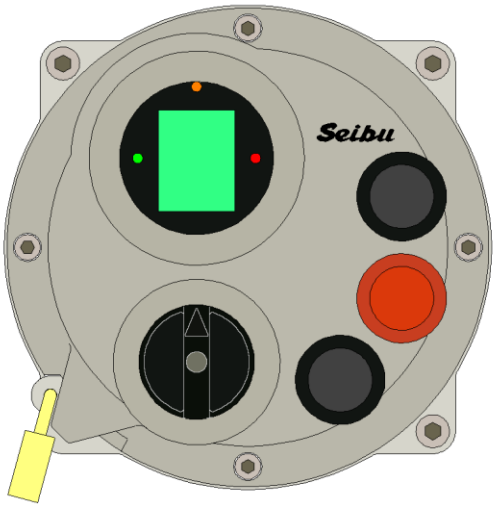
VM-Series
/ VP-Series
Operation Manual



1	Modify wiring diagram(p6,7,8,9)	19-04-10	Kawamoto	-	Mori
Original	VM-Series/VP-Series Operation Manual	10-03-03	Kitajima	–	Iwai
Rev. No.	Description	Date (yy-mm-dd)	Prepared	Checked	Approved
SEIBU ELECTRIC & MACHINERY CO., LTD.		ISSUED BY DESIGN SEC.			

The safety precautions below describe particularly important instructions in handling the valve actuator.
Read the precautions carefully prior to use for handling the valve actuator properly.
The installation should be performed only by trained and qualified professionals.

[Receiving, Transportation and Storage]

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

(1) Check the mass (weight) of the valve actuator before starting suspending and slinging work. Stay clear of the suspended load and ensure utmost safety before and during the work.

(2) Particular care should be used when handling and storing products packed in cardboard boxes, because the boxes may have lowered strength after 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 mass (weight) of the valve actuator before starting suspending and slinging work. Stay clear of the suspended load and ensure utmost safety before and during the work.

(2) Make sure to secure a safe foothold for work, and never attempt to use a pipe or anything similarly unstable for footing.

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 dampness or moisture.

(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 dampness or moisture.

(2) Make sure that ground wires have been securely connected.

Failure to observe these cautions may result in electric shock.

Contents

* However, (*1) to (*6) settings may be configured only for the following types:
(*1) with PROPORTION function
(*2) with analog output function
(*3) MgSW drive
(*4) Inverter drive
(*5) with 6 additional relay output points
(*6) MgSW drive + INC (when set value is INC)

● Overview of VM Series

The VM-series valve actuator is an intelligent, electric actuator equipped with a computer. The series with the data processing feature allows the user to set and adjust fully closed and fully open positions and torque switch operate values with externally-provided operating switches without opening the switch cover.

● Wiring Procedures

(1) Open the terminal case cover.

The terminal case cover is fixed on the terminal case with a hexagon socket head cap screw (M6). Remove the cap screw and remove the cover.

(2) Connect the power supply.

*Precautions

● Make sure that external power supply is off before connecting the power supply only.

● Check the terminal number with the number on the connection wiring diagram to ensure that wires are connected correctly.

● For the wiring entrances, use highly waterproof cable glands such as those for marine use or waterproof gasket-type unions.

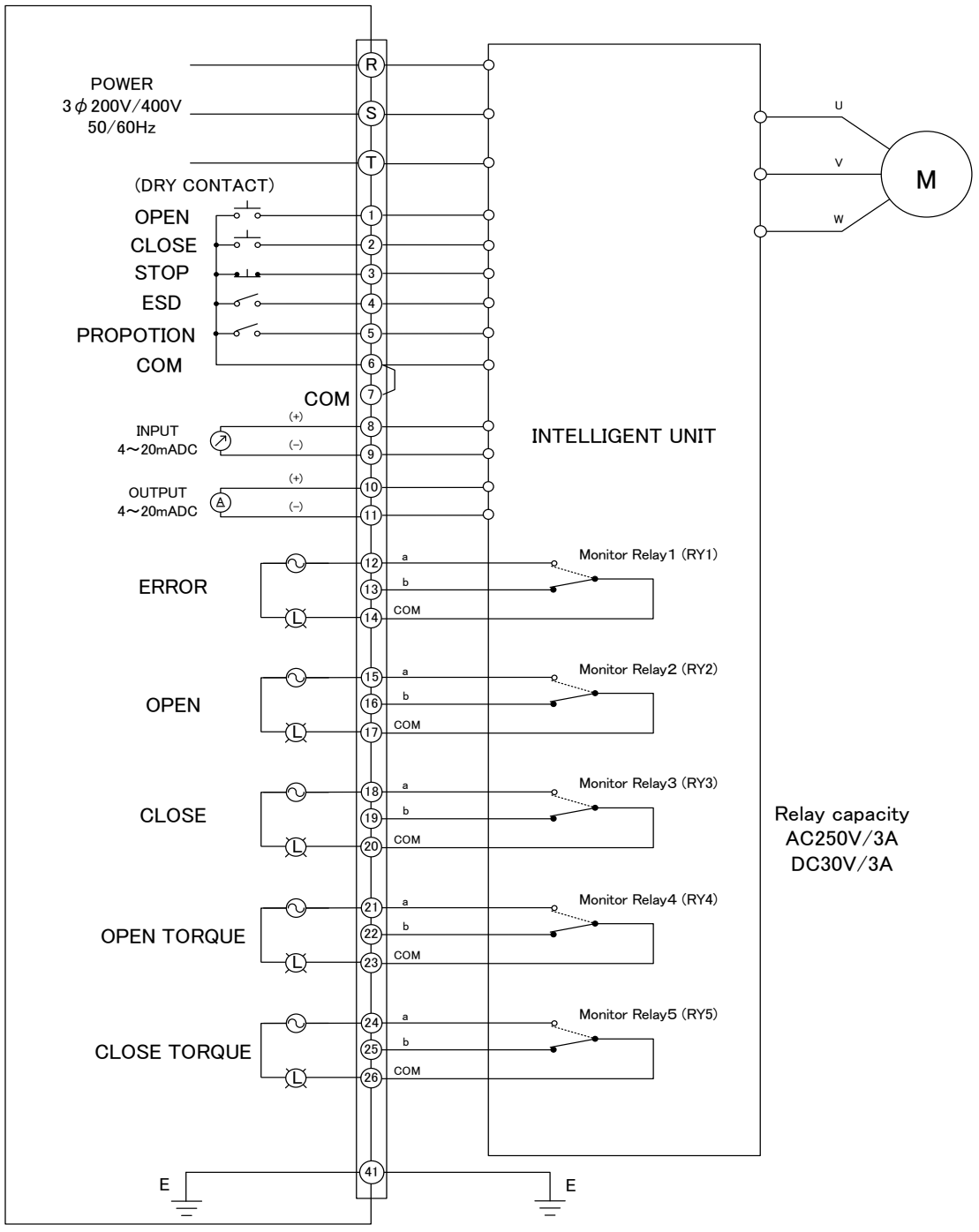
● After connecting, close the terminal cover to prevent electric shock caused by contact with live wires or terminals.

Provide an external power (3φ 200 VAC / 3φ 400 VAC ±10%, 50/60 Hz).
Connect the R, S, and T phase wires of the power supply to the R, S and T terminals respectively.

* For connection, refer to the connection wiring diagrams on the following page.

External Connection Wiring Diagram Reference for VM Series

Model [Series]	Specifications	Drawing No.	Page No.
VM - Series	Standard	3M01016	6
VM - Series	With relay options	3M01096	7
VM - Series	With PROFIBUS interface	3M01239	8
VM - Series	With Modbus interface	3M01238	9



図名 TITLE	Connecting Diagram
形式 TYPE	Semflex-VM
図番 DWG. NO.	3M01016
REV.	
尺度 SCALE	
日付 DATE	'17.08.01
製図 DWN.	Kawamoto
照査 CKD.	—
承認 APP.	Mori
単位 UNIT	mm
三角法 3RD. ANG. PROJ.	

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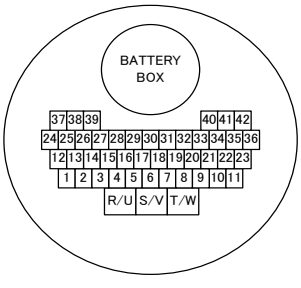
改訂 REV	日付 DATE	氏名 DWN.	承認 APP.	内容 DESCRIPTION

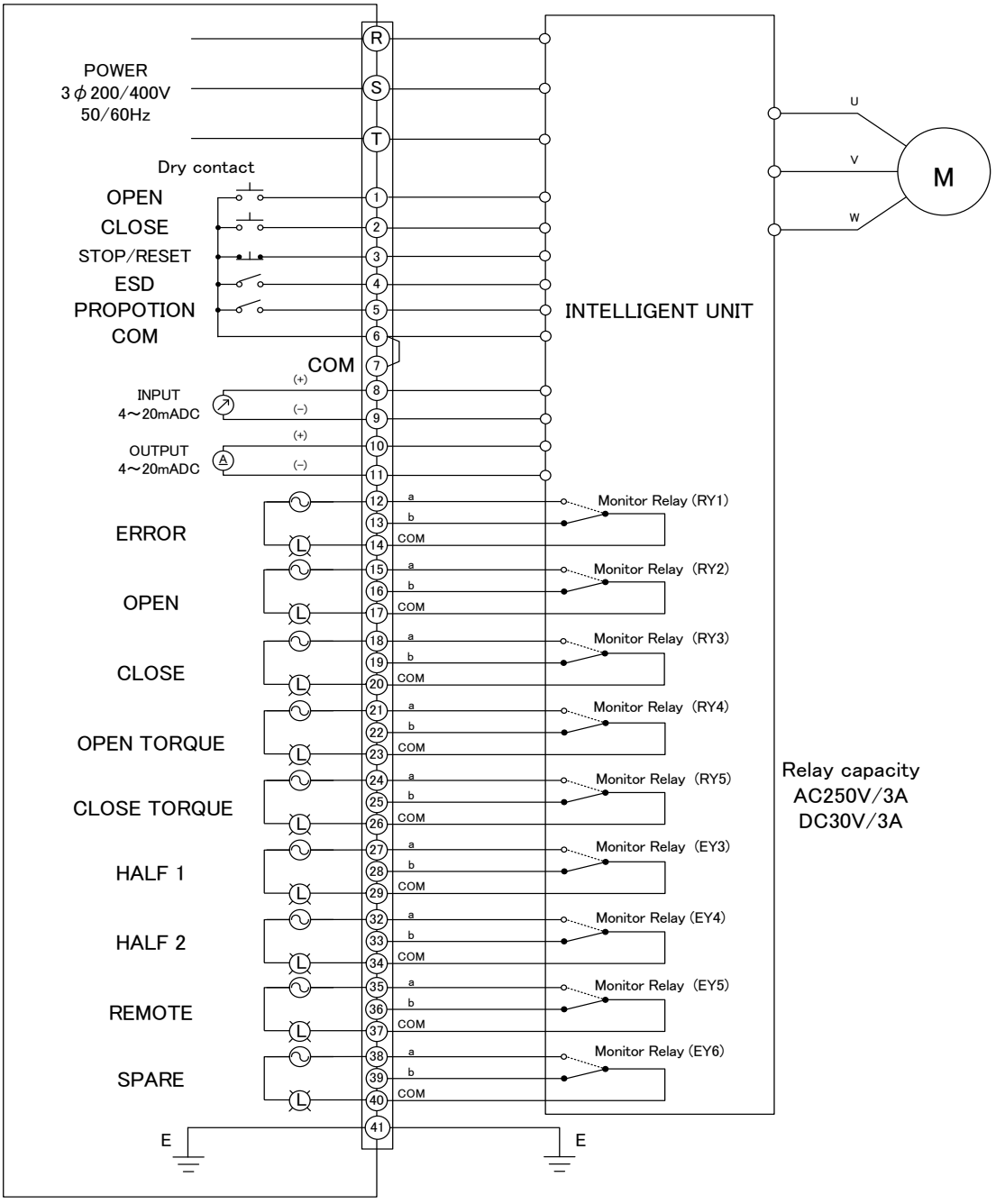
SIGNAL	TM NO.	POSITION			
		CLOSE	HF1	HF2	OPEN
OPEN:a	15−17	− − − −	− − − −	− − − −	———
OPEN:b	16−17	———	———	———	− − − −
CLOSE:a	18−20	———	− − − −	− − − −	− − − −
CLOSE:b	19−20	− − − −	———	———	———

——— :CONTACT ON − − − − :CONTACT OFF

SIGNAL	TM NO.	OPERATION
ERROR:a	12−14	When abnormality occurs, the point of contact is turned on.
ERROR:b	13−14	When abnormality occurs, the point of contact is turned off.
OPEN TORQUE:a	21−23	When open direction is over torque,the point of contact is turned on.
OPEN TORQUE:b	22−23	When open direction is over torque,the point of contact is turned off.
CLOSE TORQUE:a	24−26	When close direction is over torque,the point of contact is turned on.
CLOSE TORQUE:b	25−26	When close direction is over torque,the point of contact is turned off.

TERMINAL ARRAY





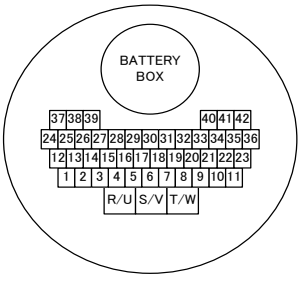
(Reference connection diagram)

SIGNAL	TM NO.	POSITION			
		CLOSE	HF1	HF2	OPEN
OPEN:a	15−17	− −	− − − −	− − − −	− − − −
OPEN:b	16−17	———	———	———	− − − −
CLOSE:a	18−20	———	− − − −	− − − −	− − − −
CLOSE:b	19−20	− −	———	———	———
HALF 1:a	27−29	− − − −	− − − −	———	———
HALF 1:b	28−29	———	———	− − − −	− − − −
HALF 2:a	32−34	− − − −	− − − −	− − − −	———
HALF 2:b	33−34	———	———	———	− − − −

——— :Contact ON　　− − − − :Contact OFF

SIGNAL	TM NO.	OPERATION
ERROR:a	12−14	When abnormality occurs, the point of contact is turned on.
ERROR:b	13−14	When abnormality occurs, the point of contact is turned off.
OPEN TOQUE:a	21−23	When open direction is over torque,the point of contact is turned on.
OPEN TOQUE:b	22−23	When open direction is over torque,the point of contact is turned off.
CLOSE TORQUE:a	24−26	When close direction is over torque,the point of contact is turned on.
CLOSE TORQUE:b	25−26	When close direction is over torque,the point of contact is turned off.
REMOTE:a	35−37	When the distance is selected, the point of contact is turned on.
REMOTE:b	36−37	When the distance is selected, the point of contact is turned off.

TERMINAL ARRAY



図名 TITLE	Connecting Diagram	REV.
形式 TYPE	Semflex-VM-AS-R1PS	
図番 DWG. NO.	3M01096	
尺度 SCALE		
日付 DATE	'17.12.22	
製図 DWN.	Nakahama	
照査 CKD.	−	
承認 APP.	MORI	
単位 UNIT	mm	
三角法 3RD ANG.PROJ.		

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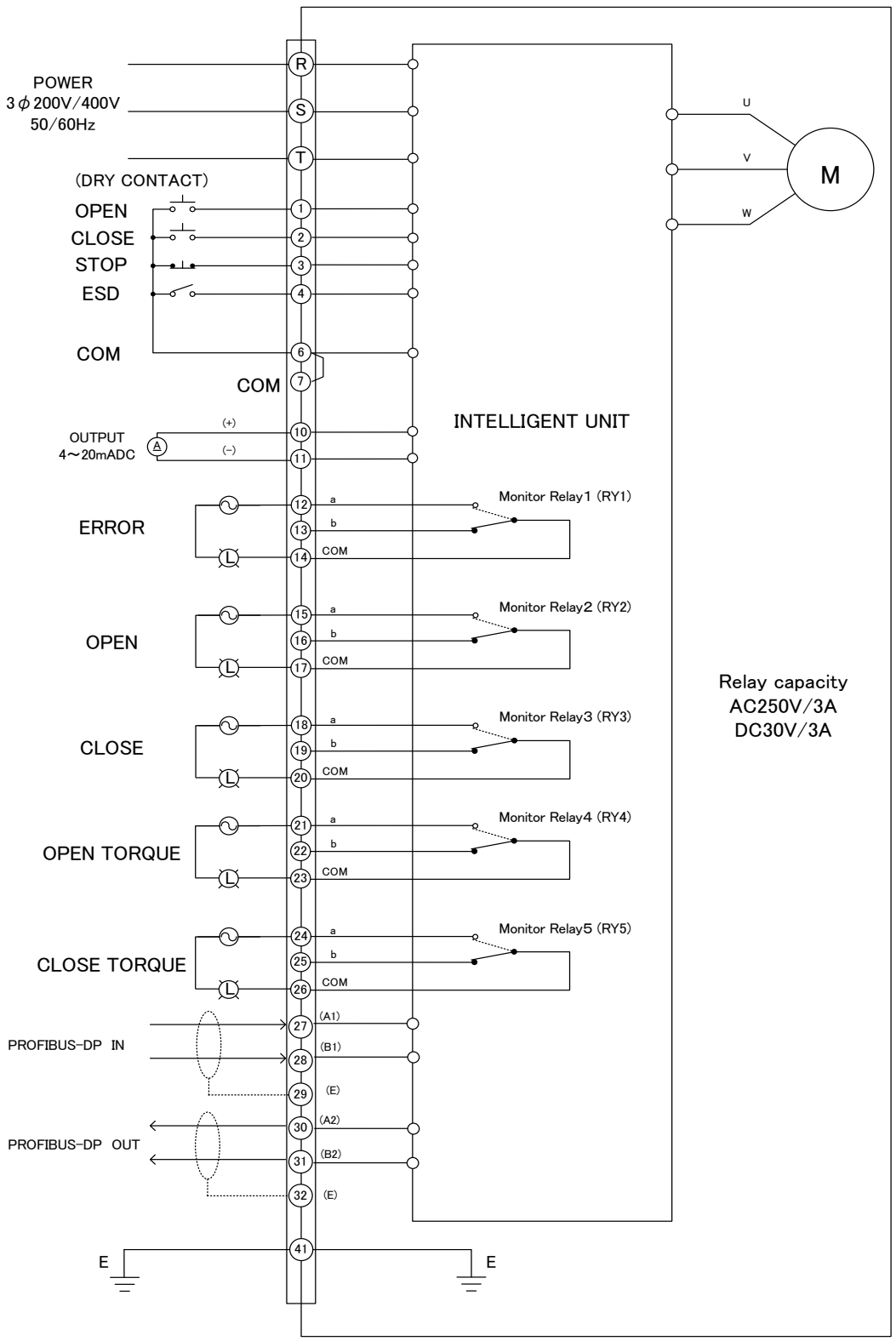
改訂 REV.	日付 DATE	氏名 DWN.	承認 APP.	内容 DESCRIPTION



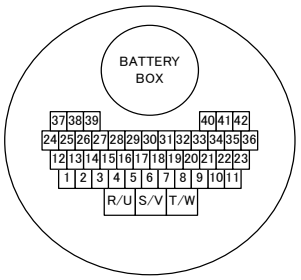
(Semflex-VM)

SIGNAL	TM NO.	POSITION			
		CLOSE	HF1	HF2	OPEN
OPEN:a	15−17	– –	– –	– –	———
OPEN:b	16−17	———	———	———	– –
CLOSE:a	18−20	———	– –	– –	– –
CLOSE:b	19−20	– –	———	———	———

——— :CONTACT ON – – – – :CONTACT OFF

SIGNAL	TM NO.	OPERATION
ERROR:a	12−14	When abnormality occurs, the point of contact is turned on.
ERROR:b	13−14	When abnormality occurs, the point of contact is turned off.
OPEN TORQUE:a	21−23	When open direction is over torque,the point of contact is turned on.
OPEN TORQUE:b	22−23	When open direction is over torque,the point of contact is turned off.
CLOSE TORQUE:a	24−26	When close direction is over torque,the point of contact is turned on.
CLOSE TORQUE:b	25−26	When close direction is over torque,the point of contact is turned off.

