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

**MOTOMAN INSTRUCTIONS**
- MOTOMAN-MFS2200D-3600 INSTRUCTIONS
- MOTOMAN-MFS2500D-4000 INSTRUCTIONS
- DX100 INSTRUCTIONS
- DX100 OPERATOR'S MANUAL
- DX100 MAINTENANCE MANUAL

The DX100 operator's manuals above correspond to specific usage. Be sure to use the appropriate manual.
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1 Introduction

This manual is a supplementary instruction for DX100 FPD handling use of S-mark specification (MFS2200D-3600, MFS2500D-4000). This supplementary instruction manual describes the differences from the DX100 Instructions. For the instructions other than the differences, refer to the DX100 Instructions.
2 Specification

2.1 Connection

2.1.1 Primary Power Source Connection

For the sizes of power supply cables and corresponding breakers, refer to Table 2-1.

Table 2-1: DX100 Power Source Capacity, Cable Size and Breaker Capacity

<table>
<thead>
<tr>
<th>Manipulator</th>
<th>Power capacity (kVA)</th>
<th>Cable size (size of terminal) (In case of four-core cabtyre cable) (mm²)</th>
<th>Capacity of breaker in DX100 (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFS2200D-3600</td>
<td>12</td>
<td>8 (M6)</td>
<td>60</td>
</tr>
<tr>
<td>MFS2500D-4000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Although the power capacity differs depending on the work conditions, the maximum load value (payload, operation speed, and frequency, etc.) are taken into account to the values in the above table.

Inquire at the nearest branch office listed on the back cover for information when selecting the transformer.

The power capacity shown above is the continuous rating value.

When the robot is rapidly accelerated, the power capacity of several times the continuous rating value may be needed instantly.
2.2 Type of the Controller

This supplementary manual describes the following types of controllers. The controller types differ depending on the specification of the manipulator, etc.

<table>
<thead>
<tr>
<th>Controller Type (ERDR-)</th>
<th>MFS050D-S00</th>
<th>MFS060D-S00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manipulator</td>
<td>MFS2200D-3600</td>
<td>MFS2500D-4000</td>
</tr>
<tr>
<td>Dimension</td>
<td>850(W) X 900(H) X 550(D) mm</td>
<td></td>
</tr>
<tr>
<td>Mass.</td>
<td>200 kg</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>0 to 25°C (during operation) -10 to 60°C (during transportation and maintenance)</td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>3-phase, 200 VAC (+10% to -15%) at 50/60 Hz (±2%), 220 VAC (+10% to -15%) at 60 Hz (±2%)</td>
<td></td>
</tr>
<tr>
<td>Grounding</td>
<td>Ground resistance (100Ω or less) Exclusive grounding Cable specifications: AWG6 (10mm²) or more Maximum leakage current: 110mA</td>
<td></td>
</tr>
<tr>
<td>Power capacity</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Switch capacity</td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>

**WARNING**

- The system must be grounded. Failure to ground equipment may result in injury from fire or electric shock.

2.3 Dimensional Drawing

Refer to the following drawing numbers for each controller specification.

Vertical (long) type controller: HB1280545
3 Equipment Configuration

This section explains the internal layout and configuration of the DX100 equipment.

3.1 Arrangement of Units and Circuit Boards

![Diagram of equipment layout]

**Table 3-1: Recommended Spare Parts**

<table>
<thead>
<tr>
<th>Type Model</th>
<th>DX100 (ERDR-)</th>
<th>SERVOPACK</th>
<th>Converter</th>
<th>Breaker</th>
<th>Power Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFS2200D-3600</td>
<td>MFS050D-S00</td>
<td>MFS060D-S00</td>
<td>SRDA-COA30A01A-E</td>
<td>NF63-CV 3P 60A</td>
<td>JZRCR-YPU22-1</td>
</tr>
<tr>
<td>MFS2500D-4000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 The SERVOPACK for the external-axis controls the U1-axis motor.
3.2 Cooling System of the Controller Interior

- The upper side of the backside duct draws in air and expels it from the bottom side of the controller or the backside duct to cool the SERVOPACK.
- Make sure that the door of the DX100 is closed to keep this cooling system effective.
### 3.3 Brake Delay Unit

The brake delay unit is for controlling the external brake which is equipped to U1-, U2-, and U3-axis.

- The operation indicator turns ON when the SERVO is ON.
- The molded-case circuit breaker for the brake power supply protection detects the ground fault and the short circuit of the brake line.
- The state of the molded-case circuit breaker is normally ON, and it turns OFF when it detects the ground fault or the short circuit.

