# CKD

# **INSTRUCTION MANUAL**

Electric Actuator ETP2 (Teaching Pendant)

- Read this manual carefully and thoroughly before using this product.
- Pay extra attention to the instructions concerning safety.
- After reading this manual, keep it in a safe and convenient place.

4<sup>th</sup> Edition

**CKD** Corporation

## To use this product safely

Before use, be sure to read this instruction manual.

When a device using an electric actuator is designed, it is necessary to manufacture a safe device, checking that the system that is operated according to the machine mechanism of the device and by an electric machine control is surely safe.

To use our product safely, the selection, use and handling of the product and appropriate safety control are important.

To secure the safety of the device, be sure to observe the warning and caution matters.

Please design a safe device by checking that the safety in the device can be secured.



CAUTION

A limited case where it is assumed that a dangerous situation will occur in which a death or severe injury will be caused and the urgency (degree of imminency) when danger occurs is high if the product is handled wrongly.



A case where it is assumed that a dangerous situation will occur in which a death or severe injury will be caused if the product is handled wrongly.



A case where it is assumed that a dangerous situation will occur in which a minor injury will be caused or only physical damage will occur if the product is handled wrongly.

In this instruction manual, the ranks of safety precautions are classified as "Danger", "Warning" and "Caution".

A matter written in "Caution" may lead to a critical result depending on the situation.

All the descriptions are important, so be sure to observe them.



- Do not use the product in a place where there are dangerous substances such as an igniting substance, inflammable substance and explosive substance. Ignition, inflammation or explosion may occur.
- The product should not be splashed with water droplets, oil droplets, etc. A fire accident or failure may be caused.

## A WARNING

- Since precision parts are contained, avoid overturning, vibrations and shocks during conveyance.
- Do not stand or put an object on the package.
- Do not stand, step or put an object on the product.
- Install the product in a place where there is no direct sunlight, dust, vicinity of a heating element, corrosive gas, inflammable gas and combustible substance.
- If an operation is performed from a position where the actuator cannot be seen, be sure to check beforehand that it is safe even if the actuator operates.

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- Do not apply strong pressures and shocks to the product. A failure may be caused.
- Do not apply unnecessary force to the cable and connector parts.
- Do not press the LCD screen and operation key part strongly.
- Connect the product to the controller only when you use it. Remove it in other cases.
- Use and store the product with no condensation at operation and storage temperatures.
- Use the product in a place where there are no strong electromagnetic waves, ultraviolet rays and X-rays.
- Do not disassemble the product.
- When disposing of the product, be sure to outsource it to a professional waste disposer etc. in accordance with the laws on waste disposal and cleaning.

#### Warranty clause

The warranty period and warranty scope are shown in the following.

1) Warranty period

The warranty period of the product shall be 1 year from delivery.

(An operating time in one day shall be 8 hours or less. If the end of life is reached within 1 year, the period shall be the warranty period.)

#### 2) Warranty scope

If a failure occurs for which we are responsible during the above warranty period, we will repair the product for free promptly.

However, if any of the following is applicable, it shall be excluded from the scope of this warranty.

- [1] If the product is used outside the scope of the conditions and environments written in the product specifications.
- [2] If a failure is caused by wrong use and wrong control such as careless handling.
- [3] If a failure is caused by a reason other than the delivered product.
- [4] If a failure is caused by use other than the appropriate use of the product.
- [5] If a failure is caused by a change of a structure, performance, specifications, etc. not related to us and repair not designated by us performed after the delivery.
- [6] In the case of damage which can be avoided if your machine and equipment have the functions, structures, etc. that are standard in the industry when this product is assembled to your machine and equipment and used.
- [7] If a failure is caused by a reason which is unpredictable with the technology used practically at the time of the delivery.
- [8] If a failure is caused by a fire accident, earthquake, flood, lightening, other natural disasters, act of providence, pollution, salt damage, gas disaster, abnormal voltage and other external factors.

The warranty mentioned here means the warranty for the delivered product itself. Damage induced by a failure of the delivered product shall be excluded.

- 3) Warranty in case where product is exported to another country
  - [1] If a product is returned to our plant or a company or plant designated by us, we will repair it. Works and costs related to the return shall be excluded from the warranty.
  - [2] A repaired product will be delivered to a place in Japan designated by the customer using the Japanese packing specifications.

#### 4) Check of conformance

The customer should have the responsibility to check the conformance of our product to a system, machine and device used by the customer.

#### 5) Others

This warranty clause specifies basic matters. If the warranty descriptions written on the individual specification diagrams or specifications are different from this warranty clause, the specification diagrams or specifications shall be prioritized.

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#### 1. Introduction

Thank you for purchasing our teaching pendant for the electric actuator "ETP2". This instruction manual describes basic matters for installation, operations, etc. to fully deliver the performance of the teaching pendant for the electric actuator "ETP2". To use the product correctly, read this manual carefully beforehand.

Keep this instruction manual in a safe place to avoid losing it.

- Do not perform handling and operations not written in this instruction manual.
- The specifications and appearance written in this instruction manual are subject to change without notice in the future.



--- MEMO ----



#### 2. Specifications

2.1. Specifications

ltem	Specifications		
Indication	20 letters x 4 rows (LCD)		
Input key	7 keys (stop key: 1 and operation key: 6)		
Cable length	2 m		
Connected controller (*)	EC, EC07 and EC63		
Applicable actuator	ERL/ESD series and ERL2/ESD2 series		
Ambient operation	0 to 40°C (There should be no freezing.)		
Ambient operation humidity	35 to 80%RH (There should be no condensation.)		
Ambient storage temperature	-10 to 50°C (There should be no freezing.)		
Ambient storage humidity	35 to 80%RH (There should be no condensation.)		
Atmosphere	There should be no corrosive gas, explosive gas and dust.		
Prevention structure	IEC Standards, Equivalent to IP40		
Weight	Approx. 140 g (cable is excluded)		

\* The following shows the versions of the teaching pendant and controllers which can be connected. Check the version of the teaching pendant on the product nameplate. (If not written on the product nameplate, the version is Ver:1.00.)

Controller	Teaching pendant, Version		
	Ver:1.02	Ver:1.01	Ver:1.00
EC	0	0	0
EC07	0	0	0
EC63	0	0	×
ECPT	0	×	×

O: Supported, x: Not supported

<ul> <li>Check the version of the teaching pendant and connect it to the</li> </ul>
controller. If connection not supported is performed, a malfunction etc.
may be caused.

