XRC and XRC 2001 Controller

Twin Drive
Function Manual
for UP/SKX-Series Robots

Part Number 148308-1
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SECTION 1
INTRODUCTION

1.1 About this Document
This manual provides information on how to use the Twin Drive Function on the XRC controller.

This manual is organized as follows:

SECTION 1 – INTRODUCTION
General information about this manual, a list of reference documents, and customer service information.

SECTION 2 – SAFETY
Provides information for the safe use and operation of Motoman products.

SECTION 3 – TWIN DRIVE FUNCTION INSTRUCTIONS
Provides detailed instructions for setting up and using the Twin Drive Function on the XRC controller.

1.2 Reference to Other Documentation
For additional information refer to the following:

• Concurrent I/O Parameters Manual for XRC 2001 (P/N 147626-1)
• Operator’s Manual for General Purpose (P/N 142099-1)
• Operator’s Manual for Handling (P/N 142100-1)
• Operator’s Manual for Spot Welding (P/N 142101-1)
• Operator’s Manual for Arc Welding (P/N 142098-1)
• Motoman UP6, XRC 2001 Manipulator Manual (P/N 145960-1)
• Motoman UP20, XRC 2001 Manipulator Manual (P/N 145965-1)
• Motoman UP50, XRC 2001 Manipulator Manual (P/N 145964-1)
• Motoman UP130/165, XRC 2001 Manipulator Manual (P/N 145967-1)

1.3 Customer Service Information
If you are in need of technical assistance, contact the Motoman service staff at (937) 847-3200. Please have the following information ready before you call:

• Robot Type (UP6, UP130, UP165, etc.)
• Application Type (welding, handling, etc.)
• Robot Serial Number (located on the back side of the robot arm)
• Robot Sales Order Number (located on back side of XRC controller)
SECTION 2
SAFETY

2.1 Introduction

It is the purchaser's responsibility to ensure that all local, county, state, and national codes, regulations, rules, or laws relating to safety and safe operating conditions for each installation are met and followed.

We suggest that you obtain and review a copy of the ANSI/RIA National Safety Standard for Industrial Robots and Robot Systems. This information can be obtained from the Robotic Industries Association by requesting ANSI/RIA R15.06. The address is as follows:

Robotic Industries Association
900 Victors Way
P.O. Box 3724
Ann Arbor, Michigan 48106
TEL: (734) 994-6088
FAX: (734) 994-3338

Ultimately, the best safeguard is trained personnel. The user is responsible for providing personnel who are adequately trained to operate, program, and maintain the robot cell. The robot must not be operated by personnel who have not been trained!

We recommend that all personnel who intend to operate, program, repair, or use the robot system be trained in an approved Motoman training course and become familiar with the proper operation of the system.

This safety section addresses the following:
- Standard Conventions (Section 2.2)
- General Safeguarding Tips (Section 2.3)
- Mechanical Safety Devices (Section 2.4)
- Installation Safety (Section 2.5)
- Programming Safety (Section 2.6)
- Operation Safety (Section 2.7)
- Maintenance Safety (Section 2.8)
2.2 **Standard Conventions**

This manual includes information essential to the safety of personnel and equipment. As you read through this manual, be alert to the four signal words:

- **DANGER**
- **WARNING**
- **CAUTION**
- **NOTE**

Pay particular attention to the information provided under these headings which are defined below (in descending order of severity).

**DANGER!**

*Information appearing under the DANGER caption concerns the protection of personnel from the immediate and imminent hazards that, if not avoided, will result in immediate, serious personal injury or loss of life in addition to equipment damage.*

**WARNING!**

*Information appearing under the WARNING caption concerns the protection of personnel and equipment from potential hazards that can result in personal injury or loss of life in addition to equipment damage.*

**CAUTION!**

*Information appearing under the CAUTION caption concerns the protection of personnel and equipment, software, and data from hazards that can result in minor personal injury or equipment damage.*

**NOTE:** Information appearing in a NOTE caption provides additional information which is helpful in understanding the item being explained.
2.3 General Safeguarding Tips

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot 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 robot, the operator's manuals, the system equipment, and options and accessories should be permitted to operate this robot system.
- Do not enter the robot cell while it is in automatic operation. Programmers must have the teach pendant when they enter the robot cell.
- Improper connections can damage the robot. All connections must be made within the standard voltage and current ratings of the robot I/O (Inputs and Outputs).
- The robot must be placed in Emergency Stop (E-STOP) mode whenever it is not in use.
- In accordance with ANSI/RIA R15.06, section 6.13.4 and 6.13.5, 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).

