightening torque shown in Table 5-1 “Rotary Motor Parts Checklist”.
2. Apply ThreeBond 1206C to the contact surface between the frame and the rotation axis motor and then mount the rotation axis motor to the frame.
   Apply ThreeBond 1206C to the thread part of the hexagon socket head cap screws, and then tighten them with the tightening torque shown in Table 5-1.
3. Mount the MS connector (signal, power) to the rotation axis motor.
4. Replenish grease (VIGO Grease RE No.0).
   (Refer to Chapter 4 “Grease Replenishment/Exchange”.)
5. Disconnect the backup battery.
6. Mount the cover with the cross head APS bolts.
7. Turn ON the MOTOPOS controller power supply.

• When replacing a motor, the backup battery does not need to be connected.
• Remove old sealing bond on each part completely before reassembly.
5 Disassembly/Reassembly of the Motor
5.1 Disassembly and Reassembly of Rotary Motor

**Table 5-1: Rotary Motor Parts Checklist**

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Qty</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cross head APS bolt M6 (length: 20 mm) washer M6</td>
<td>5 each</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Cover HS9302807-1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Rotation axis motor SGMRS-06A2B-YR11</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Hexagon socket head cap screw M8 (length: 25 mm) Conical spring washer 2H-8</td>
<td>4 each</td>
<td>Tightening Torque 24.5 N•m</td>
</tr>
<tr>
<td>5</td>
<td>Hexagon socket head cap screw M4 (length: 20 mm) Conical spring washer 2H-4</td>
<td>1 each</td>
<td>Tightening Torque 4.8 N•m</td>
</tr>
<tr>
<td>6</td>
<td>Washer HS9405311-1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Gear HS9405312-1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Key (delivered with the motor)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Collar HS0400899-1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Fig. 5-1: Disassembly & Reassembly of the Rotation Axis Motor**
6 Disassembly/Reassembly of Speed Reducer

6.1 Disassembly and Reassembly of the RV Speed Reducer

- Refer to Fig. 6-1 “Disassembly & Reassembly of the RV Speed Reducer (-A00, -A10)” and Fig. 6-2 “Disassembly & Reassembly of the RV Speed Reducer (-B00)”.
- Since -A10 is equipped with the overrun LS, perform disassembly and reassembly of the overrun LS parts. (Perform steps 1-1 and 1-2 of “Disassembly/Reassembly of -A10 Overrun LS Parts”)
- For -B00, refer to Chapter 7 "Rotary Joint Replacement (-B00 type only)" to perform disassembly and reassembly of the rotary joint. (Additionally perform the steps 2-1 and 2-2 "Reassembly" of the “Disassembly/Reassembly of the Parts for -B00”)

Disassembly/Reassembly of -A10 Overrun LS Parts

1-1 Disassembly

1. Unscrew the hexagon socket head cap screws, and then remove the dogs from the holder.
2. Unscrew the low head hexagon socket head cap screws, and remove the holder from the shaft.

1-2 Reassembly

1. Mount the holder to the shaft with the low head hexagon socket head cap screws.
2. Mount the dog using the hexagon socket head cap screws with the tightening torque shown in Table 6-1 “RV-Axis Speed Reducer Parts Checklist”.

Disassembly/Reassembly of the Parts for -B00

2-1 Disassembly

1. Unscrew the cross head APS bolts, and then remove the plate from the table.
2. Remove the air hose from the movable side air connector.
3. Unscrew the hexagon socket head cap screws and remove the flange from the shaft.
Disassembly

1. Turn OFF the MOTOPOS controller power supply.
2. Unscrew the hexagon socket head cap screws, and then remove the table from the RV speed reducer.
3. Unscrew the cross head APS bolts, and then remove the cover from the frame.
4. Unscrew the hexagon socket head cap screws and remove the shaft from the RV speed reducer. When removing the shaft, be careful not to damage the oil sealing in the frame. Remove the O-ring from the shaft.
5. Unscrew the hexagon socket head cap screws, remove the RV speed reducer from its frame by using the tapped hole M10, and then remove the O-ring from the RV speed reducer.

Reassembly

1. Mount the O-ring to the RV speed reducer, and then mount the RV speed reducer to the frame using the hexagon socket head cap screws with the tightening torque shown in Table 6-1 "RV-Axis Speed Reducer Parts Checklist".
2. Mount the O-ring to the shaft, and then mount the shaft to the RV speed reducer using the hexagon socket head cap screws with the tightening torque shown in Table 6-1. When mounting the shaft, be careful not to damage the oil sealing in the frame.
3. Mount the cover to the frame with the cross head APS bolts.
4. Mount the RV speed reducer to the table using the hexagon socket head cap screws with tightening torque shown in Table 6-1.
5. Replenish grease (VIGO Grease RE No.0) from the grease inlet.
6. Turn ON the MOTOPOS controller power supply.
### 6.1 Disassembly and Reassembly of the RV Speed Reducer