2.2. Type code indication method





2.3. Outside sizes and names of parts





[1] Hook A hook for hanging the product.

[2] LCD Indication of 20 letters x 4 rows.The backlight is turned off when no operation is performed for 1 minute and illuminated again by a key operation.

[3] Stop key Used to stop the movement of the actuator.



#### [STOP]

When it is pushed once, the movement of the actuator will be stopped and the servo will be turned off.

When it is pushed for 2 seconds or more, a stop release will be performed and the actuator will be in a standby status.

[4] Operation keys Used for various operations. The LED of an operable key is illuminated. The following shows the main functions of the keys.



#### [UP]

- Selection of menu and data
- Change of value when value is input
- + movement of jog and inch



#### [DOWN]

- Selection of menu and data
- Change of value when value is input
- movement of jog and inch



#### [LEFT]

- Change of value digit when value is input
- Change of point number
- Change of indicator



#### [RIGHT]

- Change of value digit when value is input
- Change of point number
- Change of indicator



#### [BACK]

- Cancellation of operation and return to previous screen
- Stop of point movement



#### [ENTER]

- Determination of menu and data
- Start of point movement

[5] Connector

Connected to a controller.



#### 2.4. Functions

2.4.1. Function list

#### The teaching pendant has the following functions.

Menu					Description	
Main	Sub 1	Sub 2	Sub 3	Sub 4	Description	
		Jog			A velocity is set and jog movement is performed.	
		Inch			A velocity and distance are set and inch movement is performed.	
	Movement	Point			A point number is selected and point movement is performed.	
		Origin retur	n		An origin return is performed.	
		Servo			Servo on/off is performed.	
				MDI	Point data (position) are set by a key input.	
ing			Position	Jog	Point data (position) are set by jog movement.	
Sett		Data	(teach)	Inch	Point data (position) are set by inch movement.	
nt &	Point	setting		Direct	Point data (position) are set by the position of the machine.	
Moveme			Setting other than position setting Point data (positioning width, mode, veloc deceleration, pressing current, pressing veloc distance) are set.	Point data (positioning width, mode, velocity, acceleration, deceleration, pressing current, pressing velocity and pressing distance) are set.		
	Data initiali	a initialization		Point data are returned to initial values (values when shipped from the plant).		
		Data setting	9		Parameter data are set.	
	Parameter	Data initiali	zation		Parameter data are returned to initial values (values when shipped from the plant).	
	PIO test				An input signal of the I/O connector is displayed and an output signal is turned on/off forcibly.	
	Present position output test				A present position output signal is output forcibly.	
	Actuator (position and velocity)				A present position and velocity are displayed.	
	PIO Input/output signals of the I/O con	Input/output signals of the I/O connector are displayed.				
nitor	Number of	Number of pulses			The number of counts of an input pulse string is displayed.	
Mo	Alarm				A present alarm and past 10 alarms are displayed.	
	Version			The versions of the teaching pendant and controller are displayed.		

\* In the area enclosed by the thick line, the mode of the controller is changed from the PIO mode to the TP mode (SIO mode). The input/output signals of the I/O connector of the controller will be ineffective in the TP mode (SIO mode) with some exceptions.

	• The input/output signals of the I/O connector of the controller will be ineffective in the TP mode (SIO mode) with some exceptions and cannot
	be controlled from higher equipment such as PLC.
CAUTION     • The input signals will be ineffective except for an alarm re	
	The output signals will be ineffective except for an alarm, origin return
	completion and operation preparation completion. (All output signals
	will be ineffective in a PIO test.)



#### 2.4.2. Operation flow

An operation performed using the teaching pendant has the following structure.





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#### 3. Operation

- 3.1. Connection and removal of controller
  - 3.1.1 Connection

Connect the connector of the teaching pendant to the connector for teaching pendant connection on the controller front surface.

#### 3.1.2. Removal

Operate the operation key of the teaching pendant to return the screen to the initial screen or main menu screen and remove the connector of the teaching pendant.



The display on the initial screen will vary depending on the version of the teaching pendant.

\* How to return to initial screen and main menu screen

→1. Move & Set 2. Monitor

The screen returns to the previous screen by pushing **[BACK]**. Repeat this operation to return to the initial screen or main menu screen. If the PIO mode change check screen is displayed halfway, push **[ENTER]**.

Check of PIO N	lode Change	
>>Mod e	Change ? <<	
> F	IO Mode	
No	=> (BACK )	
Yes	=> (ENTER)	

<ul> <li>In the case of a screen other than the initial screen and main menu screen, communication is performed with the controller. If it is removed in this status, a malfunction etc. may be caused.</li> <li>The input/output signals of the I/O connector of the controller will be ineffective in the TP mode (SIO mode) with some exceptions. If it is removed in this status, they cannot be controlled from the higher equipment such as PLC.</li> </ul>
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3.2. Initial screen and main menu screen when power is turned on

When it is connected to the controller, the power will be supplied to the teaching pendant and the initial screen will be displayed.

When a language is selected, data will be loaded from the controller. After the loading is completed, the main menu screen will be displayed.



The following two items are included in the main menu.

1. Move & Set

Perform the movement of the actuator, setting of point data, setting of parameter data and PIO test.

Refer to "3.3. Movement and setting" (page 3-3).

2. Monitor

The status of the actuator (position and velocity) and input/output signals, alarm and version of the <u>I/O connector</u> of the controller are displayed.

Refer to "3.4. Monitor" (page 3-23).



#### 3.3 Movement and setting

Perform the movement of the actuator, setting of point data, setting of parameter data and PIO test.



The following four items are included in the movement and setting menu.

1. Move

Perform jog movement, inch movement, point movement, origin return and servo on/off. Refer to "3.3.1. Movement" (page 3-4).

2. Point

Set and initialize point data. Refer to "3.3.2. Setting and initialization of point data" (page 3-9).

3. Parameter

Set and initialize parameter data.

Refer to "3.3.3. Setting and initialization of parameter data" (page 3-18).

4. PIO test

An input signal of the I/O connector is displayed and an output signal is turned on/off forcibly. Refer to "3.3.4. PIO test" (page 3-22).



#### 3.3.1. Movement

Perform jog movement, inch movement, point movement, origin return and servo on/off.



Select "1. Move".

