Make Life Easy

User Manual

Counters/Timers

CX Series

Thank you for purchasing an Autonics product.
This user manual contains information about the product and its proper use,
and should be kept in a place where it will be easy to access.

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Autonics

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Preface

Thank you for purchasing Autonics product.

Please familiarize yourself with the information contained in the Safety Considerations section before using this product.

This user manual contains information about the product and its proper use, and should be kept in a place where it will be easy to access.

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User Manual Guide

Please familiarize yourself with the information in this manual before using the product.

- This manual provides detailed information on the product's features. It does not offer any guarantee concerning matters beyond the scope of this manual.
- This manual may not be edited or reproduced in either part or whole without permission.
- A user manual is not provided as part of the product package. Visit our web site (www.autonics.com) to download a copy.
- The manual's content may vary depending on changes to the product's software and other unforeseen developments within Autonics, and is subject to change without prior notice. Upgrade notice is provided through out homepage.
- We contrived to describe this manual more easily and correctly. However, if there are any corrections or questions, please notify us these on our homepage.

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User Manual Symbols

Symbol	Description
 **Note**	Supplementary information for a particular feature.
 **Warning**	Failure to follow instructions can result in serious injury or death.
 **Caution**	Failure to follow instructions can lead to a minor injury or product damage.
 **Ex.**	An example of the concerned feature's use.
※1	Annotation mark.

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Safety Considerations

- Following these safety considerations will ensure the safe and proper use of the product and help prevent accidents, as well as minimizing possible hazards.
- Safety considerations are categorized as Warnings and Cautions, as defined below:

Warning	**Warning**	Failure to follow these instructions may result in serious injury or death.
Caution	**Caution**	Failure to follow these instructions may result in personal injury or product damage.

Warning

- Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
  Failure to follow this instruction may result in fire, personal injury, or economic loss.
- Install on a device panel to use.
  Failure to follow this instruction may result in electric shock or fire.
- Do not connect, repair, or inspect the unit while connected to a power source.
  Failure to follow this instruction may result in electric shock or fire.
- Check 'Connections' before wiring.
  Failure to follow this instruction may result in fire.
- Do not disassemble or modify the unit.
  Failure to follow this instruction may result in electric shock or fire.

Caution

- When connecting the power input and relay output, use AWG 20 (0.50mm^2) cable or over, and tighten the terminal screw with a tightening torque of 0.74 to 0.90N·m.
  Failure to follow this instruction may result in fire or malfunction due to contact failure.
- Use the unit within the rated specifications.
  Failure to follow this instruction may result in fire or product damage.
- Use the unit within the rated specifications.
  Failure to follow this instruction may result in shortening the life cycle of the unit, or fire.
- Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.
  Failure to follow this instruction may result in fire or explosion.
- Keep metal chip, dust, and wire residue from flowing into the unit.
  Failure to follow this instruction may result in fire or product damage.

The specifications and dimensions of user manual are subject to change and some models may be discontinued without notice.

Be sure to follow cautions written in the instruction manual, user manual and the technical descriptions (catalog, homepage).

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Cautions during Use

- Follow this instruction in 'Cautions during Use'.
  Otherwise, it may cause unexpected accidents.
- In case of 24-48VDC, 24VAC model, power supply should be insulated and limited voltage/ current or Class 2, SELV power supply device.
- Use the product, 0.1 sec after supplying power.
- When supplying or turning off the power, use a switch or etc. to avoid chattering.
- Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.
- Keep away from high voltage lines or power lines to prevent inductive noise.
  In case installing power line and input signal line closely, use line filter or varistor at power line and shielded wire at input signal line.
  Do not use near the equipment which generates strong magnetic force or high frequency noise.
- This unit may be used in the following environments.

  ①Indoors (in the environment condition rated in 'Specifications')

  ②Altitude max. 2,000m

  ③Pollution degree 2

  ④Installation category II

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1 Product Overview

1.1 Features

[Common]

- Improved visibility with LCD display
- Input method
  : voltage input (PNP)/no-voltage input (NPN) selectable model (by parameter setting),
  Free voltage input model
- Setting range of one-shot output time: 0.01 sec to 99.99 sec by 0.01 sec unit
- Mounting space saving with compact design (back length: 64.5mm)

[Counter]

- Setting range of prescale value: 0.00001 to 99999.9
- Various input/output mode (input: 11 types, output: 11 types)
- Start point (counting value reset) setting
- TOTAL counter display mode
  : Displays the present value and the integrated value simultaneously.

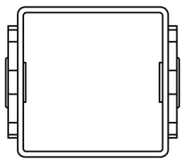
[Timer]

- Various output mode (15 types)
- Wide time setting range: 0.001 sec to 99999.9 hour
- '0' time setting function

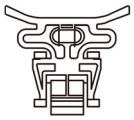
1.2 Components and Accessories

1.2.1 Components

CX Series

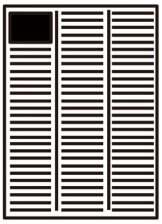


For CXS



For CXM

Braket



Instruction manual

Note

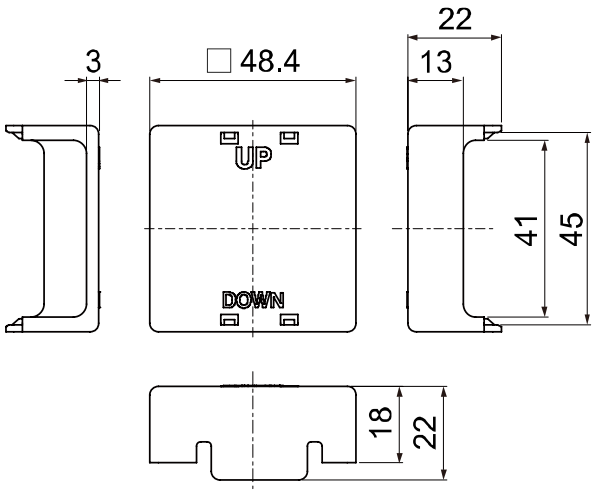
Make sure all of the above components are included with your product package before use.

If a component is missing or damaged, please contact Autonics or your distributor.

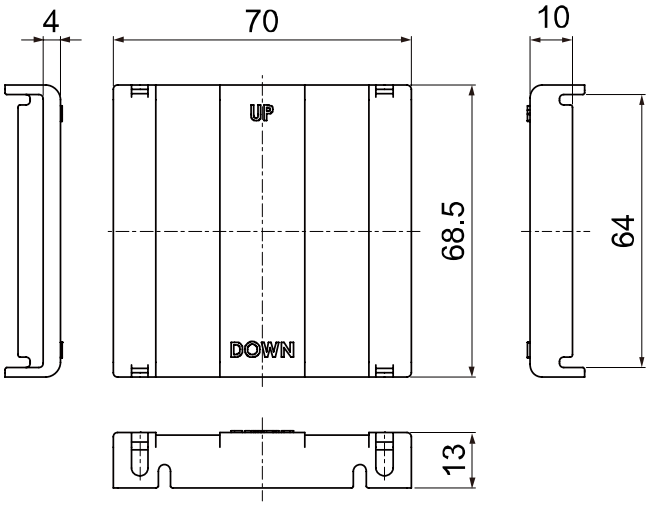
1.2.2 Sold separately

(1) Terminal cover

1) RSA-COVER (48×48mm)



2) RMA-COVER (72×72mm)



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1.3 Ordering information

CX ① | 6 ② | S ③ - 1P ④ | 4 ⑤ | F ⑥

Item		Description
① Item	CX	LCD Display Counter/Timer
② Display digit	6	999999 (6-digit)
③ Size	S	DIN W48 × H48mm
	M	DIN W72 × H72mm
④ Output	1P	1-stage setting
	2P	2-stage setting
⑤ Power supply	2	24VAC 50/60Hz, 24-48VDC
	4	100-240VAC 50/60Hz
⑥ Signal input method	No mark	Voltage input (PNP)/no-voltage input (NPN) selectable type
	F	Free voltage input

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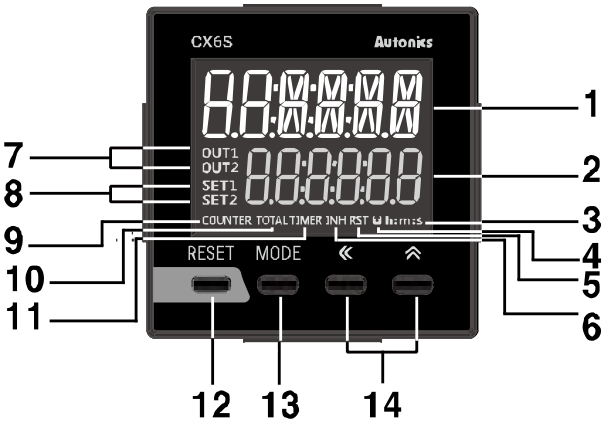
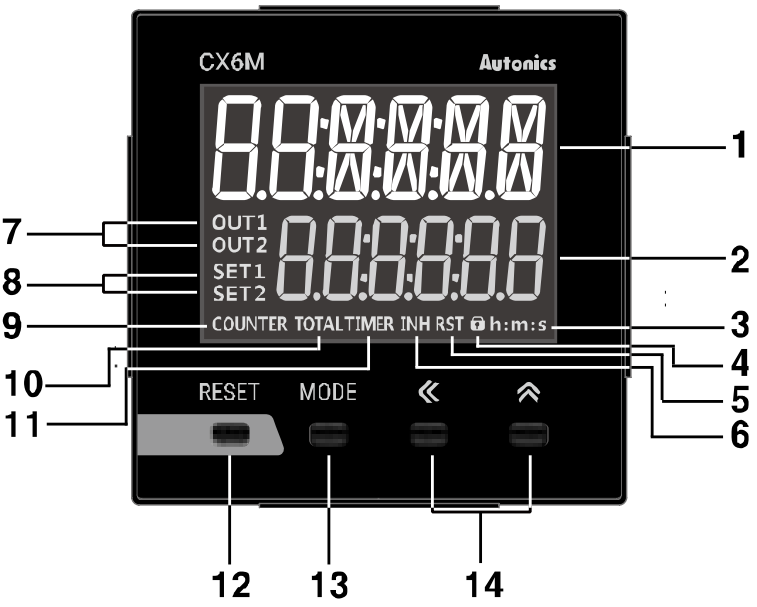
1.4 Unit description

1.4.1 CXS Series



1.4.2 CXM Series



(1) Counting value display component (red)

RUN mode: Displays counting value for counter operation or time progress value for timer operation.
Function setting mode: Displays parameter.

(2) Setting value display component (green)

RUN mode: Displays setting value.
Function setting mode: Displays setting content.

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(3) Time unit indicator (h:m:s): Turns ON for time unit for timer.

(4) Key lock indicator ( ):Turns ON for key lock setting.

(5) Reset input indicator (RST)

: Turns ON for reset key input or reset signal input.

(6) INH indicator (INH)

: For the voltage input (PNP)/no-voltage input (NPN) selectable model (CX6□-□□), it turns ON for INHIBIT signal input. (In case of CX6S Series and timer mode, it turns ON for INB/INH signal input.)

For free voltage input model (CX6□-□□F), it turns ON for INB/INH signal input for timer.

(7) Output indicator (OUT1, OUT2)

: Turns ON for the dedicated control output ON.

(8) SV checking and changing indicator (SET, SET1, SET2) (green)

: Turns ON when checking and changing SV.

(9) COUNTER indicator (COUNTER)

: Turns ON for counter operation.

(10) TOTAL indicator※1(TOTAL)

: In case of TOTAL counter display mode, it turns ON with the COUNTER indicator.

(11) TIMER indicator(TIMER)

: Flashes (progressing time) or Turns ON (stopping time) for timer operation.

(12) RESET key

RUN mode, Function setting mode: Press the RESET key to reset the counting value and turn OFF the output.

TOTAL counter display mode※1: Press the RESET key to reset the counting value of TOTAL counter.

(13) MODE key

RUN mode

: Hold the MODE key over 3 sec to enter function setting mode.

Press the MODE key to select SV2 (SET2)/ SV1 (SET1)/TOTAL counter※1 display for counter operation.

Function setting mode

: Hold the MODE key over 3 sec to return RUN mode. Press the MODE key to save the SV and enter the next setting.

Function setting check mode: Hold the MODE key over 1 sec to return RUN mode.

Changing SV mode: Press the MODE key to save SV and return RUN mode.

(14) , key

1) key

RUN mode: Press the Press the key to change SV and move SV (SET, SET1, SET2) digits.

Changing SV mode: Press the key to change digits.

2) key

Changing SV mode: Increases SV.

Function setting mode: Changes the settings.

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Note

※1: This is for the voltage input (PNP)/no-voltage input (NPN) selectable model (CX6□-□□).

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2 Specifications

Series			CXS		CXM	
Model			**CX6S-1P□□**	**CX6S-2P□□**	**CX6M-1P□□**	**CX6M-2P□□**
Display digits			6-digit			
Display method			7-segment (1st, 2nd digits of counting value display: white, setting value display: green) LCD method, 11-segment (the other digits of counting value display: white) LCD method, Operation display part: yellow LCD method			
Character size (W×H)	Counting value		4.1×10.1mm		6.2×15.2mm	
	Setting value		3.3×8.1mm		5×12.3mm	
Power supply	AC voltage		100-240VAC～ 50/60Hz			
	AC/DC voltage		24VAC～ 50/60Hz, 24-48VDC⎓			
Permissible voltage range			90 to 110% of rated voltage			
Power consumption	AC voltage	CX6□-□□	Max. 6.4VA	Max. 6.7VA	Max. 7.1VA	Max. 7.5VA
		CX6□-□□F	Max. 4.2VA	Max. 4.9VA	Max. 4.7VA	Max. 5.4VA
	AC/DC voltage	CX6□-□□	AC: max. 5.5VA DC: max. 3.5W	AC: max. 5.6VA DC: max. 3.6W	AC: max. 6.2VA DC: max. 4W	AC: max. 6.3VA DC: max. 4.1W
		CX6□-□□F	AC: max. 3.6VA DC: max. 2.5W	AC: max. 4.0VA DC: max. 2.8W	AC: max. 3.9VA DC: max. 2.9W	AC: max. 4.5VA DC: max. 3.3W
Counter	Max. INA/INB counting speed	CX6□-□□	Selectable among 1cps/30cps/300cps/1kcps/5kcps			
		CX6□-□□F	20cps			
	Counting range		-99999 to 999999			
	Scale		Decimal point up to fifth digit			
	Min. signal width	CX6□-□□	RESET, TOTAL RESET signal: selectable among 1ms/20ms			
		CX6□-□□F	RESET signal: 25ms			
Timer	Time range		999.999s, 9999.99s, 99999.9s, 999999s, 99m59.99s, 999m59.9s, 9999m59s, 99999.9m, 999999m, 99h59m59s, 9999h59m, 99999.9h			
	Operation mode		Up, Down			
	Min. signal width	CX6□-□□	INA, INHIBIT, RESET, TOTAL RESET signal: selectable among 1ms/20ms			
		CX6□-□□F	INA, INH, RESET signal: 25ms			
	Repeat error		[CX6□-□□] – In case of power ON start: max. ±0.01% ±0.05s In case of signal ON start: max. ±0.01% ±0.03s [CX6□-□□F] - In case of power ON start: max. ±0.01% ±0.08s In case of signal ON start: max. ±0.01% ±0.06s			
	SET error					
	Voltage error					
	Temperature error					

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Series			CXS		CXM	
Model			CX6S-1P□□	CX6S-2P□□	CX6M-1P□□	CX6M-2P□□
Input method	CX6□-□□		Selectable among voltage input (PNP) / no-voltage input (NPN) [Voltage input (PNP)] – input impedance: 10.8kΩ, [H]: 5-30VDC⎓, [L]: 0-2VDC [No-voltage input (NPN)] - short-circuit impedance: max. 1kΩ short-circuit residual voltage: max. 2VDC			
	CX6□-□□F		[Free voltage input] – INA (START), INB (INHIBIT) input [H]: 24-240VDC⎓/24-240VAC~ 50/60Hz, [L]: 0-10VDC/VAC [No-voltage input] - RESET input short-circuit impedance: max. 1kΩ, short-circuit residual voltage: max. 2V			
One-shot output time			0.01 to 99.99s setting			
Control output	Contact	Type	SPDT (1c): 1	SPST (1a): 2	SPDT (1c): 1	SPDT (1c): 2
		Capacity	Max. 250VAC~ 3A, 30VDC⎓ 3A resistive load			
	Solid state	Type	–		NPN open collector: 1	NPN open collector: 2
		Capacity			Max. 30VDC⎓ 100mA	
External power supply※1			Max. 12VDC⎓ ±10%, 100mA			
Memory retention			Approx. 10 years (non-volatile memory)			
Insulation resistance			Over 100MΩ (at 500VDC megger)			
Dielectric strength			3,000VAC 50/60Hz for 1 min			
Noise immunity		AC voltage	Square-wave noise by noise simulator (pulse width 1μs) ±2kV			
		AC/DC voltage	Square-wave noise by noise simulator (pulse width 1μs) ±500V			
Vibration		Mechanical	0.75mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 1 hour			
		Malfunction	0.5mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 minutes			
Shock		Mechanical	300m/s² (approx. 30G) in each X, Y, Z direction for 3 times			
		Malfunction	100m/s² (approx. 10G) in each X, Y, Z direction for 3 times			
Relay life cycle		Mechanical	Min. 5,000,000 operations			
		Malfunction	Min. 100,000 operations			
Protection structure			Front part: IP50 (IEC standard)			
Environment		Ambient temp.	-10 to 55℃, storage: -25 to 65℃			
		Ambient humi.	35 to 85%RH, storage: 35 to 85%RH			
Approval			CE			
Weight※2	AC voltage	CX6□-□□	Approx. 157g (approx. 112g)	Approx. 162g (approx. 117g)	Approx. 235g (approx. 170g)	Approx. 240g (approx. 175g)
		CX6□-□□F	Approx. 155g (approx. 110g)	Approx. 160g (approx. 115g)	Approx. 233g (approx. 168g)	Approx. 238g (approx. 173g)
	AC/DC voltage	CX6□-□□	Approx. 156g (approx. 111g)	Approx. 161g (approx. 116g)	Approx. 234g (approx. 169g)	Approx. 239g (approx. 174g)
		CX6□-□□F	Approx. 154g (approx. 109g)	Approx. 159g (approx. 114g)	Approx. 232g (approx. 167g)	Approx. 237g (approx. 172g)

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Note

※1: This is for the voltage input (PNP)/no-voltage input (NPN) selectable model (CX6□-□□).

※2: The weight includes packaging. The weight in parenthesis for unit only.

※Environment resistance is rated at no freezing or condensation.

