

Semflex A Series

Operating Manual



-	Semflex A Series Operation Manual	22-05-30	Kawamoto		Mori
Rev. No.	Description	Date (yy-mm-dd)	Prepared	Checked	Approved
SEIBU ELECTRIC & MACHINERY CO., LTD.		ISSUED BY ENGINEERING Div.			

Safety precautions below describes particularly important instructions to handle valve actuator.
Read these precautions carefully before using and handling valve actuator properly.
Installation of valve actuator should be performed only by trained and qualified professionals.

[Receiving, Transportation and Storage]

 **Caution --- Prevent accidents due to dropping the product or other such causes.**

- (1) Check the weight of valve actuator before suspending and slinging work. Stay out of suspended actuator and ensure utmost safety before and during the work.
- (2) Should be handling and storing actuator with care since the strengthen of packing would be weakened by getting wet or exposed to moisture.

Failure to observe these cautions may result in injury.

[Installation and Test Operation]

 **Caution --- Prevent accidents due to dropping or falling.**

- (1) Check the weight of valve actuator before suspending and slinging work. Stay out of suspended actuator and ensure utmost safety before and during the work.
- (2) Make sure to secure foothold for work, and never attempt to work on a pipe or anything unstable.

Failure to observe these cautions may result in injury.

 **Caution --- Prevent electric shock. (Electrically-operated type)**

- (1) When connecting, make sure that there is no insulation failure due to high moisture or wetting.
- (2) Securely connect ground wires.

Failure to observe these cautions may result in electric shock.

 **Caution --- Prevent injuries and/or accidents. (Electrically-operated type)**

- (1) Make sure to notify and maintain communications with the power supply operator.

Failure to observe this caution may result in injury.

[Maintenance and Inspection]

 **Caution --- Prevent electric shock. (Electrically-operated type)**

- (1) When changing wires, make sure that there is no insulation failure due to moisture or wetting.
- (2) Make sure that ground wires have been securely connected.

Failure to observe these cautions may result in electric shock.

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- Overview of A Series

Semflex-A is an intelligent type electric valve actuator equipped with a control device that can set fully closed / fully open position and torque switch operation value with an external operation switch without opening switch cover.

- Wiring Procedure

- (1) Connector wiring

Open Terminal case cover or connector cover. In case of connector type, use each connector pin for power supply/ control supply and arrange wiring as per wiring diagram.

- (2) Connect to Power supply

- ※ Precautions

- *Make sure external power supply is OFF before connecting the cables.

- *Check terminal number or connector pin number and the number of wiring diagram to ensure wiring is connected correctly.

- Please use highly waterproof cable glands such as those for marine use or waterproof gasket-type unions.
- Close terminal cover to prevent electric shock for terminal type.

Please prepare an external power supply (3φ200V / 3φ400V ± 10% 50 / 60Hz)

※Please refer to the next page for wiring diagram.

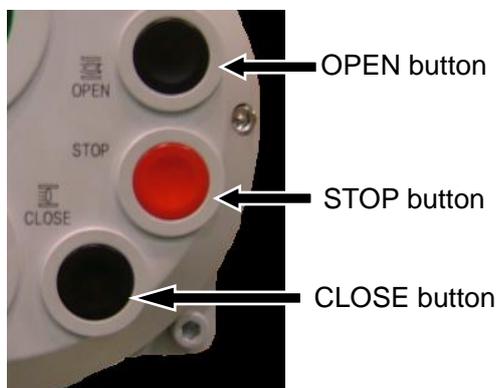
- Initial Operation

- ※ Precautions

Make sure that select switch is OFF, that push button is not pressed, and that external operation unit is not operated, and then turn the power on.



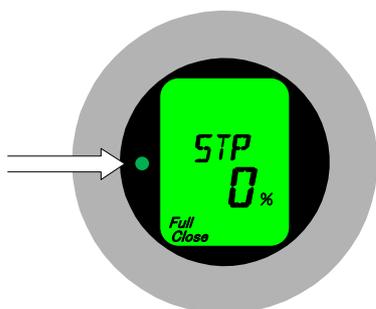
Selector switch



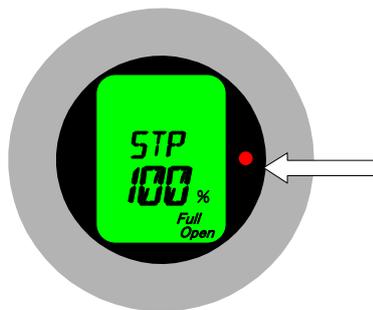
Push buttons

(Confirmation after power on)

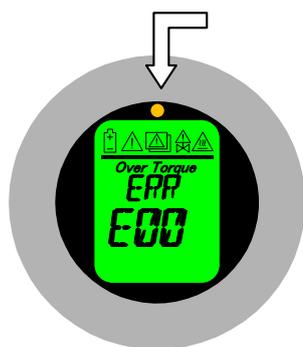
Confirm display lit in bright green when power is turned on, and check that "STP □□%" is displayed. When power is on, "Green lamp" lights up when fully closed, and "Red lamp" lights up when fully open. If an error status, "Orange lamp" lights up.



Fully Closed (Green lamp)



Fully Open (Red lamp)



Error indication (Orange lamp)

●Check Operation of Actuator only

※* Precautions

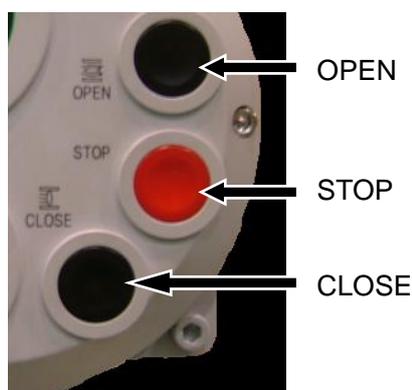
- CLOSE cannot be done while OPEN movement is in progress. Push STOP before performing CLOSE.
- OPEN cannot be done while CLOSE movement is in progress. Push STOP before performing OPEN.
- Operation stops when mode is changed by select switch during opening or closing.
- Do not touch output shaft section during opening or closing. It cause machine trouble or any accident.
- Holding circuits are used for local and remote operation modes to open and close actuator.

(1) Operate in LOCAL Operation Mode [With OPEN/CLOSE self-holding function (standard setting)]

Turn select switch to LOCAL operation mode.



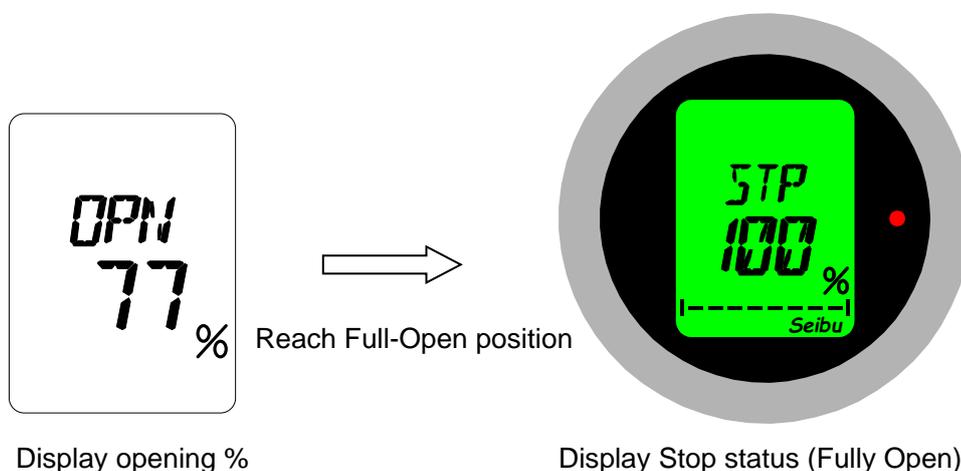
Selector switch



Push buttons

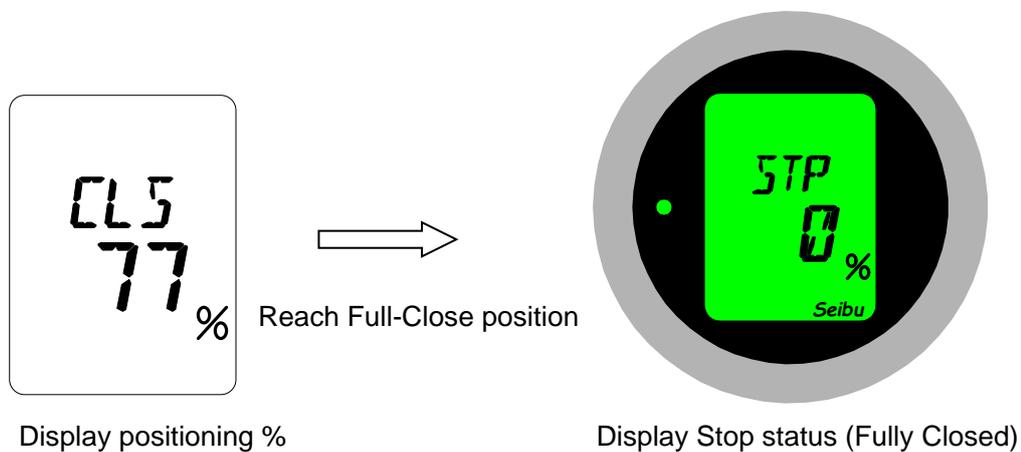
[OPEN]

When OPEN button is pressed, actuator works to open the valve. "OPN ##%" is shown on display during opening and position percent (%) is counted. The movement is stop when reach to fully open position, and the display shows "STP 100%." Confirm that Red lamp, which indicates fully open position, lights on the right side of display.

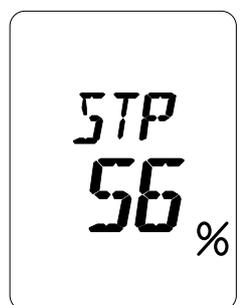


[CLOSE]

When CLOSE button is pressed, actuator works to close the valve. "CLS ##%" is shown on display during closing and position percent (%) is counted. The movement stops when reach to fully closed position and the display shows "STP 0%." Confirm that Green lamp, which indicates fully closed position, lights on the left side of display.

**[STOP]**

When STOP button is pressed during opening or closing, the movement will stop and percent (%) of opening angle at the time of stop will be shown on display.

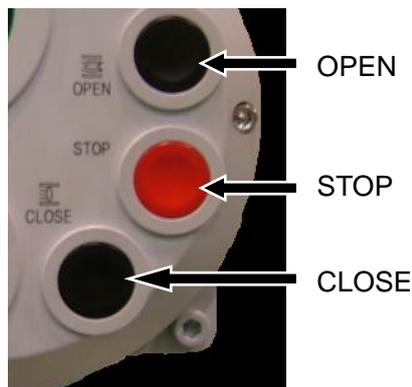


(2) Operating in LOCAL Operation Mode [Without OPEN/CLOSE self-holding function (Inching)]

Turn selector switch to local operation mode.



Selector switch

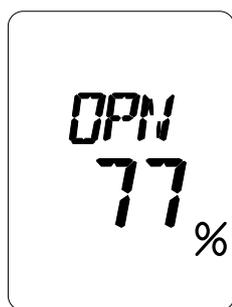


Push buttons

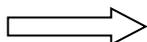
[OPEN]

With Inching operation, actuator works to open the valve while OPEN button is hold. Opening operation stops when OPEN button is released or when STOP button is pressed.

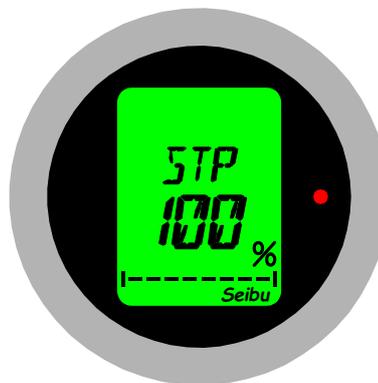
“OPN xx%” is shown on display during opening and position percent (%) is counted. The movement stops when reach to fully open position, and display shows “STP 100%.” Confirm that Red lamp, which indicates the fully open position, is lit on the right side of display.



Display positioning %



Reach Full-Open position



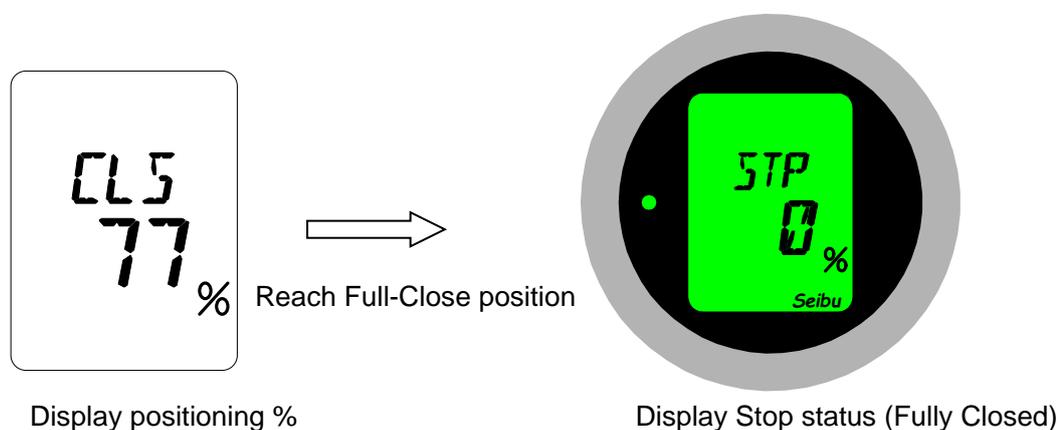
Display Stop status (Fully Open)

)

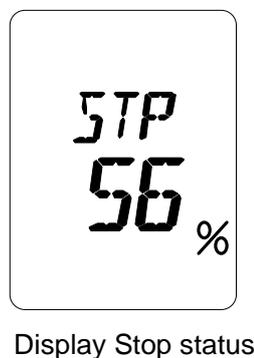
[CLOSE]

With Inching operation, actuator works to close the valve while CLOSE button is hold down. Closing operation stops when CLOSE button is released or when STOP button is pressed.

“CLS xx%” is shown on display during closing and position percent (%) is counted. The movement stops when reach to full-close position, and display shows “STP 0%.” Confirm that Green lamp, which indicates the full-close position, is lit on the left side of display.

**[STOP]**

When STOP button is pressed during opening or closing, the movement stops and position (%) at the time of stop is shown on display.

***Without OPEN/CLOSE self-holding function (Inching)**

With actuator of inching operation, OPEN or CLOSE continues only while operation is being performed in LOCAL or REMOTE mode. Movement will stop when releasing OPEN or CLOSE button or when STOP button is pressed. In addition, please do note operate as below.

- 1) Operate CLOSE during OPEN operation is active, or
- 2) Operate Open during CLOSE operation is active,

(3) Operation OFF

When actuator is not to be operated or when maintenance is to be carried out, turn LOCAL/REMOTE select switch to OFF for safety reason.



Selector switch

● Function of Input Contacts for Remote Operation

To perform remote operation, set select switch of actuator to REMOTE.

(1) How to Use the Contacts in Input for REMOTE Operation

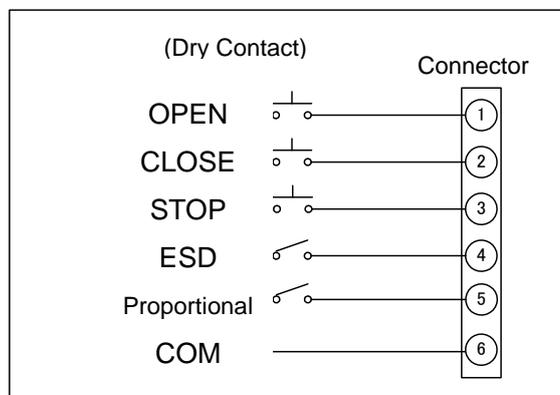


Fig : Semflex-A Wiring Diagram for reference



Selector switch

(a) OPEN, CLOSE, STOP Contacts:

- When OPEN contact is short-circuited (terminal No. ①—③—⑥), actuator works to open the valve.
- Movement stops at the position exceeding OPEN POSITION LIMIT or OPEN TORQUE LIMIT which has been set.
- When CLOSE contact is short-circuited (terminal No. ②—③—⑥), actuator works to close the valve.
- Movement stops at the position exceeding CLOSE POSITION LIMIT or CLOSE TORQUE LIMIT which has been set.
- Movement stops when Stop contact is opened (terminal No.③—⑥).

(b) Proportional control Contact:

- When Proportional control contact is short-circuited (terminal No. ③—⑤—⑥), 4 to 20mA proportional control becomes possible.
- During Proportional control (while signal is being transmitted), only Stop contact is valid.
- Proportional control is stopped only while Stop contact is open. When STOP contact is short-circuited again, it is reactivated and move toward targeted value.
- During Proportional control, intermediate stop positions are skipped, and actuator moves the valve up to set position.
*When set speed changes at intermediate positions, speed changes at these positions.
- During Proportional control, actuator stops in case of any error. Actuator reactivates automatically after the error has been cleared.
- Proportional contact is invalid during Emergency CLOSE movement.
- When actuator stops once during Proportional control, it is reactivated after set D-TIME (minimum 0.5 sec.) has passed. (Prevention of command chattering and valve hunting)

(c) Emergency CLOSE Contact:

- When Emergency close contact is short-circuited (terminal No. ③—④—⑥), the movement continues to close end limit.
- During Emergency closing, only Stop contact is valid.
- Emergency closing movement is stopped only while Stop contact is open. When Stop contact is short-circuited again, it is reactivated and move toward target position.
- During Emergency closing action, inntermidiate stop positions are skipped, and actuator moves the valve up to set position.
 - *When set speed change at intermediate positions, speed changes at these positions.
- During Emergency closing movement, actuator stops in case of any error. Actuator reactivates automatically after the error has been cleared.
- Emergency close contact is invalid during Proportional control is active.

(2) Options for Other Contacts

- * It is possible to select with or without self-holding function for OPEN/CLOSE contacts.
 - With self-holding, movement continues even if contact is released.
 - Without self-holding, movement stops when contact is released.
- * Self-holding function is not available for Proportional control and Emergency close. Possible to use self-holding when contact is short-circuited.
- * 30 ms dead time is set for contact signals. Contacts can be used if imput command signal is more than 30ms.
- * No matter with or without self-holding, if Proportional control or Emergency close contact is short-circuited during opening or closing movement, priority is given to Proportional control or forced close, and opening/closing action stops. Even if Proportional control or Emergency close contact is opened after it was once short-circuited, actuator does not automatically restart opening or closing.
 - To restart OPEN/CLOSE, Open or Close contact must be short-circuited again.

※Operation Priority

Stop contact > Emergency close contact > Proportional control contact > Open/Close contact

●User-specific Settings

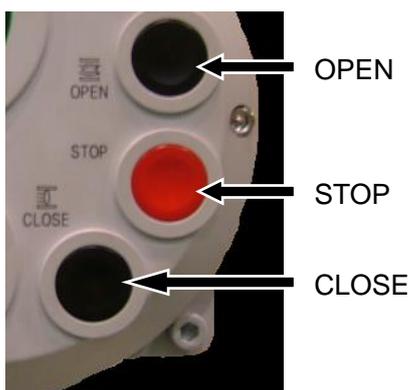
(1) How to Start User-specific Setting Mode

1) Turn Selector switch to OFF.