Menu selection: **[UP]**, **[DOWN]**, **[LEFT]** and **[RIGHT]** Determination: **[ENTER]** Return: **[BACK]** 

Select the movement menu. Menu selection: [UP], [DOWN], [LEFT] and [RIGHT] Determination: [ENTER] Return: [BACK]

The following five items are included in the movement menu.

- Jog Set a velocity and perform jog movement.
   Refer to "(1) Jog movement" (page 3-5).
- 2. Inch

Set a velocity and distance and perform inch movement. Refer to "(2) Inch movement" (page 3-6).

#### 3. Point

Select a point number and perform point movement in accordance with set point data. Refer to "(3) Point movement" (page 3-7).

4. Origin

Perform an origin return in accordance with set parameter data. Refer to "(4) Origin return" (page 3-8).

5. Servo

Perform servo on/off. Refer to "(5) Servo on/off" (page 3-8).



(1) Jog movement

Set a velocity and perform jog movement.



Select "1. Jog". Menu selection: [UP], [DOWN], [LEFT] and [RIGHT] Determination: [ENTER] Return: [BACK]

 \* The servo on check screen is displayed in a servo off status. When proceeding with it, push [ENTER].

Set a velocity.

Velocity change: [LEFT] and [RIGHT] Setting: [ENTER] Return: [BACK]

Perform jog movement. The present position is displayed.

Jog + Movement: Moves when **[UP]** is pushed. Jog - Movement: Moves when **[DOWN]** is pushed. Return: **[BACK]** 

\* When no origin return has been completed, the present position is not displayed.

- Moving (jog). The present position is displayed. Jog stop: Stops when **[UP]** or **[DOWN]** is released.
- \* When no origin return has been completed, the present position is not displayed.



#### (2) Inch movement

Set a velocity and distance and perform inch movement.



Select "2. Inch".

Menu selection: **[UP]**, **[DOWN]**, **[LEFT]** and **[RIGHT]** Determination: **[ENTER]** Return: **[BACK]** 

 \* Various check screens are displayed in a servo off status or when no origin return has been completed. When proceeding with it, push [ENTER].

Set a velocity and distance. Item selection: **[UP]** and **[DOWN]** Velocity and distance change: **[LEFT]** and **[RIGHT]** Setting: **[ENTER]** Return: **[BACK]** 

Perform inch movement. The present position is displayed.

Inch + Movement: **[UP]** Inch - Movement: **[DOWN]** Return: **[BACK]** 

Moving (inch). The present position is displayed. After movement completion, the screen returns to the inch movement standby screen.



(3) Point movement

Select a point number and perform point movement in accordance with set point data.

\* The selectable point number will vary depending on the connected controller. EC63 can be selected from point numbers P01 to P63. EC07 and EC can be selected from point numbers P01 to P07.



Select "3. Point".

Menu selection: **[UP]**, **[DOWN]**, **[LEFT]** and **[RIGHT]** Determination: **[ENTER]** Return: **[BACK]** 

 \* Various check screens are displayed in a servo off status or when no origin return has been completed. When proceeding with it, push [ENTER].

Select a point number and perform point movement. Point data can be checked (second and third rows on the screen).

Point number selection: [LEFT] and [RIGHT] Data check: [UP] and [DOWN] Movement: [ENTER] Return: [BACK]

- \* Display <P> of point data indicates that the set value of parameter data is applied. (Example: If there is display <P> in a velocity, it indicates that the set value of the "common velocity" of parameter data is applied.)
- \* Point data cannot be set on this screen.

Moving (point). The present position is displayed. After movement completion or a stop by a key operation, the screen returns to the point number selection and movement standby screen.

Stop: [BACK]

\* If the "mode" of point data is PRS1 (pressing movement 1) or PRS2 (pressing movement 2), the movement will be completed when it moves to the final target position but the movement will not be completed if it cannot move to the final target position with a workpiece etc. pressed. When stopping pressing, push [BACK].



#### (4) Origin return

Perform an origin return in accordance with set parameter data.



#### (5) Servo on/off

Perform servo on/off.



#### Select "5. Servo". Menu selection: **[UP]**, **[DOWN]**, **[LEFT]** and **[RIGHT]** Determination: **[ENTER]** Return: **[BACK]**

Perform servo on/off. The present servo status can be checked (upper right on the screen).

Servo on: **[UP]** Servo off: **[DOWN]** Return: **[BACK]** 



3.3.2. Setting and initialization of point data Set and initialize point data.



Select "2. Point". Menu selection: **[UP]**, **[DOWN]**, **[LEFT]** and **[RIGHT]** Determination: **[ENTER]** Return: **[BACK]** 

Select the point data menu. Menu selection: [UP], [DOWN], [LEFT] and [RIGHT] Determination: [ENTER] Return: [BACK]

The following two items are included in the point data menu.

1. Data Set Set point data.

Refer to "(1) Setting of point data" (page 3-10).

2. Data Initialize

Point data are returned to initial values (values when shipped from the plant). Refer to "(2) Initialization of point data" (page 3-16).



(1) Setting of point data

Select and set a point number and point data.

\* The selectable point number will vary depending on the connected controller. EC63 can be selected from point numbers P01 to P63. EC07 and EC can be selected from point numbers P01 to P07.

Pointdata Menu
[1. 2. Point]
→1. Data Set
2. Data Initialize
BACK
Point Number, Pointdata Selection
P 0 1
→Posi +000.00mm
Mode ABS, POSI
INP 0.00 <p></p>
Dece 0.0 <p></p>
P 0 1
P Curr 000 <p></p>
P Velo 00 <p></p>
P Dist +000.00 <p></p>

Select "1. Data Set".

Menu selection: **[UP]** and **[DOWN]** Determination: **[ENTER]** Return: **[BACK]** 

Select a point number and point data. Point number selection: [LEFT] and [RIGHT] Data selection: [UP] and [DOWN] Determination: [ENTER] Return: [BACK]

\* Display <P> indicates that the set value of parameter data is applied. (Example: If there is display <P> in a velocity, it indicates that the set value of the "common velocity" of parameter data is applied.)

Nine items are included in the point data.

#### Posi

Select and set a position setting (teach) method from MDI, jog, inch and direct.

- Refer to "(a) Position setting (teach) MDI" (page 3-11).
- Refer to "(b) Position setting (teach) Jog" (page 3-12).
- Refer to "(c) Position setting (teach) Inch" (page 3-13).
- Refer to "(d) Position setting (teach) Direct" (page 3-14).

#### Mode

Select and set a position designation from ABS (absolute position designation) and INC (relative position designation).

