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

MOTOMAN INSTRUCTIONS

FS100 INSTRUCTIONS
FS100 OPERATOR’S MANUAL
FS100 MAINTENANCE MANUAL

The FS100 operator’s manuals above correspond to specific usage. Be sure to use the appropriate manual.
MANDATORY

• This manual explains MotoFit pushing teaching function. Read this manual carefully and be sure to understand its contents before handling the FS100.

• General items related to safety are listed in the Chapter 1: Safety of the FS100 Instructions. To ensure correct and safe operation, carefully read the FS100 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 MOTOMAN-MPP3H.

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”, “WARNING” and “CAUTION”.

"Notes for Safe Operation"
WARNING

- Before operating the manipulator, check that servo power is turned OFF when the emergency stop button on the programming pendant is 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 manipulator during an emergency. The manipulator should not be used if the emergency stop buttons do not function.

*Figure 1: Emergency Stop Button*

- In the case of not using the programming pendant, be sure to supply the emergency stop button on the equipment. Then before operating the manipulator, check to be sure that the servo power is turned OFF by pressing the emergency stop button.
  Connect the external emergency stop button to the 5-6 pin and 16-17 pin of the robot system signal connector (CN2).
- Upon shipment of the FS100, this signal is connected by a jumper cable in the dummy connector. To use the signal, make sure to supply a new connector, and then input it.

If the signal is input with the jumper cable connected, it does not function, which may result in personal injury or equipment damage.
- 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.

*Figure 2: 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.
WARNING

- Confirm that no person is present in the manipulator’s operating range and that you are in a safe location before:
  - Turning ON the power for the controller
  - Moving the manipulator with the programming pendant.
  - Running the system in the check mode.
  - Performing automatic operations.

Injury may result if anyone enters the manipulator’s operating range during operation. Always press an emergency stop button immediately if there are problems.

The emergency stop button is located on the right side of the FS100 programming pendant.

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 FS100 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 Warning Labels in the FS100 Instructions before operating the manipulator.
Definition of Terms Used In this Manual

The MOTOMAN is the YASKAWA industrial robot product.

The MOTOMAN usually consists of the manipulator, the FS100 controller, manipulator cables, the FS100 programming pendant (optional), and the FS100 programming pendant dummy connector (optional).

In this manual, the equipment is designated as follows:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Manual Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>FS100 controller</td>
<td>FS100</td>
</tr>
<tr>
<td>FS100 programming pendant</td>
<td>Programming pendant</td>
</tr>
<tr>
<td>Cable between the manipulator and the controller</td>
<td>Manipulator Cable</td>
</tr>
<tr>
<td>Robot</td>
<td>Manipulator</td>
</tr>
<tr>
<td>FS100 programming pendant dummy connector</td>
<td>Programming pendant</td>
</tr>
</tbody>
</table>

Descriptions of the programming pendant keys, buttons, displays and keyboard of the PC 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 [ ]. e.g. [ENTER]</td>
</tr>
</tbody>
</table>
|                            | **Symbol Keys** The keys which have a symbol printed on them are not denoted with [ ] but depicted with a small picture. e.g. PAGE key
|                            | The cursor key is an exception, and a picture is not shown.                        |
|                            | **Axis Keys Numeric Keys** "Axis keys” and “Numeric keys” are generic names for the keys for axis operation and number input. |
|                            | **Keys Pressed Simultaneously** When two keys are to be pressed simultaneously, the keys are shown with a “+” sign between them. e.g. SHIFT key + COORD key |
|                            | **Mode Key** Three kinds of modes that can be selected by the mode key are denoted as follows: REMOTE, PLAY, or TEACH |
|                            | **Button** Three buttons on the upper side of the programming pendant are denoted as follows: HOLD button, START button, EMERGENCY STOP button |
|                            | **Displays** The menu displayed in the programming pendant is denoted with { }. e.g. {JOB} |
|                            | **PC Keyboard** The name of the key is denoted. e.g. Ctrl key on the keyboard     |
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.

Registered Trademark

In this manual, names of companies, corporations, or products are trademarks, registered trademarks, or brand names for each company or corporation. The indications of (R) and TM are omitted.
Customer Support Information

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

(937) 847-3200

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

technical@motoman.com

When using e-mail to contact Motoman Customer Support, please provide a detailed description of your issue, along with complete contact information. Please allow approximately 24 to 36 hours for a response to your inquiry.