2.4 Mechanical Safety Devices

The safe operation of the robot, positioner, auxiliary equipment, and system is ultimately the user's 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 safety standards, and other local codes that may pertain to the installation and use of industrial equipment. Additional safety measures for personnel and equipment may be required depending on system installation, operation, and/or location. The following safety measures are available:

- Safety fences and barriers
- Light curtains
- Door interlocks
- Safety mats
- Floor markings
- Warning lights

Check all safety equipment frequently for proper operation. Repair or replace any non-functioning safety equipment immediately.
2.5 Installation Safety

Safe installation is essential for protection of people and equipment. The following suggestions are intended to supplement, but not replace, existing federal, local, and state laws and regulations. Additional safety measures for personnel and equipment may be required depending on system installation, operation, and/or location. Installation tips are as follows:

- Be sure that only qualified personnel familiar with national codes, local codes, and ANSI/RIA R15.06 safety standards are permitted to install the equipment.
- Identify the work envelope of each robot with floor markings, signs, and barriers.
- Position all controllers outside the robot work envelope.
- Whenever possible, install safety fences to protect against unauthorized entry into the work envelope.
- Eliminate areas where personnel might get trapped between a moving robot and other equipment (pinch points).
- Provide sufficient room inside the workcell to permit safe teaching and maintenance procedures.

2.6 Programming Safety

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. Programming tips are as follows:

- Any modifications of the controller PLC can cause severe personal injury or death, as well as damage to the robot! Do not make any modifications to the PLC. Making any changes without the written permission of Motoman will VOID YOUR WARRANTY!
- Some operations require standard passwords and some require special passwords. Special passwords are for Motoman use only. YOUR WARRANTY WILL BE VOID if you use these special passwords.
- Back up all programs and jobs onto a floppy disk whenever 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.
- The concurrent I/O (Input and Output) function allows the customer to modify the internal ladder inputs and outputs for maximum robot performance. Great care must be taken when making these modifications. Double-check all modifications under every mode of robot operation to ensure that you have not created hazards or dangerous situations that may damage the robot or other parts of the system.
- 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 robot should be permitted to operate the system.
• Inspect the robot and work envelope 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 the E-STOP button on the teach pendant for proper operation before programming.
• Carry the teach pendant with you when you enter the workcell.
• Be sure that only the person holding the teach pendant enters the workcell.
• Test any new or modified program at low speed for at least one full cycle.

2.7 Operation Safety

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. Operation tips are as follows:

• Be sure that only trained personnel familiar with the operation of this robot, the operator's manuals, the system equipment, and options and accessories are permitted to operate this robot system.
• Check all safety equipment for proper operation. Repair or replace any non-functioning safety equipment immediately.
• Inspect the robot and work envelope to ensure no potentially hazardous conditions exist. Be sure the area is clean and free of water, oil, debris, etc.
• Ensure that all safeguards are in place.
• 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 robot should be permitted to operate the system.
• Do not enter the robot cell while it is in automatic operation. Programmers must have the teach pendant when they enter the cell.
• The robot must be placed in Emergency Stop (E-STOP) mode whenever it is not in use.
• This equipment has multiple sources of electrical supply. Electrical interconnections are made between the controller, external servo box, and other equipment. Disconnect and lockout/tagout all electrical circuits before making any modifications or connections.
• All modifications made to the controller will change the way the robot operates and can cause severe personal injury or death, as well as damage the robot. This includes controller parameters, ladder, and I/O (Input and Output) modifications. Check and test all changes at slow speed.
2.8 Maintenance Safety

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. Maintenance tips are as follows:

- Do not perform any maintenance procedures before reading and understanding the proper procedures in the appropriate manual.
- Check all safety equipment for proper operation. Repair or replace any non-functioning safety equipment immediately.
- 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 robot should be permitted to operate the system.
- Back up all your programs and jobs onto a floppy disk whenever program changes are made. A backup must always be made before any servicing or changes are made to options, accessories, or equipment to avoid loss of information, programs, or jobs.
- Do not enter the robot cell while it is in automatic operation. Programmers must have the teach pendant when they enter the cell.
- The robot must be placed in Emergency Stop (E-STOP) mode whenever it is not in use.
- Be sure all safeguards are in place.
- Use proper replacement parts.
- This equipment has multiple sources of electrical supply. Electrical interconnections are made between the controller, external servo box, and other equipment. Disconnect and lockout/tagout all electrical circuits before making any modifications or connections.
- All modifications made to the controller will change the way the robot operates and can cause severe personal injury or death, as well as damage the robot. This includes controller parameters, ladder, and I/O (Input and Output) modifications. Check and test all changes at slow speed.
- Improper connections can damage the robot. All connections must be made within the standard voltage and current ratings of the robot I/O (Inputs and Outputs).
Upon receipt of the product and prior to initial operation, read these instructions thoroughly, and retain for future reference.

MOTOMAN INSTRUCTIONS
MOTOMAN SETUP MANUAL
MOTOMAN-□□□ INSTRUCTIONS
YASNAC XRC INSTRUCTIONS
YASNAC XRC OPERATOR’S MANUAL
YASNAC XRC OPERATOR’S MANUAL for BEGINNERS

The YASNAC XRC operator’s manuals above correspond to specific usage. Be sure to use the appropriate manual.
This manual explains the twin drive function of the YASNAC XRC system and general operations. Read this manual carefully and be sure to understand its contents before handling the YASNAC XRC.

General items related to safety are listed in Section 1: Safety of the Setup Manual. To ensure correct and safe operation, carefully read the Setup Manual 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.
NOTES FOR SAFE OPERATION

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

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.

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

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Before operating the manipulator, check that servo power is turned off when the emergency stop buttons on the playback panel or programming pendant are pressed. When the servo power is turned off, the SERVO ON READY lamp on the playback panel and the SERVO ON LED on the programming pendant are 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.

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.

Always set the Teach Lock before entering the robot work envelope to teach a job.

Operator injury can occur if the Teach Lock is not set and the manipulator is started from the playback panel.

Observe the following precautions when performing teaching operations within the working envelope of the manipulator:
- View the manipulator from the front whenever possible.
- Always follow the predetermined operating procedure.
- 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 persons are present in the manipulator’s work envelope and that you are in a safe location before:
- Turning on the YASNAC XRC power
- Moving the manipulator with the programming pendant
- Running check operations
- Performing automatic operations

Injury may result if anyone enters the working envelope of the manipulator during operation. Always press an emergency stop button immediately if there are problems. The emergency stop button is located on the right side of both the YASNAC XRC playback panel and programming pendant.
Definition of Terms Used Often in This Manual

The MOTOMAN manipulator is the YASKAWA industrial robot product. The manipulator usually consists of the controller, the playback panel, the programming pendant, and supply 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>YASNAC XRC Controller</td>
<td>XRC</td>
</tr>
<tr>
<td>YASNAC XRC Playback Panel</td>
<td>Playback Panel</td>
</tr>
<tr>
<td>YASNAC XRC Programming Pendant</td>
<td>Programming Pendant</td>
</tr>
</tbody>
</table>

CAUTION

- Perform the following inspection procedures prior to conducting manipulator teaching. If problems are found, repair them immediately, and be sure that all other necessary processing has been performed.
  - Check for problems in manipulator movement.
  - Check for damage to insulation and sheathing of external wires.

- Always return the programming pendant to the hook on the XRC cabinet after use.

  The programming pendant can be damaged if it is left in the manipulator’s work area, on the floor, or near fixtures.

- Read and understand the Explanation of the Alarm Display in the setup manual before operating the manipulator.
Descriptions of the programming pendant and playback panel keys, buttons, and displays are shown as follows:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Manual Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming Pendant</td>
<td><strong>Character Keys</strong> The keys which have characters printed on them are denoted with [ ]. ex. [ENTER]</td>
</tr>
<tr>
<td></td>
<td><strong>Symbol Keys</strong> The keys which have a symbol printed on them are not denoted with [ ] but depicted with a small picture. ex. page key [pag] The cursor key is an exception, and a picture is not shown.</td>
</tr>
<tr>
<td></td>
<td><strong>Axis Keys</strong> and “Number Keys” are generic names for the keys for axis operation and number input.</td>
</tr>
<tr>
<td></td>
<td><strong>Keys pressed simultaneously</strong> When two keys are to be pressed simultaneously, the keys are shown with a “+” sign between them, ex. [SHIFT]+[COORD]</td>
</tr>
<tr>
<td></td>
<td><strong>Displays</strong> The menu displayed in the programming pendant is denoted with { }. ex. {JOB}</td>
</tr>
<tr>
<td>Playback Panel</td>
<td><strong>Buttons</strong> Playback panel buttons are enclosed in brackets. ex. [TEACH] on the playback panel</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.
1 Outline