Select movement from POSI (positioning movement), PRS1 (pressing movement 1) and PRS2 (pressing movement 2).

Refer to "(e) Mode setting" (page 3-15).

Items other than above

Set the value of each item by a key input.

Refer to "(f) Positioning width, velocity, acceleration, deceleration, pressing current,

pressing velocity and pressing distance setting" (page 3-15).



(a) Position setting (teach), MDI Set a position by a key input.





(b) Position setting (teach), Jog
 Perform jog movement for the actuator and set the position.





#### (c) Position setting (teach), Inch

Perform inch movement for the actuator and set the position.





- (d) Position setting (teach), Direct
  - Move the actuator by hand and set the position.
  - \* In the case of the actuator with a brake, it is necessary to release the brake using the brake release (BK) terminal of the power connector of the controller. Check that it is safe to release the brake.

	Point Numb	er, Pointdata	Selection		ę
	P01 →Posi	+0	00. 00m	ım	
	Mode INP		ABS , P 0.00	0 S I < P>	
	Position Se	ENTER	thod Selection	BACK	
	P01 P	ositio	n Teac	h	
	MD	+0	00.00m Inch	im	
	Jo	g →	Direct		
		ENTER	Ì	BACK	ł
0	Direct <pos< td=""><td>ition in Set R</td><td>ange&gt;</td><td></td><td></td></pos<>	ition in Set R	ange>		
NTER	P01 T	each (D +2	irect) 34.00m	ım	r a
	Set	=>	(ENTE	R)	(
	Direct < Pos	ition Out of S	Set Range>		
	P01 T	each (D	irect)		
		-0	01.00m	im	
	>>S o f	t Limi	t Over	<<	
					,
	Point Numb	er, Pointdata	Selection		
	P01				
	) → Posi	+2	34.00m	im	
	INP		0.00	<p></p>	

Select a point number and "Posi".

Point number selection: [LEFT] and [RIGHT] Data selection: [UP] and [DOWN] Determination: [ENTER] Return: [BACK]

Select "Direct".

Method selection: **[UP]**, **[DOWN]**, **[LEFT]** and **[RIGHT]** Determination: **[ENTER]** Return: **[BACK]** 

 Various check screens are displayed in a servo status or when no origin return has been completed. When proceeding with it, push [ENTER].

Move the movable part of the actuator by hand and set the position. The present position is displayed.

Setting: [ENTER] Return: [BACK]

\* The set range is within the soft limit. In the case of a display outside the range, move it into the range.



(e) Mode setting

Select and set a position designation from ABS (absolute position designation) and INC (relative position designation).

Select and set movement from POSI (positioning movement), PRS1 (pressing movement 1) and PRS2 (pressing movement 2).



(f) Positioning width, velocity, acceleration, deceleration, pressing current, pressing velocity and pressing distance setting

Set the value of each item by a key input. The following shows a setting example of a velocity (other data are the same).

	Point Number, Pointdata	Selection			
	P 0 1				
	→Velo	000			
	Acce	0.0 <p></p>			
	Dece	0. 0 <p></p>			
		BACK			
0	Velocity Set < In Set Rang	je>			
	P01 Velocit	У			
ENTER		200mm/s			
	(000,	015~ 300)			
	Set =>	(ENTER)			
	Velocity Set < Out of Set Range>				
	P01 Velocit	У			
		400mm⁄s			
	(000,	015~ 300)			
	>>Out of Se	t Range<<			
	L				
	Point Number, Pointdata	Selection			
	P 0 1				
	⊢Velo	200mm⁄s			
	Acce	0.0 <p></p>			
	Dece	0.0 <p></p>			

Select a point number and "Velo".

Point number selection: [LEFT] and [RIGHT] Data selection: [UP] and [DOWN] Determination: [ENTER] Return: [BACK]

Set a value.

Digit change: [LEFT] and [RIGHT] Value change: [UP] and [DOWN] Determination: [ENTER] Return: [BACK]

- \* In the case of a display outside the range, change the value.
- \* Display <P> indicates that the set value of parameter data is applied. (Example: If there is display <P> in a velocity, it indicates that the set value of the "common velocity" of parameter data is applied.)



(2) Initialization of point data

Return the point data of a selected point number or all point numbers to initial values (values when shipped from the plant).

- (a) Initialization of selected point
  - \* The selectable point number will vary depending on the connected controller. EC63 can be selected from point numbers P01 to P63. EC07 and EC can be selected from point numbers P01 to P07.





(b) All-point initialization





3.3.3. Setting and initialization of parameter data Set and initialize parameter data.



Select "3. Para". Menu selection: [UP], [DOWN], [LEFT] and [RIGHT] Determination: [ENTER] Return: [BACK]

Select the parameter data menu. Menu selection: [UP], [DOWN], [LEFT] and [RIGHT] Determination: [ENTER] Return: [BACK]

The following two items are included in the parameter data menu.

1. Data Set

Set parameter data. Refer to "(1) Setting of parameter data" (page 3-19).

2. Data Initialize

Parameter data are returned to initial values (values when shipped from the plant). Refer to "(2) Initialization of parameter data" (page 3-21).



(1) Setting of parameter data

Select and set parameter data.

The following shows a setting example of soft limit + (other data are the same).

Parameterdata Menu
[1.3.Parameter] →1 Data Set
2. Data Initialize
Parameterdata Selection →SoftLimit+ *
+000.00mm
SoftLimit— * +000.00mm
Origin Velocity
origin Offset
001.00mm
Auto Origin *
0 (Disable )
PIO Mode *
0 (N 03F017115)
COM INP
0.10mm COM Velocity
100mm∕s
1. 0m/s2
COM Deceleration
1. 0m/s2
COM Press Current
10mm/s
COM Press Distance +010.00mm
Stop Curr
080%
Press Check Time
0 2 0 0 m s e c
Control Gain1
Control Gain2
UU Control Gain3
00

Select "1. Data Set".

Menu selection: **[UP]** and **[DOWN]** Determination: **[ENTER]** Return: **[BACK]** 

Select "Soft Limit +". Data selection: **[UP]** and **[DOWN]** Determination: **[ENTER]** Return: **[BACK]** 

- \* For the display with \*, the power must be turned on again after data are changed.
- \* Even if the set values of the "PIO Mode" are the same, the display in parentheses will vary depending on the connected controller.