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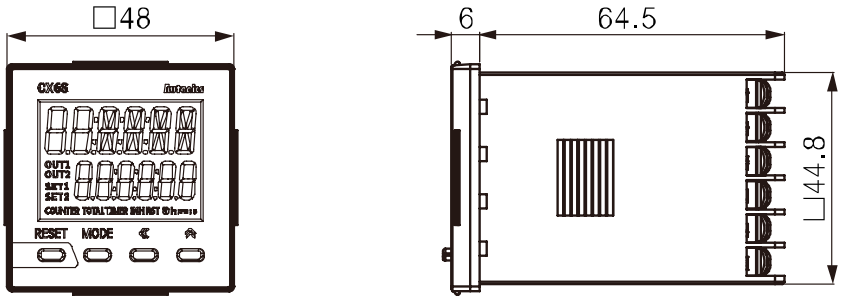
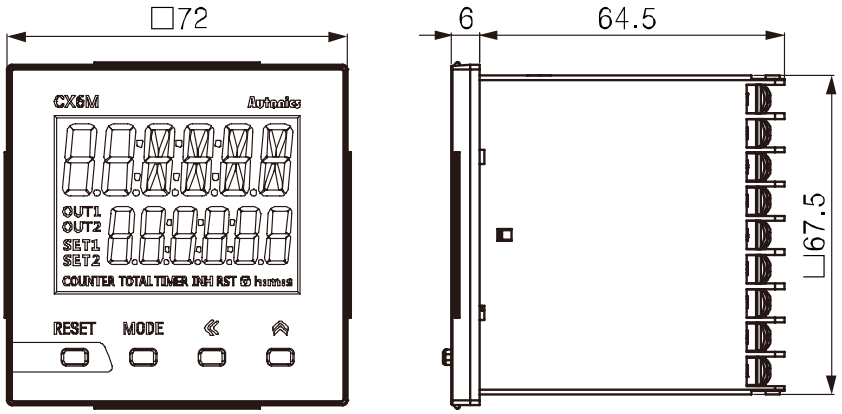
3 Dimensions

(unit: mm)

3.1 CXS Series



3.2 CXM Series



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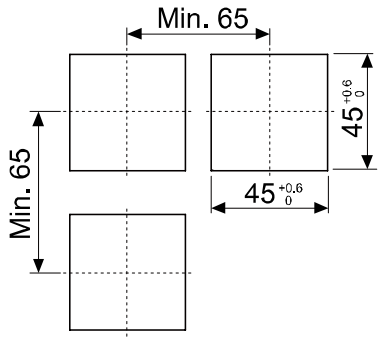
3.3 Panel cut-out dimension

(unit: mm)

3.3.1 CXS Series



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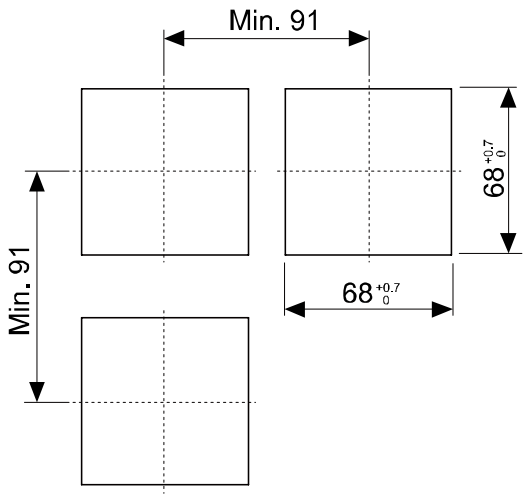

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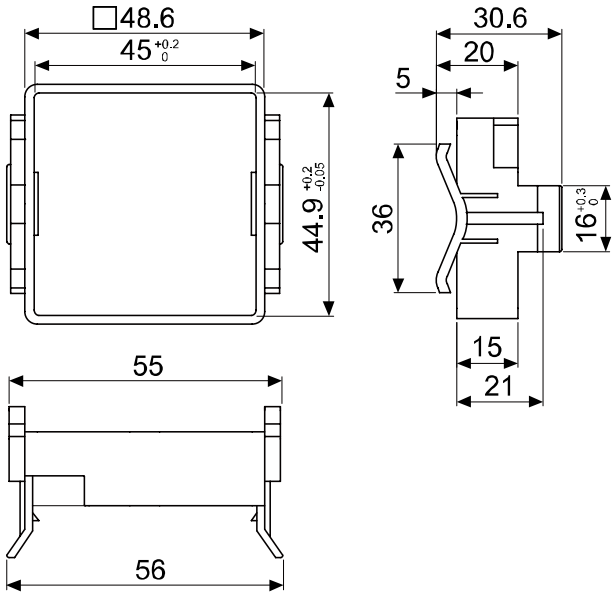
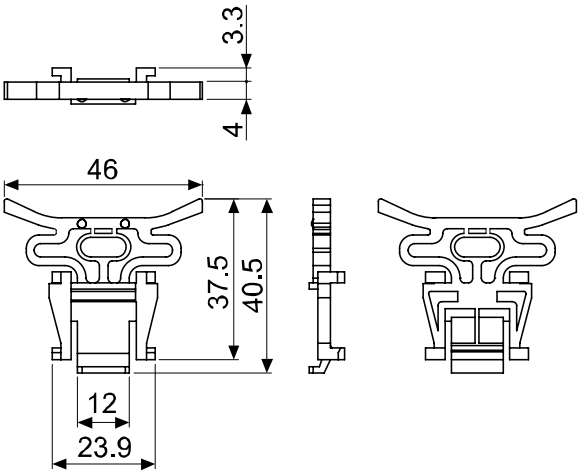
3.4 Bracket

(unit: mm)

3.4.1 CXS Series



3.4.2 CXM Series



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4 Connection Method

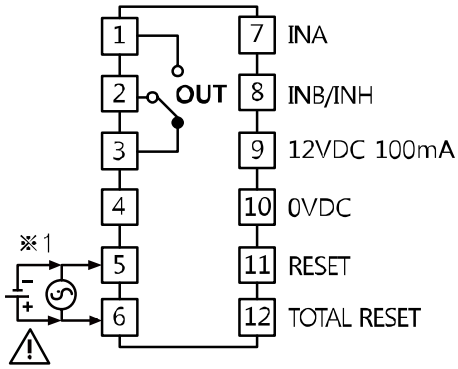
4.1 Connection

4.1.1 CXS Series

(1) Voltage input(PNP)/no-voltage input(NPN) selectable model

1) CX6S-1P□

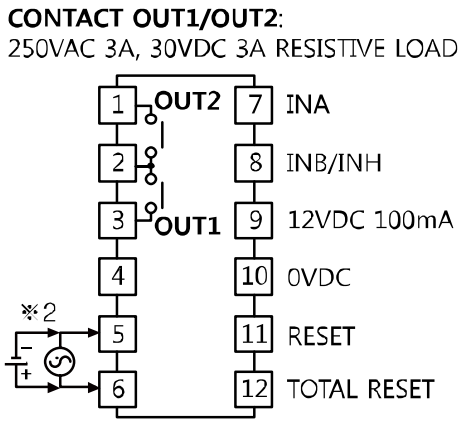
CONTACT OUT:
250VAC 3A, 30VDC 3A RESISTIVE LOAD



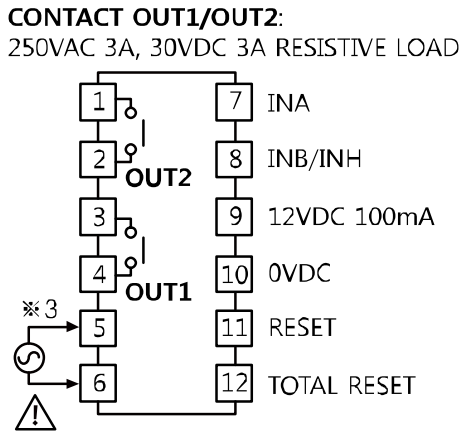
Note

※1: AC voltage type: 100-240VAC 50/60Hz
AC/DC voltage type: 24VAC 50/60Hz, 24-48VDC

2) CX6S-2P2



3) CX6S-2P4



Note

※2: AC/DC voltage type: 24VAC 50/60Hz, 24-48VDC

※3: AC voltage type: 100-240VAC 50/60Hz

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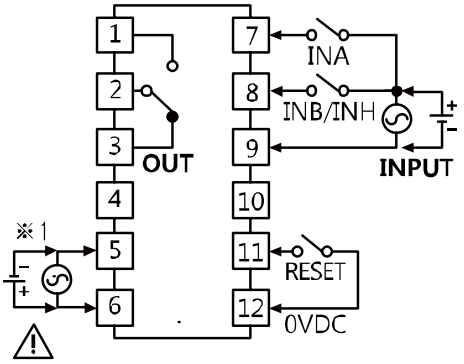
(2) Free voltage input model

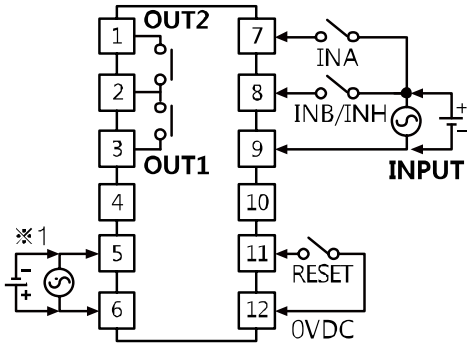
1) CX6S-1P□F

CONTACT OUT: 250VAC 3A, 30VDC 3A RESISTIVE LOAD
SIGNAL INPUT: 24-240VAC 50/60Hz, 24-240VDC



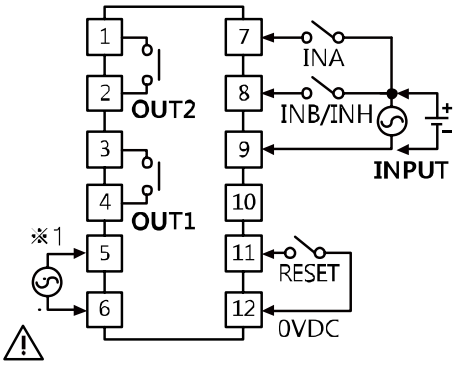
2) CX6S-2P2F

CONTACT OUT1/OUT2: 250VAC 3A, 30VDC 3A RESISTIVE LOAD
SIGNAL INPUT: 24-240VAC 50/60Hz, 24-240VDC



3) CX6M-2P4F

CONTACT OUT1/OUT2: 250VAC 3A, 30VDC 3A RESISTIVE LOAD
SIGNAL INPUT: 24-240VAC 50/60Hz, 24-240VDC



Note

※1: AC voltage type: 100-240VAC 50/60Hz
AC/DC voltage type: 24VAC 50/60Hz, 24-48VDC

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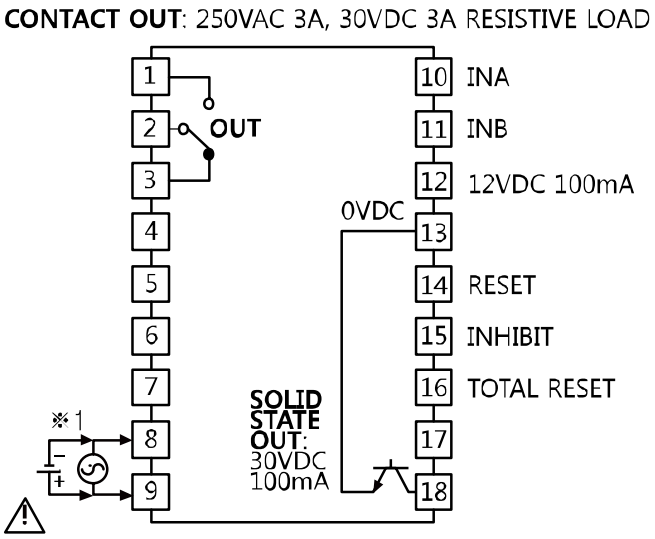
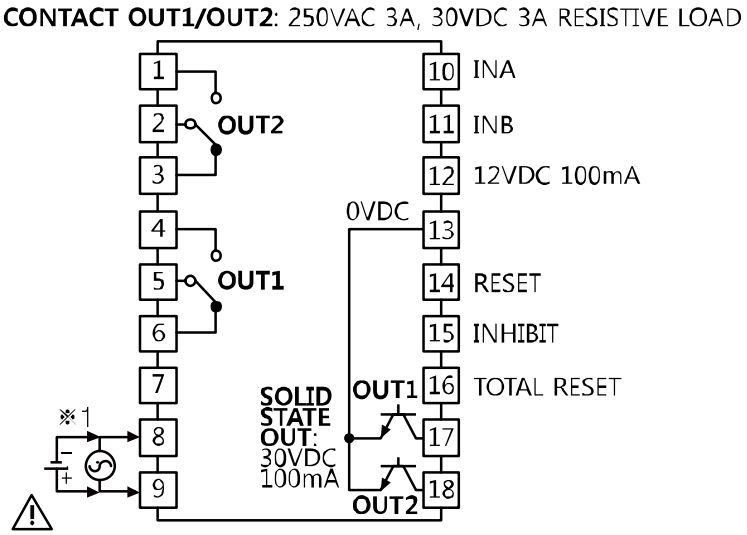
4.1.2 CXM Series

(1) Voltage input(PNP)/no-voltage input(NPN) selectable model

1) CX6M-1P□



2) CX6M-2P□



Note

※1: AC voltage type: 100-240VAC 50/60Hz
AC/DC voltage type: 24VAC 50/60Hz, 24-48VDC

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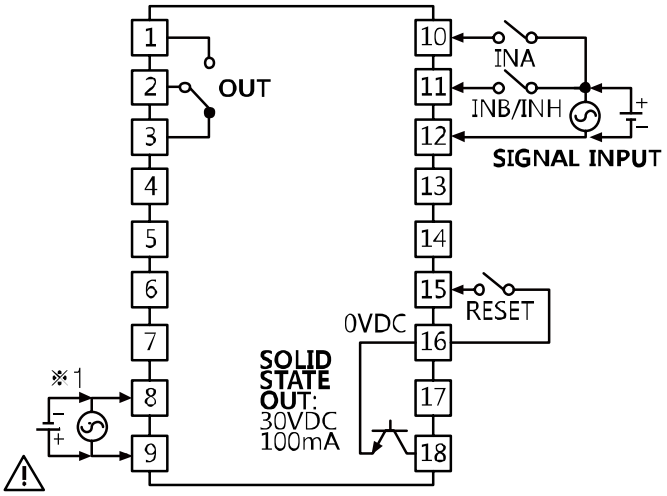
(2) Free voltage input model

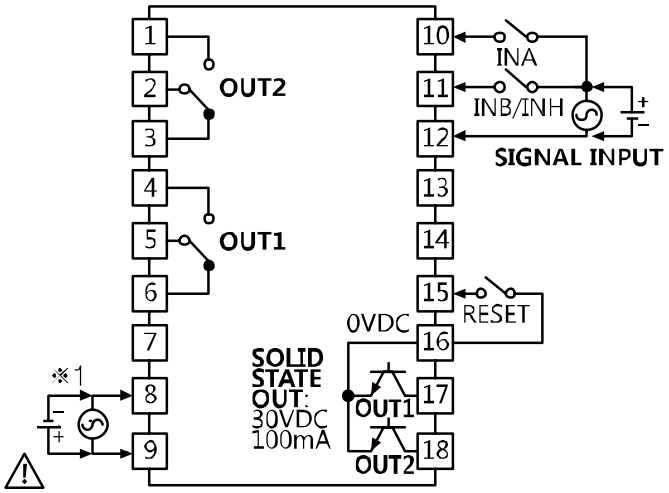
1) CX6M-1P□F

CONTACT OUT: 250VAC 3A, 30VDC 3A RESISTIVE LOAD
SIGNAL INPUT: 24-240VAC 50/60Hz, 24-240VDC



2) CX6M-2P□F

CONTACT OUT1/OUT2: 250VAC 3A, 30VDC 3A RESISTIVE LOAD
SIGNAL INPUT: 24-240VAC 50/60Hz, 24-240VDC



Note

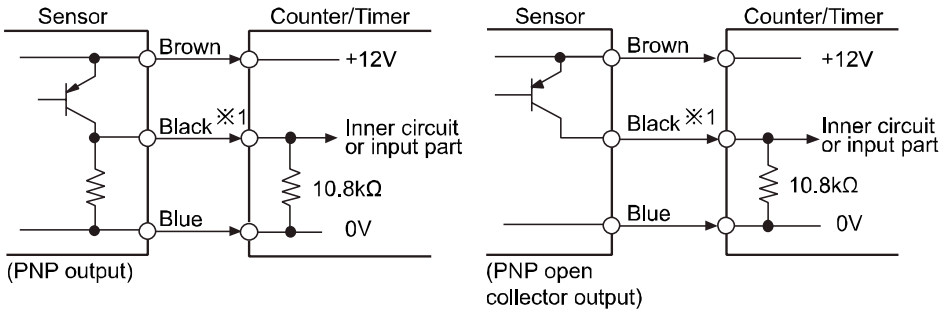
※1: AC voltage type: 100-240VAC 50/60Hz
AC/DC voltage type: 24VAC 50/60Hz, 24-48VDC

4.2 Input and Output connection

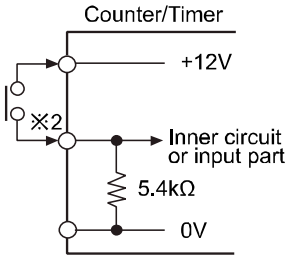
4.2.1 Input connection

(1) Voltage input (PNP)

1) Solid-state input (standard sensor: PNP output type sensor)

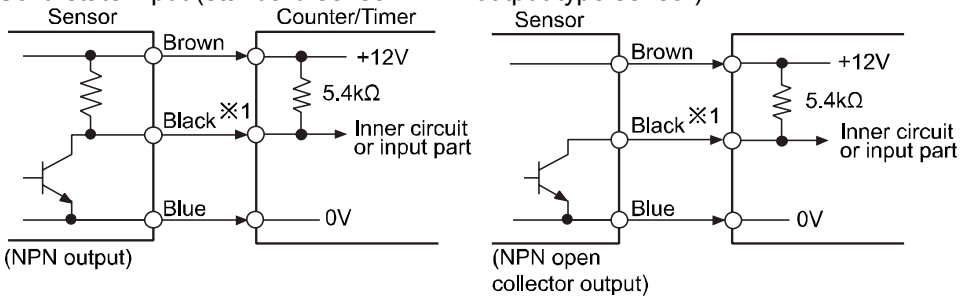


2) Contact input

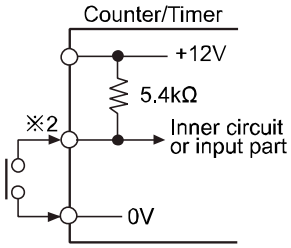


(2) No-voltage input (NPN)

1) Solid-state input (standard sensor: NPN output type sensor)



2) Contact input



Note

※1: CP1, CP2(INHIBIT), SET input part

※2: Set counting speed as 1 or 30cps.

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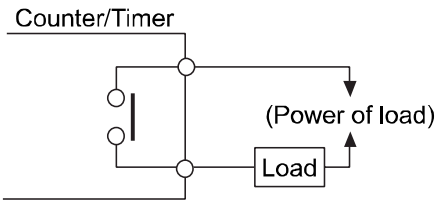
4.2.2 Output connection

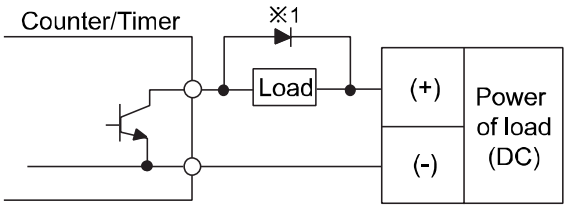
(1) Contact output



Note

Select the load which capacity is not over contact capacity.

(2) Solid-state output



Note

- For solid state output, select load power and load not to be over (max. 30VDC, 100mA), switching capacity.
- Do not supply reverse polarity voltage.

※1: For using inductive load (relay, etc), connect surge absorber (diode, varistor, etc) at the both ends of load.

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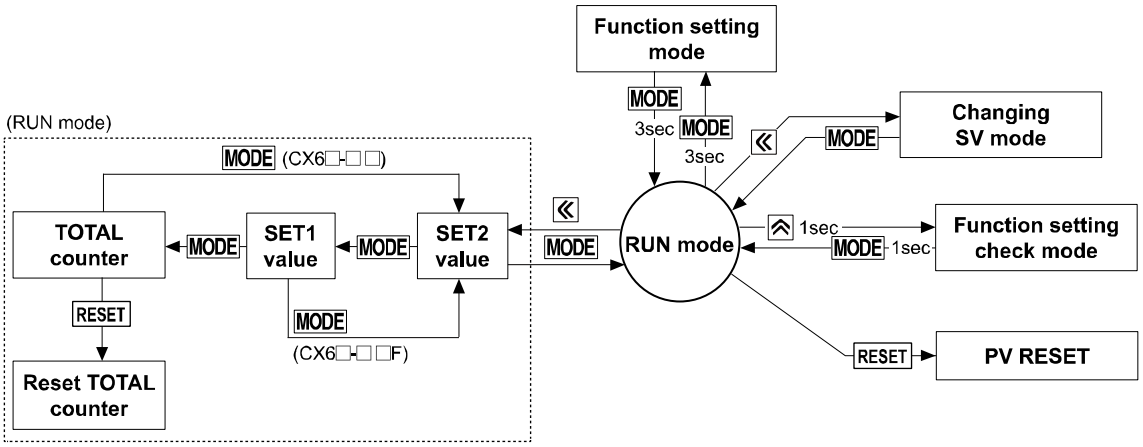
5 Counter mode

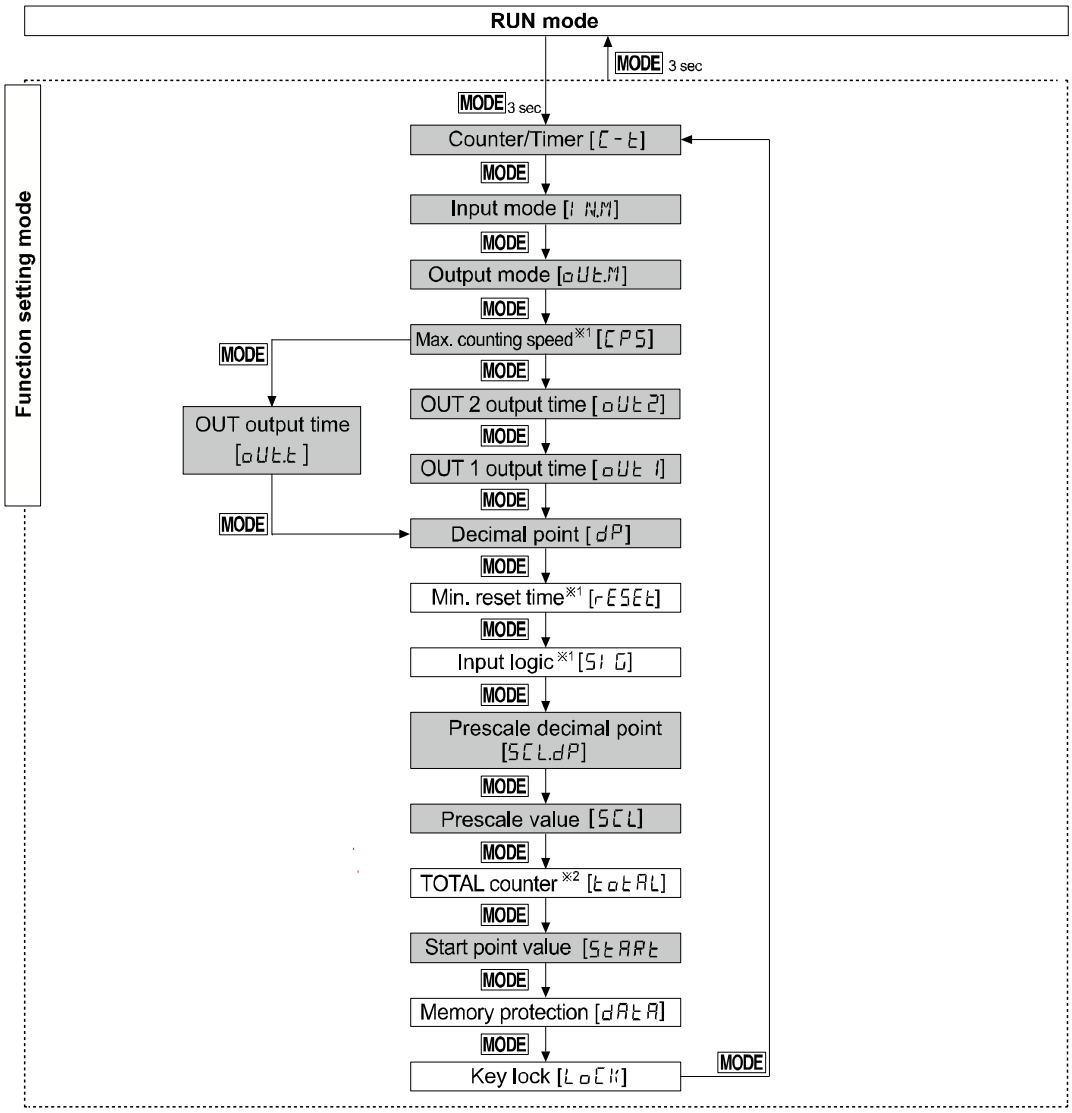
5.1 Basic Operations

5.1.1 Operations and functions



5.1.2 Function setting mode

- Hold the MODE key over 3 sec in RUN mode and it enters function setting mode.
- Hold the MODE key over 3 sec in function setting mode and it returns to RUN mode.



