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

**MOTOMAN INSTRUCTIONS**

- MOTOMAN-□□□ INSTRUCTIONS
- DX200 INSTRUCTIONS
- DX200 OPERATOR’S MANUAL (for each purpose)
- DX200 MAINTENANCE MANUAL
- DX200 INSTRUCTIONS FOR EXPLOSION-PROOF SPECIFICATION

The DX200 operator’s manual above corresponds to specific usage. Be sure to use the appropriate manual.

**Part Number:** 178072-1CD  
**Revision:** 0
MANDATORY

• This instruction manual is intended to explain mainly on the mechanical part of the DX200 (MPO10) for the application to the actual operation and for proper maintenance and inspection. It describes on safety and handling, details on specifications, necessary items on maintenance and inspection, to explain operating instructions and maintenance procedures. Be sure to read and understand this instruction manual thoroughly before installing and operating the manipulator.

• 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.
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 DX200.

In this manual, the Notes for Safe Operation are classified as “DANGER”, “WARNING”, “CAUTION”, “MANDATORY”, or “PROHIBITED”.

- **DANGER**: Indicates an imminent hazardous situation which, if not avoided, could result in death or serious injury to personnel.

- **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 “DANGER”, “CAUTION” and “WARNING”.
DANGER

- 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, and do not release the brake. Failure to observe these safety precautions may result in death or serious injury from unexpected turning of the manipulator's arm.
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.

Fig. : Emergency Stop Button

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

Injury may result from unintentional or unexpected manipulator motion.

Fig. : Release of Emergency Stop

• Observe the following precautions when performing teaching operations within the P-point maximum envelope of the manipulator:
  – Be sure to use a lockout device to the safeguarding when going inside. Also, display the sign that the operation is being performed inside the safeguarding and make sure no one closes the safeguarding.
  – 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>Controller</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>

Description of the Operation Procedure

In the explanation of the operation procedure, the expression “Select • • •” means that the cursor is moved to the object item and the SELECT key is pressed, or that the item is directly selected by touching the screen.

Registered Trademark

In this manual, names of companies, corporations, or products are trademarks, registered trademarks, or bland names for each company or corporation. The indications of (R) and TM are omitted.
**Explanation of Warning Labels**

The following warning label is attached to the Painting unit.

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.

---

**WARNING**

- The following labels are attached to the Painting unit.

  Fully comply with the precautions on the warning labels.

  Failure to observe this warning may result in injury or damage to equipment.

---

![Identification Label Image]
Safeguarding Tips

All operators, programmers, maintenance personnel, supervisors, and anyone working near the system must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. General safeguarding tips are as follows:

• Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation of this equipment, the operator's manuals, the system equipment, and options and accessories should be permitted to operate this equipment.

• Improper connections can damage the equipment. All connections must be made within the standard voltage and current ratings of the equipment.

• The system must be placed in Emergency Stop (E-Stop) mode whenever it is not in use.

• In accordance with ANSI/RIA R15.06-2012, section 4.2.5, Sources of Energy, use lockout/tagout procedures during equipment maintenance. Refer also to Section 1910.147 (29CFR, Part 1910), Occupational Safety and Health Standards for General Industry (OSHA).

Mechanical Safety Devices

The safe operation of this equipment is ultimately the users responsibility. The conditions under which the equipment will be operated safely should be reviewed by the user. The user must be aware of the various national codes, ANSI/RIA R15.06-2012 safety standards, and other local codes that may pertain to the installation and use of this equipment.

Additional safety measures for personnel and equipment may be required depending on system installation, operation, and/or location. The following safety equipment is provided as standard:

• Safety barriers
• Door interlocks
• Emergency stop palm buttons located on operator station

Check all safety equipment frequently for proper operation. Repair or replace any non-functioning safety equipment immediately.
Programming, Operation, and Maintenance Safety

All operators, programmers, maintenance personnel, supervisors, and anyone working near the system must become familiar with the operation of this equipment. Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation, manuals, electrical design, and equipment interconnections of this equipment should be permitted to program, or maintain the system. All personnel involved with the operation of the equipment must understand potential dangers of operation.

- Inspect the equipment to be sure no potentially hazardous conditions exist. Be sure the area is clean and free of water, oil, debris, etc.
- Be sure that all safeguards are in place. Check all safety equipment for proper operation. Repair or replace any non-functioning safety equipment immediately.
- Check the E-Stop button on the operator station for proper operation before programming. The equipment must be placed in Emergency Stop (E-Stop) mode whenever it is not in use.
- Back up all programs and jobs onto suitable media before program changes are made. To avoid loss of information, programs, or jobs, a backup must always be made before any service procedures are done and before any changes are made to options, accessories, or equipment.
- Any modifications to the controller unit can cause severe personal injury or death, as well as damage to the robot! Do not make any modifications to the controller unit. Making any changes without the written permission from YASKAWA will void the warranty.
- Some operations require a standard passwords and some require special passwords.
- The equipment allows modifications of the software for maximum performance. Care must be taken when making these modifications. All modifications made to the software will change the way the equipment operates and can cause severe personal injury or death, as well as damage parts of the system. Double check all modifications under every mode of operation to ensure that the changes have not created hazards or dangerous situations.
- This equipment has multiple sources of electrical supply. Electrical interconnections are made between the controller and other equipment. Disconnect and lockout/tagout all electrical circuits before making any modifications or connections.
- Do not perform any maintenance procedures before reading and understanding the proper procedures in the appropriate manual.
- Use proper replacement parts.
- Improper connections can damage the equipment. All connections must be made within the standard voltage and current ratings of the equipment.
Maintenance Safety

Turn the power OFF and disconnect and lockout/tagout all electrical circuits before making any modifications or connections.

Perform only the maintenance described in this manual. Maintenance other than specified in this manual should be performed only by YASKAWA-trained, qualified personnel.

Summary of Warning Information

This manual is provided to help users establish safe conditions for operating the equipment. Specific considerations and precautions are also described in the manual, but appear in the form of Dangers, Warnings, Cautions, and Notes.

It is important that users operate the equipment in accordance with this instruction manual and any additional information which may be provided by YASKAWA. Address any questions regarding the safe and proper operation of the equipment to YASKAWA Customer Support.
Customer Support Information

If you need assistance with any aspect of your MPO10 (FM Specification) system, please contact YASKAWA Customer Support at the following 24-hour telephone number:

(937) 847-3200

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

techsupport@motoman.com

When using e-mail to contact YASKAWA 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 use e-mail for routine inquiries only. If you have an urgent or emergency need for service, replacement parts, or information, you must contact YASKAWA Customer Support at the telephone number shown above.