TERMINAL ARRAY



図名 TITLE	Wiring Diagram
形式 TYPE	Semflex-VM
図番 DWG. NO.	3M01239
REV.	
尺度 SCALE	≠
日付 DATE	'19.04.11
製図 DWN.	Kawamoto
照査 CKD.	—
承認 APP.	Mori
単位 UNIT	mm
第三角法 3RD.ANG.PROJ.	⊟
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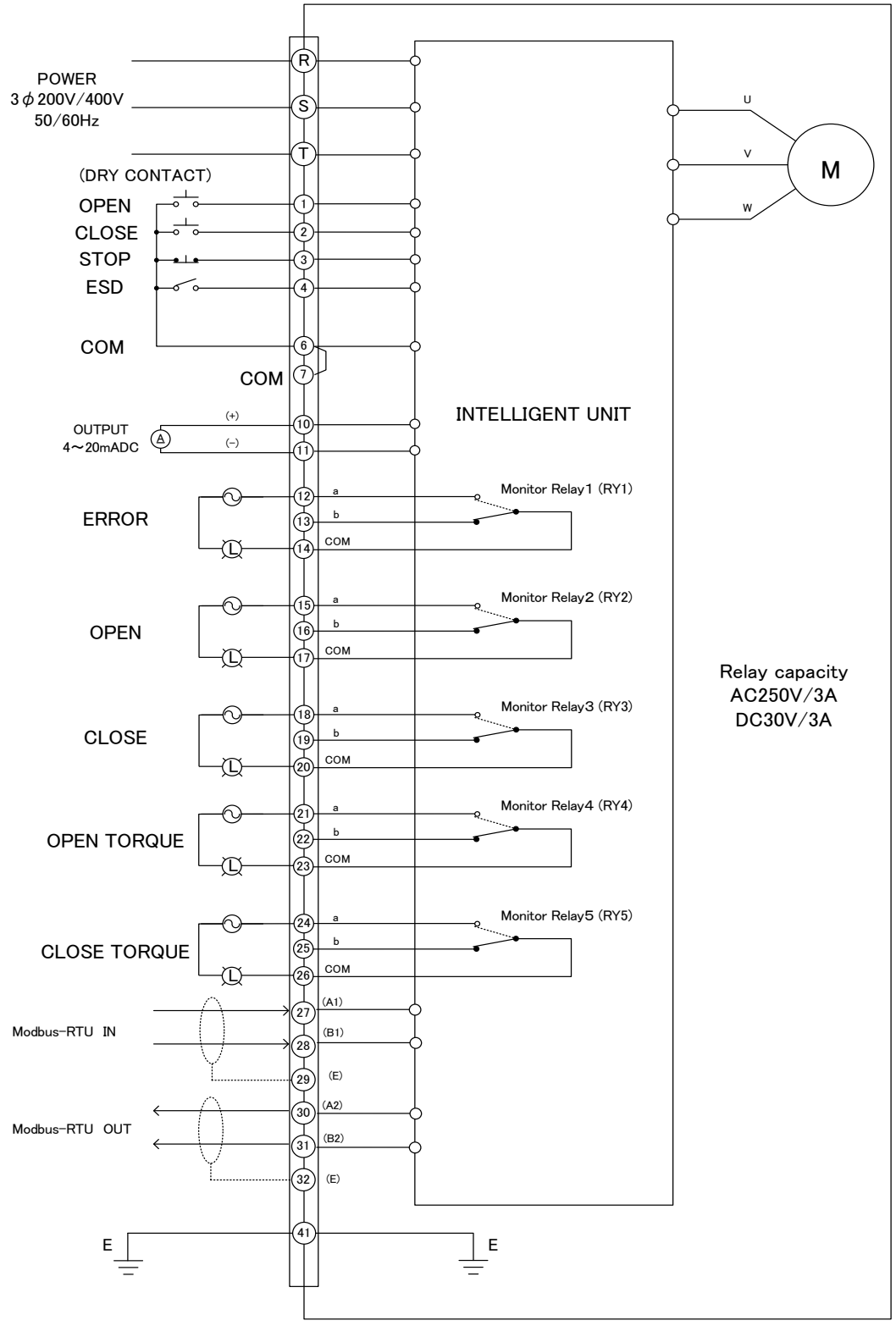
REV.	改訂	日付 DATE	氏名 DWN.	承認 APP.	内容 DESCRIPTION

Preliminaly version

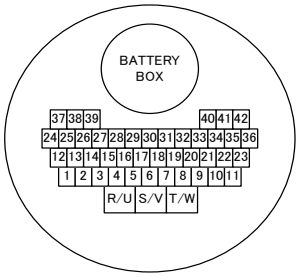


SIGNAL	TM NO.	POSITION			
		CLOSE	HF1	HF2	OPEN
OPEN:a	15−17	– – –	– – –	– – –	———
OPEN:b	16−17	———	———	———	– – –
CLOSE:a	18−20	———	– – –	– – –	– – –
CLOSE:b	19−20	– – –	———	———	———

——— :CONTACT ON – – – – :CONTACT OFF

SIGNAL	TM NO.	OPERATION
ERROR:a	12−14	When abnormality occurs, the point of contact is turned on.
ERROR:b	13−14	When abnormality occurs, the point of contact is turned off.
OPEN TORQUE:a	21−23	When open direction is over torque,the point of contact is turned on.
OPEN TORQUE:b	22−23	When open direction is over torque,the point of contact is turned off.
CLOSE TORQUE:a	24−26	When close direction is over torque,the point of contact is turned on.
CLOSE TORQUE:b	25−26	When close direction is over torque,the point of contact is turned off.

TERMINAL ARRAY



図名 TITLE	Wiring Diagram
形式 TYPE	Semflex-VM
図番 DWG. NO.	3M01238
REV.	
尺度 SCALE	—
日付 DATE	'19.04.11
製図 DWN.	Kawamoto
照査 CKD.	—
承認 APP.	Mori
単位 UNIT	mm
第三角法 3RD. ANG. PROJ.	
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改訂 REV.	日付 DATE	氏名 DWN.	承認 APP.	内容 DESCRIPTION

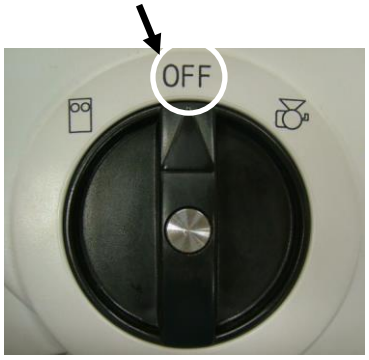
Preliminaly version

● Initial Operation

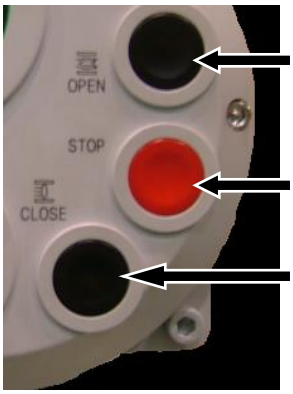
* Precautions

● Before turning the power supply on, make sure that the selecting switch is turned to OFF, the push button switches are not pressed, and the externally-provided operating switches are not being set.

Operation mode OFF selected



Selecting Switch



OPEN button

STOP button

CLOSE button

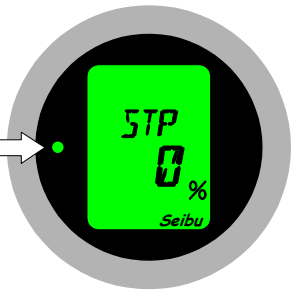
Push button switches

(Check after the power supply is turned on.)

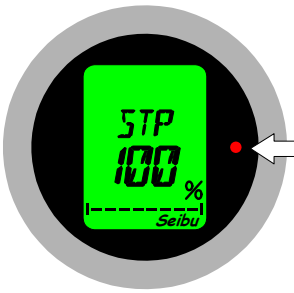
Confirm that when the power supply is turned on, the indicator window display is lit in green, and shows “STP xx%”. When the power is turned on, green lamp will light if the valve is at the fully closed position, red lamp will light if it is at the fully open position, and orange lamp will light if an error occurs.

<u>* Refer to “Error Indications (from page 54)” for the error descriptions and troubleshooting.</u>

Green lamp



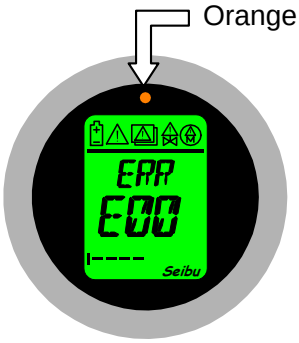
Fully-closed position indication (green light ON)



Red lamp

Fully-opened position indication (red light ON)

Orange lamp



Error indication (orange light ON)

● Check Operation of the Actuator Only

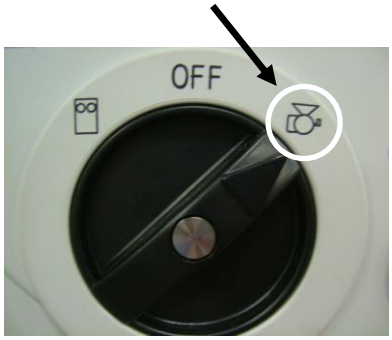
* Precautions

- ○ CLOSE cannot be done while opening movement is in progress. Stop the movement before performing CLOSE.
- ○ OPEN cannot be done while closing movement is in progress. Stop the movement before performing OPEN.
- ○ Movement stops when operation mode is changed with the selecting switch during opening or closing.
- ○ Do not touch the output shaft section during opening or closing. Failure to observe this precaution may result in an accident.
- ○ Holding circuits are used for opening and closing operations by the actuator with both local and remote operation modes.

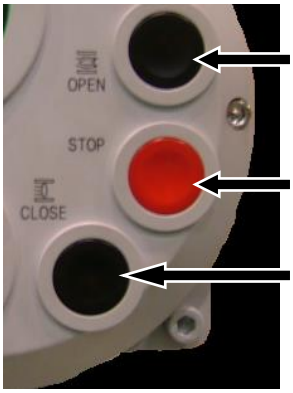
(1) Operating in LOCAL Operation Mode [Models with self-holding function for OPEN/CLOSE (standard type)]

Turn the selecting switch to LOCAL operation mode.

LOCAL operation mode selected



Selecting Switch



OPEN button

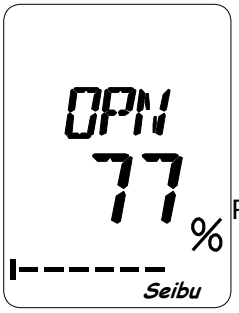
STOP button

CLOSE button

Push button switches

[OPEN]

When the OPEN button is pressed, the actuator works to open the valve. “OPN ##%” will be shown on the display during opening and the completed percent (%) of the opening process will be shown. The movement will stop when the fully-opened position is reached, and the display shows “STP 100%.” At this time, confirm that the red lamp, which indicates the fully-opened position, lights on the right side of the display.



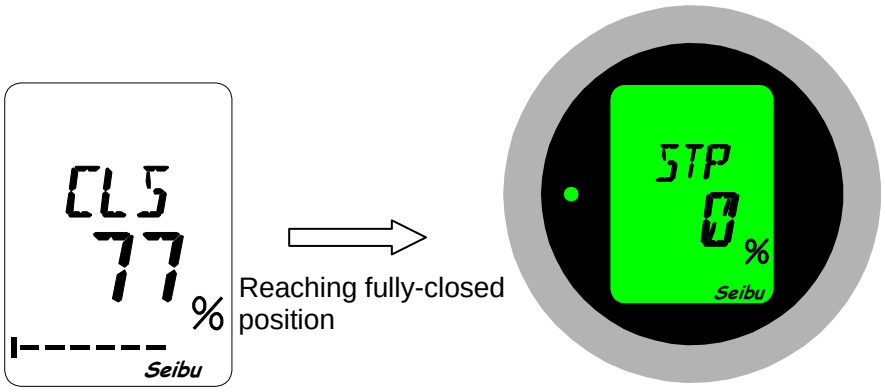
Reaching fully-opened position

Indicates opening

Indicates stopped (fully-opened position)

[CLOSE]

When the CLOSE button is pressed, the actuator works to close the valve. “CLS xx%” will be shown on the display during closing and the completed percent (%) of the opening process will be shown. The movement will stop when the fully-closed position is reached, and the display shows “STP 0%.” At this time, confirm that the green lamp, which indicates the fully-closed position, is lit on the left side of the display.

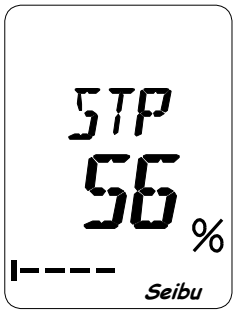


Indicates closing

Indicates stopped (fully-closed position)

[STOP]

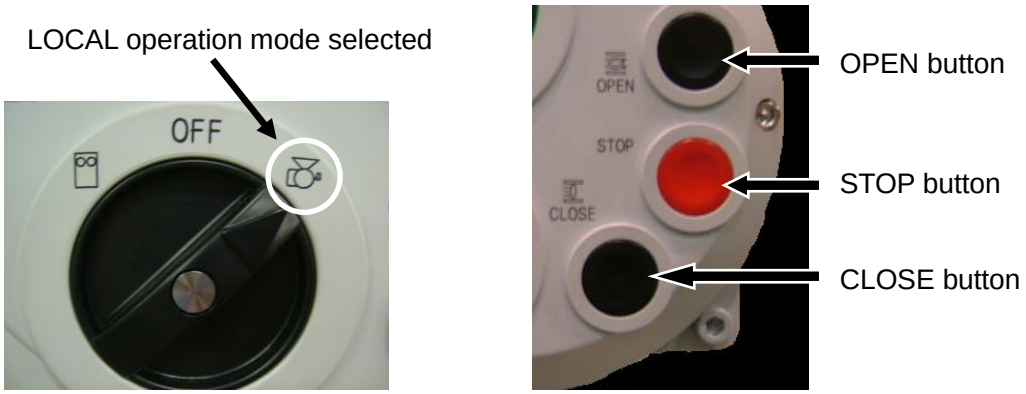
When the STOP button is pressed during opening or closing, the movement will stop and the completed percent (%) of the opening at the time of stopping will be shown on the display.



Indicates stopped

(2) Operating in LOCAL Operation Mode [Models without self-holding function for OPEN/CLOSE (inching operation)]

Turn the selecting switch to local operation mode.

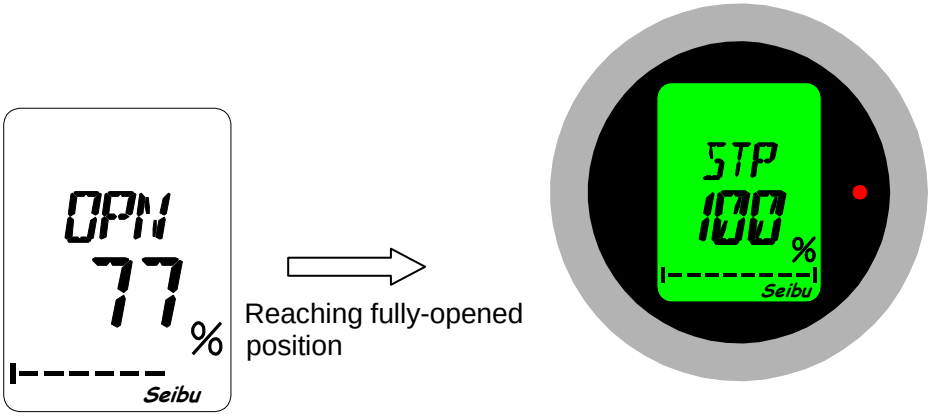


Selecting Switch　　Push button switches

[OPEN]

With the inching operation type, the actuator works to open the valve while the OPEN button is held down. The opening operation stops when the OPEN button is released or when the STOP button is pressed.

“OPN xx%” will be shown on the display during opening and the completed percent (%) of the opening process will be shown. The movement will stop when the fully-opened position has been reached, and the display will show “STP 100%.” At this time, confirm that the red lamp, which indicates the fully-opened position, is lit on the right side of the display.

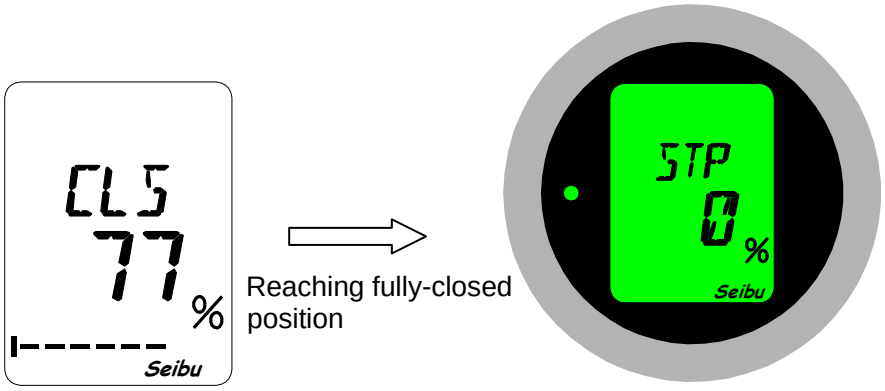


Indicates opening　　Indicates stopped (fully-opened position)

[CLOSE]

With the inching operation type, the actuator works to close the valve while the CLOSE button is held down. The closing operation stops when the CLOSE button is released or when the STOP button is pressed.

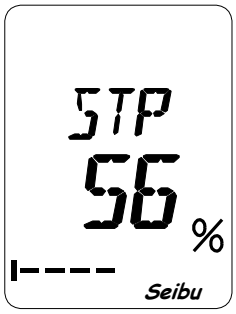
"CLS xx%" will be shown on the display during closing and the completed percent (%) of the opening process will be shown. The movement will stop when the fully-closed position has been reached, and the display will show "STP 0%." At this time, confirm that the red lamp, which indicates the fully-closed position, is lit on the left side of the display.



Indicates closing Indicates stopped (fully-closed position)

[STOP Operation]

When OPEN or CLOSE is stopped or when the STOP button is pressed during OPEN or CLOSE, the movement will stop and opening at the time of stopping will be shown on the display.



Indicates stopped

*Types without self-holding function for OPEN/CLOSE (inching operation)

With the actuator of the inching operation type, OPEN or CLOSE continues only while OPEN or CLOSE button operation is being performed in LOCAL or REMOTE mode. Movement will stop when the OPEN or CLOSE button operation is stopped or when the STOP button is pressed.

1) Even if CLOSE is performed during opening (CLOSE button operation during OPEN operation), or

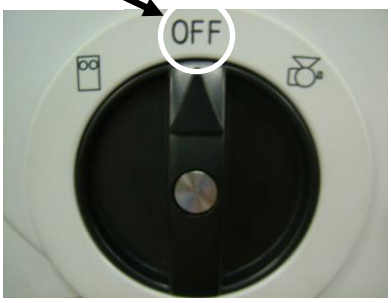
2) Even if OPEN is performed during closing (OPEN button operation during CLOSE operation),

The moving direction will not be reversed due to interlock. However, for the sake of safety, do not perform reverse-action operation (operation 1) or 2)) during opening or closing.

(3) Operation OFF

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

Operation mode OFF selected

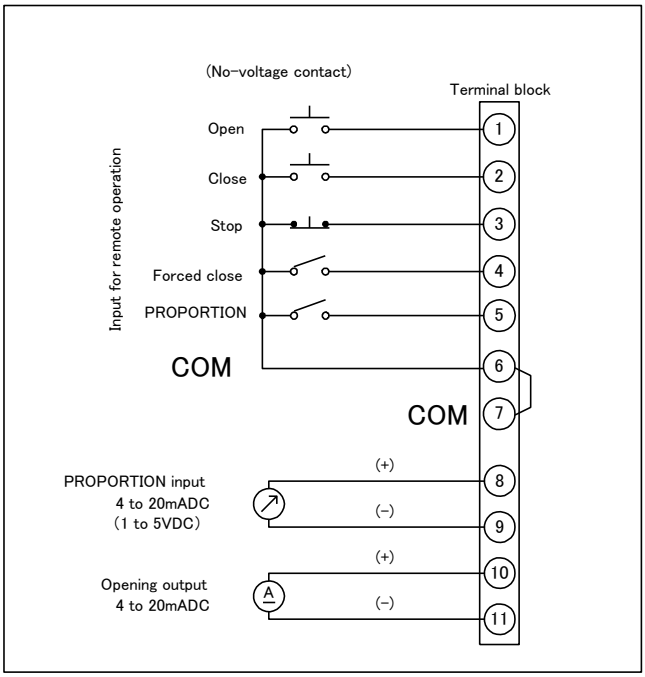


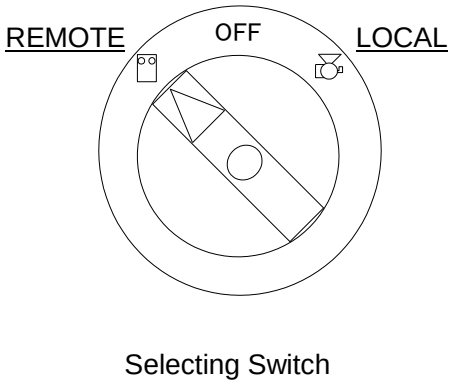
Selecting Switch

● Function of Input Contacts for Remote Operation

To perform remote operation, set the (LOCAL/REMOTE) selecting switch of the actuator to REMOTE.

