PAINT WORKPIECE SUPPLYING SYSTEM
MOTOFEEDER OPERATING INSTRUCTIONS

TYPE:
YR-MF414B-A00(-B00), YR-MF214B-A00(-B00) (ARM LENGTH: 1400mm, WITHOUT MANIPULATOR)
YR-MF416A-A00(-B00), YR-MF216A-A00(-B00) (ARM LENGTH: 1600mm, WITH MANIPULATOR)
YR-MF416B-A00(-B00), YR-MF216B-A00(-B00) (ARM LENGTH: 1600mm, WITHOUT MANIPULATOR)
YR-MF418A-A00(-B00), YR-MF218A-A00(-B00) (ARM LENGTH: 1800mm, WITH MANIPULATOR)
YR-MF418B-A00(-B00), YR-MF218B-A00(-B00) (ARM LENGTH: 1800mm, WITHOUT MANIPULATOR)
※-A00 : Japanese standard -B00 : FM standard

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

MOTOFEEDER INSTRUCTIONS
MOTOFEEDER INSTRUCTIONS
NX100 INSTRUCTIONS
NX100 OPERATOR’S MANUAL FOR PAINTING APPLICATION
NX100 MAINTENANCE MANUAL
MOTOMAN-EPX1250 INSTRUCTIONS
MOTOMAN-EPX1250 INSTRUCTIONS SUPPLEMENT
MOTOMAN-EPX2050 INSTRUCTIONS

The NX100 operator’s manuals above correspond to specific usage. Be sure to use the appropriate manual.
MOTOFEEDER

MANDATORY

• This manual describes the specifications, precautions for operation and required items for maintenance or inspections, for proper application of the MOTOFEEDER. Read this manual carefully and be sure to understand its contents before handling the MOTOFEEDER.

• General items related to safety are listed in Chapter 1: Safety of the NX100 Instructions. To ensure correct and safe operation, carefully read the NX100 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.
NOTES FOR SAFE OPERATION

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

To ensure safe and efficient operation at all times, be sure to follow all instructions, even if not designated as “CAUTION” and “WARNING.”
Before operating the MOTOFEEDER, check that servo power is turned OFF when the emergency stop buttons on the front door of the NX100, operation BOX and programming pendant are pressed. When the servo power is turned OFF, the SERVO ON LED on the programming pendant is turned OFF.

Injury or damage to machinery may result if the emergency stop circuit cannot stop the MOTOFEEDER during an emergency.

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 MOTOFEEDER motion.

Observe the following precautions when performing teaching operations within the P-point maximum envelope of the manipulator:

- View the MOTOFEEDER 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 MOTOFEEDER operation may result in injury.

Confirm that no persons are present in the P-point maximum envelope of the MOTOFEEDER and that you are in a safe location before:

- Turning ON the NX100 power
- Moving the MOTOFEEDER 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 MOTOFEEDER during operation. Always press an emergency stop button immediately if there are problems. The emergency stop buttons are located on the right of the front door of the NX100, operation BOX and the programming pendant.
CAUTION

- Perform the following inspection procedures prior to conducting MOTOFEEDER teaching. If problems are found, repair them immediately, and be sure that all other necessary processing has been performed.
  - Check for problems in MOTOFEEDER movement.
  - Check for damage to insulation and sheathing of external wires.
- Always return the programming pendant to the hook on the NX100 cabinet after use.
  The programming pendant can be damaged if it is left in the P-point maximum envelope of MOTOFEEDER, on the floor, or near fixtures.
- Read and understand the Explanation of the Warning Labels in the NX100 Instructions before operating the MOTOFEEDER.