Operation		
$\bigvee$		
	Zone1+ +000.00mm Zone1- +000.00mm	* "Zone 1 +", "Zone 1 -", "Zone 2 +", "Zone 2 -" and "Zone Hysteresis" are displayed only when the
	Zone2+ +000.00mm Zone2- +000.00mm	connected controller is EC63.
	Zone Hysteresis O. 00mm	
	Position Output Range + +000.00mm Position Output Range - +000.00mm	<ul> <li>* "Position Output Range +",</li> <li>"Position Output Range −",</li> <li>"Position Output Frequency",</li> </ul>
	Position Output Frequency 01.0kHz Pulse String Type * 0 (PA phase & B phase)	<ul> <li>"Pulse String Type",</li> <li>"Press Velocity Limit",</li> <li>"Press Curr 1",</li> <li>"Press Curr 2",</li> </ul>
	Press Velocity Limit 100mm/s Press Curr 1 050%	<ul> <li>"Positioning Deviation Width",</li> <li>"Electronic Gear Ratio Numerator" and</li> <li>"Electronic Gear Ratio Denominator"</li> <li>are displayed only if the controller to be connected</li> </ul>
	Press Curr 2 050% Positioning Deviation Width 0.10mm	is ECPT.
	Electronic Gear Ratio Numerator * 1 0 2 4 Electronic Gear Ratio Denominator * 0 6 0 0	
		Set a value.
ENTER	SoftLimit + Set < In Set Range>         SoftLimit +         +500.00mm         (+000.00~+503.00)         Set         =>         (ENTER)         SoftLimit + Set < Out of Set Range>         SoftLimit + Set < Out of Set Range>         SoftLimit + Set < In TER	Digit change: <b>[LEFT]</b> and <b>[RIGHT]</b> Value change: <b>[UP]</b> and <b>[DOWN]</b> Determination: <b>[ENTER]</b> Return: <b>[BACK]</b>
	+600.00mm ( +000.00~ +503.00) >>Out of Set Range<<	<ul> <li>In the case of a display outside the range, change the value.</li> </ul>
	Parameterdata Selection → S o f t L i m i t + * + 5 0 0 0 0 mm	
	SoftLimit- * +000.00mm	

3



#### (2) Initialization of parameter data

Parameter data are returned to initial values (values when shipped from the plant).





#### 3.3.4. PIO test

An input signal of the I/O connector is displayed and an output signal is turned on/off forcibly.

Move & Set Menu [1. Move & Set] 1. Move → 4. PIOTest 2. Point 3. Para
PIO Test <ver.1.02,ecpt> [1.4. PIO (1-13) Test] I:0000 00000 O:000000 000000</ver.1.02,ecpt>
PIO Test <ver.1.02.ec63> [1.4. PIO (1-13) Test] I:000000000000000 O:0000000000000000000</ver.1.02.ec63>
PIO Test <ver.1.02,ec07,ec> [1.4. PIO (1-7) Test] I:0000000 O:000000</ver.1.02,ec07,ec>
PIO Test <ver:1.01,ec63> [1. 4. P I O (1-13) Test] I: 00000000000000 O: 00000000000000 PIO Test <ver:1.01,ec07,ec></ver:1.01,ec07,ec></ver:1.01,ec63>
[1. 4. PIO (1-7) Test] I:0000000 O:0000000
PIO Test <ver:1.00> [1. 4. PIO Test] IN 1-7: 0000000 OUT1-7: 0000000</ver:1.00>

Select "4. PIO Test".

Menu selection: **[UP]**, **[DOWN]**, **[LEFT]** and **[RIGHT]** Determination: **[ENTER]** Return: **[BACK]** 

Display an input signal and turn on/off a selected output signal forcibly.

Output signal selection: [LEFT] and [RIGHT] Output signal on/off: [UP] and [DOWN] Return: [BACK]

- \* Display "1" will be on and display "0" will be off.
- \* If no input/output signals are allocated, "-" is displayed.
- \* The display on the PIO test screen will vary depending on the version of the teaching pendant and connected controller.



#### 3.4. Monitor

The status of the actuator (position and velocity) and input/output signals, alarm and version of the I/O connector of the controller are displayed.





Select "2. Monitor". Menu selection: **[UP]** and **[DOWN]** Determination: **[ENTER]** Return: **[BACK]** 

First, the actuator monitor screen is displayed. Change the monitor display by operating keys. Monitor display change: **[UP]** and **[DOWN]** Return: **[BACK]** 

The following four items are included in the monitor.

1. Actuator

The present position and velocity of the actuator are displayed. Refer to "3.4.1. Actuator monitor" (page 3-24).

2. PIO

The input/output signals of the I/O connector of the controller are displayed. Refer to "3.4.2. PIO monitor" (page 3-24).

3. Alarm

The present alarm and past 10 alarms of the controller are displayed. Refer to "3.4.3. Alarm monitor" (page 3-25).

4. Version

The versions of the teaching pendant and controller are displayed. Refer to "3.4.4. Version monitor" (page 3-26).

5. Pulse string count

The number of counts of an input pulse string is displayed. Refer to "3.4.5. Pulse string input" (page 3-27).



#### 3.4.1. Actuator monitor

The present position and velocity of the actuator are displayed.

```
Actuator Monitor
```

```
[2. 1. Actuator]
Posi +000. 00mm
Velo 000mm∕s
```

Monitor display change: **[UP]** and **[DOWN]** Return: **[BACK]** 

The alarm, motor power off, emergency stop, TP stop and servo off statuses are displayed. If several statuses occur at the same time, only one will be displayed in accordance with the following priority.





#### 3.4.2. PIO monitor

The input/output signals of the I/O connector of the controller are displayed. PIO Monitor <Ver:1.02,ECPT>

00000
00000
0000
0000

PIO Monitor <Ver:1.02,EC07,EC>

I : 0000000 O : 0000000

PIO Monitor <Ver: 1.01,EC63>

[2. 2. PIO (1-13)]	
I:000000 000000	
0:0000000 00000	
PIO Monitor <ver: 1.01,="" ec="" ec07,=""></ver:>	
[2. 2. PIO (1-7)]	
I:000000	
0:000000	
PIO Monitor <ver: 1.00=""></ver:>	
[2. 2. PIO (1-7)]	

IN 1-7: 0000000 OUT1-7: 0000000 Monitor display change: **[UP]** and **[DOWN]** Return: **[BACK]** 

- \* Display "1" will be on and display "0" will be off.
- \* If no input/output signals are allocated, "-" is displayed.
- \* The display on the PIO monitor screen will vary depending on the version of the teaching pendant and connected controller.



