



Stepping Motor Controller

SC-200 SC-400 SC-800

Introduction Manual



- Thank you for purchasing this product.
- Before use, be sure to read the “Introduction Manual” and “Operation Manual” carefully for correct operations. Keep this Introduction Manual in a convenient place so that it can be referred to at any time when in doubt.

Ver. 1.01

Pioneering the door to the future with a commitment to technology

KOHZU Precision Co., Ltd.

Introduction

Greeting

Thank you for purchasing our “Stepping motor controller SC-200/SC-400/SC-800.”


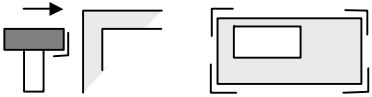

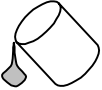

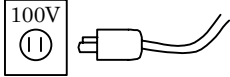

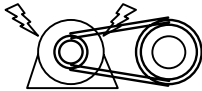

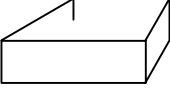

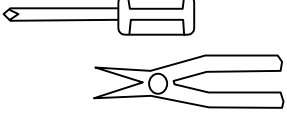


In this manual, handling methods, operating procedures and precautions of the SC series are explained.

In order to use this product safely, first carefully read this manual and the “Operation Manual” for a thorough understanding, and then use this product.

Carefully preserve this manual so that it can be referred to at any time.

Please take care of this manual so that it may reach the hand of the last user.

To use safely

 Prohibition		Do not apply strong impact to the product, or avoid using in a place where vibrations occur frequently.
 Prohibition		Liquid or chemical splashes on this device are dangerous and cause failures. Do not use this device in such places.
 Caution		Use 100V AC (50/60Hz) as a power supply.
 Prohibition		This product is a precision electronic equipment. It may malfunction near large sized-generating machinery or high voltage equipment, or equipment generating strong magnetism. Avoid using in such environments.
 Prohibition		Do not unnecessarily remove the fixed panel and cover except in cases where adjustment or setting of the integrated driver must be adjusted.
 Prohibition		Never rework or replace parts for use.
 Caution		Pay close attention when connecting the motor driven stage or a motor other than those specified by us.

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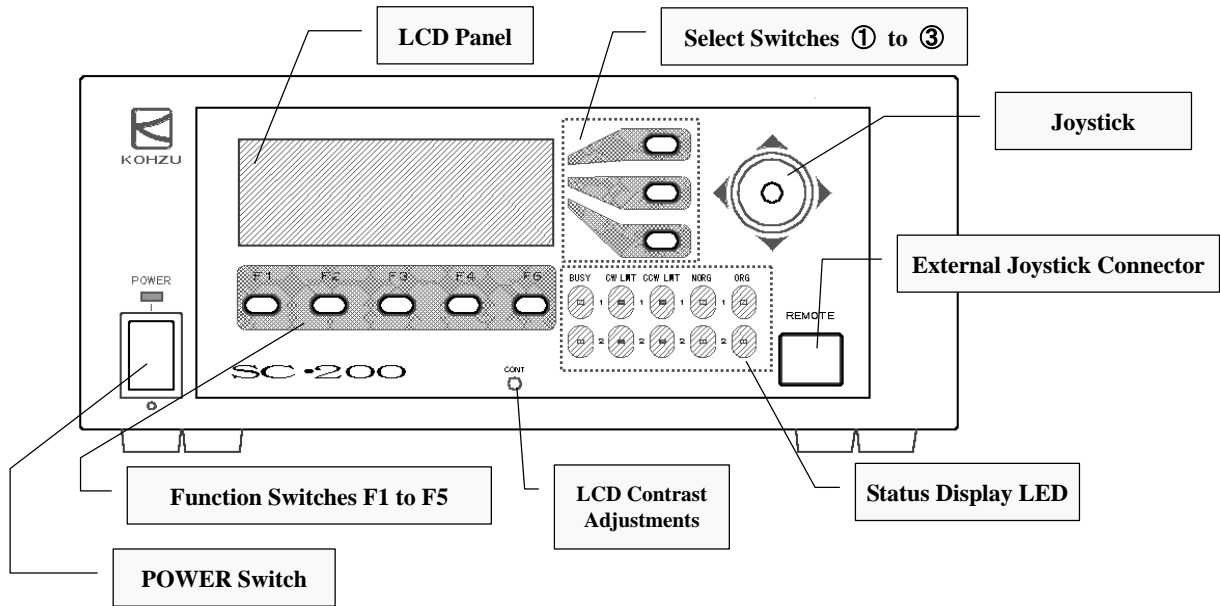
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I. Basic Version

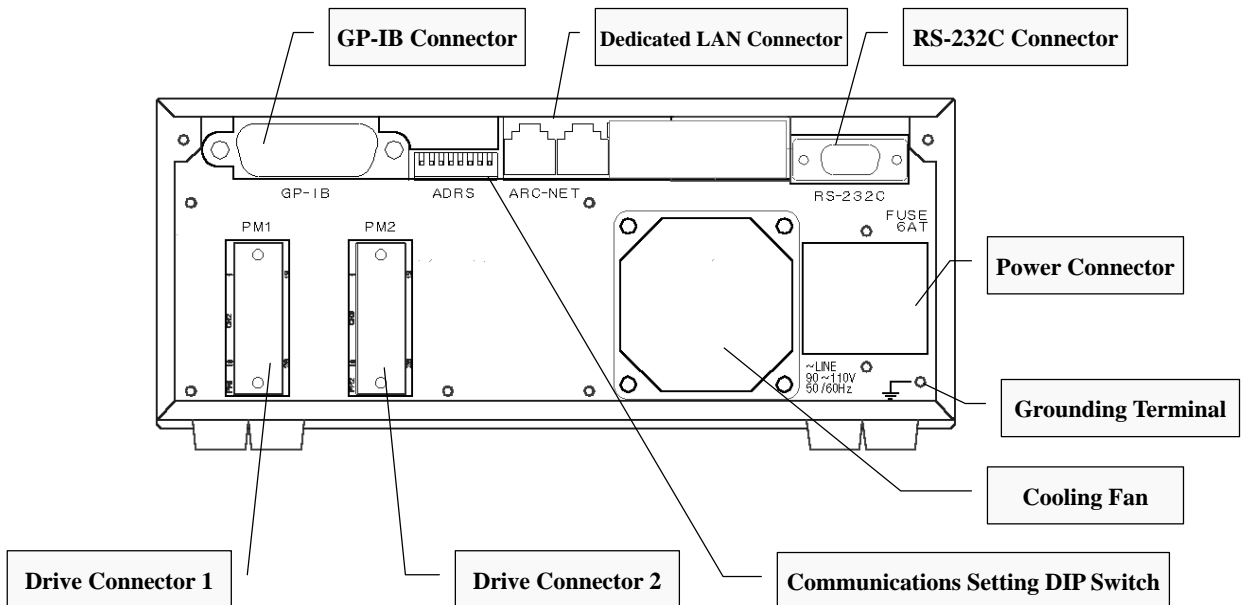
0-0. Part Names

《For the SC-200》

Front

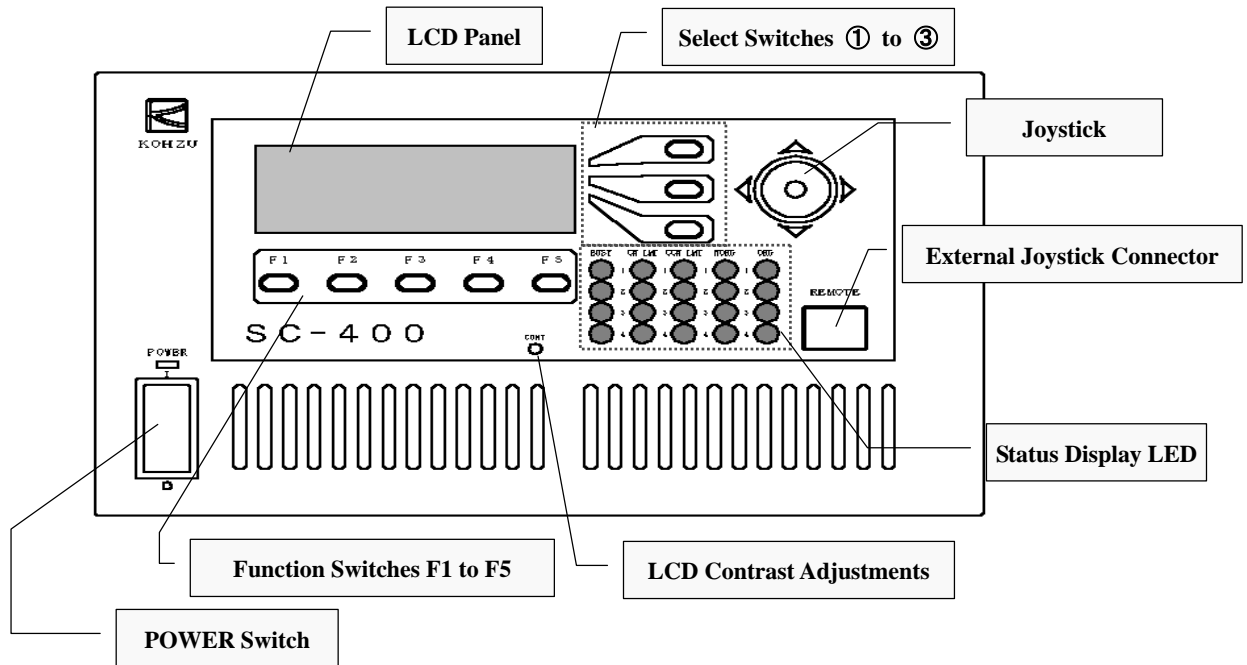


Rear

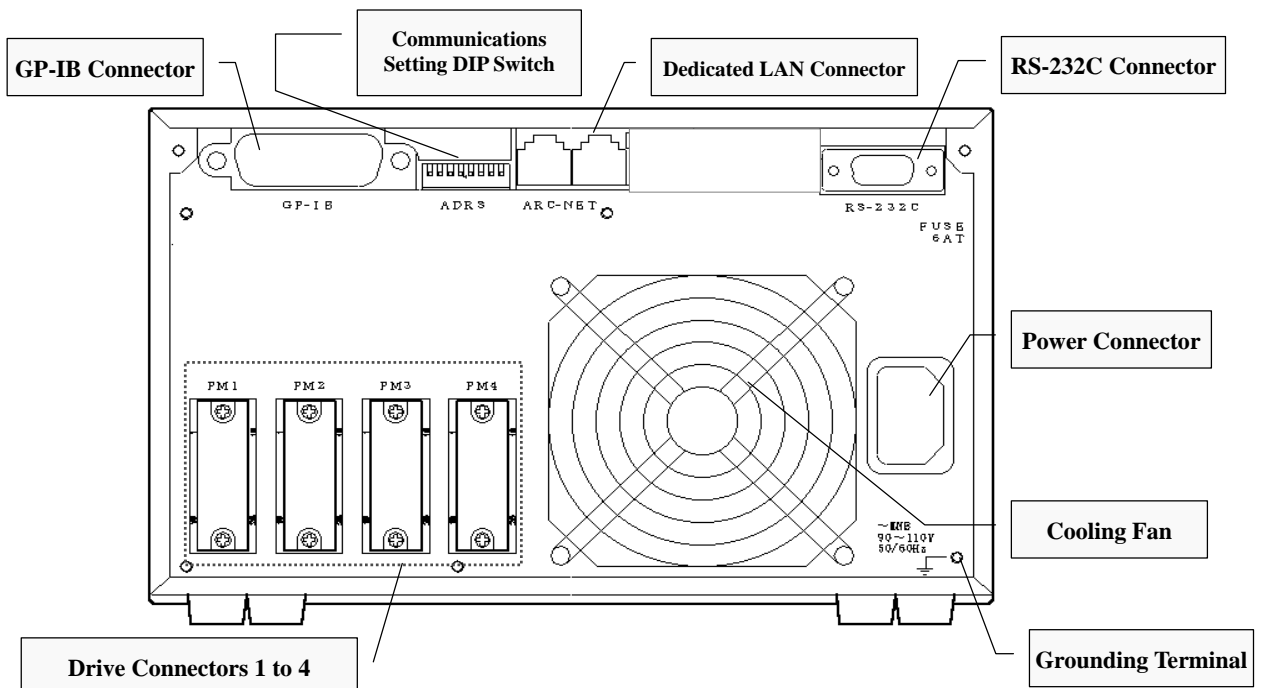


《For the SC-400》

Front



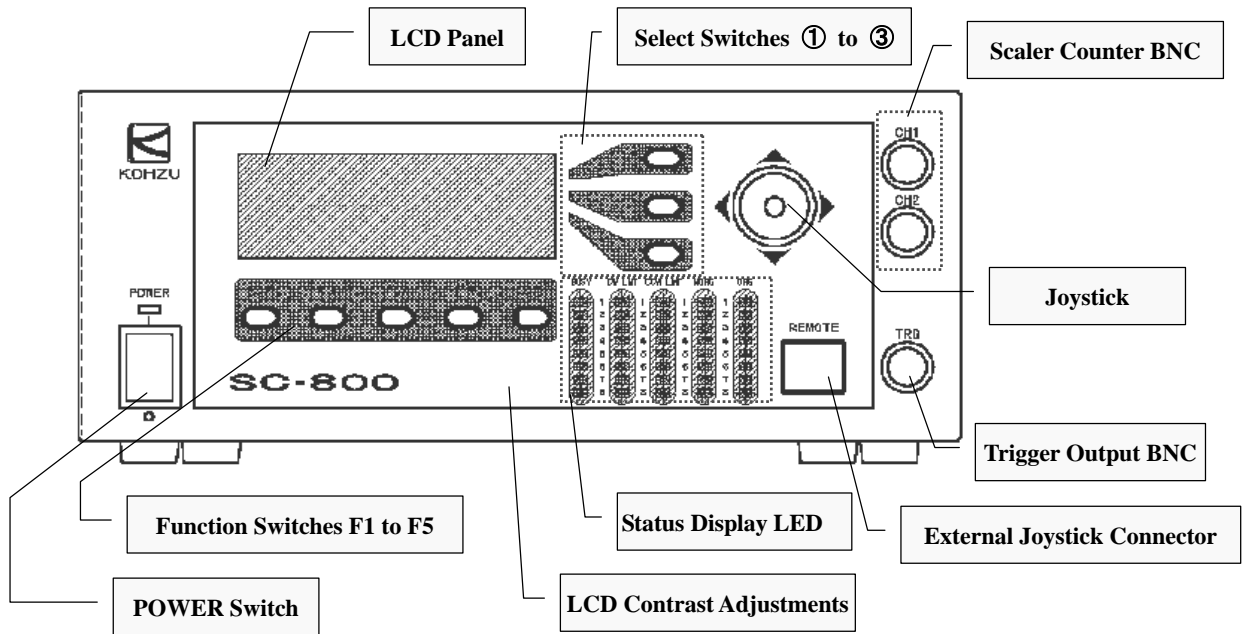
Rear



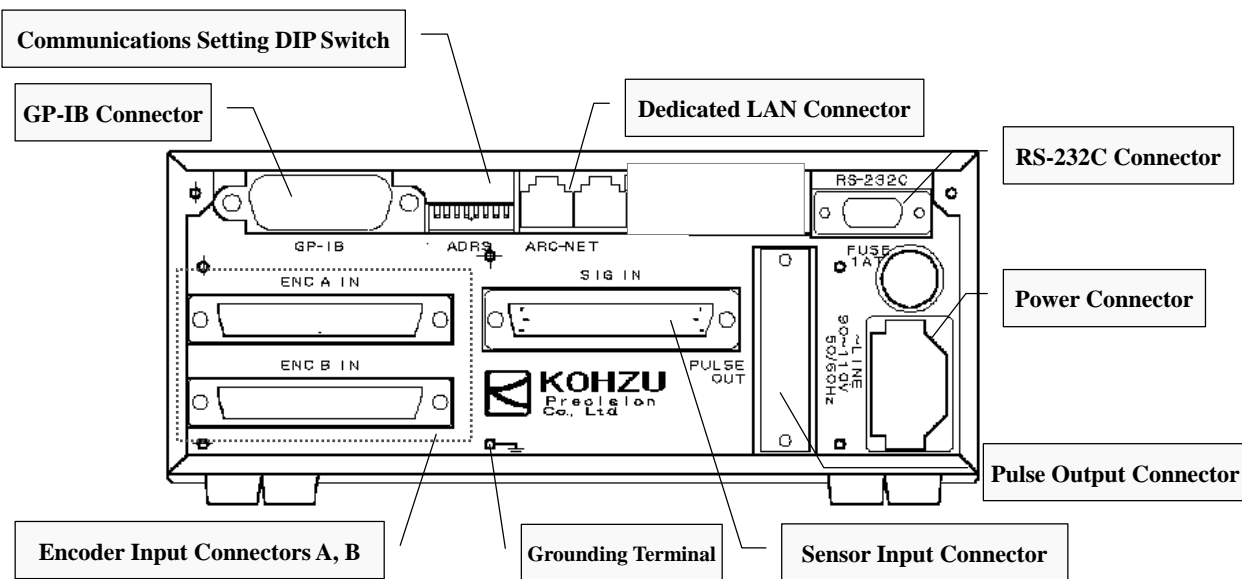
《For the SC-800》 (Controller)

A motor controller driver is comprised of a set of the SC-800 and SD-800.

Front

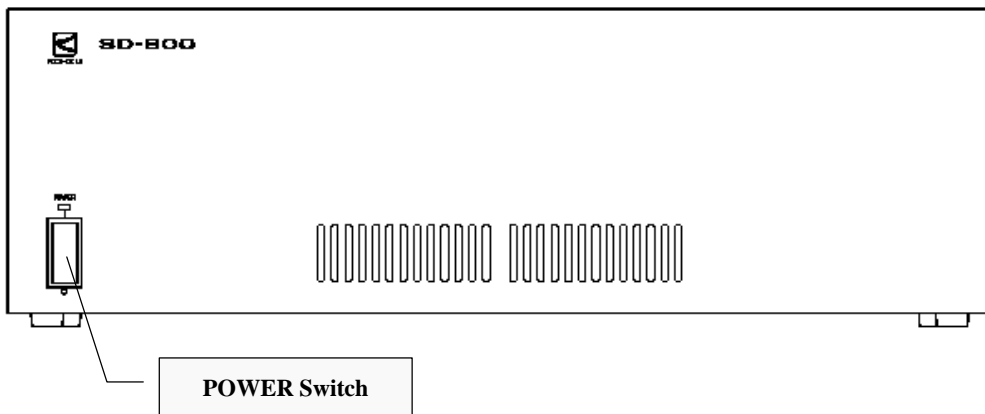


Rear

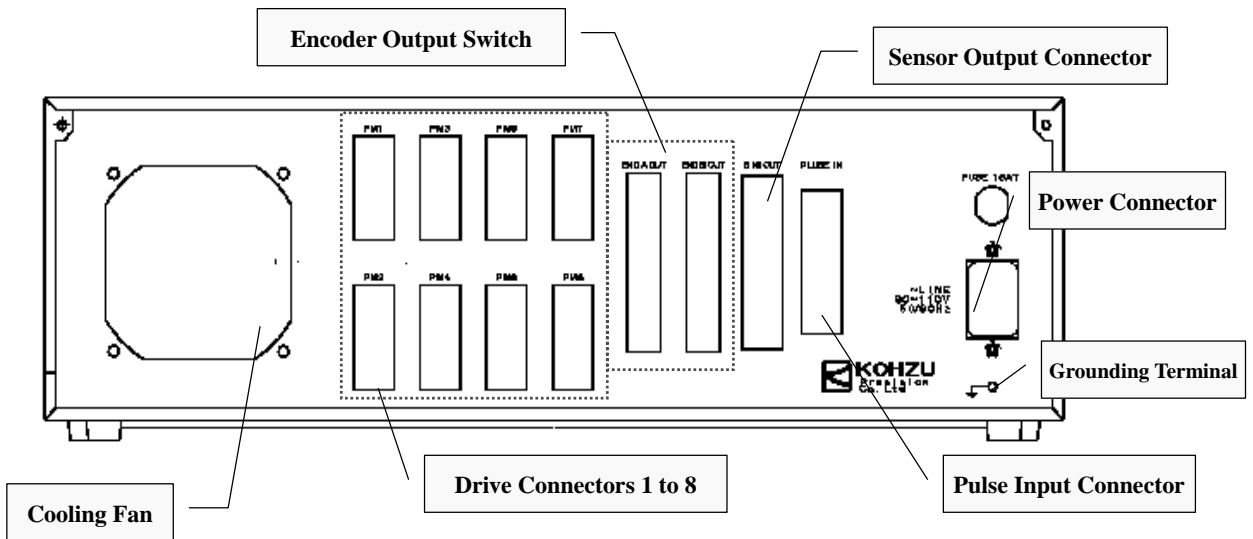


《For the SC-800》 (Driver Box: SD-800)

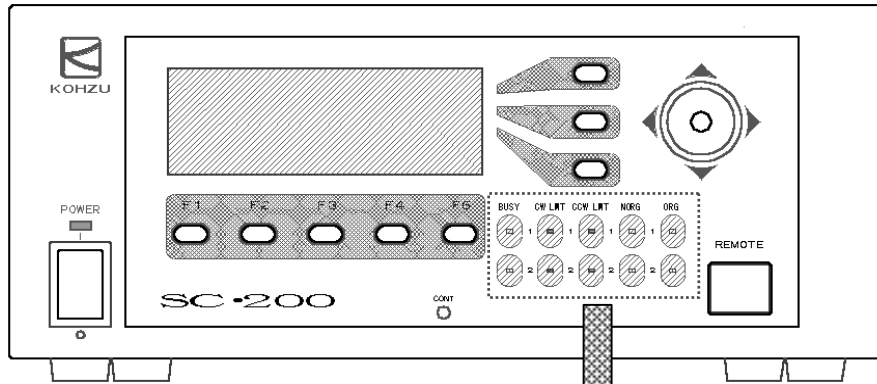
Front



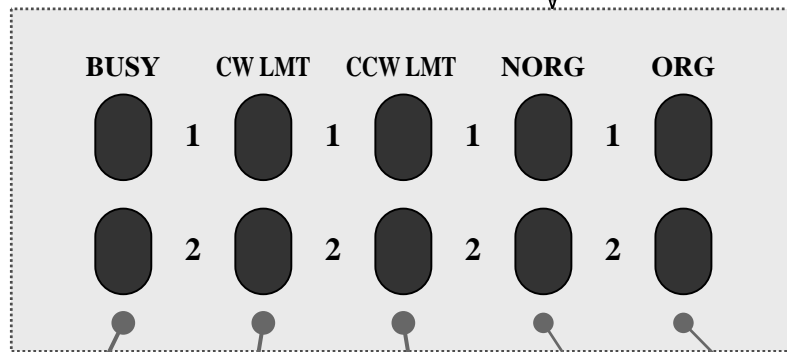
Rear





0-1. Status Display LED

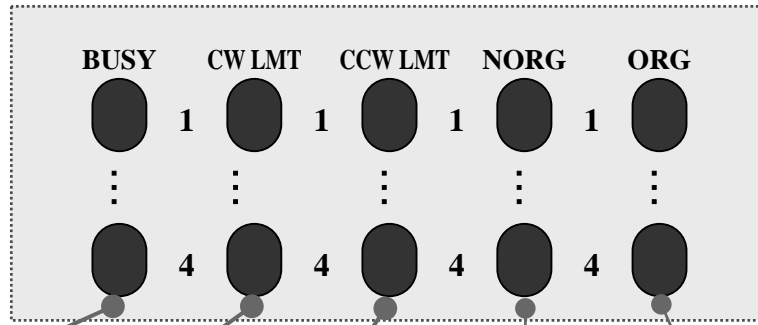


Enlarged display



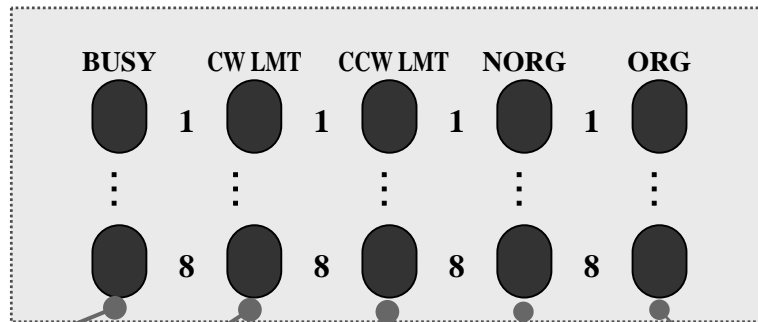
Status	BUSY	CW LMT (CW Limit)	CCW LMT (CCW Limit)	NORG (NORG Sensor)	ORG (ORG Sensor)
 Lit	On driving	ON	ON	ON	ON
 Unlit	Waiting for command	OFF	OFF	OFF	OFF