Definition of Terms Used Often in This Manual

The MOTOFEEDER is the product of YASKAWA industrial robot workpiece supplying system. The MOTOFEEDER usually consists of the MOTOFEEDER (the main body of workpiece supplying system), the controller, the programming pendant, and the manipulator cables. In this manual, the equipment is designated as follows:

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<th>Manual Designation</th>
</tr>
</thead>
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<td>NX100 controller</td>
<td>NX100</td>
</tr>
<tr>
<td>NX100 programming pendant</td>
<td>Programming Pendant</td>
</tr>
<tr>
<td>Cable between the workpiece delivery system and the controller</td>
<td>Manipulator cable</td>
</tr>
</tbody>
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1 MOTOFEEDER Overview

The MOTOFEEDER is the turntable-typed workpiece supplying equipment with the external 2-axis structure.

The MOTOFEEDER operations are controlled by the concurrent I/O and JOB of the NX100. (The specific operation program is incorporated in the robot controller.)

The operation including the paint operation can be performed by installing wiring, setting the initial settings, and creating paint programs.

The MOTOFEEDER transfers the workpiece set on the workpiece set side to the paint application side through large rotate axis.

The workpiece transferred to the paint application side is rotated through the small rotary axis, and is painted by the robot.

The small rotate axis enables the indexing and spindle motions, and those motions can be changed by the setting.

While the workpiece is painted on the paint application side, the workpiece can be set on the workpiece set side.

When the workpiece set is completed in the workpiece set side even if the work is in progress on the paint side, pressing the “Start” button makes the start reservation, and will rotate the large rotary axis to transfer the workpiece after the paint is completed.

To eject the last paint workpiece, pressing the “Complete” will rotate the large rotary axis to transfer the painted workpiece to the workpiece side.
2 Control Configuration

2.1 Control Axes

The NX100 controls the MOTOFEEDER operation with external 2-axis. The large rotary axis S1 and small rotary axis S2 are set as station axes. The small rotary axes A and B have the common station axis, and the station axis operates on only the paint application side.

Although the basic settings were set in shipping, change the setting when the workpiece to be loaded, moment of inertia including the jig, or equipment to be configured is changed.

As shown in the above figure, when the large rotary axis S1 is at the home position, the small rotary axis A side becomes the "paint application side".

Both the workpiece set position and the paint position of the large rotary axis S1 cannot be changed to a position other than 0° and 180° positions.
2.2 Restriction on Axis Motion

The MOTOFEEDER has a structure in which either of the small rotary axes A and B is selected and controlled by one motor. Therefore, the MOTOFEEDER cannot be operated under a condition other than the following conditions because of restriction of mechanical structure. Attempting to operate the MOTOFEEDER under a condition other than the following conditions will issue an alarm (in play mode) or a message (during teaching) about the axis block to block the motion. If this alarm or message is issued, adjust the position to meet the following conditions before performing the operation.

“Operational conditions”

<Condition under which the S1-axis can move>
The S1-axis can move only when the S2-axis stops at the home position

<Condition under which the S2-axis can move>
The S2-axis can move only when the S1-axis stops at 0° or 180° position
For the terminal arrangement definition of I/O signals and the capacity of I/O terminals, refer to "NX100 INSTRUCTIONS -PAINTING USE- SUPPLEMENTARY FOR EPX1250+MOTOFEEDER, EPX2050+MOTOFEEDER, 6 I/O Assignment Table".

※① Power cable
- EPX1250 mounted : (Power: 2 cables, Signal: 2 cables)
- EPX1250 non-mounted : (Power: 1 cables, Signal: 1 cables)
- EPX2050 non-mounted : (Power: 1 cables, Signal: 1 cables)
3.1.2 FM standard

For the terminal arrangement definition of I/O signals and the capacity of I/O terminals, refer to "NX100 INSTRUCTIONS -PAINTING USE- SUPPLEMENTARY FOR EPX1250+MOTOFEEDER, EPX2050+MOTOFEEDER, 6 I/O Assignment Table".