#### 3.4.3. Alarm monitor

The alarm codes and names of the present alarm and past 10 alarms of the controller are displayed.

(1) Present alarm and alarm reset

As for a present alarm, the display of the upper right on the screen is "—/—". In the case of a resettable alarm, it can be reset by operating keys.



Monitor display change: **[UP]** and **[DOWN]** Alarm change: **[LEFT]** and **[RIGHT]** Alarm reset: **[ENTER]** Return: **[BACK]** 

(2) Past 10 alarms

As for past alarms, the displays of the upper right on the screen are "01/10" to "10/10". "01/10" is the newest alarm and "10/10" is the oldest alarm.

Monitor display change: [UP] and [DOWN] Alarm change: [LEFT] and [RIGHT] Return: [BACK]



#### 3.4.4. Version monitor

The model type code and version of the teaching pendant and controller are displayed.

Version Monitor	<ver:1.02,ecpt></ver:1.02,ecpt>	
[2.4. Ve	rsion]	
ETP2	Ver:1.02	
ECPT	Ver:1.20	
Version Monitor	<ver:1.02,ec63></ver:1.02,ec63>	
[2.4. Ve	rsion]	
ETP2	Ver:1.02	
EC63	Ver:1.20	
version wonitor	<ver:1.02,ec07></ver:1.02,ec07>	
[2.4. Ver	<pre><ver:1.02,ec07> rsion]</ver:1.02,ec07></pre>	
[2.4. Ve ETP2	<pre><ver:1.02,ec0></ver:1.02,ec0> rsion] Ver:1.02</pre>	
[2.4. Ve ETP2 EC07	<pre><ver:1.02,ec0></ver:1.02,ec0> rsion] Ver:1.02 Ver:1.20</pre>	
[ 2 . 4 . V e E T P 2 E C 0 7 Version Monitor	<ver:1.02,ec07> r s i o n ] V e r : 1 . 0 2 V e r : 1 . 2 0 <ver:1.02,ec></ver:1.02,ec></ver:1.02,ec07>	
Version Monitor [ 2 . 4 . V e l E T P 2 E C 0 7 Version Monitor [ 2 . 4 . V e l	<pre><ver:1.02,ec0></ver:1.02,ec0> r s i o n ]     V e r : 1 . 0 2     V e r : 1 . 2 0     <ver:1.02,ec> r s i o n ]</ver:1.02,ec></pre>	
Version Monitor [ 2 . 4 . V e E T P 2 E C 0 7 Version Monitor [ 2 . 4 . V e E T P 2	<pre><ver:1.02,ec0></ver:1.02,ec0> r sion] V e r : 1 . 0 2 V e r : 1 . 2 0 <ver:1.02,ec> r sion] V e r : 1 . 0 2</ver:1.02,ec></pre>	
Version Monitor $\begin{bmatrix} 2 \cdot 4 \cdot V e \\ E T P 2 \\ E C 0 7 \end{bmatrix}$ Version Monitor $\begin{bmatrix} 2 \cdot 4 \cdot V e \\ E T P 2 \\ E C \end{bmatrix}$	<pre><ver:1.02,ec07> rsion] Ver:1.02 Ver:1.20 <ver:1.02,ec> rsion] Ver:1.02 Ver:1.02 Ver:1.01</ver:1.02,ec></ver:1.02,ec07></pre>	

Monitor display change: **[UP]** and **[DOWN]** Return: **[BACK]** 

\* The display on the version monitor screen will vary depending on the version of the teaching pendant and connected controller.

\* If the version of the teaching pendant is Ver:1.00, the model type code is not displayed.

#### 3.4.5. Pulse string count monitor

The number of counts of an input pulse string is displayed.

	Monitor display change	:[UP][DOWN]
[2.3. Pulse String Input]	Return	:[BACK]
Pulse String Count: +00000		
	*Displayed only in the cas	se of the ECPT controller.



#### 4. Point data

The point data of the controller and their descriptions are shown.

For details such as the movement by the point data, the setting range and the initial value, check the instruction manual of the connected controller.

Name (screen display)		Description
Posi		In the case of positioning movement, set the final target position [mm]. In the case of pressing movement 1 and 2, set the pressing start position [mm]. *Set the positioning movement and pressing movement 1 and 2 using the "mode". *The final target positions of pressing movement 1 and 2 are determined by the "position" and "pressing distance".
Mode	Position designation	<ul> <li>Select a position designation from the following.</li> <li>ABS (absolute position designation) ••• The "position" is a distance from the origin position.</li> <li>INC (relative position designation) ••• The "position" is a distance from the present position.</li> </ul>
	Movement	Select movement from the following. POSI (positioning movement) PRS1 (pressing movement 1) PRS2 (pressing movement 2)
INP		Set the output range of the point movement completion output signal and switch 1 and 2 output signals using the width for the final target position (one side) [mm]. If the set value is 0 (display <p>), the "common positioning width" of the parameter data will be applied.</p>
Velo		Set a velocity [mm/s]. If the set value is 0 (display <p>), the "common velocity" of the parameter data will be applied.</p>
Acce		Set acceleration [m/s <sup>2</sup> ]. If the set value is 0 (display <p>), the "common acceleration" of the parameter data will be applied.</p>
Dece		Set deceleration [m/s <sup>2</sup> ]. If the set value is 0 (display <p>), the "common deceleration" of the parameter data will be applied.</p>
P Curr		Set a pressing current [%]. If the set value is 0 (display <p>), the "common pressing current" of the parameter data will be applied.</p>
P Velo		Set a pressing velocity [mm/s]. If the set value is 0 (display <p>), the "common pressing velocity" of the parameter data will be applied.</p>
P Dist		Set a pressing distance [mm]. If the set value is 0 (display <p>), the "common pressing distance" of the parameter data will be applied.</p>



--- MEMO ----

#### 5. Parameter data

The parameter data of the controller and their descriptions are shown.

For details such as the movement by the parameter data, the setting range and the initial value, check the instruction manual of the connected controller.