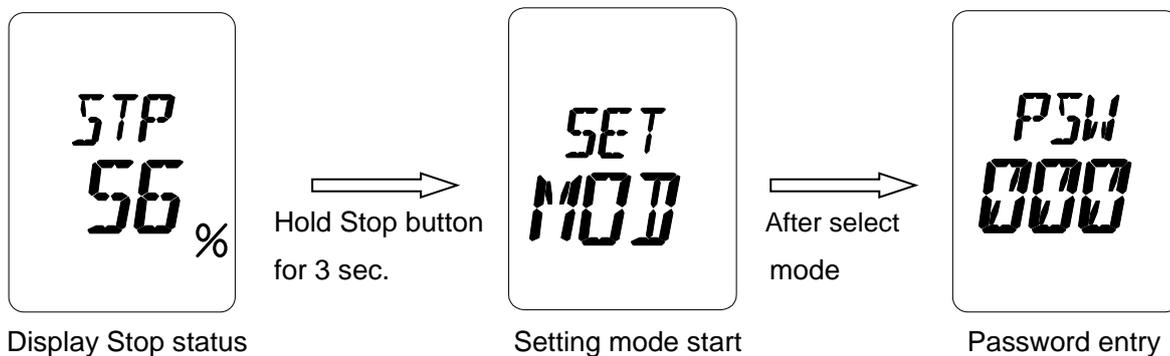


Selector switch

2) Hold STOP button for 3 seconds. Setting Mode Start screen is shown on the display and then changed to Password Entry screen.



Push buttons



(2) Password Entry Operation *Initially password is set to 000 (three zeros).

[1] Input 1st (left) digit.

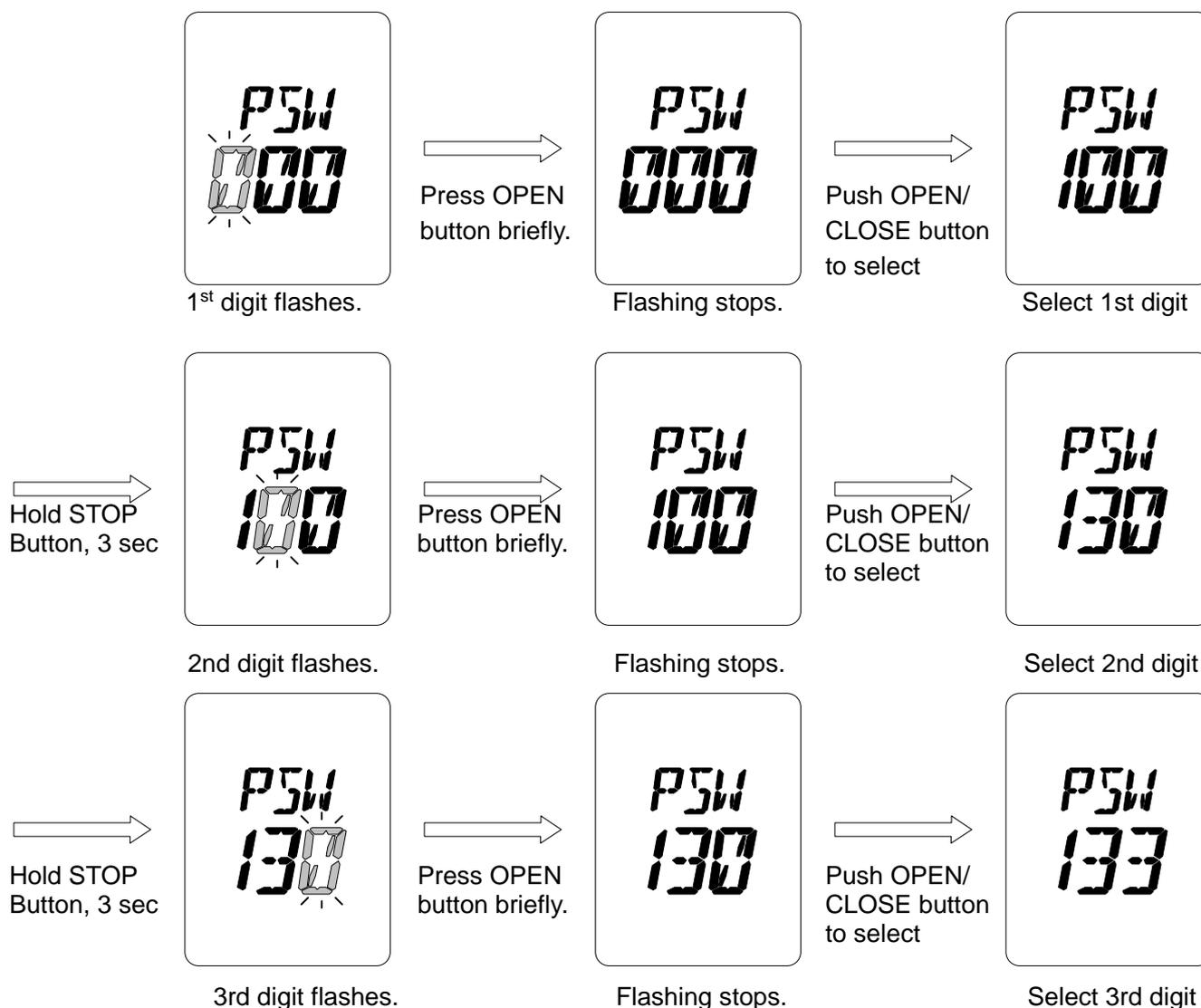
- 1) While left digit is flashing, press OPEN button briefly.
- 2) When flashing has stopped, choose a number by using OPEN and CLOSE buttons. Then hold STOP button for 3 seconds.
- 3) When 1st digit input is completed, 2nd digit start flashing to proceed to second digit input.

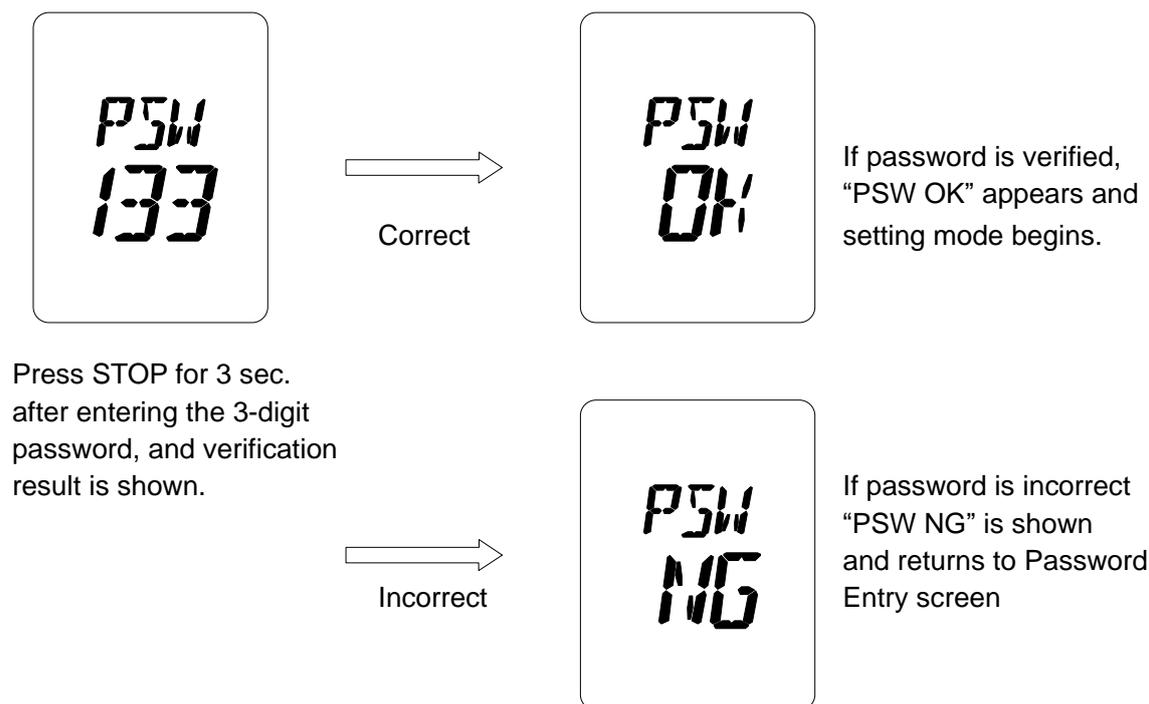
[2] Input 2nd (center) digit.

- 1) While center digit is flashing, press OPEN button briefly.
- 2) When flashing has stopped, choose a number by using OPEN and CLOSE buttons. Then hold STOP button for 3 seconds.
- 3) When 2nd digit input is completed, 3rd digit start flashing to proceed to third digit input.

[3] Input 3rd (right) digit.

- 1) While right digit is flashing, press OPEN button briefly.
- 2) When flashing has stopped, choose a number by using OPEN and CLOSE buttons. Then hold STOP button for 3 seconds.
- 3) When 3rd digit input is completed and entered password is verified, Setting Mode begins.





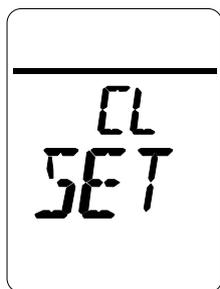
(Password entry operation)

- i) Characters for input can be chosen from 36 alphanumeric characters (0 to 9 and A to Z).
- ii) Input password of flashing digit.
- iii) When OPEN or CLOSE buttons are pressed while digit is flashing, the flashing stops.
- iv) Inputting character can be changed by pressing OPEN button (value changes in ascending order from 0 to 9 and from A to Z) and CLOSE button (value changes in descending order from 9 to 0 and from Z to A).
- v) Setting of that digit completes when STOP button is held for 3 seconds, and shifting to next digit.
*While character is flashing, inputting is NOT completed.
- vi) When 3-digit password is entered and verified, "PSW OK" is shown, and screen changes to Setting Mode screen (refer to page 22). If entered password is incorrect, "PSW NG" appears, and screen returns to Password Entry screen.
- vii) To change password later on, refer to "How to Set Password" on page 25.

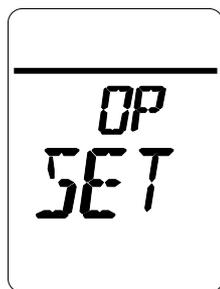
3) User-specific Setting Mode Item List

Item	Setting contents	Page
CL	Fully Closed Position	20
OP	Fully Open Position	20
OPH	Emergency Upper Limit	21
PUL	Proportional Control Upper Position Limit	22
HF	Intermediate Position	23
CLT	Closing Torque	24
OPT	Opening Torque	25
ROT	Motor Rotating Direction	26
PTM	D-TIME (Reverse holding time)	27
SWM	LOCAL Self-holding	28
	REMOTE Self-holding	28
RY	Relay Output	29
DSP	LCD Indication	31
PER	Position Indication	32
SPD	Speed	34
CSP	Closing Speed Modulation	35
OSP	Opening Speed Modulation	36
SL	Range and Speed Before Reaching Target Value Speed	37
CLM	Closing Torque Seat / Position Seat	38
OLM	Opening Torque Seat / Position Seat	38
TRC	Torque Retry	39
TRM	Torque Retry Pause Time	40
DAZ	Output ZERO (*with 4-20mA output)	41
DAS	Output SPAN (*with 4-20mA output)	41
OUT	Position Output Current Value Inversion	42
DEF	Set D-ZONE	43
PZR	Input ZERO (*with Proportional control)	44
PSN	Input SPAN (*with Proportional control)	44
PRE	Action at Proportional Control Threshold (with Proportional control)	45
SRF	Surf Drive	46
RES	STOP Contact	47
PLY	Position Limit Not-Reach Alarm	48
PLL	Position Limit Lost Alarm	49
PSW	Password	50

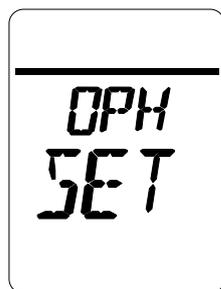
- Setting screen changes in the order shown below by pushing OPEN button.
Setting screen changes in the reverse order by pushing CLOSE button.



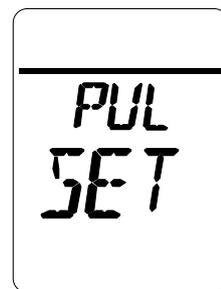
Full-Close Position



Full-Open Position



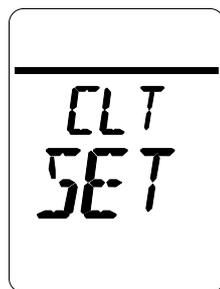
Emergency Upper Limit



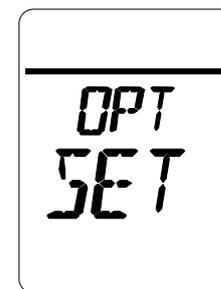
Proportional Control
Upper Position Limit



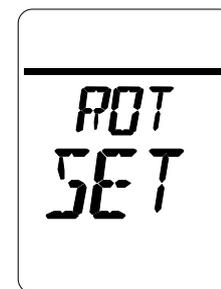
Intermediate Position



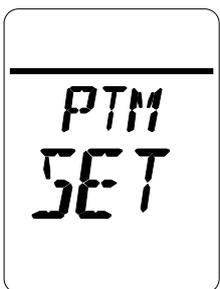
Closing Torque



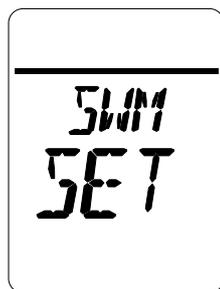
Opening Torque



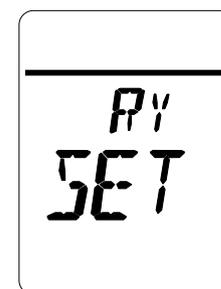
Motor Rotating Direction



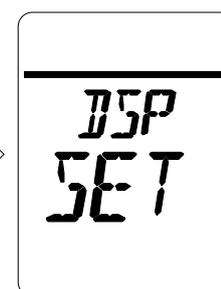
D-Time



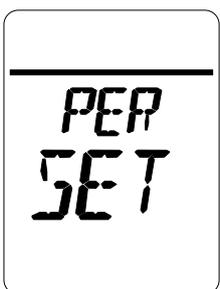
OPEN/CLOSE Self-holding



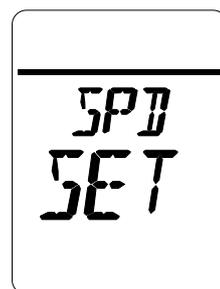
Relay Output



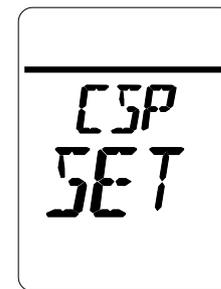
LCD Indication



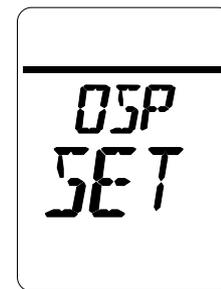
Position Indication



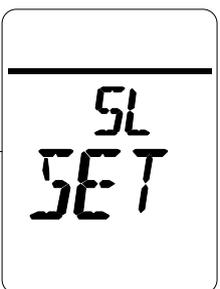
Speed



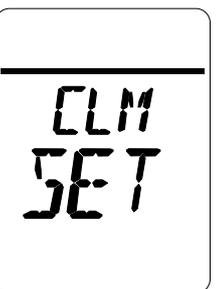
Closing Speed Modulation



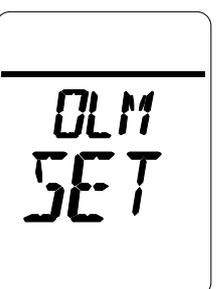
Opening Speed Modulation



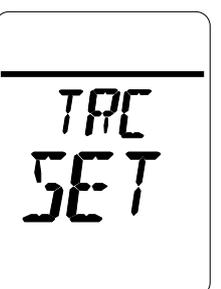
Range and Speed Before
Reaching Target Value speed



Closing Torque /
Position Seat



Opening Torque /
Position Seat



Number of Torque Retry



(4) User-specific Setting Mode

- User-specific setting mode is provided to allow setting or adjusting functions, not related to basic performance of the actuator.
- During setting mode, a bar line “ ————— ” is shown on the upper part of display.
- If selector switch (knob) is turned to LOCAL or REMOTE during setting mode, setting mode ends.
- If no operation is performed for 5 min. or more during setting mode, setting mode automatically ends.
- Data is not saved if setting is not completed before setting mode ends.

(5) User-specific Setting Operation

How to Set Fully Closed Position

- Hold STOP button for 3 sec. on Fully closed Position Setting screen (Display shows “CL SET”) to start.

[How to set]

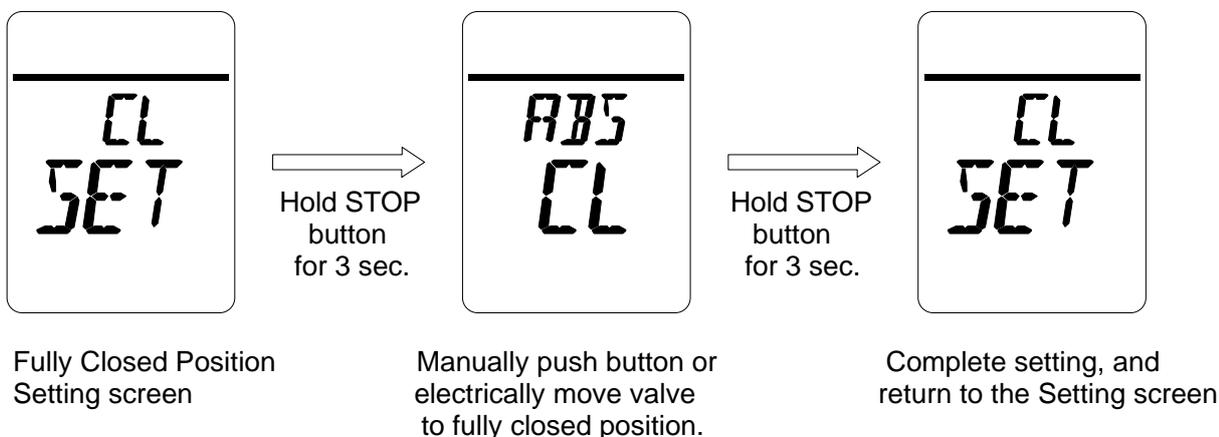
Move valve to fully closed position by motor drive or manual operation on Fully Close Position Setting Mode screen (Display shows “ABS CL”). Then, hold STOP button for 3 sec. to complete setting.

Press OPEN button : Motor rotates to forward direction (When select “REV”, rotates to reverse direction.)

Press CLOSE button : Motor rotates to reverse direction (When select “REV”, rotates to forward direction.)

Press STOP button briefly : Motor stops.

Hold STOP button for 3 seconds : Save the Fully Closed position.

**How to Set Fully Open Position**

- Hold STOP button for 3 sec. on Fully open Position Setting screen (Display shows “OP SET”) to start.