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

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

- System: MotoFit Pushing Teaching Function
- Robots: ___________________________
- Primary Application: ___________________________
- Controller: FS100
- 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 FS100 controller data plate
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2 Operation Procedure .................................................................................................................................. 2-1
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   2.3 Converting a Job (Creating a Pushing Teaching Job) .................................................................... 2-4
      2.3.1 Setting Force Condition File .................................................................................................. 2-4
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1 MotoFit Pushing Teaching Function

1.1 Outline of the Function

MotoFit pushing teaching function automatically creates a “pushing operation job” which controls positions pushed by a tool on a workpiece as teaching points.

* The “pushing operation job” created by this function is not force control but position control.

The MotoFit pushing teaching function is configured by pushing teaching instructions and pushing teaching job creating function.

There are three types of pushing teaching instructions.

• SKILLSND"FTON:
  An instruction to start the pushing teaching function

• SKILLSND"FTOF:
  An instruction to write the pushing teaching result

• FTEACH (macro instruction)
  An instruction to execute the pushing teaching operation

A pushing teaching job is configured by a step to teach the pushing start position and above instructions.

The pushing teaching job creating function creates a pushing teaching job, using the engineering support tool. (Hereinafter, it is described as FSE-Tool.) A “pushing operation job” can be automatically created by executing this pushing teaching job. The pushing teaching job creating function using FSE-Tool enables to create a pushing teaching job easily from a job which teaches only the pushing start position. (Hereinafter, it is described as a “source job”.)

For details on MotoFit function, refer to “FS100 OPTIONS INSTRUCTIONS for MotoFit”, and on FSE-Tool, refer to “FS100 OPTIONS INSTRUCTIONS” For MotoFit Function Engineering Support Tool.

1.2 Supported Version

• FS100 MotoFit application version: from AP001BMP08.00A(JP/US)-00
• FSE-Tool: from PCA6.00.00A(JP_US)-00

*How to check the version

• MotoFit application version
  Select “VARIABLE” under the main menu on the programming pendant. Then select “STRING”. The version can be checked at S098 and S099.

• FSE-Tool version
  Right-click FSE-Tool.exe. on the customer’s computer. Then click “Properties.” The version can be checked at “Description” in “General” tab.

Contact your Yaskawa representative when the application version does not fulfill the above condition.
2 Operation Procedure

Following is the procedure to create a “pushing operation job” by the MotoFit pushing teaching function.

2.1 Outline of the Procedure

There are three steps in the procedure.

**Step 1: Create a source job**
Teach a source job with the programming pendant.

**Step 2: Convert a job (create a pushing teaching job)**
Create a pushing teaching job from a source job, using FSE-Tool.

**Step 3: Execute pushing teaching operation**
Execute the pushing teaching job with the programming pendant, which creates a “pushing operation job”.

[Diagram:
1. create a source job
   ↓
2. convert a job (create a pushing teaching job)
   ↓
3. execute pushing teaching operation
   ↓
   …explained in chapter 2.2
   …explained in chapter 2.3
   …explained in chapter 2.4]
2.2 Creating a Source Job

As an example, creating a “pushing operation job” along with the workpiece edge is described below.

Create a job (a source job) shown in the following figure: the teaching points are a few millimeters away from the actual positions to be pushed. The job is named as “Test” here.

*Fig. 2-1: Creating a Source Job*

[Note 1] When teaching a source job, make the posture almost at right angles to the pushing direction of Z-axis in the tool coordinate (Z+ direction).

[Note 2] Every interpolation for a source job should be MOVL (linear interpolation). If move instruction MOVJ, MOVC or IMOV is used for a source job, it is impossible to convert to a pushing teaching job.
2 Operation Procedure

2.2 Creating a Source Job

[Note 3] When comments “AIRCUTON” and “AIRCUTOFF” are inserted in a source job, pushing teaching operation for the teaching points between the comments is disabled (pushing teaching operation is omitted) in a pushing teaching job. In the following example, pushing teaching operation for step 1 to 3 is disabled. Note that pushing teaching operation for the first and the last steps is disabled whether there are comments or not.

(Example) When comments “AIRCUTON” and “AIRCUTOFF” are inserted.

| 0000 | NOP |
| 0001 | ’AIRCUTON |
| 0002 | 0001 MOV L V=11.7 |
| 0003 | 0002 MOV L V=11.7 |
| 0004 | 0003 MOV L V=11.7 |
| 0005 | ’AIRCUTOFF |
| 0008 | 0004 MOV L V=11.7 |
| 0007 | 0005 MOV L V=11.7 |
| 0009 | 0006 MOV L V=11.7 |
| 0007 | 0007 MOV L V=11.7 |
| 0010 | 0008 MOV L V=11.7 |
| 0011 | END |
2.3 Converting a Job (Creating a Pushing Teaching Job)

Following is the procedure to create a pushing teaching job from a source job, using FSE-Tool. For details on the operation procedure of FSE-Tool, refer to “FS100 OPTIONS INSTRUCTIONS For MotoFit Function Engineering Support Tool”.