《For the SC-400》



Status	BUSY	CW LMT (CW Limit)	CCW LMT (CCW Limit)	NORG (NORG Sensor)	ORG (ORG Sensor)
 Lit	On driving	ON	ON	ON	ON
 Unlit	Waiting for command	OFF	OFF	OFF	OFF

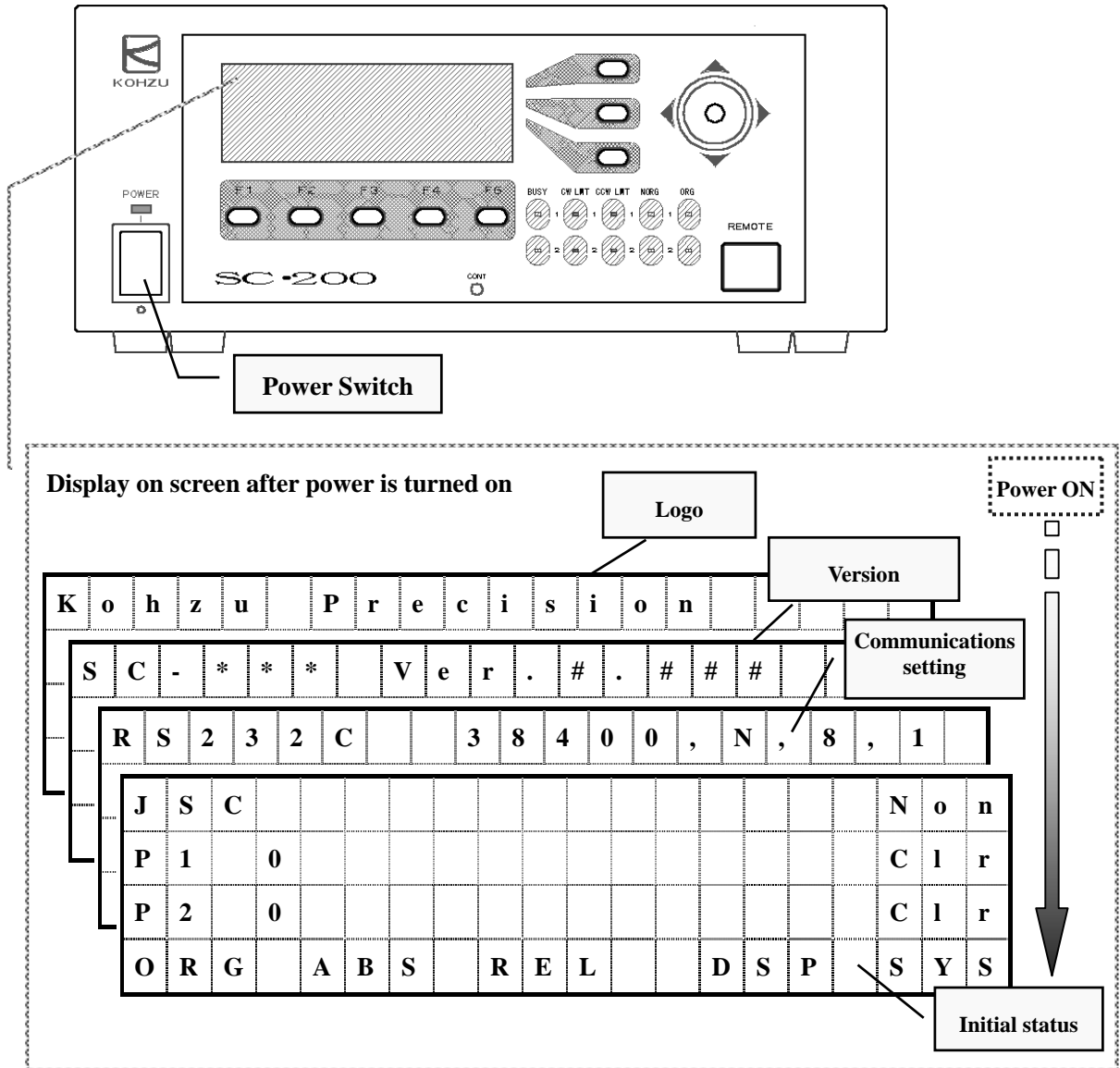
《For the SC-800》



Status	BUSY	CW LMT (CW Limit)	CCW LMT (CCW Limit)	NORG (NORG Sensor)	ORG (ORG Sensor)
 Lit	On driving	ON	ON	ON	ON
 Unlit	Waiting for command	OFF	OFF	OFF	OFF

0-2. Turning on Power and Starting Up

《For the SC-200》

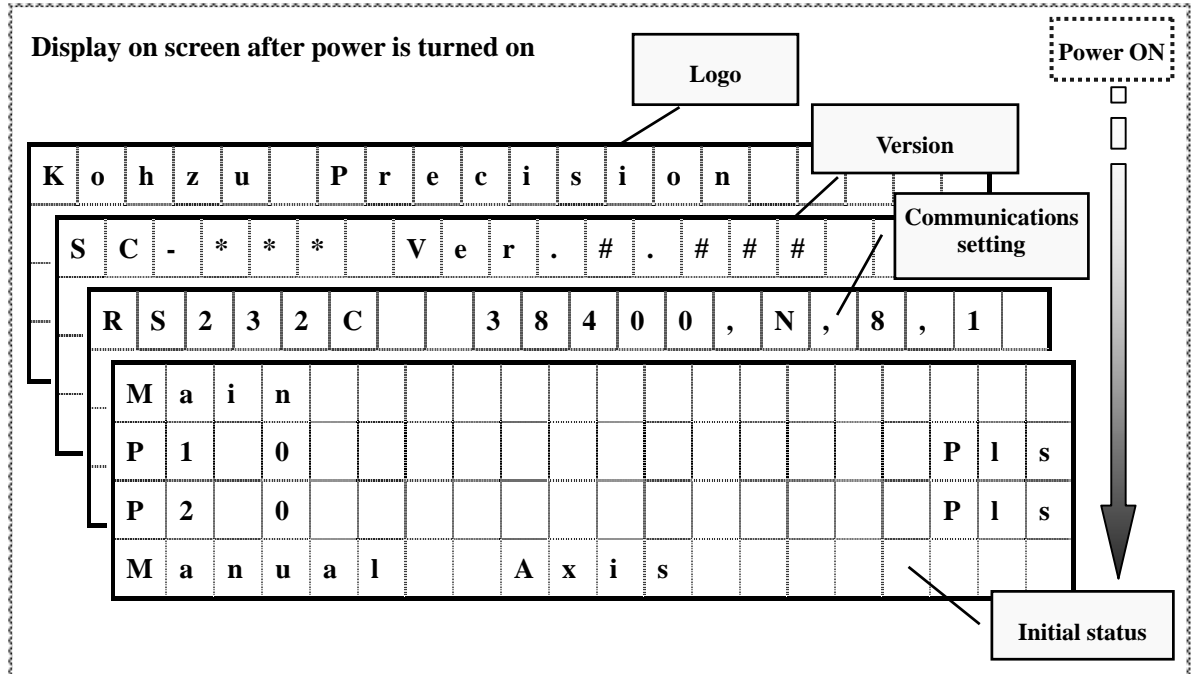
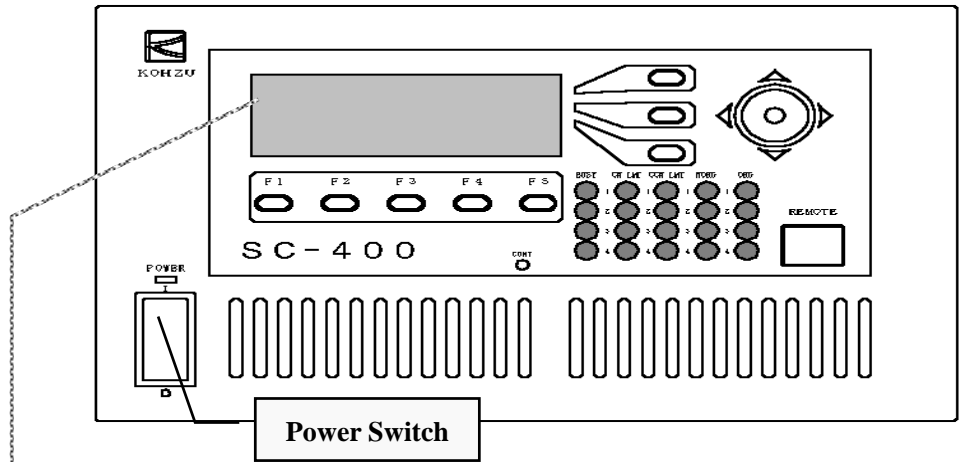


(Description of operations)

Power ON, Logo, Version, Communications Setting and Initial Setting are displayed in this order.

(The initial status is displayed and then the internal initialization of the SC Series is completed.)

《For the SC-400/SC-800》



(Description of operations)
Power ON, Logo, Version, Communications Setting and Initial Setting are displayed in this order.
 (The initial status is displayed and then the internal initialization of the SC Series is completed.)

(Reference) Initial status screen in “Menu mode” for SC-200

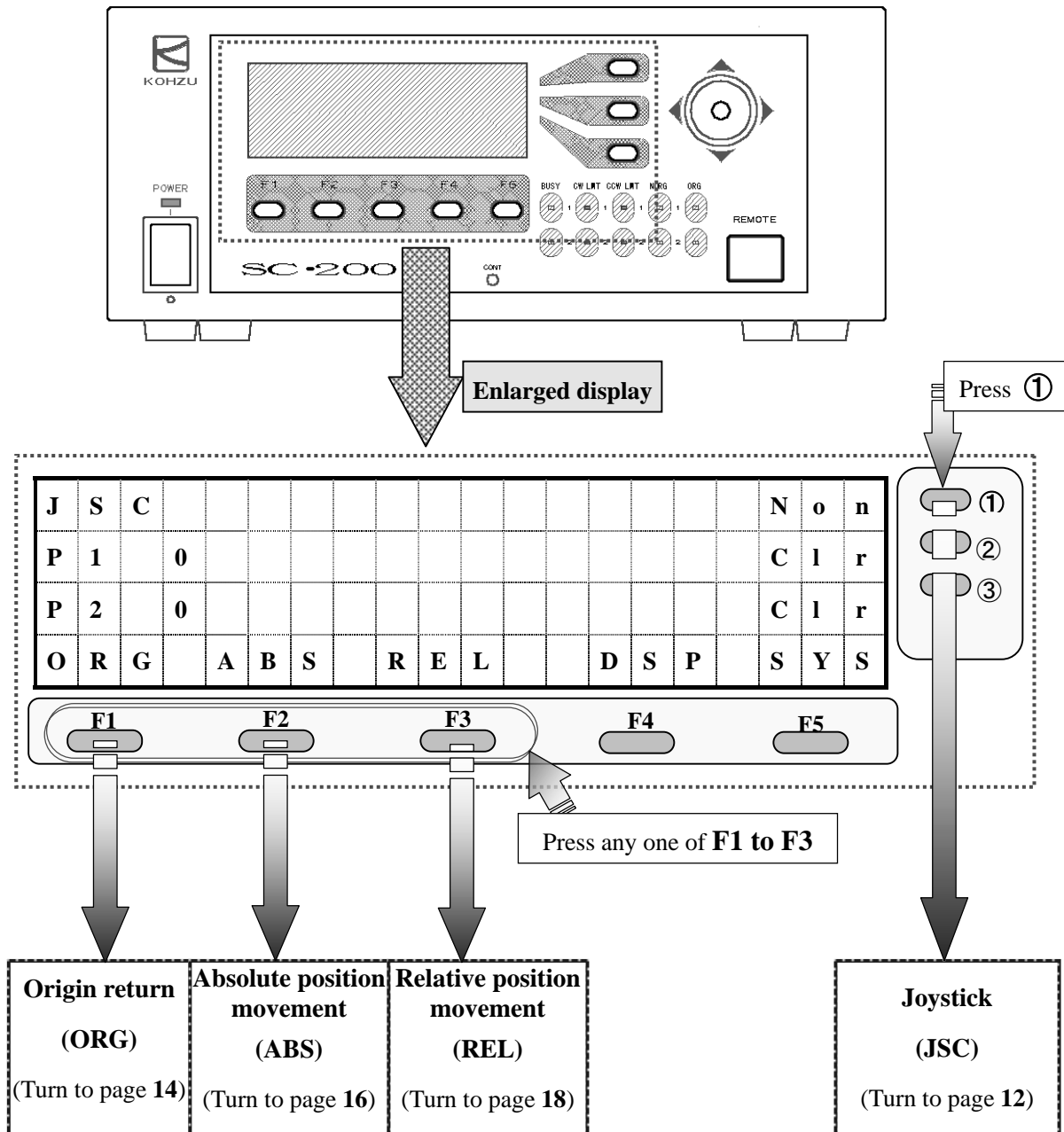
M	a	i	n																		
P	1		0																P	l	s
P	2		0																P	l	s
M	a	n	u	a	l																

However, settings can be changed to the above display by selecting when ordering.

1-0. When Attempting to Move a Stage

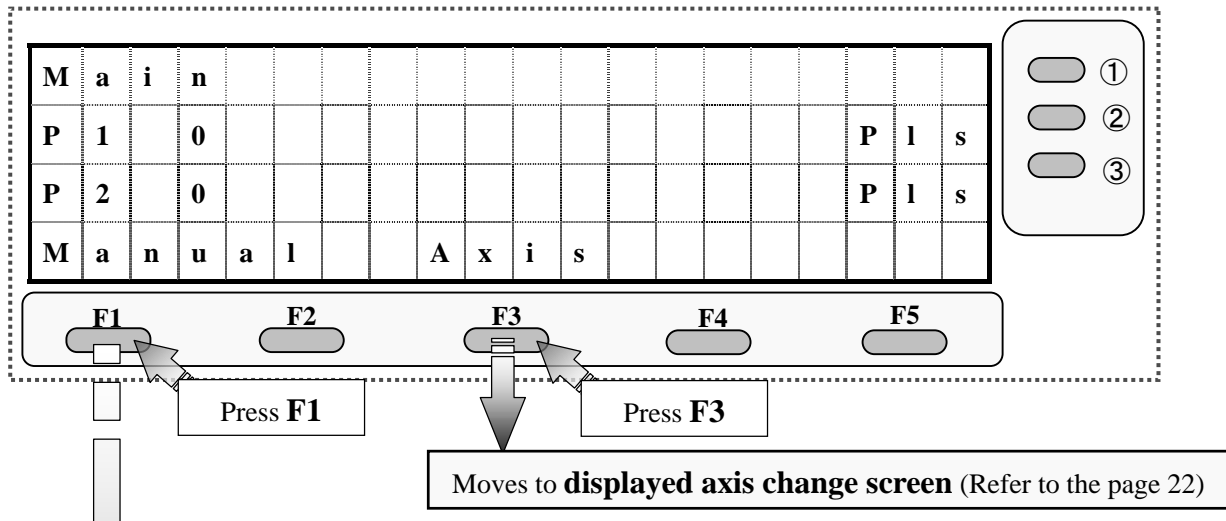
《For the SC-200》

- When attempting to change to **joystick drive (JSC)** mode >>> Press the button ①.
- When attempting to change to **origin return (ORG)** mode >>> Press the button **F1**.
- When attempting to change to **absolute position movement (ABS)** mode >>> Press the button **F2**.
- When attempting to change to **relative position movement (REL)** mode >>> Press the button **F3**.

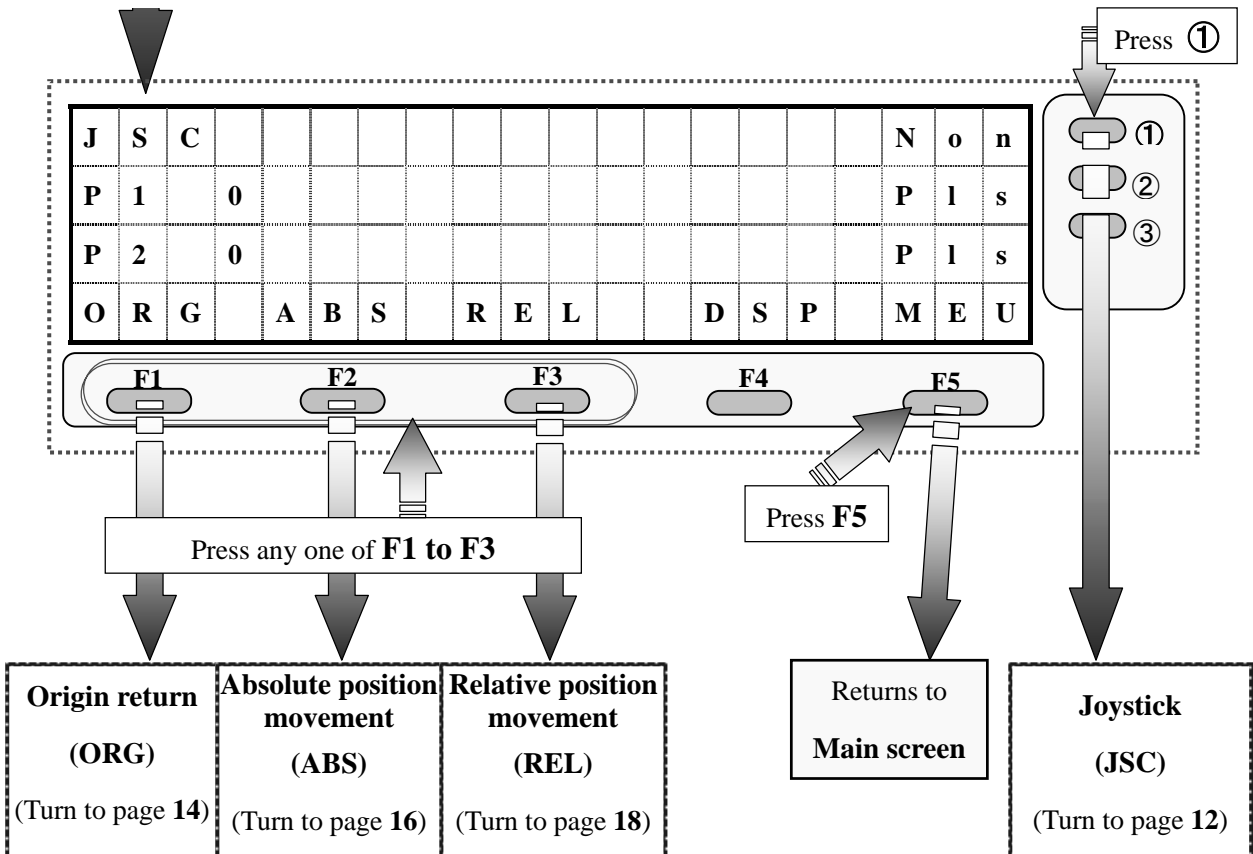


《For the SC-400/SC-800》

➤ When attempting to change to **drive selecting screen** >>> Press the button **F1**.



- When attempting to change to **joystick drive** (JSC) mode >>> Press the button ①.
- When attempting to change to **origin return** (ORG) mode >>> Press the button **F1**.
- When attempting to change to **absolute position movement** (ABS) mode >>> Press the button **F2**.
- When attempting to change to **relative position movement** (REL) mode >>> Press the button **F3**.
- When attempting to return to **Main screen** >>> Press the button **F5**.



1-1. When Attempting to Move by Joystick Operation

JSC

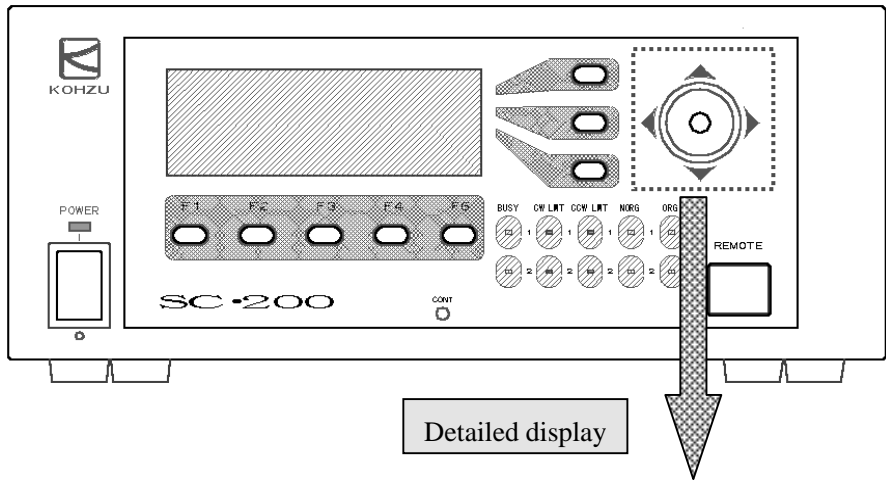
《Drive Operation》

- When attempting to move the **first axis** in the + **direction** >>> **Tilt the joystick leftward.**
- When attempting to move the **first axis** in the - **direction** >>> **Tilt the joystick rightward.**
- When attempting to move the **second axis** in the + **direction** >>> **Tilt the joystick upward.**
- When attempting to move the **second axis** in the - **direction** >>> **Tilt the joystick downward.**

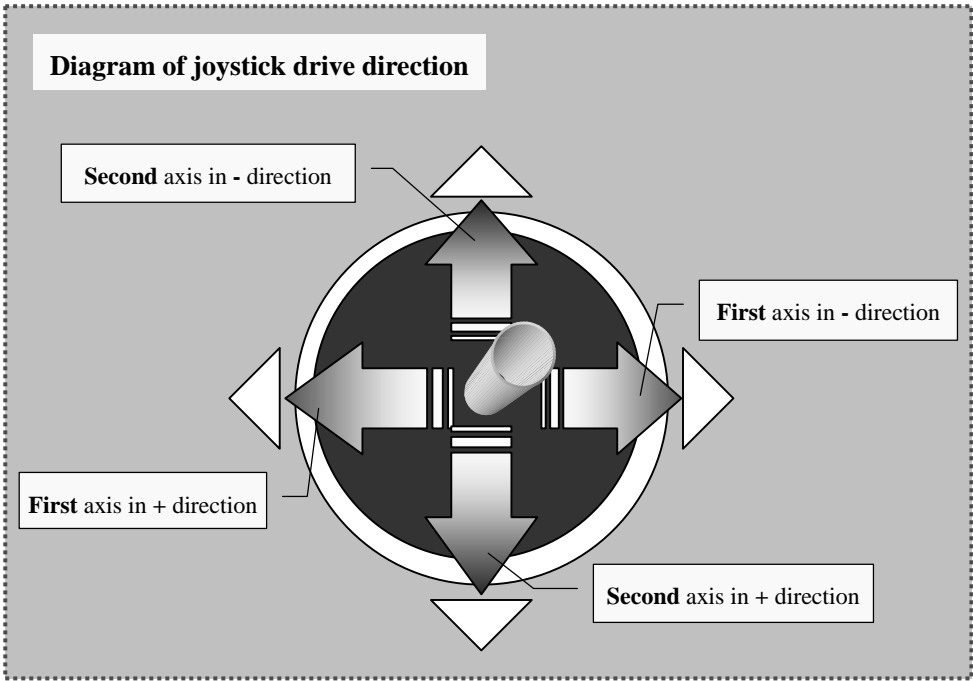
《Precaution in driving》

Make sure to set the speed setting to any other than “NON” and then drive.

(For details, refer to the next page.)

