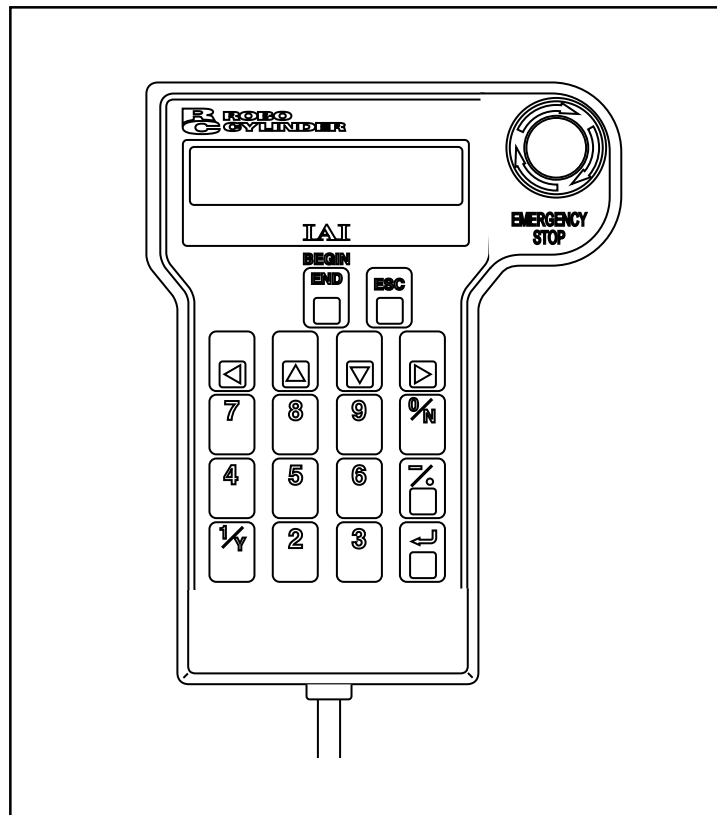


Robo Cylinder Controller Teaching Pendant RCA-E Operating Manual



Intelligent Actuator, Inc.

This publication was written to assist you in better understanding this part of your IA system. If you require further assistance, please contact IA Technical Support. For Central and East Coast Time Zones, please call our Itasca, IL office at 1-800-944-0333 or FAX 630-467-9912. For Mountain and Pacific Time Zones, please call our Torrance, CA office at 1-800-736-1712 or FAX 310-891-0815; Monday thru Friday from 8:30 AM to 5:00PM.



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1. Foreword

Thank you very much for purchasing the Easy Type Teaching Pendant (RCA-E) for the Robo Cylinder Controller. Without knowing beforehand how to correctly use or operate the Teaching Pendant, not only will the user be unable to take full advantage of all the functions built into this product but the user might also inadvertently cause damage to the Controller or shorten its life. Please carefully read this manual as well as other manuals pertaining to the product to acquire an understanding of the proper method of handling and operating the controller. Keep this manual handy so that you can refer to the appropriate sections as the need arises.

* All precautions have been taken to ensure the accuracy of the contents of this manual. However, if you become aware of any inaccuracies or discrepancies, please contact your IAI sales representative or technical service department.

2. Before You Begin

! A word of Caution

- (1) Please read this manual carefully to operate the controller properly.
- (2) You are not allowed to reproduce this manual or any portion thereof without permission.
- (3) We cannot accept any responsibility for possible damage resulting from the use of this manual.
- (4) We reserve the right to change the information contained in this manual without prior notice.

! Emergency Procedures

If hazardous conditions arise while using the controller, immediately turn OFF all power switches for the controller and any devices connected to it, or pull all the power plugs from the electric outlet. (“Hazardous condition” refers to excessive heat, smoke or flames coming from the controller or any conditions which might lead to fire or cause damage to the controller.)

3. Safety Precautions

Please read the following carefully in order to gain an understanding of safety precautions.

This product was developed as components for driving automated equipment and is not designed to produce greater torquing or speed than is necessary. However, strictly observe the following items to prevent any accidents from occurring:

1. As a rule, any handling or operating methods not described in this manual should be viewed as things that should not be attempted. Please contact the company if any portion of the contents of this manual are unclear.
2. Use only the products specified for wiring between the actuator and controller.
3. Stand clear of the operating range of the machine when it is in motion or is ready to operate. Surround the system with safety partitions if there is a possibility that people can enter the area where the machine is being used.
4. When assembling, adjusting, or performing maintenance on the machine, always disengage the power supply to the controller. During work, display a sign stating work in progress where it is readily visible. Also, keep the power cable close to the operator so that another person cannot inadvertently switch on the power.
5. When more than one person is working on the system, agree on signals beforehand to ensure everyone's safety before beginning work. In particular, when doing work involving axis movement, always call out for everyone's safety regardless of whether power is ON or OFF, or the axis is to be mechanically driven or manually moved.
6. When the user needs to lengthen the cables, check the wiring carefully to make sure it is correct before turning the power ON since miswiring can lead to misoperation.
7. Do not change the controller parameters without first consulting with an Intelligent Actuator representative. Any alternation to the parameters not suggested by IA technical staff will void the user warranty and lead to damage of equipment.

4. Warranty and Scope of Warranty

The Easy Type Teaching Pendant undergoes stringent testing before it is shipped from our factory. IAI provides the following warranty.

(1) Warranty Period

The warranty period is 12 months from the date the unit is shipped to the customer.

(2) Scope of Warranty

If within the period specified above, a breakdown occurs while operating the controller under normal conditions and is clearly the responsibility of the manufacturer, IAI will repair the unit at no cost. However, the following items are not covered by this warranty.

- Faded paint or other changes that occur naturally over time.
- Consumable components that wear out with use (battery, etc.).
- Unit seems to be noisy or similar impressions that do not affect machinery performance.
- Damage resulting from improper handling or use.
- Damage resulting from user error or failure to perform proper maintenance.
- Any alterations not authorized by IAI or its representatives.
- Damage caused by fire and other natural disasters or accidents.

The warranty pertains to the purchased product itself and does not cover any loss that might arise from a breakdown of the product. Any repairs will be done at our factory.

(3) Service

The purchase price of the product does not include programming or expenses for sending technicians to the customer's site. Even if the product is still under the warranty period, separate charges will be assessed for the following services.

- Assistance with unit installation or trial operation.
- Inspection and maintenance.
- Technical training on controller operation, wiring or programming.
- Any other services or work for which IAI normally assesses separate charges.

5. Application Environment

- In order to avoid breakdown, please do not apply any type of machinery impact onto the Teaching Pendant.
- Always hold onto the entire Teaching Pendant Body so that the Teaching Pendant Cable does not get pulled by unwanted cables.

Caution:

This Teaching Pendant is designed exclusively for the IAI RC Controller, and should not be used to connect with other devices.

Caution regarding controller connection:

Please turn the controller front side port switch OFF before connecting to the controller.

Caution regarding controller connection:

Please turn the controller front side port switch OFF before connecting to the controller.

6. Teaching Pendant Functions and Specifications

This Teaching Pendant was created exclusively for the RC Controller.

Through the communication between the controller, the RC Teaching Pendant is designed to function as the Display Operation Unit to edit or display the data (common data, move point data, etc..) that is stored inside the controller, as well as to execute teaching without using the PC Interface Software.

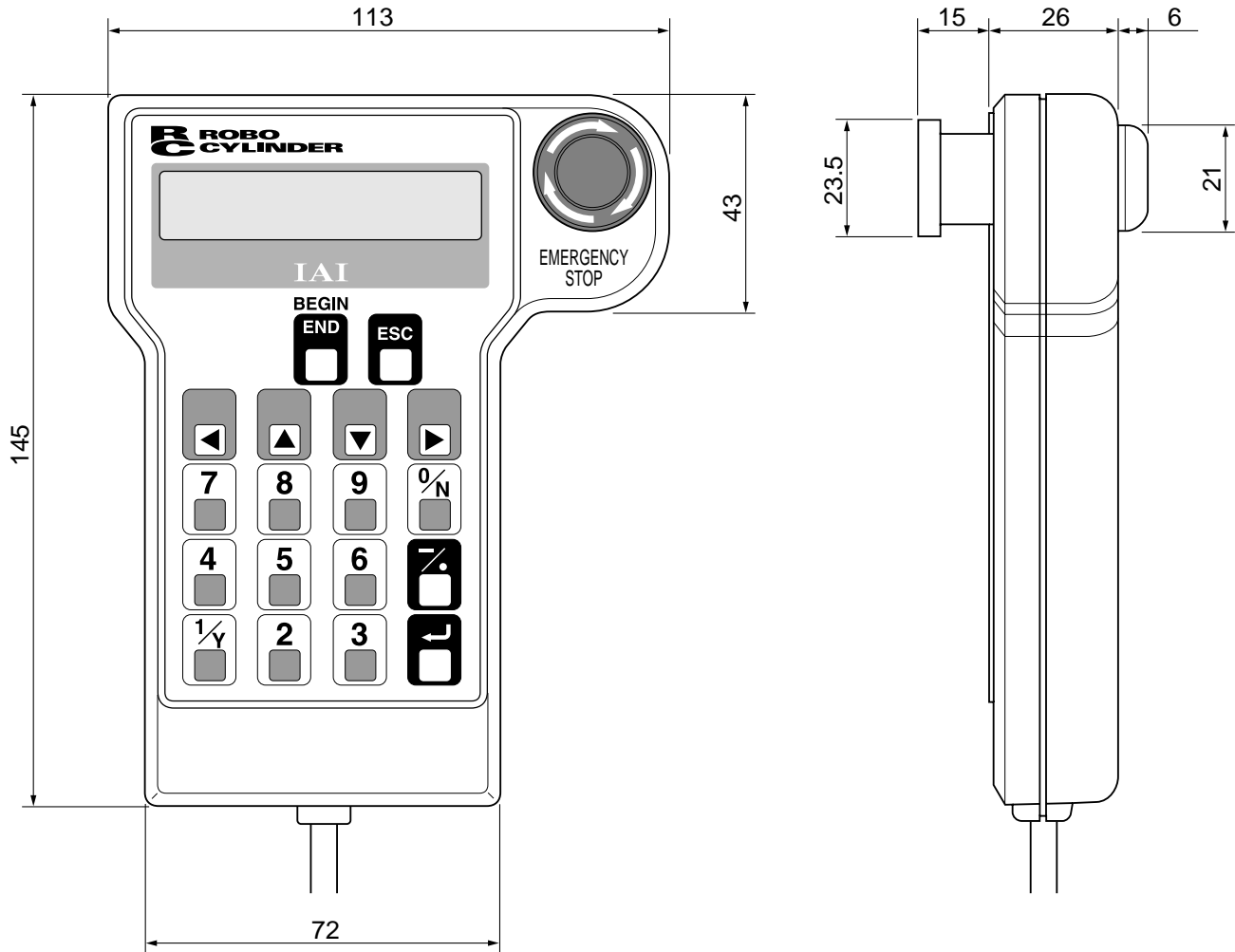
LCD..... Horizontal 16 characters Vertical 2 lines