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





Selecting Switch

Fig.: External Connection Wiring Diagram Reference for Semflex-VM

(a) Open, Close, Stop Contacts:

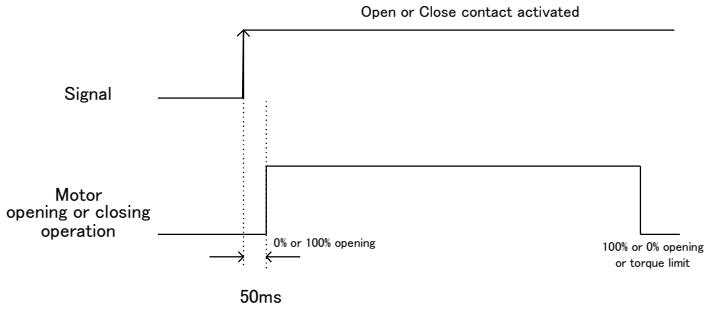
- When the Open contact is short-circuited (terminal No. ①–③–⑥), the actuator works to open the valve.
- The movement stops at the position exceeding the opening-direction POSITION LIMIT or opening-direction TORQUE LIMIT value that has been set.

- When the Close contact is short-circuited (terminal No. ②–③–⑥), the actuator works to close the valve.
- The movement stops at the position exceeding the closing-direction POSITION LIMIT or closing-direction TORQUE LIMIT value that has been set.

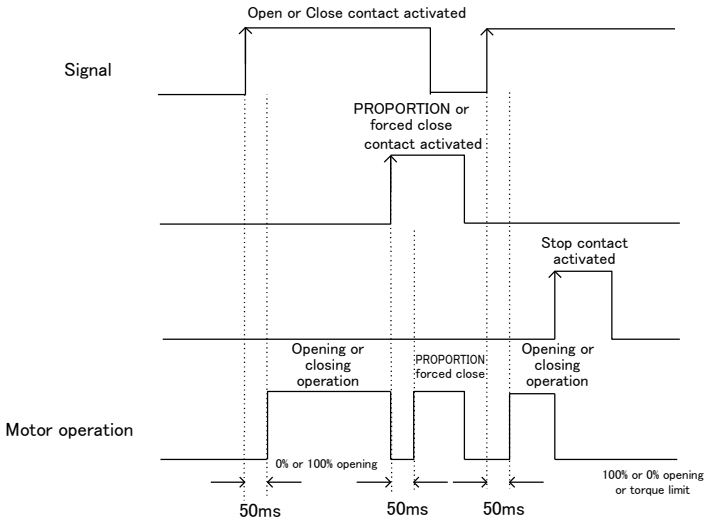
- Movement stops when the Stop contact is opened (terminal No.③–⑥).

Timing Chart (for inverter type only)

①

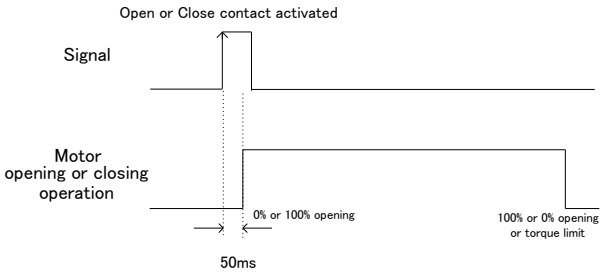


②

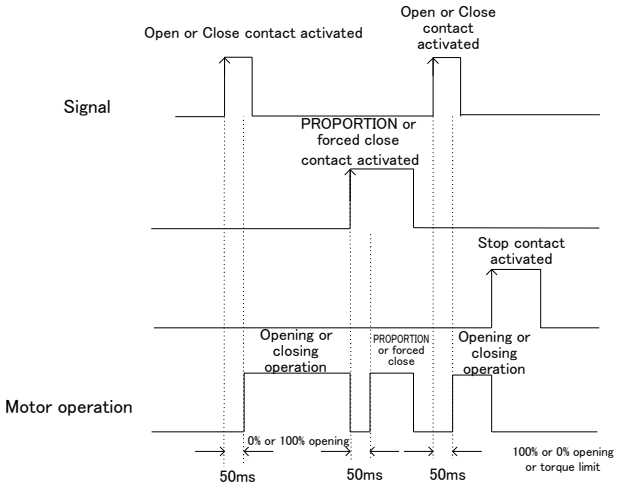


Open and Close contacts with self-holding

③



④



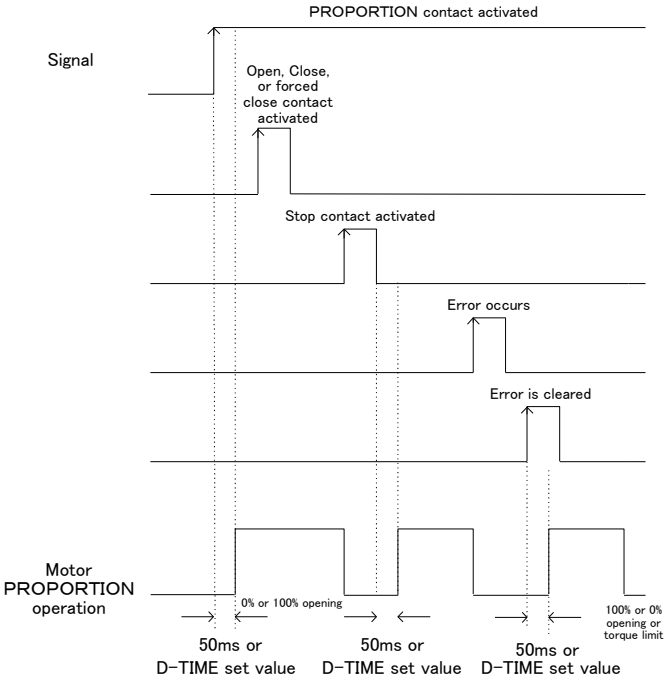
⑤ (b) PROPORTION Contact:

- When the PROPORTION contact is short-circuited (terminal No. ③—⑤—⑥), PROPORTION at 4 mA to 20 mA becomes possible.
- During PROPORTION (while the signal is being transmitted), only the Stop contact is enabled.
- PROPORTION movement is stopped only while the Stop contact is open. When the STOP contact is short-circuited again, the movement restarts toward the target value.
- During PROPORTION movement, the mid-travel stop positions are ignored, and the actuator moves the valve up to the specified position.

* With the inverter type actuator, the speed is changed at mid-travel stop positions. Only the speed will be changed at these positions.

- During PROPORTION movement, the actuator stops in the occurrence of an error. Movement restarts automatically after the error has been cleared.
- The PROPORTION contact is disabled during forced close movement.
- When the actuator stops once during PROPORTION movement, movement will not proceed again until the D-TIME (0.5 sec. minimum) that was set has passed. (Prevention of command chattering and valve hunting)

When PROPORTION contact is activated



(c) Forced Close Contact:

- When the Forced close contact is short-circuited (terminal No. ③—④—⑥), forced closing movement continues to the closed end limit.
- During forced closing, only the Stop contact is enabled.
- Forced closing movement is stopped only while the Stop contact is open. When the Stop contact is short-circuited again, the movement restarts toward the target value.

• During forced closing movement, the mid-travel stop positions are ignored, and the actuator moves the valve up to the specified position.

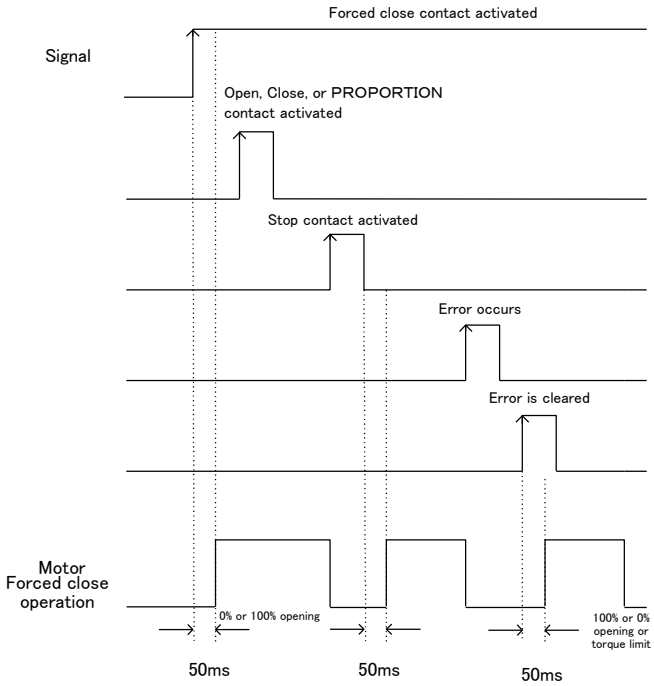
* With the inverter type actuator, the speed is changed at mid-travel stop positions. Only the speed will be changed at these positions.

• During forced closing movement, the actuator stops in the occurrence of an error. Movement restarts automatically after the error is cleared.

• The forced close contact is disabled during PROPORTION movement.

When Forced close contact is activated

⑥



(2) Options for Other Contacts

* For the Open and Close contacts, the option being with or without self-holding can be selected.
With self-holding, movement will continue even if the contact is opened.
Without self-holding, movement will stop when the contact is opened.

* Self-holding function is not available for PROPORTION and Forced close contacts. Movement continues only while the contact is short-circuited.

* The 50 ms dead time is set for contact signals. Contacts can be used if a command signal for greater than 50 ms is input.

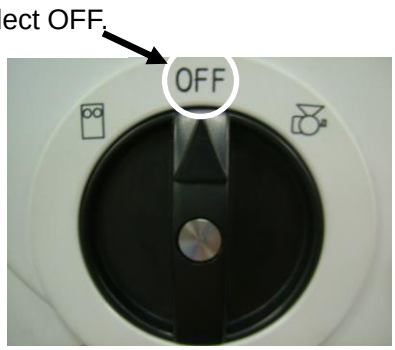
* With or without self-holding, if PROPORTION or Forced close contact is short-circuited during opening or closing movement, PROPORTION or forced close contact are given priority and the opening or closing movement will stop. Even if the PROPORTION or Forced close contact is opened after it was once short-circuited, the actuator does not automatically restart opening or closing.
To restart OPEN or CLOSE, the Open or Close contact must be short-circuited again.

*** When the operation mode is switched from manual to electric or on other such occasions, there may be some delay in the actuator movement relative to motor movement depending on the drive section conditions.**

●User-specific Settings

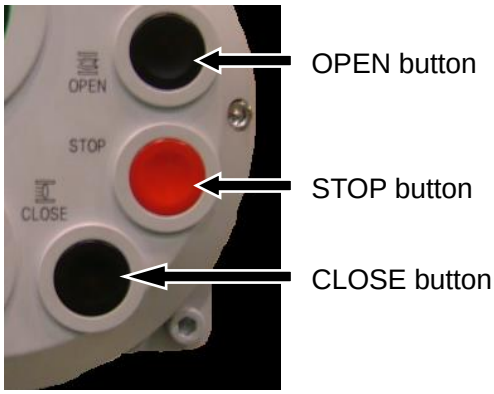
(1) How to Start User-specific Setting Mode

1) Turn the selecting switch to OFF.



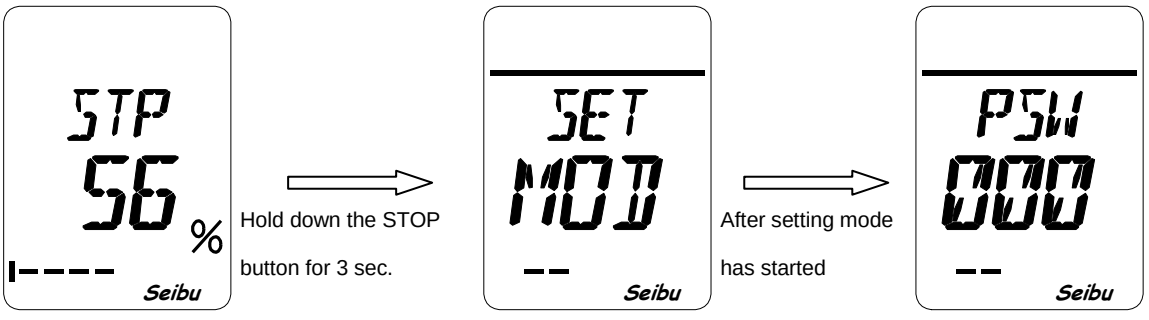
Selecting Switch

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



Push button switches

.



Indicates stopped Setting Mode Start screen Password Entry screen

(2) Password Entry Screen Operation *The set value before shipment is 000 (three zeros).

[1] Input the first character (left digit) of the three-digit code.

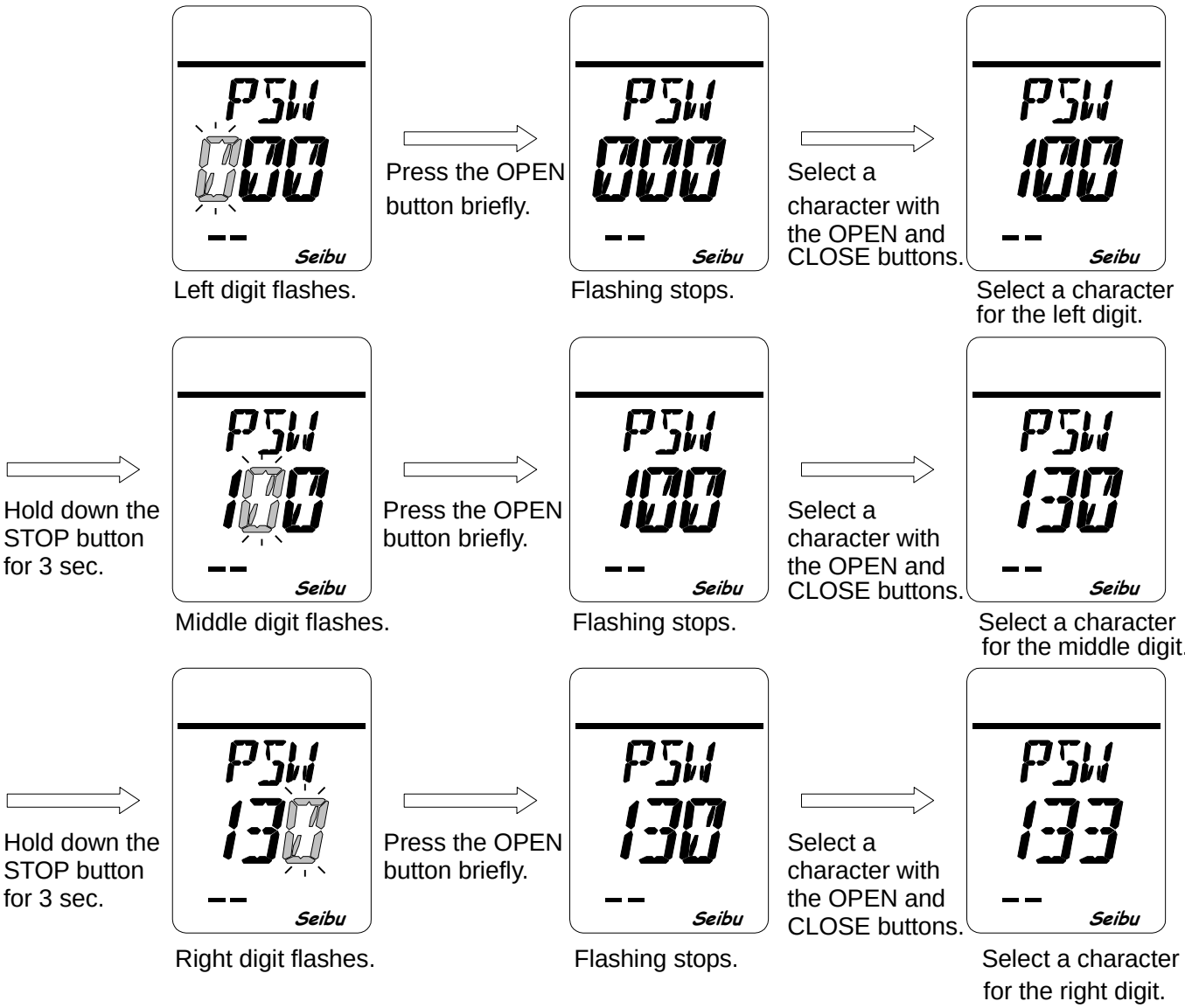
1) While the left digit is flashing, press the OPEN button briefly.
2) When that flashing has stopped, choose a character by using the OPEN and CLOSE buttons. Then hold down the STOP button for 3 seconds.
3) When the input of the first character input is completed, the middle digit will start flashing to allow input of the second character.

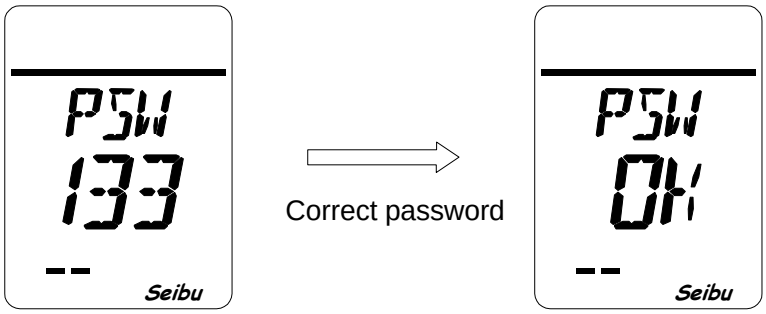
[2] Input the second character (middle digit).

1) While the middle digit is flashing, press the OPEN button briefly.
2) When that flashing has stopped, choose a character by using the OPEN and CLOSE buttons. Then hold down the STOP button for 3 seconds.
3) When the second character input is completed, the right digit will start flashing to allow input of the third character.

[3] Input the third character (right digit).

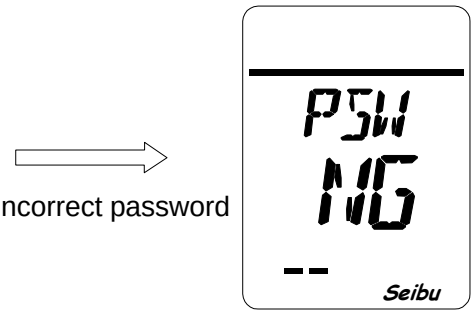
1) While the right digit is flashing, press the OPEN button briefly.
2) When that flashing has stopped, choose a character by using the OPEN and CLOSE buttons. Then hold down the STOP button for 3 seconds.
3) When the right-digit input is completed and the entered password is verified, the setting mode begins.





If the entered password is verified, “PSW OK” appears and the setting mode begins.

Press STOP for 3 sec. after entering the 3-digit password, and verification result will be shown.



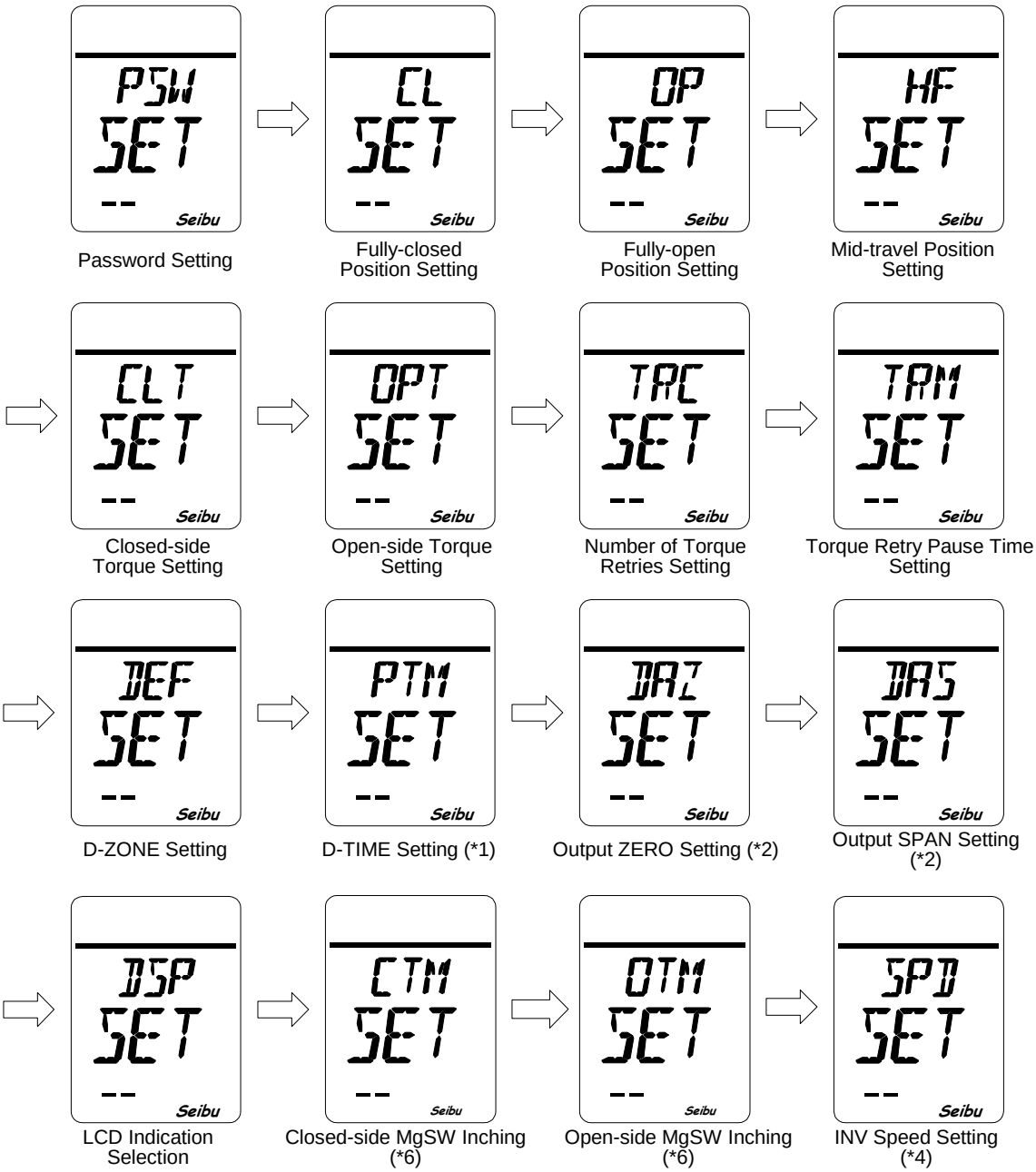
If the entered password is not verified, “PSW NG” is shown and the screen returns to the Password Entry screen.

