MOTOPOS-S500B POSITIONER INSTRUCTIONS

TYPE: YR-MPS500B-A00
   YR-MPS500B-A10 (ANSI SPECIFICATION)
   YR-MPS500B-A11 (CE SPECIFICATION)
   YR-MPS500B-A21, -A30 (COMPACT SIZE SPECIFICATION)
   YR-MPS500B-B00 (WITH ROTARY JOINT)
   YR-MPS500B-B02 (FOR CC-LINK SPECIFICATION, WITH ROTARY JOINT)

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

MOTOPOS INSTRUCTIONS

MOTOPOS-S500B 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. Be sure to use the appropriate manual.

Part Number: 174609-1CD
Revision: 0
• This instruction manual is intended to explain operating instructions and maintenance procedures primarily for the MOTOPOS.

• General items related to safety are listed in the Section 1: Safety of the NX100, DX100, or DX200 instructions. To ensure correct and safe operation, carefully read the instructions before reading this manual.

• 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.

MOTOPOS-S500B is applicable to “NX100”, “DX100”, and “DX200”. The description of “NX100” refers to all of “NX100”, “DX100”, and “DX200” in this manual unless otherwise specified.
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

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 MOTOPOS and the NX100.

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”.

---
Notes for Safe Operation

**WARNING**

- Before operating the MOTOPOS, check that servo power is turned OFF when the emergency stop buttons on the front door of the NX100 and 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 MOTOPOS during an emergency. The MOTOPOS should not be used if the emergency stop buttons do not function.

  ![](Emergency Stop Button)

- Once the emergency stop button is released, clear the cell of all items which could interfere with the operation of the MOTOPOS. Then turn the servo power ON.

  Injury may result from unintentional or unexpected MOTOPOS motion.

  ![](Release of Emergency Stop)

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

  Improper or unintended MOTOPOS operation may result in injury.

  ![](Emergency Stop Button)

- Confirm that no persons are present in the work envelope of the MOTOPOS and that you are in a safe location before:
  - Turning ON the NX100 power.
  - Operating the MOTOPOS with the programming pendant.
  - Running check operations.
  - Performing automatic operations.

  Injury may result if anyone enters the working envelope of the MOTOPOS 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 NX100 and programming pendant.
The MOTOPOS is the positioner for the YASKAWA industrial robot. The MOTOPOS usually consists of MOTOPOS positioner unit, a controller unit, a programming pendant, and 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 Controller Unit</td>
<td>NX100</td>
</tr>
<tr>
<td>DX100 Controller Unit</td>
<td></td>
</tr>
<tr>
<td>DX200 Controller Unit</td>
<td></td>
</tr>
<tr>
<td>NX100 Programming Pendant</td>
<td>Programming Pendant</td>
</tr>
<tr>
<td>DX100 Programming Pendant</td>
<td></td>
</tr>
<tr>
<td>DX200 Programming Pendant</td>
<td></td>
</tr>
<tr>
<td>MOTOPOS to NX100 Cable</td>
<td>Power Cable</td>
</tr>
<tr>
<td>MOTOPOS to DX100 Cable</td>
<td></td>
</tr>
<tr>
<td>MOTOPOS to DX200 Cable</td>
<td></td>
</tr>
</tbody>
</table>

**CAUTION**

- Perform the following inspection procedures prior to conducting MOTOPOS teaching. If problems are found, repair them immediately, and be sure that all other necessary processing has been performed.
- Check for problems in MOTOPOS operation.
- Check for damages on insulation and sheathing of power cables.

- Always return the programming pendant to the hook on the NX100 cabinet after use. The programming pendant can be damaged if it is left in work area of the MOTOPOS, on the floor, or near fixtures.

- Read and understand the Explanation of the Warning Labels in the NX100 instructions before operating the MOTOPOS.
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.
Explanation of Warning Labels

Nameplate:

WARNING label A: WARNING label B:

WARNING
Moving parts may cause injury

WARNING
Do not enter robot work area.
Customer Support Information

If you need assistance with any aspect of your S500B Positioner system, please contact Motoman Customer Support at the following 24-hour telephone number:

(937) 847-3200

For routine technical inquiries, you can also contact Motoman Customer Support at the following e-mail address:

techsupport@motoman.com

When using e-mail to contact Motoman 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 have the following information ready before you call Customer Support:

- **System**: S500B Positioner
- **Robots**: ___________________________
- **Primary Application**: ___________________________
- **Controller**: NX100, DX100, or 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 NX100, DX100, or DX200 controller data plate

**NOTE**: 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 Motoman Customer Support at the telephone number shown above.
Table of Contents

1 Receiving
   1.1 Contents Confirmation ..................................... 1-1
   1.2 Checking the Order Number ................................. 1-2

2 Transportation
   2.1 Transporting Method ....................................... 2-1
   2.1.1 Using a Crane ............................................ 2-1

3 Installation
   3.1 Installation of the Safeguarding ........................... 3-2
   3.2 Mounting Procedures for MOTOPOS Baseplate ........ 3-2
      3.2.1 In case of Installing the MOTOPOS and
              Manipulator on a Common Baseplate .................. 3-3
      3.2.2 In Case of Mounting the MOTOPOS on the Floor .... 3-4
   3.3 Location .................................................... 3-6