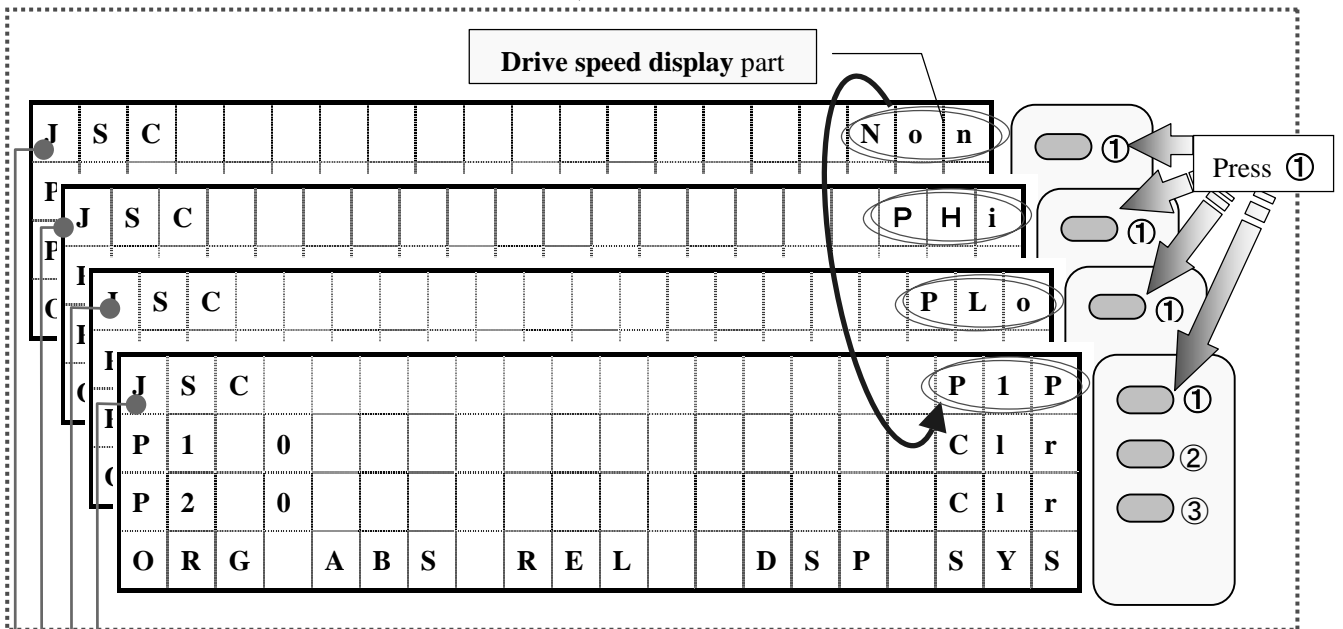
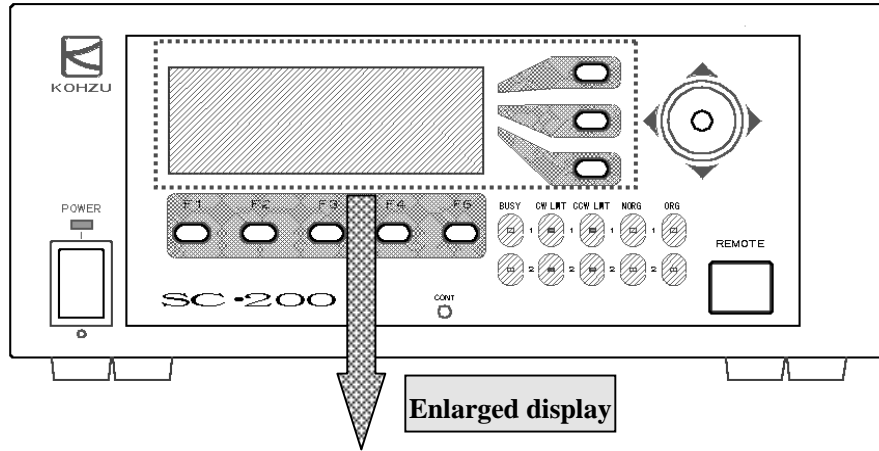


Detailed display



《Speed Setting》

- When attempting to **switch drive speed (cyclic display)** >>> **Press the button ①.**



<Description of speeds>

Display on panel	Meaning	Start Speed	Top Speed
Non	Drive prohibition	-----	-----
PHi	High speed drive	10[pps]	8000[pps]
PLo	Low speed drive	10[pps]	200[pps]
P1P	1 Pulse feed	1 Pulse feed	1 Pulse feed

(The values in the above specifications are default values)

1-2. When Attempting to Perform Origin Return Operation

ORG

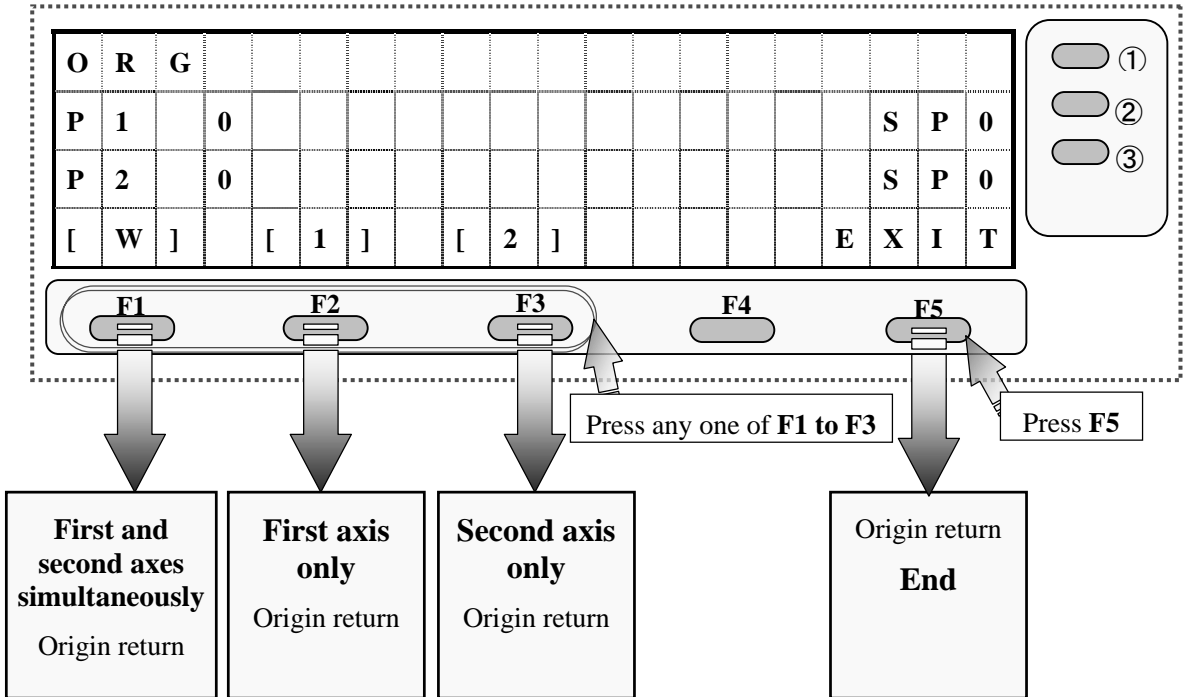
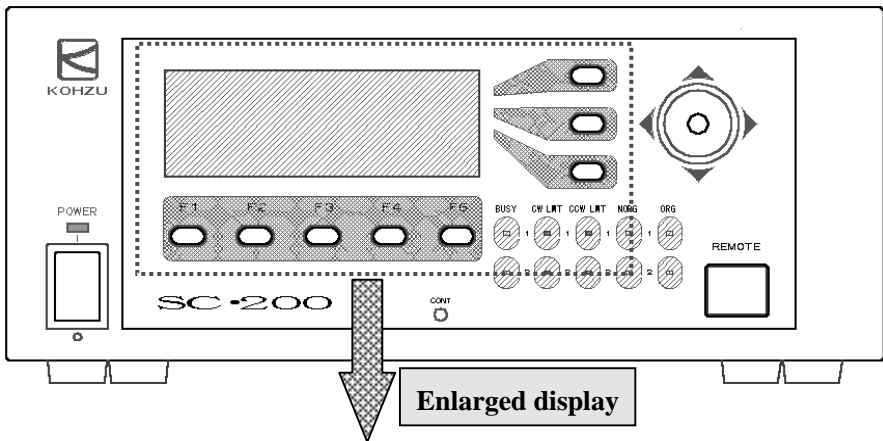
《Origin Return Operation》

- When attempting to **simultaneously** return the **first and second axes** to the origin
>>> Press the button **F1**.
- When attempting to return the **first axis** to the origin
>>> Press the button **F2**.
- When attempting to return the **second axis** to the origin
>>> Press the button **F3**.
- When attempting to **stop** the origin return operation
>>> Press the button **F5**.

《Precaution in origin return》

The initial set value of origin return operation mode is set in "3: Origin signal in origin proximity sensor is set to be the origin position."

(For details on the setting method, refer to pages 36 and 37.)

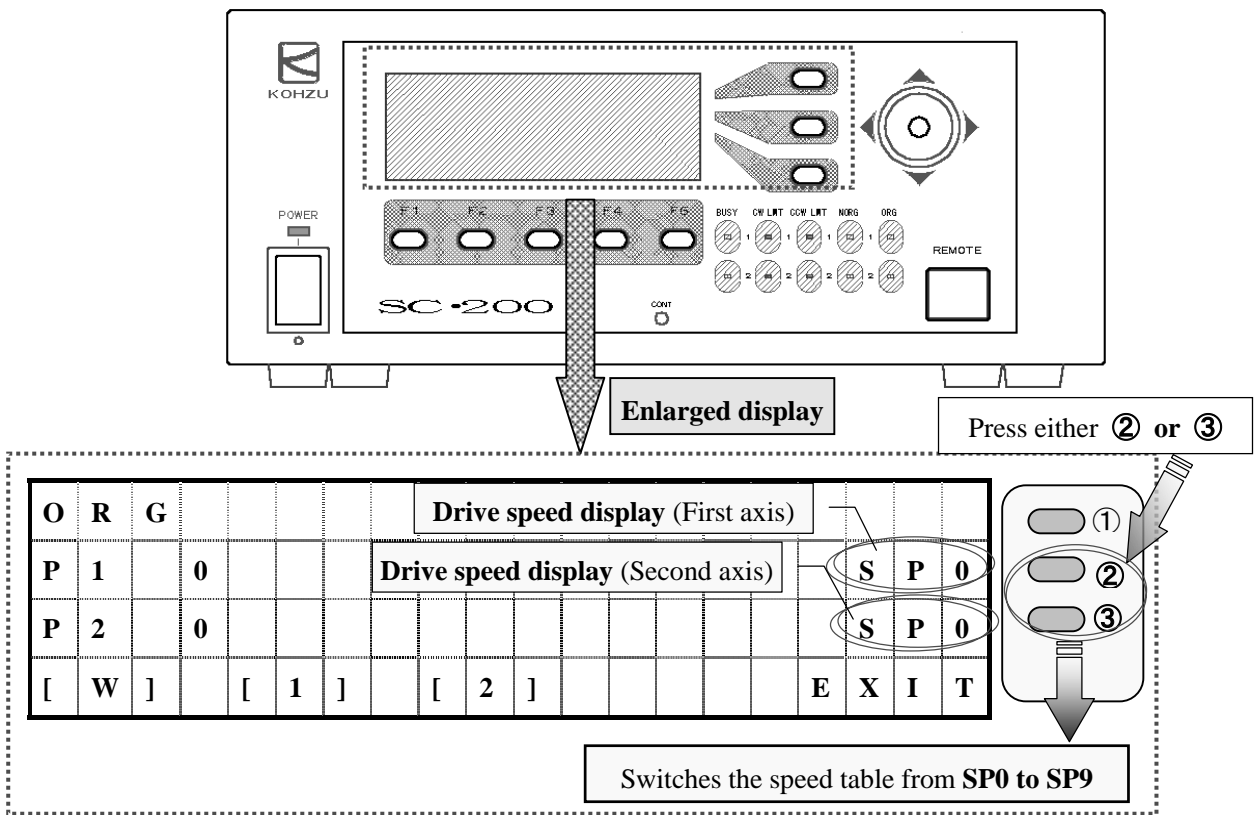


《Speed Setting》

- When attempting to **switch** drive speed of the **first axis** >>> **Press** the button ②.
- When attempting to **switch** drive speed of the **second axis** >>> **Press** the button ③.

《Precaution in speed setting》

The **speed setting after changing** is **stored** in the internal memory even when the **power** of the controller is **turned OFF**.



<Speed detailed settings>

Display on panel	Top Speed	Startup time	Display on panel	Top Speed	Startup time
SP0	5000[pps]	24[ms]	SP5	6000[pps]	25[ms]
SP1	2000[pps]	21[ms]	SP6	7000[pps]	26[ms]
SP2	3000[pps]	22[ms]	SP7	8000[pps]	27[ms]
SP3	4000[pps]	23[ms]	SP8	9000[pps]	28[ms]
SP4	5000[pps]	24[ms]	SP9	10000[pps]	29[ms]

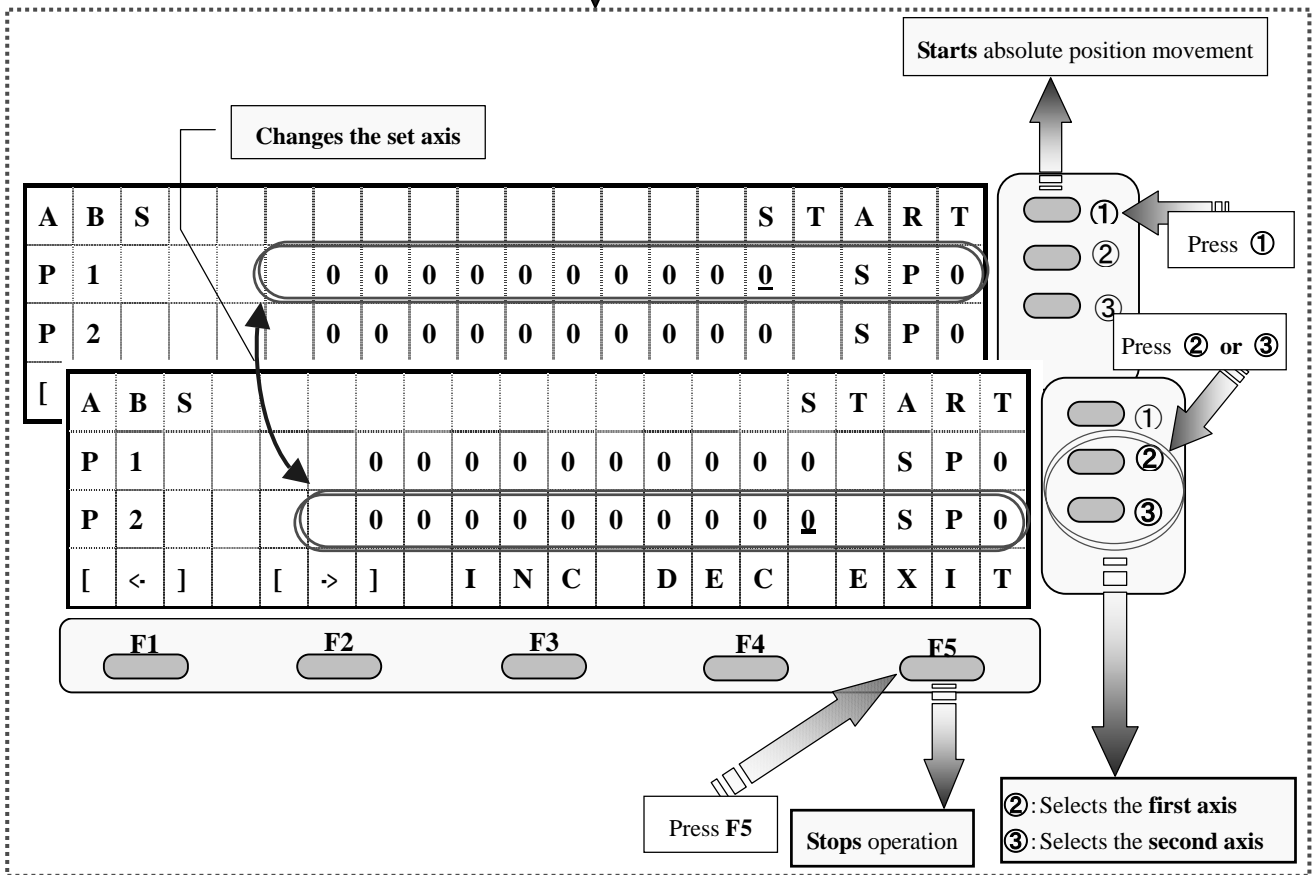
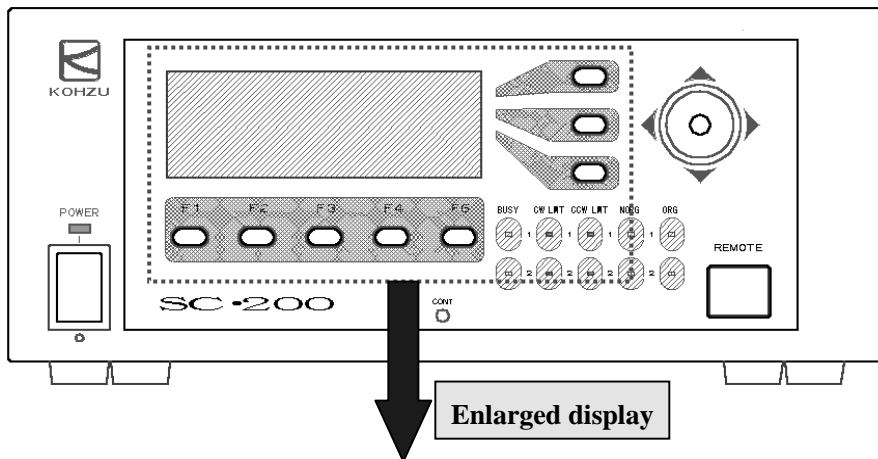
(The values in the above specifications are default values)

1-3. When Attempting to Perform Absolute Position Movement Operation

ABS

《Absolute Position Movement Operation》

- When attempting to perform **absolute position operation** to the **set position** >>> **Press the button ①.**
- When attempting to **select the first axis** >>> **Press the button ②.**
- When attempting to **select the second axis** >>> **Press the button ③.**
- When attempting to **stop** absolute position movement operation >>> **Press the button F5.**



《Setting of Movement Position》

Move the cursor and change the value at which the cursor indicates.

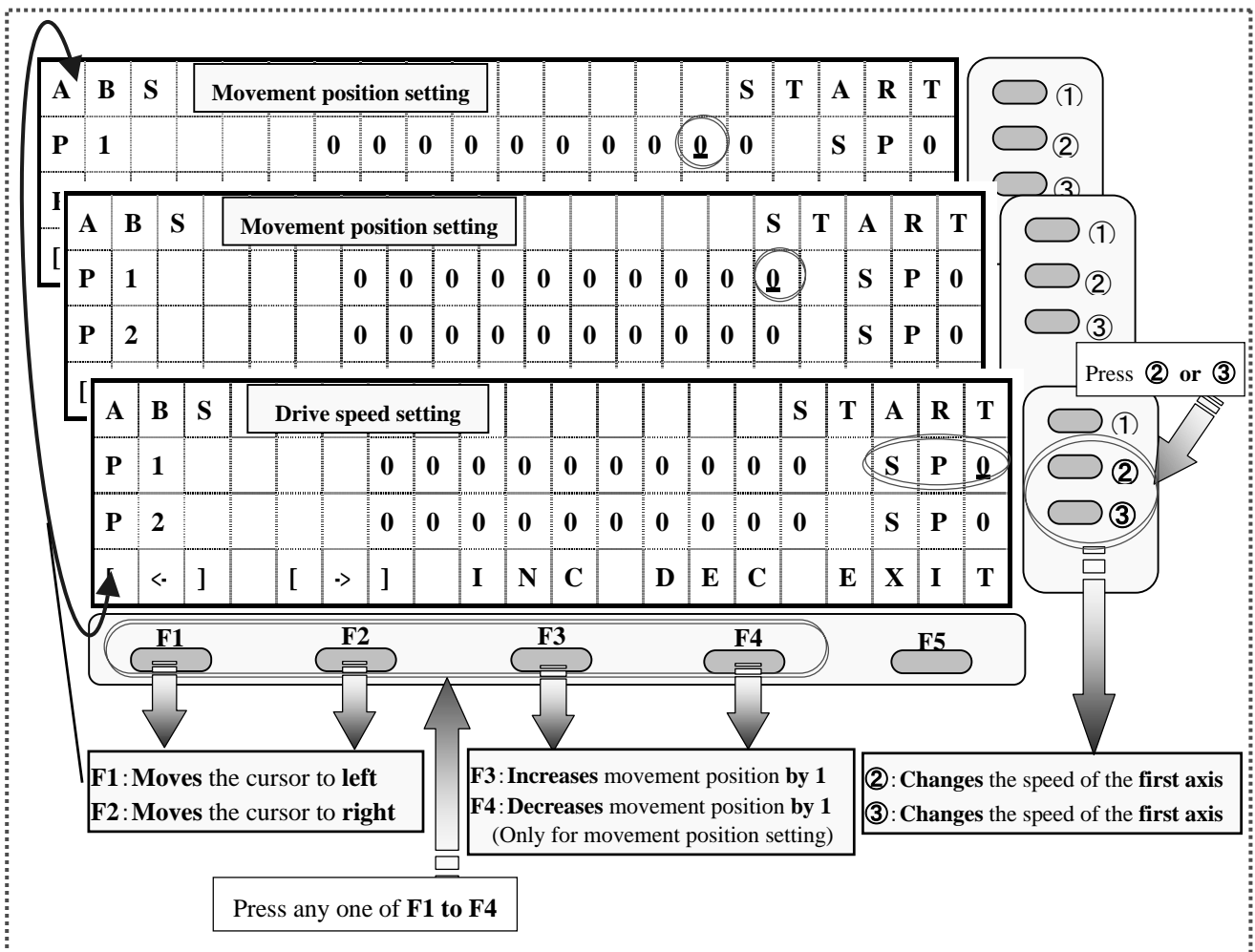
- When attempting to **move** the cursor to the **left** >>> Press the button **F1**.
- When attempting to **move** the cursor to the **right** >>> Press the button **F2**.
- When attempting to **increase** the **numeric value** on the cursor >>> Press the button **F3**.
- When attempting to **decrease** the **numeric value** on the cursor >>> Press the button **F4**.

《Setting of Drive Speed》

Move the cursor to the speed display to change the drive speed value.

- When attempting to **move** the cursor to the **speed display** >>> **Keep pressing** the button **F1** until the cursor reaches the **speed display part**.
- When attempting to **change** the drive speed of the **first axis** >>> Press the button **①**.
- When attempting to **change** the drive speed of the **second axis** >>> Press the button **②**.

(However, the default set values of drive speed are the same as those of the speed detailed settings in “When attempting to perform origin return operation” on (page 14).)