Please have the following information ready before you call Customer Support:

- System: MPO10 (FM Specification)
- Primary Application: ___________________________
- Controller: 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 DX200 controller data plate

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 YASKAWA Customer Support at the telephone number shown above.
## 1 Introduction

This manual is a supplementary instruction manual for the DX200 (MPO10).

For contents that are not described in this manual, refer to the “DX200 INSTRUCTIONS”, “DX200 MAINTENANCE MANUAL”, and all other related documents.

**NOTE** Before using this product, read this manual and all other documents carefully to ensure knowledge about the product and safety, including all the cautions.
2 Installation

2.1 Transport Method

<table>
<thead>
<tr>
<th></th>
<th>Approx. Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinated controller without transformer unit</td>
<td>300</td>
</tr>
<tr>
<td>Coordinated controller With transformer unit</td>
<td>450</td>
</tr>
</tbody>
</table>

**CAUTION**

- Sling applications and crane or forklift operations must be performed by authorized personnel only.
- Avoid excessive vibration or shock during transport.
- As a rule, the DX200 should be lifted by a crane or forklift. When transporting with casters, be sure to prevent the DX200 from falling over.

2.1.1 Using a Crane

When using a crane to lift and transport the DX200, check the following before lifting and transporting it:
- Confirm the weight of the DX200 before lifting, and use a wire rope strong enough to withstand the weight.
- Confirm that the eyebolts for transporting are securely fastened before lifting the DX200.
- Lift the DX200 using lifting support in case of Coordination type.

After checking the above, lift the DX200 by a crane.

<table>
<thead>
<tr>
<th>Approx. Mass of DX200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinated controller without transformer unit</td>
</tr>
<tr>
<td>Coordinated controller With transformer unit</td>
</tr>
</tbody>
</table>

Lifting support

Wire

45° min

M12 Eye bolt
2.1.2 Using a Forklift

Observe the following precautions when using a forklift to lift and transport the DX200:

· Confirm that the work area is safe and that the DX200 can be transported safely to the installation site.
· After checking the work area, warn people near the forklift route to clear the way and move to a safe area.
· Secure the DX200 so that it does not shift or fall during transport.
· Transport the DX200 at the lowest possible height.
· Avoid jarring, dropping, or hitting the DX200 during transport.
· When transporting the DX200, operate the forklift at a safe speed.
2.1.3 Remove the fixture

Four places are bound in fixture for transportation as prevention of damage in the DX200 inside. Remove the fixture after installed completion.
2.2 Place of Installation

The conditions listed below must be met before installing the DX200:

- Non-Hazardous area
- Ambient temperature must be 0 to 45°C (32 to 113°F) during operation and -10 to 60°C (14 to 140°F) during transportation and maintenance.
- Humidity must be low with no condensation (10~90%RH).
- It must be a place with little dirt, dust, or water.
- No flammable or corrosive liquids or gases, etc. in the area.
- Little jarring or potential for striking of the DX200 (under 0.5G oscillation).
- No large electric noise source nearby.
- No potential for collision with moving equipment such as forklifts.

**NOTE**

If the external electric noise applies, the alarm occurs and the manipulator may stop. When the alarm occurs and the manipulator stops, refer to DX200 maintenance manual and reset the alarm.

**WARNING**

Devices that are not explosion proof must not be installed in hazardous locations. Failure to observe this warning may result in a fire.
2.3 Location
Install the DX200 outside of the P-point maximum envelope of the manipulator and outside of the safeguarding.

- Install the DX200 in a location where the manipulator can be clearly seen during operation and can be operated safely.
- Install the DX200 in a location where it can be easily inspected with its door open. (Make sure to keep the maintenance area.)
- Install the DX200 back side at least 500 mm away from the nearest wall for maintenance access.
2.4 Installation Method

⚠️ CAUTION

• Do not climb on top of the DX200. Failure to observe this caution may result in injury or damage.

Fix the DX200 to the floor or baseplate by using user-supplied brackets made according to the specifications shown below.

†If casters are attached, fix the DX200 in the same way.†

<table>
<thead>
<tr>
<th>Specification</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard, with transformer</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>with caster</td>
<td>145</td>
<td>165</td>
</tr>
</tbody>
</table>

(Tap holes for M12 screws on The DX200 side)

※1 :Fixing JIG is different with specification. For detail, see the following.

Recommended Controller fixing screw: M12 (length: 20 mm) Tightening torque (45N·m (4.6kgf·m²))
Recommended plate thickness: 6mm

Note: Choose screw length in considering effective screw 14mm in depth of the fixed screw in the side panel.
Anchor bolt: M12
3 Connection

3.1 Connection Methods

A connection diagram for the manipulator, manipulator cable, primary power cable, programming pendant and intrinsically safe cable is shown below.

Fig. 3-1: Cable connection (Without transformer unit. Non-explosion-proof programming pendant)

Fig. 3-2: Cable connection (with Transformer Unit)
Fig. 3-3: Cable connection (Explosion-proof programming pendant)
3.1.1 Connecting the primary power supply

If the transformer unit is not attached to the DX200, refer to the “DX200 INSTRUCTIONS” to connect the primary power supply cable and ground wire.

Table 3-1: Power supply

<table>
<thead>
<tr>
<th>Power supply</th>
<th>DX200 power supply specifications</th>
<th>Transformer unit power supply specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3-phase</td>
<td>3-phase</td>
</tr>
<tr>
<td></td>
<td>AC200V (-15%,+10%) 50/60Hz</td>
<td>AC380V (-15%,+10%) 50Hz/60Hz—Domestic</td>
</tr>
<tr>
<td></td>
<td>AC220V (-15%,+10%) 60Hz</td>
<td>AC400V (-15%,+10%) 50Hz/60Hz—CE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AC480V (-15%,+10%) 50Hz/60Hz—North America</td>
</tr>
</tbody>
</table>

Table 3-2: DX200 Power Capacity, Cable Sizes, and Breaker Capacities

<table>
<thead>
<tr>
<th>Manipulator</th>
<th>Power capacity (kVA)</th>
<th>Transformer unit</th>
<th>Cable size (size of terminal) (three cores) (mm²)</th>
<th>Capacity of breaker in DX200 (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPO10</td>
<td>1.5 *1</td>
<td>Without transformer unit</td>
<td>5.5 (M5)</td>
<td>20 *1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With transformer unit</td>
<td>5.5 (Peeling)</td>
<td>10A *1 (In Transformer unit)</td>
</tr>
</tbody>
</table>

*1: Capacity of MPO10

In the case of Coordination type, it is assumed that the combined capacity of the Painting robot.