6-1 Specifications

Item	Specifications
Ambient Temperature & Humidity	Temperature: 0°~40° C Humidity: 85% RH or less * RH relative humidity
Operating Environment	Free of corrosive gas, especially, no excessive dust
Weight	400g
Cable Length	5m

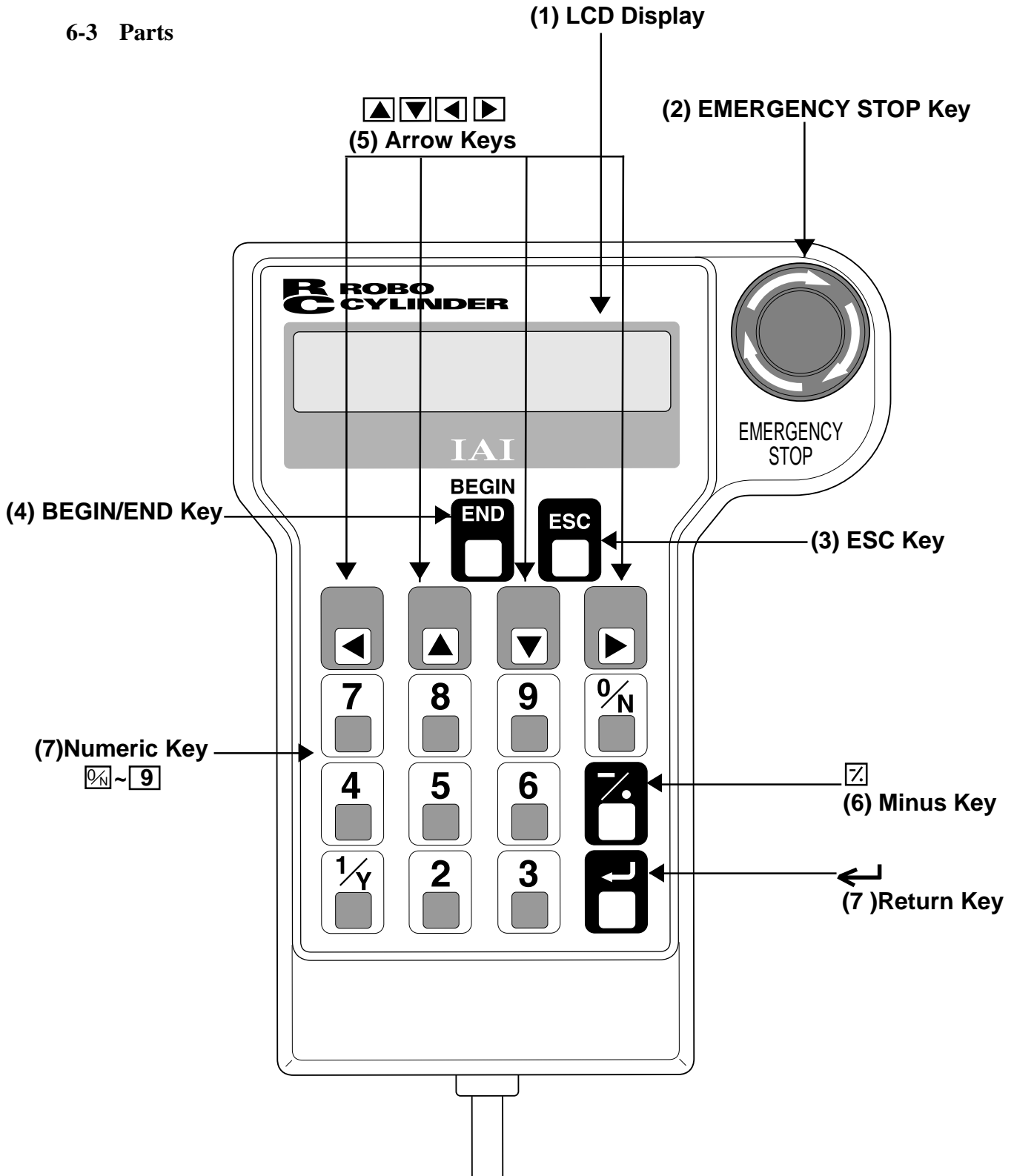
6. Teaching Pendant Functions and Specifications

6-2 External Dimensions



6. Teaching Pendant Functions and Specifications

6-3 Parts



6. Teaching Pendant Functions and Specifications

(1) LCD Display

This is a liquid crystal display with a maximum of horizontal: 21 characters per column, and vertical: 16 columns per row.

(2) EMERGENCY STOP (Emergency Stop Push Button Switch)

This switch connects serially with the controller emergency stop signal line. Once pushed down, this switch will be in an emergency stop status and the power supply to the motor will be cut off (normally, closed: b contact).

(* For information on the Emergency Stop Line and its status, please refer to the RC Robo Cylinder Operating Manual.)

(3) ESC Key

- Although Teaching Pendant operation is composed of several screens, using this key will return the user to the previous screen.

Note: When you don't understand the operation, undo the operation by pressing the ESC Key.



(4) BEGIN/END Key

- By pressing this key for more than 2.5 seconds, the screen will change into the "BEGIN/END" screen and you will be able to reconnect the axis and execute Teaching Pendant configuration.
- If entering data via key pad, you may cancel midway using this key.
- You may clear error warning.
- When an error occurs, a message for this error will appear at the very bottom of the display screen. Use this key to clear the error and to clear this message.

(5) Arrow Key:

Every time you press the cursor key of the Selection Display Column Selection and the cursor Move Key of the Position Display Table Main Display Area, the cursor will move to the first item. When pressed for more than one second, the cursor will move consecutively. When the content display is composed of more than two screens (position table and monitor display), these keys scroll to the next screen.

(6) (Minus) Key

- Position Table Column: When you push this in an area such as positioning width which allows minus input, the key functions as the "-" (minus), and the rest as "." (point). When you input either  or  in the beginning of the number, within the proper area, the key will automatically recognize it as 0. This key is used during cursor move within the Mode Select Screen and Sub-Display Screen (e.g, continuous, step, etc.).

(7) ~ Key

- This key is used for numeric input.

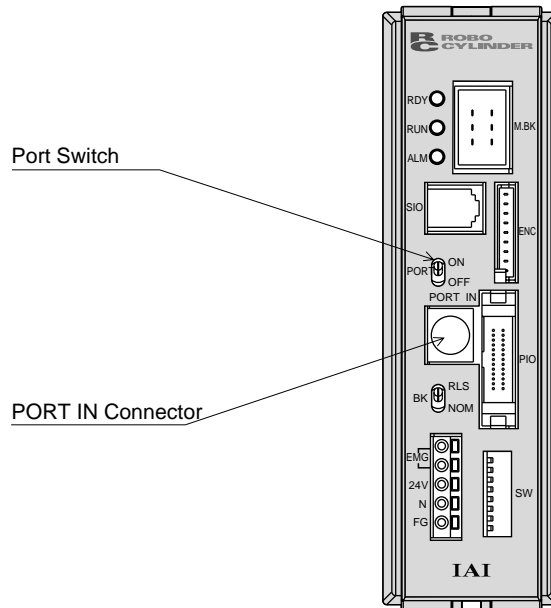
(8) (Return) Key

- This is used for data input and operation confirm.

7. Connection with the Controller

7-1 Connection with the Teaching Pendant

- (1) Connect the Teaching Pendant Cable to the “PORT IN” connector which is located on the front of the controller. Always turn OFF the controller Port Switch first before connecting.



- (2) After connecting, turn the controller PORT Switch ON .

7-2 How to Disengage the Teaching Pendant

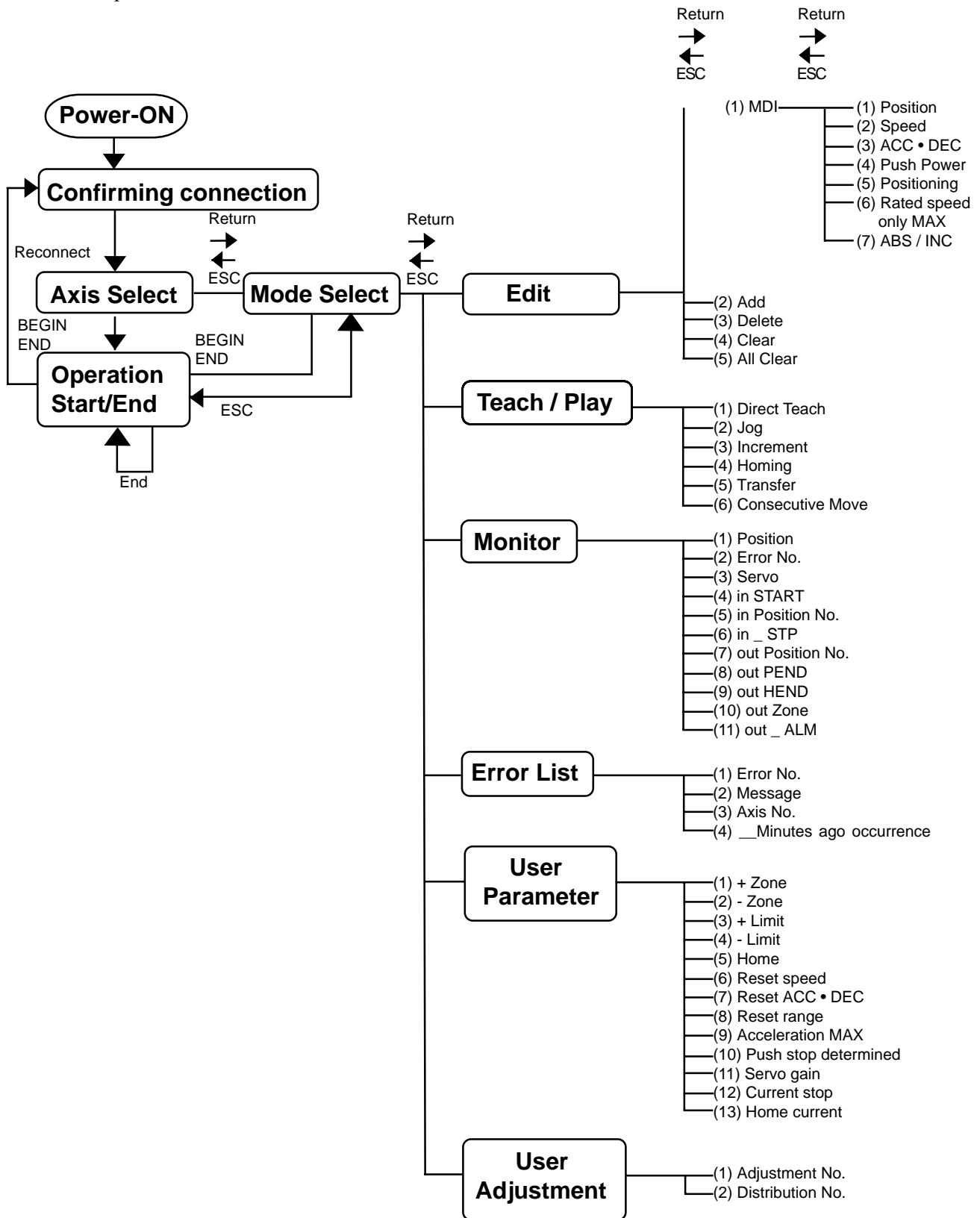
Hold down the BEGIN/END Key which is located in the upper left corner of the key pad. Select “Complete” to finish. Afterwards, turn the controller front SW side to OFF, and remove the Teaching Pendant connector.