Note

※1: In case of free voltage input model (CX6□-□□F) , these parameters do not appear due to fixed setting.

※2: This parameter is for the voltage input(PNP)/no-voltage input(NPN) selectable model (CX6□-□□).

※ : When changing the setting of shaded parameters, all output turn OFF.
When returning RUN mode, PV is reset.

※In case of 1-stage setting model(CX6□-1P□□), oUt 1 output time does not appear.
oUt2 output time is displayed as oUt.t .

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※When input mode is dn, dn-1, dn-2, or dn-3, start point [StArt] parameter does not appear.

Note

※When total count function is ON, start point [StArt] parameter does not appear.
(This is for the voltage input(PNP)/no-voltage input(NPN) selectable model (CX6□-□□).)

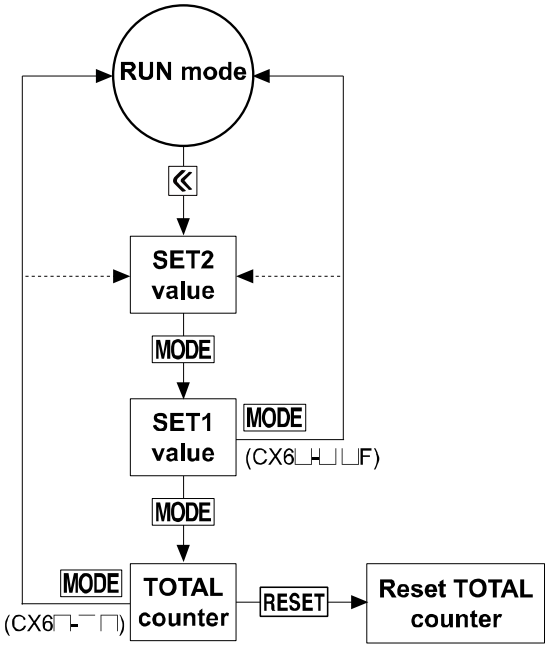
※When output mode is F, n, S, t, or d, out2 output time dose not appear. (fixed as HOLD)

※When output mode is S, t, or d, out1 output time does not appear.

※Even though entering RUN mode and function setting mode, it operates counter counting and output control.

※When changing operation setting value at function setting mode, all output turn OFF and it is reset when it returns to RUN mode.

5.1.3 Changing SV mode



- Press the « key to enter changing SV mode in RUN mode.
- When input signal is ON during changing SV, it operates counting and output control. It is available to set SV as '0' and the dedicated output for SV '0' occurs.
- There are output mode which cannot set SV as '0'. (the setting value display component flashes three times when SV is set as '0')
- When entering changing SV mode, the counting value display component displays the current value and the setting value display component displays SV.
- When setting 1-stage SV and 2-stage SV, each “SET1”, “SET2” indicator turns ON.
- In case of 1-stage setting model (CX6□-1P□□), SET2 is displayed as SET and SET1 is not displayed.
- After setting SV at each parameter, press the MODE key to save SV and it moves next parameter setting or returns to RUN mode.

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5.1.4 Checking SV of TOTAL counter

- Press the MODE key in RUN mode and it operates SET2 → SET1 → TOTAL Counter in order.
- At TOTAL counter operation, the counting value display component displays the current value and the setting value display component displays TOTAL counter counting value.
- When TOTAL counter counting value is over 999999, it counts from 0 again.

5.1.5 Function setting check mode (only for free voltage input model (CX6□-□□F))

- Hold the ⩓ key over 1 sec to enter function setting check mode in RUN mode.
- When checking the saved parameters, press the MODE, ⩓ key to check next item.
- Hold the MODE key over 1 sec at function setting check mode and it returns to RUN mode.
- At function setting check mode, the counting value display component displays the parameters and the setting value display component displays the SV of the parameters.

5.1.6 Switching display of the setting value display component

In case of 2-stage setting model(CX6□-2P□□), whenever pressing the MODE key, each SET2, SET1, TOTAL COUNTER※1 value displays consecutively.

Note

※1: This is for the voltage input(PNP)/no-voltage input(NPN) selectable model (CX6□-□□).

5.1.7 Display HOLD output mode for counter

- It displays the over value of prescale value.
- When SV is n multiplied by prescale value and the display value after HOLD output mode and SV are different, the prescale value is not the 1/n time of SV.

5.1.8 RESET

- In RUN mode, function setting mode, press the RESET key to reset the current value and the output turns OFF.
- At TOTAL counter display mode※1, press the RESET key to reset TOTAL counter counting value and the current counting value.

Note

※1: This is for the voltage input(PNP)/no-voltage input(NPN) selectable model (CX6□-□□).
TOTAL counter display mode is only when counter operation.

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5.2 Parameter setting

(MODE key: moves parameters, ▲ key: changes parameter setting value)

Parameter	Parameter setting value
Counter/Timer [C-t]	CoUnt ⟷ tImE ※CoUnt: Counter, tImE: Timer
Input mode [INM]	UP → UP-1 → UP-2 → UP-3 → dn → dn-1 → dn-2 → dn-3 → Ud-A → Ud-b*1 → Ud-C*1 → UP
Output mode [oUtM]	● Input mode is UP, UP-1, UP-2, UP-3 or dn, dn-1, dn-2, dn-3, F → n → C → r → U → P → 9 → A ● Input mode is Ud-A, Ud-b※1, Ud-C※1, F → n → C → r → U → P → 9 → A → S → t → d ※If max. counting speed is 5kcps, and output mode is d, max. counting speed is automatically changed as 30cps, factory default.
Max. counting speed ※2 [CPS]	30 → 300 → 1k → 5k → 1 ※Max. counting speed is when duty ratio of INA or INB input signal is 1:1. It is applied for INA, or INB input as same. ※When output mode is d, set max. counting speed one among 1cps, 30cps, 300cps, or 1kcps.
OUT2 output time※3 [oUt2]	※Set one-shot output time of OUT2. ※Setting range: 00.01 to 99.99 sec ※When output mode is F, n, S, t, d, this parameter oUt2 does not appear. (fixed as HOLD)
OUT1 output time※3 [oUt1]	※Set one-shot output time of OUT1. ※Setting range: 00.01 to 99.99 sec, Hold ※When number of tens digit is flashing, press the ◀ key once and HoLd appears. ※When output mode is S, t, d, this parameter oUt1 does not appear. (fixed as HOLD)
OUT output time※3 [oUtt]	※Setting range: 00.01 to 99.99 sec ※When output mode is F, n, S, t, d, this parameter oUtt does not appear. (fixed as HOLD)
Decimal point※4 [dP]	------ → -----.- → ----.-- → ---.--- → --.---- → -.---- ※Decimal point is applied to PV and SV.
Min. reset time※2 [rESEt]	1 ⟷ 20, unit: ms ※Set min. width of external reset signal input.
Input logic ※2 [SIG]	nPn: No-voltage input, PnP: Voltage input

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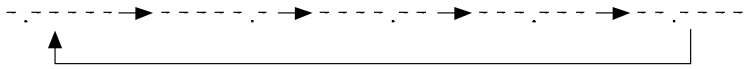
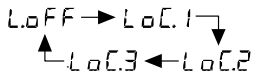
Parameter	Parameter setting value
Prescale decimal point※4 [SCL.dP]	 ※Decimal point of prescale should not set smaller than decimal point [dP]
Prescale value [SCL]	※Setting range: 0.00001 to 99999.9 ※Setting range of prescale is linked with prescale decimal point [SCL.dP] setting.
TOTAL counter※1 [totAL]	on ◄► oFF
Start point value [StArt]	※Setting range of start point value is linked with decimal point [dP] setting. (0.00000 to 999999) ※When input mode is dn, dn-1, dn-2, this parameter [StArt] does not appear. ※When total count function is ON, this parameter [StArt] does not appear. ※1
Memory protection [dAtA]	CLr ◄► rEC ※CLr : Resets the counting value when power OFF. rEC : Maintains the counting value when power OFF. (memory protection)
Key lock [LoCK]	 ※LoFF : Unlock keys, key lock indicator turns OFF LoC.1 : Locks RESET key, key lock indicator turns ON LoC.2 : Locks ≪, ≫ key, key lock indicator turns ON LoC.3 : Locks RESET, ≪, ≫ key, key lock indicator turns ON

Note

※1: This is for the voltage input(PNP)/no-voltage input(NPN) selectable model (CX6□-□□).

※2: For free voltage input model(CX6□-□□F), these parameters do not appear due to fixed setting.

※3: For 1-stage setting model (CX6□-1P□□), oUt1 output time does not appear.
The oUt2 output time is displayed as oUtt.

※4: Decimal point and prescale decimal point

- Decimal point
  : Set the decimal point for display value regardless of prescale value.
- Prescale decimal point
  : Set the decimal point for prescale value of counting value regardless of display value.

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5.2.1 Counter/Timer

Select operation type as counter or timer.

※Right after the selecting counter/timer, the below parameters are changes as the dedicated operation.

5.2.2 Input mode

Select one counter input mode; up input [UP, UP-1, UP-2, UP-3], down input [dn, dn-1, dn-2, dn-3], command input [Ud-A], individual input [Ud-b][※1], phase-difference input [Ud-C][※1] .

Note

※1: This is for the voltage input(PNP)/no-voltage input(NPN) selectable model (CX6□-□□).

5.2.3 Output mode

Select one counter output mode; F, n, C, r, U, P, 9, A, S, t, d mode.

※In case of input mode Ud-A, Ud-b[※1], Ud-C[※1], output mode S, t, d setting is available.

※When max. counting speed is set as 5kpcs, and output mode is d, max. counting speed is changed as 30cps automatically.

Note

※1: This is for the voltage input(PNP)/no-voltage input(NPN) selectable model (CX6□-□□).

5.2.4 Max. counting speed

Select one max. counting speed of INA, INB; 1cps, 30cps, 300cps, 1kcps, 5kcps.

※In case of d output mode, select one; 1cps, 30cps, 300cps, 1kcps.

5.2.5 OUT2 output time

Set one-shot output time of OUT2 output. (unit: sec)

※Setting range: 00.01 to 99.99s

- « key: Moves the setting digits of output time value.
- ^ key: Changes the flashing digit value.

※In case of 1-stage setting model(CX6□-1P□□), oUt1 output time does not appear.
oUt2 output time is displayed as oUt.t .

※In case of F, n, S, t, d output mode, oUt2 does not appear. (fixed as HOLD)

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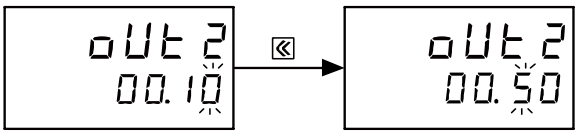
(1) When changing output time setting as 500ms,



1) Press the [◁] key to move the flashing digit at the setting value display component.
2) Press the [△] keys to set as 5 of the 2nd digit.
3) Press the [MODE] key to save SV and enter next parameter setting.

5.2.6 OUT1 output time

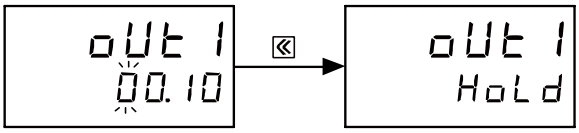
Set output operation (HOLD) and one-shot output time of OUT1 output. (unit: sec)

※Setting range: 00.01 to 99.99s, HOLD

- [◁] key: Moves the setting digit of output time.
- [△] key: Changes the flashing digit value.

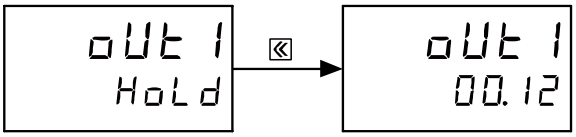
※In case of 1-stage setting model (CX6□-1P□□), oUt 1 does not appear.

(1) When changing output time setting as HOLD,



1) When number of tens digit flashes, press the [◁] key once and HOLD is displayed.
2) Press the [MODE] key to save SV and moves to next parameter.

(2) When changing output time setting from HOLD to 120ms,



1) When HOLD is displayed, press the [◁] key once and moves the 1st digit of the setting value display component.
2) Press the [△] key to set as 2 of 1st digit.
3) Press the [◁] key to move digit to the 2nd digit.
4) Press the [△] key to set as 1 of 2nd digit.
5) Press the [MODE] key to save SV and moves to next parameter.

(3) Setting parameter order

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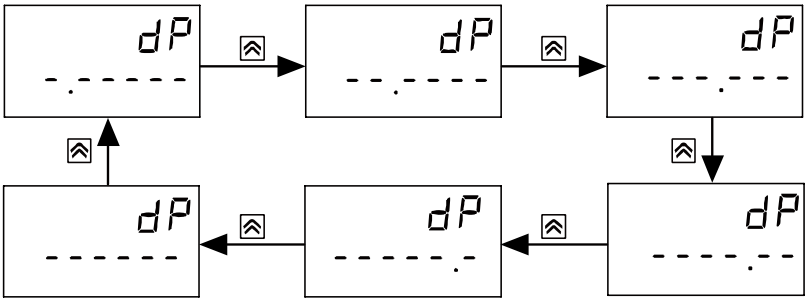
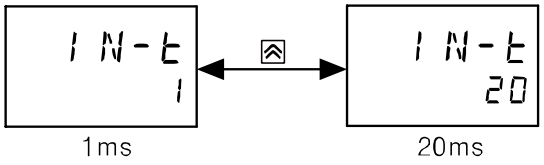
5.2.7 Decimal point

Set decimal point of counting value and SV in RUN mode.



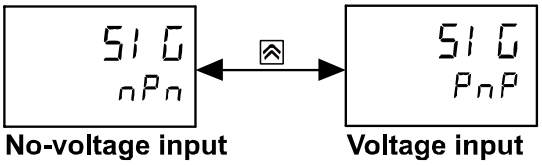
5.2.8 Min. reset time

Select min. signal width of the external RESET signal input. (unit: ms)



5.2.9 Input logic

Select external signal input logic; NPN or PNP input.



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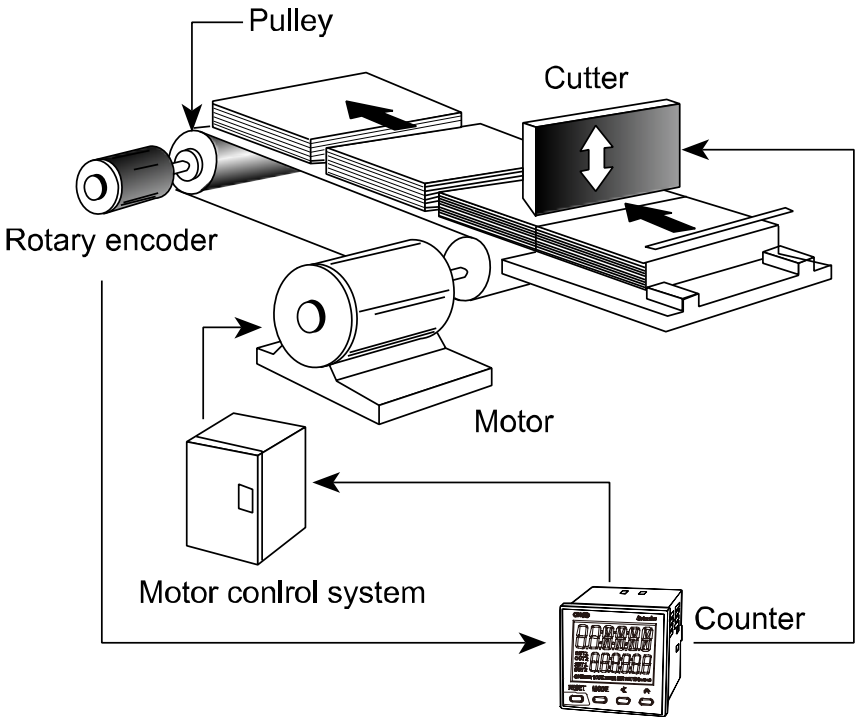
5.2.10 Prescale

This function is to set and display calculated unit for actual length, liquid, position, etc. It is called “prescale value” for measured length, liquid, or position, etc per 1 pulse. For example, when moving L, the desired length to be measured, and P, the number of pulses per 1 revolution of a rotary encoder, occurs, prescale value is L/P.

Ex.

Positioning control by counter and encoder
[Diameter (D) of pulley connected with encoder= 22mm,
the number of pulses by 1 rotation of encoder=1,000]



- Prescale value = $\frac{\pi \times \text{Diameter (D) of pulley (D)}}{\text{The number of pulses by 1 rotaiton of encoder}}$

$$= \frac{3.1416 \times 22}{1000}$$

$$= 0.069\text{mm/pulse}$$

Set decimal point [dP] as [- - - - - .-] mode, prescale decimal point [SCL.dP] as [- - - .- - -] and prescale value[SCL] parameter as [0.069] at function setting mode. It is available to control conveyer position by 0.1mm unit.

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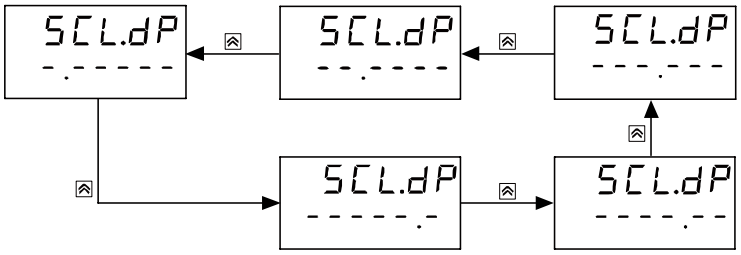
5.2.11 Prescale decimal point

Set decimal point of prescale value.



※Decimal point of prescale should not set smaller than decimal point [dP].

5.2.12 Prescale value

Set the prescale value of counter counting value.

- « key: Moves the setting digit of prescale value.
- ^ key: Changes the flashing digit value.

Ex.

※When setting prescale value as 78.1121,

① Prescale decimal point position
Set decimal point of prescale referring to [5.2.11 prescale decimal point].

② Prescale value setting

1) Press the ^ key to set as 1 and press the « key to move digit to the 2nd digit.

2) Press the ^ key to set as 2 and press the « key to move digit to the 3rd digit.

3) Press the ^ key to set as 1 and press the « key to move digit to the 4th digit.

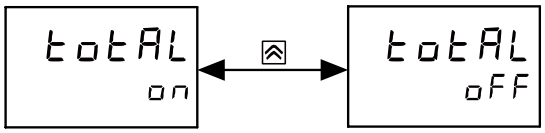
4) Press the ^ key to set as 1 and press the « key to move digit to the 5th digit.

5) Press the ^ key to set as 8 and press the « key to move digit to the 6th digit.

6) Press the ^ key to set as 7 and press the MODE key to move the next parameter.

5.2.13 TOTAL Counter

Set TOTAL counter operation ON/OFF.



Total counterON **Total counterOFF**

※In case of TOTAL counter OFF and at RUN mode, press the MODE key and it changes to SV display mode.

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5.2.14 Start point value

In case of counter operation, set the start value for counting at Start point [5tArt].

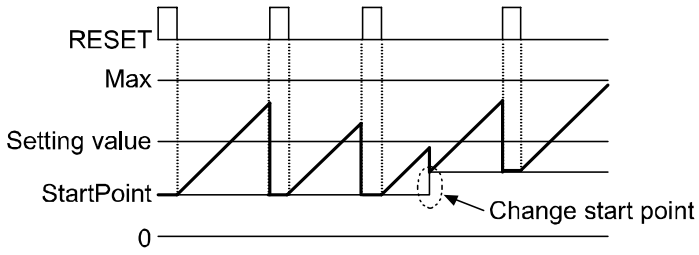
- It is not available for dn, dn-1, dn-2, dn-3 input mode.
- It is not available when TOTAL COUNTER※1 is ON.
- When pressing the RESET key, PV is reset as the start point value.
- In case of C, r, P, 9 output mode, it counts up and PV starts from the start point value.
- In case of counter operation and UP, UP-1, UP-2, UP-3, Ud-A, Ud-b※1, Ud-C※1 input mode, start point setting is available.
- When changing the start point value at function setting mode and returning to RUN mode, PV is changed as the start point value.
  When changing the start point value at function setting mode, PV is reset.
- Setting range: 0.00000 to 999999
- Start point setting method is same as SV setting method.
- Setting range of start point value is linked with decimal point [dP].