(Password entry operation)

i) Characters for input can be chosen from 36 alphanumeric characters (0 to 9 and A to Z).
ii) Flashing digit is enabled for input.
iii) When the OPEN or CLOSE buttons are pressed while a character is flashing, the flashing stops.
iv) Character can be changed by pressing the OPEN button (set value changes in ascending order from 0 toward 9 and from A toward Z) and CLOSE button (set value changes in descending order from 9 toward 0 and from Z toward A).
v) When the STOP button is held down for 3 seconds, the input for that digit is completed, and the next digit becomes ready for input.
<u>* While the character is flashing, the input cannot be completed.</u>
vi) When the 3-digit password is entered and verified, “PSW OK” will be shown, and the screen changes to the Setting Mode screen (refer to page 22). If the entered password is incorrect, “PSW NG” will appear, and the screen returns to the Password Entry screen.
vii) To change the password, refer to “How to Set Password” on page 25.

(3) User-specific Setting Mode Item List

- Every time the OPEN button is pressed, the setting screen changes in the order shown below. Every time the CLOSE button is pressed, the screen changes in the reverse order.



Password Setting

Fully-closed Position Setting

Fully-open Position Setting

Mid-travel Position Setting

Closed-side Torque Setting

Open-side Torque Setting

Number of Torque Retries Setting

Torque Retry Pause Time Setting

D-ZONE Setting

D-TIME Setting (*1)

Output ZERO Setting (*2)

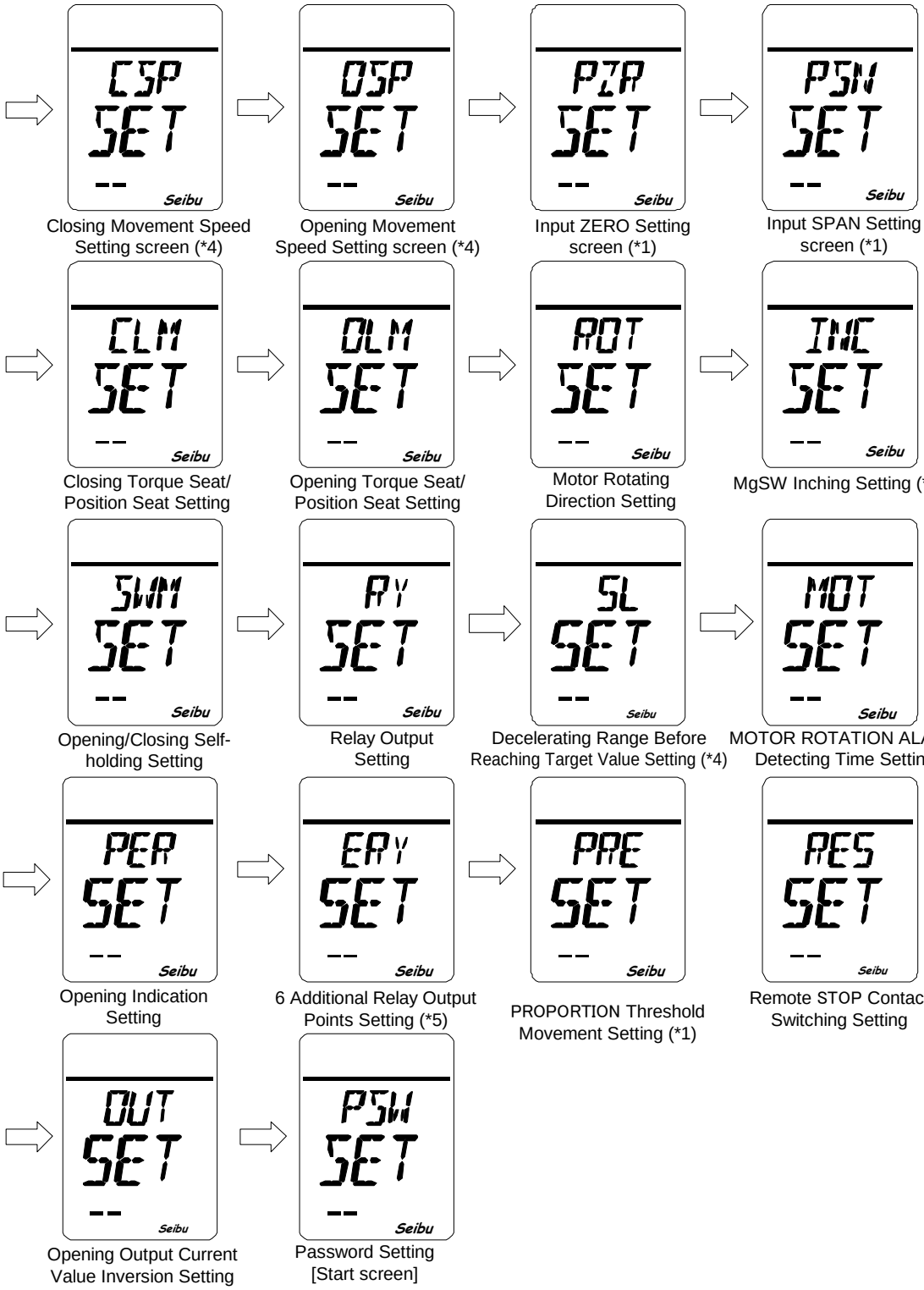
Output SPAN Setting (*2)

LCD Indication Selection

Closed-side MgSW Inching (*6)

Open-side MgSW Inching (*6)

INV Speed Setting (*4)



* However, (*1) to (*6) setting modes may be shown and enabled only for the following types:
  - (*1) with PROPORTION function
  - (*2) with analog output function
  - (*3) MgSW drive
  - (*4) inverter drive
  - (*5) with 6 additional relay output points
  - (*6) MgSW drive + INC (when set value is INC)

(4) User-specific Setting Mode

- The user-specific setting mode is provided to allow for setting or adjusting those functions that do not affect the basic performance of the actuator.
- During setting mode, “ ▬▬▬▬▬ “ will be shown on the upper part of the display.
- When the LOCAL/REMOTE selecting switch is turned to LOCAL or REMOTE during setting mode, setting mode will end.
- When the switching operation has not been performed 5 minutes or longer during setting mode, setting mode will automatically end.
- Data for the setting operation that has not been processed before the end of setting mode will not be saved.

(5) User-specific Setting Operation

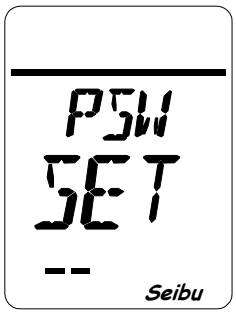
How to Set Password

- Hold down the STOP button for 3 seconds on the Password Setting screen (LCD indication “PSW SET”), and the password setting mode will start.

[Setting operation]

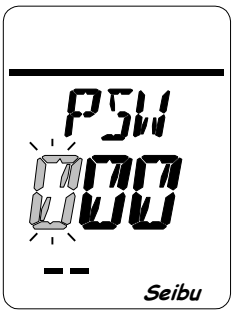
Input a three-digit code of alphanumeric characters (0 to 9, A to Z), one at a time in the digit that is flashing. After the last third character is selected, hold down the STOP button for 3 seconds, which completes password setting.

Press the OPEN button: Changes alphanumeric character in ascending order from 0 to 9 and from A to Z.
Press the CLOSE button: Changes alphanumeric character in descending order from 9 to 0 and from Z to A.
Hold down the STOP button for 3 seconds: Finalizes the entered character for the current digit.



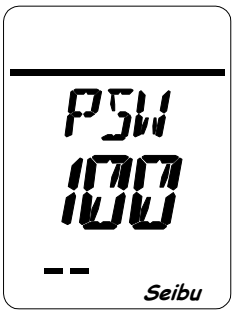
Password Setting screen

Hold down the STOP button for 3 sec.



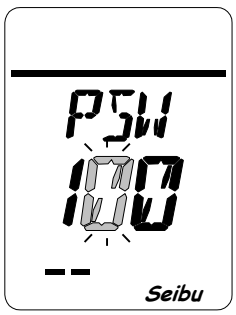
Left digit flashes.

Select a character with the OPEN and CLOSE buttons.



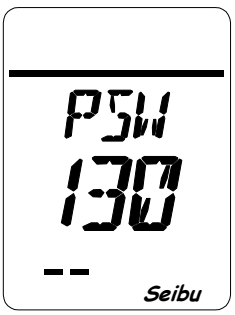
Select a character for the left digit.

Hold down the STOP button for 3 sec.



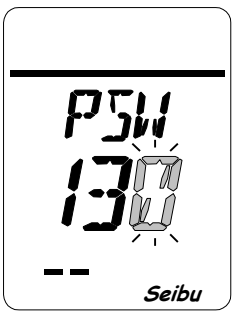
Middle digit flashes.

Select a character with the OPEN and CLOSE buttons.



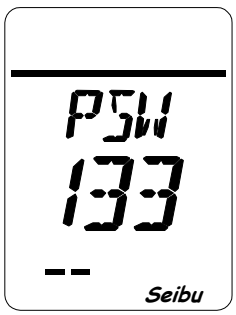
Select a character for the middle digit.

Select a character with the OPEN and CLOSE buttons.



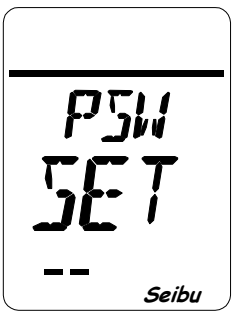
Right digit flashes.

Select a character with the OPEN and CLOSE buttons.



Select a character for the right digit.

Hold down the STOP button for 3 sec.



Upon setting completion, the display returns to the Setting screen.

* <u>When the password is changed, be sure not to forget the new password.</u>

How to Set Fully-closed Position

- Hold down the STOP button for 3 seconds on the Fully-closed Position Setting screen (LCD indication “CL SET”), and the fully-closed position setting mode will start.

[Setting operation]

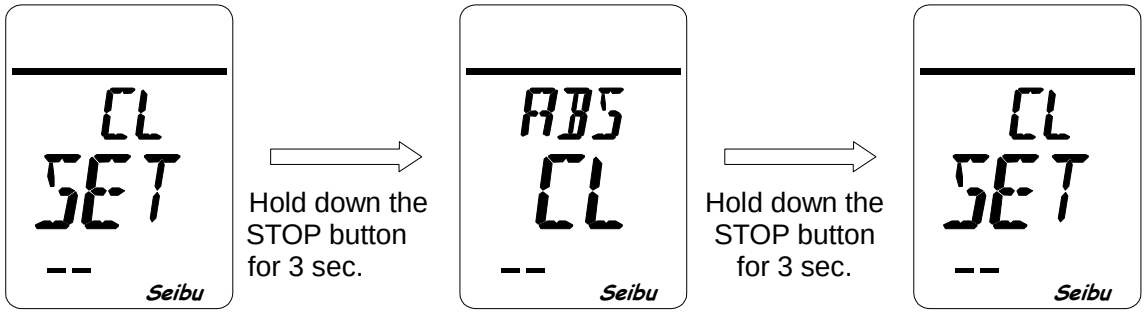
Move the valve to the fully-closed position by motor drive operation or manual operation on the operation panel on the Fully-closed Position Setting Mode screen (LCD indication: “ABS CL”). Then, hold down the STOP button for 3 seconds to complete the setting operation.

Press the OPEN button: Rotates the motor in the forward direction (When REV is selected, motor rotates in the reverse direction.)

Press the CLOSE button: Rotates the motor in the reverse direction (When REV is selected, motor rotates in the forward direction.)

Press the STOP button briefly: Stops the motor.

Hold down the STOP button for 3 seconds: Saves the entered fully-closed position.



Fully-closed Position Setting screen

Manually (panel operation) or electrically bring the valve to fully-closed position.

Upon completion of setting operation, the display returns to Fully-closed Position Setting screen.

How to Set Fully-opened Position

- Hold down the STOP button for 3 seconds on the Fully-opened Position Setting screen (LCD indication “OP SET”), and the fully-opened position setting mode will start.

[Setting operation]

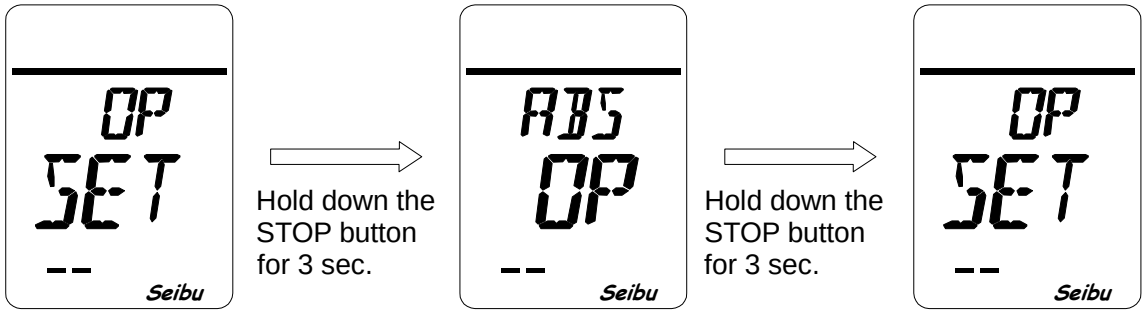
Move the valve to the fully-opened position by motor drive operation or manual operation on the operation panel on the Fully-opened Position Setting Mode screen (LCD indication: “ABS OP”). Then, hold down the STOP button for 3 seconds to complete the setting operation.

Press the OPEN button: Rotates the motor in the forward direction (When REV is selected, motor rotates in the reverse direction.)

Press the CLOSE button: Rotates the motor in the reverse direction (When REV is selected, motor rotates in the forward direction.)

Press the STOP button briefly: Stops the motor.

Hold down the STOP button for 3 seconds: Saves the entered fully-opened position.



Fully-opened Position Setting screen

Manually (panel operation) or electrically move the valve to fully-opened position.

Upon setting completion, the display returns to the Setting screen.

How to Set Mid-travel Positions

- Hold down the STOP button for 3 seconds on the Mid-travel Position Setting screen (LCD indication “HF SET”), and mid-travel position setting mode will start.

[Pause time set value]

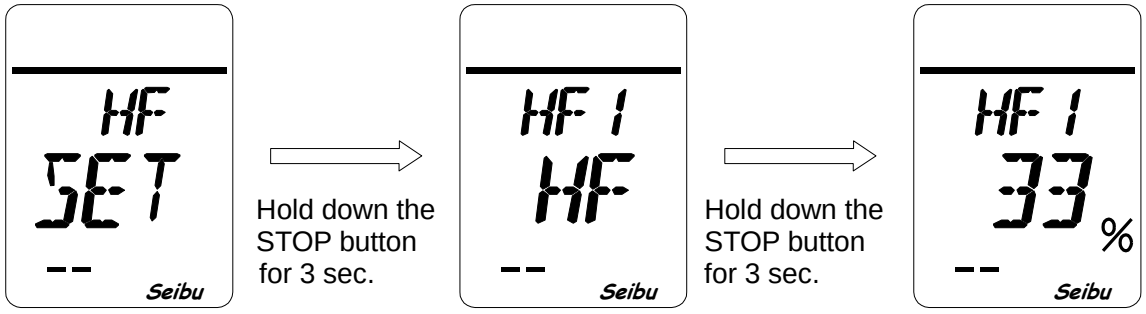
i) Set value = 0: Only speed is changed at the set mid-travel position without pausing.
ii) Set value = 1 to 20: Movement pauses only for the period of set value (1 to 20 sec.) at the set mid-travel position, and thereafter automatically restarts in the same direction as before pausing.
iii) Set value = 21: Movement pauses at the set mid-travel position, and does not restart until the next signal is input.

[Setting procedure]

1) Select the mid-travel position to be set from 1 to 4 (HF 1 to 4) on the Mid-travel Position Setting Mode screen (LCD indication: “HF# HF”) and hold down the STOP button for 3 seconds.
2) The Mid-travel Position Opening Setting screen (LCD indication: “HF# xx%”) will be shown.
3) Select the opening (0 to 100%) at the selected mid-travel position on the Opening Setting screen and hold down the STOP button for 3 seconds.
4) The Mid-travel Position Pause Time Setting screen (LCD indication: “RT# xx”) will be shown.
5) Set the pause time (0 to 21 sec.) on the Pause Time Setting screen, and hold down the STOP button for 3 seconds to complete the setting procedure.

[Setting operation]

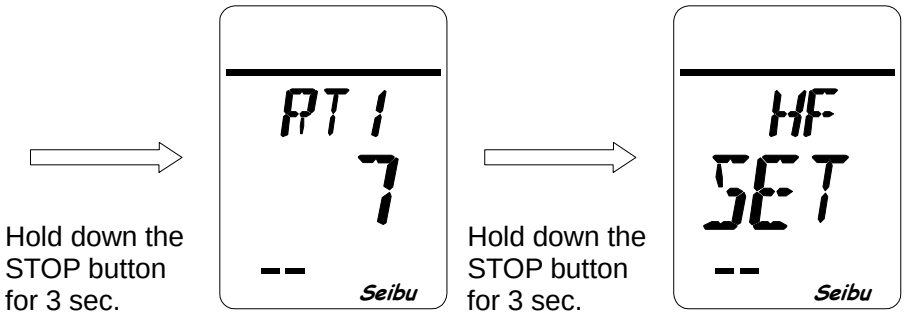
Press the OPEN button: Changes numerical value in ascending order from 0 to 9. (Value increases in high speed while the button is pressed during numerical entry operation.)
Press the CLOSE button: Changes numerical value in descending order from 9 to 0. (Value decreases in high speed while the button is pressed during numerical entry operation.)
Hold down the STOP button for 3 seconds: Saves the entered set value.



Mid-travel Position Setting screen

Select the mid-travel position to be set with the buttons on the operation panel.

Input the opening at the mid-travel position with the buttons on the operation panel.



Input the pause time at the mid-travel position with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

How to Set Closed-side Torque

- Hold down the STOP button for 3 seconds on the Closed-side Torque Setting screen (LCD indication “CLT SET”), and the closed-side torque setting mode will start.

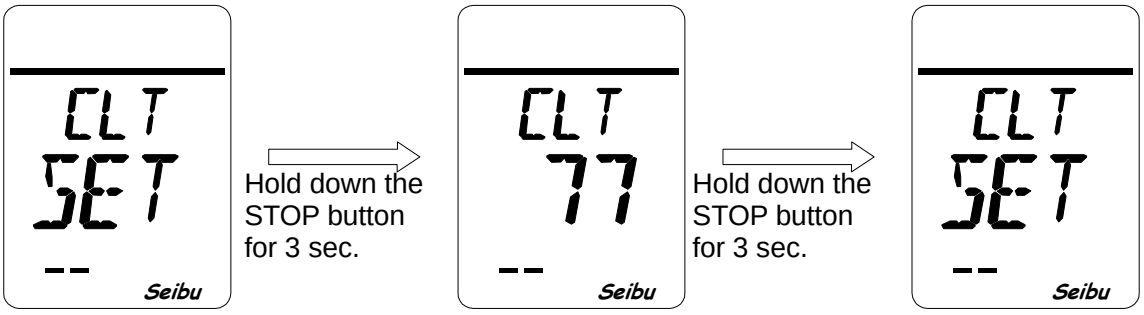
[Closed-side torque set value] *If the max. torque value exceeds 3 digits, the first three numbers will be shown.

i) Setting range = min. torque value to max. torque value: A value within the range of the mini. torque value [Nm] to max. torque value [Nm] can be set.