4 Wiring
   4.1 Grounding .................................................... 4-2
   4.2 Cable Connection ........................................... 4-3
      4.2.1 Connection to the MOTOPOS ......................... 4-3
      4.2.2 Connection to the NX100 ............................. 4-3
      4.2.3 Connection to the DX100/DX200 .................... 4-3

5 Basic Specifications
   5.1 Basic Specifications List .................................. 5-1
   5.2 Part Names and Working Axes .............................. 5-2
   5.3 Baseplate Dimensions ..................................... 5-3
   5.4 Dimensions and Working Envelope ....................... 5-4
Table of Contents

6 Load Specifications and Jig Mounting Section
   6.1 Allowable Load ........................................... 6-1
   6.2 Details of Jig Mounting Face  ......................... 6-2

7 System Application
   7.1 Internal User I/O Wiring Harness and Air Line ...... 7-1
   7.2 Minus Cable for Welding  ............................. 7-3
   7.3 Negative Side Voltage Detection Cable ............... 7-4

8 Electrical Equipment Specification
   8.1 Overrun Limit Switch (Optional) ..................... 8-1
   8.2 Internal Connections  ................................. 8-1

9 Maintenance and Inspection
   9.1 Inspection Interval  ..................................... 9-1
   9.2 Notes on Maintenance Procedures .................... 9-6
      9.2.1 Battery Pack Replacement ......................... 9-6
      9.2.2 Grease Replenishment/Exchange for Speed Reducer .... 9-8
         ▪ Grease Replenishment  ............................ 9-9
         ▪ Grease Exchange  ................................ 9-10

10 Recommended Spare Parts
1 Receiving

1.1 Contents Confirmation

Confirm the contents of the delivery when the product arrives. Standard delivery includes the following six items (information for the content of optional goods is given separately):

- Manipulator
- NX100
- Programming pendant
- Cable between the NX100 and the manipulator (2 cables or 3 cables)
- MOTOPOS
- Cable between the MOTOPOS and the NX100 (2 cables)

**CAUTION**

*Confirm that the MOTOPOS and the NX100 have the same order number. Special care must be taken when more than one units of MOTOPOS are to be installed.*

If the numbers do not match, MOTOPOS may not perform as expected and cause injury or damage.
1.2 Checking the Order Number

Check that the order number of the MOTOPOS corresponds to the NX100. The order number is located on a label as shown below.

![Image of Label with Order Number Labels]

**Fig. 1-1 Location of Order Number Labels**
2 Transportation

2.1 Transporting Method

CAUTION

* Sling applications and crane or fork lift operations must be performed by authorized personnel only.

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

* Avoid excessive vibration or shock during transportation.

The system consists of precision components. Failure to observe this caution may adversely affect the performance.

2.1.1 Using a Crane

As a rule, when unpacking the MOTOPOS and moving it, a crane should be used. The MOTOPOS should be lifted using wire rope threaded through attached eyebolts.

Figure 2-2 (a) Transporting Position (YR-MPS500B-A00, -A10, -A11, -B00, -B02)
2 Transportation

2.1 Transporting Method
3 Installation

### WARNING

- Install the safeguarding.
  Failure to observe this warning may result in injury or damage.
- Install the MOTOPOS in a location where the MOTOPOS with a jig does not hit against anything such as the wall or the safeguarding.
  Failure to observe this warning may result in injury or damage.
- Do not start operating the MOTOPOS or turn ON the power before it is firmly anchored.
  The MOTOPOS may overturn and cause injury or damage.

### CAUTION

- Do not install or operate a MOTOPOS which is damaged or lacks parts.
  Failure to observe this caution may cause injury or damage.
3.1 Installation of the Safeguarding

To insure safety, be sure to install safeguarding. It prevents unforeseen accidents with personnel and damage to equipment. The following is quoted for your information and guidance.

**Responsibility for Safeguarding (ISO10218)**

The user of a manipulator or robot system shall ensure that safeguards are provided and used in accordance with Sections 6, 7, and 8 of this standard. The means and degree of safeguarding, including any redundancies, shall correspond directly to the type and level of hazard presented by the robot system consistent with the robot application. Safeguarding may include but not be limited to safeguarding devices, barriers, interlock barriers, perimeter guarding, awareness barriers, and awareness signals.

### 3.2 Mounting Procedures for MOTOPOS Baseplate

The MOTOPOS should be firmly mounted on a baseplate or foundation strong enough to support the MOTOPOS and withstand repulsion forces in acceleration and deceleration.

Construct a solid foundation with the appropriate thickness to withstand maximum repulsion forces of the MOTOPOS. The flatness for installation must be kept at 0.5 mm or less: if the flatness of the mounting face is insufficient, the shape of the MOTOPOS may deform and its functional ability may be compromised. Mount the baseplate either as shown in section 3.2.1 “In case of Installing the MOTOPOS and Manipulator on a Common Baseplate” or section 3.2.2 “In Case of Mounting the MOTOPOS on the Floor”.