Operation:

1. Hold down the BEGIN/END Key for more than 2.5 seconds.
2. Use the Arrow Key to select “Complete” Screen, and then press the Return Key.
3. Turn the RC Controller PORT SW OFF.
4. Remove the teaching pendant connector.

8. Operation

The Teaching Pendant operation is composed of the following structure. You will need to press the ESC Key each time you wish to return to the previous screen.



Note: Display content will vary according to the connecting controller type and version as well as the version of the Easy Type Teaching Box.

8. Operation

8-1 Initial Screen During Power - UP

Once power is connected to the RC Controller and the controller PORT Switch is ON, power will be supplied to the teaching pendant and operation will begin.

Once the power is installed, the LCD Display screen will display the latest teaching pendant software version number.



**Confirming connection
IAI RC ST V. 1. 00**

Initial Screen during power installation

During this time, RS485 serial connections between controllers will occur.

Once the controller connection completes, the screen will automatically move onto the next selection screen.

8. Operation

8-2 Controller Selection (when using multiple units)

In case of multiple units connected serially via the RS485 communication line, the axis selection screen will be displayed. For a single unit, since there is no need to select the axis, the first screen below will not appear (refer to Section 8.3 entitled Operational Mode Selection of this manual). The content explained here will be based on operation of the selected axis (controller). In addition, the controller can connect up to 16 units.

Axis Select
*** Axis No. 00**



Axis Select
*** Axis No. 0 1**



Axis No. 1

Axis Select
*** Axis No. 02**



Using the Keys, select the data inputting axis (controller), and determine with the Return Key. Only the connecting axis will be displayed.

From here on, the content explained will be based on operation against the axis (controller) selected here.

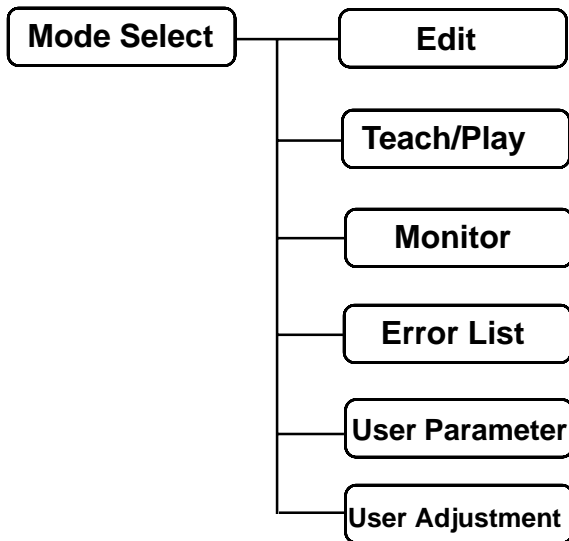
Caution:

If power is supplied with the PORT switch ON and power is present on the teaching pendant, only powered controllers will be detected.

The content explained hereupon will be based on operation against selected axis (controller).

8. Operation

8-3 Operation Mode Selection



Mode Select A. 00 * Edit ◀▲ ▼▶
Mode Select A. 00 * Teach/Play ◀▲ ▼▶
Mode Select A. 00 * Monitor ◀▲ ▼▶
Mode Select A. 00 * Error List ◀▲ ▼▶
Mode Select A. 00 * User Parameter ◀▲ ▼▶
Mode Select A. 00 * User Adjustment

Display screen

Operation Mode Selection Screen

For the modes, select one of the 6 options as it appears on the above screen. To select, move the cursor to the mode desired and confirm using the Return Key.

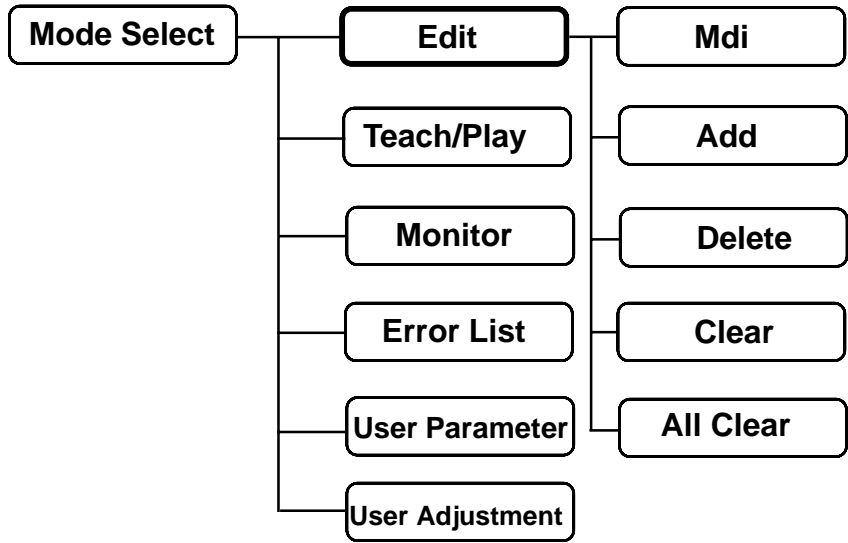
Category of Modes	
1. * Edit	Edit and numeric input function for position table
2. * Teach/Play	Move and Teach for actuator.
3. * Monitor	RC Controller status display
4. * Error list	Alarm content detailed display
5. * User Parameter	Setting of axis zone signal output range and axis
6. * User Adjustment	Executing homing and axis number setting of integrated RC controller series

8. Operation

8-4 Edit/Teaching

8-4-1 Edit Screen

When “*Edit • Teach (Position) mode is selected, the content of the position data table saved in the RC controller will be displayed.



Mode Select A. 00
* MDI



Mode Select A. 00
* Add



Mode Select A. 00
* Delete



Mode Select A. 00
* Clear



Mode Select A. 00
* All Clear



8. Operation

The position table main display area is divided into 4 screens and is displayed as below.
 You can change the screens by using the arrow keys (▲▼).

- * MDI Numerically inputs the position data directly from the ten key (input example: Page 21 in this manual).
- * Add Adds the position data into the assigned position data number (input example: Page 25 in this manual).
- * Delete Deletes position data (input example: Page 26 in this manual).
- * Clear Resets the position data (input example: Page 27 in this manual).
- * All Clear Resets all of the 16 position data.

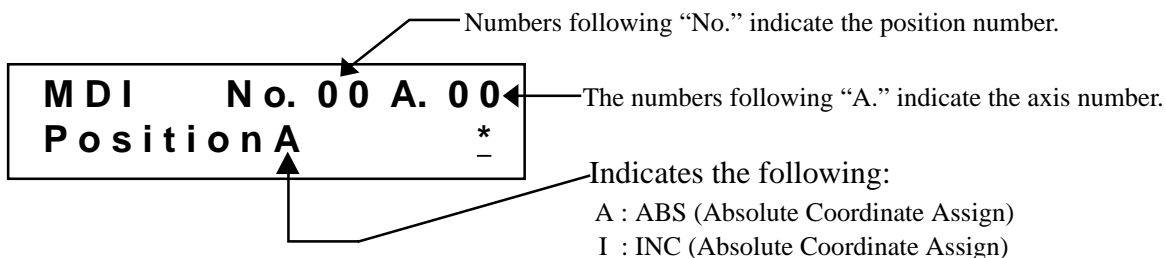
The position data table will display by selecting and determining MDI

As the table below shows, in the position table, there are 7 setting contents (position, speed, ACC • DEC, Push %, Range, ACC MAX and ABS/INC) per each position data:

No.	Position	Speed	ACC • DEC	Push %	Range	ACC MAX	ABS/INC
0	*	*mm/s	*G	*%	*mm	*	0
1	*	*mm/s	*G	*%	*mm	*	0
2	*	*mm/s	*G	*%	*mm	*	0
3	*	*mm/s	*G	*%	*mm	*	0
4	*	*mm/s	*G	*%	*mm	*	0
5	*	*mm/s	*G	*%	*mm	*	0
6	*	*mm/s	*G	*%	*mm	*	0
7	*	*mm/s	*G	*%	*mm	*	0
8	*	*mm/s	*G	*%	*mm	*	0
9	*	*mm/s	*G	*%	*mm	*	0
10	*	*mm/s	*G	*%	*mm	*	0
11	*	*mm/s	*G	*%	*mm	*	0
12	*	*mm/s	*G	*%	*mm	*	0
13	*	*mm/s	*G	*%	*mm	*	0
14	*	*mm/s	*G	*%	*mm	*	0
15	*	*mm/s	*G	*%	*mm	*	0

Position Data Table

Use either the Return Key or ◀ Key to execute content of the transfer. Use either of ▲▼ Keys for position number changes. In the display screen, only the single content of one position number will be displayed.



8. Operation

8-4-2 Position Data Table Content

The columns for the position table are Position, Speed, Acc/Dec, Push %, Range, ACC MAX and ABS/INC displayed in 7 screens.

1. Position • The desired move location from home in millimeters.

- Absolute Coordinate Assign: Moves the actuator to the desired location in reference to the home location. Inputting negative values is not possible.
- Relative Coordinate Assign: Moves the actuator to the desired position in reference to the current position. Inputting negatives values is possible. In this case (during negative direction of the display coordinate), first select Relative Coordinate Assign using (7) ABS/INC.

Note: By pressing the ◀ Key once from the Position Input Screen will move the screen to ABS/INC Input Screen.

Caution: There are cases when the input value may be rounded off to the least common denominator multiple of the controller.