[Setting operation]

Input the set value of the closed-side torque by using the OPEN and CLOSE buttons on the operation panel on the Closed-side Torque Setting Mode screen (LCD indication: “CLT xx”). Then, hold down the STOP button for 3 seconds to complete the setting operation.

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



Closed-side Torque Setting screen

Input the set value of the closed-side torque with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

How to Set Open-side Torque

- Hold down the STOP button for 3 seconds on the Open-side Torque Setting screen (LCD indication “OPT SET”), and the open-side torque setting mode will start.

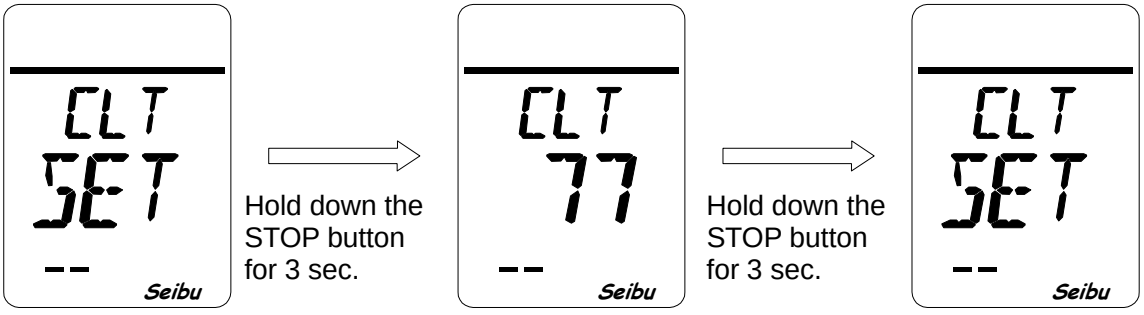
[Open-side torque set value] * If the max. torque value exceeds 3 digits, the first three numbers will be shown.

i) Setting range = min. torque value to max. torque value: A value within the range of the mini. torque value [Nm] to max. torque value [Nm] can be set.

[Setting operation]

Input the set value of the open-side by using the OPEN and CLOSE buttons on the operation panel on the Open-side Torque Setting Mode screen (LCD indication: “OPT xx”). Then, hold down the STOP button for 3 seconds to complete the setting operation.

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



Open-side Torque Setting screen

Input the set value of the open-side torque with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

How to Set Number of Torque Retries

- Hold down the STOP button for 3 seconds on the Number of Torque Retries Setting screen (LCD indication “TRC SET”), and the number of torque retries setting mode will start.

[Number of torque retries set value]

i) Set value = 0 to 5: Sets the number of times the drive will automatically move in the load release direction when the actuator is subjected to any load exceeding the set torque value and automatically move in the load bearing direction when the load is released.

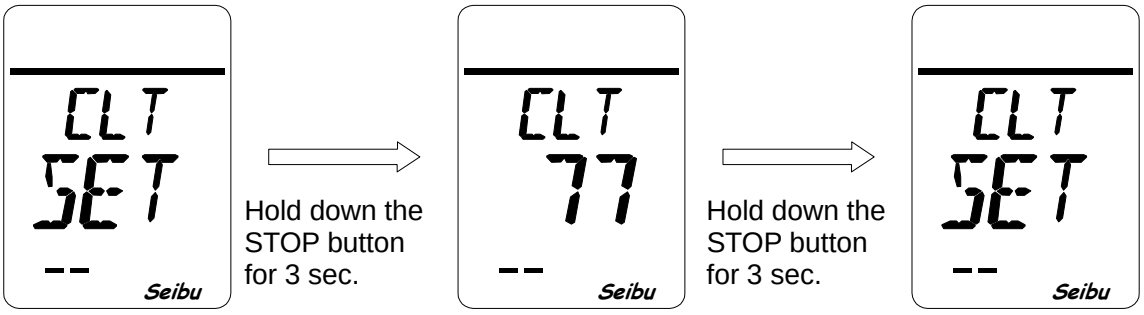
[Setting operation]

Input the set value of the number of torque retries by using the OPEN and CLOSE buttons on the operation panel on the Number of Torque Retries Setting Mode screen (LCD indication: “TRC xx”). Then, hold down the STOP button for 3 seconds to complete the setting operation.

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

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

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



Number of Torque Retries Setting screen

Input the set value of the number or torque retries with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

How to Set Torque Retry Pause Time

- Hold down the STOP button for 3 seconds on the Torque Retry Pause Setting screen (LCD indication “TRM SET”), and the torque retry pause setting mode will start.

[Torque retry pause time set value]

i) Set value＝0 to 5: Sets time (1 to 20 [sec]) to pause when in no torque state during torque retries.

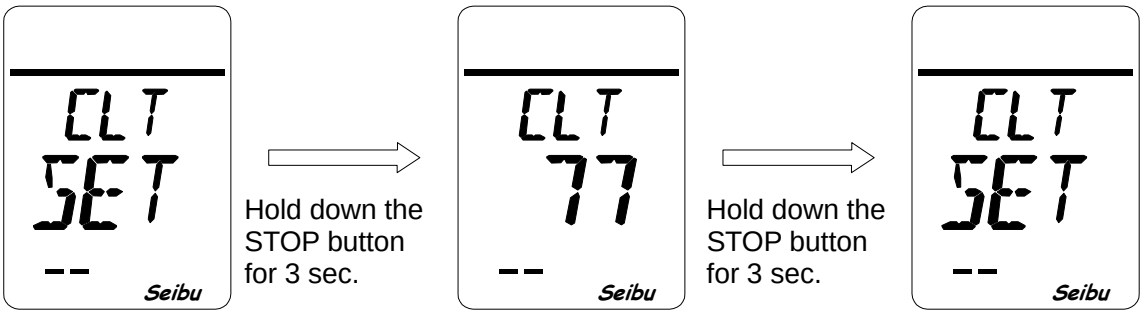
[Setting operation]

Input the set value of the torque retry pause by using the OPEN and CLOSE buttons on the operation panel on the Torque Retry Pause Setting Mode screen (LCD indication: “TRM xx”). Then, hold down the STOP button for 3 seconds to complete the setting operation.

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

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

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



Torque Retry Pause Setting screen

Input the set value of the torque retry pause time with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

How to Set D-ZONE

- Hold down the STOP button for 3 seconds on the D-ZONE Setting screen (LCD indication “DEF SET”), and the D-zone setting mode will start.

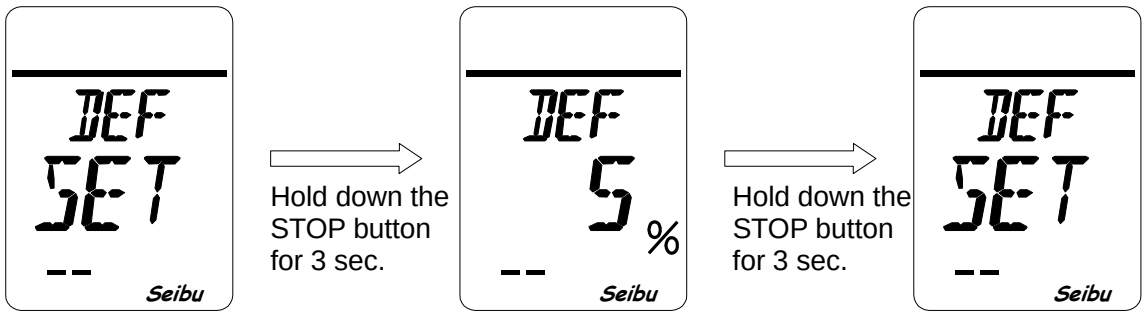
[D-ZONE set value]

i) Set value = 1 to 999: The actuator, operating under the PROPORTION and with the PROFIBUS, stops in the zone of difference (0.01 to 9.99%) from the target opening.

[Setting operation]

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

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



D-ZONE Setting screen

Input the set value of the D-ZONE with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

How to Set D-TIME (*only for models with PROPORTION function)

- Hold down the STOP button for 3 seconds on the D-TIME Setting screen (LCD indication “PTM SET”), and the D-TIME setting mode will start.

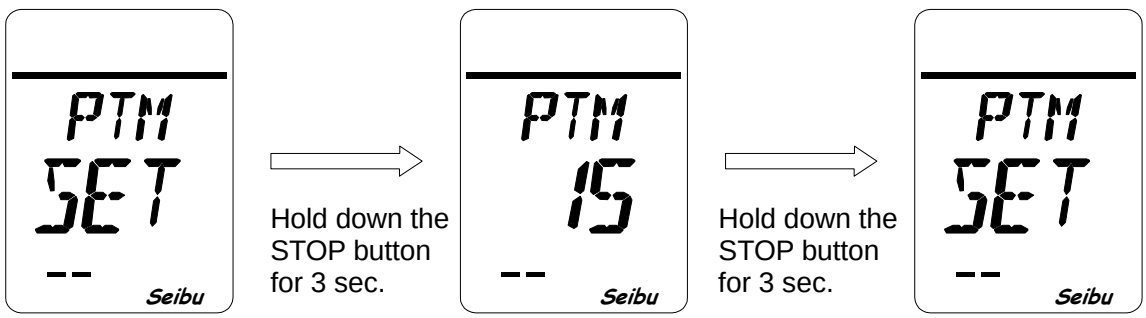
[D-TIME set value]

i) Set value = 5 to 20: An automatic delay before the PROPORTION movement signal is accepted can be set within the range of 0.5 to 2.0 [sec].

[Setting operation]

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

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



D-TIME Setting screen

Input the set value of the D-TIME with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

How to Set Output ZERO (* only for models with analog output function)

- Hold down the STOP button for 3 seconds on the Output ZERO Setting screen (LCD indication “DAZ SET”), and the output ZERO setting mode will start.

[Output ZERO set value]

i) Set value = -10 to 10: The analog output point of 0% opening can be adjusted within the range of -0.8 to 0.8 [mA].

[Setting operation]

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

Press the OPEN button: Changes numerical value in ascending order from 0 to 9.
Press the CLOSE button: Changes numerical value in descending order from 9 to 0.
Press the STOP button briefly: Saves the entered set value.

Output ZERO Setting screen

Input the set value of the output ZERO with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

How to Set Output SPAN (* only for models with analog output function)

- Hold down the STOP button for 3 seconds on the Output SPAN Setting screen (LCD indication “DAS SET”), and the output SPAN setting mode will start.

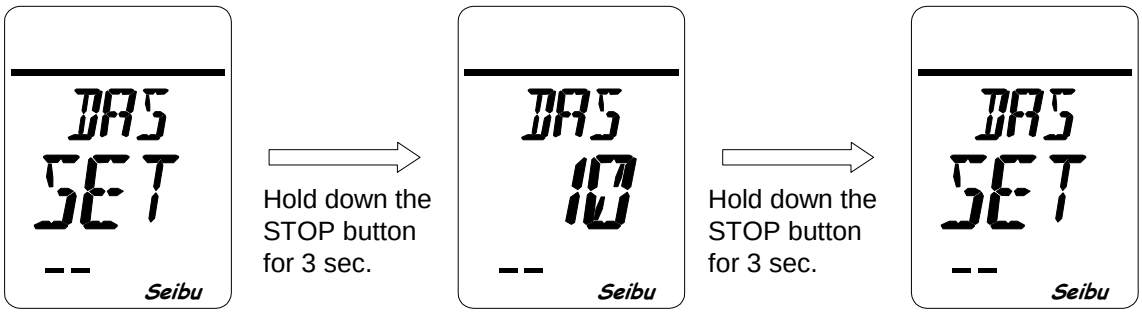
[Output SPAN set value]

i) Set value = -10 to 10: The analog output point of 100% opening can be adjusted within the range of -0.8 to 0.8 [mA].

[Setting operation]

Input the set value of the output SPAN by using the OPEN and CLOSE buttons on the operation panel on the Output SPAN Setting Mode screen (LCD indication: “DAS xx”), Then hold down the STOP button for 3 seconds. To complete the setting operation.

Press the OPEN button: Changes numerical value in ascending order from 0 to 9.
Press the CLOSE button: Changes numerical value in descending order from 9 to 0.
Press the STOP button briefly: Saves the entered set value.



Output SPAN Setting screen

Input the set value of the output SPAN with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

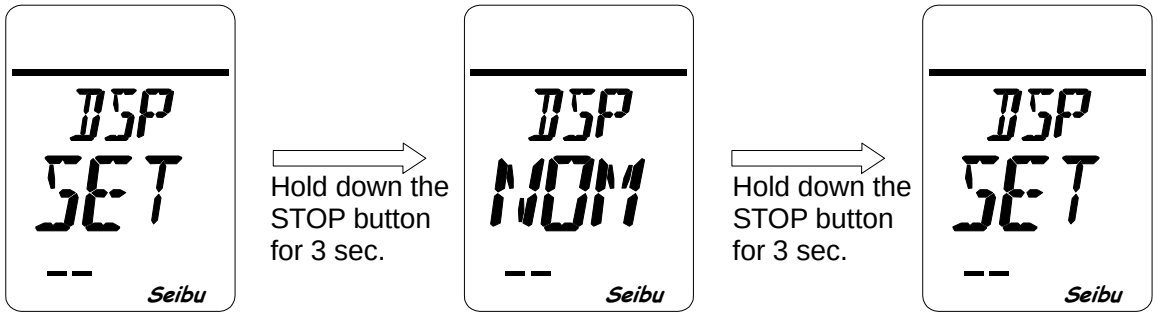
How to Set LCD Indication

- Hold down the STOP button for 3 seconds on the LCD Indication Setting screen (LCD indication “DSP SET”), and the LCD indication setting mode will start.

[Setting operation]

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

Press the OPEN button: Changes readout order from NOM to MNT as shown in LCD indication settings.
Press the CLOSE button: Changes readout order from MNT to NOM as shown in LCD indication settings.
Hold down the STOP button for 3 seconds: Saves the item of LCD indication entered.



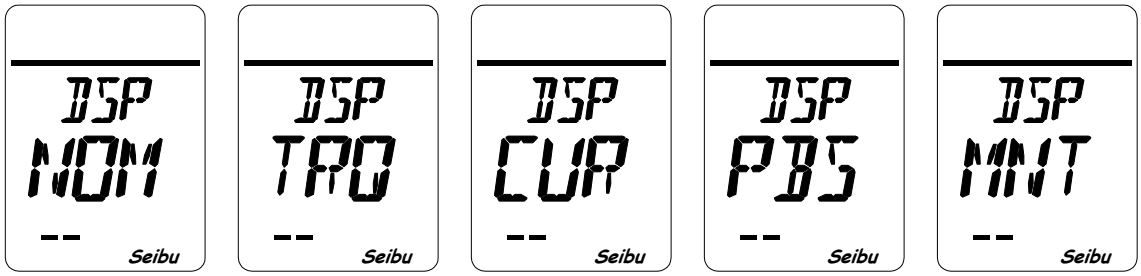
LCD Indication Setting screen

Select the set value of an LCD indicating function with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

[LCD indication settings]

1) NOM: Displays the status of movement on the upper part of the LCD.
2) TRQ: Displays the torque value on the upper part of the LCD (in data value when the torque is 30 to 100% of the allowable specified torque for the actuator model, or in text “LOW” when it is less than 30% of the allowable specified torque).
3) CUR: Displays the electric current of motor on the upper part of the LCD (in the range of 0 to 30.0 A).
4) PBS: Displays data of communication with the PROFI-CARD.
5) MNT: Displays data for maintenance.



Normal indication | Torque indication | Motor current indication | PROFIBUS communication data indication | Data for maintenance indication

How to Set Closing Operation Inching (*only for MgSW drive type + INC when set value is INC)

- Hold down the STOP button for 3 seconds on the Closing Operation Inching Setting screen (LCD indication “CTM SET”), and the closing operation inching setting mode will start.

[Closing operation inching setting]

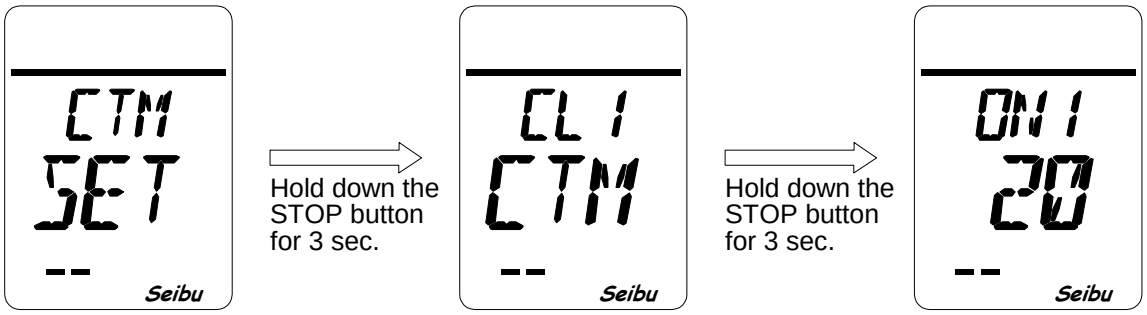
i) ON time set value = 10 to 600: Closing operation inching time (1.0 to 60.0 [sec])
ii) OFF time set value = 0 to 600: Closing operation inching-pause time (0.0 to 60.0 [sec])

[Setting procedure]

1) Change inching during a closing operation by selecting a section from 1 to 5 (CL1 to 5, numbered in order from the fully-closed side) on the Closing Operation Section Selecting screen (LCD indication: “CL**#** CTM”). Then, hold down the STOP button for 3 seconds. The Inching ON Time Setting screen (LCD indication: “ON# xxx”) will be shown.
2) Input inching ON time for the selected section by using the OPEN and CLOSE buttons on the operation panel on the Inching ON Time Setting screen (LCD indication: “ON# xxx”). Then, hold down the STOP button for 3 seconds.
   The Inching OFF Time Setting screen (LCD indication: “OF# xxx”) will be shown.
3) Input inching OFF time for the selected section by using the OPEN and CLOSE buttons on the operation panel on the Inching OFF Time Setting screen (LCD indication: “OF# xxx”). Then, hold down the STOP button for 3 seconds to complete the setting procedure.

[Setting operation]

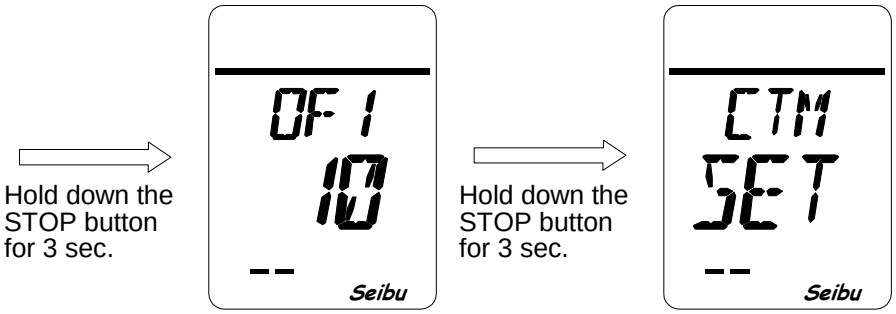
Press the OPEN button: Changes numerical value in ascending order from 0 to 9.
Press the CLOSE button: Changes numerical value in descending order from 9 to 0.
Hold down the STOP button for 3 seconds: Saves the entered set value.



Closing Operation Inching Setting screen

Select the section for which closed-side inching setting should be changed with the buttons on the operation panel.

Select ON time for the selected section.



Select OFF time for the selected section.

Upon setting completion, the display returns to the Setting screen.

How to Set Opening Operation Inching (*only for MgSW drive type + INC when set value is INC)

- Hold down the STOP button for 3 seconds on the Opening Operation Inching Setting screen (LCD indication “OTM SET”), and the opening operation inching setting mode will start.

[Opening operation inching setting]

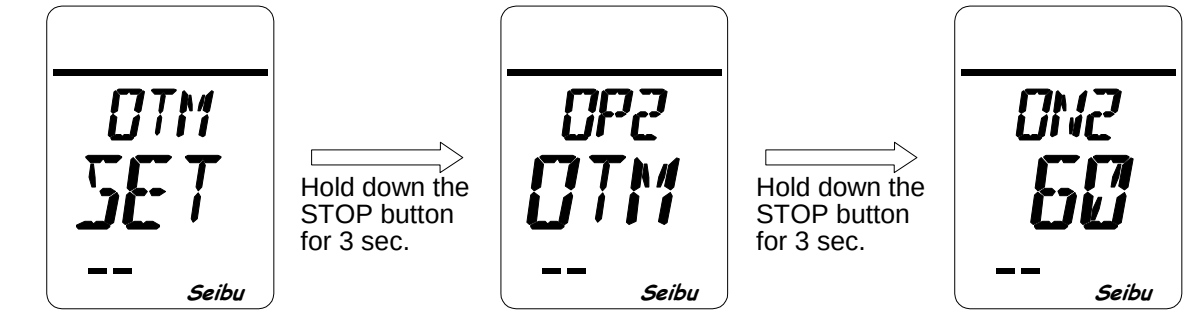
i) ON time set value = 10 to 600: Opening operation inching time (1.0 to 60.0 [sec])
ii) OFF time set value = 0 to 600: Opening operation inching-pause time (0.0 to 60.0 [sec])

[Setting procedure]

1) Change inching during an opening operation by selecting a section from 1 to 5 (OP1 to 5, numbered in order from the fully-closed side) on the Opening Operation Section Selecting screen (LCD indication: “OP# OTM”). The Inching ON Time Setting screen (LCD indication: “ON# xxx”) will be shown.
2) Input inching ON time for the selected section by using the OPEN and CLOSE buttons on the operation panel on the Inching ON Time Setting screen (LCD indication: “ON# xxx”). Then, hold down the STOP button for 3 seconds.
   The Inching OFF Time Setting screen (LCD indication: “OF# xxx”) will be shown.
3) Input inching OFF time for the selected section by using the OPEN and CLOSE buttons on the operation panel on the Inching OFF Time Setting screen (LCD indication: “OF# xxx”). Then hold down the STOP button for 3 seconds to complete the setting procedure.