<table>
<thead>
<tr>
<th>Table 3-1 Maximum repulsion forces of the MOTOPOS</th>
</tr>
</thead>
</table>
| Rotating maximum torque | 1960 N•m  
(200 kgf•m) |
| Moment by overhang payload | 2450 N•m  
(250 kgf•m) |
3.2.1 In case of Installing the MOTOPOS and Manipulator on a Common Baseplate

The baseplate should be rugged and durable to ensure that the MOTOPOS and the manipulator are in the correct relative position. Thickness of the baseplate and the size of the mounting anchor bolts should meet the recommendations in the manual for the manipulator to be combined. Mount the MOTOPOS base securely with four hexagon head screws M16 (recommended length: 55 mm). Tighten the screws and anchor bolts securely so that they will not work loose during the operation.

![Diagram showing mounting procedure](image-url)
3 Installation

3.2 Mounting Procedures for MOTOPOS Baseplate

3.2.2 In Case of Mounting the MOTOPOS on the Floor

The floor should be strong enough to support the MOTOPOS. Construct a solid foundation with the appropriate thickness to withstand maximum repulsion forces of the MOTOPOS as shown in Table 3-1 "Maximum repulsion forces of the MOTOPOS". When there is a concrete floor thickness of 200 mm or more, a baseplate (MOTOPOS baseplate thickness of 28 mm or more) can be fixed directly to the floor with anchor bolts M20. Before mounting the MOTOPOS on the floor, check the flatness, cracks, etc. of the floor. If there are any cracks and the like on the floor, they should be repaired before installation. Any thickness less than 200 mm is insufficient for mounting, even if the floor is concrete.

Fig. 3-4 (a) Fixing the MOTOPOS on the Floor (YR-MPS500B-A00, -A10, -A11, -B00, -B02)
3.2 Mounting Procedures for MOTOPOS Baseplate

Concrete floor

Drilled hole: 24 dia. (4 holes)
Tapped hole M16 (4 holes)

Bolts and baseplate should be prepared by user.

Units: mm

Fig. 3-4 (b) Fixing the MOTOPOS on the Floor (YR-MPS500B-A30)
3.3 Location

When the MOTOPOS is installed, it is necessary to satisfy the undermentioned environmental conditions:

- Ambient Temperature: 0° to +45°C
- Humidity: 20 to 80%RH (at constant temperature)
- Free from dust, soot, or water
- Free from corrosive gas or liquid, or explosive gas
- Free from excessive vibration (Vibration acceleration: 4.9 m/s² [0.5 G] or less)
- Free from large electrical noise (plasma)
- Flatness for installation: 0.5 mm or less
4 Wiring

**WARNING**

- Ground resistance must be 100 Ω or less.
  
  Failure to observe this warning may result in fire or electric shock.

- Before wiring, make sure to turn OFF the primary power supply, and put up a warning sign. (ex. DO NOT TURN ON THE POWER.)

  Failure to observe this warning may result in fire or electric shock.

**CAUTION**

- Wiring must be performed by authorized or certified personnel.
  
  Failure to observe this caution may result in fire or electric shock.
4 Wiring
4.1 Grounding

4.1 Grounding

Follow the local regulations and electrical installation standards for grounding. The recommended grounding wire size is 5.5 mm² or more.

**NOTE**

- Never use this line sharing with other ground lines or grounding electrodes for other electric power, motor power, welding devices, etc.
- Where metal ducts, metallic conduits, or distributing racks are used for cable laying, ground in accordance with Electric Equipment Technical Standards.

---

**Bolt M8 (for grounding) (Delivered with MOTOPOS)**

View A

**Fig. 4-5 Grounding Method**
4.2 Cable Connection

There are two cables for the power supply; a power cable (1BC) and an encoder cable for detection (2BC). Connect the MOTOPOS base connectors and the NX100 using both cables. Refer to Fig. (a) to (d) "Connection between the MOTOPOS and the NX100".

4.2.1 Connection to the MOTOPOS

Before connecting the cables to the MOTOPOS, check the numbers on both cables and the MOTOPOS base connectors. Connect each cable adjusting the cable connector positions to the main key positions of the MOTOPOS, and then tighten the nut until it clicks.

4.2.2 Connection to the NX100

Remove the cover of the lower side on the NX100 side. Pass the power cable (1BC) and the encoder cable (2BC) through the opening for the cables, and then fasten bolts on the opening. Connect the power cable (1BC) to the relay connector (CNEX\PW and CNEXBRK). Check the numbers on both the cable and the relay connectors before connection. Connect the encoder cable (2BC) to the relay connector (CNEX\SG and CNEX IT). Check the numbers on both the cable and the relay connector before connection.