- The power capacity is subject to change depending on the work condition. However, the maximum load value such as payload, operation speed, and frequency etc. are taken into account to the value.
- When an external axis is added, the power capacity will also increase. In that case, contact your Yaskawa representative, or check the rated value shown on the label on the DX200 for the power capacity.
- When selecting a transformer, contact your Yaskawa representative.

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.
If the transformer unit is attached to the DX200, connect the primary power supply cable according to the following procedure.

1. Confirm that the primary power supply is OFF.
2. Remove the plate on the side of the transformer unit.
3. Draw the primary power supply cable through the cable clamp attached to the plate.
4. Connect a ground wire to reduce noise and prevent electric shock. Connect the ground wire to the PE terminal on the side of the transformer unit. Perform grounding in accordance with all relevant local and national electrical codes. The size of ground wire must be the same as listed on table 3-2 “DX200 Power Capacity, Cable Sizes, and Breaker Capacities” at page 3-3.
5. Connect the primary power supply cable to the L1, L2 and L3 terminal.

6. Install the plate to the side of the transformer unit.

7. Fix primary power supply cable firmly with the cable clamp so that it won't shift or slip out of place.

**NOTE**

Don’t connect the grounding wire with the wires for the electric power source, the welder, etc.

Ground in accordance with all relevant governmental regulations when using metallic ducts, metallic conduits, and cable tray to construct the cable.
3.1.2 Connecting the Manipulator Cable

Confirm the apparatus sign of the connector of the manipulator cable, connect the manipulator cable to the connectors on the back side of the DX200.

3.1.3 Connecting the Programming Pendant

(1) Non-explosion proof programming pendant

Connect the programming pendant cable to the connector (X81) on the door lower right side of the DX200.

Connect the programming pendant cable to the connector (X81) for the painting robot in the case of Coordination type.
(2) Explosion proof programming pendant

1. Connect a ground wire to the ground terminal (for the power supply barrier for explosion proof programming pendant) on the back side of the DX200 painting unit.
   Connect a ground wire to the ground terminal on the back side of the DX200 painting unit for the painting robot in the case of Coordination type.

   ![Coordination type](image1)
   ![Single type](image2)

   Ground terminal (10 ohms or less)

   **MANDATORY**

   Ground resistance must be 10 ohms or less with independent ground connection.

   The performance of explosion proof programming pendant cannot be maintained.

   ![NOTE](image3)

   The customer must prepare the ground wire.

2. Connect the explosion proof programming pendant cable to the connector (X81) on the door of the DX200 painting unit.

   ![Connecting points](image4)
   ![Connecting points](image5)

   ![Coordination type](image6)
   ![Single type](image7)
3.1.4 Intrinsically safe cable

Intrinsically safe cable is connected to the DX200 painting unit from pressure switch unit.

1. Draw the intrinsically safe cable into the painting unit through the cable inlets for intrinsically safe cable on the back side of the painting unit.

CAUTION

- Connect through the cable inlets for intrinsically safe cable so that the intrinsically safe cable is separated from other cables. The performance of explosion proof cannot be maintained.
- The intrinsically safe cable must be fixed on the support, which is already mounted, after tied with the cable tie.
- For holding the IP54, connect with the IP54-compatible connectors through the equipped plate.

Fix the intrinsically safe cable
As illustrated in the figure below, connect the intrinsically safe cable to the terminal (P1, N1, P2, N2, P3 and N3) of the relay barrier (3BAR) and the terminal (1,2) of the isolated barrier (4BAR) in the painting unit.

For grounding the intrinsically safe cables, that are to be connected to (3BAR) and (4BAR), open the back panel of the painting unit, and then connect the grounding cables to the terminals.

(*1) The content described in this diagram is a representative example, and it is subject to change depending on the specifications.

(*2) Crimped terminal shown below is recommended for connecting the relay barrier (3BAR) inside the DX200

1.25-MS3 (J.S.T. CONNECTORS)

(*3) Crimped terminal shown below is recommended for connecting the isolated barrier (4BAR) inside the DX200

1.25-AF2.3B (J.S.T. CONNECTORS)

(*4) P2 and N2 of relay barrier connectors are short circuited inside the DX200. Do not remove the short circuit cable.
Turning ON the Main Power Supply

**WARNING**

- Confirm that nobody is present in the P-point maximum envelope of the manipulator when turning ON the DX200 power supply.

Failure to observe this caution could result in injury caused by accidental contact with the manipulator.

Press the emergency stop button immediately if any problems occur.

The emergency stop buttons are located on the right side of the front door of the DX200 and on the right side of the programming pendant.

The main power supply is turned ON when the main power supply switch on the front of the DX200 is turned to the "ON" position, and the initial diagnosis and the current position setting begin.

---

Air purge

The air purge of the manipulator is started when turning on the main power supply, and a message of "Purging" is displayed on the programming pendant. The servo power cannot be turned ON during the purge.

After the air pressure becomes the normal state, and the purge time count of the timer is completed, the message of "purge completed" is displayed on the programming pendant. When purge is completed, it become to be able to turn ON the servo power.
## 5 Controller Type List

Table 5-1: Controller Type List

<table>
<thead>
<tr>
<th>Controller Type</th>
<th>Model</th>
<th>Painting Unit Type</th>
<th>Dimension Diagram, Internal Arrangement Diagram</th>
<th>Parts List</th>
<th>Recommended Spare Parts List</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERER-</td>
<td>DKX3500-B20 MPX3500 + MPO10</td>
<td>JZRCR-YCS21-P000 (Non-Explosion proof programing pendant)</td>
<td>Figure.6-1/6-1A</td>
<td>Table.9.2-1</td>
<td>Table.9.3-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JZRCR-YCS21-P001 (Explosion proof programing pendant)</td>
<td>Figure.6-1B/6-1C</td>
<td>Table.9.2-2</td>
<td>Table.9.3-2</td>
</tr>
<tr>
<td></td>
<td>DKX3500-B00 MPO10</td>
<td>JZRCR-YCS21-P000 (Non-Explosion proof programing pendant)</td>
<td>Figure.6-1/6-1A</td>
<td>Table.9.2-1</td>
<td>Table.9.3-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JZRCR-YCS21-P001 (Explosion proof programing pendant)</td>
<td>Figure.6-1B/6-1C</td>
<td>Table.9.2-2</td>
<td>Table.9.3-2</td>
</tr>
</tbody>
</table>
6 Dimension Diagram and Internal Arrangement Diagram