[Setting operation]

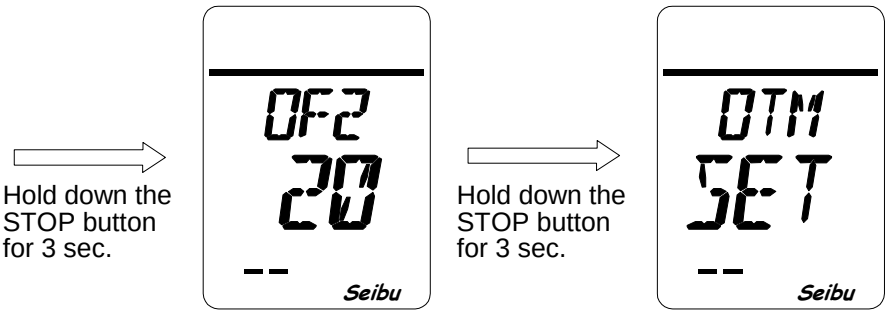
Press the OPEN button: Changes numerical valve in ascending order from 0 to 9.
Press the CLOSE button: Changes numerical valve in descending order from 9 to 0.
Hold down the STOP button for 3 seconds: Saves the entered set value.



Opening Operation Inching Setting screen

Select the section, for which open-side inching setting should be changed, with the buttons on the operation panel.

Select ON time for the selected section.



Select OFF time for the selected section.

Upon setting completion, the display returns to the Setting screen.

How to Set INV Speed (*INV drive type only)

- Hold down the STOP button for 3 seconds on the INV Speed Setting screen (LCD indication “SPD SET”), and the INV speed setting mode will start.

[Speed set value]

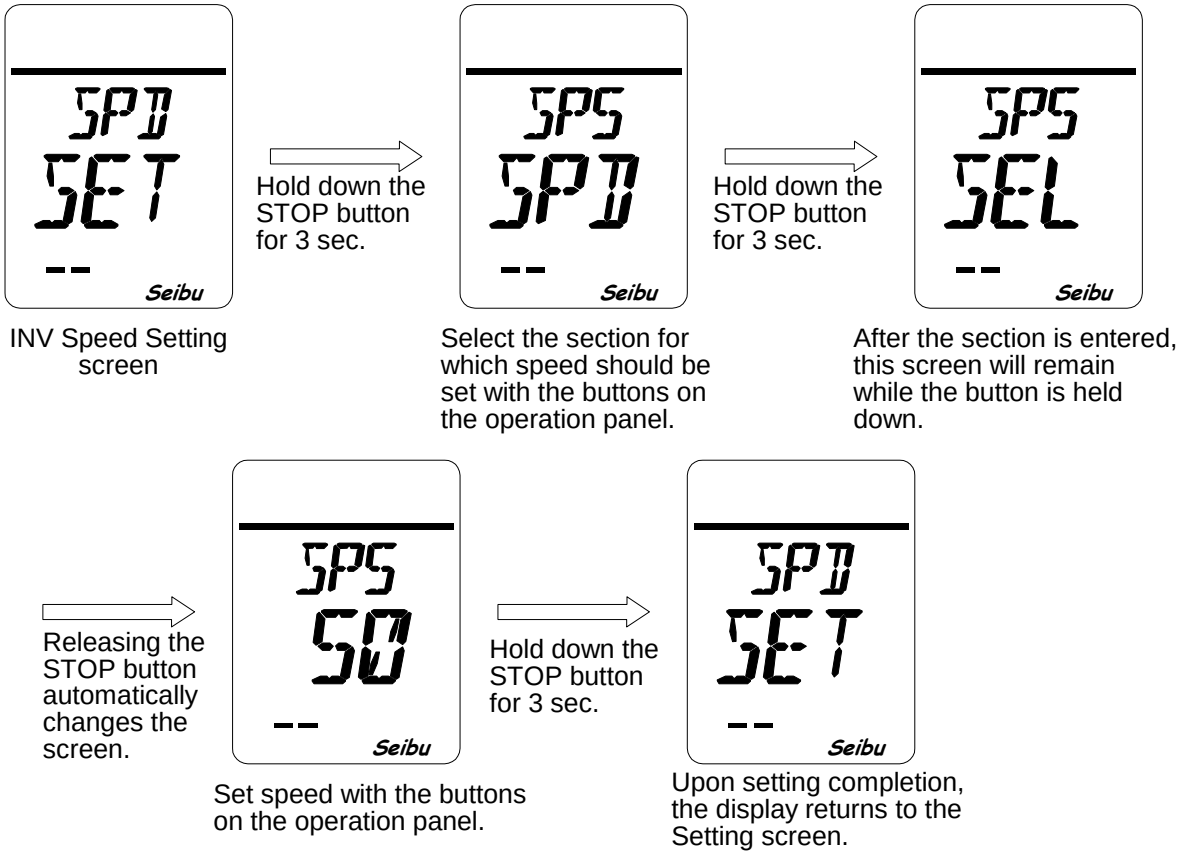
i) SP1: Speed 1 (speed when stopped at POSITION LIMIT) (Initial value = 10 [Hz])
iii) SP2: Speed 2 (speed during setting mode) (Initial value = 60 [Hz])
iv) SP3: Speed 3 (Initial value = 60 [Hz])
v) SP4: Speed 4 (Initial value = 60 [Hz])
vi) SP5: Speed 5 (Initial value = 60 [Hz])
vii) SP6: Speed 6 (Initial value = 60 [Hz])
viii) SP7: Speed 7 (Initial value = 60 [Hz])

[Setting procedure]

1) Select the speed to be set from 1 to 7 (SP1 to 7) on the INV Speed Setting Mode screen (LCD indication: “SP# SPD”). Then, hold down the STOP button for 3 seconds.
2) Release the STOP button after “SP# SEL” is displayed on the LCD, and the Speed Setting screen (LCD indication: “SP# xx”) will be shown automatically.
3) Select the speed (10 to 100 [Hz]) on the Speed Setting screen. Then, and hold down the STOP button for 3 seconds to complete the setting procedure.

[Setting operation]

Press the OPEN button: Changes readout to ascending order from 0 to 9 and from SP1 to SP7.
Press the CLOSE button: Changes readout to descending order from 9 to 0 and from SP7 to SP1.
Hold down the STOP button for 3 seconds: Saves the entered set value.



INV Speed Setting screen

Select the section for which speed should be set with the buttons on the operation panel.

After the section is entered, this screen will remain while the button is held down.

Set speed with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

How to Set Closing Operation Speed Modulation (*INV drive type only)

- Hold down the STOP button for 3 seconds on the Closing Operation Speed Modulation Setting screen (LCD indication “CSP SET”), and the closing operation speed modulation setting mode will start.

[Closing operation speed modulation set value]

i) CL1: Speed in section 1 (Initial value=SP3)
iii) CL2: Speed in section 2 (Initial value=SP4)
iv) CL3: Speed in section 3 (Initial value=SP5)
v) CL4: Speed in section 4 (Initial value=SP6)
vi) CL5: Speed in section 5 (Initial value=SP7)

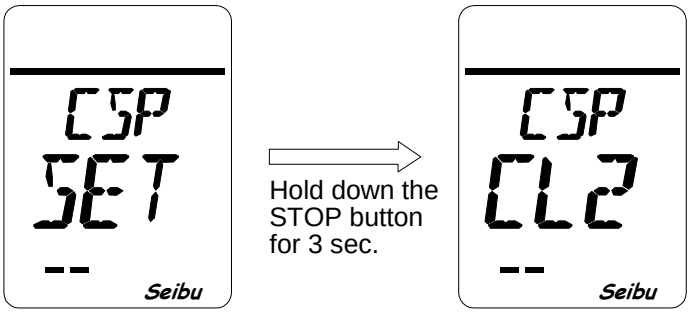
* Sections 1 to 5 vary in accordance with the mid-travel positions settings between the fully-closed and fully-opened positions. If no mid-travel position has been set, the entire travel distance from the fully-closed position to the fully-opened position is section 1. When mid-travel positions have been set, section 1 refers to the section from the fully-closed position to the nearest mid-travel position, followed by section 2 being the section from the end of section 1 to the next mid-travel position, with the subsequent sections numbered incrementally as they approach the fully-opened position.

[Setting procedure]

1) Select a section to be set during closing operation from among 1 to 5 (CL 1 to 5 numbered from the fully-closed side) on the Closing Operation Section Selection screen (LCD indication: “CSP CL#”). Then, hold down the STOP button for 3 seconds. The Speed Selection screen (LCD indication: “CL# SP#”) will be shown.
2) Select closing operation speed for the selected section by using the OPEN and CLOSE buttons on the operation panel on the Speed Selection screen (LCD indication: “CL# SP#”). Then, hold down the STOP button for 3 seconds to complete the setting procedure.

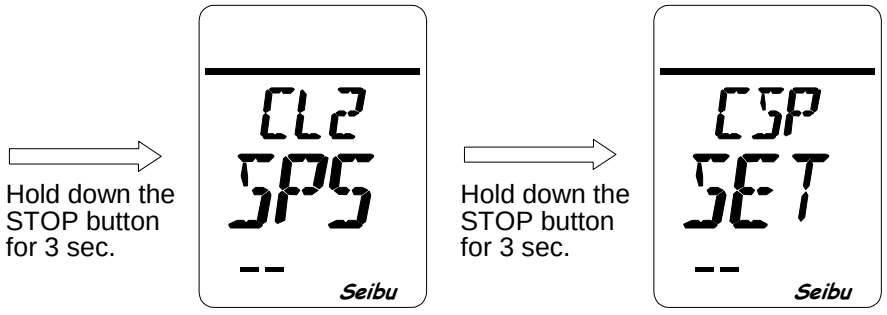
[Setting operation]

Press the OPEN button: Changes readout to ascending order from CL1 to CL5 and from SP3 to SP7.
Press the CLOSE button: Changes readout to descending order from CL5 to CL1 and from SP7 to SP3.
Hold down the STOP button for 3 seconds: Saves the entered set value.



Closing Operation Speed Setting screen

Select the section for which closed-side speed should be changed with the buttons on the operation panel.



Select speed for the selected section.

Upon setting completion, the display returns to the Setting screen.

How to Set Opening Operation Speed Modulation (*INV drive type only)

- Hold down the STOP button for 3 seconds on the Opening Operation Speed Modulation Setting screen (LCD indication “OSP SET”), and the opening operation speed modulation setting mode will start.

[Opening operation speed modulation set value]

i) OP1: Speed in section 1 (Initial value =SP3)
iii) OP2: Speed in section 2 (Initial value =SP4)
iv) OP3: Speed in section 3 (Initial value =SP5)
v) OP4: Speed in section 4 (Initial value =SP6)
vi) OP5: Speed in section 5 (Initial value =SP7)

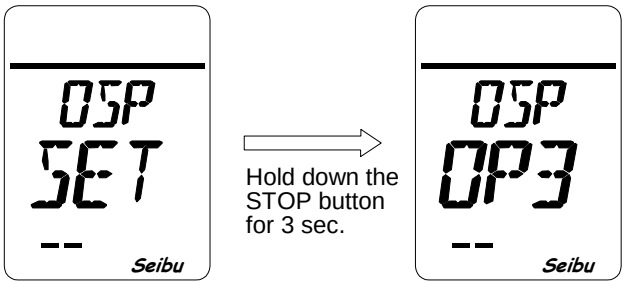
* Sections 1 to 5 vary in accordance with the mid-travel positions settings between the fully-closed and fully-opened positions. If no mid-travel position has been set, the entire travel distance from the fully-closed position to the fully-opened position is section 1. When mid-travel positions have been set, section 1 refers to the section from the fully-closed position to the nearest mid-travel position, followed by section 2 being the section from the end of section 1 to the next mid-travel position, with the subsequent sections numbered incrementally as they approach the fully-opened position.

[Setting procedure]

1) Select a section to be set during opening operation from among 1 to 5 (OP 1 to 5 numbered from the fully-opened-side) on the Opening Operation Section Selection screen (LCD indication: “OSP CL#”). Then, hold down the STOP button for 3 seconds. The Speed Selection screen (LCD indication: “OP# SP#”) will be shown.
2) Select opening operation speed for the selected section by using the OPEN and CLOSE buttons on the operation panel on the Speed Selection screen (LCD indication: “OP# SP#”). Then, hold down the STOP button for 3 seconds to complete the setting procedure.

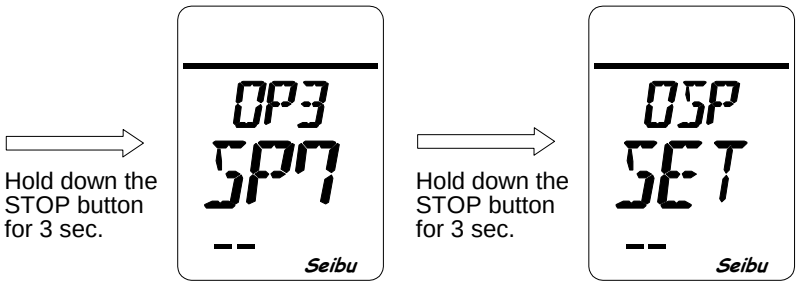
[Setting operation]

Press the OPEN button: Changes readout to ascending order from OP1 to OP3 and from SP3 to SP7.
Press the CLOSE button: Changes readout to descending order from OP3 to OP1 and from SP7 to SP3.
Hold down the STOP button for 3 seconds: Saves the entered set value.



Opening Operation Speed Setting screen

Select the section for which open-side speed should be changed with the buttons on the operation panel.



Select speed for the selected section.

Upon setting completion, the display returns to the Setting screen.

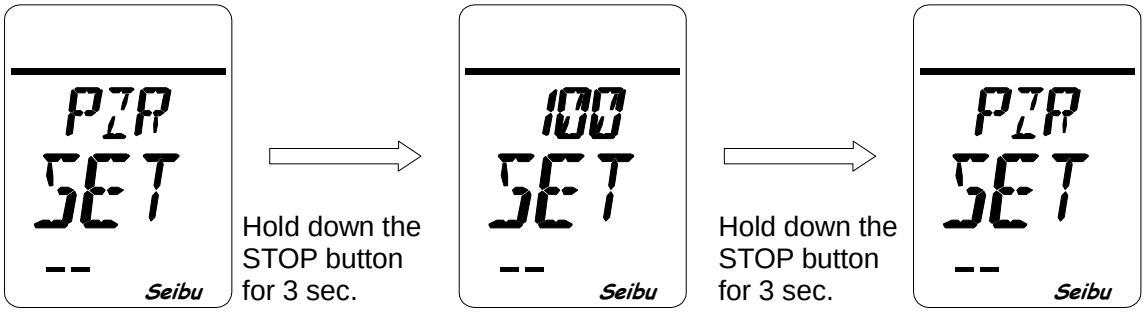
How to Set Input ZERO (*only for models with PROPORTION function)

- Hold down the STOP button for 3 seconds on the Input ZERO Setting screen (LCD indication “PZR SET”), and the input ZERO setting mode will start.

[Setting operation]

Input fully-closed reference value (4 mADC) to the PROPORTION input terminal on the Input ZERO Setting Mode screen (LCD indication: “xxx SET”). Then, hold down the STOP button on the operation panel for 3 seconds to complete the setting operation.

Hold down the STOP button for 3 seconds: Saves the entered input ZERO.



Input ZERO Setting screen

Input fully-closed reference value (4 mADC) to the PROPORTION input terminal.

Upon setting completion, the display returns to the Setting screen.

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

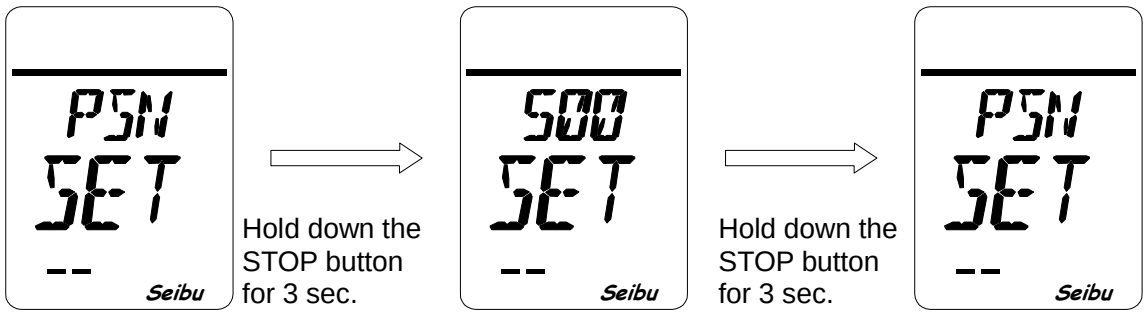
How to Set Input SPAN (*only for models with PROPORTION function)

- Hold down the STOP button for 3 seconds on the Input SPAN Setting screen (LCD indication “PSN SET”), and the input SPAN setting mode will start.

[Setting operation]

Input fully-opened reference value (20 mADC) to the PROPORTION input terminal on the Input SPAN Setting Mode screen (LCD indication: “xxx SET”). Then, hold down the STOP button on the operation panel for 3 seconds to complete the setting operation.

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



Input SPAN Setting screen

Input fully-opened reference value (20 mADC) to the PROPORTION input terminal.

Upon setting completion, the display returns to the Setting screen.

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

How to Set Closing Torque Seat / Position Seat

- Hold down the STOP button for 3 seconds on the Fully-closed Stop Condition Setting screen (LCD indication “CLM SET”), and the fully-closed stop condition setting mode will start.

[Closing torque seat and position seat set values]

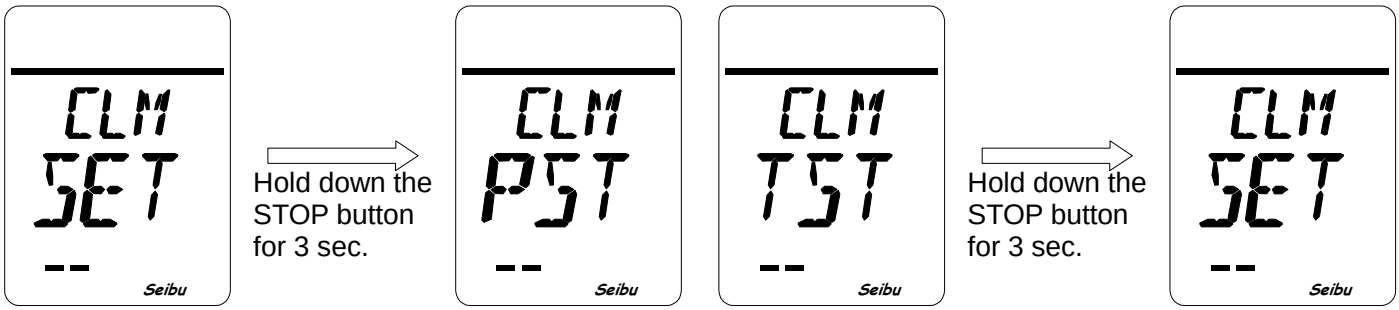
i) Set value = PST: Position seat Stops at the position 0% opening.

ii) Set value = TST: Torque seat Stops when the actuator is subjected to load exceeding torque value to be set at less than 0% opening.

[Setting operation]

Input fully-closed stop condition set value by using the OPEN and CLOSE buttons on the operation panel on the Fully-closed Stop Condition Setting Mode screen (LCD indication: “CLM xxx”). Then, hold down the STOP button on the operation panel for 3 seconds to complete the setting operation.

Press the OPEN button: Changes set value to PST or TST.
Press the CLOSE button: Changes set value to PST or TST.
Hold down the STOP button for 3 seconds: Saves the entered set value.



Fully-closed Stop Condition Setting screen

Input the fully-closed stop condition set value with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

How to Set Opening Torque Seat / Position Seat

- Hold down the STOP button for 3 seconds on the Fully-opened Stop Condition Setting screen (LCD indication “OLM SET”), and the fully-opened stop condition setting mode will start.