※① Power cable
with manipulator: (Power: 1 cables, Signal: 1 cables)
with MOTOFEEDER: (Power: 2 cables, Signal: 2 cables)

※② Power cable

※③ Intrinsically safe cable (Signal: 1 cable)

※④ Attached cable (Signal: 1 cable)

※⑤ Attached cable (Signal: 1 cable)

※⑥ Instrinsically safe cable (Signal: 1 cable)
4 Connection

Make cable connections from the manipulator and MOTOFEEDER by referring the next pages.

- For the connection to the primary source of the NX100, refer to “MOTOMAN SETUP MANUAL.”
- For the connection between the manipulator and the NX100, refer to “MANIPULATOR INSTRUCTIONS”.

Caution! The internal detection signal for the manipulator and the contact barrier A1 and B1 is of b contact type.

When connecting the field wiring, make sure to check that jumper wires are disconnected.
If the jumper wires are connected, the explosion-proof system does not function effectively.
A fire also may occur, therefore, make sure that jumper wires for A1 and B1 are disconnected.

- Releasing of door interlocking
It is a contact point used for area sensor or door interlocking.
When area sensor or door interlocking is not used, set a jumper or operation of the manipulator is not available.
4.1 Manipulator Type: EPX1250

4.1.1 Power Cable

4.1.2 Intrinsically Safe Cable
4.1.3 Operation BOX

Cable inlet for operation BOX cable

Back of NX100

Back of NX100 door

8XT terminals

Operation BOX cables

<table>
<thead>
<tr>
<th>8XT - 8</th>
<th>PB1</th>
</tr>
</thead>
<tbody>
<tr>
<td>8XT - 7</td>
<td>PB2</td>
</tr>
<tr>
<td>8XT - 34</td>
<td>PB (COM)</td>
</tr>
</tbody>
</table>
4. Connection

Disconnect the jumper wires (EMG1, EMG1(COM), EMG2, EMG2 (COM))

Operation BOX cables

<table>
<thead>
<tr>
<th>MXT</th>
<th>Operation BOX cables</th>
</tr>
</thead>
<tbody>
<tr>
<td>MXT - 19</td>
<td>EMG1 (COM)</td>
</tr>
<tr>
<td>MXT - 20</td>
<td>EMG1</td>
</tr>
<tr>
<td>MXT - 21</td>
<td>EMG2</td>
</tr>
<tr>
<td>MXT - 22</td>
<td>EMG2 (COM)</td>
</tr>
</tbody>
</table>
4.1.4 Release door interlock

If the are sensor or the doors is not used, please set a jumper to No. 5 and 33.
4.2 Manipulator Type: EPX2050

4.2.1 Power Cable

4.2.2 Intrinsically Safe Cable
4.2.3 Operation BOX

Back of NX100

Cable inlet for operation BOX cable

Back of NX100 door

8XT terminals

<table>
<thead>
<tr>
<th>8XT - 8</th>
<th>8XT - 7</th>
<th>8XT - 34</th>
</tr>
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Operation BOX cables

<table>
<thead>
<tr>
<th>PB1</th>
<th>PB2</th>
<th>PB (COM)</th>
</tr>
</thead>
</table>

4-7
4. Connection

Bottom inside of NX100

Disconnect the jumper wires

(EMG1, EMG1(COM), EMG2, EMG2 (COM))
Operation BOX cables

<table>
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</tr>
<tr>
<td>MXT - 22</td>
<td>EMG2 (COM)</td>
</tr>
</tbody>
</table>

4-8
4.2.4 Release door interlock

If you do not want to use the sensor area and doors, please jumper No. 5 and 33.
4 Connection

Make cable connections from the manipulator and MOTOFEEDER by referring the next pages.
・For the connection to the primary source of the NX100, refer to “MOTOMAN SETUP MANUAL.”
・For the connection between the manipulator and the NX100, refer to “MANIPULATOR INSTRUCTIONS”.