Figure 6-1: Dimension Diagram and Internal Arrangement Diagram

(a) Dimension Diagram

(b) Internal Arrangement Diagram
Figure 6.1A: Dimension Diagram and Internal Arrangement Diagram (with Transformer Unit)

(a) Dimension Diagram

(b) Internal Arrangement Diagram
Figure 6-1B: Dimension Diagram and Internal Arrangement Diagram: Explosion-proof Programming Pendant Specification

(a) Dimension Diagram

(b) Internal Arrangement Diagram
Figure 6.1C: Dimension Diagram and Internal Arrangement Diagram

: Explosion-proof Programming Pendant Specification (with Transformer Unit)

(a) Dimension Diagram

(b) Internal Arrangement Diagram
7 Description of Units and Circuit Boards

This section describes about units and circuit board in the DX200 Painting unit. Refer to the “DX200 INSTRUCTIONS” for the units and circuit boards of the DX200 standard.

7.1 Encoder Separation Board

Encoder Separation board JARCR-YIS22-1, JARCR-YIS23-1 turns OFF the power supply and signal of the encoder when the air purging or the air pressure fault occurs.

7.2 Relay Barrier

Relay Barrier (EB3C-R03D または EB3C-R03DN) is used to input the signal from the pressure switch to the DX200. The 5-channel relay barrier (EB3C-R05D or EB3C-R05DN) is attached to input LS signals and other signals.

Use after checking the contents of the manufacturer's instructions.

<table>
<thead>
<tr>
<th>Intrinsic safety circuit</th>
<th>1-channel Separate Circuit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum Voltage 13.2V</td>
</tr>
<tr>
<td></td>
<td>Maximum Current 14.2mA</td>
</tr>
<tr>
<td></td>
<td>Maximum Power 46.9mW</td>
</tr>
<tr>
<td></td>
<td>Allowable Inductance 87.5mH</td>
</tr>
<tr>
<td></td>
<td>Allowable Capacitance 470nF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-Intrinsic safety circuit</th>
<th>Allowable Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AC250V 50/60Hz, DC250V</td>
</tr>
</tbody>
</table>

Relay Barrier (3BAR)          Relay Barrier (5BAR)
7.3 Isolated Barrier
The Isolated (KFD0-SD2-Ex1.1065) barrier drives the solenoid valve of the pressure switch unit according to the output signal from the purge control board.

7.4 I/O Terminal Block
In case of the painting application, the I/O terminal block (6XT) is installed in the DX200. CN306 of the Universal I/O circuit board (JANCD-YIO21-E) in the DX200 cannot be connected to other devices because it is used for air purging and pressurized air control. In case of the painting application to be used as a coordination controller, the I/O terminal block (6XT) (7XT) is installed in each of the paint unit. CN306, CN307 of the Universal I/O circuit board (JANCD-YIO21-E) in the DX200 cannot be connected to other devices because it is used for air purging and pressurized air control.

7.5 Purge Control Board
The purge control board performs purge control by monitoring the pressure switch signal and drive the solenoid valve. The timers (TMR1, TMR2, TMR3, TMR4) are attached to the purge control board, and the timers are set the time about the purge by DIP switch.

**PROHIBITED**

Do not change the setting value of the timers.
(Don’t touch DIP switch on the purge control board)

The performance of explosion proof cannot be maintained.
7.6 Parts for Explosion-proof Programming Pendant

Explosion-proof Programming Pendant (JZRCR-NPP07-*) connects with DX200 through the following power supply barrier and switch barrier.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply barrier (1BAR)</td>
<td>EB3X-EK202B</td>
</tr>
<tr>
<td>Switch barrier (2BAR-A)</td>
<td>EB3N-A2ND</td>
</tr>
<tr>
<td>Switch barrier (2BAR-B)</td>
<td>EB3N-A2ND</td>
</tr>
</tbody>
</table>

A USB port is equipped on the front door of the Painting unit.

<Recommended item of the USB memory>

<table>
<thead>
<tr>
<th>No.</th>
<th>Manufacturer</th>
<th>Type</th>
<th>Note.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hagiwara Solutions Co.,Ltd.</td>
<td>UDG4-1GBRJS (1GB)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UDG4-2GBRJS (2GB)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UDG4-4GBRJS (4GB)</td>
<td></td>
</tr>
</tbody>
</table>
8 Inspection

8.1 Regular Inspection Item

Carry out the following inspections. Refer to the “DX200 MAINTENANCE MANUAL” for the inspection item except the list shown below.

<table>
<thead>
<tr>
<th>Inspection Equipment</th>
<th>Inspection Item</th>
<th>Inspection Frequency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purge time</td>
<td>Confirmation of that the purge time is not shorter than the designated purge time</td>
<td>daily</td>
<td></td>
</tr>
</tbody>
</table>

8.2 Inspection Contents

8.2.1 Inspection of the purge time

Confirm that the purge does not complete before the designated time of TMR1 (see section 9.4.1) after turning on the main power supply.
9 Maintenance

9.1 Maintenance for DX200

**WARNING**

- **Turn OFF the power supply before opening the DX200 doors.**
  Failure to observe this warning may result in electric shock.

- **To prevent anyone inadvertently turning ON the power supply during maintenance,**
  put up a warning sign such as "DO NOT TURN ON THE POWER" at the primary power supply (knife switch, wiring circuit breaker, etc.) and at the DX200 and related controllers and use accepted lockout/tag out Procedure.
  Failure to observe this caution may result in electric shock or injury.

- **After maintenance is completed, carefully check that no tools are left inside the DX200 and that the doors are securely closed.**
  Failure to observe this caution may result in electric shock or injury.