Note

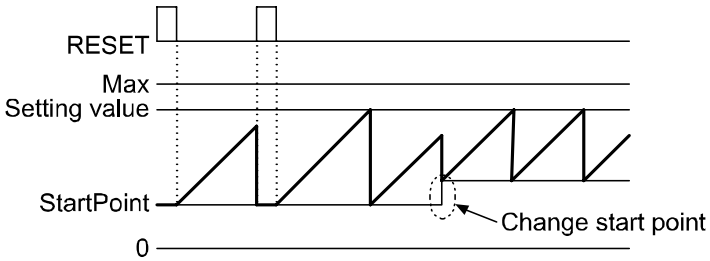
※1: This is for the voltage input(PNP)/no-voltage input(NPN) selectable model (CX6□-□□).

Ex.

※Start point for F output mode



※Start point for C output mode



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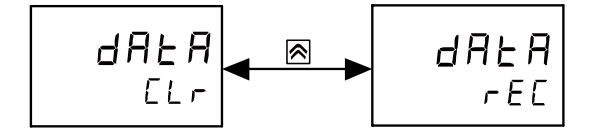
5.2.15 Memory protection

Set counting value memory protection when the unit power OFF to ON.

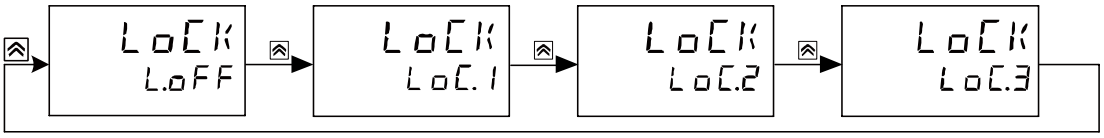


No memory protection Memory protection

※CLr : Resets the counting value when power OFF.
rEC : Maintains the counting value when power OFF. (memory protection)

5.2.16 Key lock

Set key lock function depending on counter/timer operation.



※LoFF : Unlock keys.
LoC.1 : Locks RESET key.
LoC.2 : Locks ≪, ∧ keys.
LoC.3 : Locks RESET, ≪, ∧ keys.

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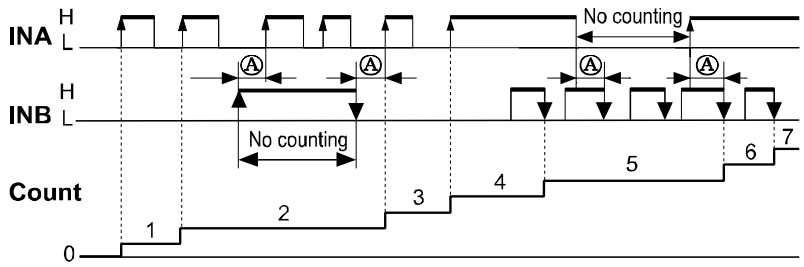
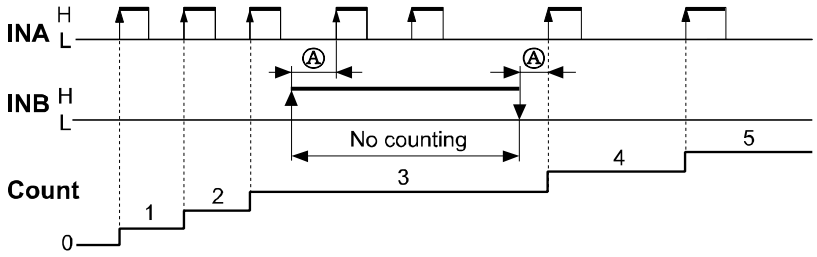
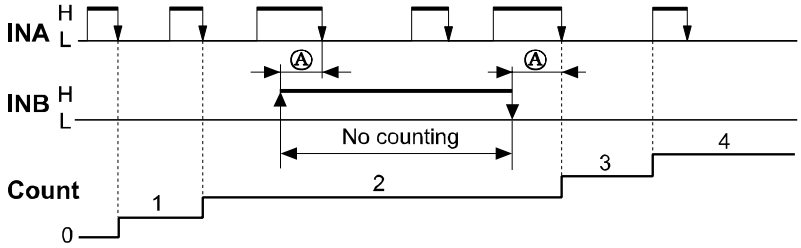
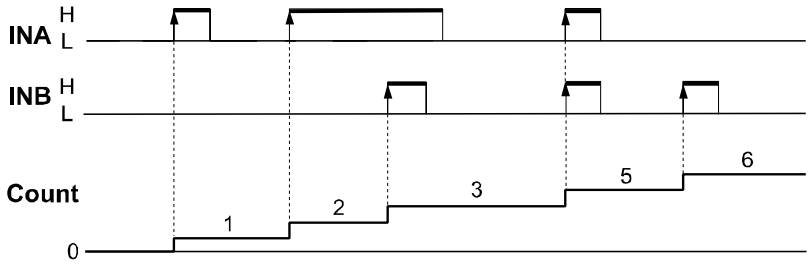
5.3 Input mode

Input mode	Counting chart
Up [UP]	 ※When INA is counting input, INB is no counting input. When INB is counting input, INA is no counting input.
Up-1 [UP-1]	 ※When INA input signal is rising ( ), it counts. ※INA: Counting input ※INB: No counting input
Up-2 [UP-2]	 ※When INA input signal is falling ( ), it counts. ※INA: Counting input ※INB: No counting input
Up-3 [UP-3]	 ※When INA or INB input signal is rising ( ), it counts. ※INA: Counting input ※INB: Counting input

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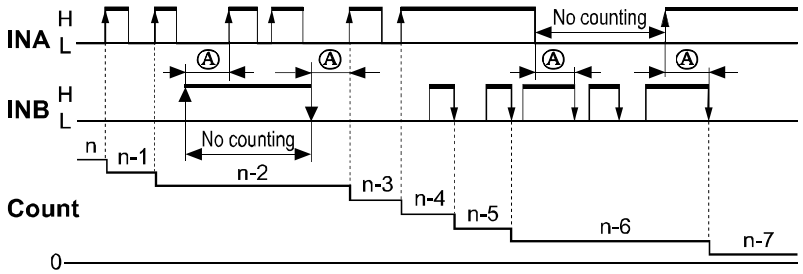
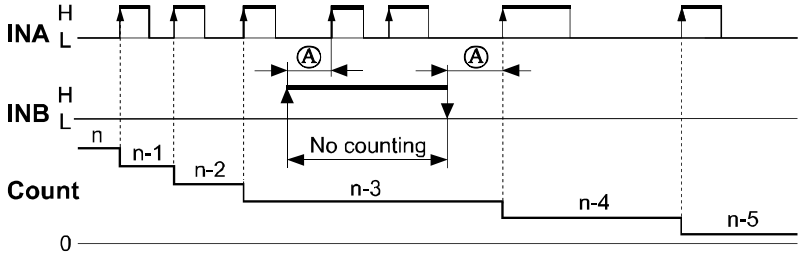
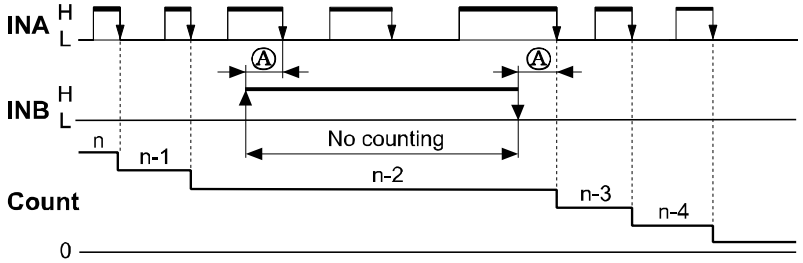
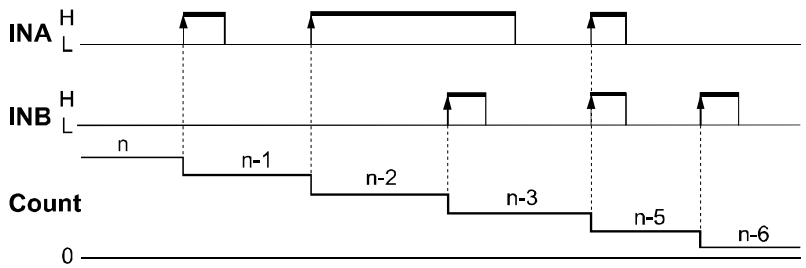
Input mode	Counting chart
Down [dn]	
	※When INA is counting input, INB is no counting input. When INB is counting input, INA is no counting input.
Down-1 [dn-1]	
	※When INA input signal is rising ( ) , it counts. ※INA: Counting input ※INB: No counting input
Down-2 [dn-2]	
	※When INA input signal is falling ( ) , it counts. ※INA: Counting input ※INB: No counting input
Down-3 [dn-3]	
	※When INA or INB input signal is rising ( ) , it counts. ※INA: Counting input ※INB: Counting input

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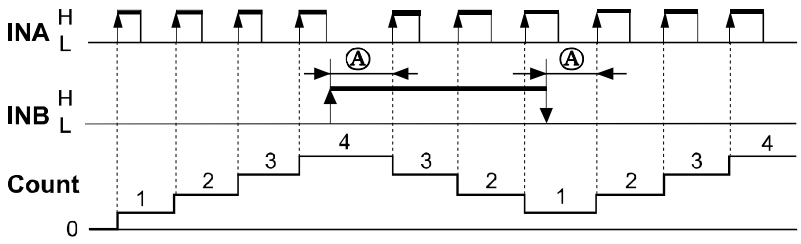
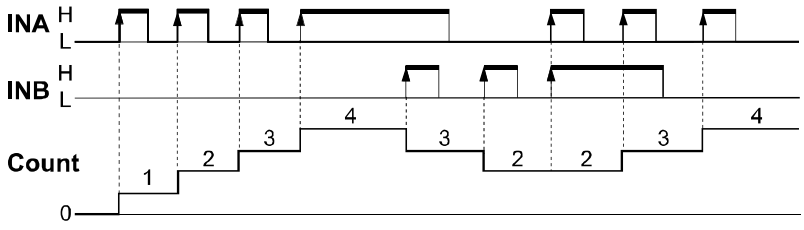
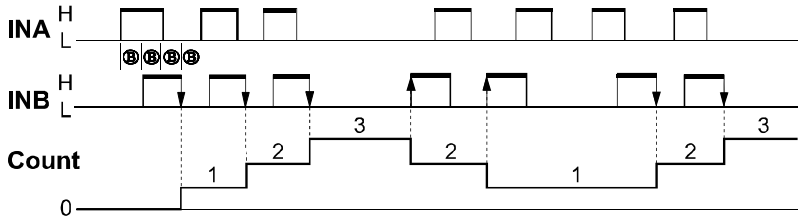
Input mode	Counting chart
Up/ Down-A [Ud-A]	
	※INA: Counting input INB: Counting command input ※When INB is "L", counting command is up. When INB is "H", counting command is down.
Up/ Down-B ※1 [Ud-b]	
	※INA: Up counting input INB: Down counting input ※When INA and INB input signals are rising (⌐↑) at the same time, it maintains previous value.
Up/ Down-C ※1 [Ud-C]	
	※When connecting encoder output A, B phase with counter input, INA, INB, set input mode [I NM] as phase different input [Ud-C] for counter operation.

Note

※1: This is for the voltage input(PNP)/no-voltage input(NPN) selectable model (CX6□-□□).

※Ⓐ: over min. signal width, Ⓑ: over than 1/2 of min. signal width. If the signal is smaller than these width, it may cause counting error (±1).

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※The meaning of “H”, “L”

Input method / Character	Voltage input (PNP)	No-voltage input (NPN)
H	5-30VDC	Short
L	0-2VDC	Open

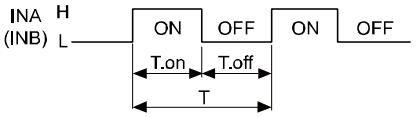
※Min. signal width by counting speed (1cps=1Hz)

- CX6□-□□

Counting speed	Min. signal width
1cps	500ms
30cps	16.7ms
300cps	1.67ms
1kcps	0.5ms
5kcps	0.1ms

- CX6□-□□F

Counting speed	Min. signal width
20cps	25ms



※T.on, T.off: Min. signal width

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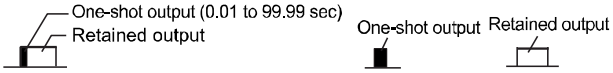
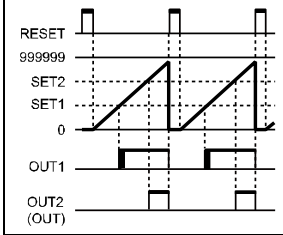
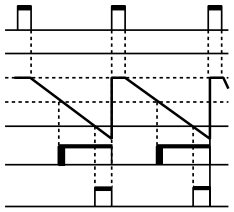
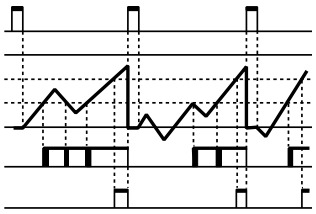
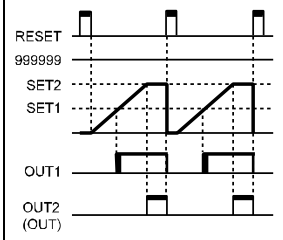
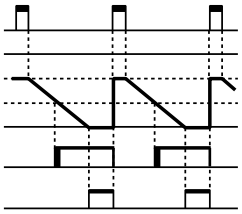
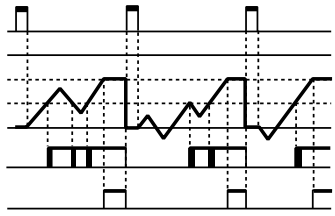
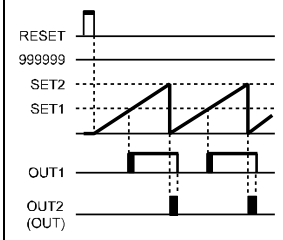
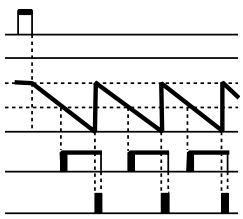
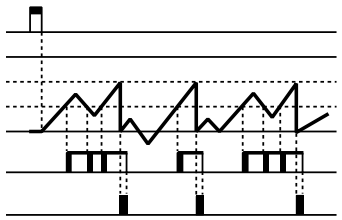
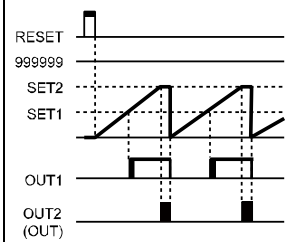
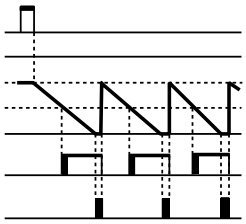
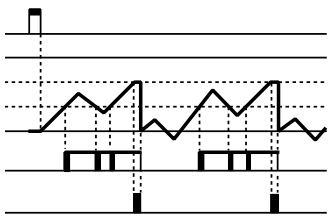
5.4 Output mode



Output mode	Input mode		
	Up, Up-1, 2	Down, Down-1, 2	Up/Down A, B, C
F [F]			
	※After count-up, counting display value increases or decreases until reset signal is applied and retained output is maintained.		
N [n]			
	※After count- up, counting display value and retained output are maintained until reset signal is applied.		
C [C]			
	※When count-up, counting display value will be reset and count simultaneously. ※OUT1 retained output will be off after OUT2 one- shot time. ※The one-shot output time of OUT1 one-shot output time is operated regardless of OUT2 output.		
R [r]			
	※After count-up, counting value display is reset after one-shot output time of OUT2 and it counts simultaneously. ※OUT1 retained output will be off after OUT2 one-shot time. ※OUT1 one-shot output time is operated regardless of OUT2 output.		

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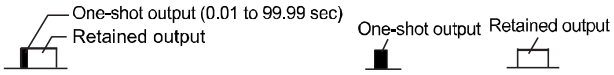
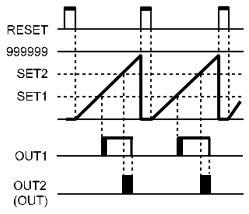
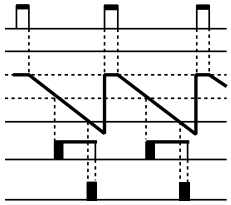
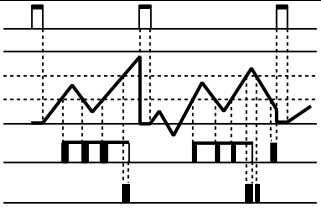
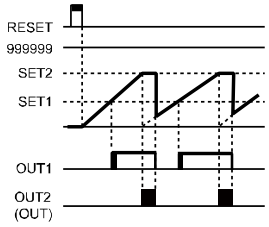
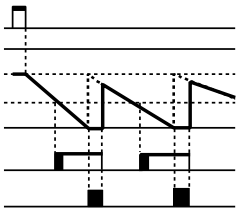
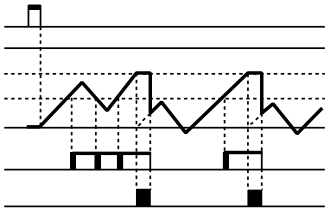
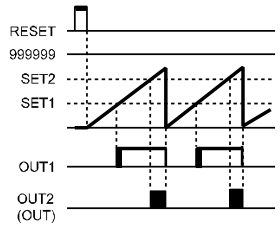
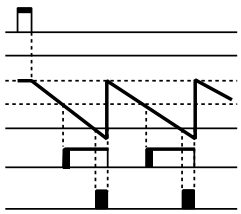
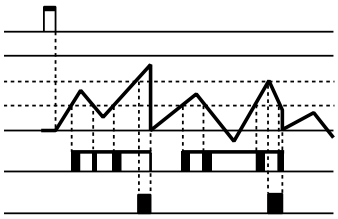
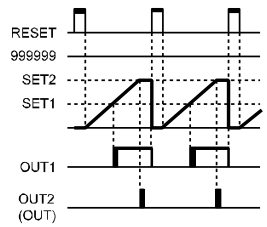
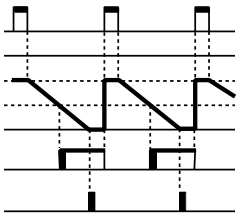
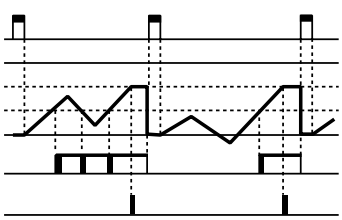


Output mode	Input mode		
	Up, Up-1, 2	Down, Down-1, 2	Up/Down A, B, C
K [ᴋ]			
	※After count-up, counting display value increases or decreases until RESET input is applied. ※OUT1 retained output is off after OUT2 one-shot time. ※OUT1 one-shot output time is operated regardless of OUT2 output.		
P [ᴘ]			
	※After count-up, counting display value is maintained while OUT2 output is on. Counting value is internally reset and counts simultaneously. ※When OUT2 output is off, displays counting value while OUT2 is ON, and it increases or decreases. ※OUT1 retained output is off after OUT2 one-shot time. ※OUT1 one-shot output time is operated regardless of OUT2 output.		
Q [ᑫ]			
	※After count-up, counting display value increases or decreases during OUT2 one-shot time. ※OUT1 retained output is off after OUT2 one-shot time. ※OUT1 one-shot output time is operated regardless of OUT2 output.		
A [ᴀ]			
	※After count-up, counting display value and OUT1 retained output are maintained until RESET input is applied. ※OUT1 one-shot output time is operated regardless of OUT2 output.		

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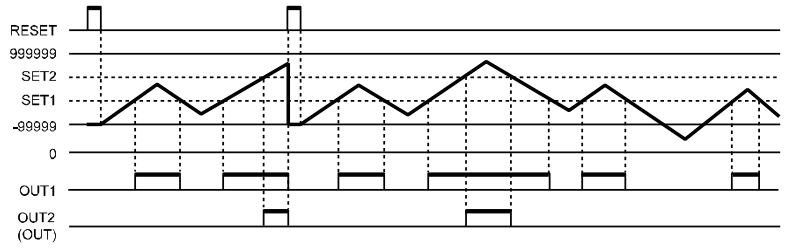
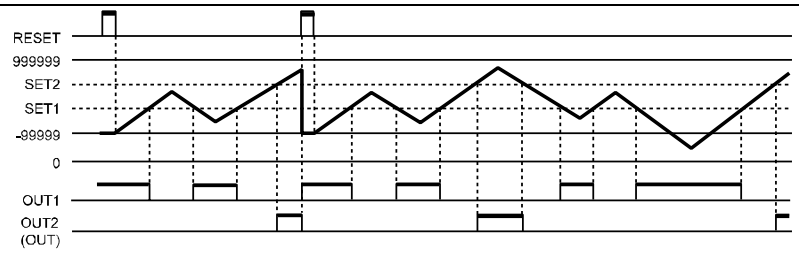
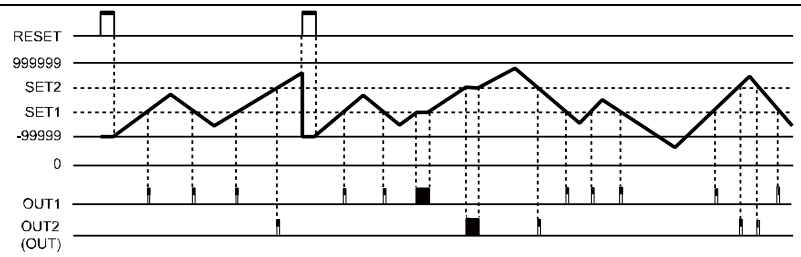
One-shot output (0.01 to 99.99 sec)
Retained output
One-shot output
Retained output

Output mode	Up/Down A, B, C
S [S]	
	※OUT1 keeps ON status in following condition: Counting display value ≥ SET1 ※OUT2 keeps ON status in following condition: Counting display value ≥ SET2
T [t]	
	※OUT1 output is off: Counting display value ≥SET1 (when SET1 is 0, OUT1 output maintains ON state.) ※OUT2 keeps ON status in following condition: Counting display value≥SET2
D [d]	
	※When counting display value is equal to setting value (SET1, SET2) only, OUT1 or OUT2 output keeps ON status. ※When setting 1kcps for counting speed, solid state contact output should be used. (when using contact output, it is difficult to execute normal output operation due to contact reaction time.)