Caution! The internal detection signal for the manipulator and the contact barrier A1 and B1 is of b contact type.
When connecting the field wiring, make sure to check that jumper wires are disconnected.
If the jumper wires are connected, the explosion-proof system does not function effectively.
A fire also may occur, therefore, make sure that jumper wires for A1 and B1 are disconnected.
・Releasing of door interlocking
It is a contact point used for area sensor or door interlocking.
When area sensor or door interlocking is not used, set a jumper or operation of the manipulator is not available.
4.1 Manipulator Type: EPX1250

4.1.1 Power Cable

4.1.2 Intrinsically Safe Cable
4.1.3 Operation BOX

Cable inlet for operation BOX cable

Back of NX100

Back of NX100 door

8XT terminals

Operation BOX cables

8XT - 8 → PB1
8XT - 7 → PB2
8XT - 34 → PB (COM)
Bottom inside of NX100

Disconnect the jumper wires

(EMG1, EMG1(COM), EMG2, EMG2 (COM))
Operation BOX cables
4.1.4 Release door interlock

If the are sensor or the doors is not used, please set a jumper to No. 5 and 33.
4.2 Manipulator Type: EPX2050

4.2.1 Power Cable

4.2.2 Intrinsically Safe Cable
4.2.3 Operation BOX

Back of NX100

Cable inlet for operation BOX cable

Back of NX100 door

8XT terminals

| 8XT - 8 | PB1 |
| 8XT - 7 | PB2 |
| 8XT - 34 | PB (COM) |

(PB1, PB2, PB (COM)) Operation BOX cables
4. Connection

Bottom inside of NX100

MXT

Disconnect the jumper wires

(EMG1, EMG1(COM), EMG2, EMG2 (COM))
Operation BOX cables

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</tr>
<tr>
<td>MXT - 22</td>
<td>EMG2 (COM)</td>
</tr>
</tbody>
</table>
4.2.4 Release door interlock

If you do not want to use the sensor area and doors, please jumper No. 5 and 33.
5 Settings

Set the following settings depending on the MOTOFEEDER application. For instructions on how to change each variable, refer to “NX100 Operator’s Manual, 3.9.3 Editing User Variables”.

5.1 Settings of Indexing and Spindle

Set variables to select either of two painting systems: the painting is performed by rotating the MOTOFEEDER’s small rotary axis S2 at any position (indexing motion) and the paint is performed to the rotating workpiece with the small rotary axis S2 rotated at arbitrary speed (rpm) (spindle motion).

5.1.1 Variable Setting: Small Rotary Axis S2 Indexing Motion

Byte variable: B097 = 0

The indexing motion operates the small rotary axis S2 in synchronization with the manipulator. The paint job must be created that register the position of the small rotary axis S2 as well as the manipulator position.

5.1.2 Variable Setting: Small Rotary Axis S2 Spindle Motion

Byte variable: B097 = 1

The spindle motion operates the small rotary axis S2 asynchronously with the manipulator. The paint job must be created that registers the position of only the manipulator.
5. Set tings

5.2 Setting of Spindle Speed

When using the MOTOFEEDER’s small rotary axis S2 in the spindle motion, use a variable to set the rotation speed to be used.

**Byte variable: B000 = *** [rpm] (1-150 rpm)**

If the spindle motion speed (B00) is set to a value greater than 150 rpm, the speed is limited to 150 rpm.

5.3 Setting of Manipulator Work Standby Position

Register the robot work standby position (the common position where the robot stops before starting the paint operation and after the operation).

The work standby position must be registers, where there is no interference with the paint workpiece and jigs even if the MOTOFEEDER’s large rotary axis S1 or small rotary axis S2 stops or rotates.

**Position (robot) variable: P000 (robot work standby position)**
6 Creating Paint Jobs

Create the paint job (work job) depending on the MOTOFEEDER application.

6.1 Creating Paint Jobs for Indexing

6.1.1 Registration of Control Groups

Prepare to create the paint operation job in which the robot operation is synchronized with the small rotary axis S2.

Register the following control groups as new ones because they are not registered.