Name (screen display)	Description
Soft Limit +	Set the positions on the + side and - side of the movement range of the point movement [mm]. *The power must be turned on again after a change.
Soft Limit -	
Origin Velocity	Set a velocity during origin return movement [mm/s].
Origin Offset	Set an offset amount of an origin position [mm].
Auto Origin	Select enable/disable of an auto origin return. When enable is set, an origin return and point movement will be performed by the first point movement command when no origin return has been completed. 0: Disable 1: Enable *The power must be turned on again after a change.
PIO Mode	Select input/output signals of the I/O connector from the following. The number of positioning points of the standard mode and simple mode will vary depending on the connected controller. 0: Standard mode (number of positioning points: 63 points (EC63), 7 points (EC07, EC)) 1: Simple mode (number of positioning points: 7 points (EC63), 3 points (EC07, EC)) 2: Solenoid valve mode double 2 position type (number of positioning points: 2 points) 3: Solenoid valve mode double 3 position type (number of positioning points: 2 points) 4: Solenoid valve mode single type (number of positioning points: 2 points) *The power must be turned on again after a change.
COM INP	If the "positioning width" of point data is 0 (display <p>), this set value [mm] will be applied.</p>
COM Velocity	If the "velocity" of point data is 0 (display <p>), this set value [mm/s] will be applied.</p>
COM Acceleration	If the "acceleration" of point data is 0 (display <p>), this set value [m/s<sup>2</sup>] will be applied.</p>
COM Deceleration	If the "deceleration" of point data is 0 (display <p>), this set value [m/s<sup>2</sup>] will be applied.</p>
COM Press Current	If the "pressing current" of point data is 0 (display <p>), this set value [%] will be applied.</p>
COM Press Velocity	If the "pressing velocity" of point data is 0 (display <p>), this set value [mm/s] will be applied.</p>
COM Press Distance	If the "pressing distance" of point data is 0 (display <p>), this set value [mm] will be applied.</p>
Stop Curr	Set a current during a stop [%].
Press Check Time	If this set time [msec] has passed with a current during pressing movement reaching the "pressing current" of point data, it will be judged as a pressing start.
Control Gain 1	Not used.
Control Gain 2	Not used.
Control Gain 3	Not used.

Zone 1 +	Set the positions on the + side and - side of the output range of the zone 1 output signal [mm].
*EC63, ECPT only	The output signals will vary depending on the magnitude relationship of the set values.
Zone 1 -	"Zone 1 -" < "Zone 1 +": The output is turned on in the range.
*EC63, ECPT only	"Zone 1 +" < "Zone 1 -": The output is turned on outside the range.
Zone 2 +	Set the positions on the + side and - side of the output range of the zone 2 output signal [mm].
*EC63, ECPT only	The output signals will vary depending on the magnitude relationship of the set values.
Zone 2 -	"Zone 2 -" < "Zone 2 +": The output is turned on in the range.
*EC63, ECPT only	"Zone 2 +" < "Zone 2 -": The output is turned on outside the range.
Zone Hysteresis	Set the widths of the hystereses of output signal zone 1 and zone 2 [mm].
*EC63, ECPT only	
Position Output Range +	Set the positions on the + side and - side of the output range of the present value output
*ECPT only	signal [mm].
Position Output Range -	
*ECPT only	
Position Output Frequency	Set the carrier frequency of the present value output signal.
*ECPT only	
Pulse String Type	Set the form of the pulse string.
	0: Positive logic A/B phase input
	1: Positive logic Up/Down input
	2: Positive logic Pulse/Direction input
	7: Negative logic A/B pridse input
	5: Negative logic Pulse/Direction input
*ECPT only	*The power must be turned on again after a change.
Press Velocity Limit	Set the velocity at which it is possible to transition to pressing movement during pulse string
*ECPT only	control [mm/s].
	The maximum velocity during pressing control is the pressing velocity limit value.
Press Curr 1	Set current value 1 in pressing movement during pulse string control [%].
*ECPT only	
Press Curr 2	Set current value 2 in pressing movement during pulse string control [%].
*ECPT only	
Positioning Deviation Width	A condition for the positioning completion signal during pulse string control to be turned ON.
-	If the difference between the movement indication amount by a pulse string signal and actual
*ECPT only	be turned ON.
Electronic Gear Ratio	Specify the movement amount of the actuator per pulse during pulse string control.
Numerator	*The power must be turned on again after a change.
^ECPT only	
Denominator	
*ECPT only	



#### 6. Failures and measures

6.1. Alarms of controller displayed on teaching pendant

The alarms of the controller displayed on the teaching pendant and their descriptions are shown. For details, check the instruction manual of the connected controller.

Alarm code and name (screen display)	Description	Reset
10: Memory (Loading)	Indicates that an error has been detected in data loading from a	Impossible
11: Memory (Loading)	memory when the power is turned on.	
12: Memory (Loading)	In the case of "13", there is an error in parameter data. Initialize	
13: Memory (Loading)	the parameter data and turn on the power again.	
14: Memory (Loading)	In the case of "15", there is an error in point data. Initialize the	
15: Memory (Loading)	point data and turn on the power again.	
16: Memory (Loading)	In the case of "17", there is an error in alarm data. Alarm data are	
17: Memory (Loading)	initialized by an alarm reset signal or alarm reset from the	
	teaching pendant (the alarm is not reset), so initialize them and	
	turn on the power again.	
	In other cases, there is an error in inside data.	
	If it reoccurs even if the power is turned on again, contact us.	
20: Memory (Writing)	Indicates that an error has been detected in data writing into a	Impossible
21: Memory (Writing)	memory when data are changed.	
22: Memory (Writing)	If it reoccurs even if the power is turned on again, contact us.	
23: Memory (Writing)		
24: Memory (Writing)		
25: Memory (Writing)		
26: Memory (Writing)		
27: Memory (Writing)		
30: Temperature	Indicates that the temperature in the controller is high.	Impossible
	Check the ambient temperature.	
	If it reoccurs even if the power is turned on again, contact us.	
31: Current	Indicates that an overcurrent has flowed in the motor.	Impossible
	If it reoccurs even if the power is turned on again, contact us.	
32: Encoder Has Not Been Connected	Indicates that there is an error in the connection condition	Impossible
	between the controller and actuator.	
	Check the cable and the connection condition of the connector.	
	If it reoccurs even if the power is turned on again, contact us.	
38: SIO Has Not Been Connected	Indicates that there is an error in the connection condition of the	Possible
	connector when the teaching pendant is connected and used in	
	the TP mode (SIO mode).	
	Check the cable of the teaching pendant and the connection	
	condition of the connector.	
	If the connector is removed, connect the connector. The mode	
	will return to the PIO mode. Reset the alarm using the PIO input	
	signal or by operating keys in this status.	