[How to set]

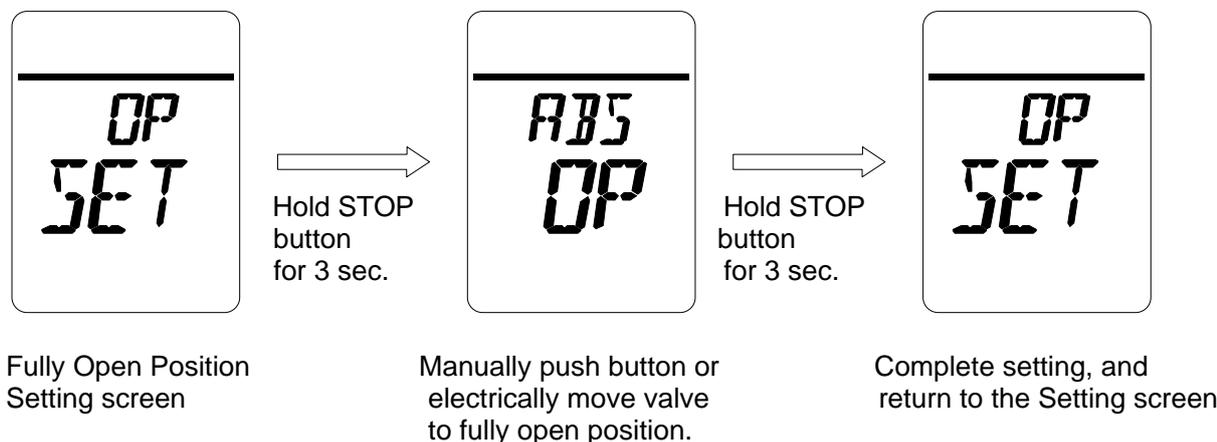
Move valve to fully open position by motor drive or manually push button on Fully Open Position Setting Mode screen (Display shows “ABS OP”). Then, hold STOP button for 3 sec. to complete setting.

Press OPEN button : Motor rotates to forward direction (When select “REV”, rotates to reverse direction.)

Press CLOSE button : Motor rotates to reverse direction (When select “REV”, rotates to forward direction.)

Press STOP button briefly : Motor stops.

Hold STOP button for 3 seconds : Save the Fully Open position.



How to Set Emergency Upper Limit

-Hold STOP button for 3 sec. on Emergency Upper Limit Setting screen (Display shows "OPH SET") to start.

[Setting Operation]

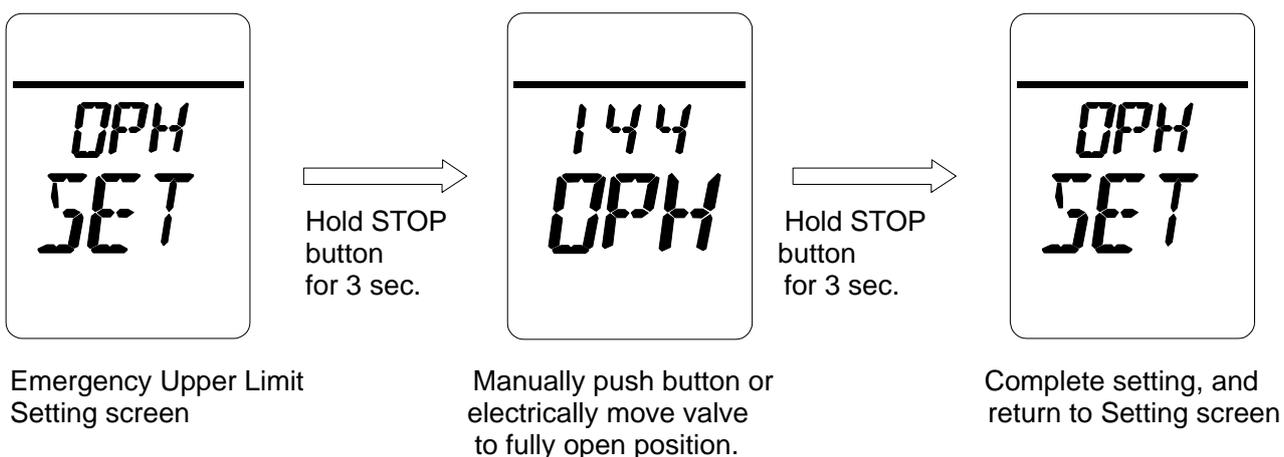
Move valve to full-open position by motor drive or manually push button on Emergency Upper Limit Setting Setting Mode (Display shows "xxx OPH"), and hold STOP button for 3 sec. to complete setting.

Press OPEN button : Motor rotates to forward direction (When select "REV", rotates to reverse direction.)

Press CLOSE button : Motor rotates to reverse direction (When select "REV", rotates to forward direction.)

Press STOP button briefly : Motor stops.

Hold STOP button for 3 seconds : Save the set Upper Limit



How to Set Proportional Control Upper Position Limit

-Hold STOP button for 3 seconds on Proportional Control Upper Position Limit Setting screen (LCD shows "PUL SET") to start.

[Proportional Control Upper Position Limit value settings]

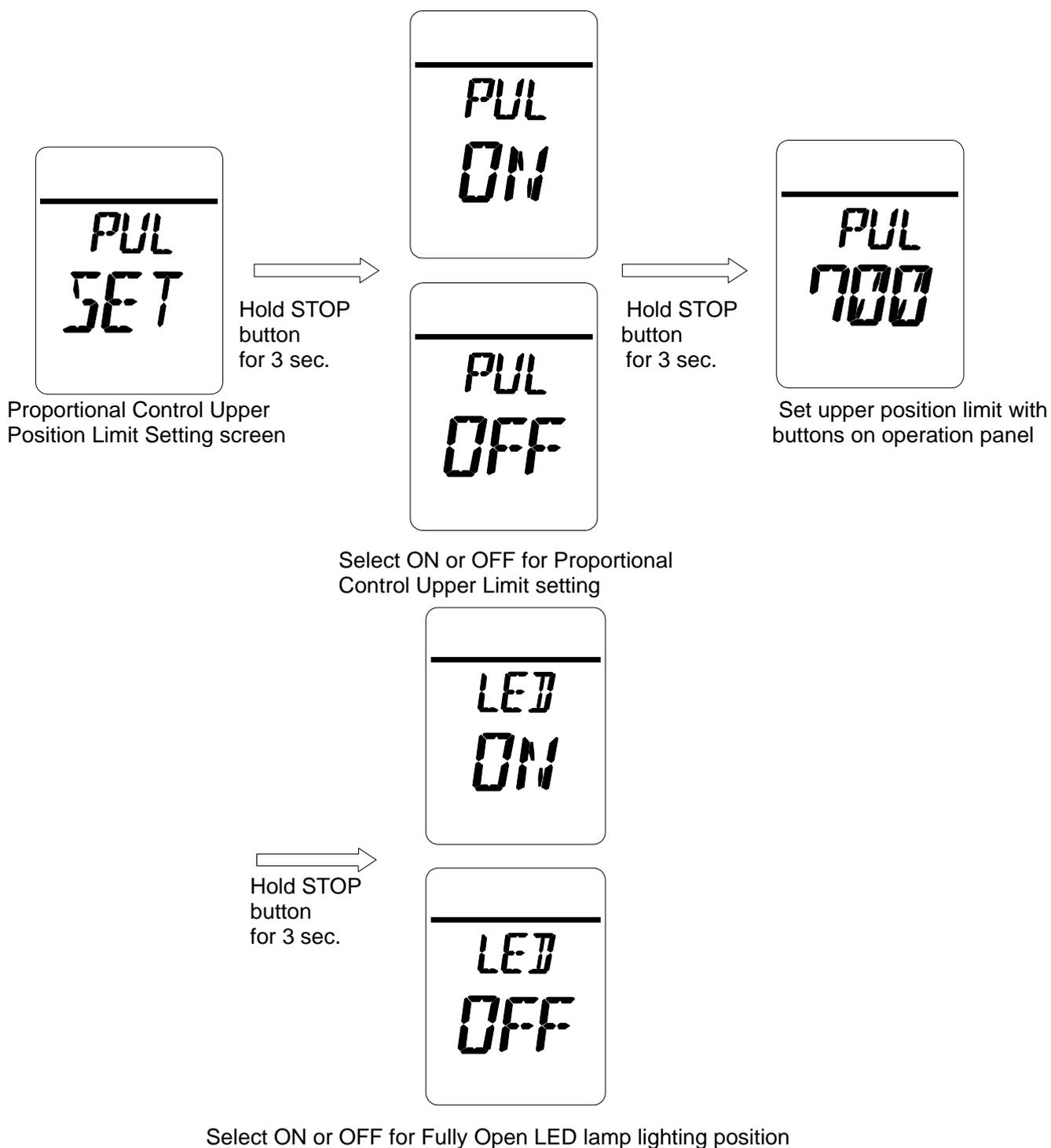
Set value =400 to 999, Full : Set proportional control upper position limit (40.0 to 99.9, FUL=100%) .

[Setting operation]

*Select ON or OFF for Proportional control upper position limit setting (LCD shows "PUL ON/OFF.")

*Input value of upper position limit to be set by OPEN / CLOSE buttons on operation panel (LCD shows "PUL xxx"), and hold STOP button on operation panel for 3 seconds.

*Then, select ON or OFF for Fully Open LED lamp lighting position (ON=light at set upper limit and flash at 100% open, OFF=light at 100% open.)



How to Set Intermediate Position

- Hold STOP button for 3 sec. on Intermediate Position Setting screen (Display shows “HF SET”) to start.

[About Pause time set]

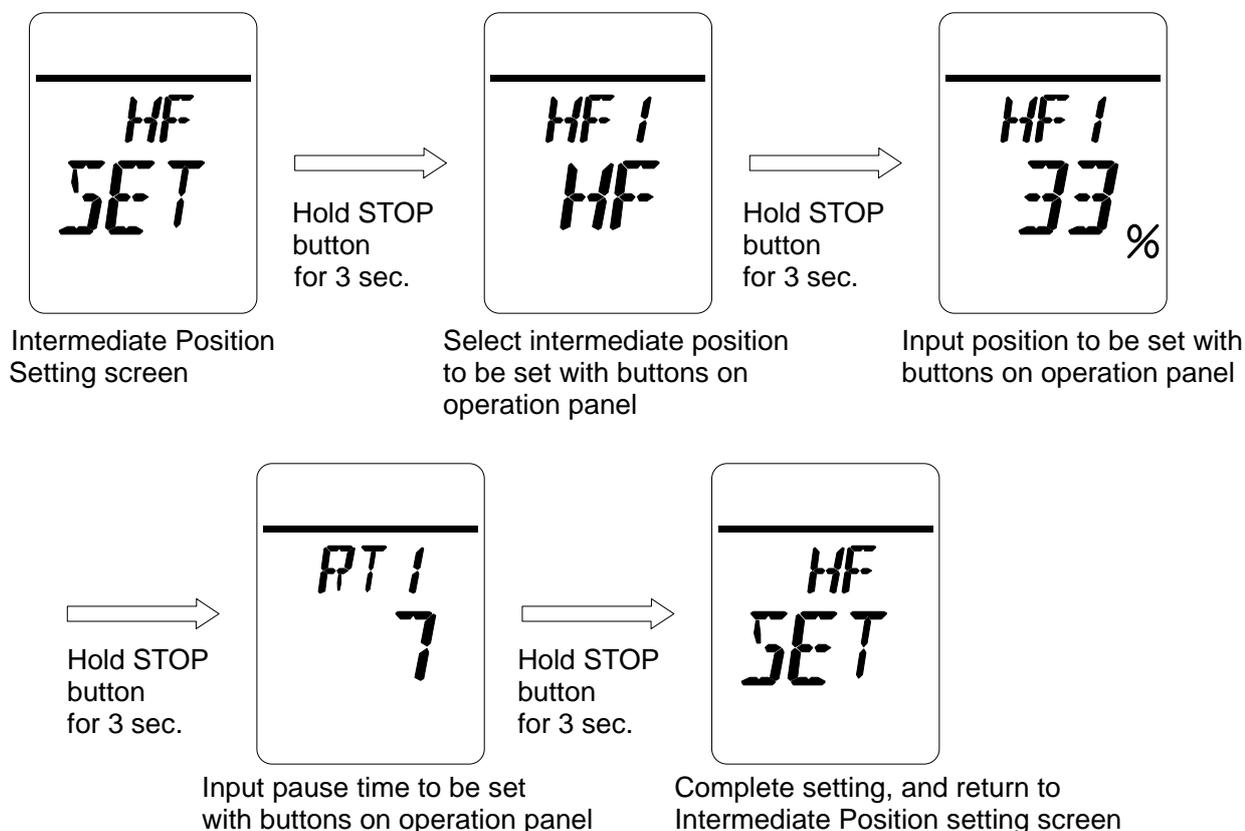
- Set value = 0 : Only speed changes without pausing at the set intermediate position
- Set value = 1~20 : Pauses for set time (1 to 20 sec.) at set intermediate position.
Thereafter automatically restarts to same direction before pausing.
- Set value = 21 : Stop at set intermediate position. Does not restart until inputing next signal.

[Setting procedure]

- 1) Select setting intermediate position from 1 to 5 (HF 1 to 5) on Intermediate Position Setting Mode screen (LCD shows : “HF# HF”) and hold STOP button for 3 seconds.
- 2) The intermediate Position Opening Setting screen (LCD shows: “HF# xx%”) is displayed.
- 3) Select intermediate opening position (0 to 100%) on Opening Setting screen and hold STOP button for 3 seconds.
- 4) Intermediate Position Pause Time Setting screen (LCD shows: “RT# xx”) is displayed.
- 5) Set pause time (0 to 21 sec.) on Pause Time Setting screen, and hold STOP button for 3 seconds to complete the setting procedure.

[Setting operation]

- Press OPEN button : Select numerical value in ascending order from 0 to 9.
(Value increases in high speed by holding the button.)
- Press CLOSE button : Select numerical value in descending order from 9 to 0.
(Value decreases in high speed by holding the button.)
- Hold STOP button for 3 seconds : Saves the set value.



How to Set Closing Torque

-Hold STOP button for 3 seconds on Closing Torque Setting screen (LCD shows "CLT SET") to start.

[Closing torque set value] *If Max. torque value exceeds 3 digits, the first three numbers are shown.

Setting range = Any value within the range of Min. torque value [Nm] to Max. torque value [Nm] can be set.

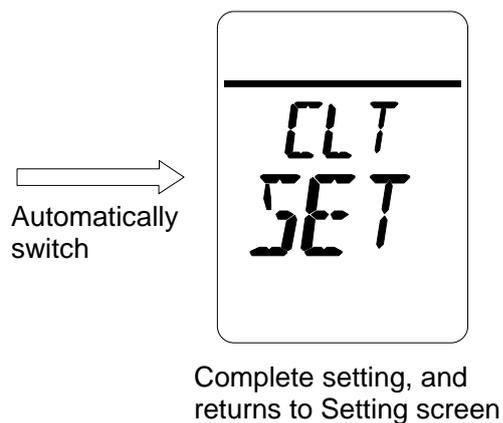
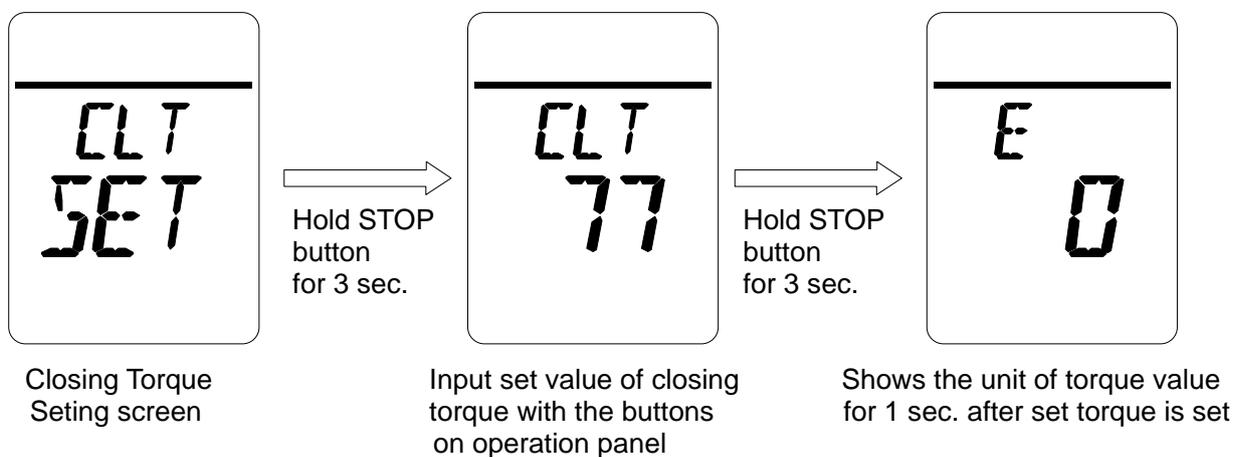
[Setting operation]

Input set value of closing torque by using OPEN / CLOSE buttons of operation panel on Closing Torque Setting Mode screen (LCD shows: "CLT xx"). Then, hold STOP button for 3 seconds to complete the setting.

Press OPEN button : Select numerical value in ascending order from 0 to 9.
(Value increases in high speed while the button is hold.)

Press CLOSE button : Select numerical value in descending order from 9 to 0.
(Value decreases in high speed while the button is hold.)

Hold STOP button for 3 seconds : Saves the set value.



*Unit of torque value

E0 : Set torque value x 1

E1 : Set torque value x 10

E2 : Set torque value x 100

How to Set Opening Torque

-Hold STOP button for 3 seconds on Opening Torque Setting screen (LCD shows "OPT SET") to start.

[Opening torque set value] * If Max. torque value exceeds 3 digits, the first three numbers are shown.

Setting range = Any value within the range of Min. torque value [Nm] to Max. torque value [Nm] can be set.

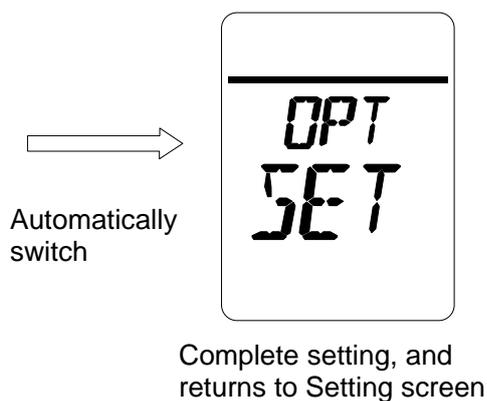
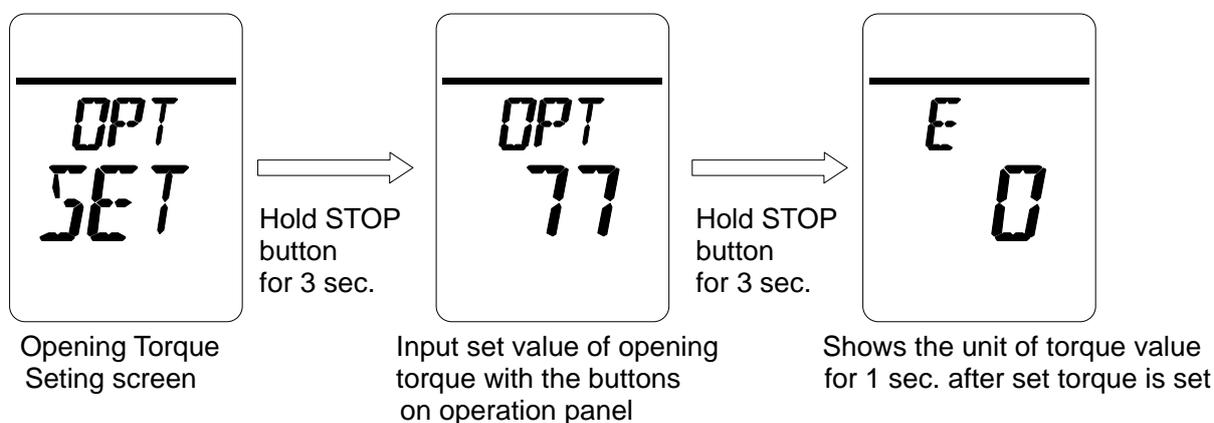
[Setting operation]

Input set value of closing torque by using OPEN / CLOSE buttons of operation panel on Closing Torque Setting Mode screen (LCD shows: "OPTxx"). Then, hold STOP button for 3 seconds to complete the setting.