[Opening torque seat and position seat set values]

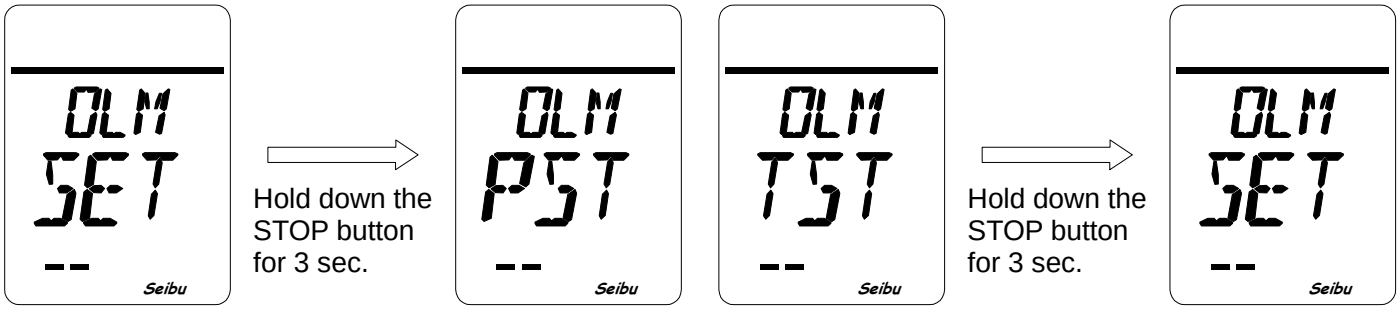
i) Set value = PST: Position seat Stops at the position 100% opening.

ii) Set value = TST: Torque seat Stops when the actuator is subjected to load exceeding torque value to be set at less than 100% opening.

[Setting operation]

Input fully-opened stop condition set value by using the OPEN and CLOSE buttons on the operation panel on the Fully-opened Stop Condition Setting Mode screen (LCD indication: “OLM xxx”). Then, hold down the STOP button on the operation panel for 3 seconds to complete the setting operation.

Press the OPEN button: Changes set value to PST or TST.
Press the CLOSE button: Changes set value to PST or TST.
Hold down the STOP button for 3 seconds: Saves the entered set value.



Fully-opened Stop Condition Setting screen

Input the fully-opened stop condition set value with the buttons on the Operation panel.

Upon setting completion, the display returns to the Setting screen.

How to Set Motor Rotating Direction

- Hold down the STOP button for 3 seconds on the Motor Rotating Direction Setting screen (LCD indication “ROT SET”), and the motor rotating direction setting mode will start.

[Motor rotating direction settings]

i) NOM: Rotates output shaft clockwise, closed

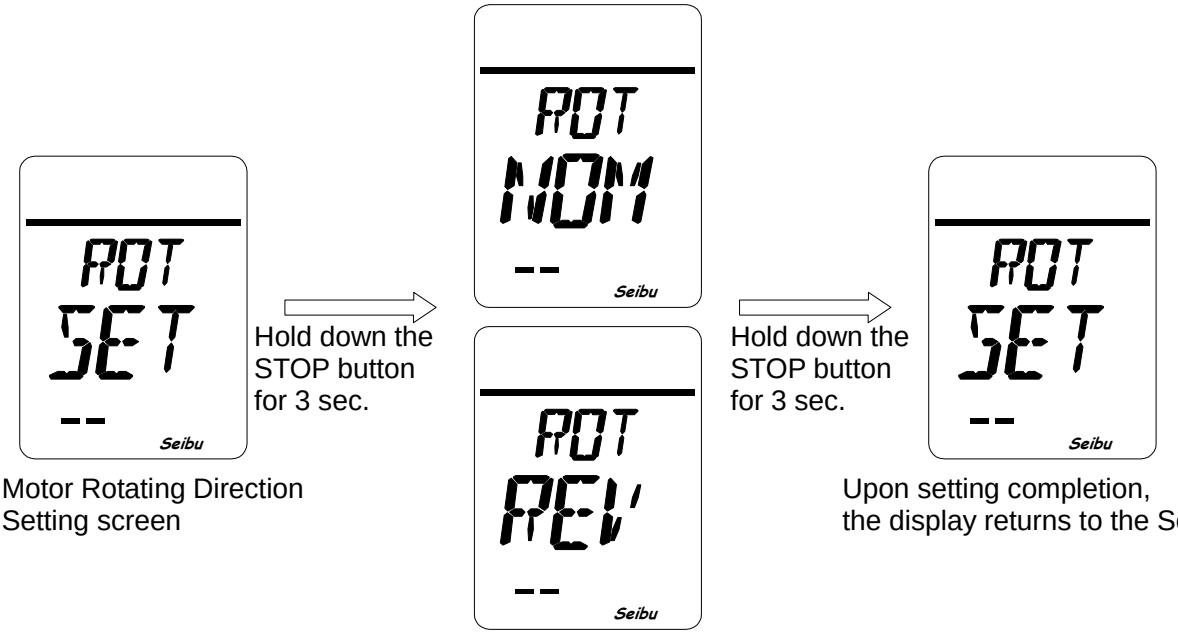
ii) REV: Rotates output shaft clockwise, open

* The above settings may not apply depending on optional specifications of such devices as a gear.

[Setting operation]

Select either of the motor rotating directions by using the OPEN and CLOSE buttons on the operation panel on the Motor Rotating Direction Setting Mode screen (LCD indication: “ROT xxx”). Then, hold down the STOP button on the operation panel for 3 seconds to complete the setting operation.

Press the OPEN button: Changes set value to NOM or REV.
Press the CLOSE button: Changes set value to NOM or REV.
Hold down the STOP button for 3 seconds: Saves the entered set value.



Motor Rotating Direction Setting screen

Input the motor rotating direction set value with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

How to Set MgSW Inching (*MgSW drive type only)

- Hold down the STOP button for 3 seconds on the MgSW Inching Setting screen (LCD indication “INC SET”), and the MgSW inching setting mode will start.

[MgSW inching settings]

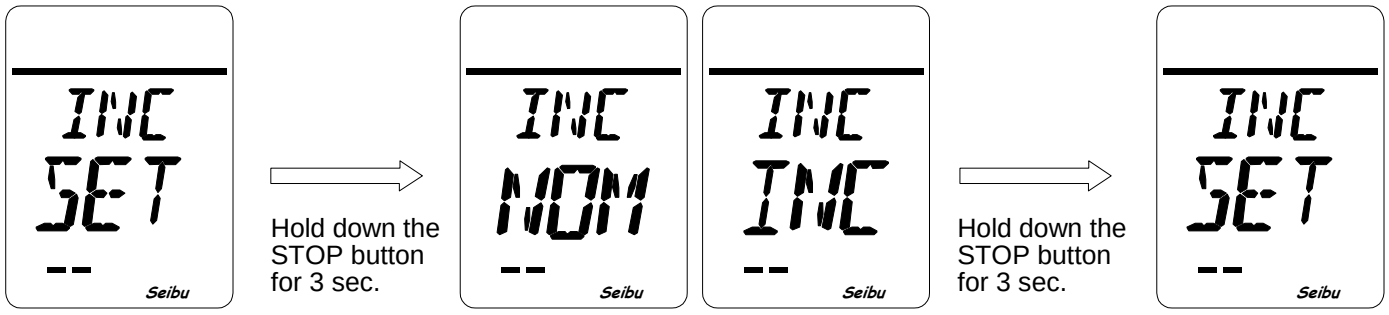
i) NOM: Normal mode

ii) INC: Inching mode

[Setting operation]

Input the MgSW inching set value by using the OPEN and CLOSE buttons on the operation panel on the MgSW Inching Setting Direction Setting Mode screen (LCD indication: “INC xxx”). Then, hold down the STOP button on the operation panel for 3 seconds to complete the setting operation.

Press the OPEN button: Changes set value to NOM or INC.
Press the CLOSE button: Changes set value to NOM or INC.
Hold down the STOP button for 3 seconds: Saves the entered set value.



MgSW Inching Setting screen

Input the MgSW inching set value with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

How to Set OPEN/CLOSE Operation Self-holding

- Hold down the STOP button for 3 seconds on the OPEN/CLOSE Self-holding Setting screen (LCD indication “SWM SET”), and the OPEN/CLOSE self-holding setting mode will start.

[OPEN/CLOSE self-holding settings]

i) HLD: With self-holding for OPEN/CLOSE

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

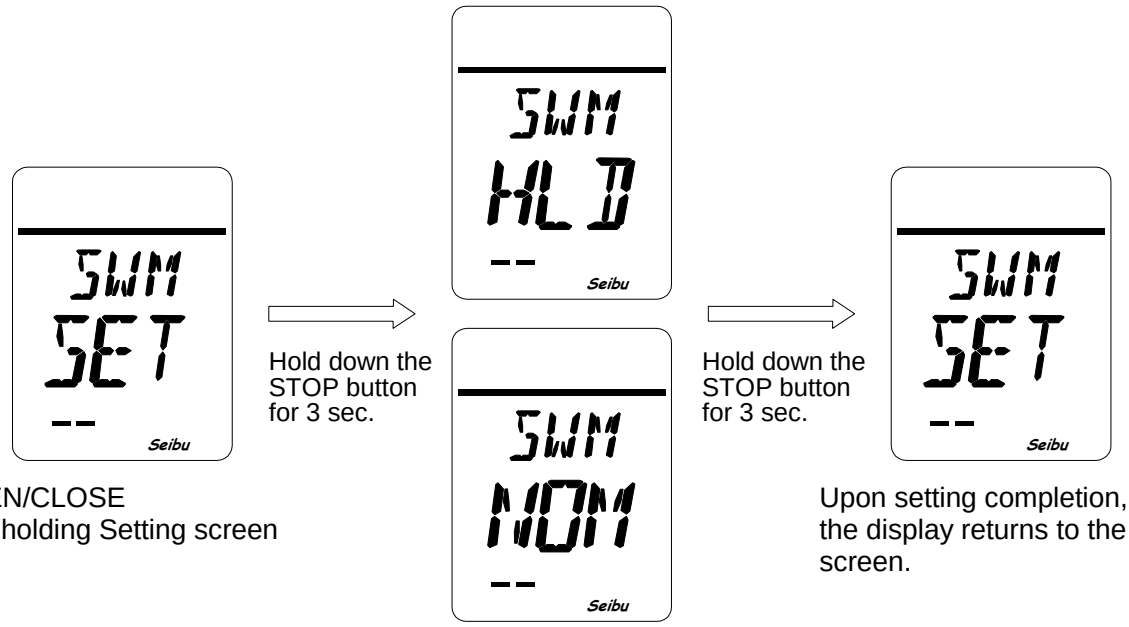
[Setting operation]

Input the set value of OPEN/CLOSE self-holding by using the OPEN and CLOSE buttons on the operation panel on the OPEN/CLOSE Self-holding Setting Mode screen (LCD indication: “SWM xxx”). Then, hold down the STOP button on the operation panel for 3 seconds to complete the setting operation.

Press the OPEN button: Changes set value to HLD or NOM.
Press the CLOSE button: Changes set value to HLD or NOM.
Hold down the STOP button for 3 seconds: Saves the entered set value.

[OPEN/CLOSE self-holding settings]

i) HLD: Input signals are held internally.
ii)NOM: Input signals are not held internally. (Operates only while the OPEN or CLOSE button is held down.)



OPEN/CLOSE Self-holding Setting screen

Input the set value of OPEN/CLOSE self-holding with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

How to Set Relay Output

- Hold down the STOP button for 3 seconds on the Relay Output Setting screen (LCD indication “RY SET”), and the relay output setting mode will start.

[Items for which setting operation is performed]

i) RY1: Changes the setting of relay 1. (Initial value: ERR)
ii) RY2: Changes the setting of relay 2. (Initial value = OP)
iii) RY3: Changes the setting of relay 3. (Initial value = CL)

[Setting procedure]

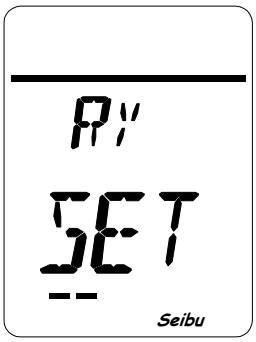
1) Select a relay number from RY1 to RY3 for which function is to be set on the Relay Output Setting Mode screen (LCD indication: "xxx RY"). Then, hold down the STOP button for 3 seconds.
2) The current function set value (LCD indication: "RY# xxx") for the selected relay will be shown.
3) Select a function set value on the Function Setting screen, and hold down the STOP button for 3 seconds to complete the setting procedure.

[Setting operation]

Press the OPEN button: Changes readout to ascending order from RY1 to RY3 and from ERR to CPU.
Press the CLOSE button: Changes readout to descending order from RY3 to RY1 and from CPU to ERR.
Hold down the STOP button for 3 seconds: Saves the entered set value.

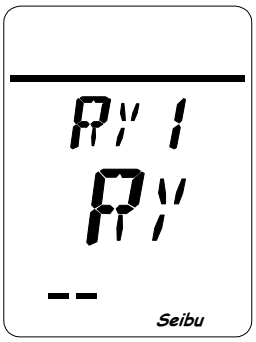
[Relay Output Setting Items]

1) ERR:	Error occurrence	10) MVO:	Under opening operation
2) OP:	Fully-opened POSITION LIMIT	11) MVC:	Under closing operation
3) CL:	Fully-closed POSITION LIMIT	12) REM:	REMOTE selected
4) HF1	Mid-travel POSITION LIMIT 1	13) LOC:	LOCAL selected
5) HF2:	Mid-travel POSITION LIMIT 2	14) THM:	Motor overheat
6) HF3:	Mid-travel POSITION LIMIT 3	15) INT:	Interlocked
7) HF4:	Mid-travel POSITION LIMIT 4	16) PRP:	Under PROPORTION
8) OPT:	Open direction TORQUE LIMIT	17) CPU:	CPU RUN
9) CLT:	Closed direction TORQUE LIMIT		



Relay Output Setting screen

Hold down the STOP button for 3 sec.

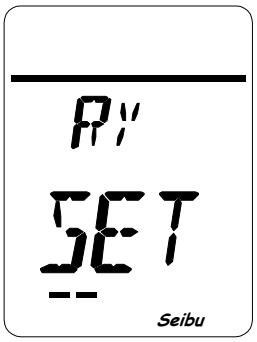


Select a relay number (RY1 to RY3) with the buttons on the operation panel.

Hold down the STOP button for 3 sec.

Select a function set value with the buttons on the operation panel.

Hold down the STOP button for 3 sec.



Upon setting completion, the display returns to the Setting screen.

How to Set Decelerating Range Before Reaching Target Value Speed (*INV drive type only)

- Hold down the STOP button for 3 seconds on the Decelerating Range Before Reaching Target Value Setting screen (LCD indication “SL SET”), and the decelerating range before reaching target value setting mode will start.

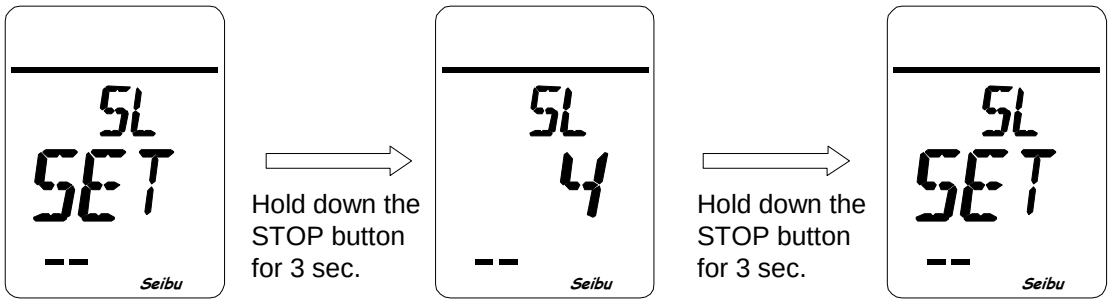
[Decelerating range before reaching target value settings]

i) Set value =1 to 10: Decelerating range (1 to 10%) before reaching the target value can be set.

[Setting operation]

Input the set value of decelerating range before reaching target value by using the OPEN and CLOSE buttons on the operation panel on the Decelerating Range Before Reaching Target Value Setting Mode screen (LCD indication: “SL xxx”). Then, hold down the STOP button on the operation panel for 3 seconds to complete the setting operation.

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



Decelerating Range Before Reaching Target Value Setting screen

Input the set value of decelerating range before reaching target value with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

How to Set MOTOR ROTATION ALARM Detecting Time

- Hold down the STOP button for 3 seconds on the MOTOR ROTATION ALARM Detecting Time Setting screen (LCD indication “MOT SET”), and the MOTOR ROTATION ALARM detecting time setting mode will start.

[MOTOR ROTATION ALARM detecting time settings]

i) Set value = 0: Disables MOTOR ROTATION ALARM output.

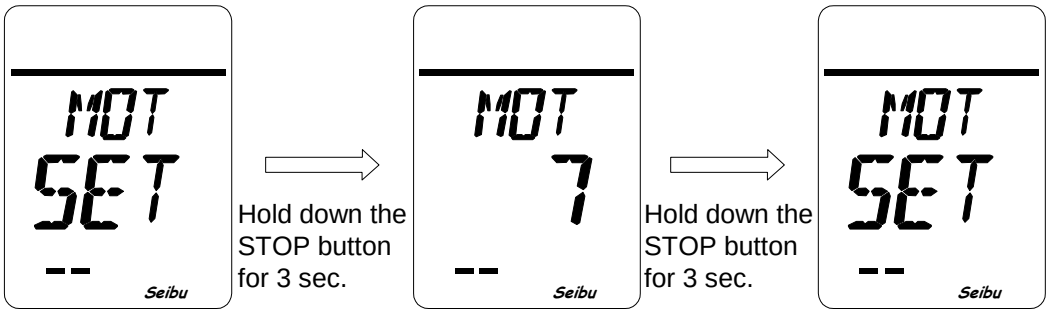
ii) Set value = 1 to 60: Occurs a MOTOR ROTATION ALARM if the opening does not change while the motor is conducted. With this setting, the time before the MOTOR ROTATION ALARM is output can be set within the range of 1 to 60 [sec.].

*** MOTOR ROTATION ALARM detecting time has been adjusted according to the actuator model before shipment. The actuator may not operate with the time setting that does not meet specifications.**

[Setting operation]

Input the set value of MOTOR ROTATION ALARM detecting time by using the OPEN and CLOSE buttons on the operation panel on the MOTOR ROTATION ALARM Detecting Time Setting Mode screen (LCD indication: “MOT xxx”). Then, hold down the STOP button on the operation panel for 3 seconds to complete the setting operation.

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



MOTOR ROTATION ALARM Detection Time Setting screen

Input the set value of MOTOR ROTATION ALARM detecting time with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

How to Set Opening Indication

- Hold down the STOP button for 3 seconds on the Opening Indication Setting screen (LCD indication “PER SET”), and the opening indication setting mode will start.

[Opening indication settings]

1) ON: Indicates the opening as a percentage in the range of 0 to 100%.
2) OFF: Indicates the opening according to the (optional) set value of the opening indication.

Example: 1) 0 to 400 mm → Input value: 400
2) 0 to 90 degrees → Input value: 90

[Setting procedure]

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

[Setting operation]

Input the set value of opening indication by using the OPEN and CLOSE buttons on the operation panel on the Opening Indication Setting Mode screen (LCD indication: “PER xxx”). Then, hold down the STOP button on the operation panel for 3 seconds to complete the setting operation.

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

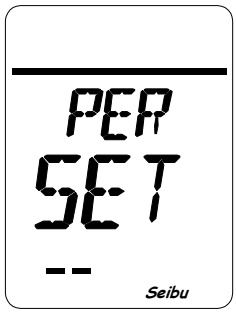
• When ON is selected for the opening indication setting.

Opening Indication Setting mode

Select ON with the buttons on the operation panel.

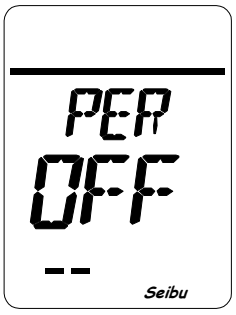
Upon setting completion, the display returns to the Setting screen.

• When OFF is selected for the opening indication setting.



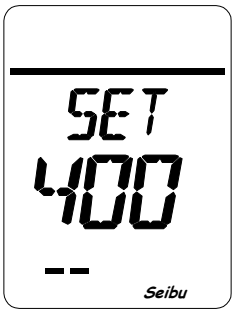
Opening Indication setting mode

Hold down the STOP button for 3 sec.



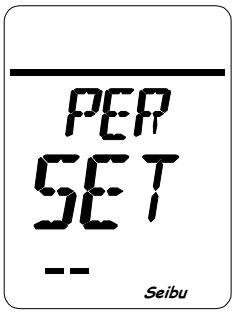
Select OFF with the buttons on the operation panel.