40: Parameter Data	Indicates that there is an error in parameter data when the power	Impossible
	is turned on.	
	Check the following parameter data.	
	"Soft limit +", "Soft limit -", "Origin return velocity", "Origin offset	
	amount" and "Current during stop"	
	Re-set the parameter data and turn on the power again.	
41: Point Data (Posi)	Indicates that when a point movement command is input, there	Possible
	is an error in the point data of the point number (the final target	
	position has exceeded the soft limit range).	
	Check the following point data.	
	"Position" and "pressing distance"	
	Re-set the point data and reset the alarm using the PIO input	
	signal or by operating keys.	
42: Point Data (Velocity)	Indicates that when a point movement command is input, there	Possible
	is an error in the point data of the point number (the pressing	
	velocity is greater than the velocity or the set range has been	
	exceeded)	
	Check the following point data	
	"Velocity", "Acceleration", "Deceleration" and "Pressing velocity"	
	Re-set the point data and reset the alarm using the PIO input	
	signal or by operating keys.	
43: Point Data (Pressing)	Indicates that when a point movement command is input there	Possible
45. Forne Data (Fressing)	is an error in the point data of the point number (the set range	1 0331016
	has been exceeded)	
	Check the following point data	
	"Pressing current"	
	Re-set the point data and reset the alarm using the PIO input	
	signal or by operating keys	
60: Sono ON	Indicators that there is an error in the encoder signal at the time	Possiblo
00. 36100 010	of motor excitation when the serve is turned on for the first time	1 0331016
	after the power is turned on	
	Check the cable that connects the controller and the actuator	
	and the connection condition of the connector. Check that the	
	and the connection condition of the connector. Check that the	
	Check that there is no problem and reset the alarm using the	
	PIQ input signal or by operating kove	
Of Eventur		Descible
61: Encoder	Indicates that the 2 phase signal of the encoder cannot be	Possible
	detected during first movement after the power is turned on.	
	Check the cable that connects the controller and the actuator	
	and the connection condition of the connector.	
	Check that there is no problem and reset the alarm using the	
	PIO input signal or by operating keys.	
62: Origin Return	Indicates that the mechanical end cannot be detected even in	Possible
	the case of movement of a distance longer than the stroke of the	
	actuator during an origin return.	
	Check the cable that connects the controller and the actuator	
	and the connection condition of the connector.	
	Check that there is no problem and reset the alarm using the	
	PIO input signal or by operating keys.	

# 6 Failures and measures Indicates that the present position has exceeded the range of the soft limit during point movement. If it occurs due to an overshoot at the time of positioning to the soft limit vicinity, review the load conditions etc. It will occur also in the case where a point movement command

	· · · · · · · · · · · · · · · · · · ·	
	soft limit vicinity, review the load conditions etc.	
	It will occur also in the case where a point movement command	
	is input outside the soft limit range. In this case, by moving the	
	actuator by hand etc., move it into the soft limit range.	
	Check that there is no problem and reset the alarm using the	
	PIO input signal or by operating keys.	
65: Overload (M)	Indicates that movement cannot be performed.	Possible
	Review the operation conditions.	
	Check that there is no problem and reset the alarm using the	
	PIO input signal or by operating keys.	
66: Overload (P)	Indicates that it has been pressed back to the pressing start	Possible
	position by external force etc. during pressing.	
	Review the operation conditions.	
	Check that there is no problem and reset the alarm using the	
	PIO input signal or by operating keys.	
67: Overload (S)	Indicates that a stop cannot be performed.	Possible
	Review the operation conditions.	
	Check that there is no problem and reset the alarm using the	
	PIO input signal or by operating keys.	
68: Overload (H)	Indicates that displacement has occurred during a stop.	Possible
	Review the operation conditions and review the setting of the	
	"Current during stop" of the parameter data.	
	Check that there is no problem and reset the alarm using the	
	PIO input signal or by operating keys.	
69: Overload (C)	Indicates that an overcurrent has flowed in the motor.	Possible
	Review the operation conditions.	
	Check that there is no problem and reset the alarm using the	
	PIO input signal or by operating keys.	

64: Soft Limit Over



#### 6.2. Messages displayed on teaching pendant

The messages displayed on the teaching pendant and their descriptions are shown.

Message (screen display)	Description
>> Communication Error <<	Indicates that an error occurred in serial communication with the controller.
	If it reoccurs even if the power is turned on again, contact us.
>> Turn OFF Power <<	
>> Alarm <<	Indicates that an alarm occurs in the controller during an operation in the
41: Point Data (Posi)	movement menu. An alarm code and name are displayed.
Reset => (ENTER)	In the case of a resettable alarm, it can be reset by using the PIO input signal or operating keys
>> Alarm <<	
40: Parameter Data	
>> Motor Power OFF <<	Indicates that the motor power is not supplied to the controller during an
	operation in the movement menu.
	When continuing it, supply the motor power.
	When returning, push the operation key [BACK].
>> Emergency Stop <<	Indicates that it is an emergency stop status due to emergency stop input off
	of the controller during an operation in the movement menu.
	When continuing it, turn on the emergency stop input and release the
	When returning push the operation key [BACK]
>> TP Stop <<	Indicates that it is a stop status due to the stop key [STOP] of the teaching
	pendant during an operation in the movement menu.
	When continuing it, hold down the stop key [STOP] of the teaching pendant
	to release the stop.
	When returning, push the operation key [BACK].
>> Data Writing Error <<	Indicates that an error occurred when data were written into the controller.
	Turn on the power again and set the data again.
>> Turn OFF Power <<	If it reoccurs even if the power is turned on again, contact us.
>> Cannot Select <<	Indicates that when the point menu is selected or the parameter menu is
(CTRL memory error)	selected, it cannot be selected because there is an error in the memory of the
Return => (BACK)	It returns by the operation key [BACK]
	If it reoccurs even if the power is turned on again, contact us.



#### 6.3. Others

 $\Box$  Nothing is displayed on the LCD.

Check the following. If there is no problem, it may be broken, so contact us.

- Check that the connector is connected to the controller securely. Check that there is no problem with the cable.
- Check that the power is supplied to the controller.

 $\hfill\square$  Even if the stop key and operation key are pushed, there is no reaction.

Check the following. If there is no problem, it may be broken, so contact us.

- Check that the connector is connected to the controller securely. Check that there is no problem with the cable.
- Check that there is a click feeling when the keys are pushed.
- As for the operation keys, the LED of an operable key is illuminated. Check that the illuminated operation key is pushed.



--- MEMO ----