4.2.3 Connection to the DX100/DX200

Before connecting the cables to the DX100, check the numbers on both cables and the DX100 base connectors in the order of EX-X2 then EX-X1. Connect each cable adjusting the cable connector positions to the main key positions of the DX100 and then tighten the nut until it clicks.
4  Wiring
4.2  Cable Connection

Fig. 4-6 (a) Connection of the MOTOPOS and the NX100

Connection to the MOTOPOS

Connection to the NX100

Power cable

Encoder cable
4.2 Cable Connection

Fig. 4-6 (b) Connection of the MOTOPOS and the DX100

Fig. 4-6 (c) Connection of the MOTOPOS and the NX100
4 Wiring
4.2 Cable Connection

Fig. 4-6 (d)  Connection of the MOTOPOS and the NX100
Fig.4-6 (e) Connection of the MOTOPOS and the NX100
## 5 Basic Specifications

### 5.1 Basic Specifications List

<table>
<thead>
<tr>
<th>Item</th>
<th>YR-MPS500B- -A00</th>
<th>YR-MPS500B- -A10, -A11</th>
<th>YR-MPS500B- -A21, -A30</th>
<th>YR-MPS500B- B00</th>
<th>YR-MPS500B- B02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of Freedom</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payload</td>
<td>500 kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repetitive Positioning</td>
<td>±0.1 mm (R250 mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.1 mm (R250 mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motion Range</td>
<td>±370°</td>
<td>±170°</td>
<td>±360°</td>
<td>±370° (endless*)</td>
<td>±370° (endless*)</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>2.18 rad/s (125°/s)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allowable Moment of Inertia</td>
<td>509.6 N•m (52 kgf•m)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allowable Overhang Amount</td>
<td>340 mm from table surface</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allowable Inertia (GD^2/4)</td>
<td>35 kg•m^2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment Specifications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signal</td>
<td>None^2</td>
<td>0.5 mm² × 6 wires</td>
<td>3 wires (For CC-link communication cable)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air</td>
<td>None^2</td>
<td>3/8 &quot; × 2 lines</td>
<td>3/8 &quot; × 2 lines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approximate Mass</td>
<td>150 kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient Conditions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>0 to 45 °C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>20% to 80% RH (non-condensing)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration</td>
<td>4.9 m/s² (0.5 G) or less</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>Clean and dry.</td>
<td></td>
<td>Free from corrosive gasses or liquids, or explosive gasses.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Capacity</td>
<td>1 kVA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*^1 SI units are used in this table. However, gravitational unit is used in ().  
^2 Conforms to ISO9283.  
^3 The rotary axis endless function is optional.  
^4 Refer to section 6.1 “Allowable Load” for details on the permissible moment of inertia.  
^5 Use hollow shaft hole (55 mm dia).
5.2 Part Names and Working Axes

Fig. 5-7 (a) Part Names and Working Axes (YR-MPS500B-A00, -A10, -A11, -B00, -B02)

Fig. 5-7 (b) Part Names and Working Axes (YR-MPS500B-A21, -A30)
5.3  Baseplate Dimensions

Fig. 5-8 (a)  Baseplate Dimensions (YR-MPS500B-A00, -A10, -A11, -B00, -B02)

Fig. 5-8 (b)  Baseplate Dimensions (YR-MPS500B-A30)

View A

View B
5.4 Dimensions and Working Envelope

*1 For MPS500B-A00 and -A00, the working envelope is 370°.
For MPS500B-A10 and -A11, the working envelope is 170°.
*2 For MPS500B-A00 and -A00, the working envelope is 370°.
For MPS500B-A10 and -A11, the working envelope is 170°.

Fig. 5-9 (a) Dimensions and Working Envelope (YR-MPS500B-A00, -A10, -A11, -B00, -B02)
5 Basic Specifications
5.4 Dimensions and Working Envelope

Fig. 5-9 (b) Dimensions and Working Envelope (YR-MPS500B-A30)

*1 For MPS500B-A21 and -A30, the working envelope is 360°.
*2 For MPS500B-A21 and -A30, the working envelope is 360°.

Units: mm
6 Load Specifications and Jig Mounting Section

6.1 Allowable Load

This section describes the allowable values and various limitations. The payload of the MOTOPOS is 500 kg. The moment and moment of inertia are limited as shown in "Table 6  Moment and Total Inertia".

Table 6  Moment and Total Inertia

<table>
<thead>
<tr>
<th>Axis Name</th>
<th>Moment N•m (kgf•m) ¹</th>
<th>GD²/4 Total Inertia kg•m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotary Axis</td>
<td>509.6 (52)</td>
<td>35</td>
</tr>
</tbody>
</table>

¹ (): Gravitational unit

When the volume load is relatively small, refer to the moment rating shown in "Fig. 6-10  Moment Rating ".

The allowable total inertia is calculated when the moment is at the maximum. Contact your Yaskawa representative when only inertia moment, or load moment is small while inertia moment is large. Also, when the load is combined as a force but a mass, contact your Yaskawa representative. For allowable overhang payload, refer to "Fig. 6-10  Moment Rating ". If overhang payload exceeds maximum value or jig length is long even if it is within allowable value, use the method of holding both ends using tailstock.

![Fig. 6-10  Moment Rating](image-url)
6.2 Details of Jig Mounting Face

The jig mounting dimensions are shown in Fig. 6-11 (a) "Details of Jig Mounting Face (YR-MPS500B-A00,-A10,-A11,-B00,-B02)", Fig. 6-11 (b) "Details of Jig Mounting Face (YR-MPS500B-A21)", Fig. 6-11 (c) "Details of Jig Mounting Face (YR-MPS500B-A30)". It is recommended that the table and the jig be mounted using an inside dowel and dowel pin, or two dowel pins. The dowel pins are to be prepared by customers.