Press OPEN button : Changes numerical value in ascending order from 0 to 9.
(Value increases in high speed while the button is hold.)

Press CLOSE button : Changes numerical value in descending order from 9 to 0.
(Value decreases in high speed while the button is hold.)

Hold STOP button for 3 seconds: Saves the set value.



*Unit of torque value

E0 : Set torque value x 1

E1 : Set torque value x 10

E2 : Set torque value x 100

How to Set Motor Rotating Direction

-Hold STOP button for 3 seconds on Motor Rotating Direction Setting screen (LCD shows "ROT SET") to start.

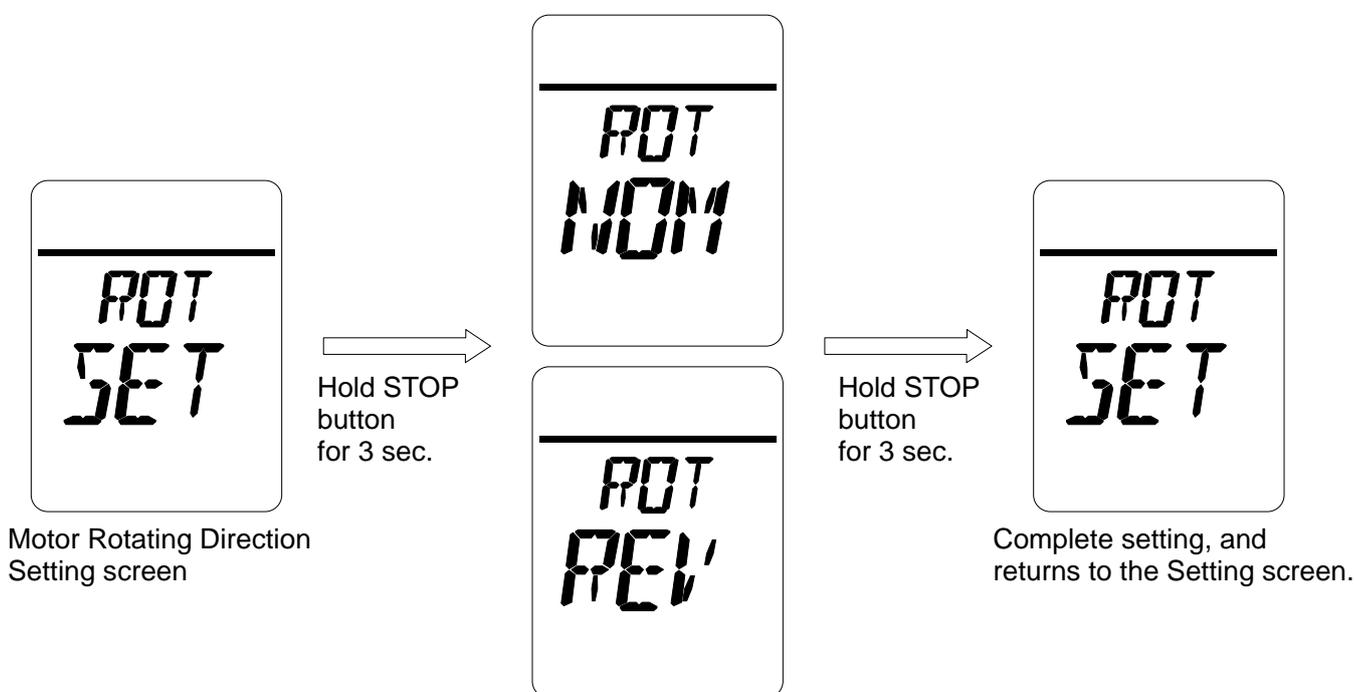
[Motor rotating direction settings]

- i) NOM : Rotates output shaft clockwise close
 - ii) REV : Rotates output shaft clockwise open (counter clockwise)
- *Above settings may not apply if any optional specification like using gear box.

[Setting operation]

Select motor rotating directions by pressing OPEN / CLOSE buttons on operation panel on Motor Rotating Direction Setting Mode screen (LCD shows: "ROT xxx"). Then, hold STOP button on operation panel for 3 seconds to complete the setting operation.

Press OPEN / CLOSE button : Select NOM or REV
 Hold STOP button for 3 seconds: Saves set direction



Select alphabet to set motor rotating direction with the buttons on operation panel.

『How to Set D-TIME

-Hold STOP button for 3 seconds on D-TIME Setting screen (LCD shows “PTM SET”) to start.

[D-TIME set value]

Set value = 5 to 20: Set time to receive Proportional control signal within the range of 0.5 to 2.0 [sec].

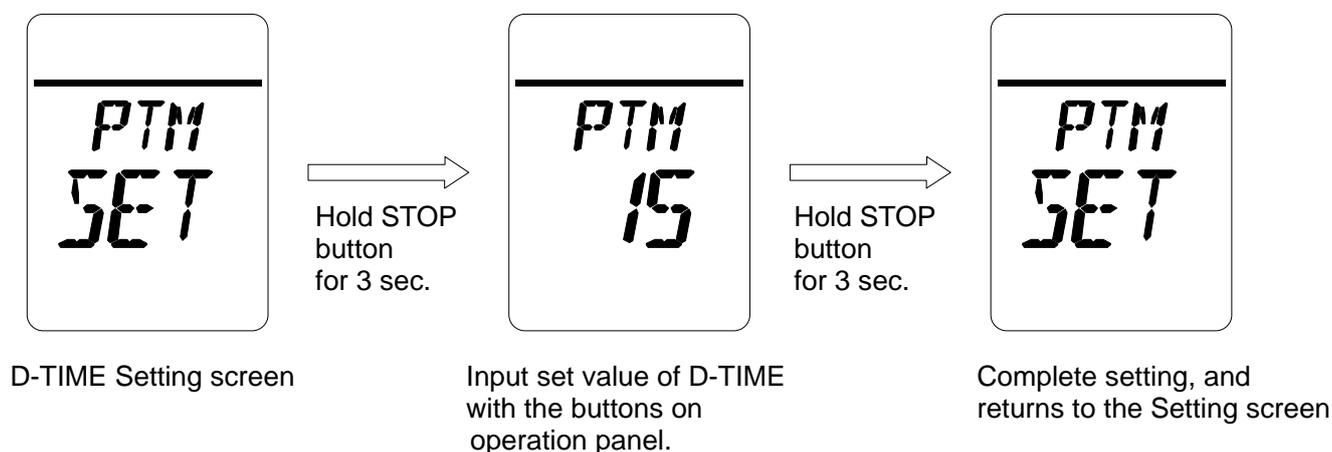
[Setting operation]

Input set value of D-TIME by using OPEN / CLOSE buttons on operation panel on D-TIME Setting Mode screen (LCD shows: “PTM xxx”). Then, hold STOP button for 3 seconds to complete the setting operation.

Press OPEN button : Select numerical value in ascending order from 0 to 9.
(Value increases in high speed while the button is hold.)

Press CLOSE button : Select numerical value in descending order from 9 to 0.
(Value decreases in high speed while the button is hold.)

Hold STOP button for 3 seconds: Saves set value.



How to Set OPEN/CLOSE Operation Self-holding

-Hold STOP button for 3 seconds on OPEN/CLOSE Self-holding Setting screen (LCD shows "SWM SET") to start.

[OPEN/CLOSE self-holding settings]

- i) HLD : With self-holding for OPEN/CLOSE
- ii) NOM : Without self-holding for OPEN/CLOSE

[Setting operation]

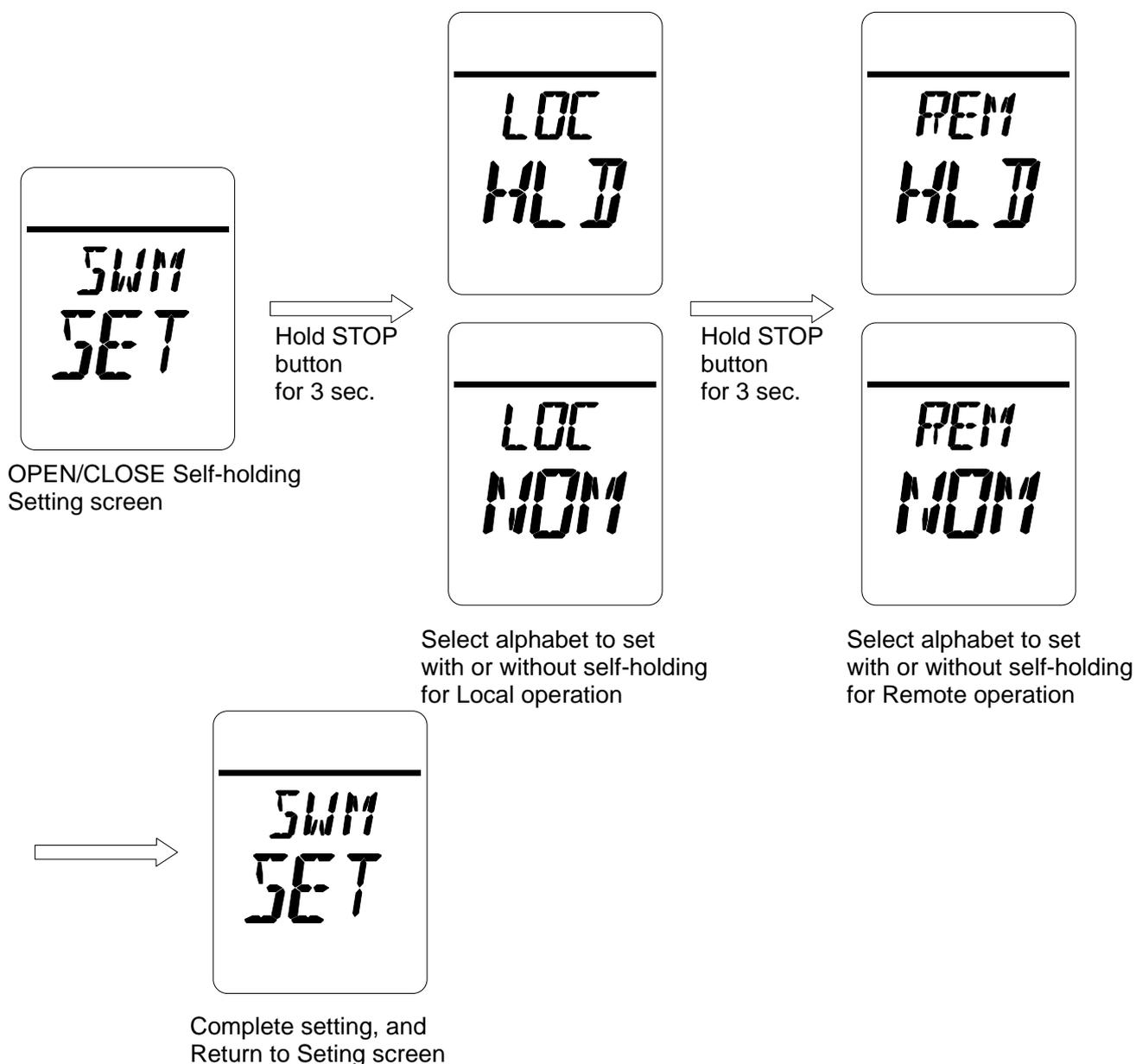
*Select HLD or NOM to set OPEN/CLOSE self-holding for LOCAL operation by using OPEN / CLOSE buttons on operation panel on OPEN/CLOSE Self-holding Setting Mode screen (LCD shows: "LOC xxx").

*Select HLD or NOM to set OPEN/CLOSE self-holding for REMOTE operation by using OPEN / CLOSE buttons on operation panel on OPEN/CLOSE Self-holding Setting Mode screen (LCD shows: "REM xxx").

*Then, hold STOP button on operation panel for 3 seconds to complete the setting operation.

Press OPEN / CLOSE button : Select HLD or NOM.

Hold STOP button for 3 seconds : Save the set value.



How to Set Relay Output

-Hold STOP button for 3 seconds on Relay Output Setting screen (LCD shows "RY SET") to start.

[Relays to be set]

- i) RY1: Change setting of relay 1. (Initial value = ERR)
- ii) RY2: Change setting of relay 2. (Initial value = OP)
- iii) RY3: Change setting of relay 3. (Initial value = CL)
- iv) RY4: Change setting of relay 4. (Initial value = CPT)
- v) RY5: Change setting of relay 5. (Initial value = CLT)

[Setting procedure]

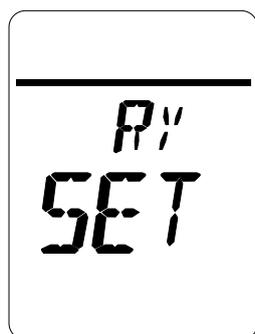
- 1) Select a relay number from RY1 to RY5 to be set on Relay Output Setting Mode screen (LCD shows "xxx RY"). Then, hold STOP button for 3 seconds.
- 2) Currently set value (LCD shows "RY# xxx") of selected relay is shown.
- 3) Select function to be set on screen, and hold STOP button for 3 seconds to complete the setting procedure.

[Setting operation]

Press OPEN button : Select relay from RY1 to RY5, and function from ERR to CPU as in below table.
 Press CLOSE button : Select relay from RY5 to RY1, and function from CPU to ERR as in below table.
 Hold STOP button for 3 seconds: Saves the set value.

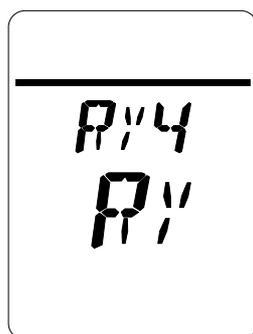
[Relay Output Setting Items]

1) ERR:	Error occurred	10) CLT:	Close direction Torque Limit
2) OP:	Fully Open Position Limit	11) MVO:	Under opening operation
3) CL:	Fully Closed Position Limit	12) MVC:	Under closing operation
4) HF1	Intermediate Position Limit 1	13) REM:	REMOTE selected
5) HF2:	Intermediate Position Limit 2	14) LOC:	LOCAL selected
6) HF3:	Intermediate Position Limit 3	15) THM:	Motor overheating
7) HF4:	Intermediate Position Limit 4	16) INT:	Interlocked
8) HF5:	Intermediate Position Limit 5	17) PRP:	Under PROPORTION
9) OPT:	Open direction Torque Limit	18) CPU:	CPU RUN



Relay Output Setting screen

Hold STOP button for 3 sec.

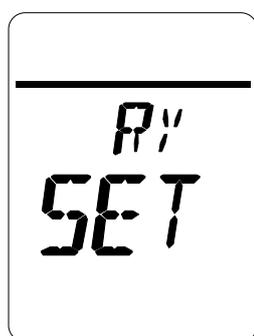


Select relay number (RY1 to RY5) with buttons on operation panel.

Hold STOP button for 3 sec.



Select setting items with buttons on operation panel



Complete setting, and, return to the Setting screen.

How to Set LCD Indication

-Hold STOP button for 3 seconds on LCD Indication Setting screen (LCD shows “DSP SET”) to start.

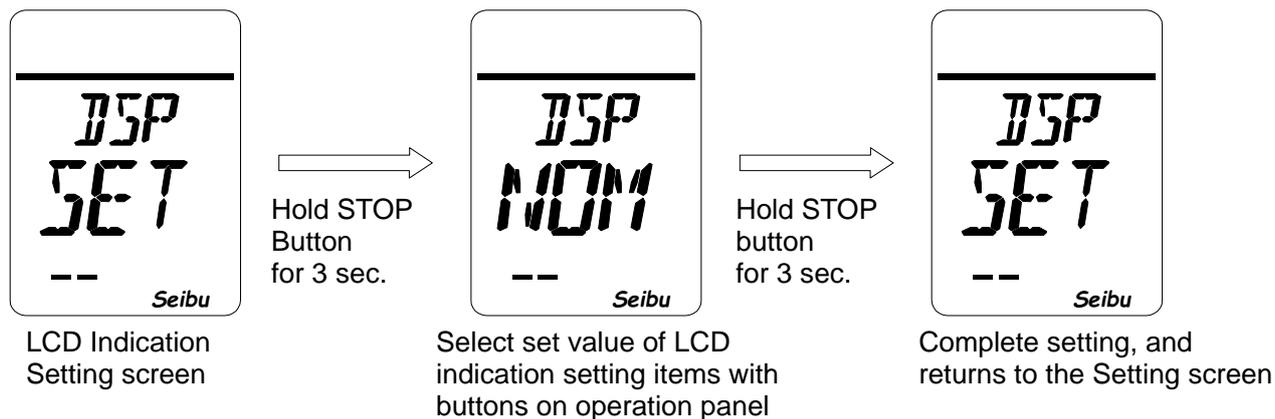
[Setting operation]

Select setting item on the LCD by using OPEN / CLOSE buttons on operation panel on LCD Indication Setting Mode screen (LCD shows “DSP xxx”). Then, hold STOP button for 3 seconds to complete the setting operation.

Press OPEN button : Select items in order from NOM to MNT as shown in setting items below.

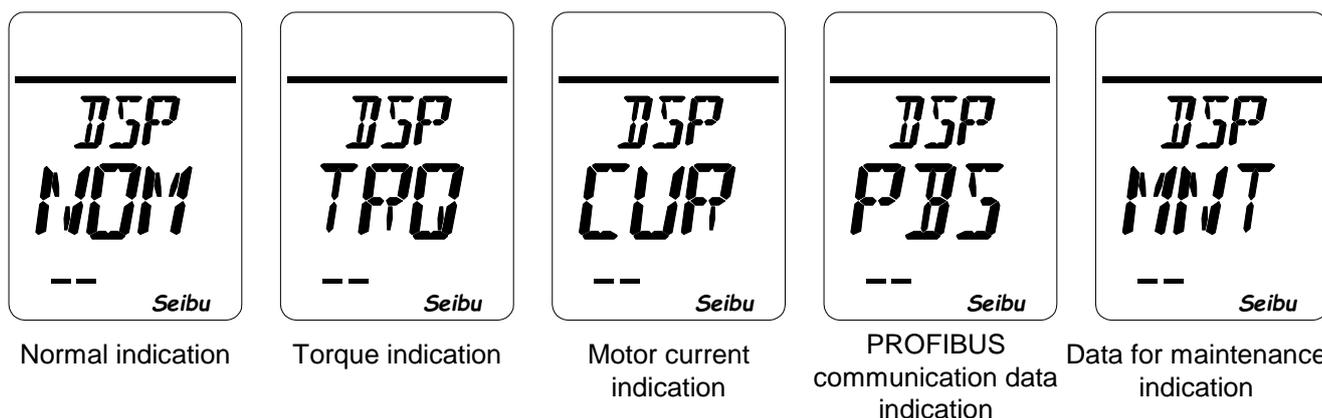
Press CLOSE button : Select items in order from MNT to NOM as shown in setting items below.