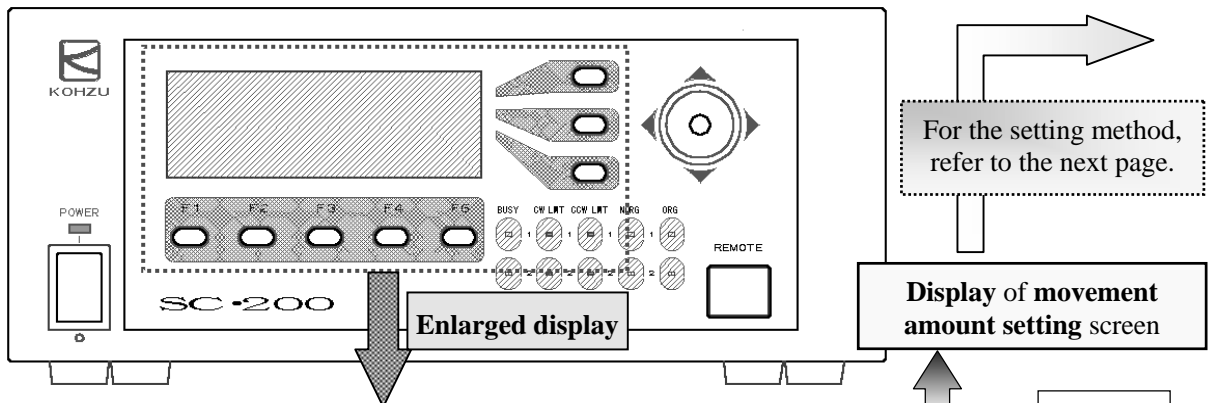


1-4. When Attempting to Perform Relative Position Movement Operation

REL

《Relative Position Movement Operation》

- When attempting to **move** the **first axis** in the **+ direction** >>> **Press the button F1.**
- When attempting to **move** the **first axis** in the **- direction** >>> **Press the button F2.**
- When attempting to **move** the **second axis** in the **+ direction** >>> **Press the button F3.**
- When attempting to **move** the **second axis** in the **- direction** >>> **Press the button F4.**
- When attempting to **stop** relative position movement operation >>> **Press the button F5.**
- When attempting to **set** relative position **movement amount** >>> **Press the button ①.**
- When attempting to **change** the **drive speed** of the **first axis** >>> **Press the button ②.**
- When attempting to **change** the **drive speed** of the **second axis** >>> **Press the button ③.**



R	E	L	Press any one of F1 to F5										S	E	T					
P	1		0														SP	0		
P	2		0														SP	0		
[+]	1	[-]		[+]	2	[-]			E	X	I	T

F1

Moves the **first axis** in the **+ direction**

F2

Moves the **first axis** in the **- direction**

F3

Moves the **second axis** in the **+ direction**

F4

Moves the **second axis** in the **- direction**

F5

Stops operation

①: Press ①

②: Changes the speed of the **first axis**

③: Changes the speed of the **second axis**

Press ② or ③

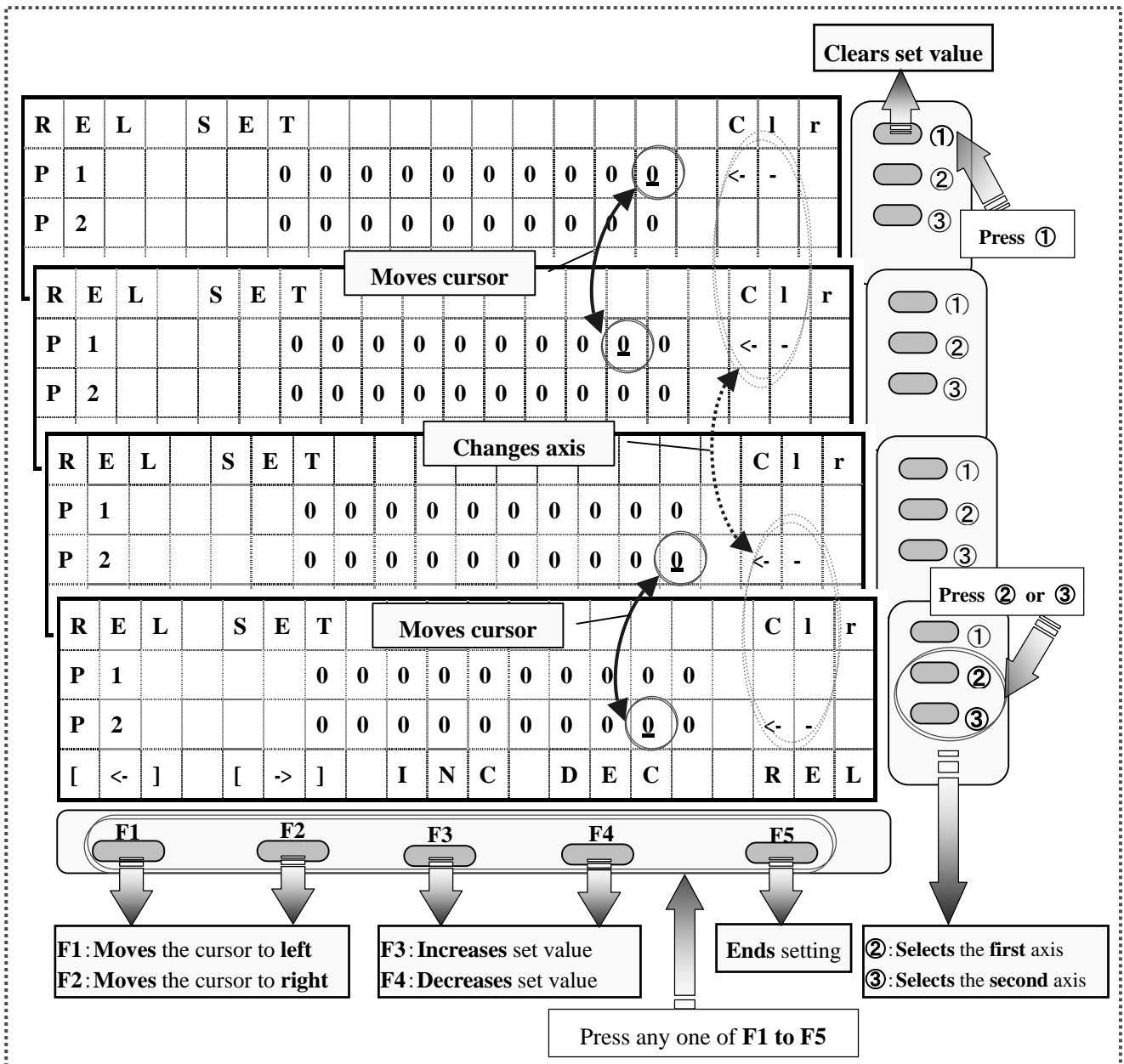
<Speed detailed settings>

(Default value)

Display on panel	Top Speed	Startup time	Display on panel	Top Speed	Startup time
SP0	5000[pps]	24[ms]	SP5	6000[pps]	25[ms]
SP1	2000[pps]	21[ms]	SP6	7000[pps]	26[ms]
SP2	3000[pps]	22[ms]	SP7	8000[pps]	27[ms]
SP3	4000[pps]	23[ms]	SP8	9000[pps]	28[ms]
SP4	5000[pps]	24[ms]	SP9	10000[pps]	29[ms]

《Setting of Movement Amount》

- When attempting to **move cursor to the left** >>> Press the button **F1**.
- When attempting to **move cursor to the right** >>> Press the button **F2**.
- When attempting to **increase the set value** on the cursor >>> Press the button **F3**.
- When attempting to **decrease the set value** on the cursor >>> Press the button **F4**.
- When attempting to **perform relative position movement** operation >>> Press the button **F5**.
- When attempting to **clear the set movement amount** >>> Press the button **①**.
- When attempting to **select the first axis** as a setting axis >>> Press the button **②**.
- When attempting to **select the second axis** as a setting axis >>> Press the button **③**.



2-0. When Attempting to Rewrite Present Position

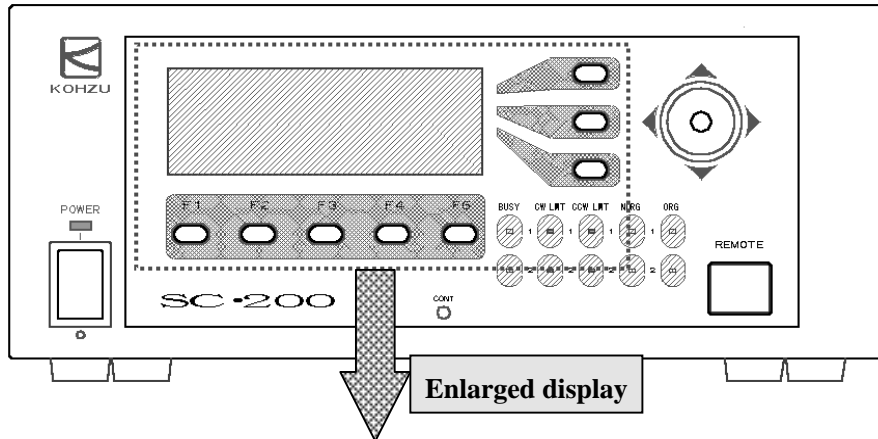
DSP

《For the SC-200》

- When attempting to **rewrite the present position** >>> **Press the button F4.**

《For the SC-400/SC-800》

- When attempting to **rewrite the present position** >>> Switch to the operation selecting mode with reference to “1-0. When attempting to move stage” (page 7) and **press the button F4.**



• For the SC-200

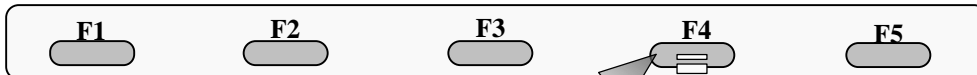
J	S	C																N	o	n
P	1		0															C	l	r
P	2		0															C	l	r
O	R	G		A	B	S		R	E	L				D	S	P		S	Y	S

①
 ②
 ③

• For the SC-400/SC-800

J	S	C																N	o	n
P	1		0															C	l	r
P	2		0															C	l	r
O	R	G		A	B	S		R	E	L				D	S	P		S	Y	S

①
 ②
 ③

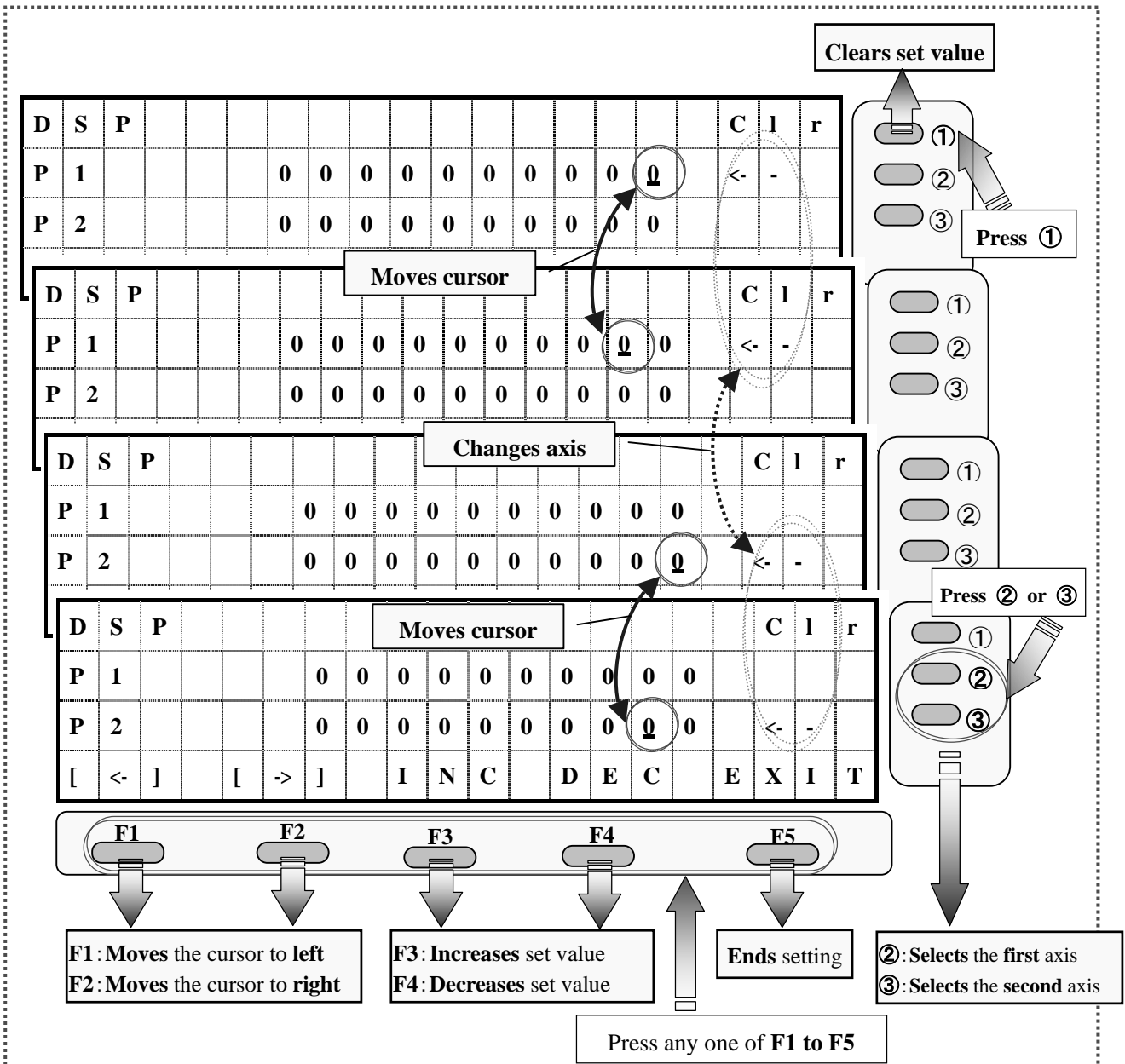


Press F4

Displays **present position rewriting (DSP)** mode

《Setting of Rewriting Value》

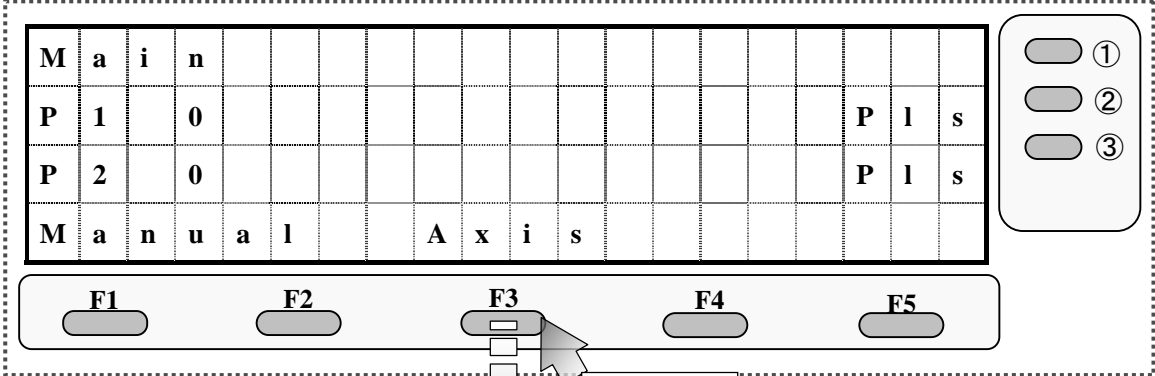
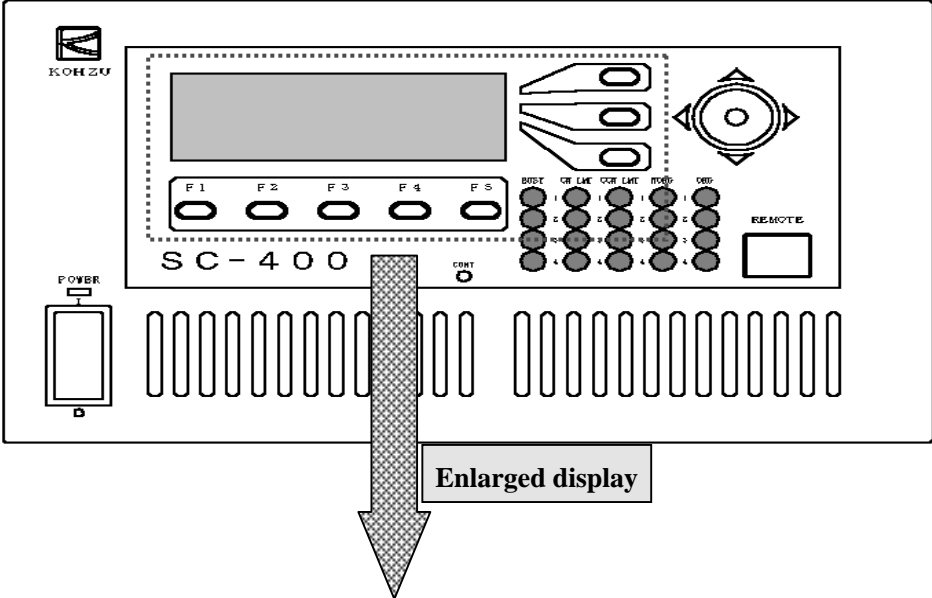
- When attempting to **move cursor to the left** >>> Press the button **F1**.
- When attempting to **move cursor to the right** >>> Press the button **F2**.
- When attempting to **increase the set value** on the cursor >>> Press the button **F3**.
- When attempting to **decrease the set value** on the cursor >>> Press the button **F4**.
- When attempting to **make rewriting of the present position valid** >>> Press the button **F5**.
- When attempting to **clear the set present value** >>> Press the button ①.
- When attempting to **select the first axis** as a setting axis >>> Press the button ②.
- When attempting to **select the second axis** as a setting axis >>> Press the button ③.



3-0. When Attempting to Change Axis to be Displayed

Only for SC-400/SC-800

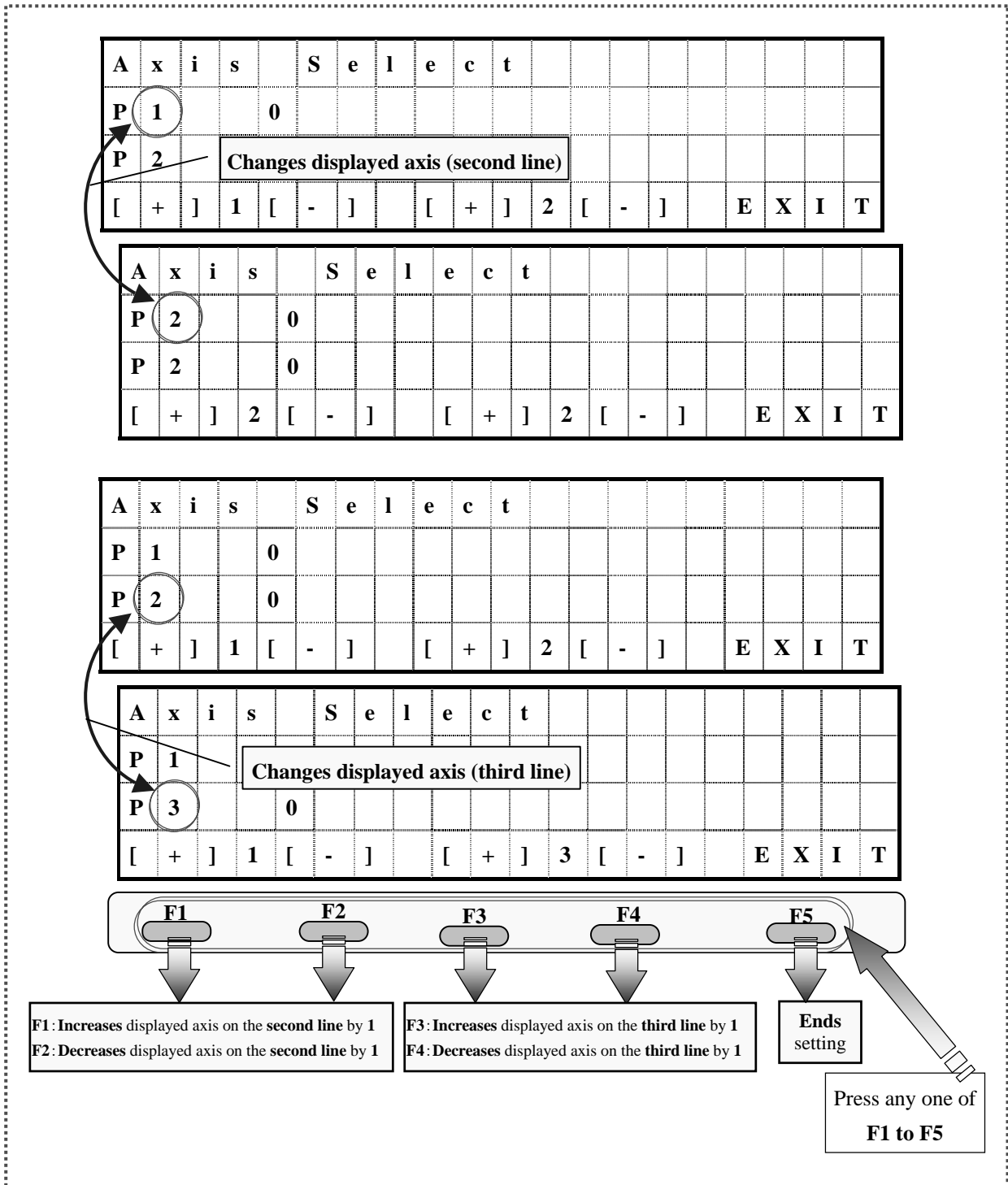
- When attempting to **change** the **axis No.** displayed on the LCD >>> **Press** the button **F3**.



Displays displayed axis change mode

《Setting of LCD Display Axis》

- When attempting to **increase axis No.** on the **second line** by 1 >>> Press the button **F1**.
- When attempting to **decrease axis No.** on the **second line** by 1 >>> Press the button **F2**.
- When attempting to **increase axis No.** on the **third line** by 1 >>> Press the button **F3**.
- When attempting to **decrease axis No.** on the **third line** by 1 >>> Press the button **F4**.
- When attempting to **end setting of displayed axis** >>> Press the button **F5**.



《MEMO》

II. Practical Version

0. Introduction of Detailed Setting Functions

In our SC Series, the following various settings can be performed in order to control our stages and machines incorporated into the stages.

● Drive speed settings supporting various automatic stages

<Speeds for relative position/absolute position/origin return movement>

- Ten kinds of speed tables (SP0 to SP9) are available.
- The speed table can be changed from 1 to 9 (from SP1 to SP9) by setting the coefficient.
- The speed table 0 can be arbitrarily set.

<Speeds for joystick movement>

- Three kinds of speed tables are available.
- The speed for Low speed/High speed can be arbitrarily set.

<Speeds for relative position/absolute position/origin return movement>

Display	Top Speed	Accelerating and decelerating time	Display	Top Speed	Accelerating and decelerating time
SP0	5000 [pps]	24 [ms]	SP5	6000 [pps]	25 [ms]
SP1	2000 [pps]	21 [ms]	SP6	7000 [pps]	26 [ms]
SP2	3000 [pps]	22 [ms]	SP7	8000 [pps]	27 [ms]
SP3	4000 [pps]	23 [ms]	SP8	9000 [pps]	28 [ms]
SP4	5000 [pps]	24 [ms]	SP9	10000 [pps]	29 [ms]

<Speeds for joystick movement>

Display	Meaning	Top Speed	Start Speed	Accelerating time	Decelerating time
PHi	High speed drive	8000 [pps]	10 [pps]	50 [ms]	15 [ms]
PLo	Low speed drive	200 [pps]	10 [pps]	1 [ms]	1 [ms]
PIP	1 Pulse feed	1 Pulse	---	---	---

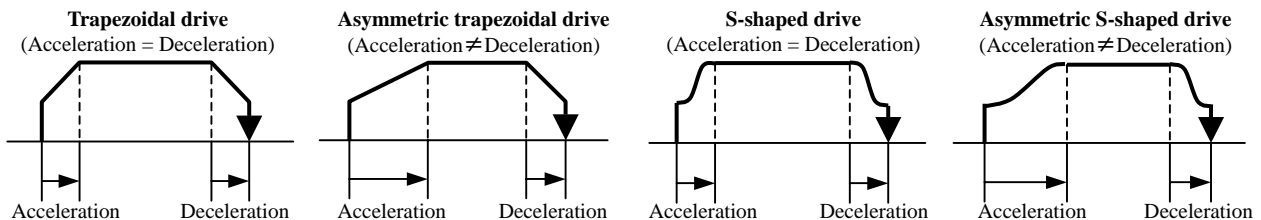
(The values in the above specifications are default values)

● Acceleration and deceleration settings realize a smooth drive

- Four kinds of accelerating and decelerating modes of Trapezoidal / Asymmetric trapezoidal / S-shaped / Asymmetric S-shaped drives are available.

Trapezoidal drive ... A drive method to increase/decrease the acceleration/deceleration at a constant acceleration and deceleration ratio.

S-shaped drive ... A drive method to realize smooth movement by accelerating and decelerating on a quadric curve.



● **Origin return mode settings** able to support various automatic stages

- **15 kinds** of origin return modes are available.

<Origin return mode>

No.	Origin Return Mode	No.	Origin Return Mode
1	Return direction is determined and origin is detected by zone sensor.	9	Only origin sensor is used.
2	Edge of the zone sensor is set to be the origin position.	10	The present position is set to be the origin position.
3	Origin located in proximity of origin is set to be the origin position.	11	After returning to the origin by method 5, and moving to the set position, this position is set to be the origin.
4	One sensor located in moving zone is set to be the origin position.	12	After returning to the origin by method 6, and moving to the set position, this position is set to be the origin.
5	Origin in proximity of CW limit is set to be the origin position.	13	After returning to the origin by method 7, and moving to the set position, this position is set to be the origin.
6	Origin in proximity of CCW limit is set to be the origin position.	14	After returning to the origin by method 8, and moving to the set position, this position is set to be the origin.
7	Edge of CW limit is set to be the origin position.	15	Reference signal of the encoder is set to be the origin position.
8	Edge of CCW limit is set to be the origin position.		

● **Pulse conversion setting** to convert real fed pulse into real distance/angle and display.

● **Encoder conversion setting** to convert encoder value into real distance/angle and display.

- Conversion coefficient is **respectively set for numerator and denominator** as **(numerator)/(denominator)**.
- Down to the **eighth decimal place** can be displayed.