For instructions on how to register them, refer to "NX100 OPTIONS INSTRUCTIONS FOR INDEPENDENT/COORDINATED CONTROL FUNCTION, 2.4.1 Registering Group Combination".

For the registration of the control groups, the security must be set to [ADMINISTRATION MODE].

Combination group setting
- The first control group: R1
- The second control group: S2
- Master designation: **

6.1.2 Creating Paint Jobs

Create the paint operation job in which the robot operation is synchronized with the small rotary axis S2.

For instructions on how to create jobs, refer to “NX100 Operator's Manual, 3.1.3 Registration of Jobs”.

Select (R1 + S2) for the control group of the job to be registered.
6.1.3 Teaching

Perform teaching operations for motions of the robot and small rotary axis S2. Rotate the small rotary axis S2 on the paint application side to the position where the paint can be easily performed by the robot, and then perform teaching operations for the paint motions of the robot and small rotary axis S2.

- For the initial and end positions of the job, perform teaching operations with the robot on the work standby position and with the small rotary axis S2 at the home position (0°).
- The small rotary axis S2 cannot be operated unless the large rotary axis S1 is at 0° or 180° position.
- The large rotary axis S1 cannot be operated unless the small rotary axis S2 is at the home position (0°).

6.1.4 Job Example

[Reference paint job]

<table>
<thead>
<tr>
<th>Line</th>
<th>Instruction</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>NO P</td>
<td>Robot: work standby position</td>
</tr>
<tr>
<td>0001</td>
<td>MO VJ VJ=40.00</td>
<td>Robot to the start position (starting point of path 1)</td>
</tr>
<tr>
<td>0002</td>
<td>MO VJ VJ=40.00</td>
<td>Small rotary axis S2: rotate to the paint position ①</td>
</tr>
<tr>
<td>0003</td>
<td>SP YON</td>
<td>Spray ON</td>
</tr>
<tr>
<td>0004</td>
<td>MO VL V=400.0</td>
<td>Robot to the end point of path 1</td>
</tr>
<tr>
<td>0005</td>
<td>SP YOF</td>
<td>Spray OFF</td>
</tr>
<tr>
<td>0006</td>
<td>MO VL V=400.0</td>
<td>Small rotary axis S2: same as Step 2</td>
</tr>
<tr>
<td>0007</td>
<td>SP YON</td>
<td>Spray ON</td>
</tr>
<tr>
<td>0008</td>
<td>MO VL V=400.0</td>
<td>Robot to end point of path 2</td>
</tr>
<tr>
<td>0009</td>
<td>SP YOF</td>
<td>Spray OFF</td>
</tr>
<tr>
<td>0010</td>
<td>MO VJ V=40.00</td>
<td>Small rotary axis S2: home position (0°)</td>
</tr>
<tr>
<td>0011</td>
<td>END</td>
<td></td>
</tr>
</tbody>
</table>
6.1.5 Registration of Paint Jobs

To perform the operation including the MOTOFEEDER motion, register the created paint job in the registration table.
For instructions on how to register jobs in the register table, refer to “NX100 Operator’s Manual for Painting Application, 9.5.6 CALL”.
Register the paint job in the following location.

[Job registration table]
Table No.: 1

Paint job for the small rotary axis A: No. 0001
Paint job for the small rotary axis B: No. 0002

The common location is used for the paint job for indexing and the paint job for spindle.
When using the job with the method changed from indexing to spindle or from spindle to indexing, be sure to change the job in the job registration table depending on the method to be used.
6.2 Creating Paint Jobs for Spindle

6.2.1 Creating Paint Jobs

Create the paint operation job for only the robot motion. The job for the small rotary axis S2 for spindle motion does not need to be created because it is previously attached. For instructions on how to create jobs, refer to “NX100 Operator’s Manual, 3.1.3 Registration of Jobs”.

Select {R1} for the control group of the job to be registered.