![Fig. 6-11 (a) Details of Jig Mounting Face (YR-MPS500B-A00,-A10,-A11,-B00,-B02)](image1)

![Fig. 6-11 (b) Details of Jig Mounting Face (YR-MPS500B-A21)](image2)
Wash OFF anti-corrosive paint (solid color) on the jig mounting surface with thinner or light oil before mounting the tools.
# System Application

## 7.1 Internal User I/O Wiring Harness and Air Line

For type MPS500B-B, internal user I/O wires and air lines are built into the MOTOPOS for user application as shown in Fig. 7-12 "Internal User I/O Wiring Harness and Air Lines (For Type MPS500B-B).

**YR-MPS500B-B00**: Internal user I/O wiring harness (0.5 mm² × 6 wires)
- Air hose (inner diameter: 6 mm × 2 lines)

**YR-MPS500B-B02**: Internal user I/O wiring harness (0.5 mm² × 3 wires)
- For CC-link communication cable (AWG20 × 3 wires)
- For power cable (0.75 mm² × 2 wires)
- Air hose (inner diameter: 8 mm × 2 lines)

Connector pins are assigned as shown in Fig. 12. Wiring must be performed by user.

- The allowable current for internal user I/O wiring harness: 2 A or less for each wire
- The maximum pressure for the air line: 490 kPa (5 kgf/cm²) or less

For types MPS500B-A00, -A10, and -A11, signal cable for jig and air line are to be equipped by user. Use hollow shaft hole (55 mm diameter).

![Fig. 7-12 Internal User I/O Wiring Harness and Air Lines (For Type MPS500B-B)](image-url)
The internal wiring harness and the air lines on the table side are designed to be pulled out from the center part.

Provide a hole for pullout on the jig base plate. Otherwise, spatters may go inside the MOTOPOS resulting in a failure.

Refer to an mounting example in Fig. 7-13 "Pullout Section of Internal Wiring Harness and Air Line".

**Table 7-1 List of Connector Types**

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Connector Type</th>
<th>Applicable Pin No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>YR-MPS500B-B00</td>
<td>Base Connector for Internal Wiring Harness</td>
<td>MS3102A-18-1P (Mating connector MS3106B-18-1S: Optional)</td>
<td>1 to 6</td>
</tr>
<tr>
<td></td>
<td>Table Connector for Internal Wiring Harness</td>
<td>Crimped contact-pin (pin) (Mating connector PC2005-F: Optional)</td>
<td>1 to 6</td>
</tr>
<tr>
<td>YR-MPS500B-B02</td>
<td>Base Connector for CC-Link</td>
<td>MS3102A-16S-1P (Mating connector MS3106B-16S-1S: Optional)</td>
<td>5 to 9</td>
</tr>
<tr>
<td></td>
<td>Table Connector for CC-Link</td>
<td>Crimped contact-pin (pin) (Mating connector PC2005-F: Optional)</td>
<td>5 to 9</td>
</tr>
<tr>
<td></td>
<td>Base Connector for Internal Wiring Harness</td>
<td>MS3102A-14S-5P (Mating connector MS3106B-14S-5S: Optional)</td>
<td>1 to 4</td>
</tr>
<tr>
<td></td>
<td>Table Connector for Internal Wiring Harness</td>
<td>Crimped contact-pin (pin) (Mating connector PC2005-F: Optional)</td>
<td>1 to 4</td>
</tr>
</tbody>
</table>

Be sure to provide a cover for the internal user I/O wiring harness and air line pullout section on the table side. Otherwise, spatters may go inside the MOTOPOS resulting in a failure.
7.2 Minus Cable for Welding

Minus cable for welding is equipped inside the MOTOPOS.

(In case of YR-MPS500B-A21,-A30, the minus cable inside the MOTOPOS is not equipped. The minus cable prepared by the customer should connect direct to the earth brush.)

- Allowable current for minus cable: 300 A

The minus cable on the table side is connected directly to the table. It is connected to the jig base plate through the table, requiring no minus cable on the jig side. However, to connect the cable to any place near the welded part, connect the minus cable to the jig base plate as shown in Fig. 7-14 (a) "Minus Cable Connection (YR-MPS500B-A00,-A10,-A11,-B00,-B02)".

Fig. 7-14 (b) "Minus Cable Connection (YR-MPS500B-A21,-A30)".

---

**Fig. 7-14 (a) Minus Cable Connection (YR-MPS500B-A00,-A10,-A11,-B00,-B02)**

**Fig. 7-14 (b) Minus Cable Connection (YR-MPS500B-A21,-A30)**
7.3 Negative Side Voltage Detection Cable

Connect the negative side voltage detection cable of the welding machine to the M8 tap described in Fig. 7-15 "Connection Part of Negative Side Voltage Detection Cable".
8 Electrical Equipment Specification

8.1 Overrun Limit Switch (Optional)

An overrun limit switch can be mounted on type MPS500B-A00. An overrun limit switch is already mounted on types MPS500B-A10 and -A11 as a standard specification. For the location, refer to Fig. 8-16 "Location of Limit Switch".