● Encoder correction and backlash correction allowing for precise positioning

<Encoder correction>

- **Three kinds** of correcting methods of **no correction / correcting one time / constantly correcting** are available.
- Count signal from the encoder can be **multiplied by 1, 2 or 4**.
- **Completion conditions for correction** can be **changed**.

<Backlash correction>

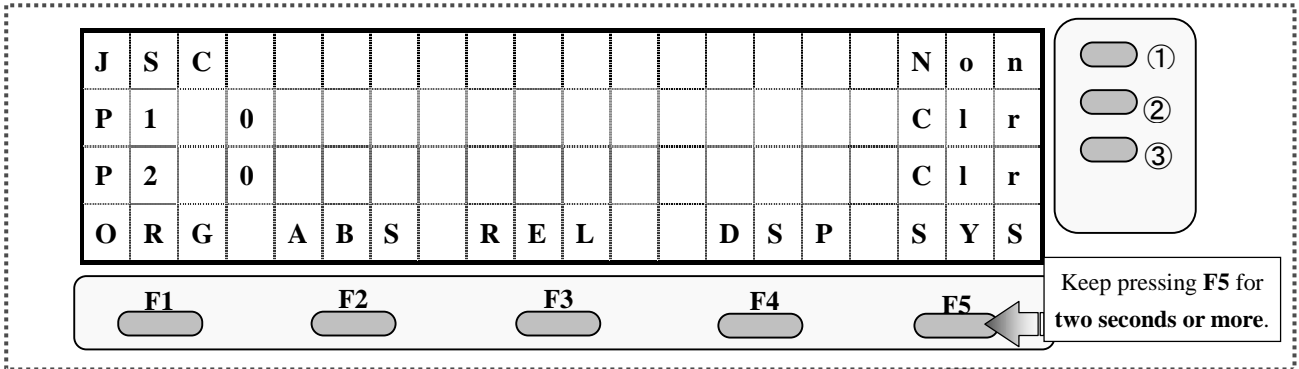
- **Pulse amount when correcting** can be arbitrarily set.
- **Four kinds** of correcting methods are available.

<Backlash correcting method>

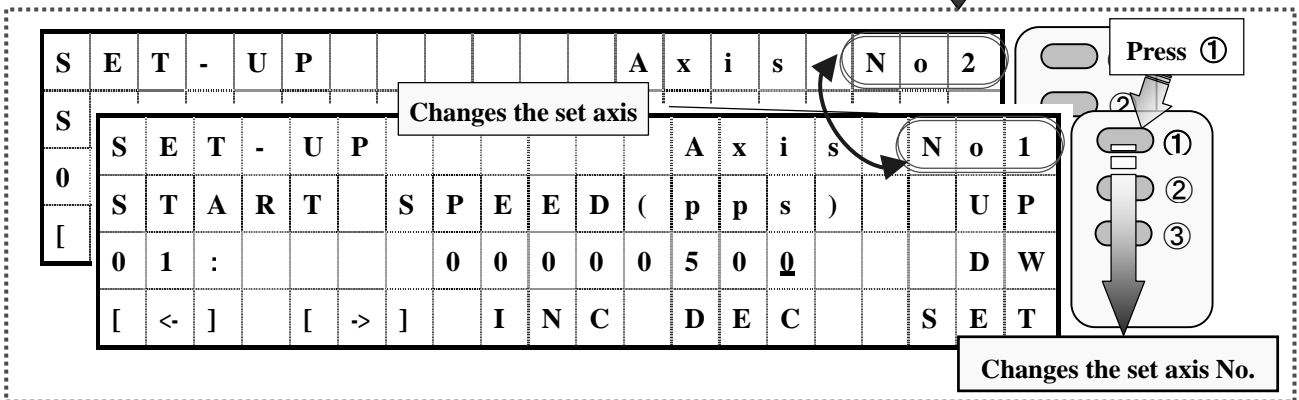
No.	Backlash correcting method
1	Backlash correction is invalidated.
2	In inversion from CW direction to CCW direction, reciprocating movement by correcting pulse amount is performed before moving.
3	In inversion from CCW direction to CW direction, reciprocating movement by correcting pulse amount is performed before moving.
4	In moving in CCW direction, reciprocating movement by correcting pulse amount is performed after moving.
5	In moving in CW direction, reciprocating movement by correcting pulse amount is performed after moving.

1. Operating Method of System Setting Screen

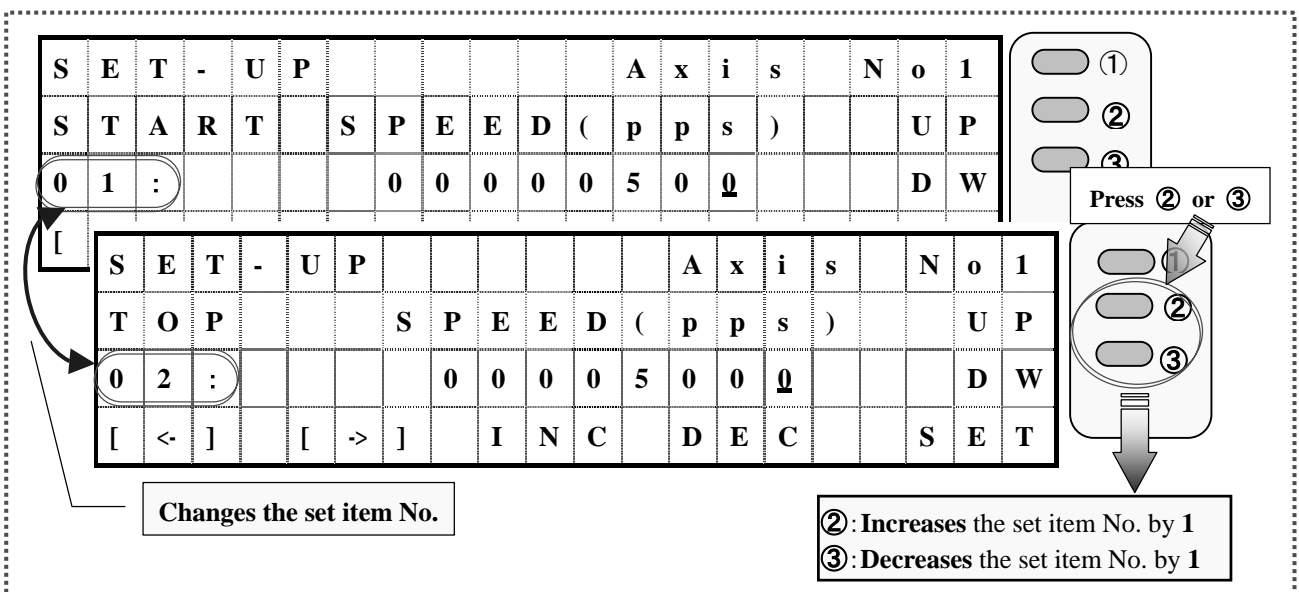
- Keep pressing the button F5 on the initial status screen for **two seconds or more** (pressing the buttons F4 and F5 simultaneously in the case of SC-400/SC-800). A screen for which “SET-UP” is displayed at the upper left of the screen is displayed.



- Axis No. to be set can be selected by pressing the button ①.

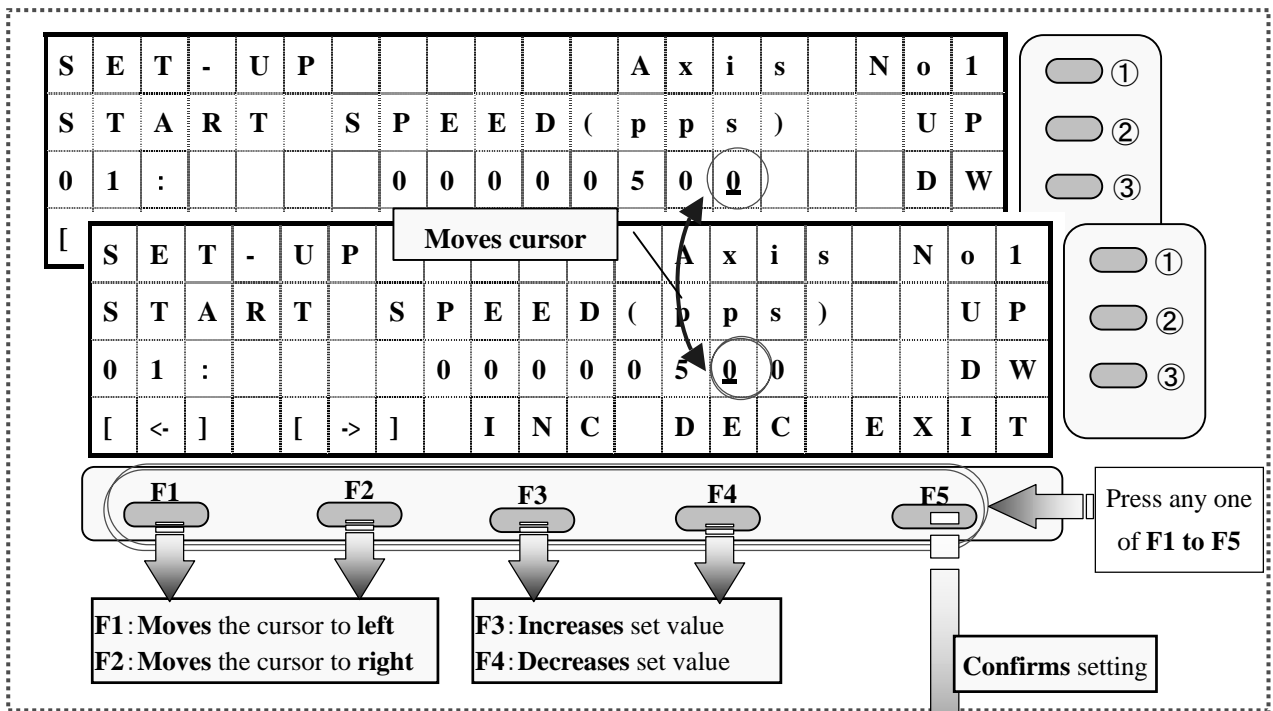


- The set item No. can be changed by pressing the button ② or ③.

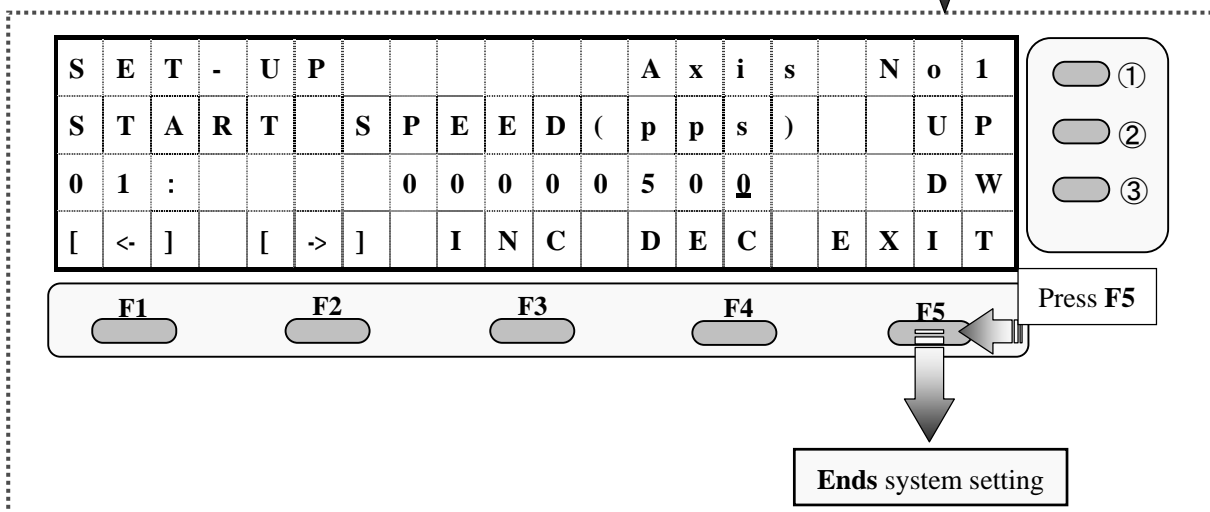


《Setting of System Setting Values》

- When attempting to **move cursor** to the **left** >>> **Press the button F1.**
- When attempting to **move cursor** to the **right** >>> **Press the button F2.**
- When attempting to **increase the set value** on the cursor >>> **Press the button F3.**
- When attempting to **decrease the set value** on the cursor >>> **Press the button F4.**
- When attempting to make the rewritten **set value valid** >>> **Press the button F5.**



- The **system setting** screen can be **closed** by pressing the button **F5**.



《List of System Setting Items》

No.	Display on LCD	Functional description	Default
1	START SPEED (pps)	Setting of start speed for speed table No. 0	500
2	TOP SPEED (pps)	Setting of maximum speed for speed table No. 0	5000
3	ACC TIME (10ms)	Setting of accelerating time for speed table No. 0	24
4	DEC TIME (10ms)	Setting of decelerating time for speed table No. 0	24
5	ORG PRESET DATA	Setting of coordinate value/origin preset value after origin return	0
6	PM PRESCALE	Setting of prescaler	0
7	BACKLASH PULSE	Setting of pulse number at backlash correction	0
8	BACKLASH TYPE 0-4	Setting of backlash correcting method (0: invalid, 1 to 4: Method selection)	0
9	ORG TYPE 1-15	Setting of origin return method	3
10	PLS CAL DIV 1/N	Setting of denominator of the angle conversion coefficient for feed pulse amount	1
11	PLS CAL DIV N/1	Setting of numerator of the angle conversion coefficient for feed pulse amount	1
12	PLS RND OFF 0-9	Setting of displayed valid digit numbers of displayed value after angle conversion	1
13	STOP EMG:0 SLW:1	Setting of limit stop method (0: Emergency stop, 1: Decelerating stop)	0
14	OFFSET DATA	Setting of optical offset value	0
15	PM ROTATE CHANGE	Changing and setting of rotating direction	0
16	CWL NON:0 INV:1	Changing and setting of Cw limit signal logic	0
17	CCWL NON:0 INV:1	Changing and setting of Ccw limit signal logic	0
18	NORG NON:0 INV:1	Changing and setting of NORG sensor signal logic	0
19	ORG NON:0 INV:1	Changing and setting of ORG sensor signal logic	0
20	LMT SWAP N:0 Y:1	Setting of Ccw limit	0
21	COFF ON:0 OFF:1	Setting of motor excitation (0: Excitation ON, 1: Excitation OFF)	0
22	ACC CURVE 1-5	Setting of accelerating and decelerating method 1: Rectangular drive 2: Trapezoidal drive 3: Asymmetric trapezoidal drive 4: S-shaped drive 5: Asymmetric S-shaped drive	2
23	CONSTANT PULSE	Setting of low speed moving pulse amount from deceleration to stop	0
24	ENC CAL DIV 1/N	Setting of denominator of the angle conversion coefficient for encoder value	1
25	ENC CAL DIV N/1	Setting of numerator of the angle conversion coefficient for encoder value	1
26	ENC MULTIPLI 1-4	Setting of multiplication (1: Multiplication by 1, 2: Multiplication by 2, 4: Multiplication by 4)	1

No.	Display on LCD	Functional description	Default
27	ENC PRESCALE	Setting of zero clear position when high speed table is used	0
28	ENC RND OFF 0-9	Setting of display valid digit number of displayed value after angle conversion	1
29	FEEDBACK TYPE 0-2	Setting of encoder correcting method 0: No correction 1: Correction only in positioning 2: Constant correction	0
30	PERMIT RANGE PULSE	Setting of allowable range pulse amount when encoder is corrected	1
31	RETRY COUNT	Setting of retry number when encoder is corrected	100
32	WAIT TIME (1ms)	Setting of stop standby time before encoder is corrected	100
33	ENC ROTATE CHANGE	Setting of adding direction of encoder count	0
34	PM&ENC SYNC WRITE	Setting of encoder coordinate synchronization	0
35	SPD TABLE 1-300	Setting of speed table rewriting	1
36	SYS Refresh!! Pass:0 Exec:1	Execution of system initialization	0
37	JSC Function P:0 R:1 P&R:2	Setting of joystick selection 0: Main body 1: External 2: Both are available	0
38	JSC Fnc d:0 LR:1 UD:2	Setting of joystick control assignment 0: Default 1: Right and left directions 2: Up and down directions	1/2
39	JSC DIR NON:0 INV:1	Setting of joystick direction (0: Standard 1: Reverse)	0
40	JSC Hi Speed(pps)	Setting of high speed drive speed of joystick	8000
41	JSC Low Speed(pps)	Setting of low speed drive speed of joystick	200
42	DSP Line No1 Axis_No Select	Setting of axis No. on second line on LCD panel	1
43	DSP Line No1 SOUR PMC:0 ENC:1	Setting of displayed data on second line on LCD panel 0: Motor feed 1: Encoder feed	0
44	DSP Line No1 DATA Pls:0 Cal:1	Setting of conversion display on second line on LCD panel 0: Non converted display 1: Converted display	0
45	DSP Line No2 Axis_No Select	Setting of axis No. displayed on third line on LCD panel	2
46	DSP Line No2 SOUR PMC:0 ENC:1	Setting of displayed data on third line on LCD panel 0: Motor feed 1: Encoder feed	0
47	DSP Line No2 DATA Pls:0 Cal:1	Setting of conversion display on third line on LCD panel 0: Non converted display 1: Converted display	0

2. When Attempting to Set Drive Speed

《Rewriting of Speed Tables 1 to 9 (SP1 to SP9)》 (Setting item No.: No. 35)

- i) Press either the ② or ③ button to change the setting item number to No. 35.
- ii) Input a coefficient for the speed table with reference to the equation below.

<Relation between speed table and operating speed>

Maximum speed of speed table	x	Coefficient of speed table	=	Actual drive maximum speed
------------------------------	---	----------------------------	---	----------------------------

<Example of setting>

SP1: 2,000[pps] SP2: 3,000[pps] SP3: 4,000[pps] SP4: 5,000[pps] SP5: 6,000[pps] SP6: 7,000[pps] SP7: 8,000[pps] SP8: 9,000[pps] SP9: 10,000[pps]	x	20	=	SP1: 40,000[pps] SP2: 60,000[pps] SP3: 80,000[pps] SP4: 100,000[pps] SP5: 120,000[pps] SP6: 140,000[pps] SP7: 160,000[pps] SP8: 180,000[pps] SP9: 200,000[pps]
--	---	----	---	--

- iii) Press the button F5 to confirm the setting.

Press ② or ③

Press F5

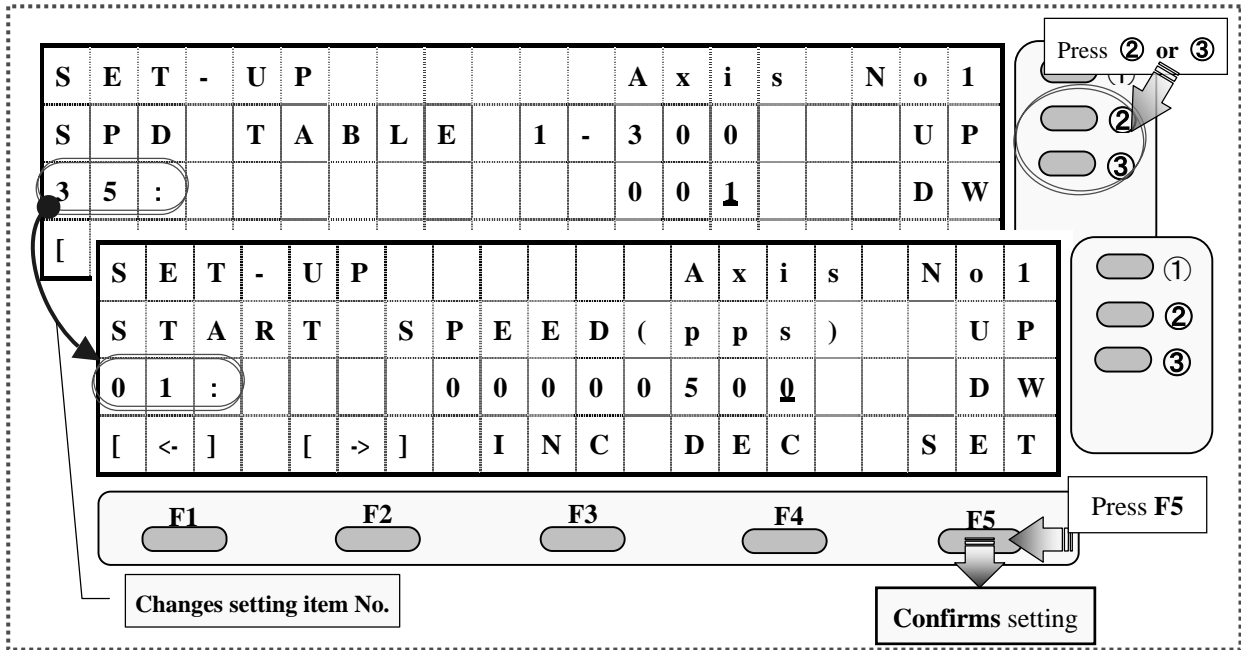
Changes set item No.

Confirms setting

《Rewriting of Speed Table 0 (SP0)》 (Setting item No.: No. 1, No. 2)

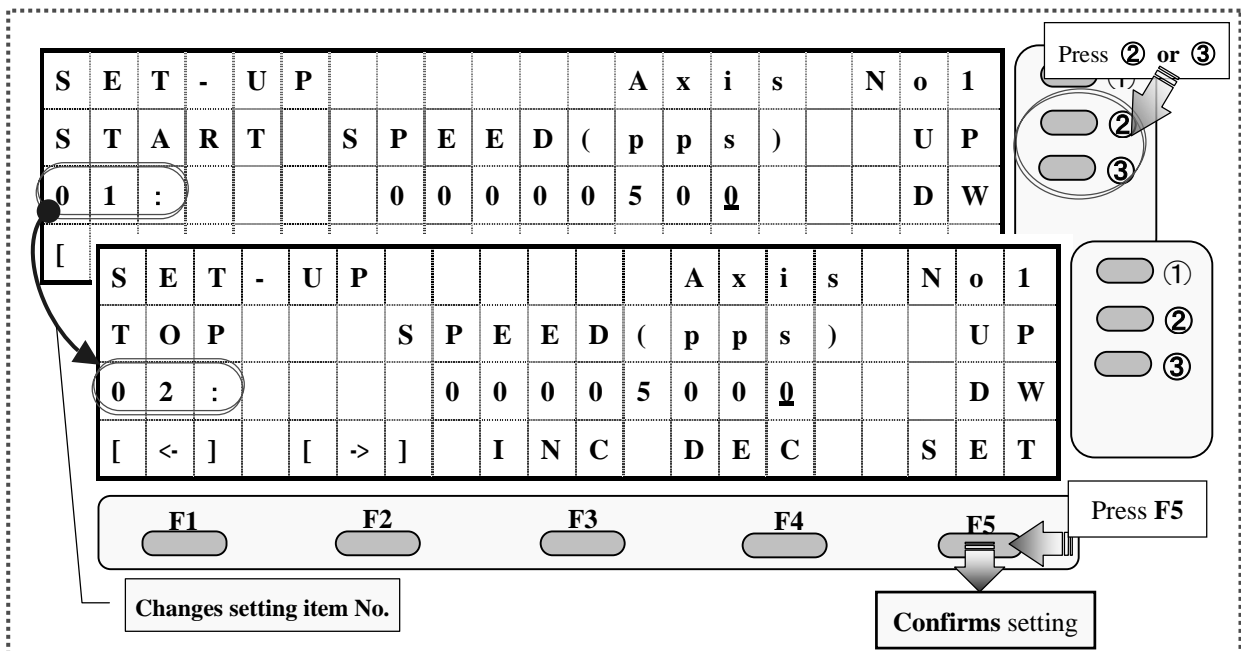
(A) The start speed of the speed table 0 (SP0) is rewritten. (Setting item No.: No. 1)

- i) Press either the ② or ③ button to change the setting item number to No. 1.
- ii) Input a start speed with reference to the “Operating procedure of system setting screen.”
- iii) Press the button F5 to confirm the setting.