2.3.1 Setting Force Condition File

Start FSE-Tool and set the force condition file as follows.

**a.** Select “Setting Force Condition File” among the tabs at the top of the window.

**b.** Input a file number.

**c.** Press “Receive” button. The dialog described “The force condition file was received” appears. Then press “OK”.

**d.** Set “R1” to Robot. When the control group in the source job is R2, select “R2”.

**e.** Set “Robot” to Coordinate.

**f.** Input a tool number used in the source job.

**g.** Set “X, Y, Z: enable” and “Rx, Ry, Rz: disable” to Force control.

**h.** Press “Send” button. The dialog described “The force condition file was sent” appears. Then press “OK”.

Setting the force condition file is completed.
2.3.2 Creating a Pushing Teaching Job

Create a pushing teaching job as follows.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Select “FTEACH” among the tabs at the top of the window.</td>
</tr>
</tbody>
</table>
| b.   | Input a job name created in section 2.2 in original job.  
      (Input “Test” in this example.) |
| c.   | Press “STEP 1” button. The dialog described “-STEP1 COMPLETED-”  
      appears. Then press “OK”. |
| d.   | Two prospected lines of pushing teaching directions (red and blue  
      lines) appears in the graph at the right of the window. |
| e.   | Select a pushing teaching direction (A or B). Direction A is the red line  
      and direction B is the blue line. |
| f.   | Input a number set in section 2.3.1 in force condition file. |
| g.   | Input a value in force. Decide the value based on the force to push a  
      tool against a workpiece. |
| h.   | Input the operation speed of “pushing operation job” in velocity. |
| i.   | Press “STEP 2” button. The dialog described “-STEP2 COMPLETED-”  
      appears. Then press “OK”. |
| j.   | Creating a pushing teaching job is completed when it is confirmed that  
      job names displayed in created job 1 and created job 2 have sent to the  
      FS100. (In this example, created job 1 is “Test A” and created job 2 is  
      “Test B”). |
2.4 Executing Pushing Teaching Operation

Execute the pushing teaching job (the converted job) created in section 2.3 to perform the pushing teaching operation.

2.4.1 Explanation

The job created in section 2.3 is configured as follows.

<table>
<thead>
<tr>
<th>Created job 1: Test A</th>
<th>Created job 2: Test B</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOP</td>
<td>NOP</td>
</tr>
<tr>
<td>SKILLSND “FTON:Test B”</td>
<td>MOVL V= · · ·</td>
</tr>
<tr>
<td>MOVL···</td>
<td>:</td>
</tr>
<tr>
<td>FTEACHR1···</td>
<td>[b]</td>
</tr>
<tr>
<td>:</td>
<td>[c]</td>
</tr>
<tr>
<td>MOVL···</td>
<td>:</td>
</tr>
<tr>
<td>FTEACHR1···</td>
<td></td>
</tr>
<tr>
<td>SKILLSND “FTOF”</td>
<td>[d]</td>
</tr>
<tr>
<td>END</td>
<td>END</td>
</tr>
</tbody>
</table>

The created job 1 ("Test A") is configured by adding pushing teaching instructions to the source job. The created job 2 ("Test B") differs only in the operation speed from the source job.

[Explanation]

a. SKILLSND "FTON" instruction is added to the top of the job. This is an instruction to start the pushing teaching function.

b. FTEACHR1 instruction is added after the step taught in the source job. This is an instruction to execute the pushing operation.

c. From here, FTEACHR1 instruction is respectively added after every step taught in the source job.

d. SKILLSND "FTOF" instruction is added to the last line of the job. This is an instruction to write the pushing teaching result. If the instruction is executed, the teaching position of the job specified by SKILLSND "FTON" instruction ("Test B") is rewritten to the position performed the pushing teaching operation by FTEACHR1 instruction.
2.4.2 Execution Procedure

Execute the created job 1(Test A) from the top. When executing the job to the last line, the teaching position of created job 2(Test B) is changed to the pushing teaching position.

[Note 1] The created job 1 can be executed in test run operation. FTOF button (see the following figure) on the interface panel is also available instead of the SKILLSND"FTOF" instruction.
3 Pushing Teaching Instruction

The following three instructions are used in the MotoFit pushing teaching function.

- SKILLSND"FTON"
- SKILLSND"FTOF"
- FTEACH (macro instruction)

3.1 SKILLSND“FTON”

SKILLSND“FTON” is an instruction to start the pushing teaching function. Executing the instruction enables the pushing teaching operation. The job written in the instruction parameter is the pushing operation job (the destination to write the pushing teaching result).

Input the parameter of the SKILLSND instruction as follows.