9.1.1 Check operation of the encoder separation board

Confirm the LED on the encoder separation board (JARCR-YIS22-1) and the encoder separation board for external axes (JARCR-YIS23-1) light on when the purge is completed.
And confirm that the alarm of the communication error (encoder) does not occur.

Even if the encoder separation board normally works, it is recommended that the encoder separation board is exchanged in ten years after beginning to use.
## 9.2 Parts List

### Table 9.2-1: Parts List

<table>
<thead>
<tr>
<th>Items</th>
<th>Standard (Transformer: None)</th>
<th>Option (Transformer: Built in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breaker</td>
<td>194RC-301753</td>
<td>194RC-301753</td>
</tr>
<tr>
<td>Transformer unit</td>
<td>-</td>
<td>JZRCR-YTB24-B480</td>
</tr>
<tr>
<td>(Option) Breaker</td>
<td>-</td>
<td>NF32-SVF 3P 10A</td>
</tr>
<tr>
<td>(Option) Cooling fan</td>
<td>-</td>
<td>4715MS-22T-B50-B00 x2 or 11938MB-B2N-EA-01 x2</td>
</tr>
<tr>
<td>Control power supply unit</td>
<td>JZNC-YPSS21-E</td>
<td>JZNC-YPSS21-E</td>
</tr>
<tr>
<td>CPU unit</td>
<td>JZNC-YRK21-1E</td>
<td>JZNC-YRK21-1E</td>
</tr>
<tr>
<td>CPU circuit board</td>
<td>JANCD-YCP21-E</td>
<td>JANCD-YCP21-E</td>
</tr>
<tr>
<td>Back circuit board</td>
<td>JANCD-YBB21-E</td>
<td>JANCD-YBB21-E</td>
</tr>
<tr>
<td>PCI riser circuit board</td>
<td>JANCD-YBB22-E</td>
<td>JANCD-YBB22-E</td>
</tr>
<tr>
<td>Robot I/F circuit board</td>
<td>JANCD-YIF01□-E</td>
<td>JANCD-YIF01□-E</td>
</tr>
<tr>
<td>Machine safety CPU circuit board</td>
<td>JANCD-YSF21-E</td>
<td>JANCD-YSF21-E</td>
</tr>
<tr>
<td>Machine safety I/O logic circuit board</td>
<td>JANCD-YSF22□-E</td>
<td>JANCD-YSF22□-E</td>
</tr>
<tr>
<td>Machine safety terminal block circuit board</td>
<td>JANCD-YFC22-E</td>
<td>JANCD-YFC22-E</td>
</tr>
<tr>
<td>Universal I/O circuit board</td>
<td>JANCD-YIO21-E</td>
<td>JANCD-YIO21-E</td>
</tr>
<tr>
<td>Power ON unit</td>
<td>JZRCR-YPU53-1</td>
<td>JZRCR-YPU53-1</td>
</tr>
<tr>
<td>Major axes control circuit board</td>
<td>SRDA-EAXA21A</td>
<td>SRDA-EAXA21A</td>
</tr>
<tr>
<td>External axis control circuit board (Note.1)</td>
<td>SRDA-EAXB21A</td>
<td>SRDA-EAXB21A</td>
</tr>
<tr>
<td>Brake control circuit board</td>
<td>JANCD-YBK21-3E</td>
<td>JANCD-YBK21-3E</td>
</tr>
<tr>
<td>Converter</td>
<td>SRDA-COA30A21B-E or SRDA-COA12A21A-E</td>
<td>SRDA-COA30A21B-E or SRDA-COA12A21A-E</td>
</tr>
<tr>
<td>Capacitor module</td>
<td>SRDA-CUA662AA or SRDA-CUA492AA (Note.2)</td>
<td>SRDA-CUA662AA or SRDA-CUA492AA (Note.2)</td>
</tr>
<tr>
<td>Amplifier module</td>
<td>AMP1 S SRDA-SDA14A01A-E</td>
<td>SRDA-SDA14A01A-E</td>
</tr>
<tr>
<td>AMP2 L SRDA-SDA14A01A-E</td>
<td>SRDA-SDA14A01A-E</td>
<td></td>
</tr>
<tr>
<td>AMP3 U SRDA-SDA06A01A-E</td>
<td>SRDA-SDA06A01A-E</td>
<td></td>
</tr>
<tr>
<td>AMP7 (Note.1) EX1</td>
<td>SRDA-SDA14A01A-E</td>
<td>SRDA-SDA14A01A-E</td>
</tr>
<tr>
<td>AMP8 (Note.1) EX2</td>
<td>SRDA-SDA14A01A-E</td>
<td>SRDA-SDA14A01A-E</td>
</tr>
<tr>
<td>AMP9 (Note.1) EX3</td>
<td>SRDA-SDA06A01A-E</td>
<td>SRDA-SDA06A01A-E</td>
</tr>
<tr>
<td>Regenerative resistor</td>
<td>SMVK500W6R0J/R0 A6103</td>
<td>SMVK500W6R0J/R0 A6103</td>
</tr>
<tr>
<td>Rated value</td>
<td>500W</td>
<td>500W</td>
</tr>
<tr>
<td>Resistor value</td>
<td>6Ω</td>
<td>6Ω</td>
</tr>
<tr>
<td>Regenerative resistor (Note.2)</td>
<td>SMVK500W12R5J/RO -A6102A</td>
<td>SMVK500W12R5J/RO -A6102A</td>
</tr>
<tr>
<td>Rated value</td>
<td>500W</td>
<td>500W</td>
</tr>
<tr>
<td>Resistor value</td>
<td>12.5Ω</td>
<td>12.5Ω</td>
</tr>
<tr>
<td>Cooling fan</td>
<td>4715MS-22T-B50-B00 x3 or 11938MB-B2N-EA-01 x3</td>
<td>4715MS-22T-B50-B00 x3 or 11938MB-B2N-EA-01 x3</td>
</tr>
</tbody>
</table>

Note.1: Mounted in case of the external axis specification.
Note.2: Mounted in case of the converter specifications SRDA-COA12A21A-E.
### Table 9.2-2: Parts List (Painting unit)