![Overrun limit switch](image)

Fig. 8-16 Location of Limit Switch

8.2 Internal Connections

High reliability connectors which can be easily put on and removed are used in each connector part.
Fig. 8-17 (a) Internal Connection Diagram (YR-MPS500B-A00,-A10,-A11)
Fig.8-17 (b) Internal Connection Diagram (YR-MPS500B-B00)
Fig. 8-17 (c) Internal Connection Diagram (YR-MPS500B-B02)
Fig.8-17 (d)  Internal Connection Diagram (YR-MPS500B-A30)
9 Maintenance and Inspection

9.1 Inspection Interval

Proper inspections are essential not only to assure that the mechanism will be able to function for a long period, but also to prevent malfunctions and assure safe operation. Inspection intervals are classified into six levels as shown in Table 9-2 "Inspection Items". Conduct periodical inspections according to the inspection schedule in Table 9-2 "Inspection Items".

In Table 9-2 "Inspection Items", the inspection items are categorized by 3 types of operations: operations which can be performed by personnel authorized by the user, operations which can be performed by personnel being trained, and operations which can be performed by service company personnel. Only specified personnel are to do inspection work.

WARNING

• Before maintenance or inspection, be sure to turn OFF the main power supply, and put up a warning sign. (ex. DO NOT TURN ON THE POWER.) Failure to observe this warning may result in electric shock or injury.

CAUTION

• Maintenance and inspection must be performed by specified personnel. Failure to observe this caution may result in electric shock or injury.

• For disassembly or repair, contact your Yaskawa representative.

• Do not remove the motor or release the brake. Failure to observe this caution may result in injury from unexpected turning of the table.

NOTE

• The inspection interval depends on the total servo operation time.

• For axes which are used very frequently other than arc welding, it is recommended that inspections be conducted at shorter intervals. Contact your Yaskawa representative.
## 9.1 Inspection Interval

### Table 9-2  Inspection Items

<table>
<thead>
<tr>
<th>Items</th>
<th>Inspection Interval</th>
<th>Method</th>
<th>Operation</th>
<th>Inspection Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daily</td>
<td>1000H Cycle</td>
<td>6000H Cycle</td>
<td>12000H Cycle</td>
</tr>
<tr>
<td>1 Alignment mark</td>
<td>○</td>
<td>Visual</td>
<td>Check alignment mark accuracy and damage at the home position.</td>
<td>○</td>
</tr>
<tr>
<td>2 External lead</td>
<td>○</td>
<td>Visual</td>
<td>Check for damage and deterioration of leads.</td>
<td>○</td>
</tr>
<tr>
<td>3 Working area and whole exterior of MOTOPOS</td>
<td>○</td>
<td>Visual</td>
<td>Clean the work area if dust or spatter is present. Check for damage and outside cracks.</td>
<td>○</td>
</tr>
<tr>
<td>4 Motor</td>
<td>○</td>
<td>Visual</td>
<td>Check for grease leakage.</td>
<td>○</td>
</tr>
<tr>
<td>5 Earth brush</td>
<td>○</td>
<td>Air blow</td>
<td>Check for damage, deterioration and wear of brushes. Remove wear powder or spatter.</td>
<td>○</td>
</tr>
<tr>
<td>6 Baseplate mounting bolts</td>
<td>○</td>
<td>Spanner Wrench</td>
<td>Tighten loose bolts. Replace if necessary.</td>
<td>○</td>
</tr>
<tr>
<td>7 Cover mounting screws</td>
<td>○</td>
<td>Screwdriver, Wrench</td>
<td>Tighten loose bolts. Replace if necessary.</td>
<td>○</td>
</tr>
<tr>
<td>8 Connectors</td>
<td>○</td>
<td>Manual</td>
<td>Check for loose connectors and tighten if necessary.</td>
<td>○</td>
</tr>
<tr>
<td>9 Air line</td>
<td>○</td>
<td>Auditory</td>
<td>Check for air leak.</td>
<td>○</td>
</tr>
<tr>
<td>10 Rotary joint (Only for type B00)</td>
<td>○</td>
<td>Visual, auditory</td>
<td>Check for damages on rotary locking parts, spatter engagement and air leakage. (Replace if a fault is found.)</td>
<td>○</td>
</tr>
<tr>
<td>11 Wire harness in MOTOPOS</td>
<td>○</td>
<td>Multimeter</td>
<td>Check for conductivity between the main connector of base and end connector with manually shaking the wire. Check for wear of protective spring.</td>
<td>○</td>
</tr>
<tr>
<td>12 Battery pack in MOTOPOS</td>
<td>○</td>
<td>Replace the battery pack when the battery alarm occurs or the MOTOPOS drove for 36000H.</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>13 Speed reducer</td>
<td>○</td>
<td>Grease Gun</td>
<td>Check for malfunction. (Replace if necessary) Supply grease (6000H cycle). See Par. 9-2.2 Replace grease (12000H cycle). See Par. 9-2.2</td>
<td>○</td>
</tr>
<tr>
<td>14 Overhaul</td>
<td>○</td>
<td></td>
<td></td>
<td>○</td>
</tr>
</tbody>
</table>

*3 Items 1-13 are those that are critical for MOTOPOS. If the MOTOPOS is used in a harsh environment, inspection frequency may be increased.

*4 Specifications differ by model. Please refer to the model manual for more information.

*5 Specifications differ by model. Please refer to the model manual for more information.