Note

※oUt1 is available to set as '0' regardless of output mode. The output for '0' setting executes.

※In case of C, r, P, 9 output mode for oUt2, setting '0' is not available.

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5.5 Output operation for other conditions

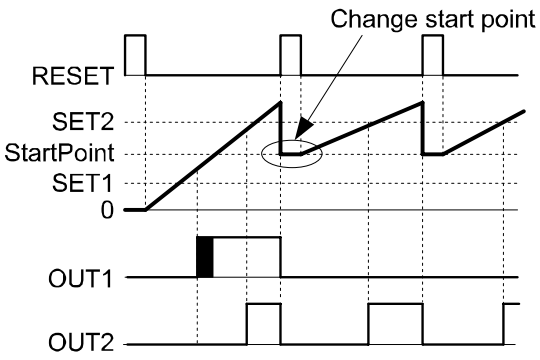
5.5.1 Start point value is larger than setting value (UP, UP-1, UP-2, UP-3, Ud-A, Ud-b, Ud-C mode)

(1) When setting SET > Start point > SET1

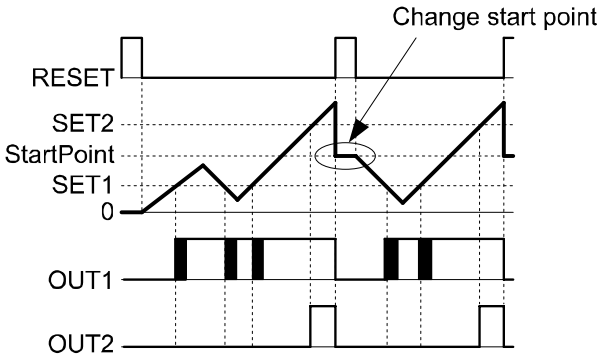
- UP, UP-1, UP-2, UP-3 mode
  : Output of oUt1 does not execute. When PV is same as SET2, output of oUt2 turns ON.
- Ud-A, Ud-b※1, Ud-C※1 mode
  : When PV counts down and is same as SET1, output of oUt1 turns ON.

Ex.

※Output mode: F
Input mode: UP, UP-1, UP-2, UP-3



※Output mode: F
Input mode: Ud-A, Ud-b※1, Ud-C※1



(2) When setting SET2 > Start point = SET1

In case of UP, UP-1, UP-2, UP-3, Ud-A, Ud-b※1, Ud-C※1 mode, output of oUt1 turns ON when RESET ON to OFF.

Note

※1: This is for the voltage input(PNP)/no-voltage input(NPN) selectable model (CX6□-□□).

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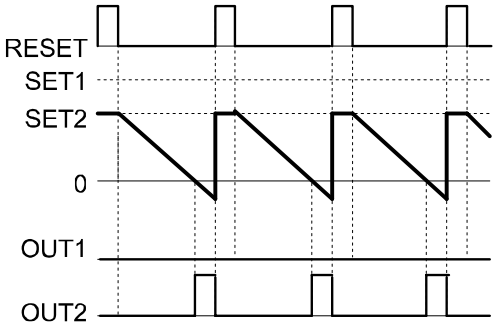
5.5.2 When SET1 is larger or equal than SET2 at down mode

(1) When SET1 > SET2

- Output of oUt 1 does not execute.

Ex.

※Output mode: F

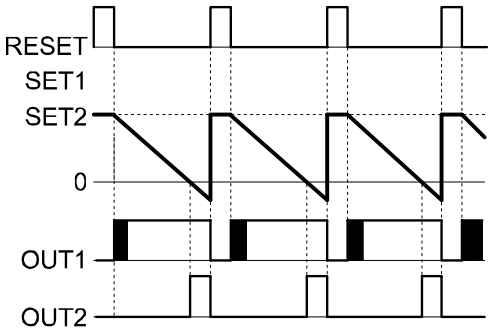


(2) When SET1 = SET2

- Output of oUt 1 turns ON for RESET OFF.

Ex.

※Output mode: F



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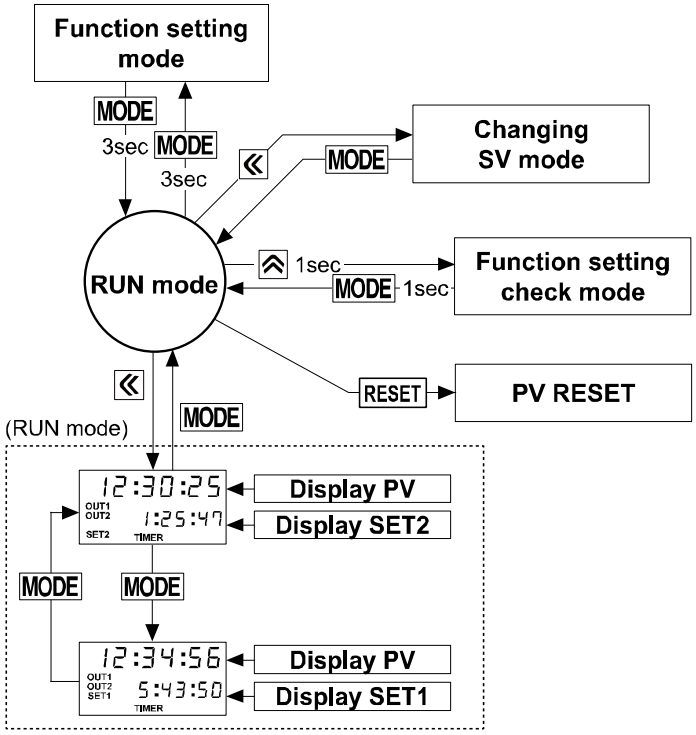
6 Timer mode

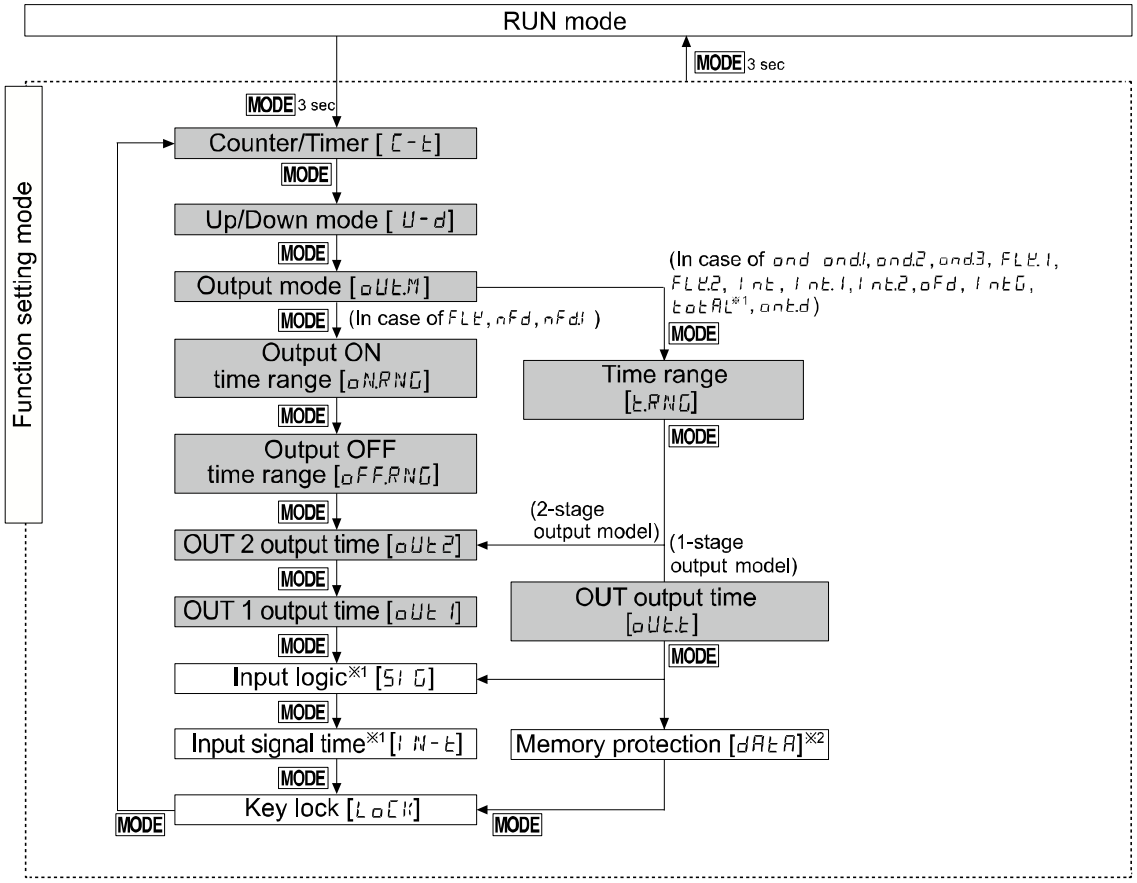
6.1 Basic Operations

6.1.1 Operations and functions



6.1.2 Function setting mode

- Hold the MODE key over 3 sec in RUN mode and it enters function setting mode.
- Hold the MODE key over 3 sec in function setting mode and it returns to RUN mode.



Note

※1: In case of free voltage input model (CX6□-□□F) , these parameters do not appear due to fixed setting.

※2: Memory protection menu is available when output mode is ont.d .

※ : When changing the setting of shaded parameters, all output turn OFF. When returning RUN mode, PV is reset.

※When output mode is FLt.1, FLt.2, IntG, or output mode is ond, ond.1, ond.2, ond.3 for 1-stage setting model (CX6□-1P□□), oUt 1 output time does not appear. oUt2 output time is displayed as oUt.t .

※When output mode is FLt, FLt.1, FLt.2, Int, Int.1, oFd, nFd, nFd.1, IntG, totAL, ont.d, oUt2 output time does not appear.

※Even though entering RUN mode and function setting mode, it operates timer and output control.

※When changing operation setting value at function setting mode, all output turn OFF and it is reset when it returns to RUN mode.

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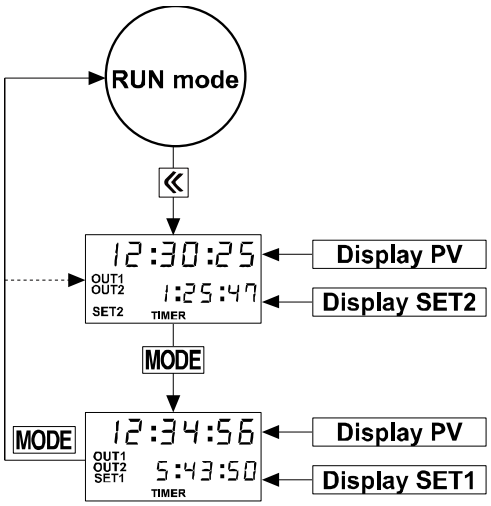
6.1.3 Changing SV mode

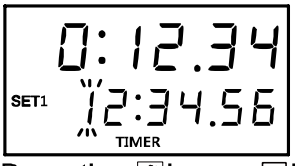


6.1.4 Changing SV operation

1) Entering changing SV mode

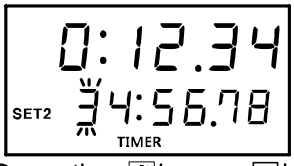
In RUN mode, press the « key to enter changing SV mode,
"SET1" indicator turns ON and 1st digit of SV is flashing.

2) Changing 1-stage SV



Press the « key or » key to set as "12:34.56".
Press the MODE key to entering changing 2-stage SV.

3) Changing 2-stage SV



Press the « key or » key to set as "34:56.78".
Press the MODE key to save the changings and it returns to RUN mode.

- Even though entering changing SV mode, the counting value display component displays PV.
- Even though changing SV, it operates time progress and output control.
- Press the « key to enter changing SV mode in RUN mode.
- When setting 1-stage SV and 2-stage SV, each "SET1", "SET2" indicator turns ON.
- In case of 1-stage setting model (CX6□-1P□□), SET2 is displayed as SET and SET1 is not displayed.
- After setting SV at each parameter, press the MODE key to save SV and it moves next parameter setting or returns to RUN mode.

6.1.5 Switching display of the setting value display component

Select the display value at the setting value display component. Depends on output mode, there are manual display switching and auto display switching.

(1) Manual display switching

1) In case of 2-stage setting model (CX6□-2P□□) and ond, ond.1, ond.2, ond.3 output mode, it is available.
2) In run mode, whenever pressing the MODE key, the setting value display component displays SET1, SET2 SV in turn. In case of 1-stage setting model (CX6□-1P□□), it is not available.

(2) Auto display switching

1) When output mode is FLY, nFd, nFd.I for 1-stage or 2-stage setting model (CX6□-1/2P□□) and I nt.2 mode for 2-stage setting model (CX6□-2P□□), the setting value display component automatically displays the set times depends on the operation status.

6.1.6 RESET

In RUN mode, function setting mode, press the RESET key to reset the current value and the output is also reset.

6.1.7 Display type of the setting value display component by output mode

- In case of 2-stage setting model (CX6□-2P□□) and ond, ond.I, ond.2, ond.3, I nt.2 output mode, there are SET1 and SET2 setting. It displays the each SV and the SET1, SET2 indicator turns ON when displaying or setting the each SV.
- In case of 1-stage setting model (CX6□-1P□□) , SET is available and there is one setting value.
- In case of 1-stage setting model (CX6□-1P□□), I nt.2 output mode is not available.
- FLY output mode has t.oFF, t.on setting values. In case of 2-stage setting model (CX6□-2P□□) and 1-stage setting model (CX6□-1P□□), each SET2, SET display is available. (t.oFF, t.on setting value is for oUt2 output. It displays SET2 or SET.)
- The other output modes display SET2 or SET and have one setting value. (only for 1-stage setting model (CX6□-1P□□))

6.1.8 Timer display operation

- During timer progress, TIMER indicator flashes.
- When timer stops or holds, TIMER indicator turns ON.

6.1.9 Zero blanking display

PV is displayed with zero blanking for the highest unit.

Ex.

When time range is 99m59.99s and PV is 00m04.05s, zero blanking is applied to minute which is the highest unit. At the below digits of decimal point, it is not applied. It displays as "0:04.05".

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6.2 Parameter setting

(MODE key: moves parameters, ⋀ key: changes parameter setting value)

Parameter	Parameter setting value
Counter/Timer [C-t]	CoUnt ◀▶ tIME ※CoUnt: Counter tIME: Timer
UP/DOWN mode [U-d]	UP ◀▶ dn ※UP: Time progresses from '0' to the setting time. dn: Time progresses from the setting time to '0'.
Output mode [oUt.M]	ond → ond.1 → ond.2 → ond.3 → FLK → FLK.1 → FLK.2 → Int ont.d ← totAL ※1 ← IntG ← nFd.1 ← nFd ← oFd ← Int.2 ※2 ← Int.1
Time range※3 [t.RNG]	
Output ON time range※4 [oN.RNG], Output OFF time range※4 [oFF.RNG]	999.999 → 9999.99 → 99999.9 → 999999 → 99:59.99 → 999:59.9 99999.9 ← 9999:59 ← 99:59:59 ← 999999 ← 99999.9 ← 9999:59
OUT2 output time※5 [oUt2]	※Set one-shot output time of OUT2. ※Setting range: 00.01 to 99.99 sec, HOLD ※When number of tens digit is flashing, press the ⋘ key once and HoLd appears.
OUT1 output time※5 [oUt1]	※Set one-shot output time of OUT1. ※Setting range: 00.01 to 99.99 sec, HOLD ※When number of tens digit is flashing, press the ⋘ key once and HoLd appears.
OUT output time※5 [oUt.t]	※Setting range: 00.01 to 99.99 sec, HOLD ※When number of tens digit is flashing, press the ⋘ key once and HoLd appears.
Input logic※6 [SIG]	nPn: No-voltage input, PnP: Voltage input
Input signal time※6 [IN-t]	1 ◀▶ 20, unit: ms ※Set min. width of INA, INHIBIT, RESET, TOTAL RESET signal.
Memory protection [dAtA]	CLr ◀▶ rEC ※CLr: Resets the counting value when power OFF. rEC: Maintains the counting value when power OFF. (memory protection)
Key lock [LoCK]	LoFF → LoC.1 → LoC.2 → LoC.3 → LoFF ※LoFF: Unlock keys, key lock indicator OFF LoC.1: Locks RESET key, key lock indicator ON LoC.2: Locks ⋘, ⋀ keys, key lock indicator ON LoC.3: Locks RESET, ⋘, ⋀ keys, key lock indicator ON

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Note

※1: This is for the voltage input(PNP)/no-voltage input(NPN) selectable model (CX6□-□□).

※2: `Int.2` mode is available only for 2-stage setting model (CX6□-2P□□).

※3: When output mode is `ond`, `ond.1`, `ond.2`, `ond.3`, `FLE.1`, `FLE.2`, `Int`, `Int.1`, `Int.2`, `oFd`, `IntG`, `totAL`, `ont.d`, set time range [`t.RNG`].

※4: When output mode is `FLE`, `nFd`, `nFd.1`, set output ON time range [`oN.RNG`] and output OFF time range [`oFF.RNG`].

※5: In case of 1-stage setting model(CX6□-1P□□), `oUt 1` output time does not appear. `oUt2` output time is displayed as `oUt.t` .

※6: In case of free voltage input model (CX6□-□□F), this parameter does not appear due to fixed setting.

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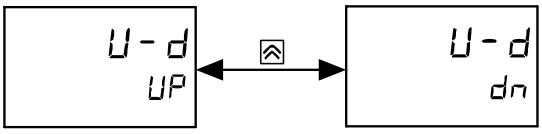
6.2.1 Counter/Timer

Select operation type as counter or timer.

※Right after the selecting counter/timer, the below parameters are changes as the dedicated peration.

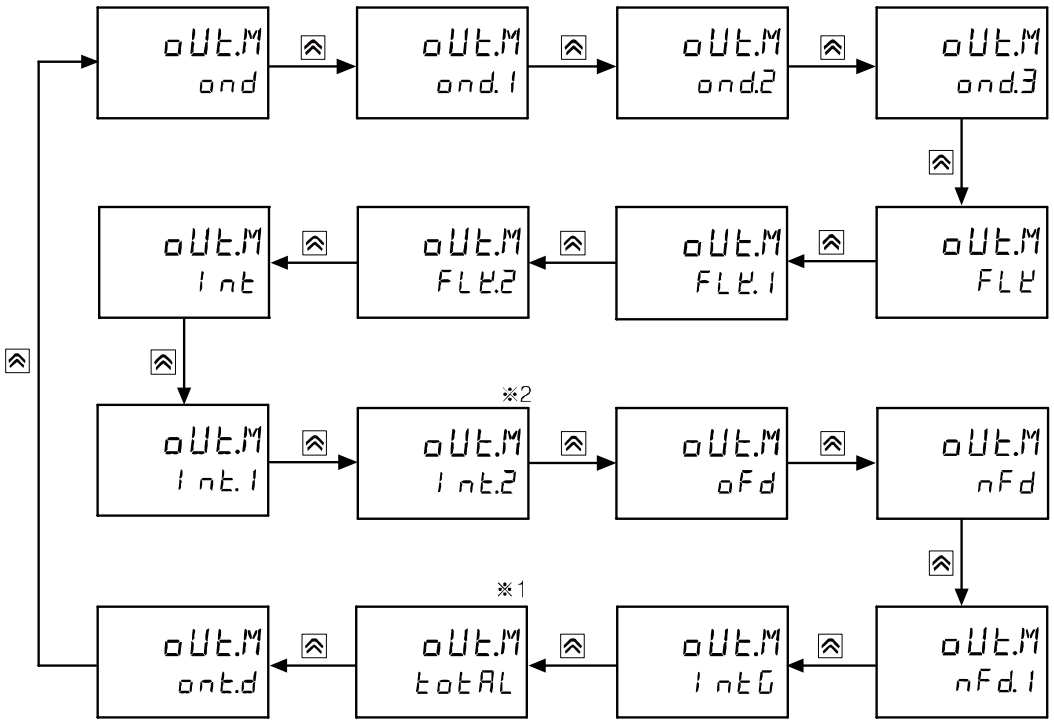
6.2.2 UP/DOWN mode

Set timer up/down mode.



6.2.3 Output mode

Set timer output mode; Signal ON Delay [ond, ond.1, ond.2, ond.3], Flicker [FLY, FLY.1, FLY.2], Interval [Int, Int.1, Int.2], Signal OFF Delay[oFd], ON-OFF Delay [nFd, nFd.1], Integration Time [IntG], Total Counter※1 [totAL], ON Time Delay[ont.d].