![New Job Create Interface]

Enter a job name (a maximum of 8 one-byte characters)
Select {ROBOT JOB}
PRESS {EXECUTE} to create the job

6.2.2 Teaching

Perform teaching operations for the robot. Perform teaching operations for the paint operation for the workpiece rotated by the spindle motion.

- For the initial and end positions of the job, perform teaching operations with the robot on the work standby position.
- Because the spindle motion of the small rotary axis S2 is disabled during teaching, perform teaching operations on the assumption of the rotation.
- The small rotary axis S2 cannot be operated unless the large rotary axis S1 is at 0° or 180° position.
- The large rotary axis S1 cannot be operated unless the small rotary axis S2 is at the home position (0°).
6.2.3 Spindle Reverse Instruction

The spindle motion rotates in a given direction, and can be reversed by calling the following job at a desired location in the paint job.

Name of the job for reverse: SPIN_REV

6.2.4 Job Example

<table>
<thead>
<tr>
<th>Line</th>
<th>Instruction</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>NO P</td>
<td>Robot: work standby position (Step 1)</td>
</tr>
<tr>
<td>0001</td>
<td>MO VJ VJ=40.00</td>
<td>Robot: work standby position (Step 2)</td>
</tr>
<tr>
<td>0002</td>
<td>MO VJ VJ=40.00</td>
<td>Robot: to paint the start position (starting point of path 1)</td>
</tr>
<tr>
<td>0003</td>
<td>SP YON</td>
<td>Spray ON</td>
</tr>
<tr>
<td>0004</td>
<td>MO VL V=400.0</td>
<td>Robot: to the end point of path 1 (Step 3)</td>
</tr>
<tr>
<td>0005</td>
<td>MO VL V=400.0</td>
<td>Robot: to the end point of path 2 (Step 4)</td>
</tr>
<tr>
<td>0006</td>
<td>MO VL V=400.0</td>
<td>Robot: to the end point of path 2 (Step 5)</td>
</tr>
<tr>
<td>0007</td>
<td>SP YOF</td>
<td>Spray OFF</td>
</tr>
<tr>
<td>0008</td>
<td>CALL JOB: SPIN_REV</td>
<td>Calling the spindle reverse job (Step 6)</td>
</tr>
<tr>
<td>0009</td>
<td>MO VL V=400.0</td>
<td>Robot: to the starting point of path 3 (Step 7)</td>
</tr>
<tr>
<td>0010</td>
<td>SP YON</td>
<td>Spray ON</td>
</tr>
<tr>
<td>0011</td>
<td>MO VL V=400.0</td>
<td>Robot: to the end point of path 3 (Step 8)</td>
</tr>
<tr>
<td>0012</td>
<td>MO VL V=400.0</td>
<td>Robot: to the end point of path 4 (Step 9)</td>
</tr>
<tr>
<td>0013</td>
<td>MO VL V=400.0</td>
<td>Robot: to the end point of path 4 (Step 10)</td>
</tr>
<tr>
<td>0014</td>
<td>SP YOF</td>
<td>Spray OFF</td>
</tr>
<tr>
<td>0015</td>
<td>MO VJ V=40.00</td>
<td>Robot: work standby position (Step 10)</td>
</tr>
<tr>
<td>0016</td>
<td>END</td>
<td></td>
</tr>
</tbody>
</table>
6.2.5 Registration of Paint Jobs

To perform the operation including the MOTOFEEDER motion, register the created paint job in the registration table.

For instructions on how to register jobs in the register table, refer to “NX100 Operator’s Manual for Painting Application, 9.5.6 CALL”.

Register the paint job in the following location.

[Job registration table]
Table No.: 1

Paint job for the small rotary axis A: No. 0001
Paint job for the small rotary axis B: No. 0002

The common location is used for the paint job for indexing and the paint job for spindle.
When using the job with the method changed from indexing to spindle or from spindle to indexing, be sure to change the job in the job registration table depending on the method to be used.
7. Operation

7.1 Operational Preparation (NX100 Operation)

Use the following procedure to operate the NX110.
If the manipulator and the MOTOFEEDER are not at the work standby positions when the NX100 operation starts, they automatically move to the work standby position in the sequence of the manipulator, small rotary axis S2, and large rotary axis S1.
(The work standby position for the large rotary axis S1 of the MOTOFEEDER is 0° or 180° position.)