<table>
<thead>
<tr>
<th>Items</th>
<th>Non-Explosion proof programming pendant specification</th>
<th>Explosion proof programming pendant specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Painting unit</td>
<td>JZRCR-YCS21-P000</td>
<td>JZRCR-YCS21-P001</td>
</tr>
<tr>
<td>Purge control board</td>
<td>JARCR-YIS21-1</td>
<td>JARCR-YIS21-1</td>
</tr>
<tr>
<td>Encoder separation board (Manipulator, external axis)</td>
<td>JARCR-YIS22-1</td>
<td>JARCR-YIS22-1</td>
</tr>
<tr>
<td>Encoder separation board (external axis) (Note.1)</td>
<td>JARCR-YIS23-1</td>
<td>JARCR-YIS23-1</td>
</tr>
<tr>
<td>Relay barrier (3-point input)</td>
<td>EB3C-R03DN</td>
<td>EB3C-R03DN</td>
</tr>
<tr>
<td>Relay barrier (5-point input)</td>
<td>EB3C-R05DN</td>
<td>EB3C-R05DN</td>
</tr>
<tr>
<td>Isolated barrier</td>
<td>KFD0-SD2-EX1.1065</td>
<td>KFD0-SD2-EX1.1065</td>
</tr>
<tr>
<td>DC power supply</td>
<td>S8VS-01505</td>
<td>S8VS-01505</td>
</tr>
<tr>
<td>DC power supply</td>
<td>KHEA90F-24</td>
<td>KHEA90F-24</td>
</tr>
<tr>
<td>Power supply barrier</td>
<td>-</td>
<td>EB3X-EK202B</td>
</tr>
<tr>
<td>Switch barrier</td>
<td>-</td>
<td>EB3N-A2ND ×2</td>
</tr>
<tr>
<td>Safety relay</td>
<td>-</td>
<td>G9SA-501</td>
</tr>
</tbody>
</table>

Note.1: Mounted in case of more than two external axes.
9.3 Recommended Spare Parts List

The recommended parts and components for DX200 are ranked as follows. It is recommended that the following parts and components be kept in stock as spare parts for DX200.

- Rank A: Expendable and frequently replaced parts
- Rank B: Boards and sub-units
- Rank C: Units

When purchasing of spare parts, please inform Yaskawa representative of the manufacturing number (or order number) and controller type (refer to chapter 5- table.5).

Product performance cannot be guaranteed when using spare parts from any company other than Yaskawa.

NOTE: For replacing parts in Rank B or Rank C, be sure to contact your Yaskawa representative.
<table>
<thead>
<tr>
<th>Rank</th>
<th>Parts No.</th>
<th>Name</th>
<th>Type</th>
<th>Manufacturer</th>
<th>Qty</th>
<th>Qty par unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 1</td>
<td>1</td>
<td>Battery</td>
<td>ER6VC3N 3.6V</td>
<td>TOSHIBA BATTERY CO., LTD</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A 2</td>
<td>2</td>
<td>Control power supply cooling fan</td>
<td>JZNC-YZU21-E</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A 3</td>
<td>3</td>
<td>Fan for the heat exchanger</td>
<td>4715MS-22T-B50-B00 or 11938MB-B2N-EA-01</td>
<td>Minebea Co., Ltd</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A 4</td>
<td>4</td>
<td>Backside duct fan</td>
<td>4715MS-22T-B50-B00 or 11938MB-B2N-EA-01</td>
<td>Minebea Co., Ltd</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>A 5</td>
<td>5</td>
<td>Transformer unit fan</td>
<td>4715MS-22T-B50-B00 or 11938MB-B2N-EA-01</td>
<td>Minebea Co., Ltd</td>
<td>2</td>
<td>2 Note.1</td>
<td></td>
</tr>
<tr>
<td>A 6</td>
<td>6</td>
<td>AC control power supply fuse</td>
<td>0215010MXP</td>
<td>Littlefuse</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>A 7</td>
<td>7</td>
<td>AC cooling fan fuse</td>
<td>GP2S 2.5A, 250V</td>
<td>Daito Communication Apparatus Co., Ltd</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>A 8</td>
<td>8</td>
<td>24VDC fuse for I/O Brake power supply fuse</td>
<td>02173.15P 3.15A, 250V</td>
<td>Littlefuse</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>A 9</td>
<td>9</td>
<td>PG power supply fuse</td>
<td>HM10 1A, 250V</td>
<td>Daito Communication Apparatus Co., Ltd</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A 10</td>
<td>10</td>
<td>DC24V fuse for I/O</td>
<td>0217002P 2A, 250V</td>
<td>Littlefuse</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A 11</td>
<td>11</td>
<td>Purge control board fuse</td>
<td>0217002.MXP 2A 250V</td>
<td>Littlefuse</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>A 12</td>
<td>12</td>
<td>Purge control board fuse</td>
<td>0218.500 0.5A 250V</td>
<td>Littlefuse</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>B 13</td>
<td>13</td>
<td>Amplifier 1.2</td>
<td>SRDA-SDA14A01A-E</td>
<td>Yaskawa Electric Corporation</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>B 14</td>
<td>14</td>
<td>Amplifier 3</td>
<td>SRDA-SDA06A01A-E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 15</td>
<td>15</td>
<td>Major axes control circuit board</td>
<td>SRDA-EAXX21A</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 16</td>
<td>16</td>
<td>External axis control circuit board</td>
<td>SRDA-EAXX21A</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1 Note.2</td>
<td></td>
</tr>
<tr>
<td>B 17</td>
<td>17</td>
<td>CPU circuit board</td>
<td>JANCD-YCP21-E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 18</td>
<td>18</td>
<td>Robot IF circuit board</td>
<td>JANCD-YIF01-□E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 19</td>
<td>19</td>
<td>Machine safety CPU circuit board</td>
<td>JANCD-YSF21-E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 20</td>
<td>20</td>
<td>Machine safety I/O logic circuit board</td>
<td>JANCD-YSF22□E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 21</td>
<td>21</td>
<td>Universal I/O circuit board</td>
<td>JANCD-YIO21-E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 22</td>
<td>22</td>
<td>Brake control circuit board</td>
<td>JANCD-YBK21-3E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 23</td>
<td>23</td>
<td>DC power supply</td>
<td>S8VS-01505</td>
<td>OMRON</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 24</td>
<td>24</td>
<td>DC power supply</td>
<td>KHEA90F-24</td>
<td>Cosel</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 25</td>
<td>25</td>
<td>Purge control board</td>
<td>JARCR-YIS21-1</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 26</td>
<td>26</td>
<td>Encoder separation board</td>
<td>JARCR-YIS22-1</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 27</td>
<td>27</td>
<td>Encoder separation board</td>
<td>JARCR-YIS23-1</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1 Note.3</td>
<td></td>
</tr>
<tr>
<td>B 28</td>
<td>28</td>
<td>Converter</td>
<td>SRDA-COA30A21B-E or SRDA-COA12A21A-E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 29</td>
<td>29</td>
<td>CPU Unit</td>
<td>JZNC-YRK21-1E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 30</td>
<td>30</td>
<td>Power ON Unit</td>
<td>JZCR-YPUS53-1</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1 Standard</td>
<td></td>
</tr>
<tr>
<td>C 31</td>
<td>31</td>
<td>Control power supply</td>
<td>JZNC-YPS21-E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 32</td>
<td>32</td>
<td>Capacitor module</td>
<td>SRDA-COA12A21A-E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 33</td>
<td>33</td>
<td>Relay barrier (3-point input)</td>
<td>EB3C-R03DN</td>
<td>IDEC</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 34</td>
<td>34</td>
<td>Relay barrier (5-point input)</td>
<td>EB3C-R05DN</td>
<td>IDEC</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 35</td>
<td>35</td>
<td>Isolated barrier</td>
<td>KFD0-SD2-EX1.1065</td>
<td>Pepperl+Fuchs GmbH</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 36</td>
<td>36</td>
<td>Programming pendant</td>
<td>JZCR-YPFP21-1</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1 With Cable(8M)</td>
<td></td>
</tr>
</tbody>
</table>