(1) Output mode depending on model type

- 1-stage setting model (CX6□-1P□□)

  ond, ond.1, ond.2, ond.3, FLY, FLY.1, FLY.2, Int, Int.1, oFd, nFd, nFd.1, IntG, totAL※1, ont.d

- 2-stage setting model (CX6□-2P□□)

  ond, ond.1, ond.2, ond.3, FLY, FLY.1, FLY.2, Int, Int.1, Int.2※2, oFd, nFd, nFd.1, IntG, totAL※1, ont.d

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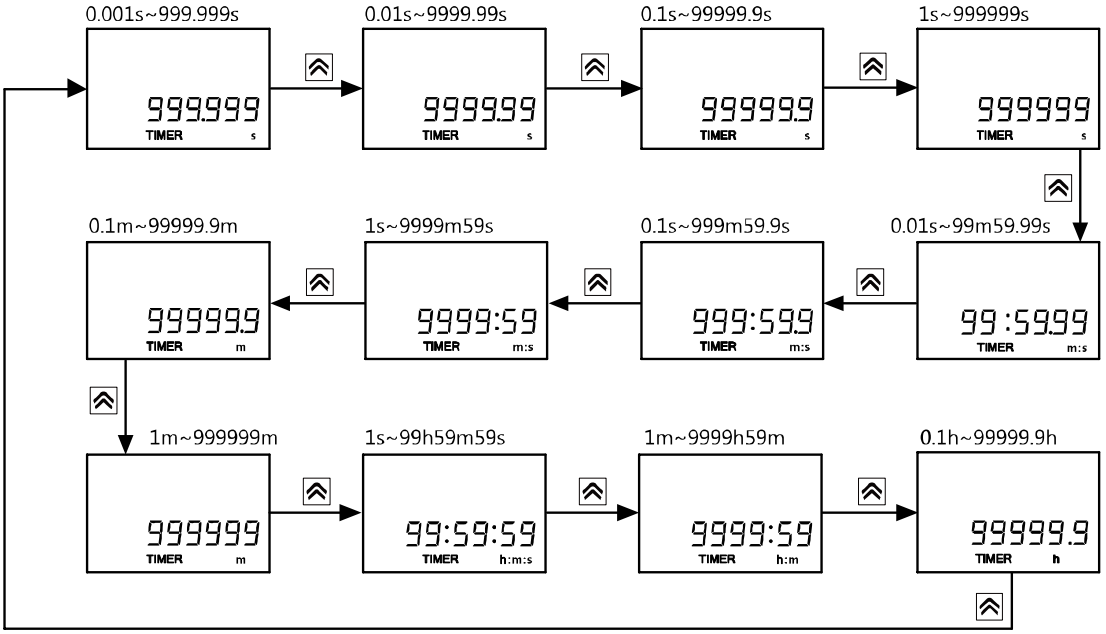
Note

※1: This is for the voltage input(PNP)/no-voltage input(NPN) selectable model (CX6□-□□).

※2: `1 nt.2` mode is available only for 2-stage setting model (CX6□-2P□□).

6.2.4 Time range

Set timer time range.



※Set time setting range of `oN.RNG`, `oFF.RNG`, `t.RNG`.

6.2.5 OUT2 (OUT) output time

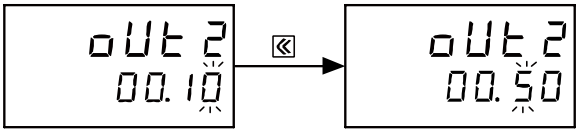
Set one-shot output time of OUT2 or OUT. (unit: sec)

※Setting range: 00.01s to 99.99s, HOLD

- « key: Moves the setting digit of output time value.
- ^ key: Changes the flashing digit value.

※When number of tens digit flashes, press the « key once and `HoLd` is displayed.

(1) When changing output time setting as 500m



- Press the « key to move the flashing digit at the setting value display component.
- Press the ^ keys to set as 5 of the 2nd digit.
- Press the MODE key to save SV and moves to next parameter.

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※In case of 1-stage setting model (CX6□-1P□□), it is displayed as oUt.t .

※In case of 2-stage setting model (CX6□-2P□□) and FLt.1, FLt.2, Int G, ont.d output mode, oUt2 is displayed as oUt.t .

※In case of FLt, Int, Int.1, oFd, ndF, nFd.1 output mode, output time setting does not appear.

6.2.6 OUT1 output time

In case of 2-stage setting model (CX6□-2P□□) and ond, ond.1, ond.2, ond.3 output mode, set one-shot output time of control output OUT1. (unit: sec)

※Setting range: 00.01 to 99.99s, HOLD

- ≪ key: Moves the setting digit of output time.
- ∧ key: Changes the flashing digit value.

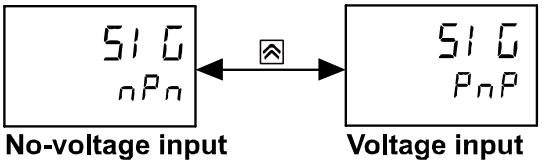
※When the number of tens digit flashes, press the ≪ key once and HoLd is displayed.

※Press the MODE key to save SV and moves to next parameter.

※In case of 1-stage setting model (CX6□-1P□□), oUt 1 dose not appear.

6.2.7 Input logic

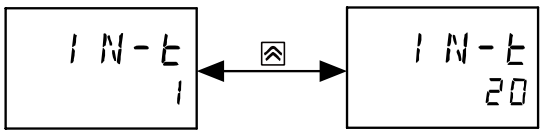
Select external signal input logic; NPN or PNP input.



No-voltage input Voltage input

6.2.8 Input signal time

Select min. signal width of the external signal input. (unit: ms)



1ms 20ms

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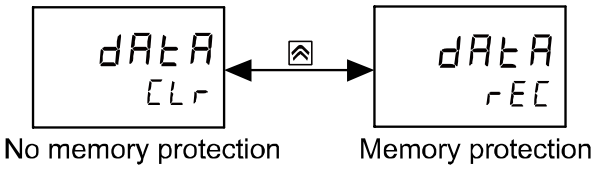
6.2.9 Memory protection

It is available only when timer operation mode is tOtAL ※1 or , on.t.d .
Set the counting value memory protection when the unit power OFF to ON.



No memory protection Memory protection

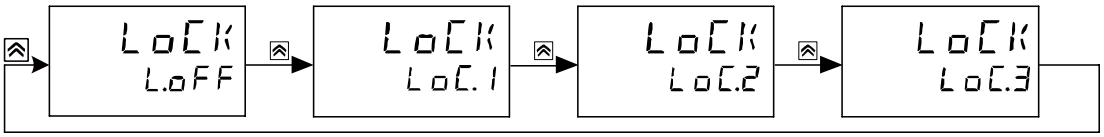
※CLr : Resets the counting value when power OFF.
rEC : Maintains the counting value when power OFF. (memory protection)

Note

※1: This is for the voltage input(PNP)/no-voltage input(NPN) selectable model (CX6□-□□).

6.2.10 Key lock

Set key lock function depending on counter/timer operation.



※L.oFF : Unlock keys.
LoC.1 : Locks RESET key.
LoC.2 : Locks ≪, ∧ keys.
LoC.3 : Locks RESET, ≪, ∧ keys.

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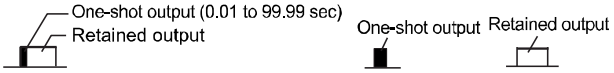
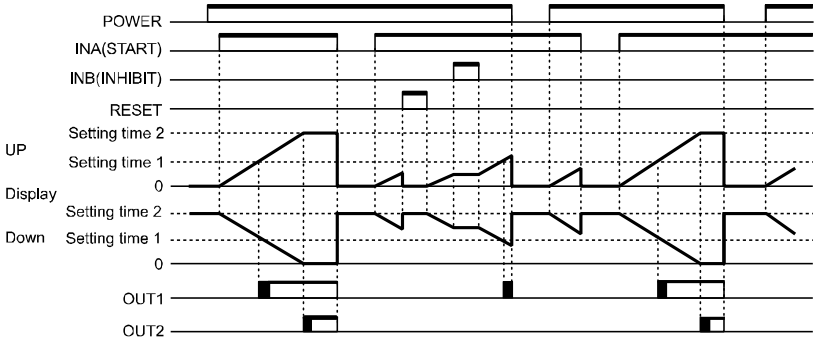
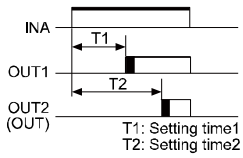
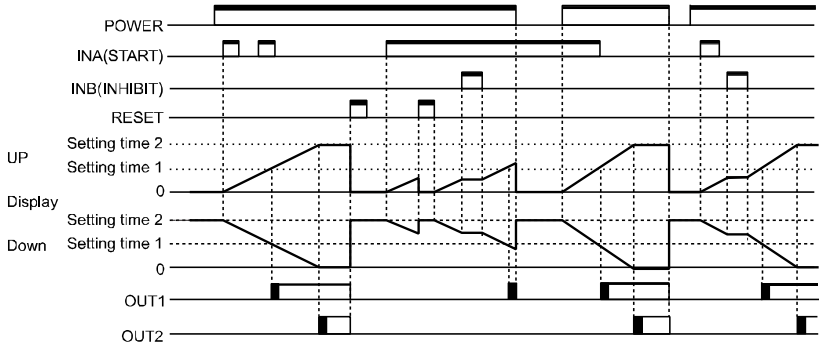
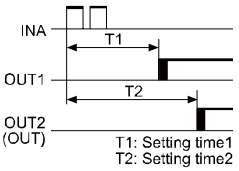
6.3 Output operation mode



Output mode	Time chart
OND [ond]	Signal ON Delay (Power RESET)  1)Time starts when INA signal turns ON. 2)When INA signal turns OFF, time resets. 3)When INA signal is ON : Power ON Time Start is operated. RESET OFF Time Start is operated. 4)Control output operates as retained (Hold) or one-shot output. 
OND.1 [ond.1]	Signal ON Delay 1 (Power RESET)  1)Time starts when INA signal turns ON. 2)When INA signal is ON : Power ON Time Start is operated. RESET OFF Time Start is operated. 3)Control output operates as retained (Hold) or one-shot output. 4)Only first INA input signal is valid in case INA input signal is repeatedly applied. 

Note

※Power RESET: There is no memory protection. (resets the display value when power is off)

※Power Hold: There is memory protection. (memorizes the display value at the moment of power off, indicates the memorized display value when power is resupplied.)

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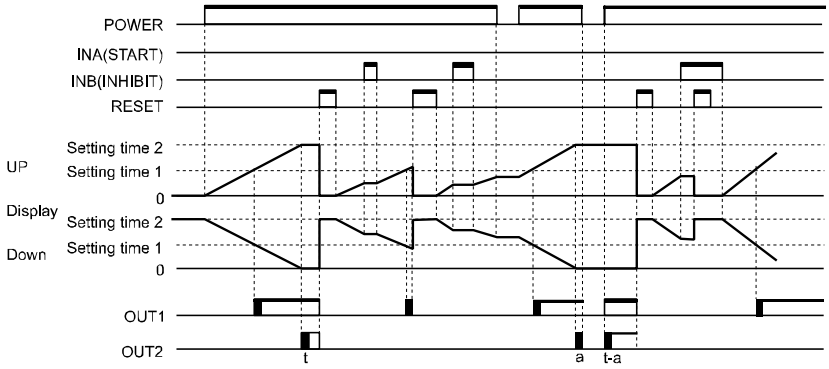
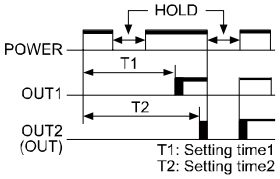
One-shot output (0.01 to 99.99 sec)
Retained output
One-shot output
Retained output

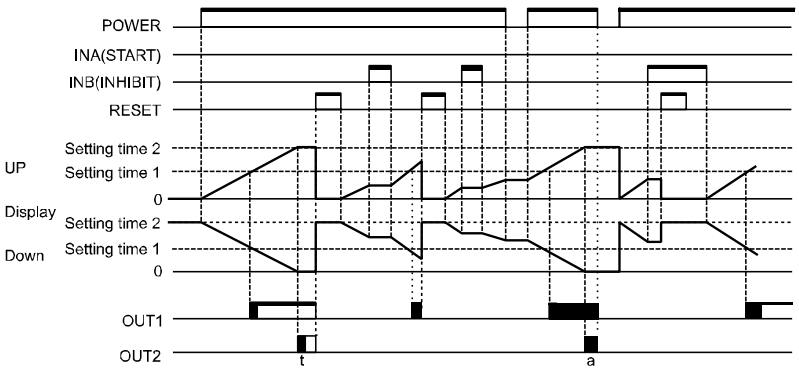
Output mode	Time chart
OND.2 [ond.2]	Power ON Delay 2 (Power Hold)



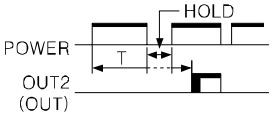
1)Power ON Time Start (there is no INA function)
2)RESET ON: Time RESET
RESET ON→OFF: Time Start
3)Control output operates as retained (Hold) or one-shot output.
4)It memorizes display value at the moment of power OFF.



OND.3 [ond.3]	Signal ON Delay 3 (Power HOLD/RESET)



1)Power ON Time Start (there is no INA function)
2)RESET ON: Time RESET
RESET ON→OFF: Time Start
3)Control output operates as retained (Hold) or one-shot output.
4)If time reached setting time at the moment of power ON, it is automatically reset.



Note

※Power RESET: There is no memory protection. (resets the display value when power is off)

※Power Hold: There is memory protection. (memorizes the display value at the moment of power off, indicates the memorized display value when power is resupplied.)

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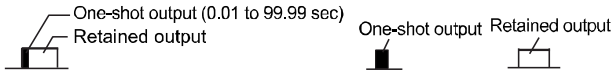
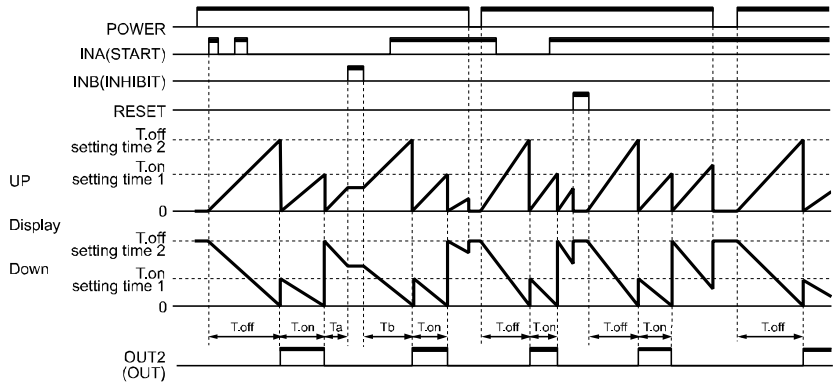
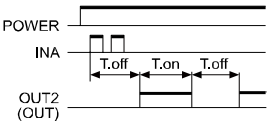
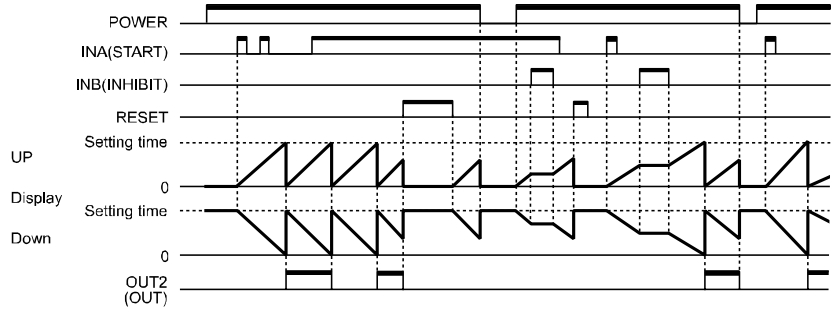
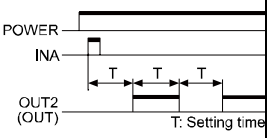


<table>
<tr><th>Output mode</th><th>Time chart</th></tr>
<tr><td rowspan="3">FLK
[F L K]</td><td>Flicker (Power RESET)</td></tr>
<tr><td> 
</td></tr>
<tr><td>1)Time starts when INA signal turns ON.
2)When INA signal is ON: Power ON Time Start is operated. RESET OFF Time Start is operated.
3)Control output operates as retained output, output turns off for the T.off time and turns off for the T.off time and turns on for the T.on time repeatedly.
Ta+Tb = T.off
4)The T.on time and T.off time must be set individually.
5)In case of using the contact output, min. setting time must be set over 100ms.
 
</td></tr>
<tr><td rowspan="3">FLK.1
[F L K. 1]</td><td>Flicker 1 (Power RESET)</td></tr>
<tr><td>Retained(Hold) output
 
</td></tr>
<tr><td>1)Time starts when INA signal turns ON.
2)When INA signal is ON
: Power ON Time Start is operated.
RESET OFF Time Start is operated.
3)Control output operates as retained (Hold) output.
4)In case of using the contact output, min. setting time must be set over 100ms.
 
</td></tr>
</table>

Note

※Power RESET: There is no memory protection. (resets the display value when power is off)

※Power Hold: There is memory protection. (memorizes the display value at the moment of power off, indicates the memorized display value when power is resupplied.)

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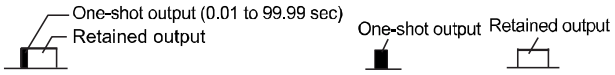
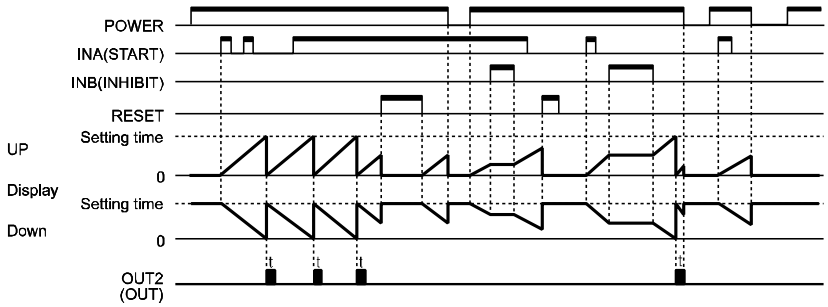
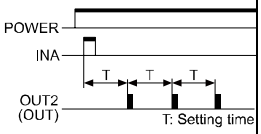
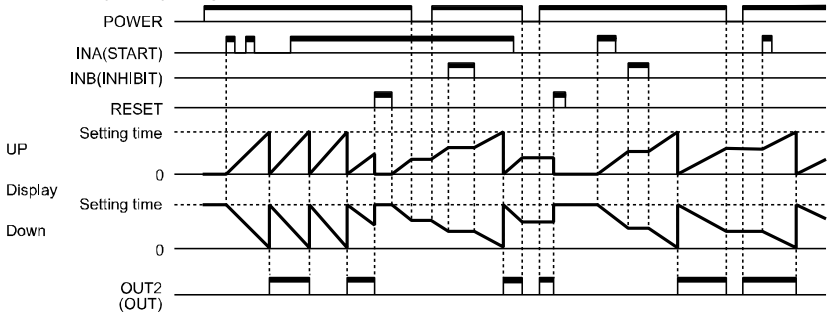
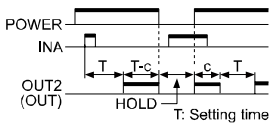


Output mode	Time chart
FLK.1 [FLK.1]	One-shot output  1)Time starts when INA signal turns ON. 2)When INA signal is ON : Power ON Time Start is operated. RESET OFF Time Start is operated. 3)Control output operates as one-shot output. 4)In case of using the contact output, min. setting time must be set over 100ms. 
FLK.2 [FLK.2]	Flicker 2 (Power Hold) Retained(Hold) output  1)Time starts when INA signal turns ON and the display value at the moment when power is off is memorized. 2)When INA signal is ON : Power ON Time Start is operated. RESET OFF Time Start is operated. 3)Control output operates as retained (Hold) output. 4)Control output will be reversed when it reaches to setting time. (at the initial start, OUT2 control output is OFF). 5)In case of using the contact output, min. setting time must be set over 100ms. 

Note

※Power RESET: There is no memory protection. (resets the display value when power is off)

※Power Hold: There is memory protection. (memorizes the display value at the moment of power off, indicates the memorized display value when power is resupplied.)