Hold STOP button for 3 seconds: Saves the set value.



[LCD indication setting items]

- 1) NOM: Display action status on the upper part of LCD.
- 2) TRQ: Display torque value on the upper part of LCD.
- 3) CUR: Display electric current of motor on the upper part of LCD.
- 4) PBS: Display data of communication with PROFI-CARD (when use Profibus.)
- 5) MNT: Display data for maintenance.



How to Set Position Indication

-Hold STOP button for 3 seconds on Position Indication Setting screen (LCD shows "PER SET") to start.

[Opening indication settings]

- 1) ON: Indicate position by percentage in the range of 0 to 100%.
- 2) OFF: Indicate position by any set value

Example: 1) 0 to 400 mm → Input value: 400

2) 0 to 90 degrees → Input value: 90

*Select unit (No unit, degree, m, mm, %)

[Setting procedure]

- 1) Select Position indication setting (either ON or OFF) on Position Indication Setting Mode screen (LCD shows: "PER xxx"), and hold STOP button for 3 seconds.
- 2) When OFF is selected on Position Indication Setting Mode screen, current set value of position indication (LCD shows "SET xxx") is shown.
- 3) Select set value of Position indication on Setting screen. Then, hold STOP button for 3 seconds to complete the setting procedure.

[Setting operation]

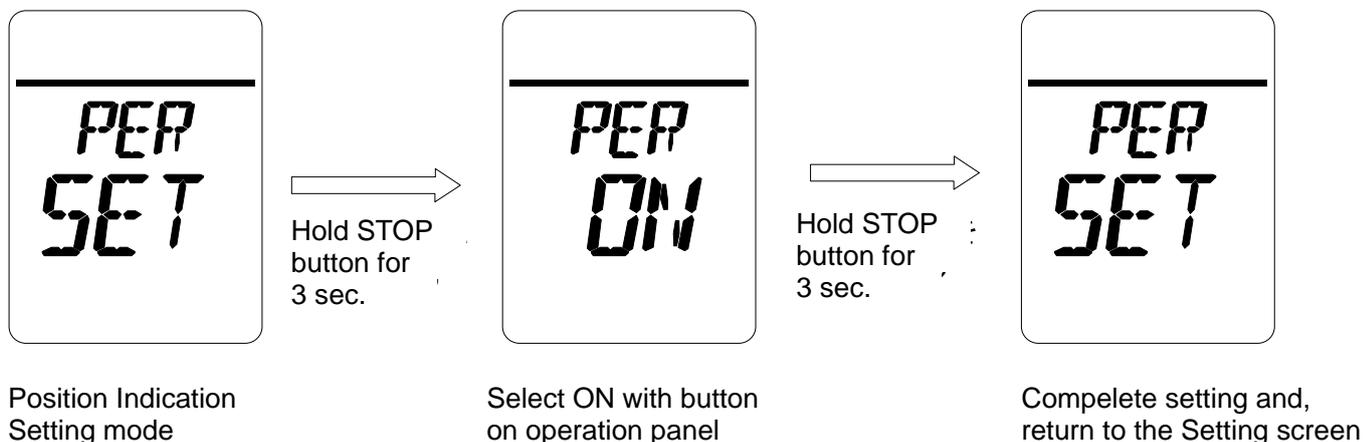
Input value of position indication by using OPEN / CLOSE buttons on operation panel on Position Indication Setting Mode screen (LCD shows "PER xxx"). Then, hold STOP button on operation panel for 3 seconds to complete the setting operation.

Press OPEN button: Select numerical value in ascending order from 0 to 9.

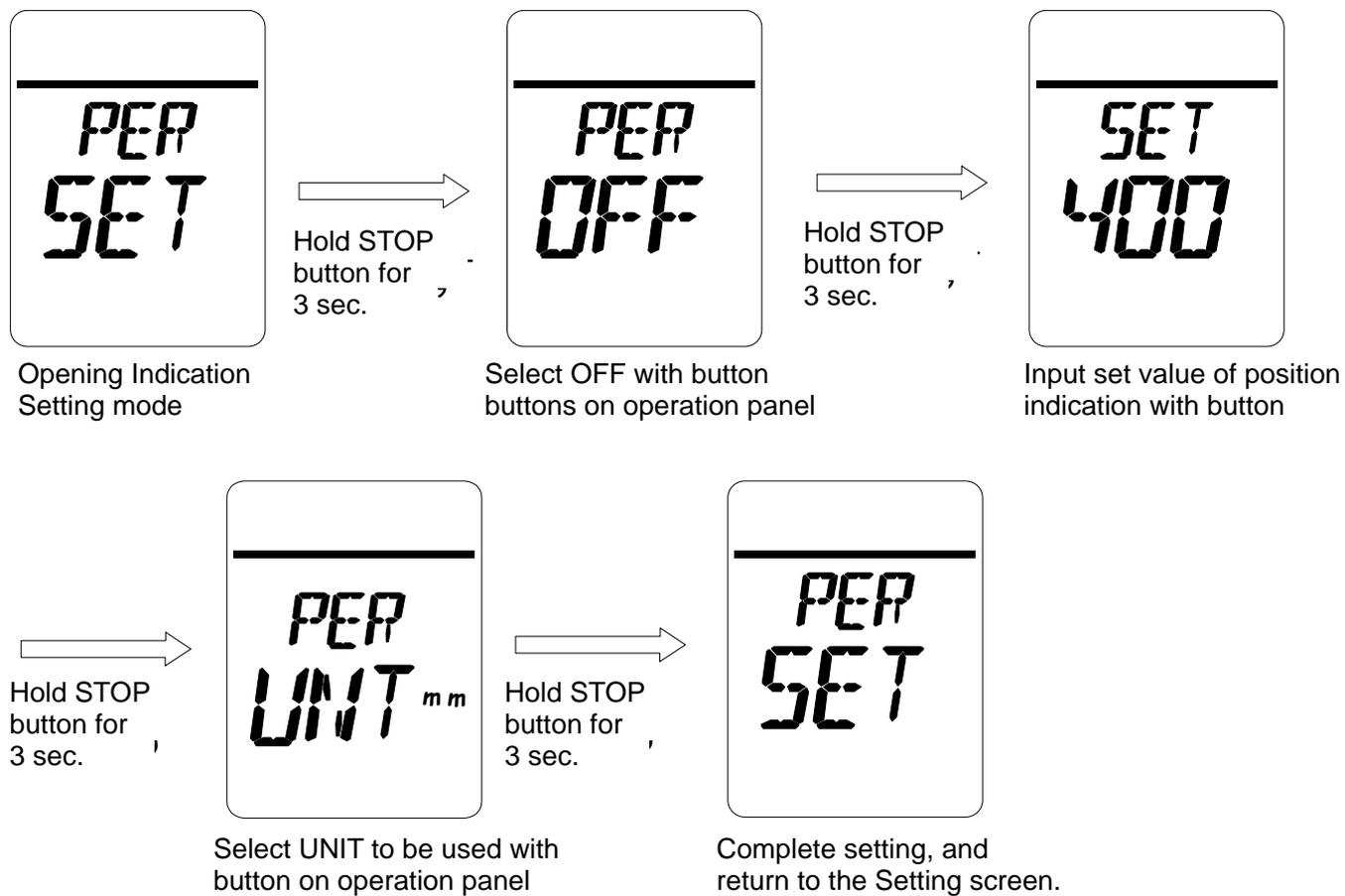
Press CLOSE button: Select numerical value in descending order from 9 to 0.

Hold STOP button for 3 seconds: Saves the set value.

- When ON is selected for Position Indication setting.



- When OFF is selected for Position Indication setting.



How to Set Speed

-Hold STOP button for 3 seconds on INV Speed Setting screen (LCD shows "SPD SET") to start.

[Speed set value]

SP1	: Speed 1	(Initial value = 3000min ⁻¹)
SP2	: Speed 2	(Initial value = 3000min ⁻¹)
SP3	: Speed 3	(Initial value = 3000min ⁻¹)
SP4	: Speed 4	(Initial value = 3000min ⁻¹)
SP5	: Speed 5	(Initial value = 3000min ⁻¹)
SP6	: Speed 6	(Initial value = 3000min ⁻¹)
SP7	: Speed 7	(Initial value = 3000min ⁻¹)

**Set value is motor rotation speed (Unit: $\times 10\text{min}^{-1}$)

Actuator output rotation speed is converted by multiplying the value on LCD by 0.02.

[Setting procedure]

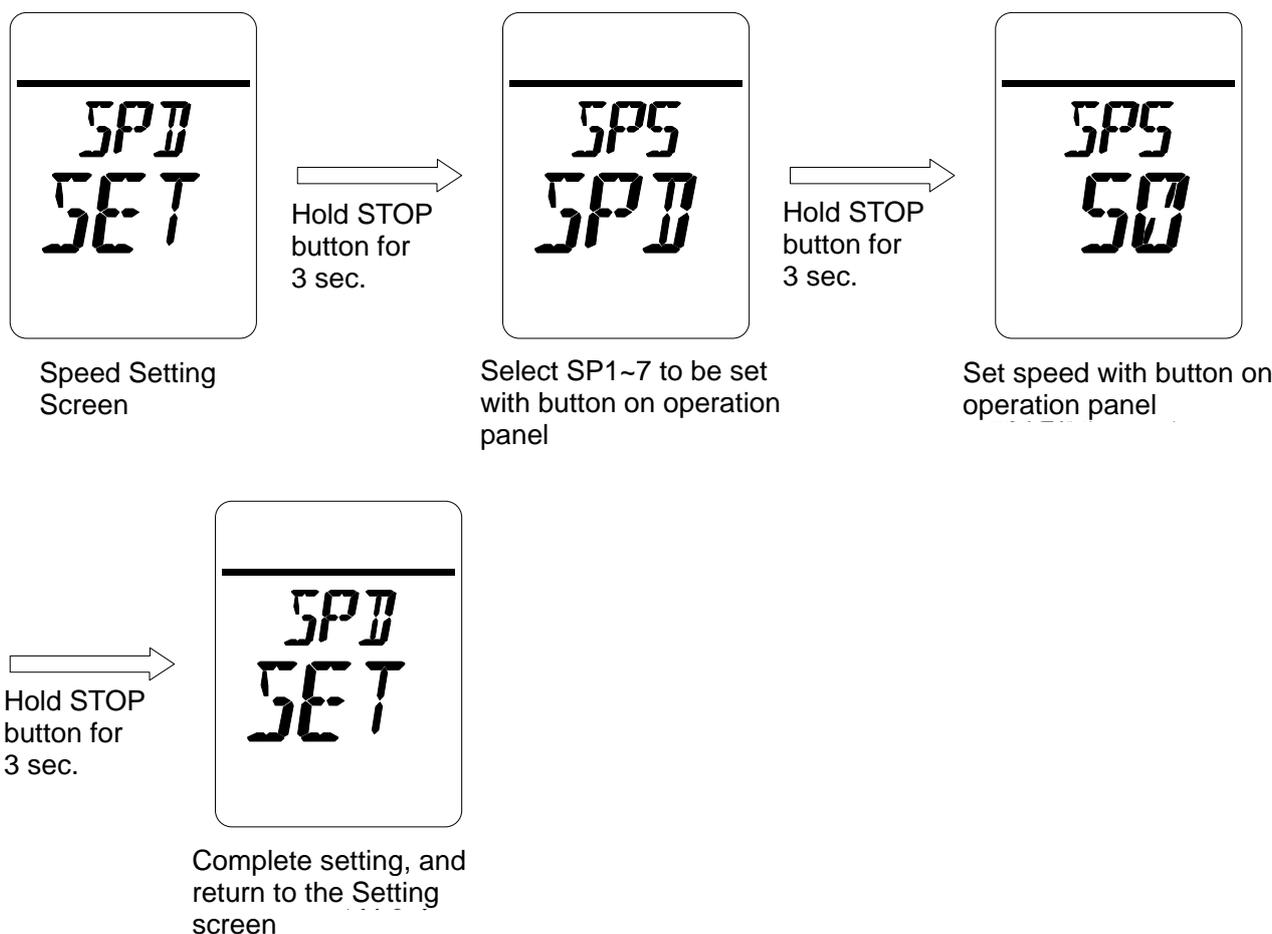
- 1) Select speed to be set from 1 to 7 (SP1 to 7) on INV Speed Setting Mode screen (LCD shows "SP# SPD"). Then, hold STOP button for 3 seconds.
- 2) Speed Setting screen (LCD shows "SP# xx") is shown on LCD.
- 3) Select speed (5~500 [$\times 10\text{min}^{-1}$]) on Speed Setting screen, and hold STOP button for 3 seconds to complete the setting procedure.

[Setting operation]

Press OPEN button : Select by ascending order from 0 to 9 and from SP1 to SP7.

Press CLOSE button : Select by descending order from 9 to 0 and from SP7 to SP1.

Hold STOP button for 3 seconds: Saves the set value.



How to Set Closing Speed Modulation

-Hold STOP button for 3 seconds on Closing Speed Modulation Setting screen (LCD shows "CSP SET") to start.

[Closing speed modulation set value]

- i) CL1: Speed in section 1 (Initial value=SP1)
- ii) CL2: Speed in section 2 (Initial value=SP2)
- iii) CL3: Speed in section 3 (Initial value=SP3)
- iv) CL4: Speed in section 4 (Initial value=SP4)
- v) CL5: Speed in section 5 (Initial value=SP5)
- vi) CL6: Speed in section 6 (Initial value=SP6)

* Setting of Sections 1 to 5 vary in accordance with intermediate position settings.

If intermediate position setting is not used, Section 1 is set from full-close to full-open position.

When intermediate positions are used, Section 1 is set from full-close position to the nearest intermediate position, followed by Section 2 which to be till next intermediate position, and following sections to be set subsequently.

[Setting procedure]

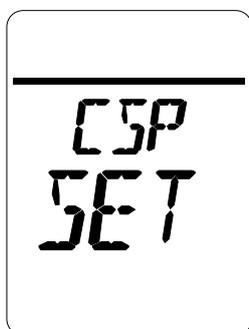
- 1) Select section 1 to 6 (CL 1 to 6 from full-close side) on the Closing Speed Modulation mode screen (LCD shows "CSP CL#"), and hold STOP button for 3 seconds. The Speed Selection screen (LCD shows "CL# SP#") is shown.
- 2) Select closing speed for the selected section by OPEN / CLOSE buttons on operation panel on Speed Selection screen (LCD shows: "CL# SP#"), and hold STOP button for 3 seconds to complete the setting procedure.

[Setting operation]

Press OPEN button : Select in ascending order from CL1 to CL6 and from SP1 to SP6.

Press CLOSE button : Select in descending order from CL6 to CL1 and from SP6 to SP1.

Hold STOP button for 3 seconds: Saves the set value.



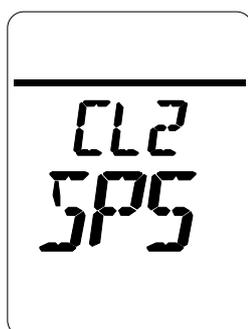
Closing Speed Modulation
Setting screen

Hold STOP
button for
3 sec.



Select section to set
closing speed with button
on operation panel

Hold STOP
button for
3 sec.



Select speed of selected
section

Hold STOP
button for
3 sec.



Complete setting, and return
to the Setting screen

How to Set Opening Speed Modulation

-Hold STOP button for 3 seconds on Closing Speed Modulation Setting screen (LCD shows "OSP SET") to start.

[Closing speed modulation set value]

- i) OP1: Speed in section 1 (Initial value=SP1)
- ii) OP2: Speed in section 2 (Initial value=SP2)
- iii) OP3: Speed in section 3 (Initial value=SP3)
- iv) OP4: Speed in section 4 (Initial value=SP4)
- v) OP5: Speed in section 5 (Initial value=SP5)
- vi) OP6: Speed in section 6 (Initial value=SP6)

* Setting of Sections 1 to 5 vary in accordance with intermediate position settings.

If intermediate position setting is not used, Section 1 is set from fully closed to fully open position.

When intermediate positions are used, Section 1 is set from fully closed position to the nearest intermediate position, followed by Section 2 which to be till next intermediate position, and following sections to be set subsequently.

[Setting procedure]

- 1) Select section 1 to 6 (OP1 to 6 from fully close side) on the Closing Speed Modulation mode screen (LCD shows "OSP CL#"), and hold STOP button for 3 seconds. The Speed Selection screen (LCD shows "OP# SP#") is shown.
- 2) Select closing speed for the selected section by OPEN / CLOSE buttons on operation panel on Speed Selection screen (LCD shows: "OP# SP#"), and hold STOP button for 3 seconds to complete the setting procedure.

[Setting operation]

Press OPEN button : Select in ascending order from OP1 to OP6 and from SP1 to SP6.

Press CLOSE button : Select in descending order from OP6 to OP1 and from SP6 to SP1.

Hold STOP button for 3 seconds: Saves the set value.



Opening Speed Modulation
Setting screen

Hold STOP
button for
3 sec.



Select section to set
opening speed with button
on operation panel

Hold STOP
button for
3 sec.



Select speed of selected
section

Hold STOP
button for
3 sec.



Complete setting, and return
to the Setting screen

How to Set Range and Speed Before Reaching Target

-Hold STOP button for 3 seconds on Range and Speed Range Before Reaching Target Setting screen (LCD shows "SL SET") to start.