Parameter 1: A job to write the teaching result

Specifies a job name to write the pushing teaching result. Up to 27 letters can be input for a job name.

3.2 SKILLSND“FTOF”

SKILLSND“FTOF” is an instruction to end the pushing teaching function and write the teaching result. When the instruction is executed, the teaching position of the job specified by FTOF instruction is changed to the position performed the pushing teaching operation by FTEACH instruction.

Input the parameter of the SKILLSND instruction as follows. (only the character string FTON)
3.3 FTEACH (Macro Instruction)

FTEACH is an instruction to execute the pushing teaching operation. When the instruction is executed, the pushing operation in the direction specified by the force command value is performed. When the bigger force than the force threshold is added by touching the workpiece, the position at that time is recorded and the pushing operation ends. Unless the FTOF instruction is executed, the pushing position recorded by the FTEACH instruction is not written to the job.

This is a macro instruction. Use FTEACHR1 when the corresponding manipulator is R1 and FTEACHR2 when it is R2.

Parameters of macro instruction are as follows.

Parameter 1: pushing mode (M)
Is an option to specify the pushing mode.
[0: Disable (omit the pushing operation)  1: Enable]

Parameter 2: step number (ST)
Specifies a step to write the pushing teaching position
When specifying the first step of the job, set 0.

Parameter 3: force condition file
Specifies a force condition file number. Setting range: 1 to 24

Parameter 4: force command value X (FX)
Sets a force command value in X direction (robot coordinate).
The unit is N (newton).

Parameter 5: force command value Y (FY)
Sets a force command value in Y direction (robot coordinate).
The unit is N (newton).

Parameter 6: force command value Z (FZ)
Sets a force command value in Z direction (robot coordinate).
The unit is N (newton).

Parameter 7: force detection threshold value
Sets a force detection threshold value.
The unit is N (newton).
The pushing operation is continued until the force detected by the sensor (resultant force of X, Y and Z directions) exceeds the setting value.

Parameter 8: convergence waiting time
Sets the waiting time until the pushing operation converges.
The unit is second.
When there is no specified value, set 0.5.

Parameter 9: pushing return ratio
Is a value to adjust the start position before the pushing operation.
When there is no specified value, set 1.0.
4 Alarm and Error

4.1 Alarm

For alarms of pushing teaching instructions, refer to the following table.

For other alarms related to Motofit than the followings, refer to "FS100 OPTIONS INSTRUCTIONS for MotoFit".

<table>
<thead>
<tr>
<th>Alarm No.</th>
<th>Alarm name</th>
<th>Meaning</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>8002</td>
<td>ALM_FSE-TOOL CMD NONE</td>
<td>(Command confirmation error of FSE-Tool)</td>
<td>Sub code: 0 Software (version)</td>
<td>MotoFit application version may be old. Refer to section 1.2 of this manual and check the version. When it is not the supported version, contact your YASKAWA representative.</td>
</tr>
<tr>
<td>8029</td>
<td>ALM_FTEACH (pushing teaching instruction error)</td>
<td>Sub code: 0 Software (setting error)</td>
<td>Sub code: 1 Operation</td>
<td>Execution order of instructions is wrong. Execute FTON instruction first.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sub code: 2 Operation</td>
<td>A wrong job is specified by FTON instruction. Check the specified job contents.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sub code: 3 Operation</td>
<td>Parameter of FTON instruction is wrong. Check the description.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Parameter of FTEACH instruction is wrong. Check the setting value.</td>
</tr>
</tbody>
</table>
### 4.2 Error (PC Application)

Following is the error list for creating pushing teaching job by FSE-tool. For other errors than the followings, refer to “FS100 OPTIONS INSTRUCTIONS For MotoFit Function Engineering Support Tool”.

<table>
<thead>
<tr>
<th>Type</th>
<th>Error No.</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Errors starting with E40</td>
<td>5</td>
<td>Unable to be converted. Following jobs are unable to be converted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Multiple control groups (R1+R2, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Relative jobs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Move instructions using P variables to parameters</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Unable to be converted when parameter information comments at the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>job header are input.</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Other instructions than MOVL are used.</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>Failed to load the job (sending from PC to the FS100)</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Unable to be converted when alarm occurs.</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>Failed to operate the job because of edit lock</td>
</tr>
<tr>
<td>Errors starting with F-</td>
<td>1</td>
<td>Unable to calculate the pushing position when the same position is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>continuously taught. (Unable to set the same position within two steps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>before and after.)</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Lack of teaching step numbers. (At least three steps are necessary.)</td>
</tr>
</tbody>
</table>
FS100 OPTIONS
INSTRUCTIONS
For MotoFit Pushing Teaching Function

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