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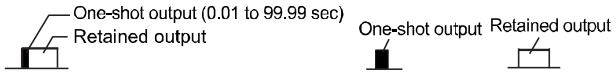
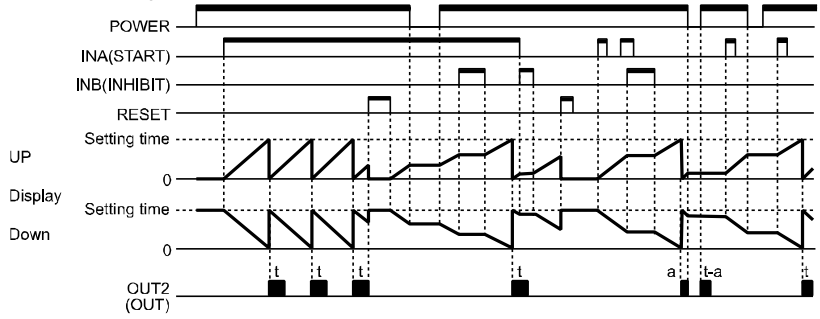
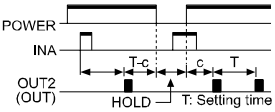
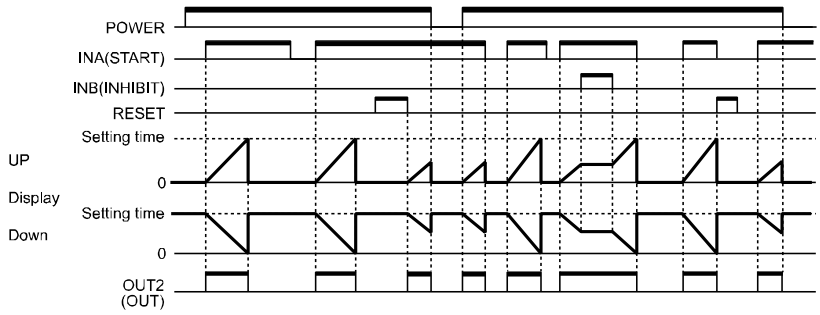
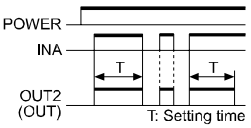


Output mode	Time chart
FLK.2 [FLK.2]	One-shot output  1)Time starts when INA signal turns ON and the display value at the moment when power is off is memorized. 2)When INA signal is ON : Power ON Time Start is operated. RESET OFF Time Start is operated. 3)Control output operates as one-shot output. 4)In case of using the contact output, min. setting time must be set over 100ms. 
INT [Int]	Interval (Power RESET)  1)Control output turns ON and time starts when INA signal turns ON. 2)When INA signal is OFF, time is reset. 3)When INA signal is ON : Power ON Time Start is operated. RESET OFF Time Start is operated. 4)When it reaches setting time, it is auto reset. 5)Control output is ON when the time is progressing. 

Note

※Power RESET: There is no memory protection. (resets the display value when power is off)

※Power Hold: There is memory protection. (memorizes the display value at the moment of power off, indicates the memorized display value when power is resupplied.)

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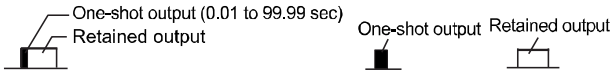
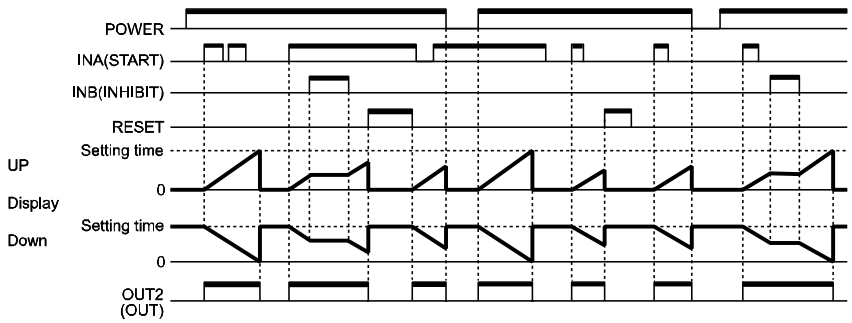
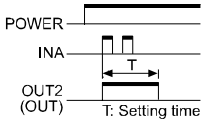
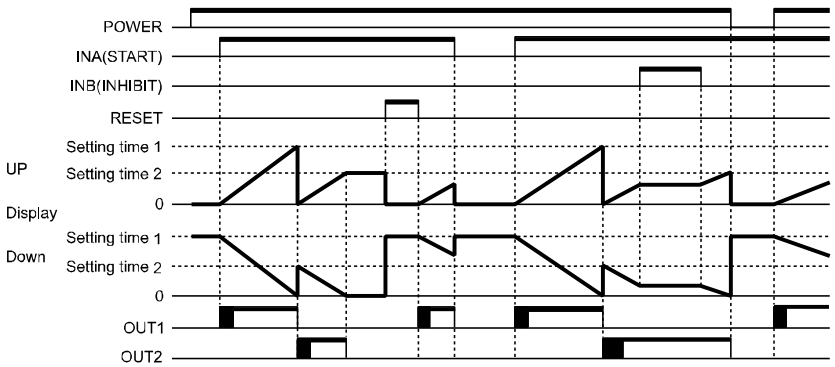
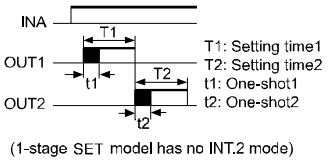


Output mode	Time chart
INT.1 [I nt. 1]	Interval 1 (Power RESET)  1)Control output turns ON and time starts when INA signal turnsn ON. 2)When INA signal is ON : Power ON Time Start is operated. RESET OFF Time Start is operated. 3)When it reaches setting time, it is auto reset. 4)Control output is ON when the time is progressing. 5)Time is ignored while time is progressing. 
INT.2 [I nt.2]	Interval 2 (Power RESET)  1)Time starts when INA signal is ON, and resets when INA signal is OFF. 2)INA signal is ON, OUT1 output is ON during T1 (HOLD) or t1. 3)When it reaches setting time 1, display value resets and OUT2 output is ON during T2 (HOLD) or t2 output time. ※Output turns OFF when reaching the setting time even if one-shot is longer than setting time.  (1-stage SET model has no INT.2 mode)

Note

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※Power Hold: There is memory protection. (memorizes the display value at the moment of power off, indicates the memorized display value when power is resupplied.)

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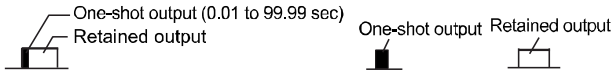
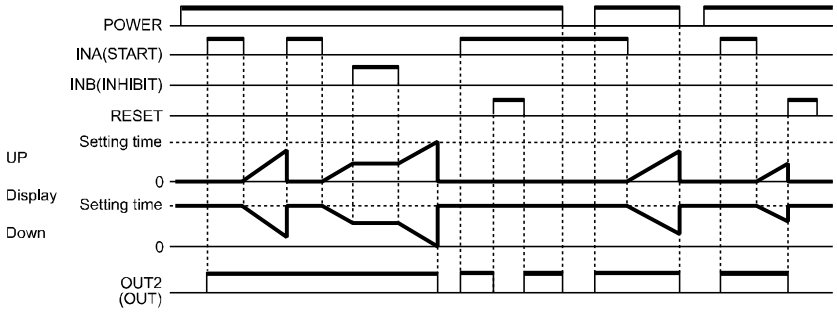
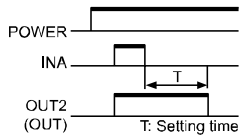
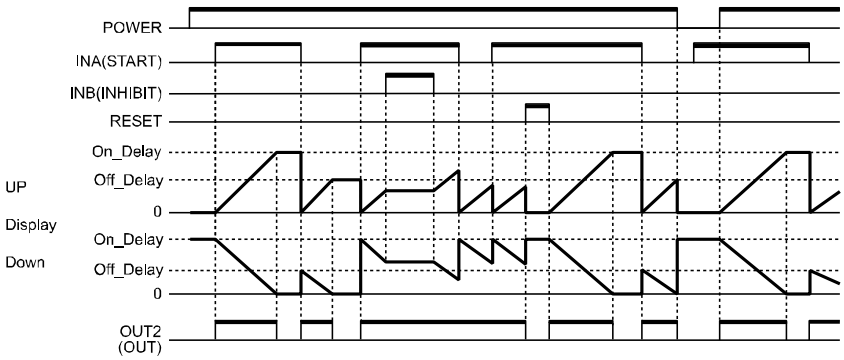
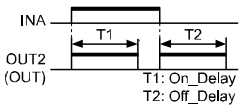


Output mode	Time chart
OFD [oFd]	Signal Off Delay (Power RESET)
	
	1)If INA is ON, control output remains ON. (except when power is off and reset is on) 2)When INA signal is OFF, time processes. When it reaches setting time, indication value and control output are auto reset automatically. 
NFD [nFd]	On-Off Delay (Power RESET)
	
	1)When INA input is ON, output is ON and time is progressing, then output is OFF after On_Delay time. 2)When INA input is OFF, output is ON and time is progressing, then output is OFF after Off_Delay time. 3)If INA input is OFF within On_Delay time, step 2 starts. 4)If INA input is ON within Off_Delay time, step 1 starts. 

Note

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※Power Hold: There is memory protection. (memorizes the display value at the moment of power off, indicates the memorized display value when power is resupplied.)

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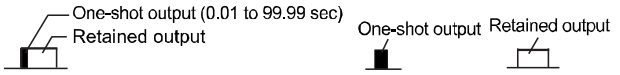
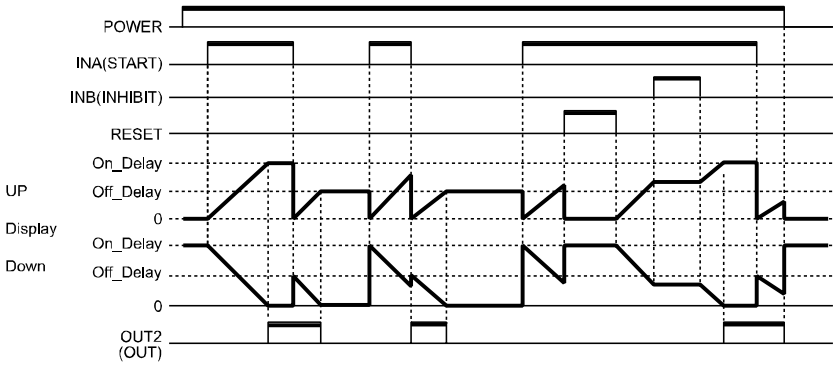
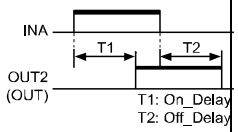


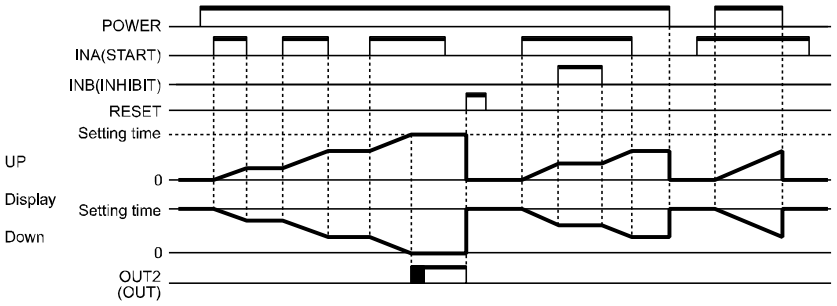
Output mode	Time chart
NFD.1 [nFd.1]	On-Off Delay1 (Power RESET)



1)When INA input turns ON, time progresses and output turns ON after On_Delay time.
2)When INA input turns OFF, time progresses and output turns OFF after Off_Delay time.
3)If INA input turns OFF within On_Delay time, output will turn ON and step 2 operate.
4)If INA input turns ON within Off_Delay time, output will turn OFF and step 1 operate.



INTG [Intg]	**Integration Time (Power RESET)**



1)Time is progressing while INA input is ON.
2)Time progress stops while INA input is OFF.
3)When it reaches the setting time, output is ON.

Note

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※Power Hold: There is memory protection. (memorizes the display value at the moment of power off, indicates the memorized display value when power is resupplied.)

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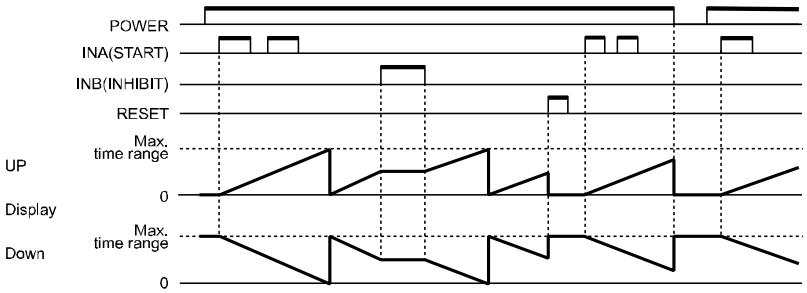
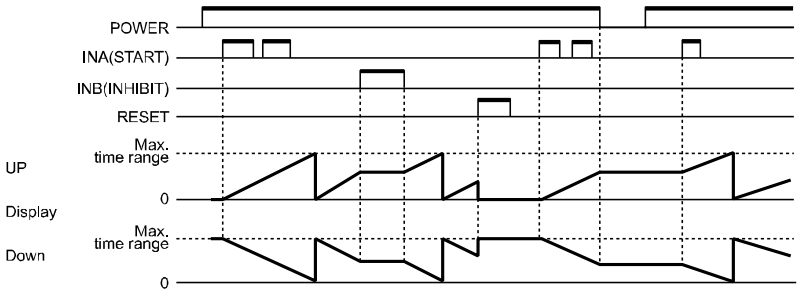
One-shot output (0.01 to 99.99 sec)
Retained output
One-shot output
Retained output

Output mode	Time chart
TOTAL [totAL]	**When memory protection setting is OFF**  1)Time starts when INA input is ON. 2)When RESET signal is ON, the display value is reset. 3)Time progress stops when INHIBIT signal is ON. 4)The progressed time is reset when power OFF. **When memory protection setting is ON**  1)Time starts when INA input is ON. 2)When RESET signal is ON, the display value is reset. 3)Time progress stops when INHIBIT signal is ON. 4)The progressed time at the moment of power OFF is memorized.

Note

※Power RESET: There is no memory protection. (resets the display value when power is off)

※Power Hold: There is memory protection. (memorizes the display value at the moment of power off, indicates the memorized display value when power is resupplied.)

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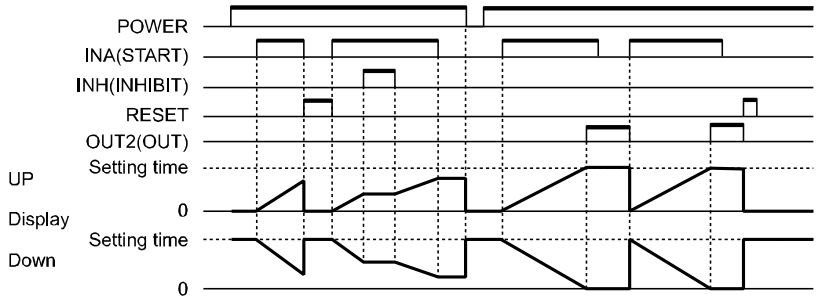
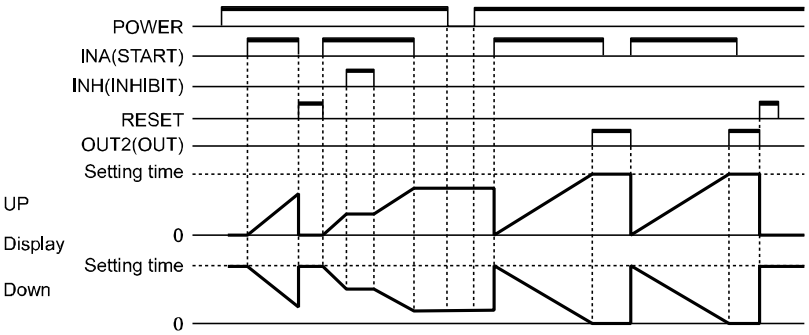
One-shot output (0.01 to 99.99 sec)
Retained output
One-shot output
Retained output

Output mode	Time chart
ON TIME Display [ontd]	**When memory protection setting is OFF** 
	※ON time indicate mode of INA signal. 1)Time reset start operates when INA signal turns ON. 2)Time progress stops while INA signal is OFF. 3)When INA signal is OFF, if INA input time is greater than the setting time, the display value flashes and the operation stops until RESET signal ON.※1 4)When time progress stops and power turns OFF, the progressed time is reset.
	When memory protection setting is ON 
	※ON time indicate mode of INA signal. 1)Time reset start operates when INA signal turns ON. 2)Time progress stops while INA signal is OFF. 3)When time progress stops and power turns OFF, the progressed time at the moment of power OFF is memorized.

Note

※1: For free voltage input model (CX6□-□□F).

※Power RESET: There is no memory protection. (resets the display value when power is off)

※Power Hold: There is memory protection. (memorizes the display value at the moment of power off, indicates the memorized display value when power is resupplied.)

※When memory protection setting is OFF, it does not memorize the display value when power turns OFF. (the display value is reset when power turns OFF)

※When memory protection setting is ON, it memorizes the display value when power turns OFF. When re-suppling the power, it displays the memorized value.

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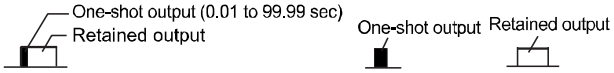
6.4 Timer ‘0’ time setting

6.4.1 Timer output mode for ‘0’ time setting

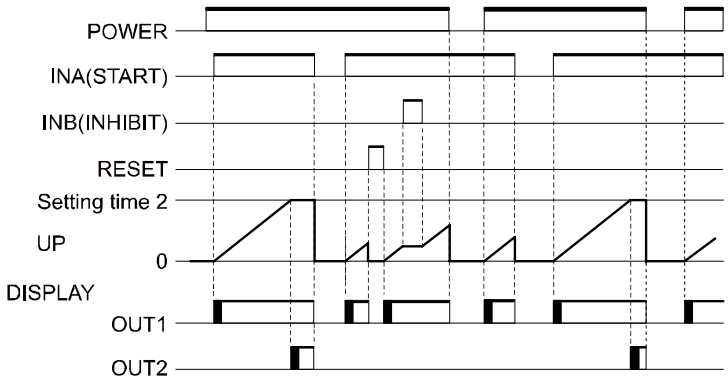
ond, ond.1, ond.2, ond.3, nFd, nFd.1

6.4.2 Operations by output mode (‘0’ time setting)

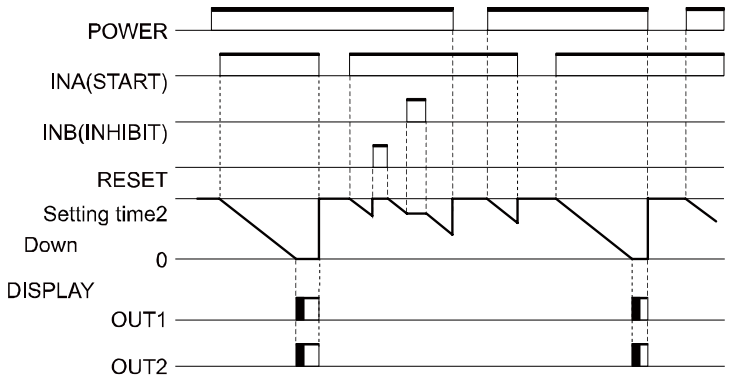


(1) OND (Signal ON Delay) mode [ond]

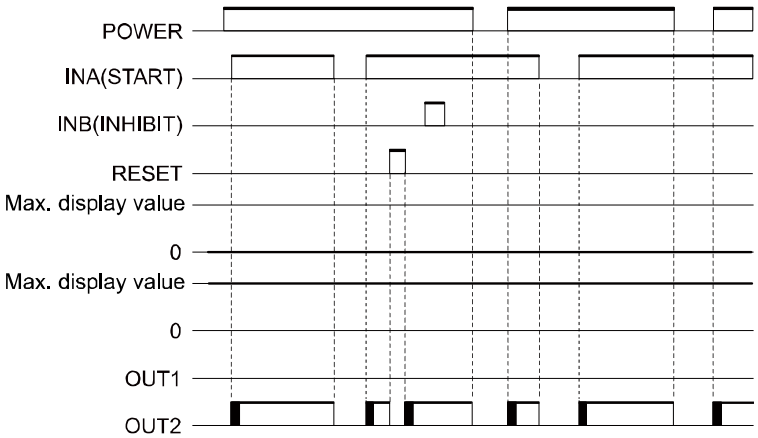
- Set ‘0’ for setting time 1.
  1) UP mode



  2) DOWN mode



- Set ‘0’ for setting time 2.