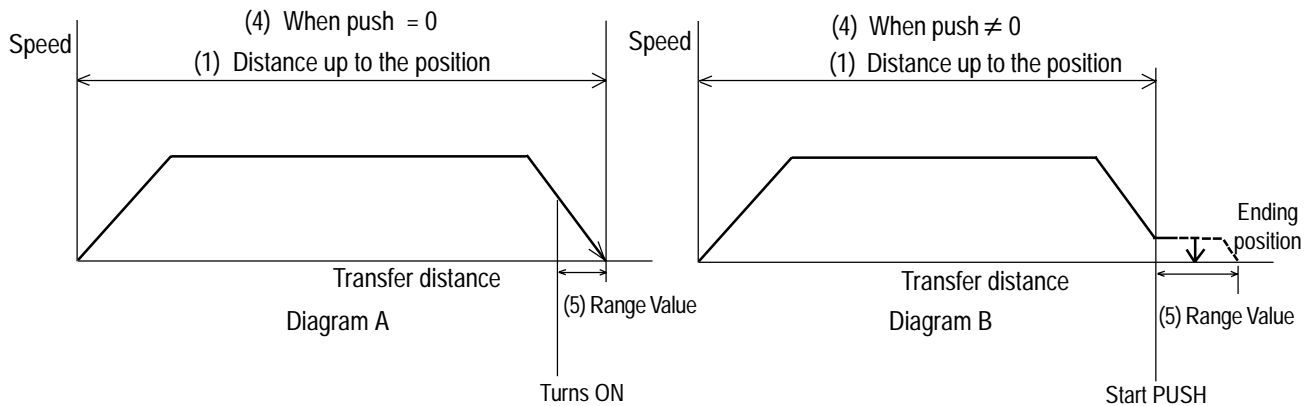
- 2. Speed
 - The speed when moving the actuator (mm/sec). Initial value will depend on the actuator type.
- 3. Acc/Dec
 - The acceleration/deceleration setting for the move to the corresponding position (in G's).
- 4. Push%
 - Selects the positioning mode or push mode. The initial value will vary according to the actuator type.
 - 0: Positioning Mode (normal movement)
 - Besides 0: Push Mode (%)
 - In case of push mode, data number is the servo motor current control value during push. Uses a value that matches the actuator that match the actuator with a maximum value of 70%.

Caution:
For your information, the relationship of “current control value” and “push power during stop” is listed on the next Section 8-4-3 in this manual.

8. Operation

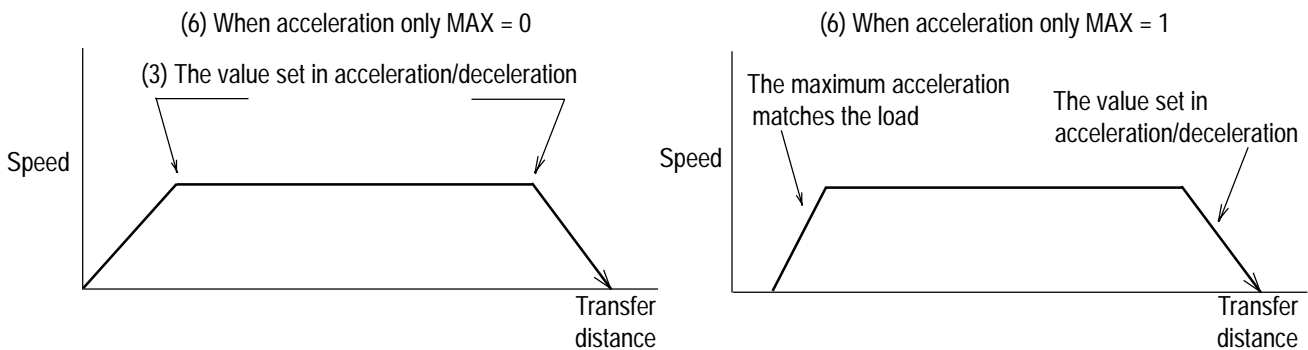
5. Range

- As for the range, depending on the setting in the push as either 0 or other than 0, this function will vary.
 - (A) Push = 0 (Positioning Mode)**
 - The positioning mode uses range value as a location to turn ON the position complete output prior to reaching the actual data.
 - The default range value is set as 0.1mm (see diagram A).
 - (B) Push ≠ besides 0 (Push Mode)**
 - The push mode uses the range value as the distance of the push.
 - When the push direction is towards home, a “minus” sign should be placed in the range column.



6. MAX Acceleration

- Selects either the assigned acceleration or the maximum acceleration. Inputs are either 1 or 0. The default value is set as 0.
 - 0: Assigned acceleration
 - The value placed in (3) will be used as the actual acceleration value and deceleration value.
 - 1: Maximum acceleration
 - This will automatically utilize the maximum acceleration matched to the load.
 - Deceleration remains as the assigned value in (3).



7. ABS/INC

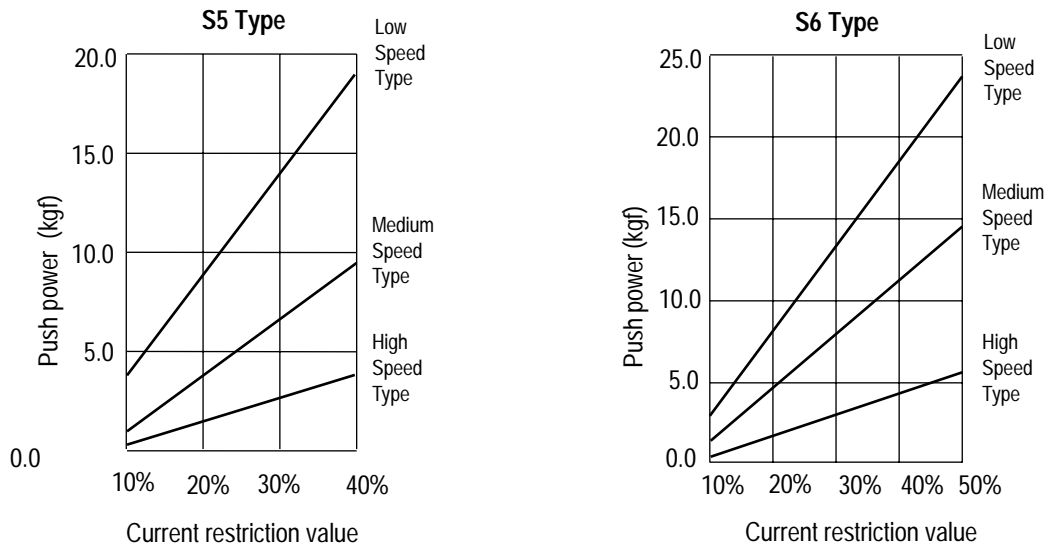
- Select either the absolute or increment positioning.
 - 0: Absolute positioning (ABS)
 - 1: Incremental positioning (INC)

The default value is absolute positioning (ABS).

8. Operation

8-4-3 The Relationship Between the Push Power During Stop and Current Restriction Value

When executing the push mode, place the current restriction value as a “% of max” column into the “push” column of the position data table. Determine the current restriction (in %) using the tables below. The diagram below shows the relationship between the current restriction value and push power for each actuator type.

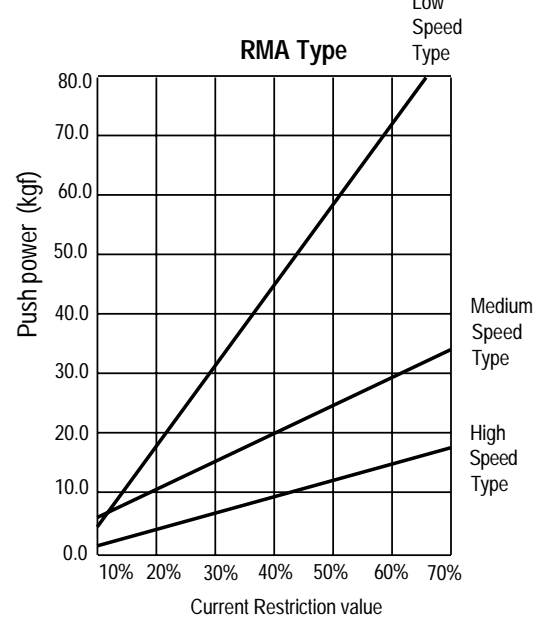
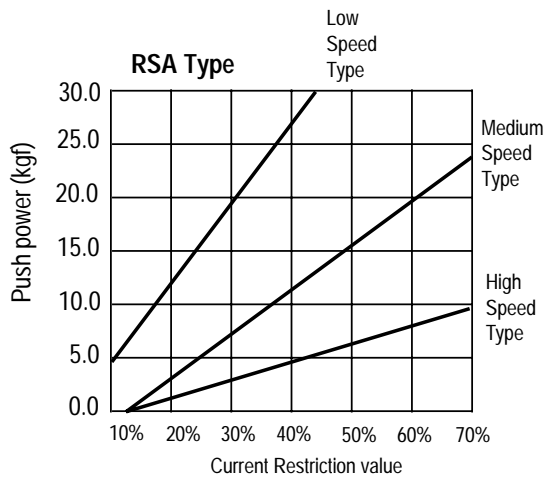
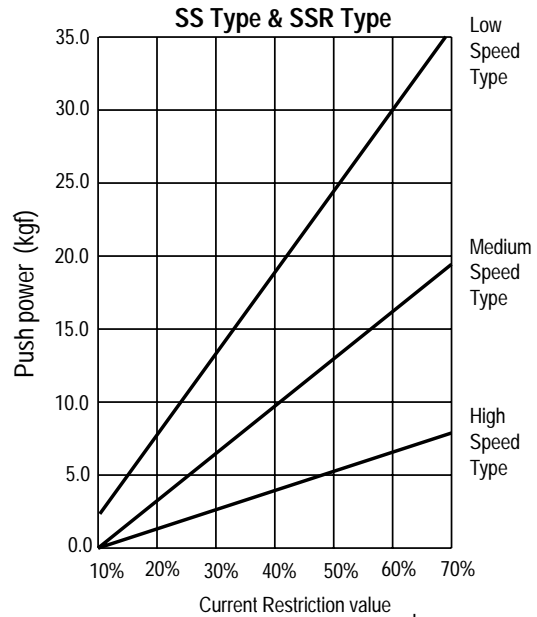
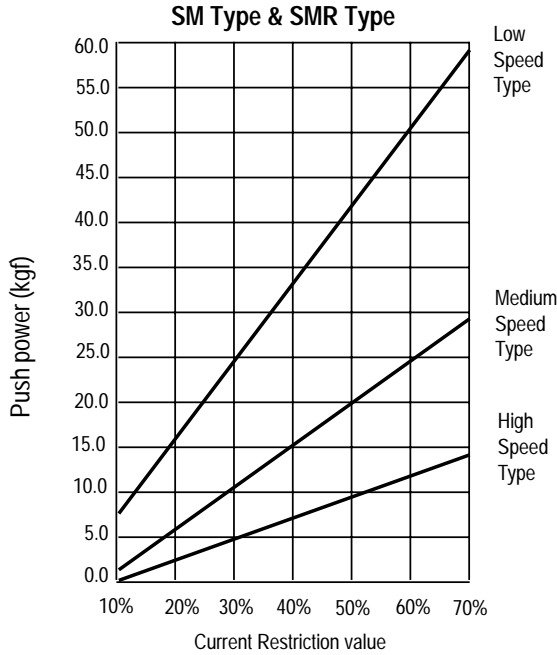


Caution:
 Please be aware that the push power is a standard, and is not guaranteed. When the push power is too small, push malfunction may occur due to driven resistance, so please be careful. The maximum amount of the current restriction value is listed in the table below:

Lead \ Type	S5
Low Speed Type	40% or less
Middle Speed Type	40% or less
High Speed Type	40% or less

Lead \ Type	S6
Low Speed Type	50% or less
Middle Speed Type	50% or less
High Speed Type	50% or less

8. Operation



Caution:
 Please be aware that the push power during stop is standard, and is not guaranteed. When the push power is too small, push malfunction may occur due to driven resistance, so please be careful. The maximum amount of the current restriction value is listed in the tables below:

Lead \ Type	SS • SSR
Low Speed Type	70% or less
Middle Speed Type	70% or less
High Speed Type	70% or less

Lead \ Type	SM • SMR
Low Speed Type	70% or less
Middle Speed Type	70% or less
High Speed Type	70% or less

Lead \ Type	RSA • RSW RSI(W) • RSGB RSGS • RSGD
Low Speed Type	45% or less
Middle Speed Type	70% or less
High Speed Type	70% or less

Lead \ Type	RMA • RMW RMI (W) • RMGB RMGS • RMGD
Low Speed Type	65% or less
Middle Speed Type	70% or less
High Speed Type	70% or less

8. Operation

8-4-4 MDI Numeric Input

MDI is a method which numerically inputs the position data directly from the numeric keys. In this section, we will explain the input procedure according to MDI (numeric input).