Note.1: Only if the transformer unit is added.
Note.2: Mounted if the external axis specification.
Note.3: Mounted in case of more than two external axes.
Table 9.3-2: Recommended Spare Parts List of DX200
(Explosion proof programming pendant specification)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Parts No.</th>
<th>Name Type</th>
<th>Manufacturer</th>
<th>Qty</th>
<th>Qty per unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 1</td>
<td>Battery</td>
<td>ER6VC3N 3.6V</td>
<td>TOSHIBA BATTERY CO., LTD</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A 2</td>
<td>Control power supply cooling fan</td>
<td>JZNC-YZU21-E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A 3</td>
<td>Fan for the heat exchanger</td>
<td>4715MS-22T-B50-B00 or 11938MB-B2N-EA-01</td>
<td>Minebea Co., Ltd</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A 4</td>
<td>Backside duct fan</td>
<td>4715MS-22T-B50-B00 or 11938MB-B2N-EA-01</td>
<td>Minebea Co., Ltd</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>A 5</td>
<td>Transformer unit fan</td>
<td>4715MS-22T-B50-B00 or 11938MB-B2N-EA-01</td>
<td>Minebea Co., Ltd</td>
<td>2</td>
<td>2</td>
<td>Note.1</td>
</tr>
<tr>
<td>A 6</td>
<td>AC control power supply fuse</td>
<td>0215010MXP</td>
<td>Litteiufse</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>A 7</td>
<td>AC cooling fan fuse</td>
<td>GP25 2.5A, 250V</td>
<td>Daito Communication Apparatus Co., Ltd</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>A 8</td>
<td>24VDC fuse for I/O Brake power supply fuse</td>
<td>02173.15P 3.15A, 250V</td>
<td>Litteiufse</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>A 9</td>
<td>PG power supply fuse</td>
<td>HM10 1A, 250V</td>
<td>Daito Communication Apparatus Co., Ltd</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A 10</td>
<td>DC24V fuse for I/O</td>
<td>0217002 2A, 250V</td>
<td>Litteiufse</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A 11</td>
<td>Purge control board fuse</td>
<td>0217002.MXP 2A 250V</td>
<td>Litteiufse</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>A 12</td>
<td>Purge control board fuse</td>
<td>0218.500 0.5A 250V</td>
<td>Litteiufse</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>A 13</td>
<td>Fuse for barrier</td>
<td>217001 1A, 250V</td>
<td>Litteiufse</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>A 14</td>
<td>Fuse for barrier</td>
<td>FGQ0 2A</td>
<td>FUJI TERMINAL INDUSTRY Co., LTD</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>B 15</td>
<td>Amplifier 1.2</td>
<td>SRDA-SDA14A01A-E</td>
<td>Yaskawa Electric Corporation</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>B 16</td>
<td>Amplifier 3</td>
<td>SRDA-SDA06A01A-E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 17</td>
<td>Major axes control circuit board</td>
<td>SRDA-EAXA21A</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 18</td>
<td>External axis control circuit board</td>
<td>SRDA-EAXB21A</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 19</td>
<td>CPU circuit board</td>
<td>JANC-D-UCP21-E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 20</td>
<td>Robot I/F circuit board</td>
<td>JANC-D-YIF01-E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 21</td>
<td>Machine safety CPU circuit board</td>
<td>JANC-D-YSF21-E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 22</td>
<td>Machine safety I/O logic circuit board</td>
<td>JANC-D-YSF22-E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 23</td>
<td>Universal I/O circuit board</td>
<td>JANC-D-YIO21-E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 24</td>
<td>Brake control circuit board</td>
<td>JANC-D-YBK21-3E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 25</td>
<td>DC power supply</td>
<td>S8VS-01505</td>
<td>OMRON</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 26</td>
<td>DC power supply</td>
<td>KHEA90F-24</td>
<td>Cosel</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 27</td>
<td>Purge control board</td>
<td>JARC-R-YS21-1</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 28</td>
<td>Encoder separation Board</td>
<td>JARC-R-YS22-1</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 29</td>
<td>Encoder separation Board</td>
<td>JARC-R-YS23-1</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B 30</td>
<td>Converter</td>
<td>SRDA-COA30A21B-E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 31</td>
<td>CPU Unit</td>
<td>JZNC-YRK21-1E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 32</td>
<td>Power ON Unit</td>
<td>JZRCR-YPS53-1</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>Standard</td>
</tr>
<tr>
<td>C 33</td>
<td>Control power supply</td>
<td>JZNC-YPZ51-E</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 34</td>
<td>Capacitor module</td>
<td>SRDA-CUA682AA</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 35</td>
<td>Relay barrier (3-point input)</td>
<td>EB3C-R03DN</td>
<td>IDEC</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 36</td>
<td>Relay barrier (5-point input)</td>
<td>EB3C-R05DN</td>
<td>IDEC</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 37</td>
<td>Isolated barrier</td>
<td>KFD0-SD2-EX1.1065</td>
<td>Pepper+Fuchs GmbH</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C 38</td>
<td>Power supply barrier</td>
<td>EB3X-EK202B</td>
<td>IDEC</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
### 9 Maintenance

<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>39</td>
<td>Switch barrier</td>
<td>EB3N-A2ND</td>
<td>IDEC</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>40</td>
<td>Safety relay</td>
<td>G9SA-501</td>
<td>OMRON</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>41</td>
<td>Programming pendant</td>
<td>JZRCR-NPP07-*</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>Note.2</td>
</tr>
</tbody>
</table>

Note.1: Only if the transformer unit is added.
Note.2: Mounted in case of the external axis specification.
Note.3: Mounted in case of more than two external axes.
Note.4: The length of the programming pendant cable varies depending on the order.