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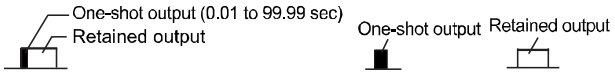
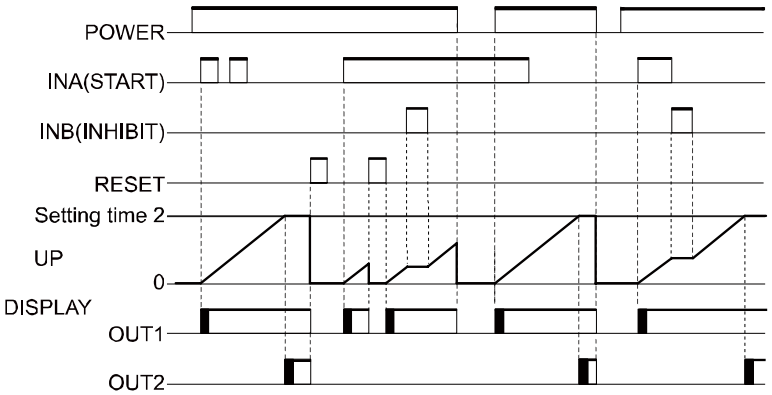
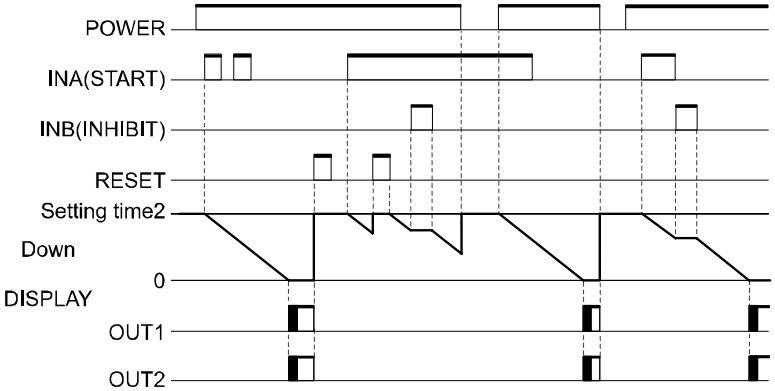


(2) OND.1 (Signal ON Delay1) mode [ond.1]

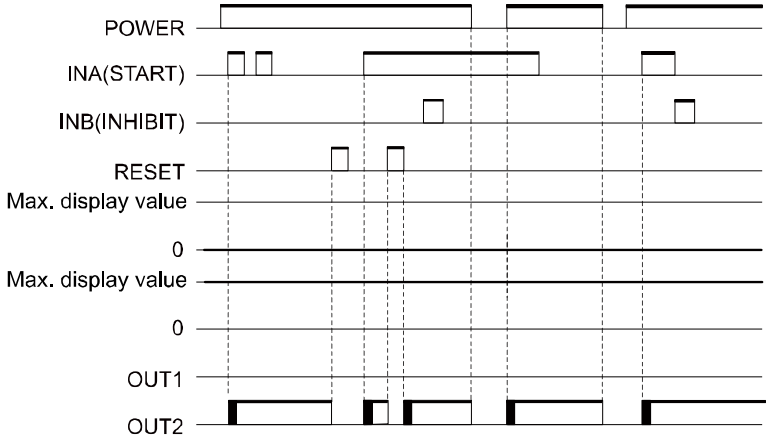
- Set '0' for setting time 1.
  1) UP mode



  2) DOWN mode



- Set '0' for setting time 2.



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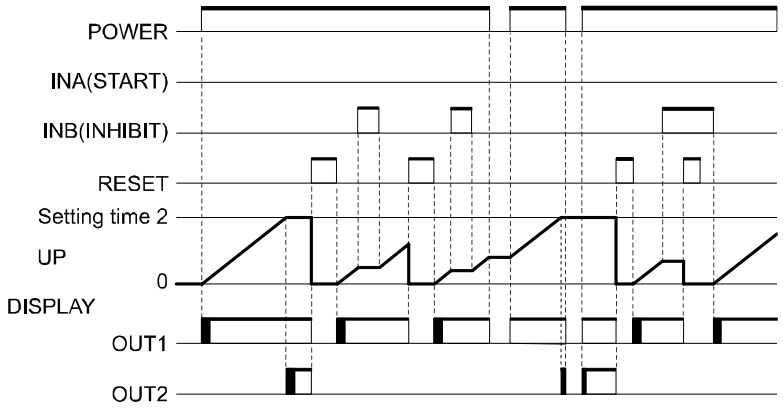
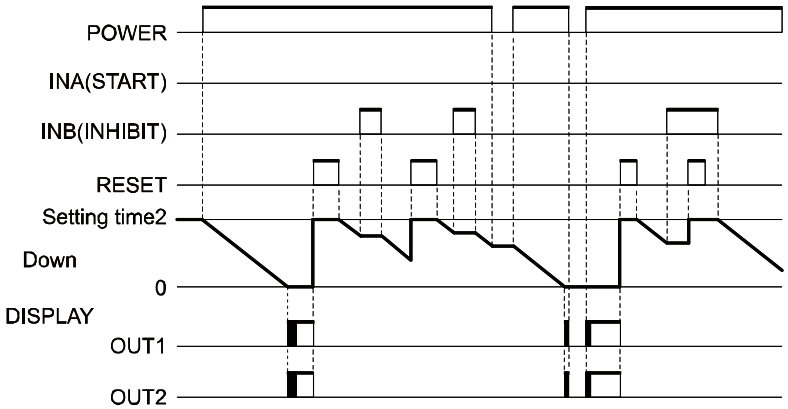
(3) OND.2 (Power ON Delay2) mode [ond.2]

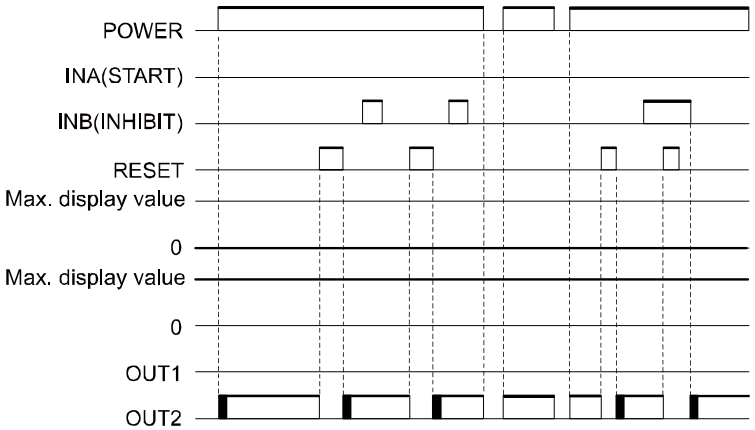
- Set '0' for setting time 1.
  1) UP mode



  2) DOWN mode



- Set '0' for setting time 2.



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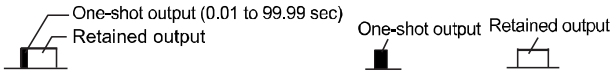
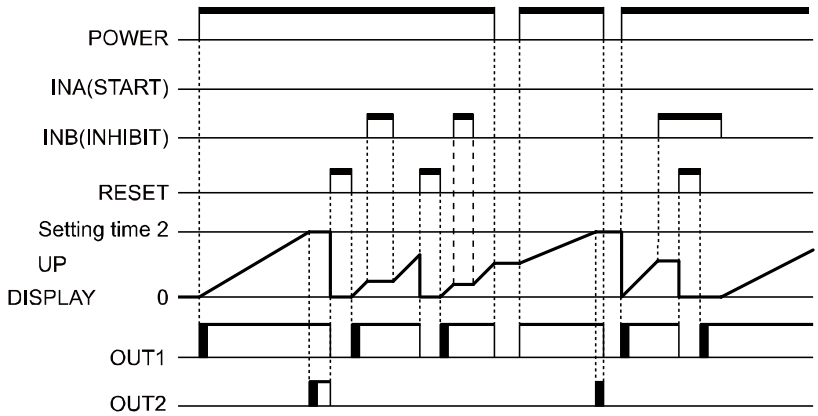
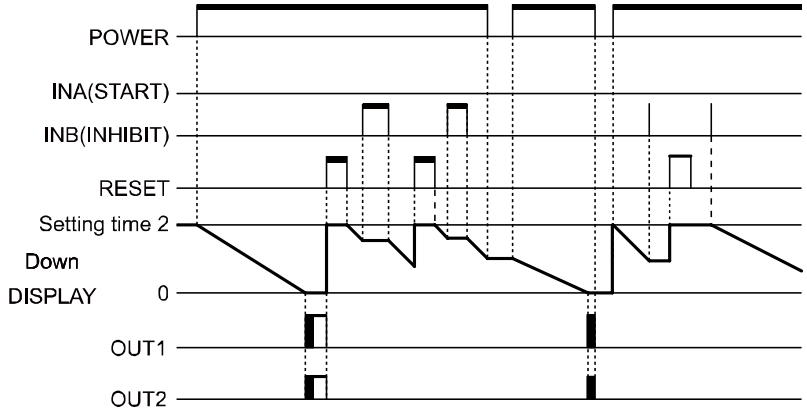


(4) OND.3 (Signal ON Delay3) mode [ond.3]

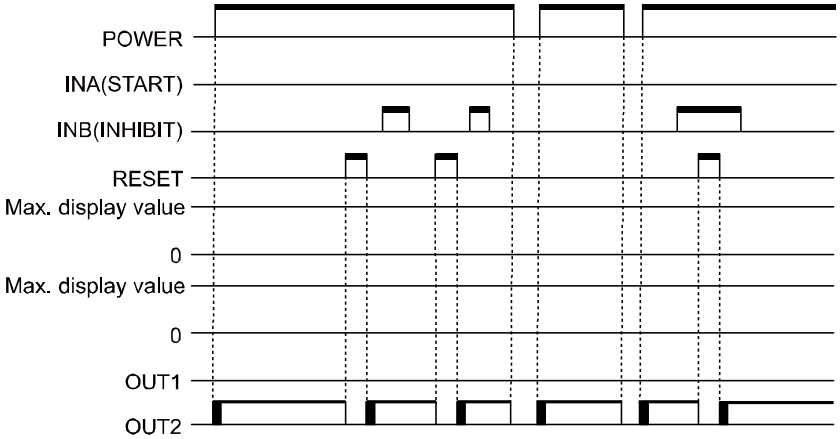
- Set '0' for setting time 1
  1) UP mode



  2) DOWN mode



- Set '0' for setting time 2



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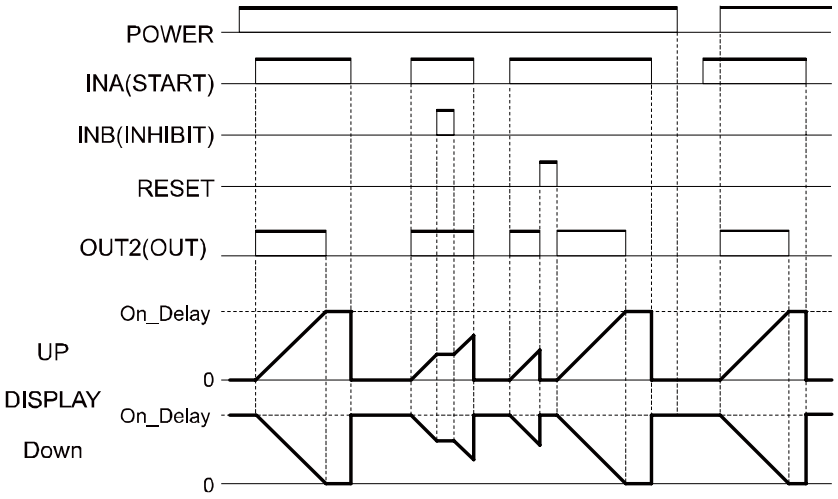
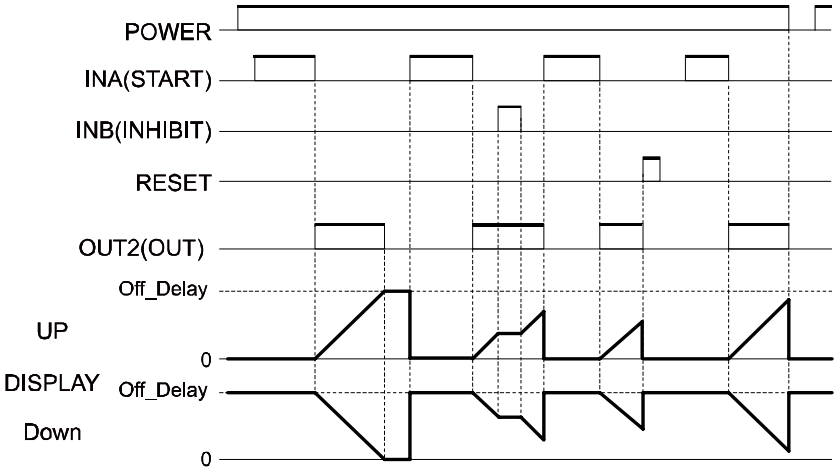
(5) NFD (ON-OFF Delay) mode [nFd]

1) Set '0' for Off_Delay setting time.



2) Set '0' for On_Delay setting time.



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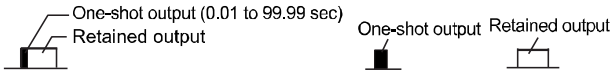
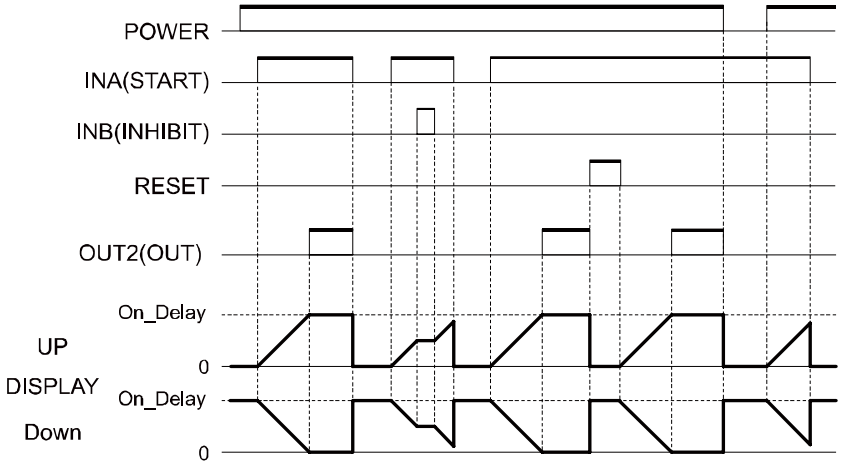
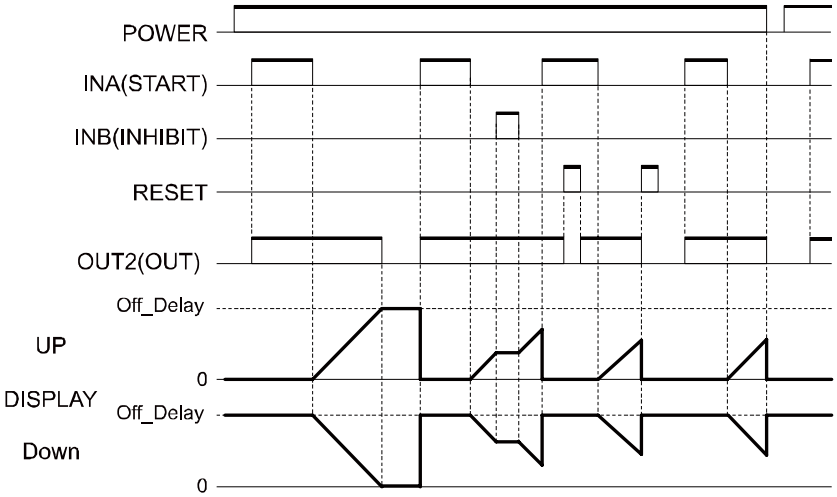


(6) NFD.1 (ON-OFF Delay1) mode [nFd.1]

1) Set '0' for Off_Delay setting time.



2) Set '0' for On_Delay setting time.



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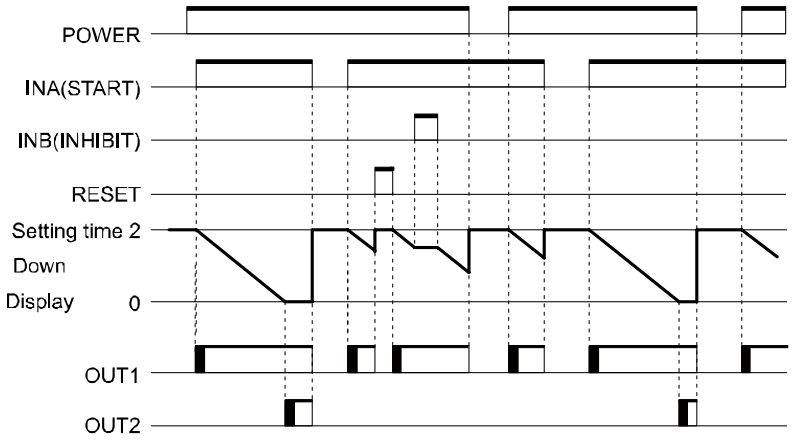
(7) When SET1 is greater than SET2

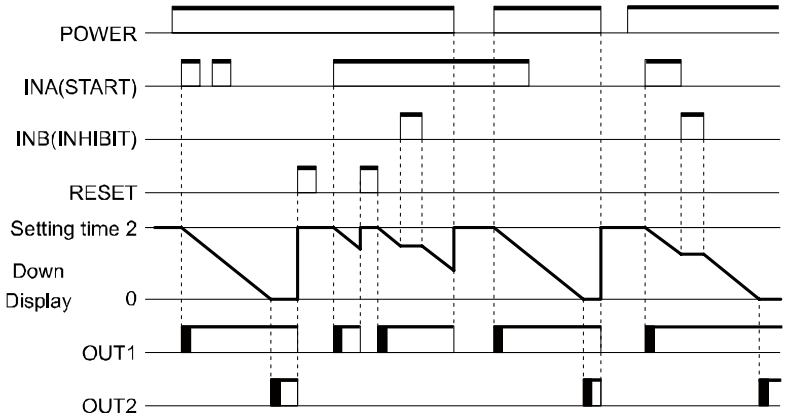
In case of OND[ond], OND.1[ond.1], OND.2[ond.2] , or OND.3[ond.3] output mode,

- UP mode: When timer setting value 1 (SET1) is greater than setting value 2 (SET2), out 1 output does not turn ON.
- DOWN mode: When timer setting value 1 (SET1) is greater than setting value 2 (SET2), out 1 oututput does not turn ON. When timer setting value 1 (SET1) and setting value 2 (SET2) are same, out 1 output turns ON when applied the start signal.

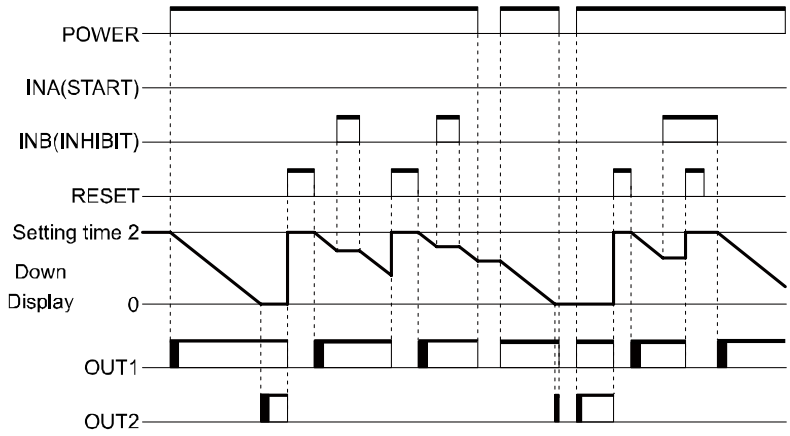
1) Output mode: ond (Signal On Delay)



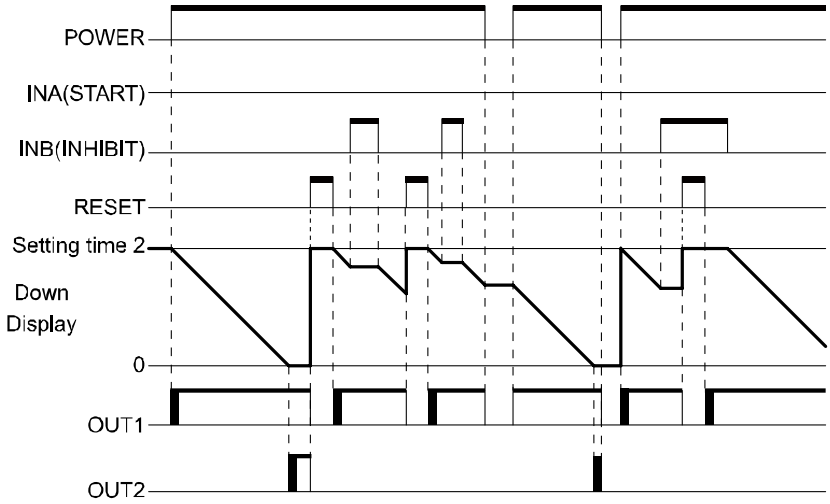
2) Output mode: ond.1 (Signal ON Delay 1)



3) Output mode: ond2 (Signal On Delay 2)



4) Output mode: ond3 (Signal On Delay 3)



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7 Factory Default

7.1 Common

Parameter	Factory default	
	CX6□-□□	CX6□-□□F
LoCK	LoFF	
SET1	1000	
SET2	5000	

7.2 Counter

Parameter	Factory default	
	CX6□-□□	CX6□-□□F
INM	Ud-C	Ud-A
oUt.M	F	F
CPS	30	–
oUt.2 (oUt.t※1)	HoLd (fixed)	HoLd (fixed)
oUt 1※1	00.10	00.10
dP	------	------
rESEt	20ms	–
SIG	nPn	–
SCL.dP	-.-----	-.-----
SCL	1.00000	1.00000
totAL※2	oFF	–
StARt	000000	000000
dAtA	CLr	CLr

Note

※1: In case of 1-stage setting model (CX6□-1P□□), oUt 1 output time does not appear.
oUt2 output time is displayed as oUt.t .

※2: This is for the voltage input(PNP)/no-voltage input(NPN) selectable model (CX6□-□□).

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7.3 Timer

Parameter	Factory default	
	CX6□-□□	CX6□-□□F
U-d	UP	UP
oUt.M	ond	ond
oUt2 (oUt.t※1)	HoLd	HoLd
oUt 1※1	00.10	00.10
t.RNG	999.999s	999.999s
SIG※2	nPn	–
IN-t	20ms	–

Note

※1: For 1-stage setting model (CX6□-1P□□), OUT1 does not appear.

The output time of OUT2 is displayed as oUt.t .

※2: This is for the voltage input (PNP)/no-voltage input (NPN) selectable model (CX6□-□□).

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* Dimensions or specifications on this manual are subject to change and some models may be discontinued without notice.

MCC-CXU1-V1.5-1902US