#### Table 6-1: RV-Axis Speed Reducer Parts Checklist

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Qty</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hexagon socket head cap screw M12 (length: 35 mm) GT washer GT-LH12</td>
<td>9 each</td>
<td>Tightening Torque 142 N•m</td>
</tr>
<tr>
<td>2</td>
<td>Table HS1300104-1 (For -A00, -A10) Table HS1300106-1 (For -B00)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>RV Speed reducer HS9381751-A</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Cross head APS bolt M4 (length: 10 mm) Flat washer M4</td>
<td>6 each</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Cover HS0300693-A</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Hexagon socket head cap screw M6 (length: 12 mm) Conical spring washer 2H-6</td>
<td>6 each</td>
<td>Tightening Torque 10.0 N•m</td>
</tr>
<tr>
<td>7</td>
<td>Shaft HS9302803-1 (For -A00) Shaft HS0300232-1 (For -B00)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>O-ring C00546A</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Hexagon socket head cap screw M10 (length: 90 mm) Conical spring washer 2H-10</td>
<td>14 each</td>
<td>Tightening Torque 82.0 N•m</td>
</tr>
<tr>
<td>10</td>
<td>O-ring AS(ARP)568-173</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Hexagon socket head cap screw M3 (length: 20 mm) Conical spring washer 2H-3</td>
<td>2 each</td>
<td>Tightening Torque 1.40 N•m</td>
</tr>
<tr>
<td>12</td>
<td>Dog HS0400928-1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Holder HS0400929-1, -2</td>
<td>1 each</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Low head hexagon socket head cap screw CBS 5-20</td>
<td>2</td>
<td>MISUMI Corporation</td>
</tr>
<tr>
<td>15</td>
<td>Cross head APS bolt M6 (length: 15 mm) Washer M6</td>
<td>3 each</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Plate HS0400885-1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Air hose TUS1208B</td>
<td>2</td>
<td>SMC Corporation</td>
</tr>
<tr>
<td>18</td>
<td>Hexagon socket head cap screw M4 (length: 20 mm) Conical spring washer 2H-4</td>
<td>4 each</td>
<td>Tightening Torque 2.80 N•m</td>
</tr>
<tr>
<td>19</td>
<td>Flange</td>
<td>1</td>
<td>Accessories for the rotary joint</td>
</tr>
</tbody>
</table>
6 Disassembly/Reassembly of Speed Reducer
6.1 Disassembly and Reassembly of the RV Speed Reducer

Fig. 6-1: Disassembly & Reassembly of the RV Speed Reducer (-A00, -A10)

Fig. 6-2: Disassembly & Reassembly of the RV Speed Reducer (-B00)
7 Rotary Joint Replacement (-B00 type only)

7.1 Rotary Joint Replacement

Refer to Fig. 7-1 “Rotary Joint Replacement (-B00”).

- **Removal**
  1. Turn OFF the MOTOPOS controller power supply.
  2. Unscrew the cross head APS bolts, and then remove the cover.
  3. Unscrew the hexagon socket head cap screws, and then remove the bracket.
  4. Disconnect the fixed side air tube from the elbow connector attached to the rotary joint.
  5. Remove the crimped contact-pin of the fixed side internal wire harness.
  6. Unscrew the hexagon socket head cap screws, and then remove the rotary joint from the flange. At this time, since the hexagon socket head cap screws are not visible, rotate the rotary joint using the rotation stopper pin, and then remove the hexagon socket head cap screws.
  7. Remove the crimped contact-pin of the movable side internal wire harness at the base of the rotary joint side, and then remove the rotary joint.

- **Mounting**
  1. Attach the crimped contact-pin of the movable side internal wire harness at the base of the rotary joint side.
  2. Attach the rotary joint to the flange using the hexagon socket head cap screws with the tightening torque shown in Table 7-1 “Rotary Joint Parts Checklist (-B00)”. At this time, since the drilled holes are not visible, rotate the rotary joint using the rotation stopper pin, and then screw the hexagon socket head cap screws.
  3. Attach the fixed side air tube to the elbow connector attached to the rotary joint.
  4. Attach the crimped contact-pin of the fixed side internal wire harness.
  5. Align the positions of the bracket and the rotation stopper pin attached to rotary joint, and then tighten the hexagon socket head cap screws with the tightening torque shown in Table 7-1.
  6. Attach the cover, and then tighten the cross head APS bolts.
  7. Turn ON the MOTOPOS controller.
7 Rotary Joint Replacement (-B00 type only)
7.1 Rotary Joint Replacement

Table 7-1: Rotary Joint Parts Checklist (-B00)