(B) The maximum speed of the speed table 0 (SP0) is rewritten. (Setting item No.: No. 2)

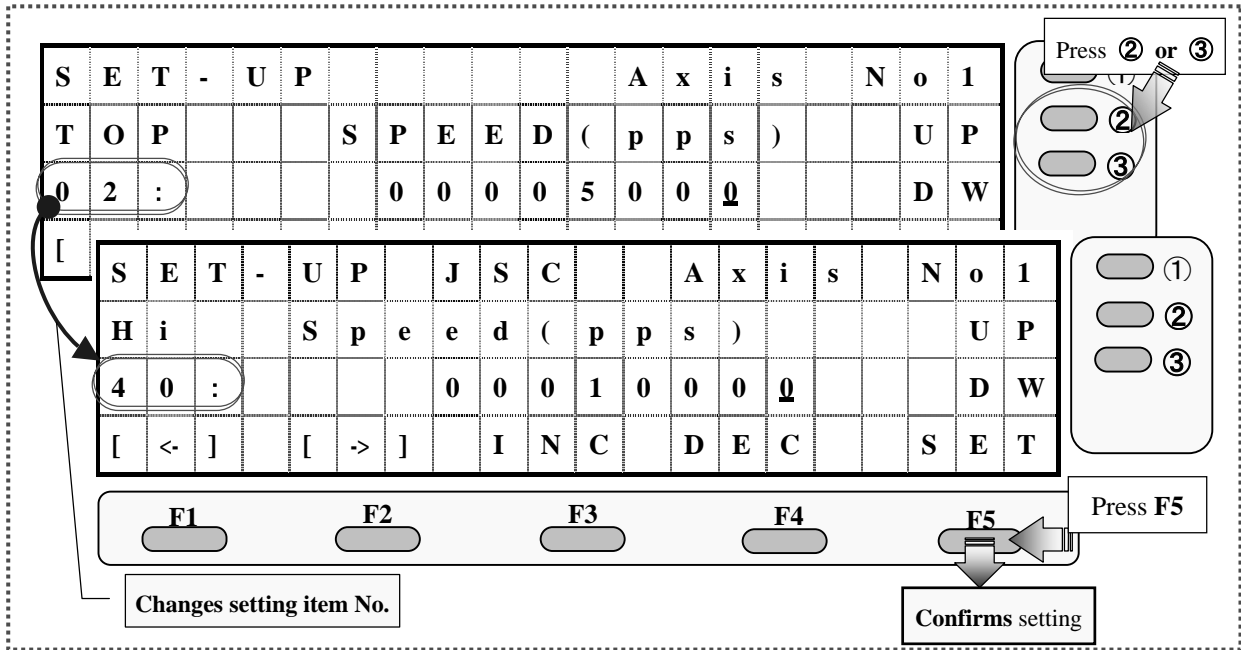
- i) Press either the ② or ③ button to change the setting item number to No. 2.
- ii) Input a maximum speed with reference to the “Operating procedure of system setting screen.”
- iii) Press the button F5 to confirm the setting.



《Rewriting of Joystick Drive Speed》 (Setting item No.: No. 40, No. 41)

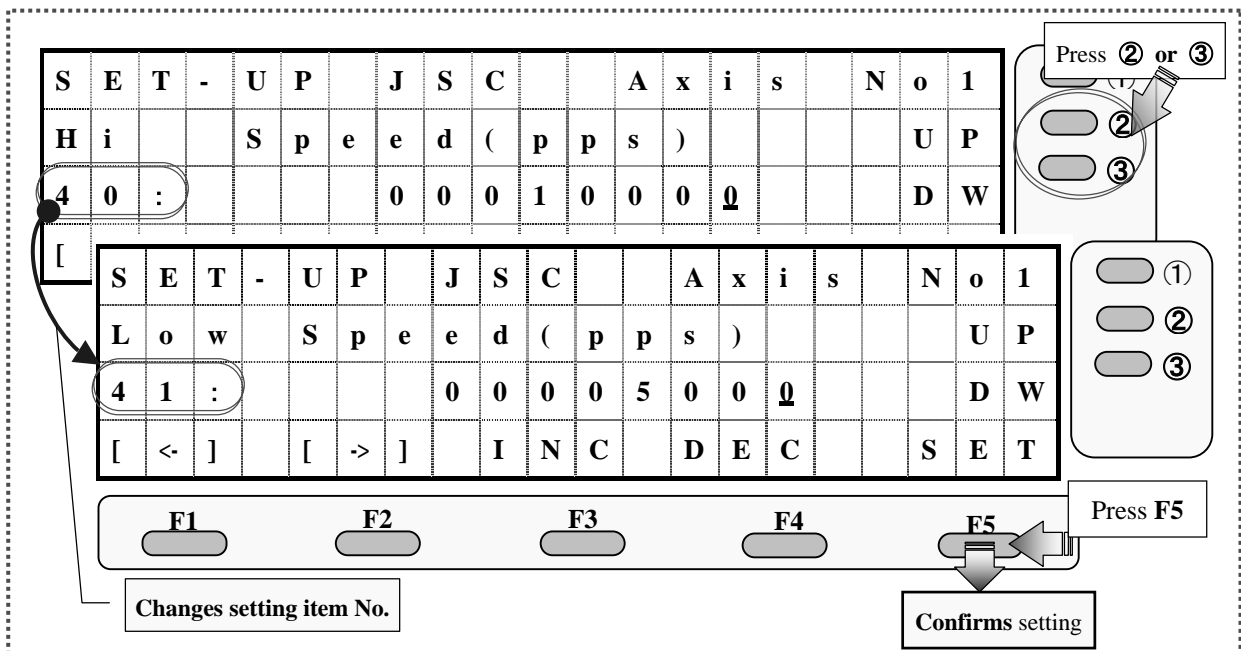
(A) The speed at high speed drive is rewritten. (Setting item No.: No. 40)

- i) Press either the ② or ③ button to change the setting item number to No. 40.
- ii) Input a drive speed with reference to the “Operating procedure of system setting screen.”
- iii) Press the button F5 to confirm the setting.



(B) The speed at low speed drive is rewritten. (Setting item No.: No. 41)

- i) Press either the ② or ③ button to change the setting item number to No. 41.
- ii) Input a drive speed with reference to the “Operating procedure of system setting screen.”
- iii) Press the button F5 to confirm the setting.



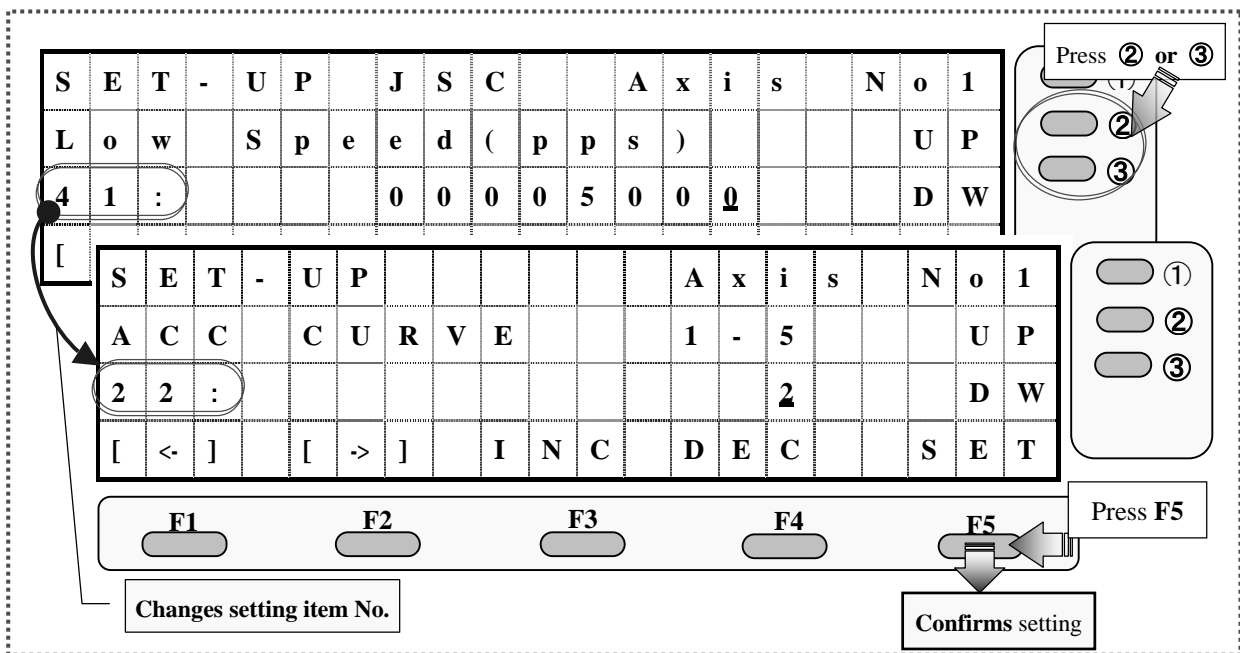
《Setting of Acceleration and Deceleration Mode》 (Setting item No.: No. 22)

- i) Press either the ② or ③ button to change the setting item number to No. 22.
- ii) Input an acceleration and deceleration mode No. with reference to the “Operating procedure of system setting screen.”

<Accelerating and decelerating mode No.>

No.	Accelerating and decelerating mode	Mode description
1	Rectangular drive	A mode to drive at maximum speed from the start and not to perform gradual acceleration/deceleration.
2	Trapezoidal drive	A mode to perform acceleration/deceleration at constant acceleration/deceleration ratios with the same values.
3	Asymmetric trapezoidal drive	A mode to perform acceleration/deceleration at constant acceleration/deceleration ratios with different values.
4	S-shaped drive	A mode to perform acceleration/deceleration at acceleration/deceleration ratios on the same quadric curves.
5	Asymmetric S-shaped drive	A mode to perform acceleration/deceleration at acceleration/deceleration ratios on different quadric curves.

- iii) Press the button F5 to confirm the setting.



3. When Attempting to Set Origin Return Method

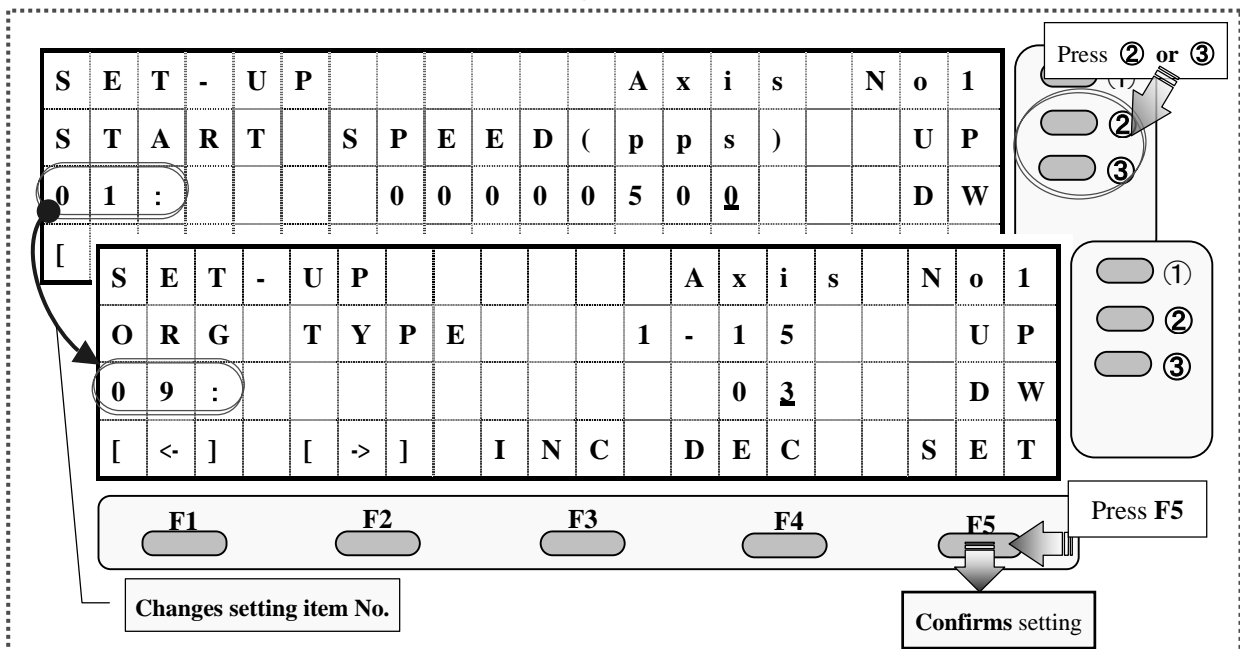
《Setting of Origin Return Mode》 (Setting item No.: No. 9)

- i) Press either the ② or ③ button to change the setting item number to No. 9.
- ii) Input an origin return mode No. with reference to the “Operating procedure of system setting screen.”

<Origin return mode No.>

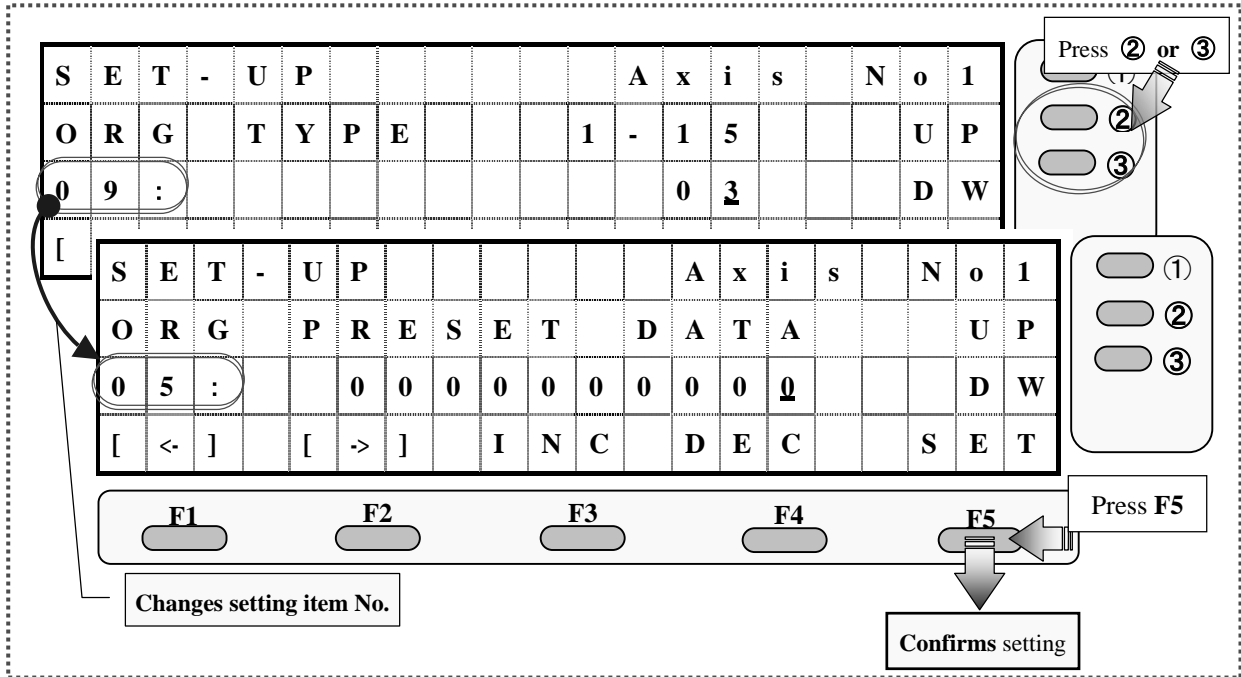
No.	Origin return mode	Mode description
1	Datum + Org	Return direction is determined and origin is detected with zone sensor.
2	Datum	Edge of the zone sensor is set to be the origin position.
3	Norg + Org	Origin located in proximity of origin is set to be the origin position.
4	Norg	One sensor located in the moving zone is set to be the origin position.
5	Cw Limit + Org	Origin in proximity of CW limit is set to be the origin position.
6	Ccw Limit + Org	Origin in proximity of CCW limit is set to be the origin position.
7	Cw Limit	Edge of CW limit is set to be the origin position.
8	Ccw Limit	Edge of CCW limit is set to be the origin position.
9	Org	Only origin sensor is used.
10	Now Position	The present position is set to be the origin position.
11	Cw Limit + Org & Go to Zero	After returning to the origin position by method 5, and moving to the set position, this position is set to be the origin position.
12	Ccw Limit + Org & Go to Zero	After returning to the origin position by method 6, and moving to the set position, this position is set to be the origin position.
13	Cw Limit & Go to Zero	After returning to the origin position by method 7, and moving to the set position, this position is set to be the origin position.
14	Ccw Limit & Go to Zero	After returning to the origin position by method 8, and moving to the set position, this position is set to be the origin position.
15	Enc Reference	Reference signal of the encoder is set to be the origin position.

- iii) Press the button F5 to confirm the setting.



《Setting of Preset Position》 (Setting item No.: No. 5)

- i) Press either the ② or ③ button to **change the setting item number** to No. 5.
- ii) **Input a preset position** with reference to the “Operating procedure of system setting screen.”
- iii) Press the button **F5** to **confirm** the setting.

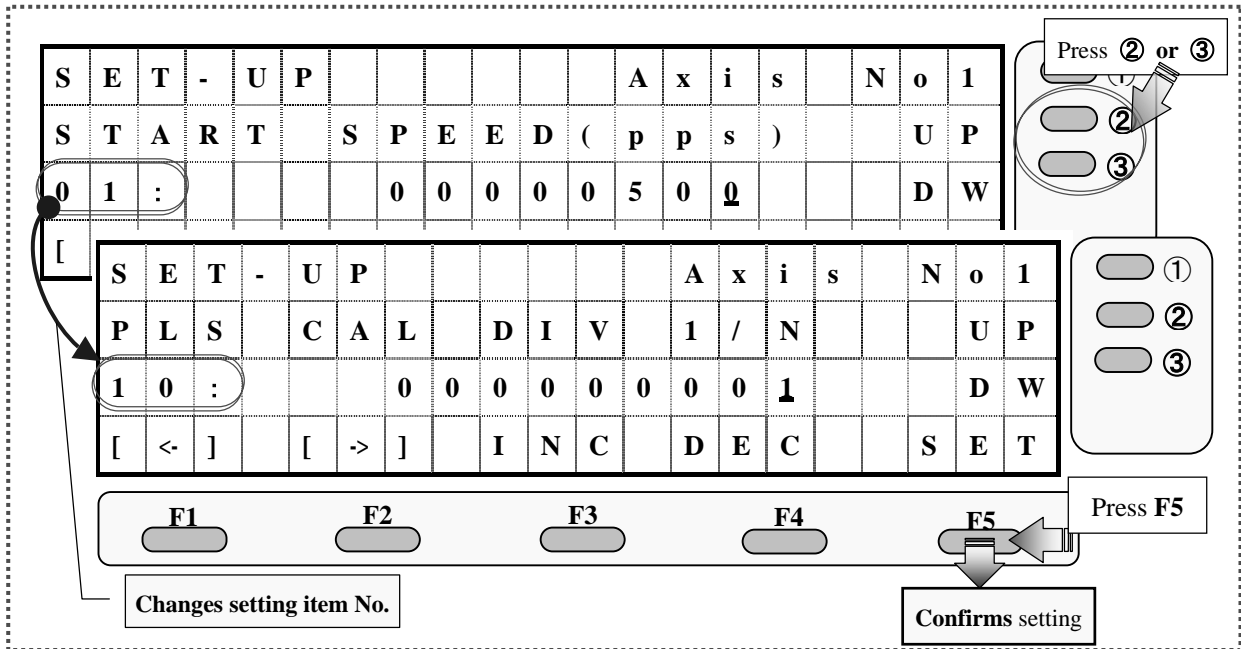


4. When Attempting to Display Pulse Number by Distance/Angle Conversion

《Setting of Conversion Coefficient》 (Setting item No.: No. 10, No. 11)

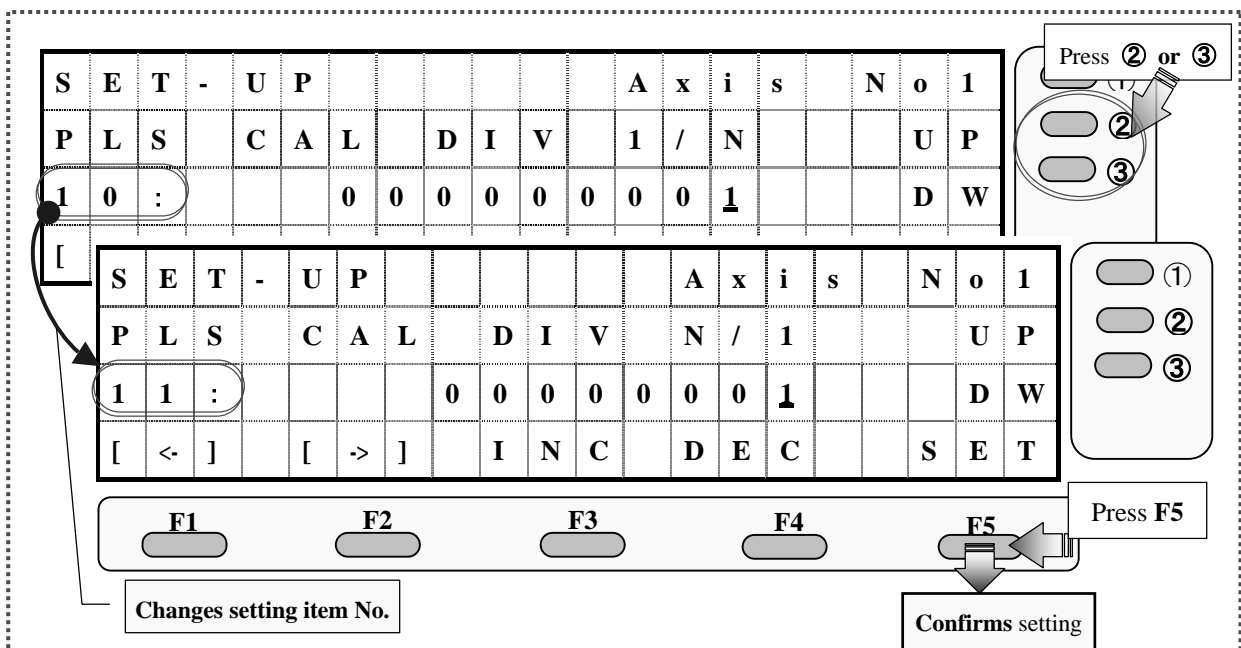
(A) The denominator of the conversion coefficient is set. (Setting item No.: No. 10)

- i) Press either the ② or ③ button to change the setting item number to No. 10.
- ii) Input the denominator of the conversion coefficient with reference to the “Operating procedure of system setting screen.”
- iii) Press the button F5 to confirm the setting.



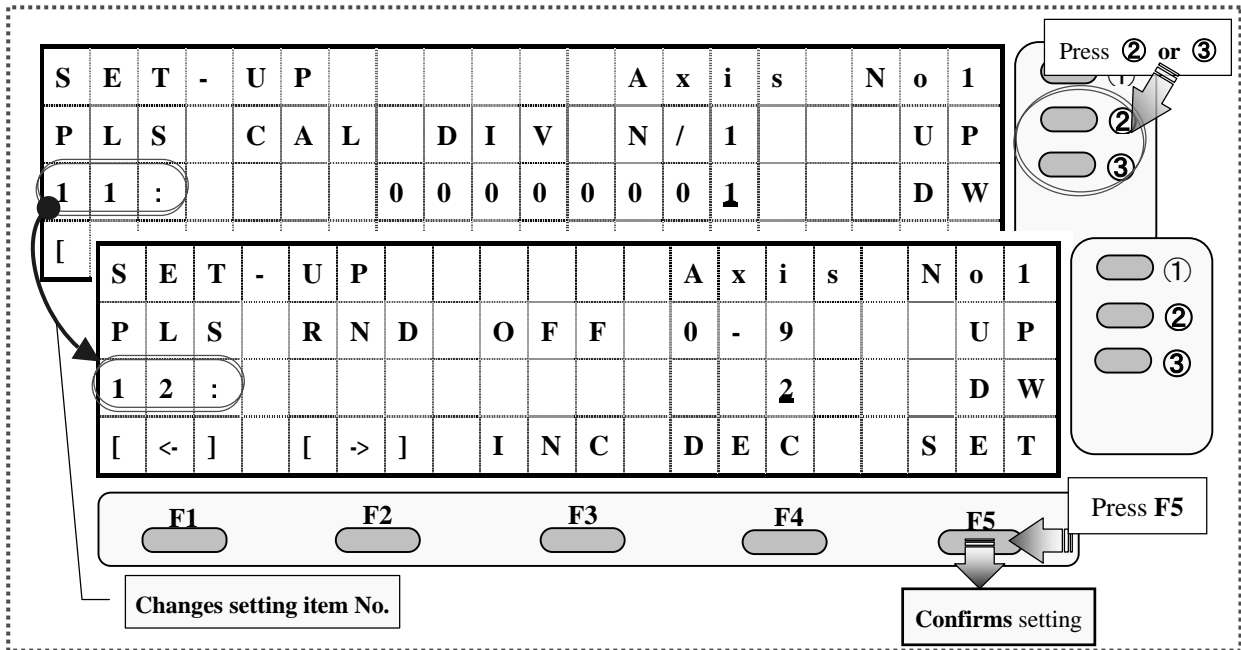
(B) The numerator of the conversion coefficient is set. (Setting item No.: No. 11)

- i) Press either the ② or ③ button to change the setting item number to No. 11.
- ii) Input the numerator of the conversion coefficient with reference to the “Operating procedure of system setting screen.”
- iii) Press the button F5 to confirm the setting.