Position No. 0	Absolute coordinate position mode Position 0mm
Position No. 1	Absolute coordinate position mode Position 50mm, Speed 100mm/s, ACC•DEC 0.1G Range 0.2mm, ACC MAX 1
Position No. 2	Absolute coordinate push mode Position 80mm, Speed 100mm/s, ACC• DEC 0.1G Push 40%, Range 5mm
Position No. 3	Incremental coordinate position mode Position 10mm, speed 20mm/s

Data not assigned utilizes initial value. The example here is based on initial status during shipment (when data is all clear). You may input data from position data table similar to the table below.

No.	Position	Speed	ACC • DEC	Push %	Range	ACC MAX	ABS/INC
0	0.00	125 mm/s	0.20 G	0 %	0.10 mm	0	0
1	50.00	100 mm/s	0.10 G	0 %	0.20 mm	1	0
2	80.00	100 mm/s	0.10 G	40 %	5.00 mm	0	0
3	10.00	20 mm/s	0.20 G	0 %	0.10 mm	0	1

Input the data inside the thick line (see above table). By inputting the position data, the initial value will automatically input. The default values (Speed, ACC • DEC and Range) will vary according to actuator machine type (in this example: RSA Low speed type).

Mode Select A. 00
*** Edit/Teach**

Using the ▲▼ Key in the Mode Select Screen, select Edit/Teach and choose using the Return Key.

Edit/Teach A. 00
*** MDI**

Using the ▲▼ Key in the Edit/Teach Screen, select MDI and choose using the Return Key.

Input using position number 0.

MDI No. 00 A. 00
**Position A *
 _**

The screen will turn into the Input Screen for Position.

MDI No. 00 A.00
Position A 0.____

Using the Numeric Key, press 0 and the Return Key

8. Operation

MDI	No. 00	A. 00
Speed	12 <u>5</u>	mm/s

Input using position number 1

MDI	No. 01	A. 00
Position A	<u>▲</u>	* _

Position number 1

MDI	No. 01	A. 00
Position A		<u>50</u>

MDI	No. 01	A. 00
Speed	<u>100</u>	mm/s

MDI	No. 01	A. 00
ACC•DEC	<u>0.1</u>	G

MDI	No. 01	A. 00
Push %	<u>0</u>	%

MDI	No. 01	A. 00
Range		<u>0.2</u> mm

MDI	No. 01	A. 00
ACC MAX	<u>1</u>	

MDI	No. 01	A. 00
ABS→ 0	INC→ 1	<u>0</u>

Input using position number 2

MDI	No. 02	A. 00
Position A	<u>▲</u>	* _

Position number 2

The screen will turn into the Input Screen for Speed.
The default value will be utilized as is. Since other data will use the default value, input for position number 0 will end here.
Next, position number 1 input will be executed.

Press the ▲ Key to advance position number to 1.

The screen will turn into the Input Screen for Position. Use the Numeric Key to input 50 and then, press the Return Key.

The screen will turn into the Input Screen for Speed. Use the Numeric Key to input 100 and then, press the Return Key.

The screen will turn into the Input Screen for ACC•DEC.
Use the Numeric Key to input 0.1 and then, press the Return Key.

The screen will turn into the Input Screen for Push %.
The initial value will be utilized as is, so press the Return Key.

The screen will turn into the Input Screen for Range.
Use the Numeric Key to input 0.2 and then, press the Return Key.

The screen will turn into the Input Screen for ACC MAX.
Use the Numeric Key to input 1 and then, press the Return Key.

With the above, input for position number 1 is completed.
Next, we will execute input for position number 2.

Press the ▲ Key to advance position number to 2.

8. Operation

M D I	N o. 0 2	A. 00
Position A		8<u>0</u>

The screen will turn into the Input Screen for Position. Use the Numeric Key to input 80 and then, press the Return Key.

M D I	N o. 0 2	A. 00
Speed	1<u>00</u>	mm/s

The screen will turn into the Input Screen for Speed. Use the Numeric Key to input 100 and then, press the Return Key.

M D I	N o. 0 2	A. 00
ACC•DEC	0.<u>1</u>	G

The screen will turn into the Input Screen for ACC • DEC. Use the Numeric Key to input 0.1 and then, press the Return Key.

M D I	N o. 0 2	A. 00
Push %	4<u>0</u>	%

The screen will turn into the Input Screen for Push %. Use the Numeric Key to input 40 and then, press the Return Key.

M D I	N o. 0 2	A. 00
Range		5<u>mm</u>

The screen will turn into the Input Screen for Range. Use the Numeric Key to input 5 and then, press the Return Key.

M D I	N o. 0 2	A. 00
ACC MAX	0	

With the above, input for position number 2 is completed. Next, we will execute input for position number 3.

Input using position number 3

M D I	N o. 0 3	A. 00
Position A	▲	* _

Press the ▲ Key to advance position number to 3. The screen will turn into Input Screen for Position.

Position number 3

M D I	N o. 0 3	A. 00
ABS→	0	INC→ 1 <u>1</u>

Press the ◀ Key to change screen into ABS/INC Display Screen. Use the Numeric Key to input 1 and then, press the Return Key.

M D I	N o. 0 3	A. 00
Position I	10. <u>00</u>	

The screen will turn into the Input Screen for Position. Use the Numeric Key to input 10 and then, press the Return Key.

↑
INC

(Relative coordinate assign)

M D I	N o. 0 3	A. 00
Speed	2<u>0</u>	mm/s

The screen will turn into the input screen for speed. Use the Numeric Key to input 20, and then press the Return Key.

From the above, MDI input is completed.

8. Operation

8-4-5 Add • Delete

In this section, we will give specific examples of how to add • delete and clear data in the position table.

- 1) **Add:** Adds the position data into the assigned position data number location.
- 2) **Delete:** Deletes assigned position data.
- 3) **Clear:** Resets the assigned position data.
- 4) **All Clear:** Resets all of 16 position data.

8. Operation

1) Add:

Method: Enter position data between existing position data

Example: Insert an empty row into point number 2

No.	Position	Speed	ACC/DEC	Push %	Range	ACC MAX	ABS/INC
0	0.00	125 mm/s	0.20G	0%	0.10 mm	0	0
1	50.00	100 mm/s	0.10G	0%	0.20 mm	1	0
2	80.00	100 mm/s	0.10G	40%	5.00 mm	0	0
3	10.00	20 mm/s	0.20G	0%	0.10 mm	0	1



No.	Position	Speed	ACC/DEC	Push %	Range	ACC MAX	ABS/INC
0	0.00	125 mm/s	0.20G	0%	0.10 mm	0	0
1	50.00	100 mm/s	0.10G	0%	0.20 mm	1	0
2	*	* mm/s	* G	* %	* mm	*	0
3	80.00	100 mm/s	0.10G	40%	5.00 mm	0	0
4	10.00	20 mm/s	0.20G	0%	0.10 mm	0	1

Mode Select **A. 00**
* **Edit**

In the Mode Select Screen, using the Keys, select Edit and then, press the Return Key.

Mode Select **A. 00**
* **Add**

In the mode select screen, using the Keys, select Add and then, press the Return Key.

Add? **No. 02** **A. 00**
 80.00 **Y →1** **N →0**

Using the Keys, change the position number into 2.

Add? **No. 02** **A. 00**
* **Y →1** **N →0**

Pressing 1 on the Numeric Key will insert a blank point and then, the screen will return to the Edit Screen.

Edit **A. 00**
* **Add**

Mode Select **A. 00**
* **Edit**

Press the ESC Key once to return the screen back to Mode Select Screen.

8. Operation

2) Delete:

Method: To delete a point in the point table

Example: Delete the row of position data number 2.

No.	Position	Speed	ACC/DEC	Push %	Range	ACC MAX	ABS/INC
0	0.00	125 mm/s	0.20G	0%	0.10 mm	0	0
1	50.00	100 mm/s	0.10G	0%	0.20 mm	1	0
2	*	* mm/s	* G	* %	* mm	*	0
3	80.00	100 mm/s	0.10G	40%	5.00 mm	0	0
4	10.00	20 mm/s	0.20G	0%	0.10 mm	0	1



No.	Position	Speed	ACC/DEC	Push %	Range	ACC MAX	ABS/INC
0	0.00	125 mm/s	0.20G	0%	0.10 mm	0	0
1	50.00	100 mm/s	0.10G	0%	0.20 mm	1	0
2	80.00	100 mm/s	0.10G	40%	5.00 mm	0	0
3	10.00	20 mm/s	0.20G	0%	0.10 mm	0	1

Mode Select **A. 00**
* **Edit**

In the Mode Select Screen, using the ◀▶▲▼ Keys, select Edit and then, press the Return Key.

Mode Select **A. 00**
* **Delete**

In the Edit Screen, using the ◀▶▲▼ Keys, select Delete and then, press the Return Key.

Delete? N o. 0 2 A. 00
* **Y → 1 N → 0**

Using the ▲▼ Keys, change the position number into 2. Pressing 1 on the Numeric Key will delete position number 2 and then, the screen will return to the Edit Screen. To cancel, press 0. In either case, the screen will return to the previous screen.

Edit **A. 00**
* **Delete**

Mode Select **A. 00**
* **Edit**

Press the ESC Key once to return the screen back to Mode Select Screen.

8. Operation

3) Clear:

Method: Clear the position data of assigned location

Example: Clear the row of position data number 1

No.	Position	Speed	ACC/DEC	Push %	Range	ACC MAX	ABS/INC
0	0.00	125 mm/s	0.20G	0%	0.10 mm	0	0
1	50.00	100 mm/s	0.10G	0%	0.20 mm	1	0
2	80.00	100 mm/s	0.10G	40%	5.00 mm	0	0
3	10.00	20 mm/s	0.20G	0%	0.10 mm	0	1



No.	Position	Speed	ACC/DEC	Push %	Range	ACC MAX	ABS/INC
0	0.00	125 mm/s	0.20G	0%	0.10 mm	0	0
1	*	* mm/s	* G	* %	* mm	*	0
2	80.00	100 mm/s	0.10G	40%	5.00 mm	0	0
3	10.00	20 mm/s	0.20G	0%	0.10 mm	0	1

Mode Select **A. 00**
* **Edit**

In the Mode Select Screen, using the Keys, select Edit and then, press the Return Key.