If any alarms like “BRAKE POWER ERROR” occur, check if the brake output line is not under the condition of the ground fault nor the short circuit.
It is recommended that the following parts and components be kept in stock as spare parts for the DX100. The spare parts list for the DX100 is shown below. Product performance cannot be guaranteed when using spare parts from any company other than Yaskawa. To buy the spare parts which are ranked B or C, inform the manufacturing number (or order number) of DX100 to Yaskawa representative. 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

**NOTE**

For replacing parts in Rank B or Rank C, contact your Yaskawa representative.
### 4.1 Recommended Spare Parts List per Controller Type

Refer to the recommended spare parts list.

**Table 4-1: Recommended Spare Parts List for Type ERDR-MFS050D-S00, ERDR-MFS060D-S00**

<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>Battery</td>
<td>ER6VC3N 3.6V</td>
<td>TOSHIBA BATTERY CO., LTD.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>2</td>
<td>YPS Unit Cooling Fan</td>
<td>JZNC-YZU01-E</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>3</td>
<td>Interior Circulation Fan</td>
<td>4715MS-22T-B50-B00</td>
<td>Minebea Co., Ltd</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>A</td>
<td>4</td>
<td>Backside Duct Fan</td>
<td>4715MS-22T-B50-B00</td>
<td>Minebea Co., Ltd</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>A</td>
<td>5</td>
<td>Brake Fuse for AC Cooling Fan</td>
<td>GP25 2.5A 250V</td>
<td>Daito Communication Apparatus Co., Ltd.</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>A</td>
<td>6</td>
<td>24VDC Fuse for I/O</td>
<td>02173.15P 3.15A 250V</td>
<td>Littelfuse, Inc.</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>A</td>
<td>7</td>
<td>PG Power Supply Fuse</td>
<td>HM10 1.0A 250V</td>
<td>Daito Communication Apparatus Co., Ltd.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>8</td>
<td>Converter</td>
<td>SRDA-COA30A01A-E</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>9</td>
<td>Servo Amplifier 1, 2, 3</td>
<td>SRDA-SDA71A01A-E</td>
<td>Yaskawa</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>B</td>
<td>10</td>
<td>Servo Amplifier 4</td>
<td>SRDA-SDA35A01A-E</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>11</td>
<td>Servo Amplifier 5, 6</td>
<td>SRDA-SDA21A01A-E</td>
<td>Yaskawa</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>12</td>
<td>SERVOPACK</td>
<td>SRDA-SDB95A01A-E</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>13</td>
<td>Basic Axis Control Circuit Board</td>
<td>SRDA-EAXA01A</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>14</td>
<td>External Axis Control Circuit Board</td>
<td>SRDA-EAXB01A</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>15</td>
<td>CPU Unit</td>
<td>JZNC-YRK01B-1E</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>16</td>
<td>Control Circuit Board</td>
<td>JANCD-YCP01B-E</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>17</td>
<td>Robot I/F Circuit Board</td>
<td>JANCD-YIF01-2E</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>18</td>
<td>Power Supply Contactor Unit</td>
<td>JZRCR-YP22-1</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>19</td>
<td>YPS Unit</td>
<td>JZNC-YP01-E</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>20</td>
<td>Brake Board</td>
<td>JANCD-YBK01-1E</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>21</td>
<td>Machine Safety Unit</td>
<td>JANC-YSU01-1E</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>22</td>
<td>I/O Unit</td>
<td>JZNC-YIU01-E</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>23</td>
<td>Brake Delay Unit</td>
<td>JZRCR-YBP01-1</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>24</td>
<td>Programming Pendant</td>
<td>JZRCR-YPP06-1</td>
<td>Yaskawa</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

1 The CPU unit (JZNC-YRK01B-1E) does not include the robot I/F circuit board (JANCD-YIF01-2E). Must be ordered separately if required.
DX100
INSTRUCTIONS SUPPLEMENT
FOR FPD HANDLING USE (S-MARK SPECIFICATION)
(MFS2200D-3600, MFS2500D-4000)

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, 85391 Allershausen, Germany
Phone   +49-8166-90-100   Fax   +49-8166-90-103

YASKAWA Nordic AB
Bredbandet 1 vån. 3 varvsholmen 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   +86-21-5385-2200   Fax   +86-21-5385-3299

YASKAWA SHOUGANG ROBOT Co. Ltd.
No7 Yongchang North Road, Beijing E&T Development Area, China 100176
Phone   +86-10-6799-2658   Fax   +86-10-6799-2678

YASKAWA India Private Ltd. (Robotics Division)
#426, 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, Yeouido-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, Beishin 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 556741
Phone   +65-6282-3003   Fax   +65-6289-3003

YASKAWA Electric (Thailand) Co., Ltd.
252/125-126 27th Floor, Tower B Muang Thai-Phatra Complex Building,
Rachadaphisek 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 13610, Indonesia
Phone   +62-21-2982-6470   Fax   +62-21-2982-6741

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for ongoing product modifications and improvements.