《Setting of Digit Number of Displayed Data》 (Setting item No.: No. 12)

- i) Press either the ② or ③ button to change the setting item number to No. 12.
- ii) Input the digit number of displayed data with reference to the “Operating procedure of system setting screen.”
- iii) Press the button F5 to confirm the setting.

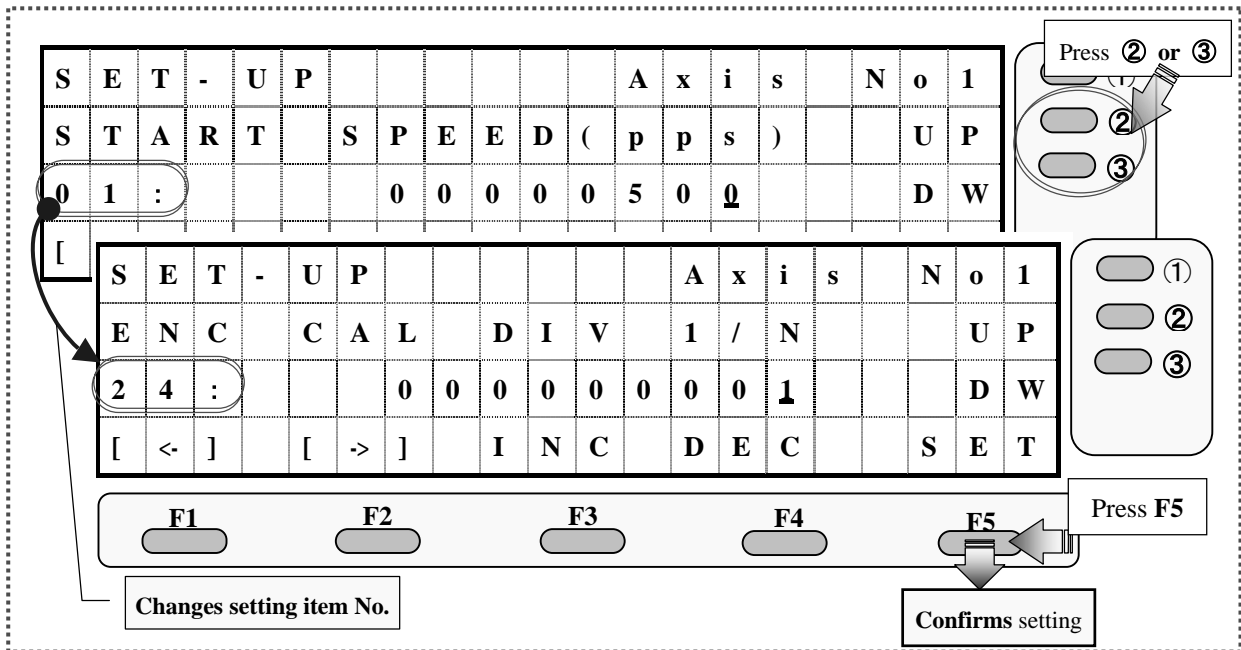


5. When Attempting to Display Encoder Value by Distance/Angle Conversion

《Setting of Conversion Coefficient》 (Setting item No.: No. 24, No. 25)

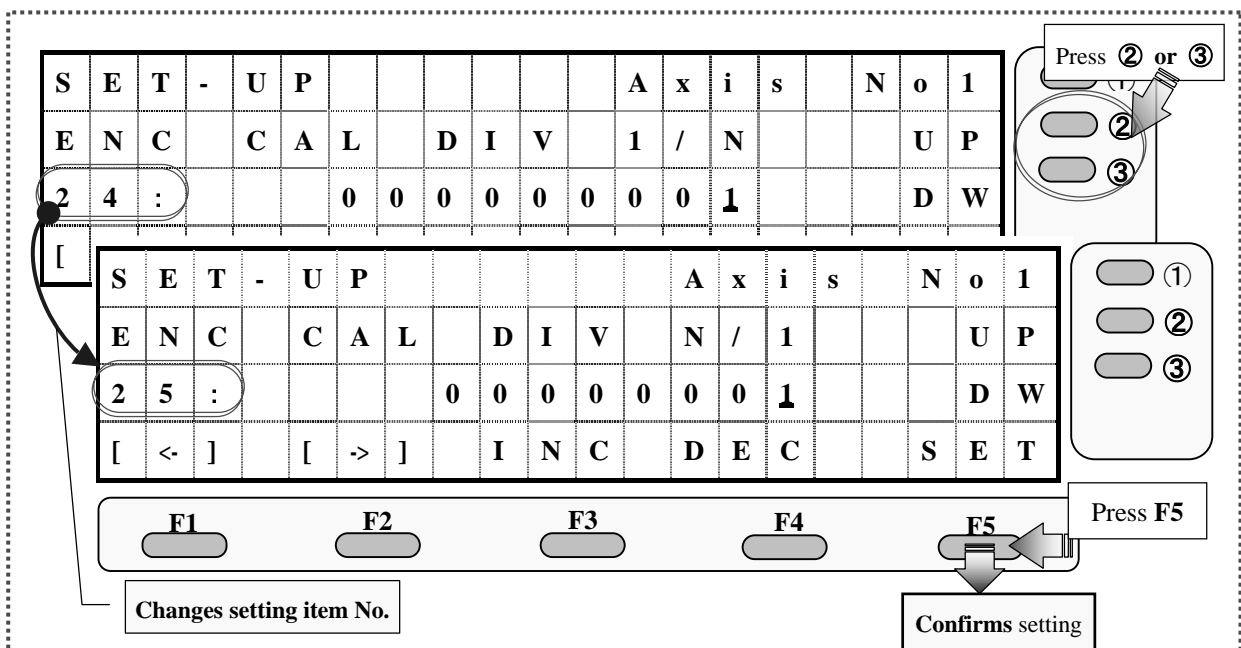
(A) The denominator of the conversion coefficient is set. (Setting item No.: No. 24)

- i) Press either the ② or ③ button to change the setting item number to No. 24.
- ii) Input the denominator of the conversion coefficient with reference to the “Operating procedure of system setting screen.”
- iii) Press the button F5 to confirm the setting.



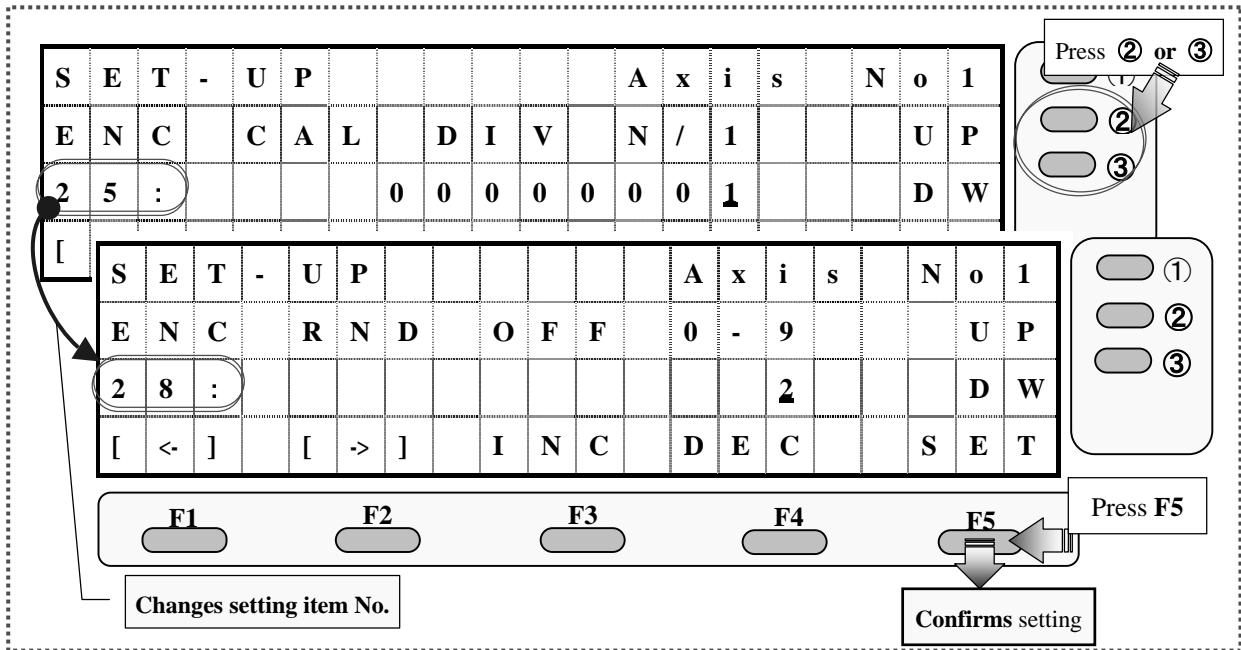
(B) The numerator of the conversion coefficient is set. (Setting item No.: No. 25)

- i) Press either the ② or ③ button to change the setting item number to No. 25.
- ii) Input the numerator of the conversion coefficient with reference to the “Operating procedure of system setting screen.”
- iii) Press the button F5 to confirm the setting.



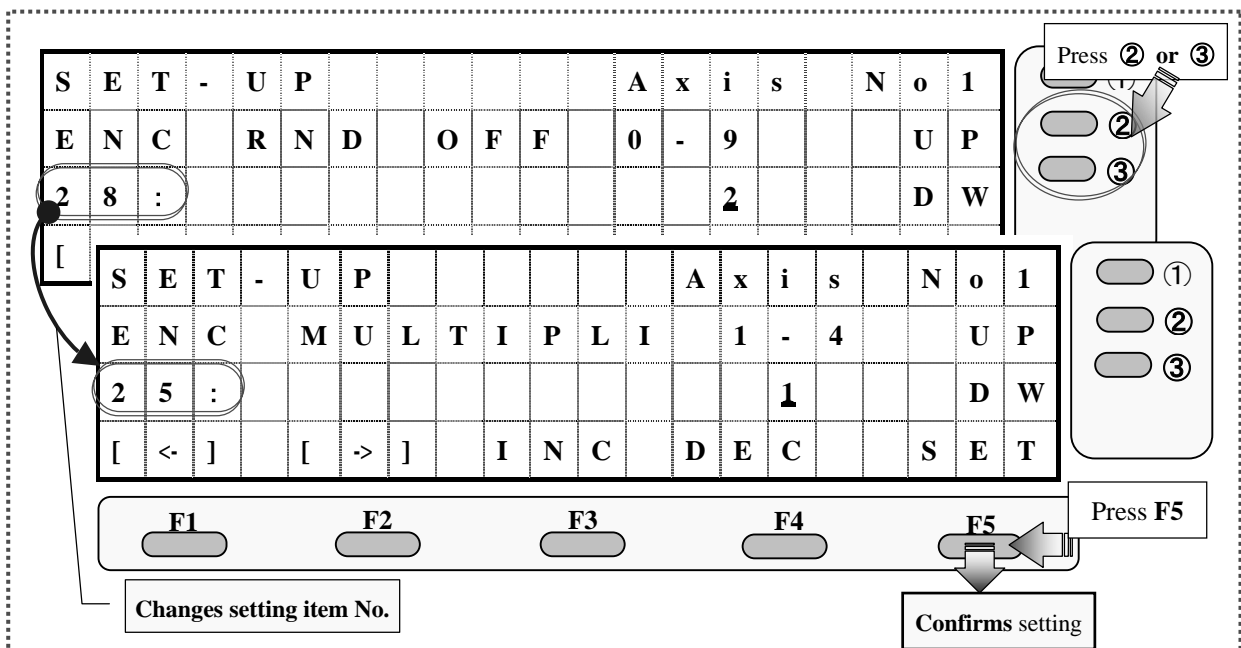
《Setting of Digit Number of Displayed Data》 (Setting item No.: No. 28)

- i) Press either the ② or ③ button to change the setting item number to No. 28.
- ii) Input the digit number of displayed data with reference to the “Operating procedure of system setting screen.”
- iii) Press the button F5 to confirm the setting.



《Setting of Multiplication of Encoder》 (Setting item No.: No. 26)

- i) Press either the ② or ③ button to change the setting item number to No. 26.
- ii) Input the digit number of displayed data with reference to the “Operating procedure of system setting screen.”
- iii) Press the button F5 to confirm the setting.



6. When Attempting to Perform Encoder Correction

《Setting of Encoder Correction Method》 (Setting item No.: No. 29)

- i) Press either the ② or ③ button to change the setting item number to No. 29.
- ii) Input an encoder correction method with reference to the “Operating procedure of system setting screen.”

<Encoder correction method>

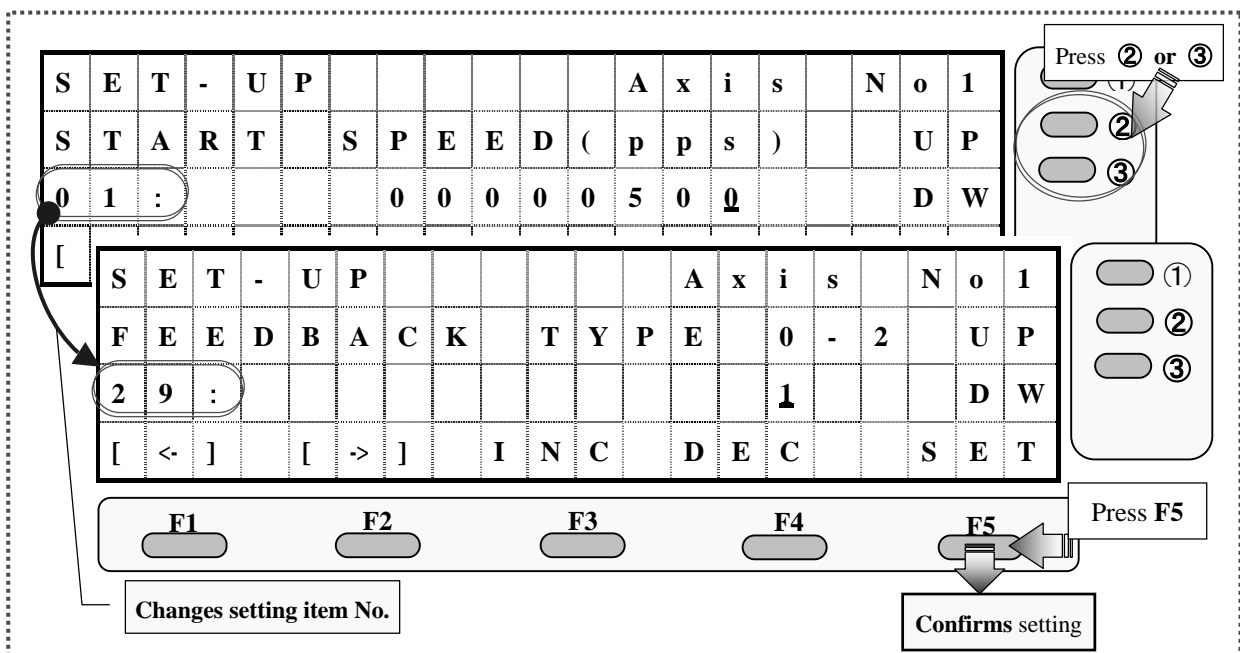
No.	Description of encoder correction
0	Encoder correction is made invalid .
1	Encoder correction is performed only once after moving is ended.
2	Encoder correction is continuously performed after moving is completed.

- iii) Press the button F5 to confirm the setting.

《Precaution in encoder correction》

At encoder correction, make sure to set so that the **digit number of the displayed data** of the pulse conversion is the **same** as that of the encoder conversion.

(For details on the setting method, refer to the pages 39 and 41.)



《Setting of Completion Conditions of Encoder Correction》

(Setting item No.: No. 30, No. 31, No. 32)

<Completion conditions of encoder correction>

The completion conditions of encoder correction are valid respectively for events in the table below.

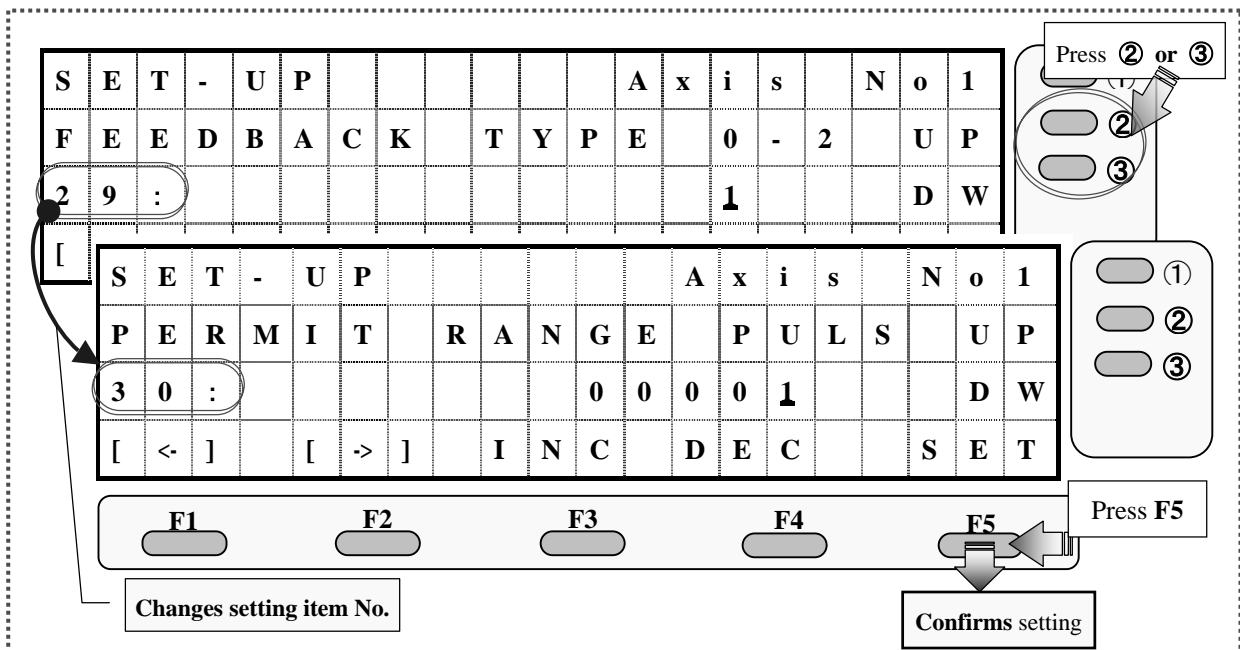
Carry out settings with reference to the table below.

<Relation between correction completion conditions and setting items>

Symptom after driving	Completion conditions of encoder correction
The pulse conversion value and encoder conversion value are not the same.	Set the allowable range (No. 30) slightly larger .
Correction does not end for a long time.	Set the retry numbers (No. 31) slightly smaller .
Driving distance at one time is long.	Set the stop standby time (No. 32) before correction completion slightly longer .

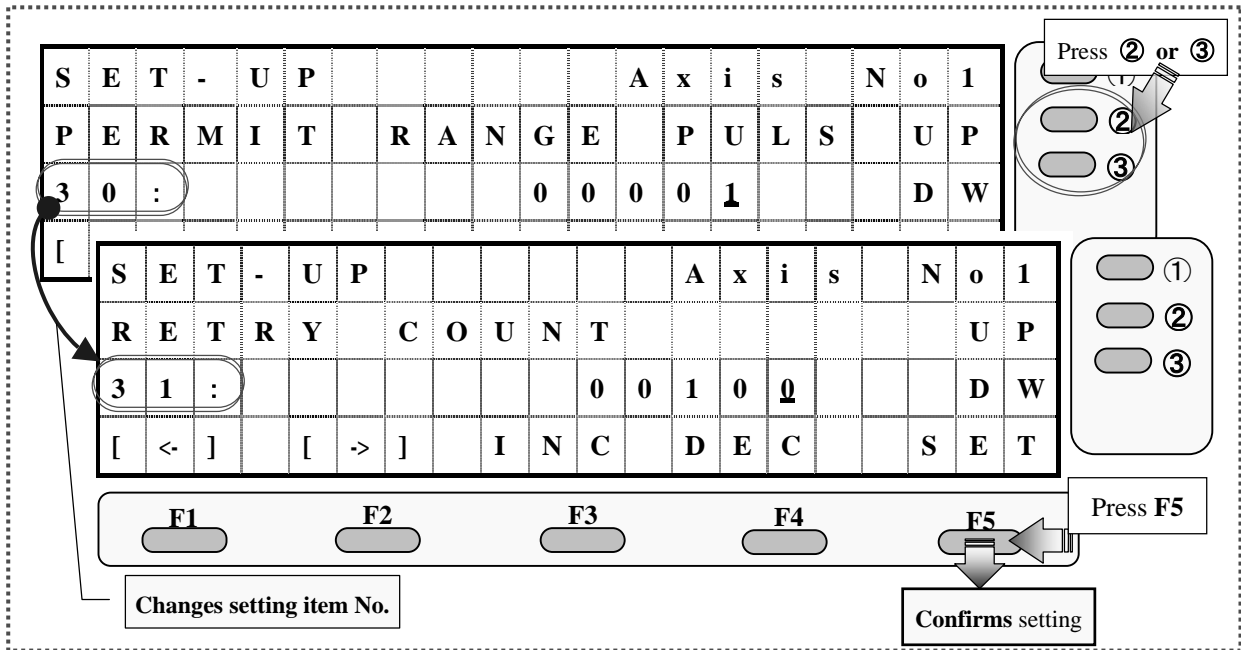
(A) The allowable range for encoder correction is set. (Setting item No.: No. 30)

- i) Press either the ② or ③ button to **change** the **setting item number** to No. 30.
- ii) **Input the pulse numbers in allowable range** with reference to the “Operating procedure of system setting screen.”
- iii) Press the button **F5** to **confirm** the setting.



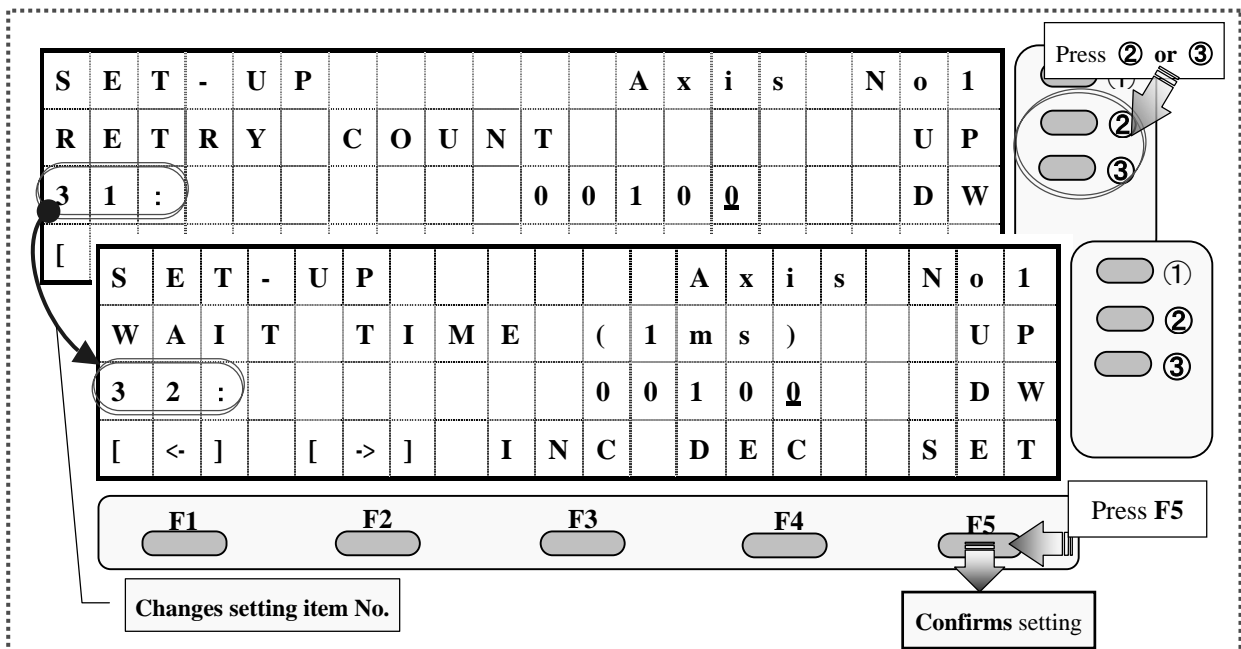
(B) The retry number for encoder correction is set (Setting item No.: No. 31)

- i) Press either the ② or ③ button to **change** the **setting item number** to No. 31.
- ii) **Input the retry number** with reference to the “Operating procedure of system setting screen.”
- iii) Press the button **F5** to **confirm** the setting.