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Qty</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cross head APS bolt M6 (length: 20 mm) Washer M6</td>
<td>5 each</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Cover HS9302807-1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Hexagon socket head cap screw M6 (length: 15 mm) Conical spring washer 2H-6</td>
<td>2 each</td>
<td>Tightening Torque 10.0 N•m</td>
</tr>
<tr>
<td>4</td>
<td>Bracket HS0400488-1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Rotary joint HS0382490-A</td>
<td>1</td>
<td>BL AUTOTEC, LTD.</td>
</tr>
<tr>
<td>6</td>
<td>Air tube at fixed side TU1208B</td>
<td>2</td>
<td>SMC Corporation</td>
</tr>
<tr>
<td>7</td>
<td>Internal wire harness at fixed side</td>
<td>1</td>
<td>Accessories for the rotary joint</td>
</tr>
<tr>
<td>8</td>
<td>Hexagon socket head cap screw M4 (length: 15 mm) Conical spring washer 2H-4</td>
<td>4 each</td>
<td>Tightening Torque 2.80 N•m</td>
</tr>
<tr>
<td>9</td>
<td>Flange</td>
<td>1</td>
<td>Accessories for the rotary joint</td>
</tr>
<tr>
<td>10</td>
<td>Internal wire harness at movable side</td>
<td>1</td>
<td>Accessories for the rotary joint</td>
</tr>
</tbody>
</table>

Fig. 7-1: Rotary Joint Replacement (-B00)
8 Battery Pack Replacement

The battery pack is installed in the position shown in Fig. 8-1 “Battery Pack Location”. If the battery alarm occurs in the Controller system, replace the battery in accordance with the following procedures:

Fig. 8-1: Battery Pack Location

![Battery Pack Location Diagram]

Fig. 8-2: Battery Pack Connection

![Battery Pack Connection Diagram]

- **Internal wires**
- **New battery pack**
- **Battery pack before replacement**

a: Crimped contact-pin (pin)
b: Crimped contact-pin (socket)
1. Turn OFF the power supply of the Controller.
2. Remove the cover on the tilting frame part, then pull the battery pack out to replace it with the new one.
3. Unscrew the battery pack fixing screws.
4. Remove the plastic tape (insulation tape) protecting the battery pack connecting part in the MOTOPOS.
5. Connect the new battery pack.
6. Remove the old battery pack.

**NOTE** Remove the old battery pack after connecting the new one so that the encoder absolute data does not disappear.

7. Protect the battery pack connecting part remaining in the MOTOPOS with the plastic tape (insulation tape).
8. Mount the battery pack with the screws and cover to complete the operation.

**NOTE** Do not allow the plate to pinch the cables when reinstalling the plate.
9 Grounding Unit Replacement

9.1 Grounding Unit Replacement Procedure

Refer to Fig. 9-1 “Grounding Unit Replacement” when replacing the grounding unit.

- Removal
  1. Turn OFF the power supply of the MOTOPOS.
  2. Unscrew the cross head APS bolts and remove the cover from the side of the table. Wipe off the residue on the back side of the table or on the collector ring (it is mounted between the grounding unit and the table) if any.
  3. Unscrew the cross head APS bolts, and then remove the side cover.
  4. Unscrew the hexagon head bolt and disconnect the negative cable from the grounding unit.
  5. Unscrew the hexagon socket head cap screws and pull out the grounding unit. (The grounding unit is mounted by pressing against the mounting place using the spring structure. For this reason, be careful to the spring mechanism tension when removing.)

- Attachment
  1. Insert the grounding unit till its mounting position, and then tighten it with the hexagon socket head cap screws with the tightening torque shown in Table 9-1 “Grounding Unit Parts Checklist”. (The grounding unit is mounted by pressing against the mounting place using the spring structure. For this reason, be careful to the spring mechanism tension when removing.)
  2. Connect the negative cable to the grounding unit with the hexagon head bolt.
  3. Mount the side cover with the cross head APS bolts.
  4. Mount the cover on the side of the table with the cross head APS bolts.
  5. Turn ON the power supply of the MOTOPOS.
9 Grounding Unit Replacement
9.1 Grounding Unit Replacement Procedure

Table 9-1: Grounding Unit Parts Checklist

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Qty</th>
<th>Remark</th>
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<tr>
<td>1</td>
<td>Cross head APS bolt M5 (length: 10 mm) Flat washer M5</td>
<td>6 each</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Cover HS9302891-1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Cross head APS bolt M5 (length: 8 mm) Flat washer M5</td>
<td>6 each</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Cover HS9302889-A, HS9302889-C</td>
<td>1 each</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Hexagon head bolt M10 (length:20 mm) Nut M10 Washer M10 Spring washer M10</td>
<td>1 each</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Negative cable HS9471557-H0.3M</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Hexagon socket head cap screw M6 (length:25 mm) Conical spring washer 2H-6</td>
<td>2 each</td>
<td>Tightening Torque 10.0 N•m</td>
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<td>8</td>
<td>Grounding unit HS9381750-A</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Collector ring HS1300105-1</td>
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Fig. 9-1: Grounding Unit Replacement
## Revision History

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