Edit **A. 00**
* **Clear**

In the Edit Screen, using the Keys, select Clear and then, press the Return Key.

Position number 1
↓

Clear? No. 01 A. 00
50.00 Y → 1 N → 0

Using the Keys, change the position number into 1. Pressing 1 on the Numeric Key will clear position number 1 and then, the screen will return to the Edit Screen. To cancel, press 0. In either case, the screen will return to the previous screen.

↑
Position data for position number 1

Edit **A. 00**
* **Clear**

Mode Select **A. 00**
* **Edit**

Press the ESC Key once to return the screen back to Mode Select Screen.

8. Operation

1) All Clear:

Operation: Clear all position data

No.	Position	Speed	ACC/DEC	Push %	Range	ACC MAX	ABS/INC
0	0.00	125 mm/s	0.20G	0%	0.10 mm	0	0
1	50.00	100 mm/s	0.10G	0%	0.20 mm	1	0
2	80.00	100 mm/s	0.10G	40%	5.00 mm	0	0
3	10.00	20 mm/s	0.20G	0%	0.10 mm	0	1



No.	Position	Speed	ACC/DEC	Push %	Range	ACC MAX	ABS/INC
0	*	* mm/s	* G	* %	* mm	*	0
1	*	* mm/s	* G	* %	* mm	*	0
2	*	* mm/s	* G	* %	* mm	*	0
3	*	* mm/s	* G	* %	* mm	*	0

Mode Select	A. 00
* Edit	

In the Mode Select Screen, using the Keys, select Edit and then, press the Return Key.

Mode Select	A. 00
* All Clear	

In the Edit Screen, using the Keys, select All Clear and then, press the Return Key.

All Clear? No. 0 1	A. 00
50. 00 Y → 1 N → 0	

Pressing 1 on the Numeric Key will clear all data and then, the screen will return to the Edit Screen. To cancel, press 0. In either case, the screen will return to the previous screen.

Edit	A. 00
* All Clear	

Mode Select	A. 00
* Edit	

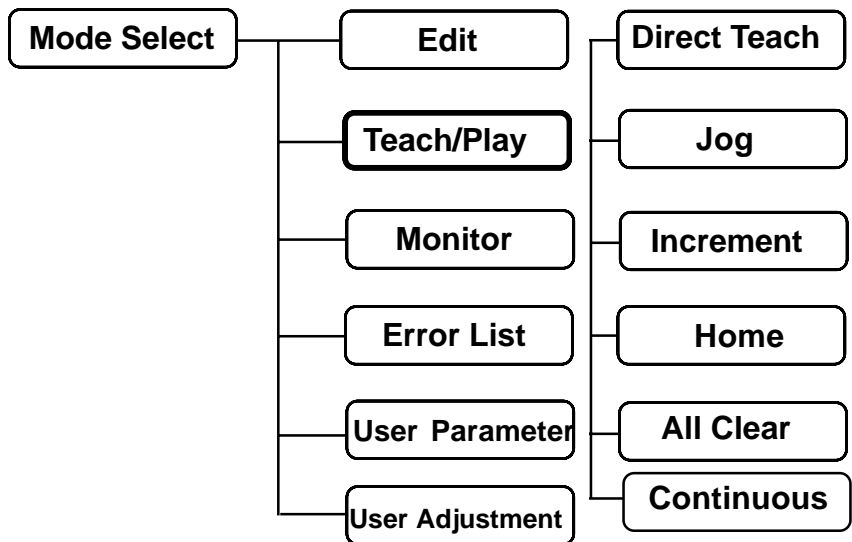
Press the ESC Key to return the screen back to Mode SelectScreen.

8. Operation

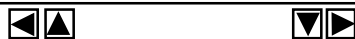
8-5 Teach / Play

8-5-1 Teach Play Screen

Selecting “Teach/Play” from the Mode Selection will display the Teach/Play Screen. You may execute Teach and Move the actuator using this screen. As the diagram below shows, there are six options available in the Teach/Play Screen.



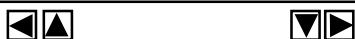
Teach / Play A. 00
* Direct Teach



Teach / Play A. 00
* Jog



Teach / Play A. 00
* Increment



Teach / Play A. 00
* Home



Teach / Play A. 00
* Move



Teach / Play A. 00
* Continuous



8. Operation

8-5-2 Teach

- 1) **Direct Teach:** Turns the servo controller OFF, manually move the slider to match to the desired location, and reads that location in the position table.
- 2) **Jog:** Uses the arrow keys to jog to the desired location, and reads that location and reads that location into the position table.
- 3) **Increment:** Uses the arrow keys to incrementally move and read the desired location into the position table.
- 4) **Home:** Executes home.

Caution Regarding Teaching:

**** You must home the unit before teaching points.***

**** Jog and Increment before homing will allow you to move up until the end of the mechanism, therefore please do a thorough check prior to operation.***

**** Only position data may be taught. Please use MDI mode for all other data.***

8. Operation

1) Direct Teach

Method: Manually move the actuator to the desired position, and teach that position into the position table.

Example: Teach position number 4 using Direct Teach

Mode Select * Edit	A. 00
-------------------------------------	--------------

In the Mode Select Screen, using the ◀▶▲▼ Keys, select Edit and then, press the Return Key.

Edit * Direct Teach	A. 00
--------------------------------------	--------------

In the Edit Screen, using the ▲▼ Keys, select Direct Teach and then, press the Return Key.

Direct Teach Servo OFF	A. 00 51. 23F
---	--------------------------------

Servo will turn OFF and the current location will be displayed. In this status, manually move either the slider or rod, and determine the desired location (for actuators with brake, be sure to release the brake). Once the desired location is determined, press the Return Key.

Displays the current location. _____
*Although this displays even during home incomplete status, it is not an accurate value.

Incorporate? N o. 0 4 A. 00 * Y→ 1 N→ 0	Position number 4 ▼
--	------------------------

Use the ▲▼ Keys to change the position number to 4. Press 1 to teach the current location (if the slider or rod moves prior to pressing 1, then redetermine the desired location). To cancel, press 0.

Displays the old position data.
This is not the desired position determined in the previous screen.

Direct Teach Servo OFF	A. 00 51.23F
---	-------------------------------

In either case, the screen will return to the previous screen. You may use this screen to continue teaching using Direct Teach.

Mode Select * Edit	A. 00
-------------------------------------	--------------

Press the ESC Key twice to return the screen back to Mode SelectScreen.

Caution:

- For data (speed, ACC • DEC) other than position, use MDI to input.
- You must home the unit before teaching points.

8. Operation

2) Jog

Method: Jog the actuator to the desired position, and teach that position into the position table.

Example: Teach position number 5 using Jog

Mode Select * Teach / Play	A. 00
---	--------------

In the Mode Select Screen, using the Keys, select Teach/Play and then, press the Return Key.

Teach / Play * Jog	A. 00
-------------------------------------	--------------

In the Edit Screen, using the Keys, select Jog and then, press the Return Key.

Jog Speed V2	A. 00 18. 90 N
-------------------------------	---------------------------------

You may select the jog speed and current location here.
Use the Key to select the Jog speed as follows:
V1→(slow) V2 V3 V4 V5→ (fast)

Displays the Jog speed.

Displays the current location.
*Although this displays even during home incomplete status, it is not an accurate value.

Use the Key to move either the slider or rod, to the desired location.
 : Positive direction
 : Negative direction

Once the desired location is determined, press the Return Key.

Position number 5

Incorporate? N o. 0 5 A. 00 * Y→ 1 N→ 0
--

Use the Keys to change the position number to 5. Press 1 to teach the current location. To cancel, press 0.

Displays the old position data using Position number 5. This is not the desired position determined in the previous screen.

Jog Speed V2	A. 0 0 18. 90N
-------------------------------	---------------------------------

In either case, the screen will return to the previous screen. You may use this screen to continue teaching using Jog .

Teach / Play * Jog	A. 00
-------------------------------------	--------------

Press the ESC Key twice to return the screen to Teach /Play screen.

Mode Select * Teach / Play	A. 00
---	--------------

Press the ESC Key twice to return the screen to Mode SelectScreen.

8. Operation

3) Increment

Method: Increment movement using ◀ ▶ Keys to the desired position, and teach that position into the position table.

Example: Teach position number 6 using increment.

Mode Select * Teach / Play	A. 00
--------------------------------------	-------

In the Mode Select Screen, using the ◀ ▶ ▲ ▼ Keys, select Teach/Play and then, press using the Return Key.

Teach / Play * Increment	A. 00
------------------------------------	-------

In the Edit Screen, using the ◀ ▶ ▲ ▼ Keys, select Increment and then, press the Return Key.

Increment Distance 0. 10	A. 00 4. 00 N
------------------------------------	------------------

You may select the increment distance and current location here. Use the [Z] Key to select the increment distance (0.03→0.10→0.50).

Displays the increment distance.

Use the ◀ ▶ Keys to move either the slider or rod, matching it to the desired position.

Displays the current location.
*Although this displays even during home incomplete status, it is not an accurate value.

▶: Positive direction
◀: Negative direction

Position number 6 →

Incorporate? N o. 06 * Y → 1 N → 0	A. 00
--	-------

Jog move is possible by pressing ◀ ▶ Keys for more than 2 seconds (beyond that, speed will jump up after every second). In case the desired location is far, approach closer to that desired location using this function, and then return to increment and do fine adjustment using the ◀ ▶ Keys.

Displays the old position data using Position number 6. This is not the desired position determined in the previous screen.

Use the ◀ ▶ Keys to change the position number to 6. Press 1 on the Numeric Key to teach the current position. To cancel, press 0.

Increment Distance 0. 10	A. 00 4. 00N
------------------------------------	-----------------

In either case, the screen will return to the previous screen. You may use this screen to continue teaching using Increment.

Teach / Play * Increment	A. 00
------------------------------------	-------

Press the ESC Key to return the screen to Teach / Play screen.

8. Operation





Mode Select * Teach / Play	A. 00
---	--------------

Use the ESC Key to return the screen back to Mode Select Screen.

4) Home

Executes home.

Mode Select * Teach / Play	A. 00
---	--------------

In the Teach/Play Screen, use the     Keys to select Home and then, press the Return Key.

Teach / Play * Home	A. 00
--------------------------------------	--------------

Press the Return Key to execute homing.

Homing Return Key → Execute	A. 00
--	--------------

Teach / Play * Home	A. 00
--------------------------------------	--------------

Press the ESC Key to return to the Teach/Play Screen.

Mode Select * Teach / Play	A. 00
---	--------------

Press the ESC Key to return to the Mode Select Screen.