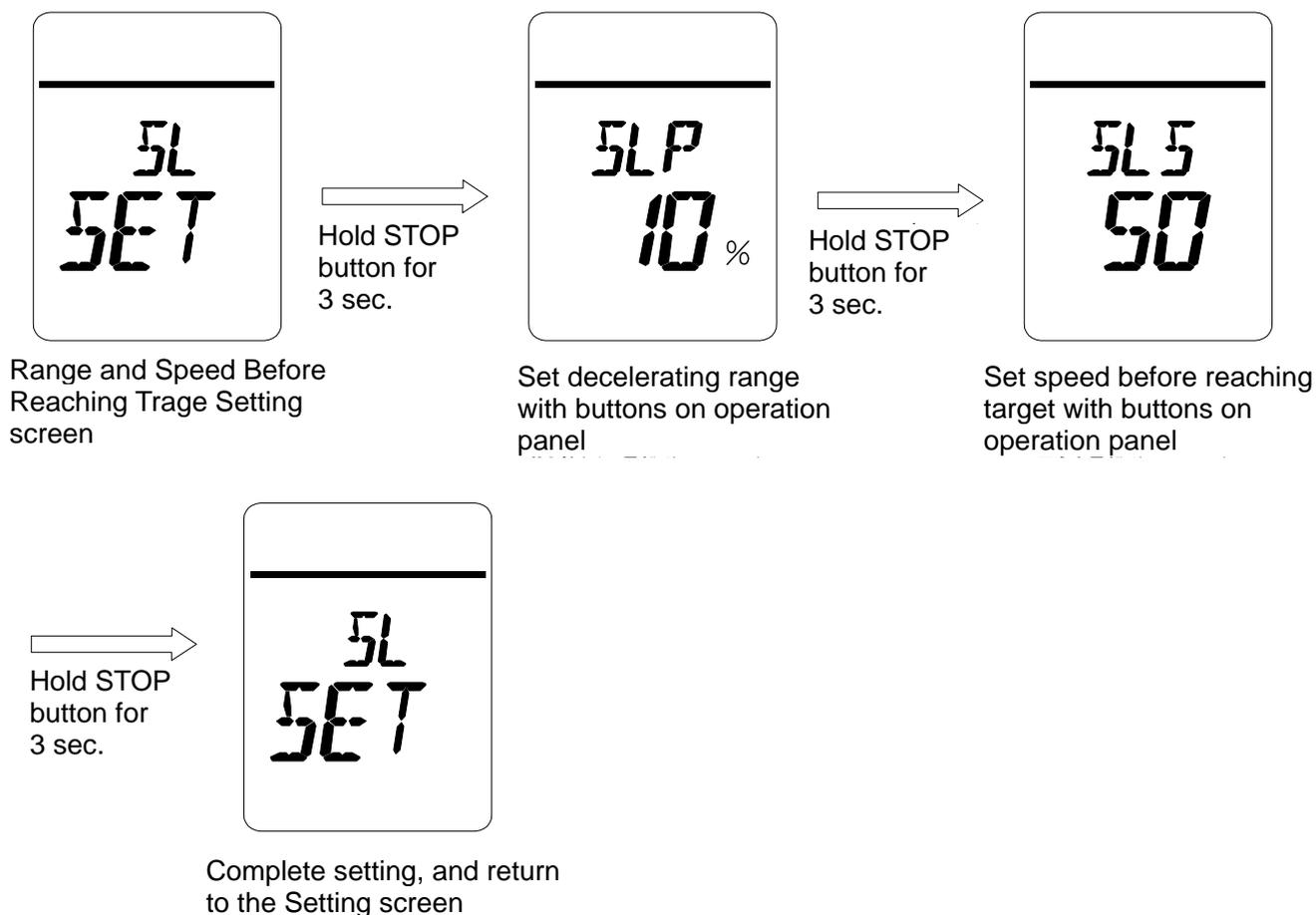
[Decelerating range before reaching target value settings]

- i) Set value =1 to 100 : Set range (1 to 10%) to decelerate before reaching target value
- ii) Set value = 5~5000 : Set speed before reaching target value

[Setting operation]

1. Input decelerating range to be set by using OPEN / CLOSE buttons on operation panel with Range and Speed Before Reaching Target Value Setting Mode screen (LCD shows: "SLP xxx%"), and hold STOP button on operation panel for 3 seconds to complete the setting operation.
2. Input speed to be set by using OPEN / CLOSE buttons on operation panel with Range and Speed Before Reaching Target Value Setting Mode screen (LCD shows: "SLS xxx%"), and hold STOP button on operation panel for 3 seconds to complete the setting operation.

Press OPEN button : Changes numerical value in ascending order from 0 to 9.
 Press CLOSE button : Changes numerical value in descending order from 9 to 0.
 Hold STOP button for 3 seconds: Saves the set value.



How to Set Closing Torque Seat / Position Seat

-Hold STOP button for 3 seconds on Full-close Condition Setting screen (LCD shows "CLM SET") to start.

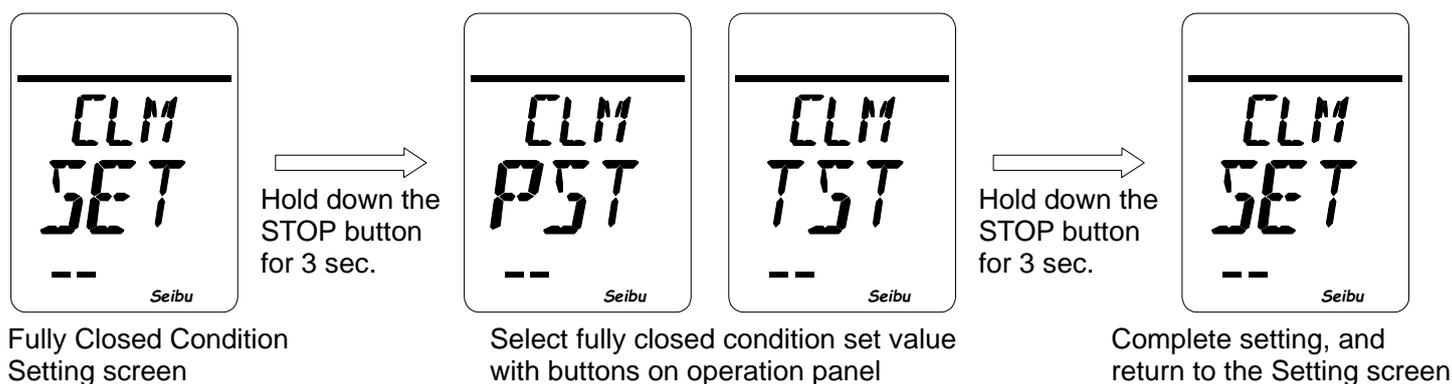
[Closing torque seat and position seat set values]

- i) Set value = PST : Position seat. Stop at 0% position
- ii) Set value = TST : Torque seat. Stop actuator when loading torque exceeds set value at less than 0%.

[Setting operation]

Input fully closed condition set value by using OPEN / CLOSE buttons on operation panel on Fully Closed Condition Setting Mode screen (LCD shows "CLM xxx"), and hold STOP button on operation panel for 3 seconds to complete the setting operation.

Press OPEN / CLOSE button : Select PST or TST.
Hold STOP button for 3 seconds: Saves the set value.



How to Set Opening Torque Seat / Position Seat

-Hold STOP button for 3 seconds on Full-Open Condition Setting screen (LCD shows "OLM SET") to start.

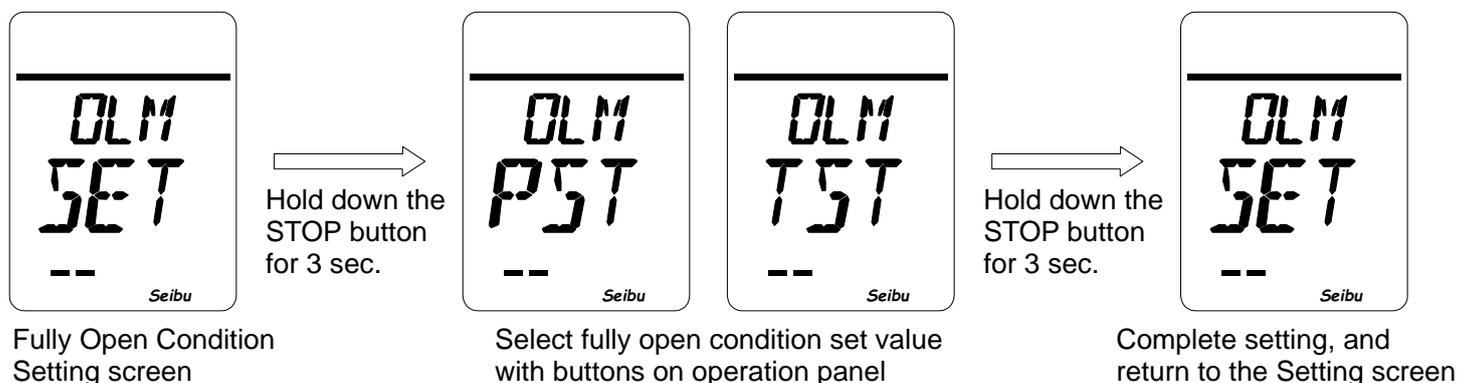
[Closing torque seat and position seat set values]

- iii) Set value = PST : Position seat. Stop at 100% position
- iv) Set value = TST : Torque seat. Stop actuator when loading torque exceeds set value at more than 100%.

[Setting operation]

Input full open condition set value by using OPEN / CLOSE buttons on operation panel on Fully Open Condition Setting Mode screen (LCD shows "OLM xxx"), and hold STOP button on operation panel for 3 seconds to complete the setting operation.

Press OPEN / CLOSE button : Select PST or TST.
Hold STOP button for 3 seconds: Saves the set value.



How to Set Torque Retry

-Hold STOP button for 3 seconds on Torque Retry Setting screen (LCD shows "TRC SET") to start.

[Torque retry set value]

- i) Set value = 0 to 5 : Set number of times to do retry to make the actuator automatically move back and force when loading torque is more than set value.
- ii) Set value = 0 to 100 : Set position (%) to invert for torque retry

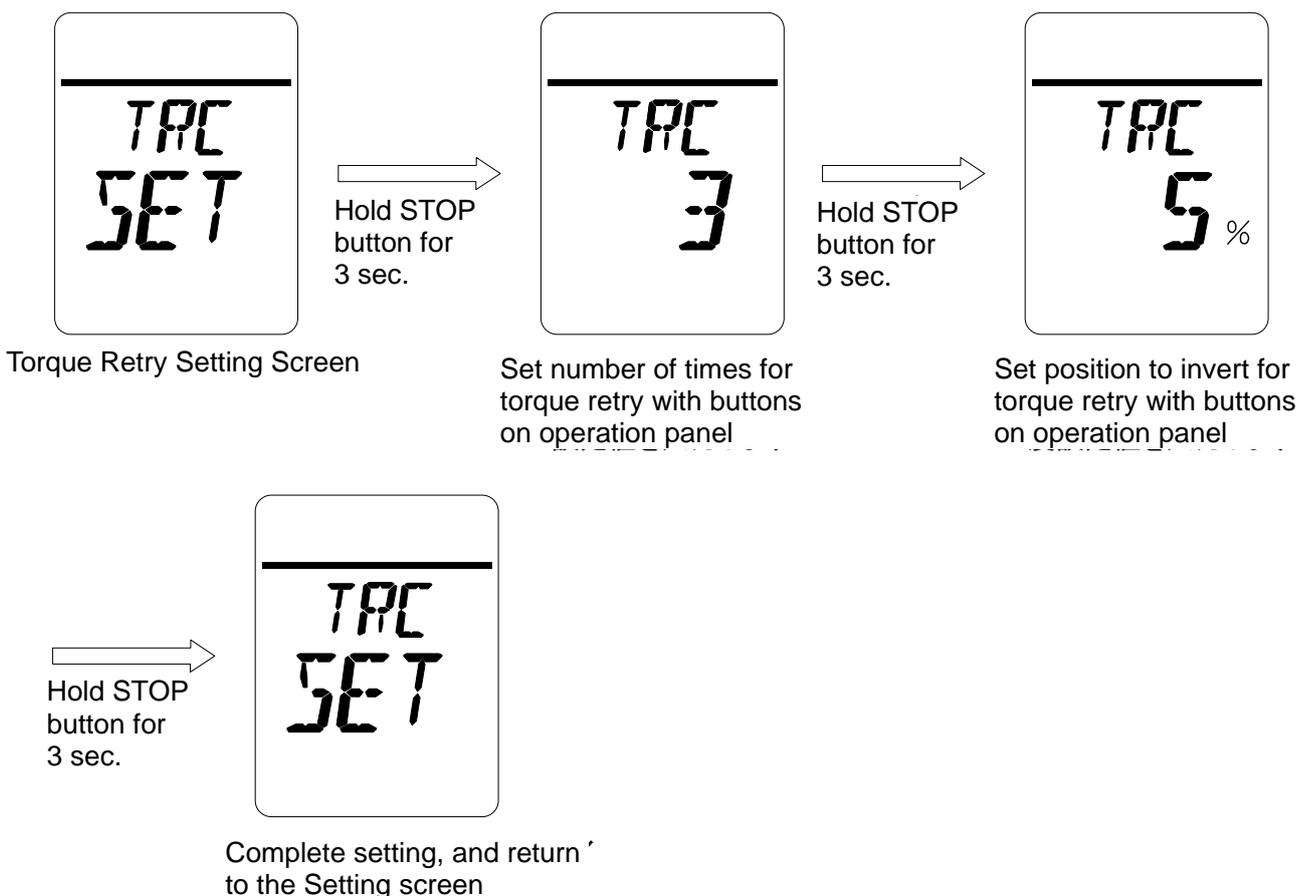
[Setting operation]

1. Input number of times for torque retries by using OPEN / CLOSE buttons on operation panel on Number of Torque Retries Setting Mode screen (LCD shows: "TRC xx"), and hold STOP button for 3 seconds to complete the setting operation.
2. Input position for torque retry by using OPEN / CLOSE buttons on operation panel on Torque Retry Position Setting Mode screen (LCD shows: "TRC xx%"), and hold STOP button for 3 seconds to complete the setting operation.

Press OPEN button : Select numerical value in ascending order from 0 to 9.
(Value increases in high speed while the button is hold)

Press CLOSE button : Select numerical value in descending order from 9 to 0.
(Value decreases in high speed while the button is hold)

Hold STOP button for 3 seconds: Saves the set value.



How to Set Torque Retry Pause Time

-Hold STOP button for 3 seconds on Torque Retry Pause Setting screen (LCD shows "TRM SET") to start.

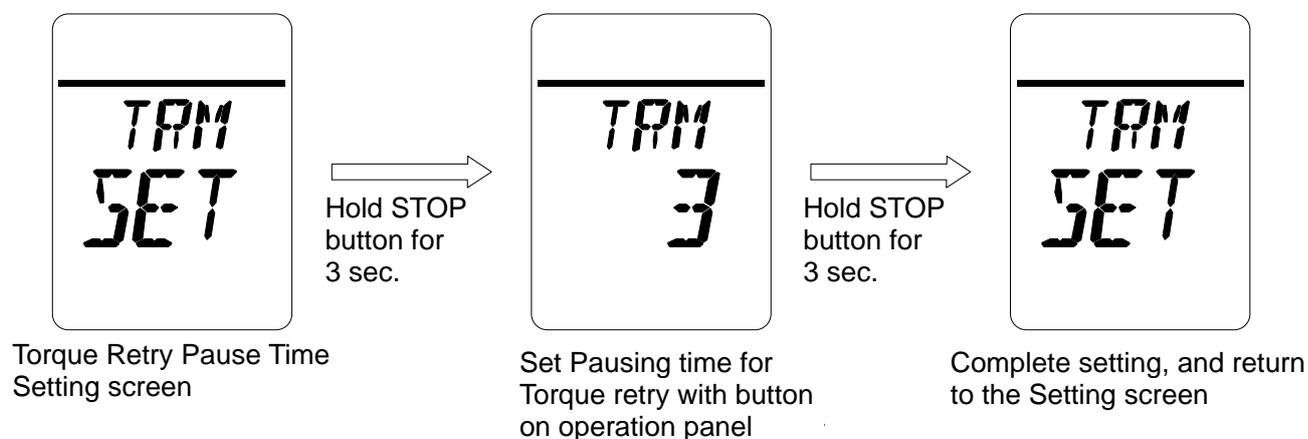
[Torque retry pause time set value]

- i) Set value = 0 to 5 : Set time (1 to 5 [sec]) to pause when in no torque state during torque retries.
- ii) Set value = 6 : Stop and Output torque alarm after reversing for torque retry

[Setting operation]

Input time (sec) for torque retry pause using OPEN / CLOSE buttons on operation panel on Torque Retry Pause Time Setting Mode screen (LCD shows: "TRM xx"), and hold STOP button for 3 seconds to complete the setting operation.

- Press OPEN button : Select numerical value in ascending order from 0 to 9.
(Value increases in high speed while the button is hold)
- Press CLOSE button : Select numerical value in descending order from 9 to 0.
(Value decreases in high speed while the button is hold)
- Hold STOP button for 3 seconds: Saves the set value.



How to Set Output ZERO (*with 4-20mA output)

-Hold STOP button for 3 seconds on Output ZERO Setting screen (LCD shows “DAZ SET”) to start.

[Output ZERO set value]

Set value = -25 to 25 : Analog output position of 0% can be adjusted within the range of -1.0 to 1.0 [mA].

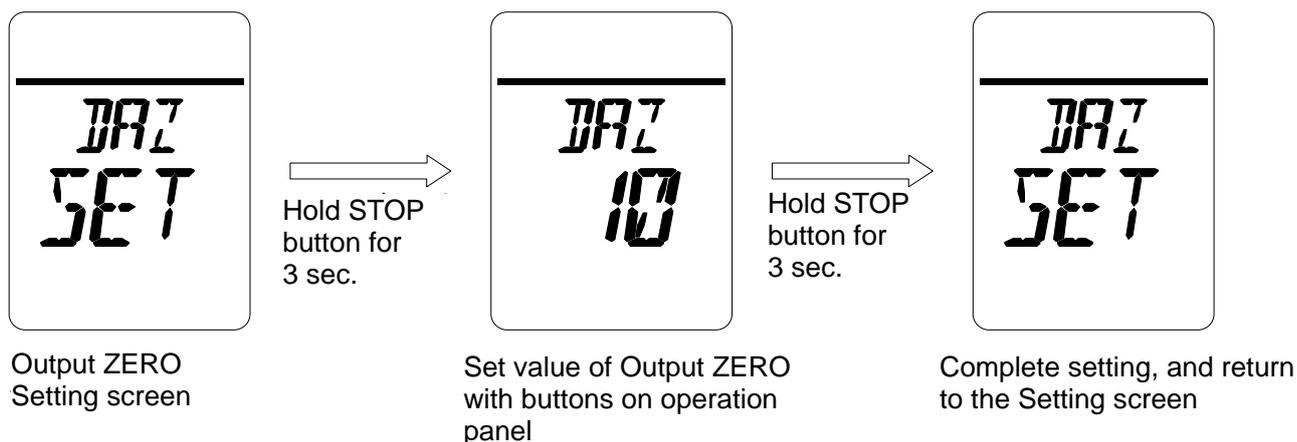
[Setting operation]

Input set value of Output ZERO by using OPEN / CLOSE buttons on operation panel on Output Zero Setting Mode screen (LCD shows “DAZ xx”), and hold STOP button for 3 seconds to complete the setting operation.

Press OPEN button : Select numerical value in ascending order from 0 to 9.

Press CLOSE button : Select numerical value in descending order from 9 to 0.

Press STOP button briefly : Saves the set value.



How to Set Output SPAN (*with 4-20mA output)

-Hold STOP button for 3 seconds on Output SPAN Setting screen (LCD shows “DAS SET”) to start.

[Output SPAN set value]

Set value = -25 to 25: Analog output position of 100% can be adjusted within the range of -1.0 to 1.0 [mA].