Hold down the STOP button for 3 sec.



Input the set value of opening indication with the buttons.

Hold down the STOP button for 3 sec.



Upon setting completion, the display returns to the Setting screen.

How to Set 6 Additional Relay Output Points (*only for models with 6 additional relay output points)

- Hold down the STOP button for 3 seconds on the 6 Additional Relay Output Points Setting screen (LCD indication “ERY SET”), and the 6 additional relay output points setting mode will start.

[Items for which setting operation is performed]

i) RY4:	Changes the setting of relay 4.	(Initial value: OPT)
ii) RY5:	Changes the setting of relay 5.	(Initial value: CLT)
iii) RY6:	Changes the setting of relay 6.	(Initial value: HF1)
iv) RY7:	Changes the setting of relay 7.	(Initial value: HF2)
v) RY8:	Changes the setting of relay 8.	(Initial value: REM)
vi) RY9:	Changes the setting of relay 9.	(Initial value: INT)

[Setting procedure]

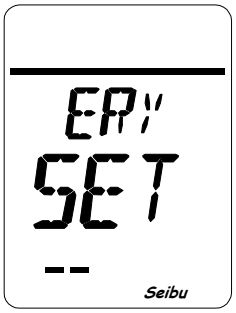
1) Select a relay number from RY4 to RY9 for which function is to be set on the 6 Additional Relay Output Points Setting Mode screen (LCD indication: "xxx RY"). Then, hold down the STOP button for 3 seconds.
2) The current function set value (LCD indication: "RY# xxx") for the selected relay will be shown.
3) Select a function set value on the Function Setting screen, and hold down the STOP button for 3 seconds to complete the setting procedure.

[Setting operation]

Press the OPEN button: Changes readout to ascending order from RY4 to RY9 and from ERR to CPU.
Press the CLOSE button: Changes readout to descending order from RY9 to RY4 and from CPU to ERR.
Hold down the STOP button for 3 seconds: Saves the entered set value.

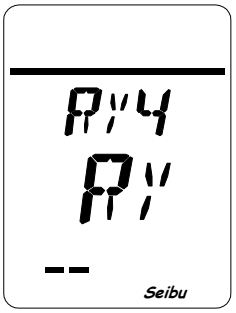
[Relay Output Setting Items]

1) ERR:	Error occurrence	10) MVO:	Under opening operation
2) OP:	Fully-opened POSITION LIMIT	11) MVC:	Under closing operation
3) CL:	Fully-closed POSITION LIMIT	12) REM:	REMOTE selected
4) HF1	Mid-travel POSITION LIMIT 1	13) LOC:	LOCAL selected
5) HF2:	Mid-travel POSITION LIMIT 2	14) THM:	Motor overheat
6) HF3:	Mid-travel POSITION LIMIT 3	15) INT:	Interlocked
7) HF4:	Mid-travel POSITION LIMIT 4	16) PRP:	Under PROPORTION
8) OPT:	Open direction TORQUE LIMIT	17) CPU:	CPU RUN
9) CLT:	Closed direction TORQUE LIMIT		



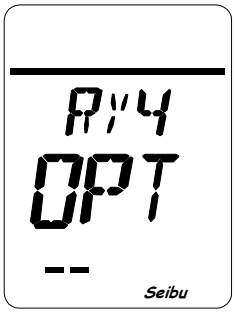
6 Additional Relay Output Points Setting screen

Hold down the STOP button for 3 sec.



Select a relay number (RY4 to RY9) with the buttons on the operation panel.

Hold down the STOP button for 3 sec.



Select a function set value with the buttons on the operation panel.

Hold down the STOP button for 3 sec.

Upon setting completion, the display returns to the Setting screen.

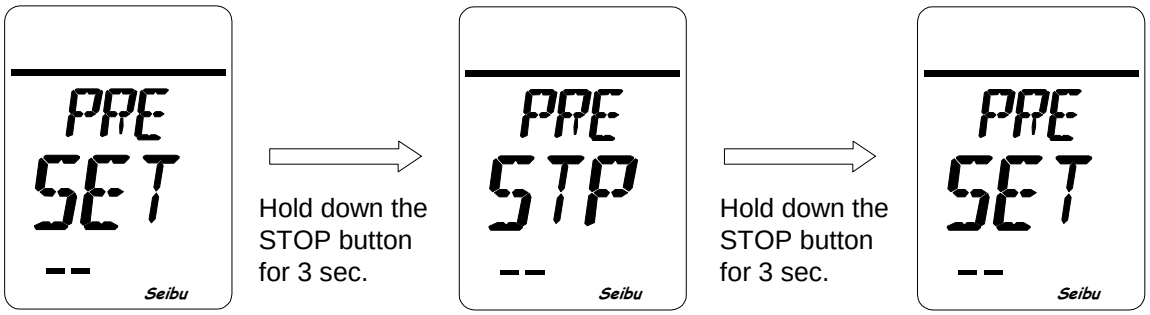
How to Set PROPORTION Threshold Movement (*only for models with PROPORTION function)

- Hold down the STOP button for 3 seconds on the PROPORTION Threshold Movement Setting screen (LCD indication “PRE SET”), and the PROPORTION threshold movement setting mode will start.

[Setting operation]

Select the item to be displayed on the LCD by using the OPEN and CLOSE buttons on the operation panel on the PROPORTION Threshold Movement Setting Mode screen (LCD indication: “PRE xxx”). Then, hold down the STOP button for 3 seconds to complete the setting operation.

Press the OPEN button: Changes readout order form STP to CLS as shown in LCD indication settings.
Press the CLOSE button: Changes readout order form CLS to STP as shown in LCD indication settings.
Hold down the STOP button for 3 seconds: Saves the item of LCD indication entered.



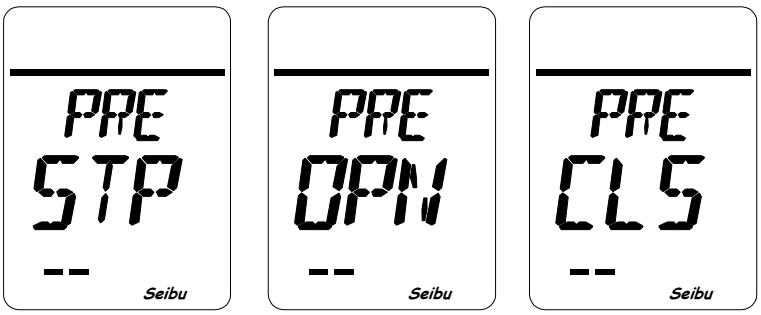
PROPORTION Threshold Movement Setting screen

Select the set value of a PROPORTION Threshold movement function with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

[LCD indication settings]

1) STP: Stops on the spot when the PROPORTION input value is in the range of 0 to 1 mA.
2) OPN: Moves to the fully-opened limit position when the PROPORTION input value is in the range of 0 to 1 mA.
3) CLS: Moves to the fully-closed limit position when the PROPORTION input value is in the range of 0 to 1 mA.



Stop

Movement in the opening direction

Movement in the closing direction

How to Set Remote STOP Contact Switching

- Hold down the STOP button for 3 seconds on the Remote STOP Contact Switching screen (LCD indication “RES SET”), and the remote STOP contact switching mode will start.

[Remote STOP contact switching settings]

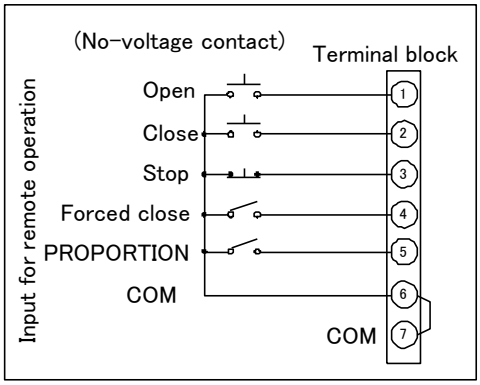
i) A: Stop contact N/O contact
ii) B: Stop contact N/C contact (standard)

[Setting operation]

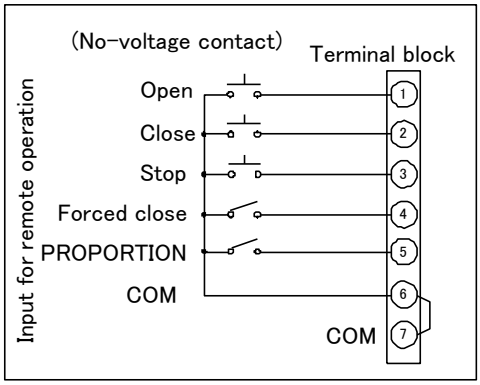
Input the set value of remote STOP contact switching by using the OPEN and CLOSE buttons on the operation panel on the Remote STOP Contact Switching Mode screen (LCD indication: “RES x”). Then, hold down the STOP button on the operation panel for 3 seconds to complete the setting operation.

Press the OPEN button: Changes set value to A or B.
Press the CLOSE button: Changes set value to A or B.
Hold down the STOP button for 3 seconds: Saves the entered set value.

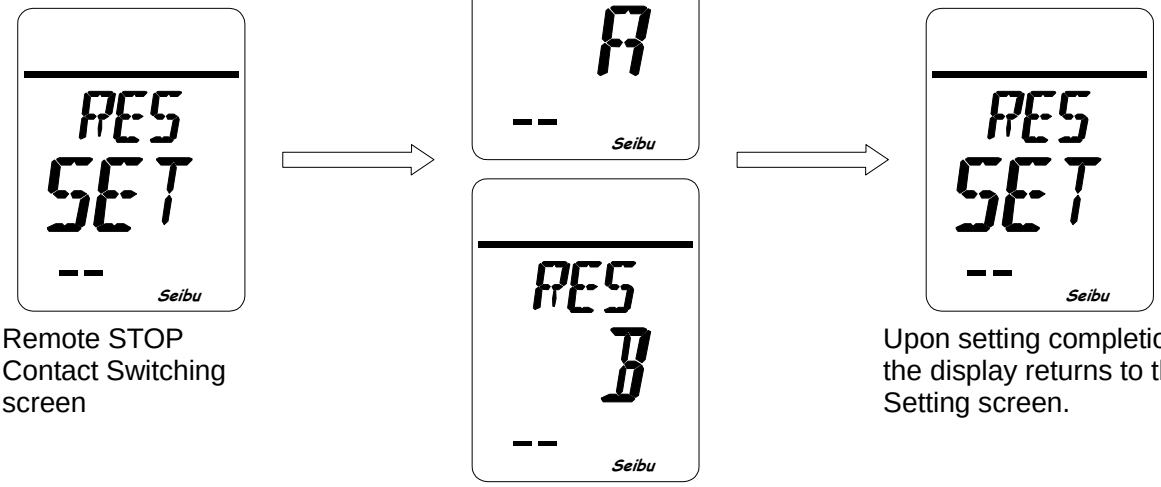
[Wiring method for each set value]



Wiring when the set value B is selected



Wiring when the set value A is selected



Remote STOP Contact Switching screen

Input the set value of remote STOP contact switching with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

How to Set Opening Output Current Value Inversion

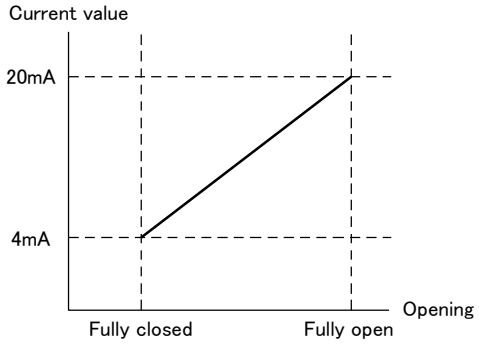
- Hold down the STOP button for 3 seconds on the Opening Output Current Value Inversion Setting screen (LCD indication “OUT SET”), and the opening output current value inversion setting mode will start.
  [Opening output current value inversion settings]
  i) NOM: Fully closed 4 mA, fully open 20 mA
  ii) REV: Fully closed 20 mA, fully open 4 mA

[Setting operation]

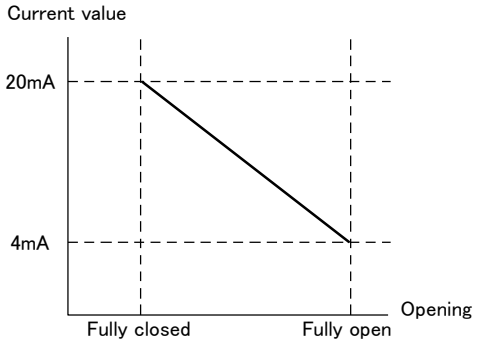
Input the set value of the opening output current value inversion by using the OPEN or CLOSE button on the control panel on the opening Output Current Value Inversion Setting Mode screen (LCD indication: “OUT xxx”). Then, hold down the STOP button for 3 seconds to complete the setting operation.

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

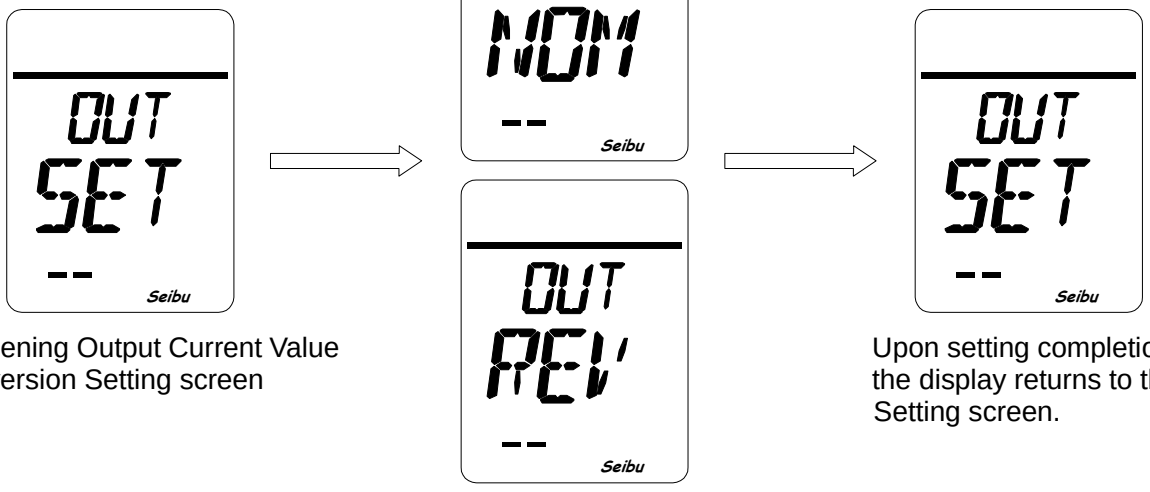
[Opening output current value for each set value]



Opening output current when
NOM is selected as the set value



Opening output current when
REV is selected as the set value



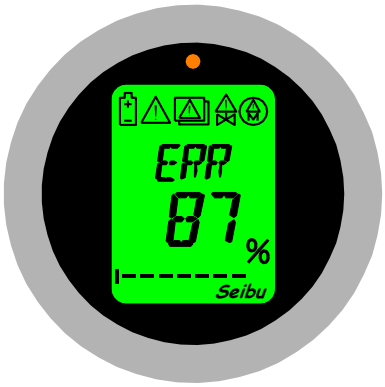
Opening Output Current Value Inversion Setting screen

Input the set value of opening output current value inversion with the buttons on the operation panel.

Upon setting completion, the display returns to the Setting screen.

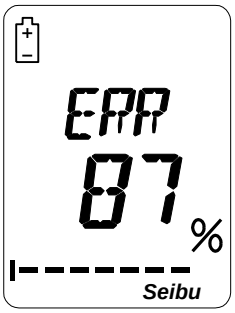
● Error Indications

*In the event of an error, the orange lamp will be lit, an error icon will appear or an error code will appear on the upper part of the display, and the actuator will stop.

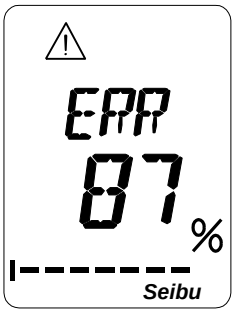


Error indication

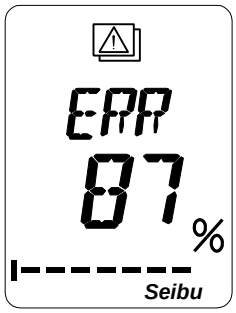
(1) Error Icons



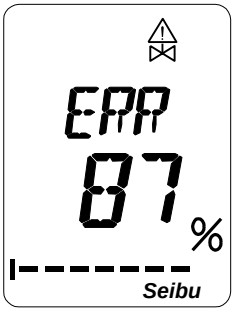
Battery alarm



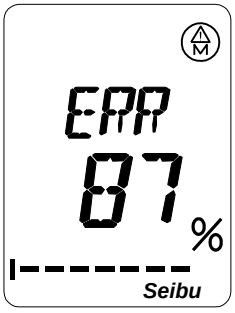
Torque error
(over-torque)



INVERTER ALARM



MOTOR ROTATION
ALARM or power supply
alarm



Thermal alarm

(2) Error Icon Descriptions and Countermeasures

1) Thermal alarm
When the thermal protector built in the motor detects the motor's abnormal temperature rise, the icon "  " and the error code E09 will appear on the display and the movement will stop.

[Error resetting method]
When the motor temperature has lowered to or below the specified value, the error indication will go out and the OPEN/CLOSE becomes possible.

2) Torque error (over-torque)

When the torque-detecting potentiometer built in the actuator detects torque exceeding the set value with the open-/closed-side torque setting, the icon "  " will be shown on the display and the movement will stop.

[Error resetting method]
Check the valve condition and operate in the reverse direction of the applied torque to release torque. In the event of excessive opening torque, perform a closing movement or in the event of excessive closing torque, perform an opening movement to release torque.

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

3) MOTOR ROTATION ALARM

When the actuator output shaft does not rotate for some reason or when the number of revolutions in a given period of time falls short, a rotation error will be detected showing the icon "  " and the error code E03 on the display, and the movement will stop.

[Error resetting method]
Investigate the cause of actuator output shaft stoppage or insufficient revolutions within a given period of time, and take appropriate countermeasures. Then, restart operation.

* If a MOTOR ROTATION ALARM repeatedly occurs, stop the operation and investigate the valve and valve actuator.

4) POWER SUPPLY ALARM

When the signal from the power supply board built in the actuator detects open-phase in AC input (S phase), the icon "  " and the error code E02 will be shown on the display, and the movement will stop.

[Error resetting method]
Check the power supply (S phase).

5) Battery alarm

When the power is low or some error is detected for the battery for display while the main power supply is OFF, the icon "  " will be shown on the display.

[Error resetting method]
Turn on the power immediately to charge, or replace the battery with a charged one.

Error code	Error	Description	Resetting method
E09	THERMAL ALARM	Motor thermal activated.	When the motor temperature has dropped to or below the specified value, the error indication resets and motor recovers automatically.
E03	MOTOR ROTATION ALARM	As the number of revolutions of the actuator output shaft per unit time fell below the specified value, emergency stop was activated.	Investigate the cause. (Actuator STOP resets the error indication.)
E02	POWER SUPPLY ALARM	AC input (S phase) is open.	Check the power supply. (Automatically resets after recovery.)
E01	POWER FAILURE ALARM	Power failure was detected while the actuator was working.	Check the power supply. (Error indication resets with OPEN, CLOSE OR STOP of the actuator.)
E13	PROPORTION REFERENCE VALUE ERROR	Input current value of PROPORTION is 1 mA or less.	Check the input current value of the PROPORTION and the input cable. (Automatically resets after recovery.)
E04	AD CONVERTER ALARM	Error of the DC power supply for potentiometer.	—(Note)
E05	INVERTER ERROR SIGNAL BEING OUTPUT	A signal informing of an error is being output from the inverter multifunction output signals.	
E06	INVERTER MEMOBUS ERROR CODE OUTPUT	Data informing of an error has been output from the inverter via memobus.	
E07	INVERTER ZERO SPEED UNACHIEVED	Although a stop command was sent to the inverter, the inverter did not stop within the specified period of time.	
E08	MEMOBUS ERROR	Memobus communication was consecutively down for the specified period of time or longer.	
E10	PROFIBUS COMMUNICATION ERROR	Communication with the Profi-Card was consecutively down for the specified period of time or longer.	
E11	PROFIBUS COMMUNICATION ERROR OUTPUT	Error of data from the Profi-Card (sum mismatch, etc.)	
E12	RELAY BOARD COMMUNICATION ERROR	Communication with the relay board was consecutively down for the specified period of time or longer.	
E14	CONTROL BOARD SETTING ERROR	Error of the set value for the control board	
F01	OTHER ERRORS	Other errors were detected.	—(Note)
A01			
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Note: contact us for further information.

(3) In the Event of an Error

*When an error occurs, be sure to thoroughly understand the error and take appropriate countermeasures.