- JZRCR-NPP07-8:8m
- JZRCR-NPP07-20:20m

Note.5: Mounted in case of the converter specifications SRDA-COA12A21A-E.
9.4 Replacing Explosion-proof equipment parts

9.4.1 Replacing the Purge control board (JARCR-YIS21-1)

**NOTE**

Turn OFF the power supply before replace the boards.

**Exchange procedure**

This board is on the right inside Painting unit.

1. Disconnect all cables connected to the Purge control board.
2. Loosen the screw (two places) of a base fixing Purge control board and take off with base. Loosen the housing ground screw connected to the base mentioned above and remove it.
3. Remove Purge control board from board base.
4. Attach new Purge control board to a base for boards in a reverse procedure.
5. Connect all cables which disconnect with 2.

*Check new Purge control board timer setting correspond to Robot. Before replacing Purge control board.

Fig 9-1: Purge control board

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CN660</td>
<td>Input DC24V</td>
<td></td>
</tr>
<tr>
<td>CN661</td>
<td>Connector barrier signal</td>
<td></td>
</tr>
<tr>
<td>CN662</td>
<td>Connector purge signal</td>
<td></td>
</tr>
<tr>
<td>CN663</td>
<td>Connector purge circuit signal</td>
<td></td>
</tr>
<tr>
<td>CN664</td>
<td>Connector purge completed signal</td>
<td></td>
</tr>
<tr>
<td>CN665</td>
<td>Output DC24V</td>
<td></td>
</tr>
<tr>
<td>CN666</td>
<td>Connector purge circuit signal</td>
<td></td>
</tr>
</tbody>
</table>

TMR1: Timer setting Value: 2min  
S1 1: OFF, 2: OFF S5 2: ON
TMR2: Timer setting Value: 2min  
S2 1: OFF, 2: OFF S6 2: ON
TMR3: Timer setting Value: 1min  
S3 1: OFF, 2: OFF S7 1: ON
TMR4: Timer setting Value: 10sec  
S4 1: ON, 2: OFF S8 10: ON
9.4.2 Replacing Encoder separation board (JARCR-YIS22)

**NOTE**

Turn OFF the power supply before replace the boards.

**Exchange procedure**

1. Remove back plate to the painting unit upper back side.
2. Disconnect all cables connected to the Encoder separation board.
3. Loosen the screws (eight places) fixing the Encoder separation board.
4. Remove the Encoder separation board from board base.
5. Attach new Encoder separation board to board base in a reverse procedure.
6. Connect all cables which disconnect with 2.

![Encoder separation board diagram](CNPG7) For External axis (EX1)

![Encoder separation board diagram](CNPG123) For Manipulator(S, L, U)

![Encoder separation board diagram](CNPGC) For EAXB board

![Encoder separation board diagram](CNPGB) For EAXA board

![Encoder separation board diagram](CNPGA) For EAXA board
9.4.3 Replacing Encoder separation board (JARCR-YIS23)

**NOTE**

Turn OFF the power supply before replace the boards.

**Exchange procedure**

1. Remove back plate to the painting unit upper back side.
2. Disconnect all cables connected to the Encoder separation board.
3. Loosen the screws (eight places) fixing the Encoder separation board.
4. Remove the Encoder separation board from board base.
5. Attach new Encoder separation board to board base in a reverse procedure.
6. Connect all cables which disconnect with 2.

Fig9-3: Encoder separation board
9.4.4 Replacing Relay barrier (EB3C-R03DN, EB3C-R05DN)

**NOTE**
Turn OFF the power supply before replace the Relay barrier.

**Exchange procedure**
The Relay barrier is on the upper inside Painting unit.
1. Disconnect all cables connected to the Relay barrier.
2. Remove the Relay barrier loosen the lock fixing the Relay barrier to DIN-rail.
3. Attach new Relay barrier to DIN-rail in a reverse procedure.
4. Connect all cables which disconnect with 1.

Fig9-4: Relay barrier

![Relay barrier diagram](image-url)
9.4.5 Replacing Isolated barrier

Exchange procedure
The Isolated barrier is on the upper inside Painting unit.

1. Disconnect all cables connected to the Isolated barrier.
2. Remove the Isolated barrier loosen the lock fixing the Isolated barrier to DIN-rail.
3. Attach new Isolated barrier to DIN-rail in a reverse procedure.
4. Connect all cables which disconnect with 1.

Fig9-5: Isolated barrier

NOTE
Turn OFF the power supply before replace the Isolated barrier.
9.4.6 Replacing Barrier for Explosion-proof Programing pendant

**Exchange procedure**

The Barrier for Explosion-proof Programing pendant is on the backside door of Painting unit.

1. Remove the Barrier cover to the painting unit door.
2. Disconnect all cables connected to the each barriers.
3. Remove the barrier loosen the lock fixing the barriers to DIN-rail.
4. Attach new barrier to DIN-rail in a reverse procedure.
5. Connect all cables which disconnect with 2.
6. Reattach the Barrier cover.

**Note:** Turn OFF the power supply before replace the Barrier for Explosion-proof Programing pendant.

**Fig9-6: Barrier for Explosion-proof Programing pendant**

![Barber for Explosion-proof Programing pendant diagram]

- Barrier cover
- Power supply barrier EB3X-EK202B
- Switch barrier EB3N-A2ND
- (1BAR) Power supply barrier EB3X-EK202B
- (2BAR-A),(2BAR-B) Switch barrier EB3N-A2ND
DX200

INSTRUCTIONS

SUPPLEMENT FOR MPO10

(FM SPECIFICATION)

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

MANUAL No.

HW1483833