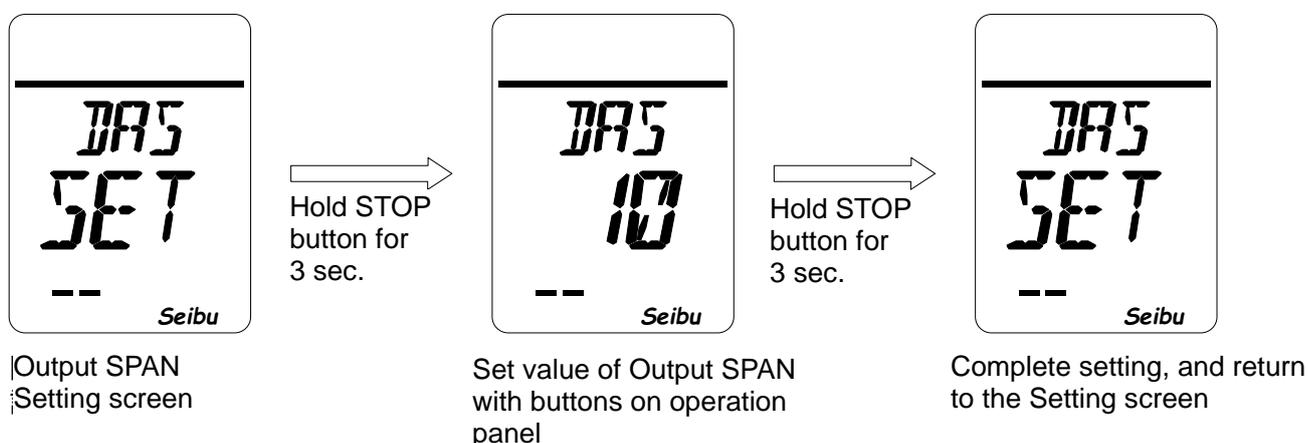
[Setting operation]

Input set value of Output SPAN by OPEN / CLOSE buttons on operation panel on Output SPAN Setting Mode screen (LCD shows “DAS xx”), and hold STOP button for 3 seconds to complete the setting operation.

Press OPEN button : Select numerical value in ascending order from 0 to 9.

Press CLOSE button : Select numerical value in descending order from 9 to 0.

Press STOP button for 3 seconds : Saves the set value.



How to Set Position Output Current Value Inversion

-Hold STOP button for 3 seconds on Position Output Current Value Inversion Setting screen (LCD shows "OUT SET") to start.

[Opening output current value inversion settings]

- i) NOM: Full Close 4 mA Full Open 20 mA
- ii) REV: Full Close 20 mA Full Open 4 mA

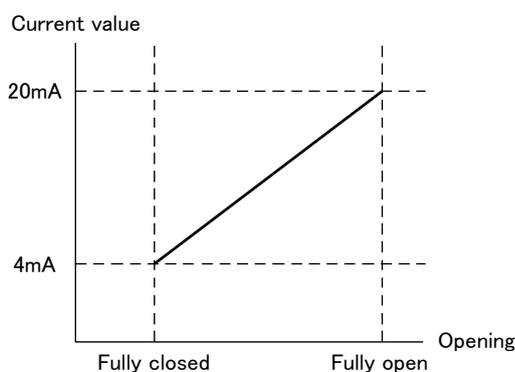
[Setting operation]

Select set value of opening output current value inversion by OPEN / CLOSE button on control panel on Position Output Current Value Inversion Setting Mode screen (LCD shows: "RES xxx"), and hold STOP button for 3 seconds to complete the setting operation.

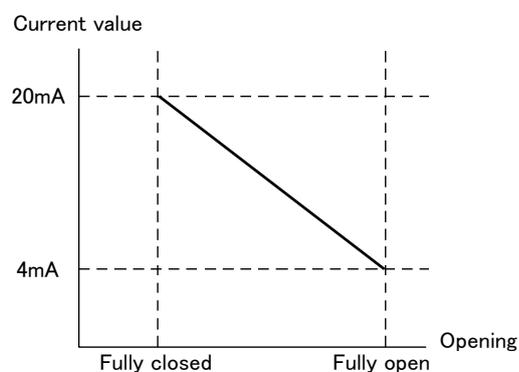
Press OPEN / CLOSE button : Select NOM or REV.

Hold STOP button for 3 seconds: Saves the set value.

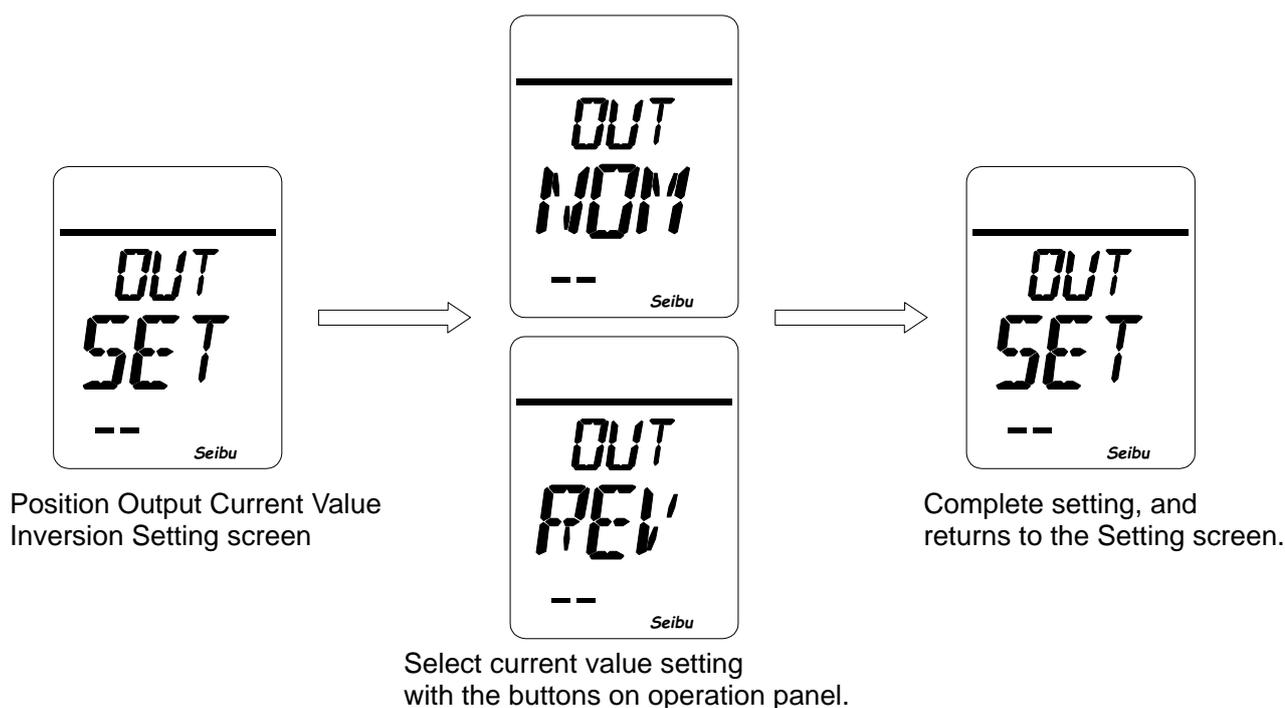
[Position output current value for each set value]



Current value when NOM is selected



Current value when REV is selected



How to Set D-ZONE

-Hold STOP button for 3 seconds on D-ZONE Setting screen (LCD shows “DEF SET”) to start.

[D-ZONE set value]

Set value = 1 to 999: Actuator stops within the range of difference (0.01 to 9.99%) from target position when using Proportional control or PROFIBUS.

[Setting operation]

Input set value of D-ZONE by OPEN / CLOSE buttons on operation panel on D-ZONE Setting Mode screen (LCD shows “DEF xx%”), and hold STOP button for 3 seconds to complete the setting operation.

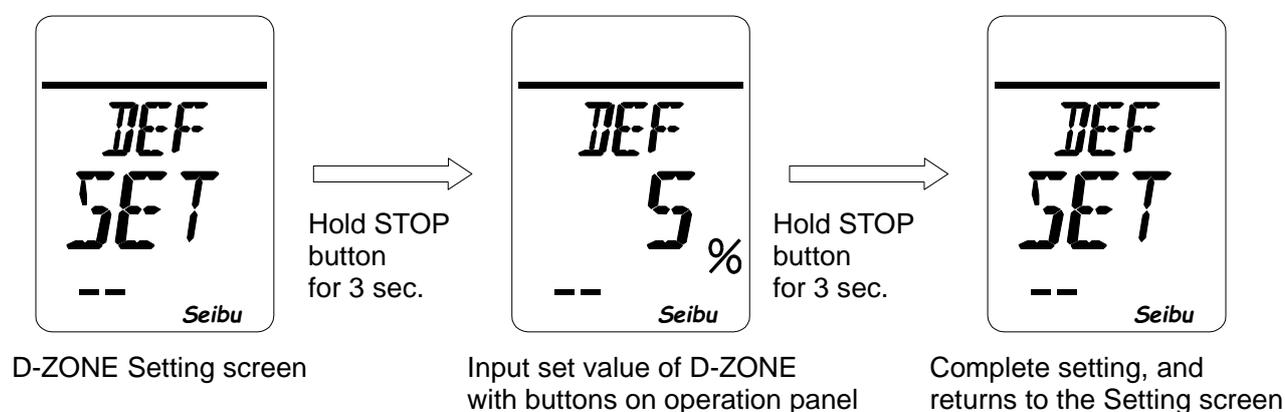
Press OPEN button : Select numerical value in ascending order from 0 to 9.

(Value increases in high speed while the button is hold)

Press CLOSE button : Select numerical value in descending order from 9 to 0.

(Value decreases in high speed while the button is hold)

Hold STOP button for 3 seconds: Saves the set value.



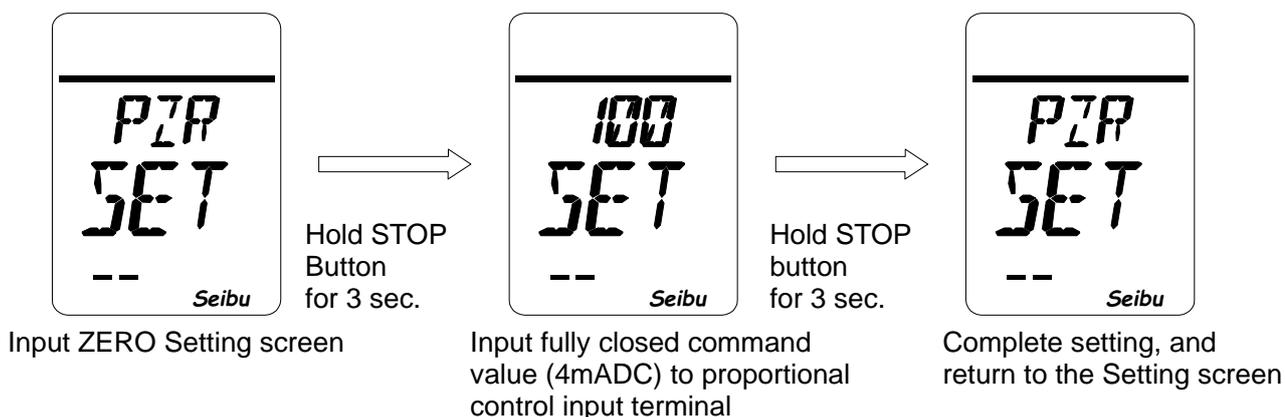
How to Set Input ZERO (*with Proportional control)

-Hold STOP button for 3 seconds on Input ZERO Setting screen (LCD shows "PZR SET") to start.

[Setting operation]

Input fully close command current (4mADC) to Proportional control input terminal on Input ZERO Setting Mode screen (LCD shows "xxx SET"), and hold STOP button on operation panel for 3 seconds to complete the setting operation.

Hold STOP button for 3 seconds: Save the input ZERO.



* Value that appears on screen during setting operation is not related to setting, as it is a data value of voltage internally converted from input current.

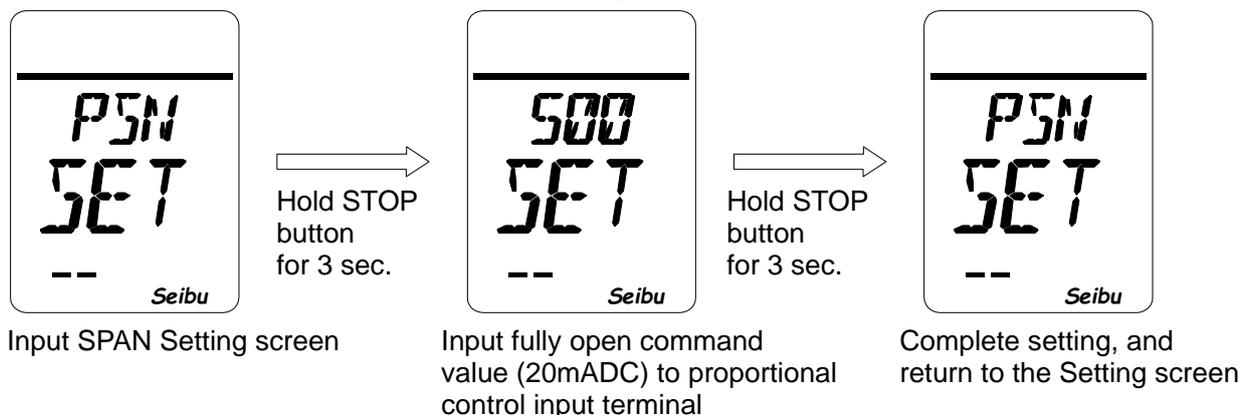
How to Set Input SPAN (*with Proportional control)

-Hold STOP button for 3 seconds on Input SPAN Setting screen (LCD shows "PSN SET") to start.

[Setting operation]

Input fully open command current (20mADC) to Proportional control input terminal on Input SPAN Setting Mode screen (LCD shows "xxx SET"), and hold STOP button on operation panel for 3 seconds to complete the setting operation.

Hold STOP button for 3 seconds: Saves the input SPAN.



* Value that appears on screen during setting operation is not related to setting, as it is a data value of voltage internally converted from input current.

How to Set Action at Proportional Control Threshold (*with Proportional control)

-Hold STOP button for 3 seconds on Action at Proportional Control Threshold Setting screen (LCD shows "PRE SET") to start.

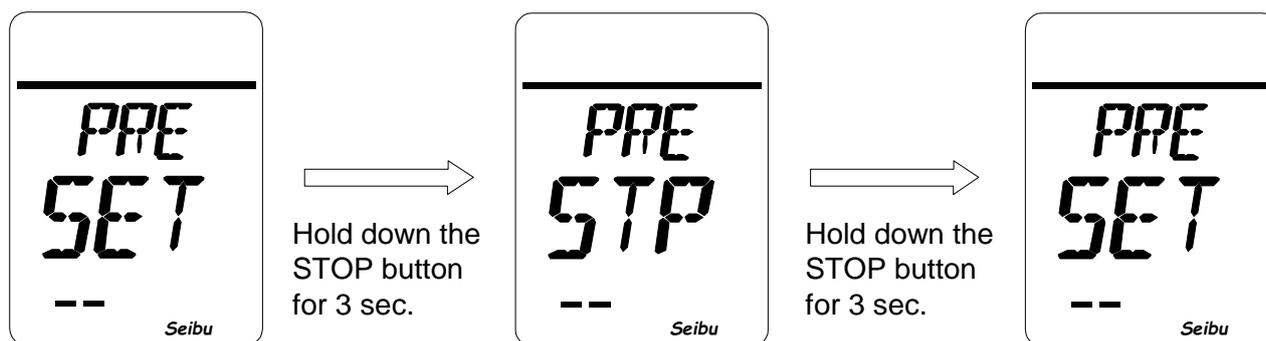
[Setting operation]

Select the item to be set on LCD by OPEN / CLOSE buttons on operation panel on Action at Proportional control Threshold Setting Mode screen (LCD shows "PRE xxx"), and hold STOP button for 3 seconds to complete the setting operation.

Press OPEN button : Select from STP to CLS as items listed below.

Press CLOSE button : Select from CLS to STP as items listed below.

Hold STOP button for 3 seconds: Saves the set value.



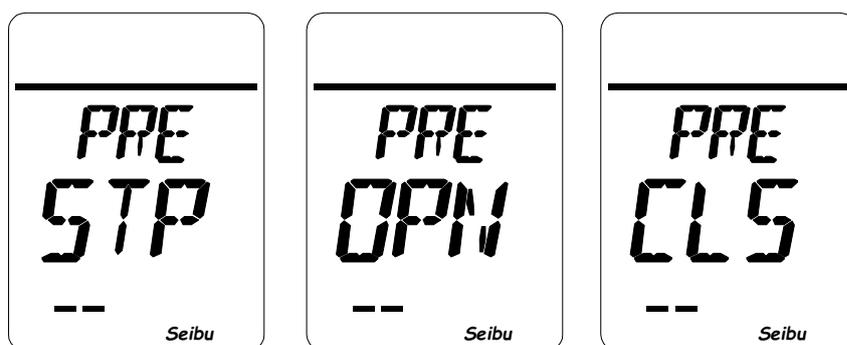
Action at Proportional Control Threshold setting screen

Select item to be set with buttons on operation panel

Complete setting, and return to the Setting screen

[Items to be set for Action at Proportional Control Threshold]

- 1) STP: Stop at the point when Proportional control input value is in the range of 0 to 1mA.
- 2) OPN: Move to full-open limit position when Proportional control value is in the range of 0 to 1mA.
- 3) CLS: Move to full-close limit position when Proportional input value is in the range of 0 to 1mA.



Stop

Movement in the opening direction

Movement in the closing direction

How to Set Surf Drive

-Hold STOP button for 3 seconds on Surf Drive Setting screen (LCD shows “SRF SET”) to start.

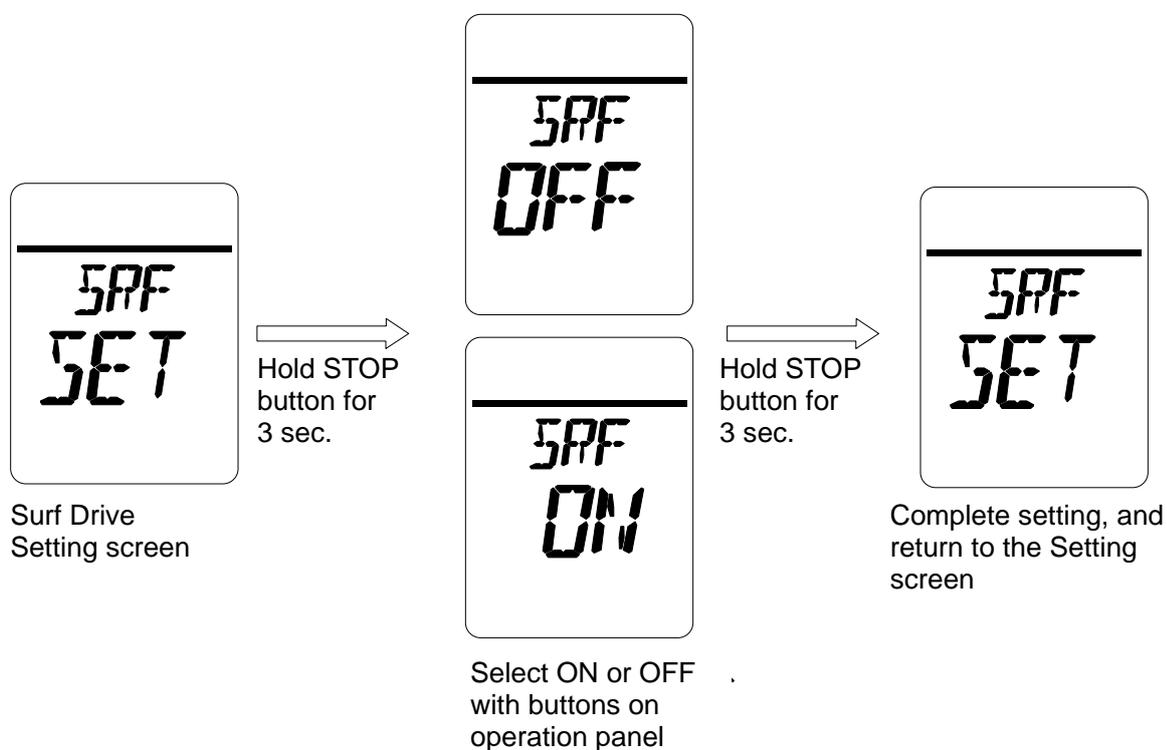
[Surf Drive set value]

- i) Set value = OFF : Surf drive setting is OFF
- ii) Set value = ON : Surf drive setting is ON

[Setting operation]

Select ON or OFF set value by OPEN / CLOSE buttons on operation panel on Surf Drive Setting Mode screen (LCD shows “SRF xxx”), and hold STOP button on operation panel for 3 seconds to complete the setting operation.