*6 Specifications differ by model. Please refer to the model manual for more information.
9 Maintenance and Inspection

9.1 Inspection Interval

1. When checking for conduction with multimeter, remove connectors on detector side for each axis from the motor.

2. For the grease, refer to Table 9-3 "Inspection Parts and Grease Used".

3. Inspection No. correspond to the numbers in Fig. 9-18 (a), Fig. 9-18 (c), Fig. 9-18 (d).

4. A grease leakage indicates the possibility that grease has seeped into the motor, which can cause a motor breakdown. Contact your Yaskawa representative.

5. When a surface contact is not secured because of flaws or adhesion of foreign substances or when wearing over a predetermined amount, the earth brush may be damaged.

- When a surface contact is secured, the dimension indicated in Fig. 9-18 (b) "Check for the Wear of Earth Brush" is the standard for the replacement.

![Fig. 9-18 (a) Inspection Parts and Inspection Numbers (YR-MPS500B-A00,-A10,-A11,-B00,-B02)](image)

![Fig. 9-18 (b) Check for the Wear of Earth Brush](image)

<table>
<thead>
<tr>
<th>No.</th>
<th>Grease Used</th>
<th>Inspected Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>VIGO grease RE No.0</td>
<td>Speed reducers</td>
</tr>
</tbody>
</table>

The numbers in the above table correspond to the numbers in Table 9-2 "Inspection Items".
Refer to Table 9-3 "Inspection Parts and Grease Used" for grease. The numbers in the above table correspond to the numbers in Table 9-2 "Inspection Items".
9 Maintenance and Inspection
9.1 Inspection Interval

Fig.9-18 (d) Inspection Parts and Inspection Numbers (YR-MPS500B-A30)

Refer to Table 9-3 "Inspection Parts and Grease Used" for grease.
The numbers in the above table correspond to the numbers in Table 9-2 "Inspection Items".
9.2 Notes on Maintenance Procedures

9.2.1 Battery Pack Replacement

The battery pack is mounted in the location indicated in Fig. 9-19 (a) "Battery Location (YR-MPS500B-A00,-A10,-A11,-B00,-B02)". Fig. 9-19 (b) "Battery Location (YR-MPS500B-A30)".

If a battery alarm occurs in the NX100, replace the battery according to the following procedure:

![Battery Pack Replacement Diagram]

Fig. 9-19 (a) Battery Location (YR-MPS500B-A00,-A10,-A11,-B00,-B02)

Fig. 9-19 (b) Battery Location (YR-MPS500B-A30)
9.2 Notes on Maintenance Procedures

1. Turn OFF the NX100 main power supply.
2. -Remove the cover of the tilting frame section and pull out the battery pack to replace.
   -Remove the cover of the terminal box and pull out the battery pack to replace.
3. Remove the battery pack mounting screw.
4. -Remove the plastic tape (insulation tape) protecting the connection part of the battery pack in the MOTOPOS.
   -Remove the plastic tape (insulation tape) protecting the connection part of the battery pack in the terminal box.
5. Connect the new battery.
6. Remove the old battery.

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

7. -Protect the connection part of the battery pack in the MOTOPOS with plastic tape (insulation tape).
   -Protect the connection part of the battery pack in the terminal with plastic tape (insulation tape).
8. Mount the battery pack with the screws, and then reinstall the cover to complete the replacement.

   **NOTE**
   Be sure not to pinch cables in reinstalling the cover of the frame section.
9.2.2 Grease Replenishment/Exchange for Speed Reducer

To Grease exhaust port
(Hexagon socket head plug PT1/8)

Ti: Grease inlet
(Grease zerk A-PT1/8)

Out of Yaskawa scope

Fig. 9-21 (a) Speed Reducer Diagram (YR-MPS500B-A00,-A10,-A11,-B00,-B02)

To Grease exhaust port
(Hexagon socket head plug PT1/8)

Ti: Grease inlet
(Grease zerk A-PT3/8)

Out of Yaskawa scope

Fig.9-21 (b) Speed Reducer Diagram (YR-MPS500B-A21)
9 Maintenance and Inspection

9.2 Notes on Maintenance Procedures

- **Grease Replenishment**
  
  (Refer to Fig. 9-21 (a), Fig. 9-21 (b).)

  1. Remove the plug from To grease exhaust port.

  **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 the grease into the Ti grease inlet using a grease gun.

     - Grease type: VIGO Grease RE No.0
     - Amount of grease: approx. 500cc
     - 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.

  4. Wipe the To grease exhaust port with a cloth and reinstall the plug. (Apply the Modifier silicon Caulk on the thread part of the plug.)
9.2 Notes on Maintenance Procedures

Grease Exchange
(Refer to Fig. 9-21 (a), Fig. 9-21 (b).)

1. Remove the plug from To grease exhaust port.

   **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 the grease into the Ti grease inlet using a grease gun.
   - 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 To grease exhaust port. 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.

5. Wipe the To grease exhaust port with a cloth and reinstall the plug. (Apply the Modifier silicon Caulk on the thread part of the plug.)
10 Recommended Spare Parts

It is recommended to keep the parts and components in the following table in stock as spare parts for the MOTOPOS. Product performance cannot be guaranteed when using spare parts from any company other than Yaskawa. The spare parts are ranked as follows:

- Rank A: Expendable and frequently replaced parts
- Rank B: Parts for which replacement may be necessary as a result of frequent operation
- Rank C: Drive Unit

To replace parts in Rank B or Rank C, contact your Yaskawa representative.