<table>
<thead>
<tr>
<th>Operating procedure</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Set the {MODE} key of the programming pendant to PLAY</td>
</tr>
</tbody>
</table>
| 2                   | Press the {SERVO ON READY} key on the programming pendant
|                     | SERVO becomes ON, and {SERVO ON} is lit on the programming pendant. After entering into the PLAY mode and SERVO ON, the master job is automatically called. |
| 3                   | Press the {START} key on the programming pendant
|                     | {START} is lit on the programming pendant, the operation start, and then the state becomes waiting for {START} from the operation BOX. |
# 7.2 Operation (Production Operation)

Use the following procedure to perform the paint operation by the MOTOFEEDER and manipulator. The paint operation is performed with the prepared job and the created paint job.

<table>
<thead>
<tr>
<th>Operating procedure</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Press the {START} button on the operation BOX</td>
<td>• The large rotary axis S1 rotates to transfer the set workpiece to the paint side and to paint the workpiece with the created paint job. (The spindle motion automatically rotates at the specified speed) • Pressing the {START} button again will transfer the workpiece on the workpiece set side to the paint side to paint the workpiece.</td>
</tr>
<tr>
<td>2 Press the {Complete} button on the operation BOX</td>
<td>The large rotary axis S1 rotates to transfer the painted workpiece to the workpiece set side. In this case, the manipulator does not perform paint operation.</td>
</tr>
</tbody>
</table>
8 Home Positioning

Home positioning

The data of home position data may be deleted when dismount the power cable. In this case, calibrate the home position again.

Home position calibration

MOTOFEEDER has [S1: Big rotation] part and [S2: Small rotation] part. Insert a specified aligning pin to each part and calibrate the respective home position, and then register.

■ Procedures

1. Register the home position of S2-axis (small rotation) first.
   Register the position without any modification since the position is calibrated before shipping.

   Note: Do not move the S2-axis till the home position is registered because it is already calibrated before shipping.

2. Move the S1-axis and register its home position.
   When adjusting the position, use the specified aligning pin.

Aligning Pin Position

Aligning pins are delivered with MOTOFEEDER, please use them.
9. Small rotation (S2) specification switching

Small rotation of the MOTOFEEDER(S2). There is a high speed and heavy specification. (Shown in Table 1 shows the basic specification list)

Perform the following, in the switching conditions of the specification.
・ Large rotation (S1) origin.
・ Small rotation (S2) origin.
・ Operation rights of management mode or above.

※ Specification switching, work qualified personnel please go.
・ " Robot school completers "
・ " Service company (back cover described) "
# Switching Procedure

1. Management mode in PP.
   "System" — "Security"

2. The switching function with an option screen.
   "System" — "Settings"

3. Switch a heavy load specification / high-speed rotation specification.

The switching procedure, please be performed in reference to the figure below.
9. Small rotation (S2) specification switching

(HeavyLoad ⇒ High-Speed)

(HeavyLoad ⇒ High-Speed)

(High-Speed ⇒ HeavyLoad)

(High-Speed ⇒ HeavyLoad)
4. Specifications after switching, execute the operation check.