(C) The stop standby time before starting encoder correction is set. (Setting item No.: No. 32)

- i) Press either the ② or ③ button to **change** the **setting item number** to No. 32.
- ii) **Input the stop standby time** with reference to the “Operating procedure of system setting screen.”
- iii) Press the button **F5** to **confirm** the setting.



7. When Attempting to Perform Backlash Correction

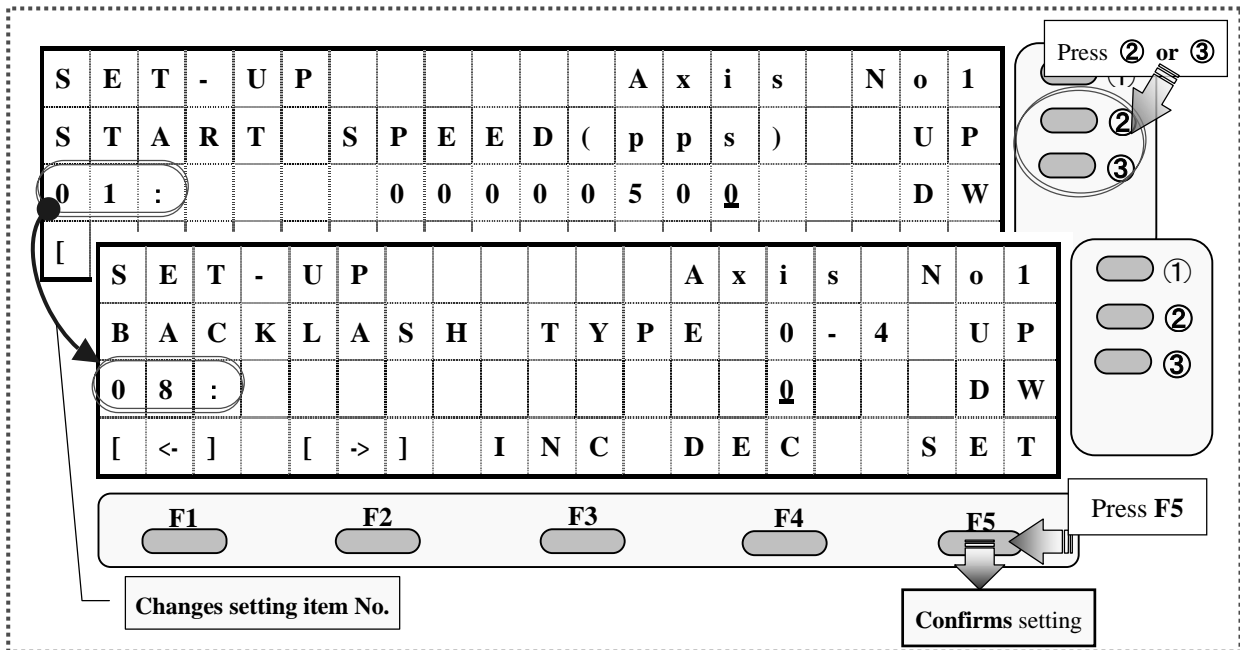
《Setting of Backlash Correction Method》 (Setting item No.: No. 8)

- i) Press either the ② or ③ button to change the setting item number to No. 8.
- ii) Input the backlash correction method with reference to the “Operating procedure of system setting screen.”

<Backlash correction method>

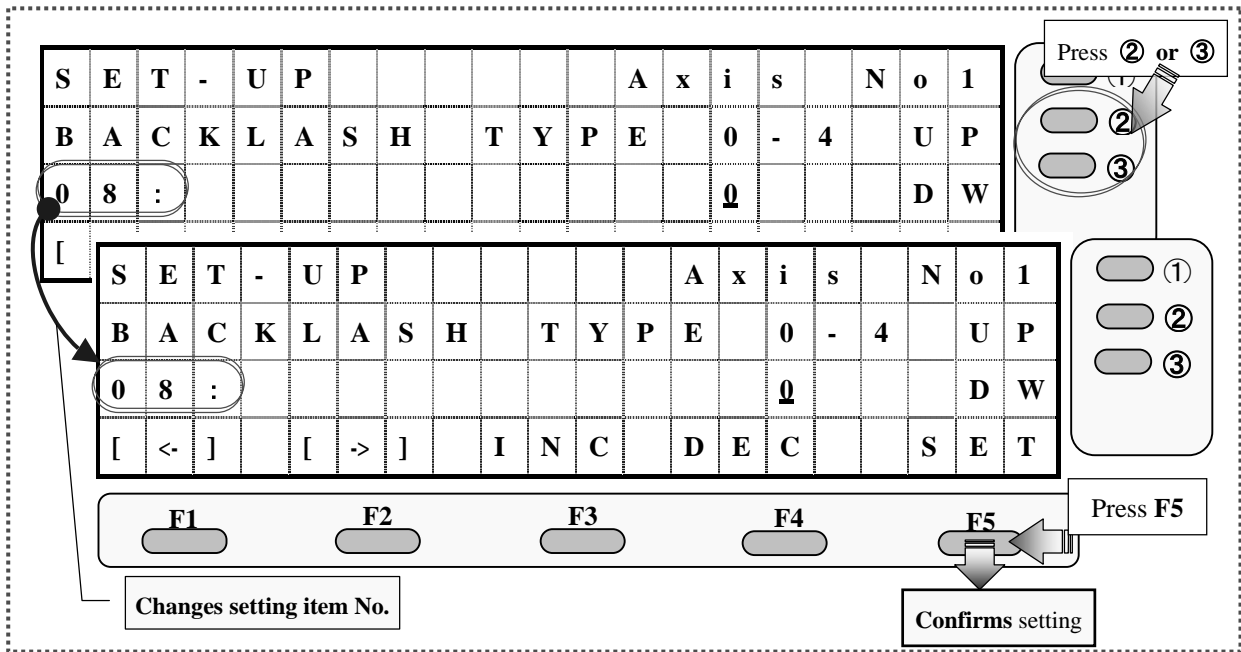
No.	Description of backlash correction
0	The backlash correction is made invalid .
1	In inverting from Cw direction to Ccw direction, reciprocating movements are performed by the correction pulse numbers before moving .
2	In inverting from Ccw direction to Cw direction, reciprocating movements are performed by the correction pulse numbers before moving .
3	In moving in Ccw direction, reciprocating movements are performed by the correction pulse numbers after moving is ended .
4	In moving in Cw direction, reciprocating movements are performed by the correction pulse numbers after moving is ended .

- iii) Press the button F5 to confirm the setting.



《Setting of Backlash Correction Pulse Amount》 (Setting item No.: No. 7)

- i) Press either the ② or ③ button to change the setting item number to No. 7.
- ii) Input the correction pulse amount with reference to the “Operating procedure of system setting screen.”
- iii) Press the button F5 to confirm the setting.



8. When Attempting to Change LCD Display

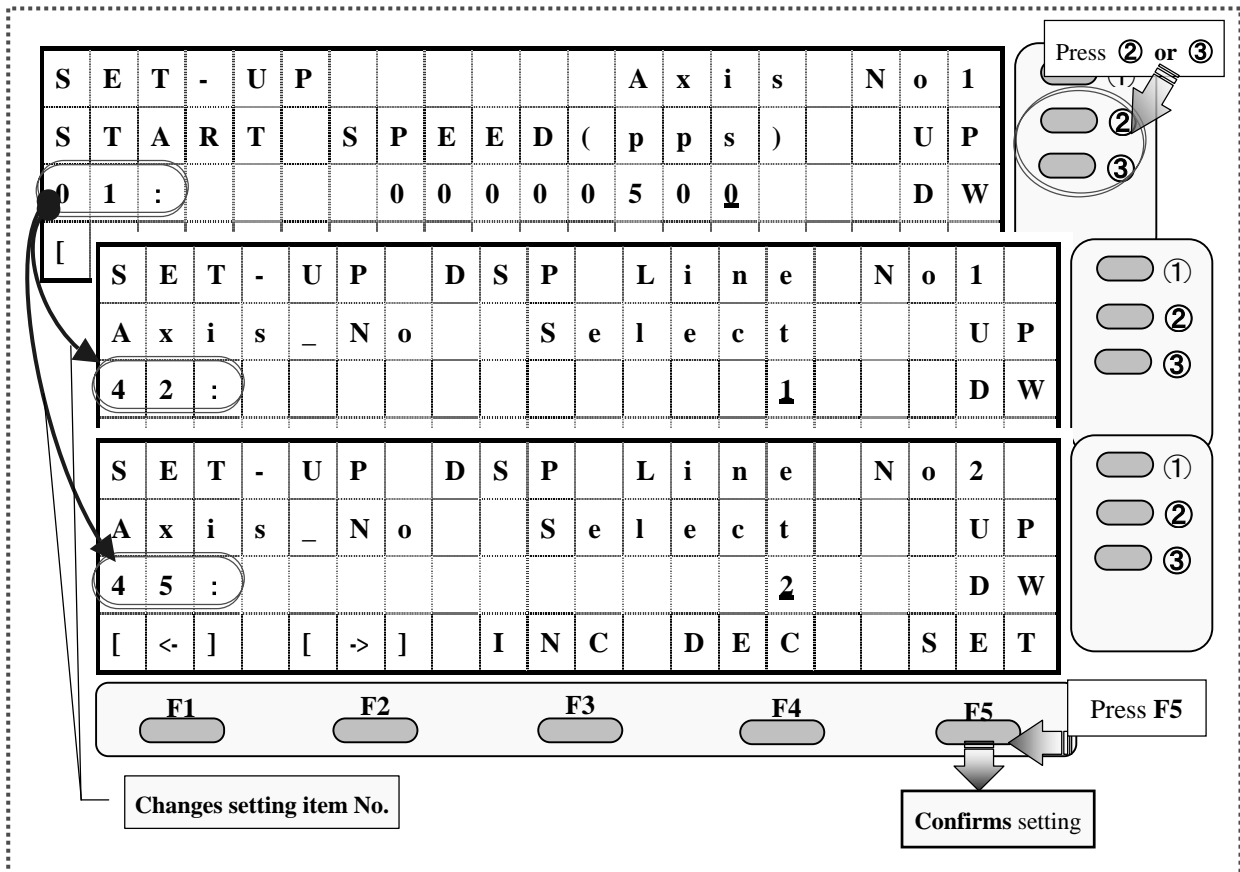
《Setting of Axis No. Displayed on LCD》 (Setting item No.: No. 42, No. 45)

- i) Press either the ② or ③ button to change the setting item No. with reference to the following.

<Correspondence between display change line and setting item No.>

Setting item No.	Setting item
42	The axis No. displayed on the second line is set.
45	The axis No. displayed on the third line is set.

- ii) Input the axis No. to be displayed with reference to the “Operating procedure of system setting screen.”
- iii) Press the button F5 to confirm the setting.



《Setting of Data Source Displayed on LCD》 (Setting item No.: No. 43, No. 46)

i) Press either the ② or ③ button to change the setting item No. with reference to the following.

<Correspondence between display change line and setting item No.>

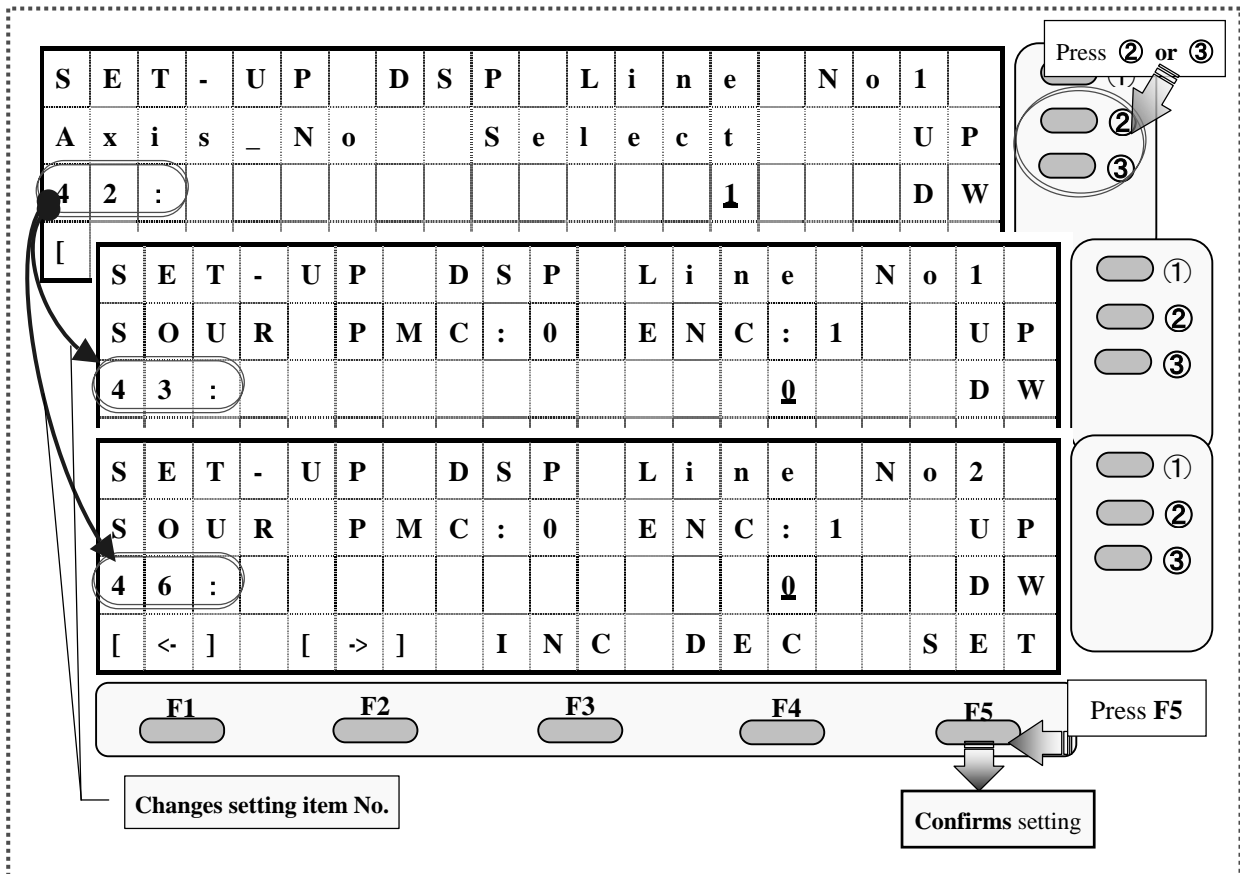
Setting item No.	Setting item
43	Data source (pulse display/encoder display) displayed on the second line is set.
46	Data source (pulse display/encoder display) displayed on the third line is set.

ii) Input the data source No. to be displayed with reference to the “Operating procedure of system setting screen.”

<Number of data source to be displayed>

No	Setting item
0	Value of pulse motor is displayed.
1	Value of encoder is displayed.

iii) Press the button F5 to confirm the setting.



《Setting of Conversion Display to LCD》 (Setting item No.: No. 44, No. 47)

i) Press either the ② or ③ button to change the setting item No. with reference to the following.

<Correspondence between display change line and setting item No.>

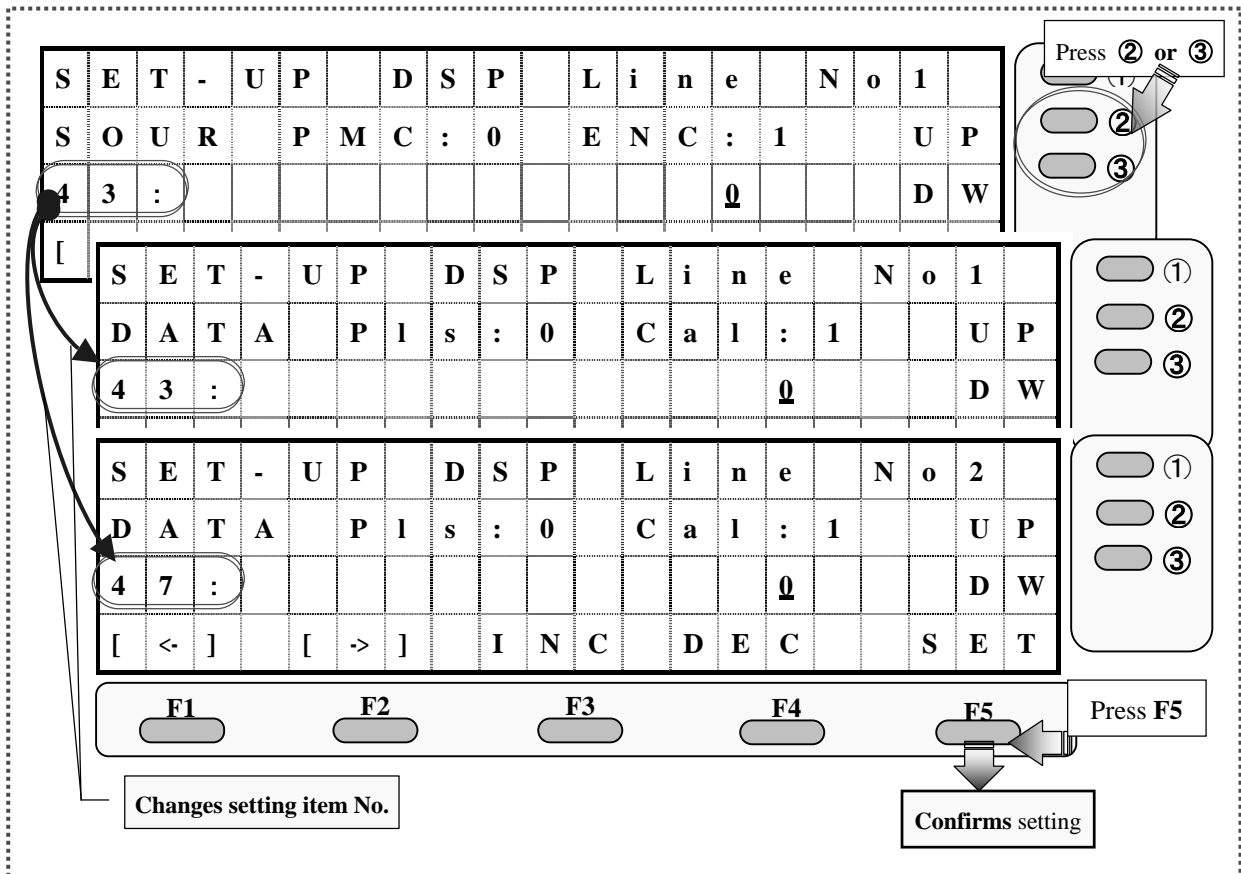
Setting item No.	Setting item
44	Presence or absence of conversion display displayed on the second line is set.
47	Presence or absence of conversion display displayed on the third line is set.

ii) Input the number of conversion/non conversion with reference to the “Operating procedure of system setting screen.”

<Number of Conversion/Non conversion>

No	Setting item
0	Conversion display is not performed.
1	Conversion display is performed.

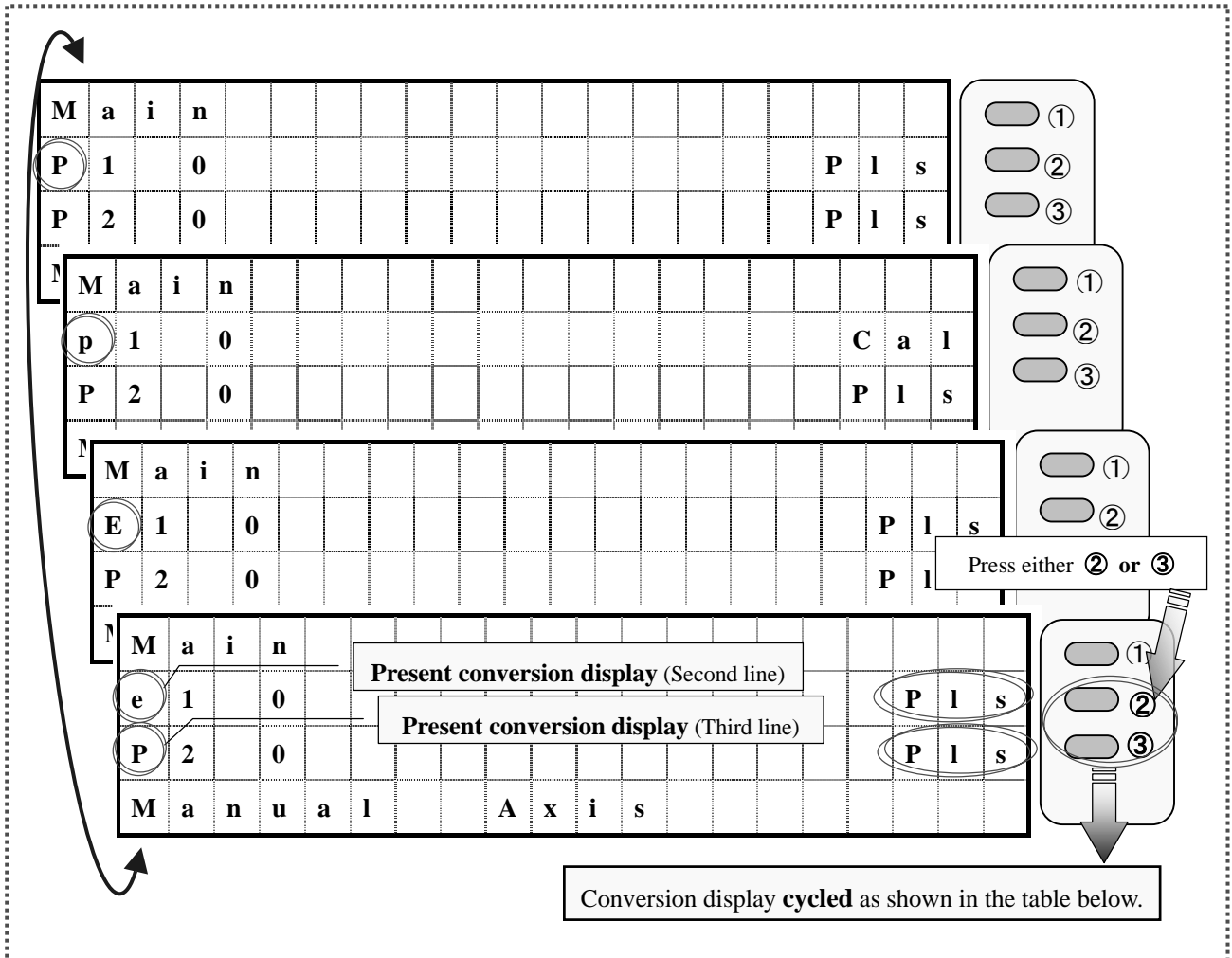
iii) Press the button F5 to confirm the setting.



《Simple Operation Setting of Displayed Data Selection》

Only for SC-400/SC-800

- When attempting to **change** conversion display on the **second line** >>> Press the button ②.
- When attempting to **change** conversion display on the **third line** >>> Press the button ③.



<Setting of conversion display>

Present conversion display	Displayed data source	Presence or absence of conversion display	Next conversion display
P	Pulse	Conversion display is not performed .	p
p	Pulse	Conversion display is performed .	E
E	Encoder	Conversion display is not performed .	e
e	Encoder	Conversion display is performed .	P

(MEMO)

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Pioneering the door to the future with a commitment to technology

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Section for records

Purchase Date **Year** **Month** **Date**

Purchased from

Person in charge **TEL**

Production No.

Special note



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