2 Applicable Stations

3 Operation

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  3.1.3 Precautions .......................................................3-3

4 Setting Parameters

5 Status Display

6 Precautions

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6.2 Precautions when Setting Station Axes ....................6-1
  6.2.1 Setting Mechanical Specifications .......................6-1
  6.2.2 Setting Motor Specifications ...............................6-1
  6.2.3 Setting the Rotating Direction .............................6-2
6.3 Setting the Home Position .................................6-2
6.4 Precautions upon Application
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  6.4.2 Coordinated Motion with TWIN-3A or TWIN-3B ..........6-2
1 Outline

When configuring the station axes in the XRC and using a single motor to control an axis with a heavy load applied during an operation, a large-capacity motor with sufficient capacity and torque is required. In this case, the station axis becomes very large and requires a wide space for equipment installation.

A system, where a station axis with a heavy load is operated by two motors may be built to provide the necessary motor capacity and torque.

In such a system, the two motors must be operated at the same time, or the system and station axes may be damaged.

Use the twin drive function to operate the motor on the slave axis side at the same time as the station master axis during teaching. This function economizes on system space and obtains sufficient motor power.
2 Applicable Stations

The twin drive function is valid only for the station axes that have been configured for the twin drive.
The following table lists the configurations and the three types of stations where the twin drive can be used.

<table>
<thead>
<tr>
<th>Station type</th>
<th>Configuration</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of station axes</td>
<td>Master axis</td>
</tr>
<tr>
<td>TWIN -3A (TDT3A)</td>
<td>3 axes</td>
<td>Second axis</td>
</tr>
<tr>
<td>TWIN -3B (TDT3B)</td>
<td>3 axes</td>
<td>First axis</td>
</tr>
<tr>
<td>TWIN -2 (TDT2)</td>
<td>2 axes</td>
<td>First axis</td>
</tr>
</tbody>
</table>

The above three station types can be selected when setting the station axis for the system configuration.
3 Operation

When the station axis with the twin drive is selected for the axis operation, the twin-driven axes (master axis and slave axis) can be operated at the same time by a single instruction. Station axis operation and teaching can be easily performed when teaching. During playback, the axes move according to the taught job data.

3.1 Axis Operation

When the station axis with the twin drive is selected for the axis operation, the following motion is performed.

For the station axis with the twin drive, press the master axis key, and the slave axis and the master axis move at the same time. However, the external input signal specified by the parameters restricts the axis as outlined in the following table.

<table>
<thead>
<tr>
<th>External input signal</th>
<th>ON</th>
<th>Single motion mode</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OFF</td>
<td>Twin motion mode</td>
</tr>
</tbody>
</table>

The following describes each mode.
3.1 Axis Operation

3.1.1 Twin Motion Mode

When using the twin drive, the axes can move in twin motion mode. When the specified external input status is OFF, the axes move in the twin (concurrent) motion mode.

[Example] For TWIN-2
Press the 1st axis key to move the 2nd axis and the 1st axis at the same time. In this case, no axis moves when the 2nd axis key is pressed.

Pressing the master axis key moves both axes at the same time.

The slave axis key is invalid.
3.1.2 Single Motion Mode

In this mode, the master axis and the slave axis move individually. When the specified external input status is ON, each axis moves in a single motion.

[Example] For TWIN-2
Press the 1st axis key or the 2nd axis key to move the corresponding axis only.

3.1.3 Precautions

Select either the twin motion mode or the single motion mode by external input before starting the axis operation.
The motion mode does not change when the external input status is changed while an axis key is pressed.
The motion mode is determined according to the external input status that exists when the axis key is pressed, not after.
3.1 Axis Operation
4 Setting Parameters

In the twin drive, the status of external general-purpose input signal determines the mode as the twin motion or single motion.
The following parameters specify the general-purpose input numbers.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>S4C040</td>
<td>Station 1</td>
</tr>
<tr>
<td>S4C041</td>
<td>Station 2</td>
</tr>
<tr>
<td>S4C042</td>
<td>Station 3</td>
</tr>
<tr>
<td>S4C043</td>
<td>Station 4</td>
</tr>
<tr>
<td>S4C044</td>
<td>Station 5</td>
</tr>
<tr>
<td>S4C045</td>
<td>Station 6</td>
</tr>
</tbody>
</table>

General-purpose input number specification in the twin drive

When general-purpose input numbers are not set to the above parameters (when “0” is set) for the station axes with twin drive function, the twin motion is the default mode.
5 Status Display

The application status of the twin drive function can be confirmed.