※ NP by switching specification, is bonded to the MOTOFEEDER (nameplate)
There is a thing different formats. When contacting us, it is displayed in PP
(optional feature screen: MOTOFEEDER specification) format.
Format can also be seen in the robot axis configuration screen.
<table>
<thead>
<tr>
<th>Item</th>
<th>Type</th>
<th>YR-MF414B</th>
<th>YR-MF416A</th>
<th>YR-MF416B</th>
<th>YR-MF418A</th>
<th>YR-MF418B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of Freedom</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Allowable on-board mass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>40 kgf</td>
</tr>
<tr>
<td></td>
<td>S2: Table (heavy loading specifications)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S2: Table (high rotation specifications)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20 kgf</td>
</tr>
<tr>
<td>Repetitive Positioning Accuracy*2</td>
<td></td>
<td>±0.55 mm (S2: Table, R: 300 mm position)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motion Range</td>
<td></td>
<td>±180°</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S1: Arm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S2: Table</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Continuous rotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum Speed</td>
<td></td>
<td>120°/s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S1: Arm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S2: Table (heavy loading specifications)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>270°/s</td>
</tr>
<tr>
<td></td>
<td>S2: Table (high rotation specifications)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>900°/s</td>
</tr>
<tr>
<td>Allowable Moment of Inertia (GD²/4)</td>
<td></td>
<td>2.8 kg•m²</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S2: Table (heavy loading specifications)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.8 kg•m²</td>
</tr>
<tr>
<td></td>
<td>S2: Table (high rotation specifications)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.7 kg•m² / Table (double spindle)</td>
</tr>
<tr>
<td>Standard painting color</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>YE blue</td>
</tr>
<tr>
<td>Mass</td>
<td></td>
<td>400 kgf</td>
<td>430 kgf</td>
<td>416 kgf</td>
<td>420 kgf</td>
<td>406 kgf</td>
</tr>
<tr>
<td>Ambient Conditions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td>0 to +40°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td></td>
<td>20 to 80 %RH (non-condensing)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration</td>
<td></td>
<td>4.9 m/s² (0.5 G) or less</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Free from excessive electrical noise</td>
</tr>
<tr>
<td>Power Capacity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.5kVA</td>
</tr>
</tbody>
</table>

*1 SI units are used in this table. Gravitational unit are also described in parentheses.
*2 Conformed to JIS B 8432
PAINT WORKPIECE SUPPLYING SYSTEM
MOTOFEEDER OPERATING INSTRUCTIONS

HEAD OFFICE
2-1 Kurosakishiroishi, Yahatanishi-ku, Kitakyushu 805-0004 Japan
Phone +81-93-645-7745 Fax +81-93-645-7746

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 Nordic AB
Verkstadsgatan 2, PO Box 504, SE-385 25 Torsås, Sweden
Phone +46-480-417-800 Fax +46-486-414-10

YASKAWA Europe GmbH Robotics Div.
Kammerfeldstr. 1, 80591 Allershausen, Germany
Phone +49-8166-90-0 Fax +49-8166-90-103

YASKAWA Electric Korea Co., Ltd
9F, KYOBUS Securities Bldg., 26-4, Yeoido-Dong Yeoungdeungpo-ku, Seoul, KOREA
Phone +82-2-784-784 Fax +82-2-784-8495

YASKAWA Electric (Singapore) PTE Ltd.
151 Lorong Chuan, #04-02A, New Tech Park, Singapore 556741
Phone +65-6202-3003 Fax +65-6202-3003

YASKAWA Electric (Thailand) Co., Ltd.
262/246, 4F, Muang Thai-Phatra Office Tower II Rachadapisek Road, Huaykwang Bangkok, 10320 Thailand
Phone +66-2-693-2200 Fax +66-2-693-4200

YASKAWA Shougang Robot Co. Ltd.
No.7, Yongchang-North Road, Beijing E&T Development Area, China 100176
Phone +86-10-6788-0548 Fax +86-10-6788-0548-813

YASKAWA ELECTRIC (SHANGHAI) Co., Ltd.
No.18, Xiang Zhong Road, 17F, Harbour Ring Plaza, Shanghai 200001, CHINA
Phone +86-21-5385-055 Fax +86-21-5385-2770

YASKAWA Robotics India Ltd.
#426, Udyog Vihar, Phase-IV, Gurgaon, Haryana, India
Phone +91-124-475-8500 Fax +91-124-414-8016

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

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