8. Operation

8-5-3 Move

You may move towards a position registered in the position data table (1 step move) and consecutively move through the consecutive position data. In this section, the move will differ from jog and increment move used with the arrow key. This will be move towards a position that was registered in the position data table within the controller.

1. Move

1 step move from the current location to the assigned position number registered in the position table.

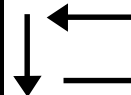
2. Consecutive Move

Consecutive operation from the assigned position data number to the consecutive position data number until an empty location is reached.

What is consecutive move?

In case of the position data similar to the table below, when a consecutive move command is executed from the position No., the place where data exists consecutively will operate as one group (Example: Position No.2 → No. 3 → No. 1 → No.2 and so on).

No	Position mm	Speed mm/s	Acc/Dec G
0	*	*	*
1	10.00	20	0.05
2	50.00	33	0.11
3	100.00	100	0.22
4	*	*	*
5	555.55	333	0.22
6	666.66	444	0.11
7	777.77	777	0.07



Caution:

As for positioning mode and push mode, position complete output may not turn ON at a speed of 10% and 50%.

The positioning complete output will not turn ON when push mode does not encounter a force.

When this occurs, the RC will stop at that step.

Upon installing power or after alarm, if you try to move before homing, the RC will home and then, move to the assigned position number.

8. Operation

1) Move

Operation: Move to position in position table.

Example: Move from current position to position number 2.

Mode Select * Teach / Play	A. 00
---	--------------

In the Mode Select Screen, using the Keys, select Teach/Play and then, press the Return Key.

Teach / Play * Move	A. 00
--------------------------------------	--------------

In the Edit Screen, using the Keys, select Move and then, press the Return Key.

Move No. 02	Speed	A. 00 10%
------------------------------	--------------	----------------------------

Position number and move speed ratio will be displayed. Changes can be made in the move speed ratio using the Key (10% 50% 100%).

Position number

Move speed ratio

Use the Keys to turn the moving position number into 2.

Move No. 02	A. 00 10. 25N
------------------------------	--------------------------------

Current position will display for numeric values that have N at the end. N indicates servo ON.

The numeric value indicated inside the dotted box can be changed by pressing 0 on the Numeric Key. These values show speed%, current position or next position to move to (from point table). Press the Return Key from either screen to move to the position number 2. In case of homing incomplete status, after first homing, the actuator will move to position number 2.

Move? No. 02	A. 00 50.00
-------------------------------	------------------------------

Position data from the point table is displayed.

Move No. 03	Speed	A. 00 10%
------------------------------	--------------	----------------------------

Position Number

Upon move, the position number will automatically turn into 3. Here, press the Return Key to move to position number 3.

Move No. 01	Speed	A. 00 10%
------------------------------	--------------	----------------------------

Upon move, the position number will automatically turn into 1 (if the position table is the one indicated on Page 35 in this manual).

Teach / Play * Move	A. 00
--------------------------------------	--------------

Press the ESC Key to return the screen to Teach / Play Screen.

Mode Select * Teach / Play	A. 00
---	--------------

Press the ESC Key to return the screen to Mode Select Screen.

8. Operation

2) Consecutive Move

Operation: Continuously move through positions in the point table.

Example: Consecutive move position number 0 through position number 2.

Mode Select * Teach / Play	A. 00
---	--------------

In the Mode Select Screen, using the Keys, select Teach/Play and then, press the Return Key.

Teach / Play * Consecutive Move	A. 00
--	--------------

In the Edit Screen, using the Keys, select Consecutive Move, and press the Return Key.

Consecutive Move No. 02	A. 00
Speed	10%

Position number Move speed ratio

Position number and move speed ratio will be displayed. Changes can be made in the move speed ratio using the Key (10% 50% 100%).

Use the Keys to turn the moving position number into 2.

Consecutive Move No. 02	A. 00
	10. 25N

Current position will display for numeric values that have N at the end. N indicates servo ON.

The numeric value indicated inside the dotted box can be changed by pressing 0 on the Numeric Key. These values show speed%, current position or next position to move to (from point table). Press the Return Key from either screen to move to the position number 2. In case of homing incomplete status, after first homing, the actuator will move to position number 2.

Incorporate? N o. 06 No. 02	A. 00
	50.00

Position data from the position table is displayed.

Consecutive Move No. 03	A. 00
Speed	10%

Position Number

During Consecutive Move, the position number will display the position number it is currently moving towards.

Consecutive Move No. 03	A. 00
Speed	10%

Press either the ESC Key or emergency stop button to stop Consecutive Move. Press the Return Key to resume Consecutive Move (the emergency stop button is in released status).

Teach Play * Consecutive Move	A. 00
--	--------------

Upon stop, press the ESC Key to return the screen to Teach / Play Screen.

Mode Select * Teach / Play	A. 00
---	--------------

Press the ESC Key to return the screen to Mode Select Screen.

8. Operation

8-6 Data Modification

You may write over all of the position data. Similar to new input, there are the following 4 cases:

- 1) **Manual Input** Manually enter the position data directly from teaching pendant key pad.
- 2) **Direct Teach** Turns the servo OFF, manually move the slider to the desired location, and read that location into the position table.
- 3) **Jog** Use the arrow keys to jog to the desired location, and read that location into the position table.
- 4) **Increment** Use the arrow keys to incrementally move and read that location into the position table.

Caution during data modification:

- * *As for manual input, the data entered will erase the old data.*
- * *The position will be updated only when the return key is pressed to read in the current location (direct teach, jog, increment).*
- * *Once the position data is cleared, the previous data will not remain.*

8. Operation

8-7 Monitor

The RC Controller I/O status and current location will be displayed. The status for multiple axes will be displayed on the screen, and by using the Keys, you can switch between the axes.

Mode Select	A. 00
* Monitor	

In the Mode Select Screen, using the Keys, select Monitor then, press the Return Key.

Use either the Keys or Return Key to select the display content.
Use the Keys to change the axis number.
(Display example of controller RCA-S)

Monitor	A. 00
Pos	0. 00N mm

Displays the current position.

Monitor	A. 00
Error No. 000	

Displays the error code number.

Monitor	A. 00
Servo ON	

Displays the ON/OFF status of servo.

Monitor	A. 00
in Start	OFF

Displays the ON/OFF status of start input.

Monitor	A. 00
in Pos	No. 00

Displays the assigned position number.

Monitor	A. 00
in _ STP	ON

Displays the ON/OFF status of temporary stop input.

Monitor	A. 00
out	No. 00

Displays the complete position number.

Monitor	A. 00
out PEND	ON

Displays the ON/OFF status of positioning complete output.

Monitor	A. 00
out HEND	ON

Displays ON if homing is complete, and displays OFF if homing is incomplete.

Monitor	A. 00
out ZONE	ON

Displays ON/OFF status of zone output.

Monitor	A. 00
out _ ALM	ON





Displays ON/OFF status of alarm output.

Mode Select	A. 00
Monitor	





Press the ESC Key to return to the Mode Select Screen.





8. Operation

8-8 Error List

As long as the Teaching Pendant is connected, this display will show the content of the controller error. With the     Keys, you may scroll through the error log. The error will clear when the axis reconnects.

Mode Select	A. 00
* Error List	

In the Mode Select Screen, using the     Keys, select Error List then, press using the Return Key.

Use either the   Keys or Return Key to select the display content.
Use the   Keys to change the axis number.

Error List	List No. 00
Error No.	0E8

Displays the error code number.

Error List	List No. 00
A, B Phase	Disconnection

Displays the error name.

Error List	List No. 00
Axis No.	00

Displays axis number in which the error occurred.

Error List	List No. 00
1 Min	

Displays how many minutes ago the error occurred.

Mode Select	A. 00
* Error List	





Press the Return Key to return to the Mode Select Screen.





8. Operation

8-9 User Parameter

The User parameter assigns zone and soft limit ranges, actuator attributes and home direction. Zone and soft limit are set within ± 9999.99 (input unit: mm). Home and servo parameters are determined by the actuator. Each setting for initial setting value parameters is the registered default value for position data during teaching.

Mode Select	A. 00
* User Parameter	

In the Mode Select Screen, using the     Keys, select User Parameter then, press the Return Key.

Use either the     Keys or Return Key to select the display content. To change the value, use the Numeric Key for input and then, press the Return Key.

User Para	A. 00
+ Zone	150. 3<u>0</u>mm

Displays the zone limit +side.

User Para	A. 00
- Zone	-0. 3<u>0</u>mm

Displays the zone limit -side.

User Para	A. 00
+ Limit	150. 3<u>0</u>mm

Displays the soft limit + side.

User Para	A. 00
- Limit	-0. 3<u>0</u>mm

Displays the soft limit - side.

User Para	A. 00
Home (CWO CCW1)	1

Displays the homing direction.

User Para	A. 00
Initi. Vel	12<u>5</u>mm

Displays the initial velocity value.

User Para	A. 00
Initi. ACC	0. 2<u>0</u>G

Displays the initial ACC • DEC value.

User Para	A. 00
Range	0. 1<u>0</u>mm

Displays initial positioning width value.

User Para	A. 00
ACC (1: MAX)	0

Displays the initial ACC MAX value.

User Para	A. 00
Push Comp	25<u>5</u>ms

Displays the push stop determination time.

8. Operation

User Para	A. 00
Servo Gain	<u>6</u>

Displays the number of the servo gain.

User Para	A. 00
Hold Cur	<u>24%</u>

Displays the positioning hold current.

User Para	A. 00
Home Cur	<u>50%</u>

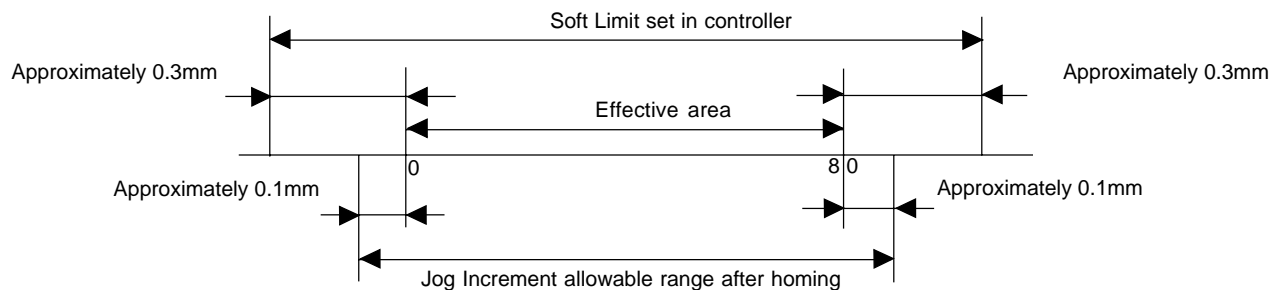
Displays the home current limit value.

- When soft limit is modified at the customer site, please set a value which extends 0.3mm outside of the effective area.