Operation

Select {ROBOT} from the menu ➔ Select {TWIN DRIVE}*1

Explanation

*1 The twin drive display appears.

<table>
<thead>
<tr>
<th>TWIN DRIVE</th>
<th>MASTER</th>
<th>SUB</th>
<th>INPUT NO.</th>
<th>MODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>1-AXIS</td>
<td>3-AXIS</td>
<td>01</td>
<td>TWIN</td>
</tr>
<tr>
<td>S2</td>
<td>2-AXIS</td>
<td>3-AXIS</td>
<td>02</td>
<td>SINGLE</td>
</tr>
</tbody>
</table>

MASTER: The number of the master axis appears when the twin drive function is used.

SUB: The number of the slave axis appears when the twin drive function is used.

INPUT NO.: The general-purpose input number set for the parameter appears. When there is not set general-purpose input number, “----” appears.

MODE: The external input signal status appears.

“TWIN”: The specified general-purpose input is OFF.
The twin (concurrent) motion is possible.

“SINGLE”: The specified general-purpose input is ON.
The single motion is possible.
6 Precautions

Observe the following precautions when using the twin drive.

6.1 Precautions when selecting Motor

When using the twin drive, both twin-driven axes have to move in the same way and the same level for both axis operation and playback. Use the same motors for the twin-driven axes.

6.2 Precautions when Setting Station Axes

To use the twin drive function, the station axes must be in maintenance mode. Note the following precautions when setting the station axes.


6.2.1 Setting Mechanical Specifications

When setting the station axis, enter the following data for the mechanical specifications.

- MOTION RANGE (+)
- MOTION RANGE (-)
- REDUCTION RATIO (NUMER)
- REDUCTION RATIO (DENOM)

When using the twin drive, both twin-driven axes have to move in the same way and the same level for both axis operation and playback. Set the same condition data for both axes.

6.2.2 Setting Motor Specifications

When setting a station axis, enter the following data for the motor specifications.

- ROTATION DIRECTION (NORMAL/REVERSE)
- MAX. RPM
- ACCELERATION TIME
- INERTIA RATIO

When using the twin drive function, both twin-driven axes have to move in the same way and the same level for both axis operation and playback. Set the same condition data for “MAX. RPM”, “ACCELERATION TIME”, and “INERTIA RATIO” of both axes.
6.3 Setting the Home Position

6.2.3 Setting the Rotating Direction

When using the twin drive, specify the same motor rotating direction for both twin-driven axes. Specifying a different direction for each axis may damage a jig and break down the system. Before using the twin drive, confirm the rotating direction of the twin-driven axes to set the correct rotating direction.

6.3 Setting the Home Position

Operate the two station axes configured for the twin drive at the same time and teach the home position so that the two axes have the same “0” position. Because the two axes have the same “0” pulse position, axis operation and playback can be performed with the same pulse value.

6.4 Precautions upon Application with Coordinated Motion

The station coordinated function can be used as an option. The following restrictions apply for the station axes with the twin drive.

6.4.1 Coordinated Motion with TWIN-2

When the robot moves in a coordinated motion using TWIN-2, the coordinated motion is applied to the 1st station axis. The 2nd station axis and the 1st station axis move in twin drive. Calibrate the 1st station axis only. The coordinated motion is not valid for the 2nd station axis.

6.4.2 Coordinated Motion with TWIN-3A or TWIN-3B

When the robot moves in a coordinated motion using TWIN-3A or TWIN-3B, the coordinated motion is applied to the station configured by the 1st station axis and the 2nd station axis. The 1st, 2nd, and 3rd station axes move in the twin drive. Calibrate the station configured by the 1st and 2nd station axes. The coordinated motion is not valid for the 3rd station axis.
YASNAC XRC OPTIONS
INSTRUCTIONS
FOR TWIN DRIVE FUNCTION

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