Table 10-4  Spare Parts for the MOTOPOS

<table>
<thead>
<tr>
<th>Rank</th>
<th>Parts No.</th>
<th>Name</th>
<th>Type</th>
<th>Manufacturer</th>
<th>Qty per Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>Grease</td>
<td>VIGO grease RE No.0</td>
<td>Yaskawa</td>
<td>16kg</td>
<td>For all axes speed reducers</td>
</tr>
<tr>
<td>A</td>
<td>2</td>
<td>Silicon Rubber</td>
<td>Compound Tube modifier</td>
<td>Konishi Co., Ltd.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>3</td>
<td>Battery Pack</td>
<td>HW8471030-A</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>Brush Unit</td>
<td>HS9381750-A</td>
<td>Yaskawa</td>
<td>1</td>
<td>For YR-MPS500B-A00, -A10, -A11, -B00, -B02.</td>
</tr>
<tr>
<td>B</td>
<td>5</td>
<td>Bearing</td>
<td>6816</td>
<td>Nippon Seiko K.K.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>6</td>
<td>Rotary Axis Speed Reducer</td>
<td>HS9381751-A</td>
<td>Yaskawa</td>
<td>1</td>
<td>For YR-MPS500B-A00, -A10, -A11, -B00, -B02.</td>
</tr>
<tr>
<td>B</td>
<td>7</td>
<td>Rotary Joint</td>
<td>HS0381083-A</td>
<td>Yaskawa</td>
<td>1</td>
<td>For YR-MPS500B-B00</td>
</tr>
<tr>
<td>B</td>
<td>8</td>
<td>AC Servomotor</td>
<td>SGMRS-12A2B-YR11</td>
<td>Yaskawa</td>
<td>1</td>
<td>For YR-MPS500B-A00, -A10, -A11, -B00, -B02.</td>
</tr>
</tbody>
</table>

NOTE
To replace parts in Rank B or Rank C, contact your Yaskawa representative.
## Table 10-4  Spare Parts for the MOTOPOS

<table>
<thead>
<tr>
<th>Rank</th>
<th>Parts No.</th>
<th>Name</th>
<th>Type</th>
<th>Manufacturer</th>
<th>Qty</th>
<th>Qty per Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>9</td>
<td>Input Gear</td>
<td>HS0405005-1</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
<td>For YR-MPS500B-A00, A10, A11, B00, B02,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>HS0401235-1</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
<td>For YR-MPS500B-A21, A30,</td>
</tr>
<tr>
<td>C</td>
<td>10</td>
<td>Wire Harness in MOTOPOS</td>
<td>HS0370664-A</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
<td>For YR-MPS500B-A00, A10, A11, A00, B00,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>HS0370667-A</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
<td>For YR-MPS500B-A00, A10, A11, A00, B00,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>HS0371109-A</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
<td>For YR-MPS500B-A00, A10, A11, A00, B00,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>HS1370189-A</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
<td>For YR-MPS500B-A00, A10, A11, A00, B00,</td>
</tr>
<tr>
<td>C</td>
<td>11</td>
<td>Servo amplifier</td>
<td>SGDR-SDB350A01B</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
<td>For NX100</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SRDA-SDA14A01A-E</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
<td>For DX100/200</td>
</tr>
</tbody>
</table>
MOTOPOS-S500B POSITIONER INSTRUCTIONS

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, 85381 Aulershauen, Germany
Phone +49-8166-90-100  Fax +49-8166-90-103

YASKAWA Nordic AB
Bredbandet 1 v.v. 3 vanvholmen 392 30 Kalmar, Sweden
Phone +46-480-417-800  Fax +46-480-417-999

YASKAWA Electric (China) Co., Ltd.
22/F One Corporate Avenue No.222, Hubin Road, Huangpu District, Shanghai 200021, China
Phone +86-21-5385-2220  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 Pvt. Ltd. (Robotics Division)
#42E, Udyog Vihar, Phase- IV, Gurgaon, Haryana, India
Phone +91-124-475-8500  Fax +91-124-475-8542

YASKAWA Electric Korea Co., Ltd
9F, Kyobo Securities Bldg., 26-4, Yeoulido-dong, Yeongdeungpo-gu, Seoul 150-737, Korea
Phone +82-2-784-7844  Fax +82-2-784-8495

YASKAWA Electric Taiwan Corporation
12F, No.207, Sec. 3, Baishin 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 566741
Phone +65-6282-3003  Fax +65-6289-3003

YASKAWA Electric (Thailand) Co., Ltd.
252/25-126 27th Floor, Tower B Muang Thai-Phra Complex Building, Rachadapisek Road, Huaykwang, Bangkok 10320, Thailand
Phone +66-2693-2200  Fax +66-2693-4200

PT. YASKAWA Electric Indonesia
Secure Building-Gedung B Lantai Dasar & Lantai 1 Jl. Raya Protokol Halim Perdanakusuma,
Jakarta 13510, Indonesia
Phone +62-21-2982-6470  Fax +62-21-2982-6741

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

MANUAL NO. 59 of 59
HS0481293