Press OPEN / CLOSE button : Select ON or OFF.
Hold STOP button for 3 seconds: Saves the set value.



How to Set STOP Contact

-Hold STOP button for 3 seconds on STOP Contact Setting screen (LCD shows "RES SET") to start.

[STOP Contact settings]

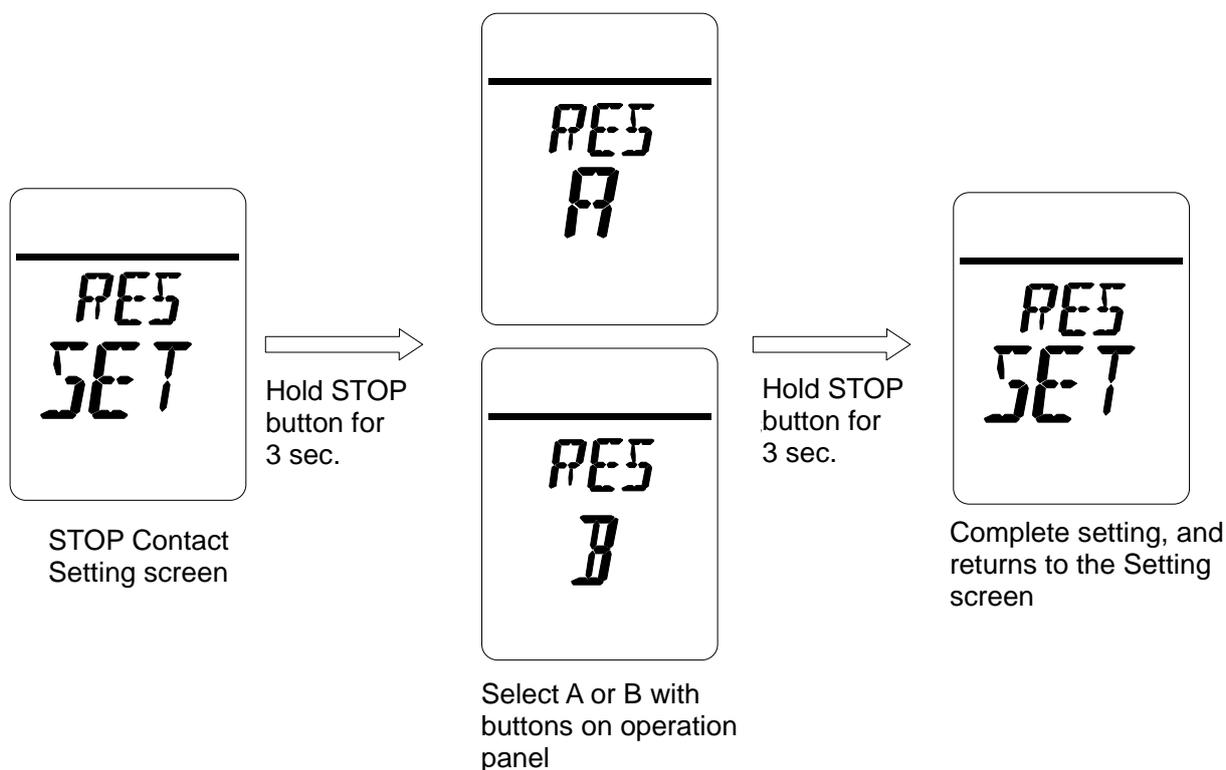
- i) A: STOP contact is A contact
- ii) B: STOP contact is B contact

[Setting operation]

Select A or B of STOP contact by OPEN / CLOSE button on control panel on STOP Contact Setting Mode screen (LCD shows: "RES x"), and hold STOP button for 3 seconds to complete the setting operation.

Press OPEN / CLOSE button : Select A or B.

Hold STOP button for 3 seconds: Saves the set value.



How to Set Position Limit Not-Reach Alarm

-Hold STOP button for 3 seconds on Position Limit Alarm Setting screen (LCD shows "PLY SET") to start.

[Position Limit Not-Reach Alarm settings]

- 1) OFF: Off the function
- 2) ON: Set alarm in case not to reach open/close position limit within set time, when use Remote control
 **Set value = 1 to 540 : Set time 10 to 5400 sec. till output position limit not-reach alarm

[Setting procedure]

- 1) Select Position Limit alarm (either ON or OFF) on Position Limit Not-Reach Alarm Setting Mode screen (LCD shows: "PLY xxx"), and hold STOP button for 3 seconds.
- 2) When OFF is selected on the Setting Mode screen, return to Position Limit Not-Reach Alarm setting screen (LCD shows "PLY SET.")
- 3) Input set value of Position Limit Not-Reach Alarm setting screen, and hold STOP button for 3 seconds to complete the setting procedure.

[Setting operation]

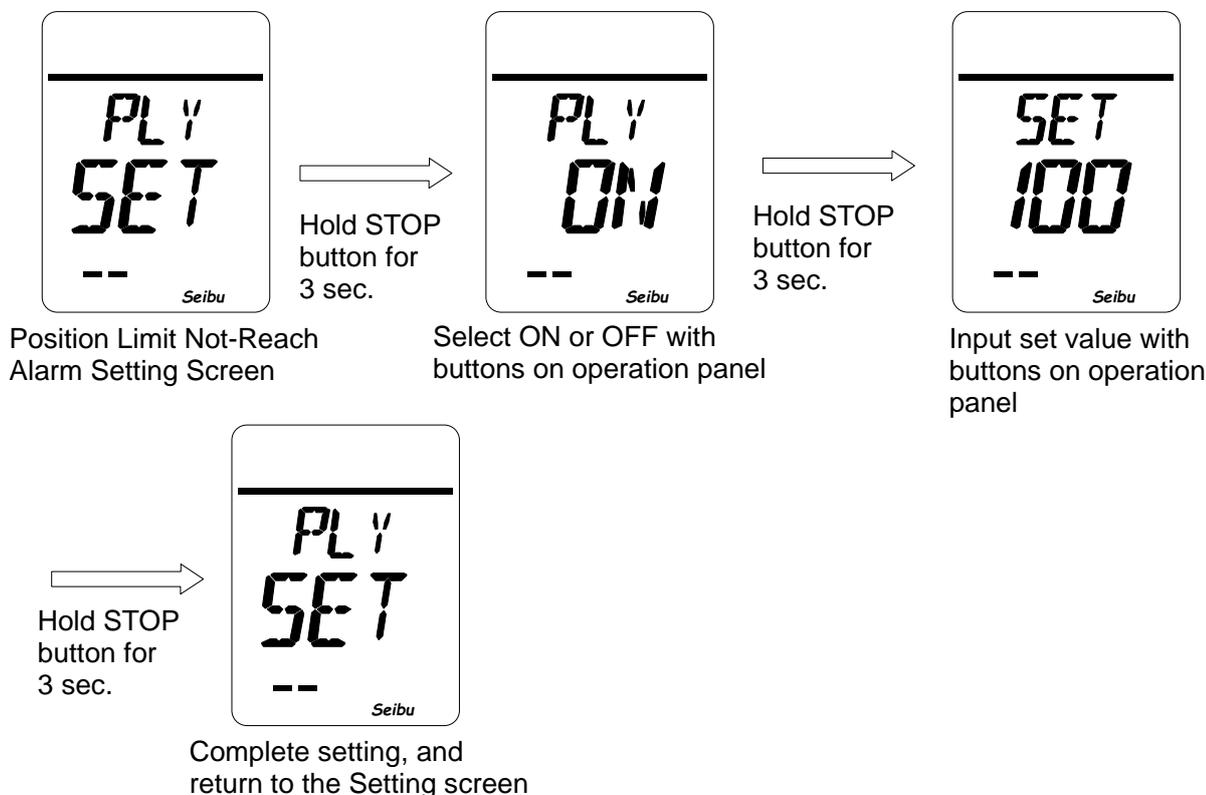
Input value of position limit alarm timing by OPEN / CLOSE buttons on operation panel on Position Limit Not-Reach Alarm Setting Mode screen (LCD shows "PLY xxx"), and hold STOP button on operation panel for 3 seconds to complete the setting operation.

Press OPEN button: Select ON or OFF and numerical value in ascending order from 0 to 9.

Press CLOSE button: Select ON or OFF and numerical value in descending order from 9 to 0.

Hold STOP button for 3 seconds: Saves the set value.

• When select ON



How to Set Position Limit Lost Alarm

-Hold STOP button for 3 seconds on Position Limit Lost Alarm Setting screen (LCD shows "PLL SET") to start.

[Position Limit Lost Alarm settings]

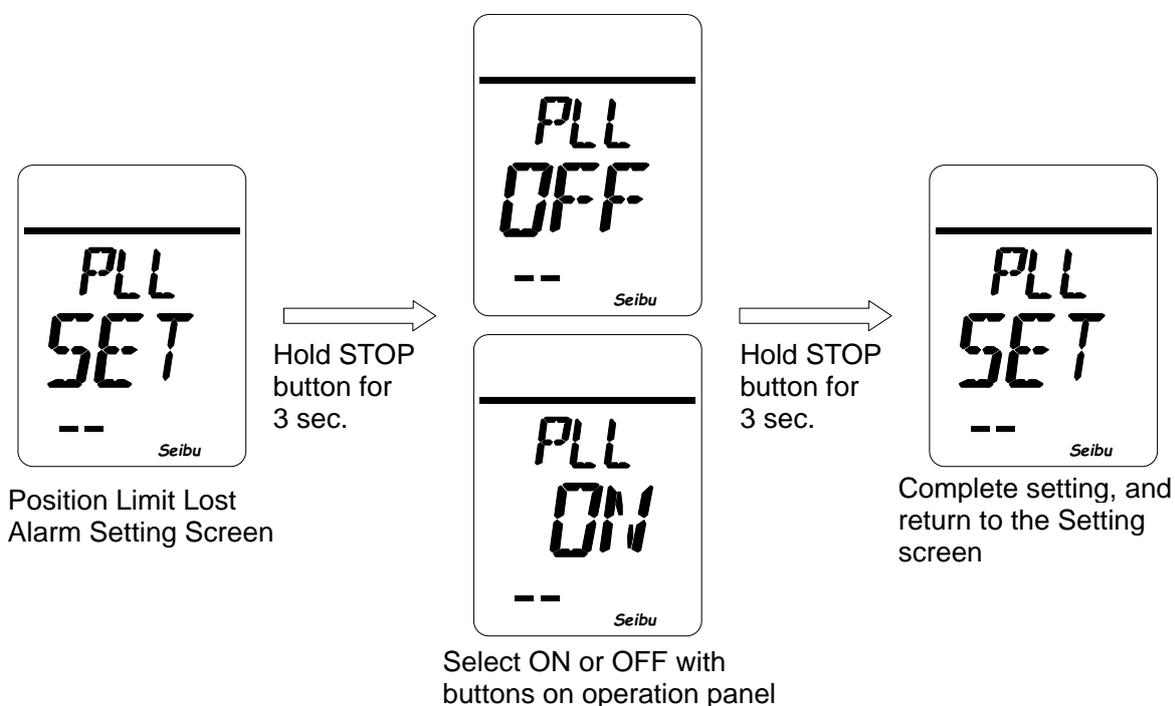
- 1) OFF: Off the function
- 2) ON: Set alarm in case to deviate from position limit when no Remote open/close operation

**Activate alarm only when selector switch set to REMOTE

[Setting operation]

Select ON or OFF of Position Limit Lost Alarm by OPEN / CLOSE buttons on operation panel on Position Limit Lost Alarm Setting Mode screen (LCD shows "PLL xxx"), and hold STOP button on operation panel for 3 seconds to complete the setting operation.

Press OPEN/CLOSE button : Select ON or OFF.
Hold STOP button for 3 seconds: Saves the set value.



How to Set Password

-Hold STOP button for 3 seconds on Password Setting screen (LCD shows "PSW SET") to start.

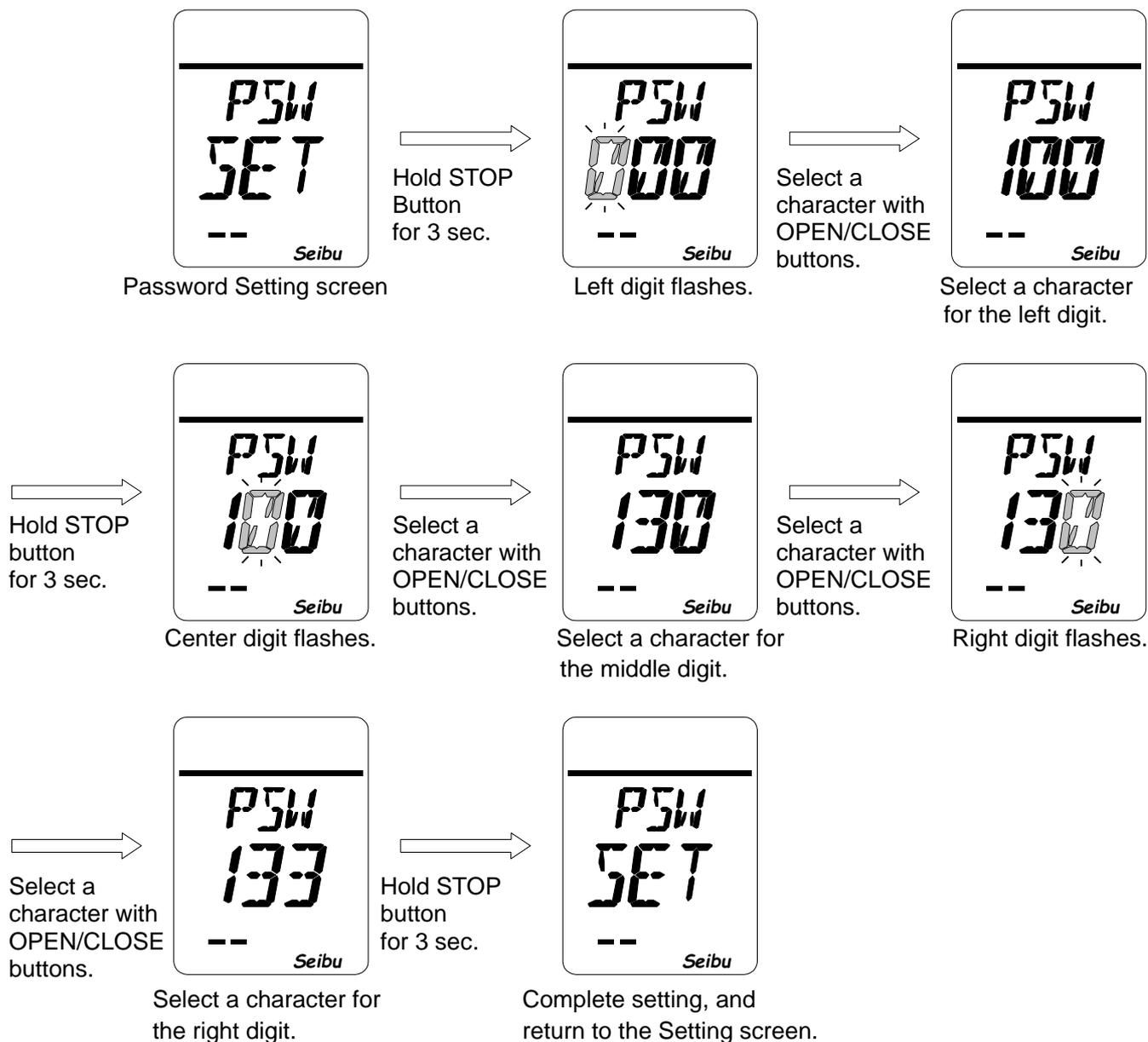
[Setting operation]

Input a three-digit code of alphanumeric characters (0 to 9, A to Z) in the digit that is flashing. Hold STOP button for 3 seconds after the last third character is selected, and password setting completes.

Press OPEN button : Select alphanumeric character, from 0 to 9 and from A to Z.

Press CLOSE button : Select alphanumeric character, from 9 to 0 and from Z to A.

Hold STOP button for 3 seconds: Confirm the input digit.



* When password is changed, be sure not to forget the new password.

● Error Indications

*When any error is detected, the orange lamp is lit and ERR icon or an error code appears on upper part of LCD, and the actuator stops.



Error Indication

-Torque error (Over-torque)

Actuator stops when over torque is detected by built in torque-detecting potentiometer against Open/Close torque setting. Icon "  Over Torque " is shown on the display.

Flashing "OPEN" when opening over torque, and "CLOSE" when closing over torque.

[To Reset error]

Check valve condition and operate in reverse direction against applied torque to release. Perform Closing operation with Opening over torque, and Opening torque with closing over torque.

*If torque error repeatedly occurs, stop the operation and investigate valve and actuator.

(2) Error code, contents, and Error indication reset

Error code	Error icon	Error	Description	To Rest error indication
E01	—	Power off when active	Power off when actuator is active to open/close valve.	Input action command or stop operation
E02		Position detection error	Motor is not moving even when input action command	Stop operation
E03		Over load alarm	Overload level exceeds the set value	Input action command or stop operation under the condition that overload value is less than 20%
E04	—	Proportional control command value error	Proportional control input is less than 1mA.	Automatically recover after getting more than 1mA
E05	—	Additional relay card communication error	Communication between servo driver and relay board is down for more than the set period of time.	Stop operation
E06	—	PROFIBUS communication error	Communication between servo driver and PROFIBUS board is down for more than the set period of time.	Stop operation
E07	—	PROFIBUS data error	Communication data between servo driver and PROFIBUS board is abnormal.	Stop operation after recovery
E08		Battery error	Battery voltage drops below 3.3V	Automatic recovery after voltage goes back
E09		Over current	Excessive current flowed into motor	Stop operation
E10		Overvoltage error	Drive voltage goes more than set value	Stop operation
E11		Resolver error	Resolver signal error	Stop operation *But need to readjust Position Limit after reset.
E12		Speed error	Motor rotates at a speed exceeding 8000 min-1	Input action command or stop operation
E13		Driver overheat	Inside of the driver exceeded 100 ° C	Automatically recover when temp. inside driver drops to 75° C or less.
E14		Driver memory error	Non-volatile memory error inside the driver	Need to change driver
E15		Sensor backup error	Battery ran out during sensor backup	Stop operation *But need to readjust Position Limit after reset.
A01	—	Position limit not set	Position limit not set	To set Position Limit
A02	—	Position limit data error	Fully Closed / Fully Open position reversed	To set Position Limit
A03	—	Torque table not set	Torque table not set	To do torque calibration
A04	—	Torque table reversal	Minimum and maximum values of torque table are reversed.	To do torque calibration
A05	—	Proportional control data not set	Proportional control input ZERO / SPAN is not set	To set proportional control input

(3) When Error happened

*When any error occurs, take appropriate action and be sure to understand the details of error.