Example: When setting the effective area between 0mm~80mm

Soft limit + side: 80.3

Soft limit - side: -0.3



- After changing the homing direction, all saved position data will be cleared. As needed, please re-enter the data.
- Reversed homing direction may not be done on the Rod Type Actuator.
- Homing direction setting is reversed on the In-Line Type (SSR • SMR) Actuator (0: Correct, 1: Reversed).

Caution:

Please cycle the controller power after making parameter changes.

Although pressing the emergency switch or port switch ON/OFF will rewrite the parameter, there may be ones that will not be changed.

* Regarding parameter, please refer to the RC Controller Operating Manual.

8. Operation

8-10 User Adjustment

Execute home move and axis number setting of integrated RC Controller. Please enter setting for disabled or enable emergency stop input.

Mode Select A. 00
*** User Adjustment**

In the Mode Select Screen, using the ◀▶▲▼ Keys, select Error List and then, press the Return Key.

Home:

User Adjustment A. 00
Adjustment No. 1

Input 1 into the adjustment number and then, press Return Key to execute home.

Disable hold input:

User Adjustment A. 00
Adjustment No. 91

Input 91 into the adjustment number and then, press the Return Key. Afterwards, the controller must be turned OFF.

↑
Input 91

Enable hold input:

User Adjustment A. 00
Adjustment No. 90

Input 90 into the adjustment number and then, press the Return Key. Afterwards, the controller must be turned OFF.

↑
Input 90

Integrated RC Controller axis number setting:

User Adjustment A. 00
Alloc. No. 0

Input the axis number into the allocation number and then, press the Return Key.

←
↑
Input axis number

User Adjustment A. 00
Adjustment No. 2

Input 2 into the adjustment number and then, press the Return Key. If this procedure is done on a non-integrated controller, you will get error number 61. Afterwards, the controller must be turned OFF.

↑
Input 2

Caution: Please do not input numeric value other than 1, 2, 90 and 91 into the adjustment numbers.

8. Operation

8-11 End

Execute end in order to record each setting and save the content of the teaching pendant.
Please execute this end whenever disabling the Teach Port of the RC controller.

Operation:

1. Press the BEGIN/END for more than 2.5 seconds.
2. Move the cursor to “End,” and press the return key.

Afterwards, to remove, turn the controller port switch to OFF, then remove the Teach Pendant connector. You will be able to reopen the connection from the initial screen by selecting “reconnect” and pressing down the return key.

In case data input ends, and the Easy Type Teaching Box needs to be removed

Op. Start / End
*** End ST= Efct**



Home

Op. Start / End
*** End ST-Non**

Turn the RC Controller PORT Switch to OFF.
Then, remove the connector.

In case you reconnect and wish to reopen from the Reset Screen.

Op. Start / End
*** Reconnection**



Confirming Connection
IAI RC ST V. 1.00



Select Axis
*** Axis No. 00**

(in case of multiple axes connection)

Or

Mode Select A. 00
*** Edit**

(in case of single axis connection)

Caution:

When multiple axes are connected with a controller link cable, after cycling power of a controller that is not directly connected to the teaching pendant, please execute a reconnect.

9. Message Area

In the message screen, content during error and warning will be displayed.

Code No.	Error Label	Error Reset	Reference
000-07F	Controller Warning	Yes	Controller rejects command
080-0FF	Controller Error	Yes	Error inside the controller
100-1FF	TB* Message	Yes	Input error, guide message, etc.
200-2FF	TB* Movement Release	Yes	Movement continuation impossible
300-3FF	TV Cold Start Error	No	TB Power install or reconnect are not necessary.

* Refers to the Teaching Box

9-1 Warning Label Error

Warning message is cleared by recovery procedure as follows:

Release operation:

1. First, confirm the cause of the warning and resolve the problem.
2. Press down BEGIN/END Key.

Warning is probably due to the following possibilities:

- RS485 communication abnormality
- Teaching Pendant operational mistake

Cause: 1) RS 485 communication related abnormality

For example, when move command is delivered by PIO signal from teaching while communicating to other devices (PLC), "075h" will occur.

- 2) Influence by foreign noise or connections is not properly installed.
The teaching pendant and RC controller execute packet communication at all times. At this time, when data changes due to noise, the RC controller will determine that it is incorrect data and will reject the data.

Solution: 1) Confirm the above causes. In the case of frequent warning occurrences, please remove the signal cable and power line.

9-2 Teaching Pendant Message Label Error

Teaching Pendant operational mistake:

When you attempt to input an incorrect value, the message label error will occur.

Code No: 112h, 113h, 114h, 118h, 11Eh, 11Fh ••• Keypad input value is incorrect.

9. Message Area

9-3 Controller Error

An alarm detected from the controller side can be displayed. This is a serious error due to abnormality related to servo control and electricity. Please read through the RC Controller operating manual carefully for error compliance.

Code No: 0B0h, 0B1h, 0B8h, 0B9h, 0BBh, 0BCh, 0BDh, 0BEh
0C0h, 0C1h, 0D0h, 0D1h, 0D8h, 0E0h, 0E8h, 0E9h, 0EAh, 0F8h

9-4 Error Code Glance Sheet

Code	Error Description	Common Solutions
05A	Transmission Error	Abnormal Communication, Check for noise. Inspect all serial ports and cables involved.
05B	Transmission Framing Error	
05D	Start Text Error	
05E	End Text Error	
07F	BCC Error	
061	FNCCHR, W Address Error	Serial string needs to be formatted correctly.
062	1 Operand Error	Incorrect Data Command (possibly an operation not allowed with the controller type).
063	2 Operand Error	Incorrect Data Command (possibly an operation not allowed with the controller type). In case of another placed controller, there could be an initialization of rotation numbers which surpasses 200rpm against the SW7-ON, SW8-off against the controller.
064	3 Operand Error	Incorrect Data Command Rejection (possibly an operation not allowed with the controller type).
067	BCC Error	Incorrect Data Command Rejection (characters other than either 0-9 or A-F are included).
070	RUN-OFF, Transfer Command	Incompatible Command Rejection (possibly due to External PIO command).
071	No homing, PTP	
073	Servo ON, Error Reset	
074	Communication Error	
075	During homing, movement command	Attempted move while homing.
0B0	Bank 30 Error (Parameter)	Execute a common parameter edit or initialize the controller.
0B1	Bank 31 Error (Point)	1. Cycle power to controller 2. Possibly, parameters need to be set correctly.

9. Message Area

Code	Error Description	Common Solutions
0B8	Communication Error 1	Please check the following: <ul style="list-style-type: none"> • Payload is within specification. • If external power source works well - check motor encoder cable.
0B9	Communication Error 2	
0BB	ORG - Search C Error	Abnormal Z phase.
0BC	ORG - Search A, B Error	Abnormal A and B Phase
0BD	Speed prior to ORG Search Error	During homing, already moving over the rated speed.
0BE	Homing Time Out Error	Check the motor and encoder cables. Make sure that the slider is not jammed against the hard stop.
0C0	Over Speed	Please reduce the payload or lower the velocity and ACC/DEC.
0C1	Servo Error	
0D1	Excessive Circuit Voltage	Please check the payload or lower the velocity and ACC/DEC.
0D8	Deviation Error	Please check mechanical binding.
0E0	Over Load	Too much payload. Please check mechanical binding.
0E8	No A, B Phase Feedback	Please check the encoder • cable.
0E9	No A Phase Feedback	
0EA	No B Phase Feedback	
0EB	No C Phase Feedback	
0EC	No PS Phase Feedback	
0F8	Memory Error	Controller reset is needed.
0F9	Abnormal PLD	Base mounted PLD is showing abnormal movement.
101	Over run error (s)	Check for noise. Inspect all serial ports and cables involved.
102	Framing Error (S)	Please check serial baud rate
104	SCI R-QUE OV (S)	Excessive data is being externally transmitted (during update)
105	SCI S-QUE OV (S)	SCI Transmission Over Flow (during update)
106	Termi R-BF OV (S)	External excess data reception (during update)
10A	Motorola S Sum Error	Abnormal program file (during update)
10B	Motorola S Record Error	Abnormal update program file (during update)

9. Message Area

Code	Error Description	Common Solutions
10C	Motorola S Address Error	Abnormal Update program file (during update)
10D	Motorola S File Name Error	Abnormal update program file (during update)
10E	Timing Limit (W) (S)	Please check the TB-CPU Board Flash ROM Address setting DIP-SW (during update).
10F	Timing Limit (E) (S)	Please check the TB-CPU Board Flash ROM Address setting DIP-SW (during update).
111	Timing Limit (P) (S)	Please check the TB-CPU Board Flash ROM Address setting DIP-SW (during update).
112	Input Incorrect Error	Input value is incorrect. Please input allowable data.
113	Input Under Error	Input value is too small. Please input allowable data.
114	Input Over Error	Input value is too big. Please input allowable data.
115	Homing Incomplete	Moved before home complete.
116	Last Position Data Exists	During position add, please clear or delete the last position data.
117	No Move Data	Moving position data does not exist. Please assign position data.
118	Non-connect Axis Select	Non-connected axis is selected (this is not an error).
119	TB Paramater Rotation Over	The TB internal parameter change allowable rotation number exceeds after update.
11A	Flash Verify Error: S	Please check the TB-CPU Board Flash ROM Address setting DIP-SW (during update).
11B	Flash ACK Time Out: S	
11C	Flash Verify Error: M	
11D	Flash ACK Time Out: M	
11E	Pair Data Mismatch	Data values are not consistent (i .e. one (+) is smaller than sone (-1)).
11F	Absolute Value Error	The absolute value of the input value is too small.
120	Initialize factor error	Factor data input data during controller initialization is abnormal. Please input allowable data.
121	Push search end over	Push final destination point has an excessive stroke. Please modify the position or positioning width.
122	Allocate, multi-axes connect	Axis Number allocate must be done with 1 axis
180	Change to axis number OK	(Not an error)
181	Controller initialize OK	(Not an error)

9. Message Area

Code	Error Description	Common Solutions
182	Home Change All Clear	(No error).
201	Emergency Stop	(No error).
20A	During movement, Servo OFF	Servo turned OFF during movement.
20C	During movement, CSTR-ON	Start turned ON during movement.
20D	ILK-OFF during movement	STP turned OFF during movement.
301	Over Run Error (M)	Please check for noise. Inspect all serial ports and cables involved.
302	Framing Error (M)	Inspect all serial ports and cables that are involved.
304	SCI R-QUE OV (M)	External excessive data reception.
305	SCI S-QUE OV (M)	SCI transmission QUE over Flow (during central port)
306	Termi R-BF OV (M)	External excessive data reception.
307	Memory Command Reject	Command was rejected from the controller. In order to investigate the cause, record all error list before TB power is turned OFF.
308	Response Time Out (M)	Inspect all serial ports and cables involved.
309	Termi Light Address Error	Termi light address non-determined error.
30A	Packet R-QUE	External excessive data reception.
30B	Packet S-QUE OV	Packet transmission QUE overflow.
30C	No Connect Error	Inspect controller power and all serial ports and cables that are involved.

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