LCD Counter / Timer

CX Series

PRODUCT MANUAL

For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.
The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

Features

- LCD display with easy-to-read white PV characters
- Input type: voltage input (PNP) / no-voltage input (NPN) selectable (through parameter setting), universal voltage input type available
- One-shot output time: 0.01 to 99.99 seconds (in 0.01 second increments)
- Compact rear-length size (64.5 mm)

[Counter]
- Prescale value setting range: 0.00001 to 99999.9
- Various input / output modes (11 input modes, 11 output modes)
- Set start point function
- Total count display mode: displays current count and aggregate count simultaneously

[Timer]
- Various output modes (15 output modes)
- Time setting range: 0.001 second to 99999.9 hours
- Set output time to 0 feature

Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

⚠ Warning Failure to follow instructions may result in serious injury or death.

01. 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 personal injury, economic loss or fire.
02. 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 explosion or fire.
03. Install on a device panel to use.
Failure to follow this instruction may result in fire or electric shock.
04. Do not connect, repair, or inspect the unit while connected to a power source.
Failure to follow this instruction may result in fire or electric shock.
05. Check 'Connections' before wiring.
Failure to follow this instruction may result in fire.
06. Do not disassemble or modify the unit.
Failure to follow this instruction may result in fire or electric shock.

⚠ Caution Failure to follow instructions may result in injury or product damage.

01. When connecting the power input and relay output, use AWG 20 (0.50 mm^2) cable or over, and tighten the terminal screw with a tightening torque of 0.74 to 0.90 N m.
Failure to follow this instruction may result in fire or malfunction due to contact failure.
02. Use the unit within the rated specifications.
Failure to follow this instruction may result in fire or product damage.
03. Use a dry cloth to clean the unit, and do not use water or organic solvent.
Failure to follow this instruction may result in fire or electric shock.
04. Keep the product away from metal chip, dust, and wire residue which flow into the unit.
Failure to follow this instruction may result in fire or product damage.

Cautions during Use

- Follow instructions in 'Cautions during Use'.
  Otherwise, it may cause unexpected accidents.
- 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.
  - Indoors (in the environment condition rated in 'Specifications')
  - Altitude max. 2,000 m
  - Pollution degree 2
  - Installation category II

CE EAC

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics webstie.

CX	6	❶	-	❷	❸	❹

❶ Size
S: DIN W 48 × H 48 mm
M: DIN W 72 × H 72 mm

❷ Output
1P: 1-stage preset
2P: 2-stage preset

❸ Power supply
2: 24 VAC~ ± 10 % 50 / 60 Hz,
24 - 48 VDC⎓ ± 10 %
4: 100 - 240 VAC~ ± 10 % 50 / 60 Hz

❹ Signal input method
No mark: voltage input (PNP), no-voltage input (NPN) selectable type
F: free voltage input type

Product Components

- Product (+ bracket)
- Instruction manual

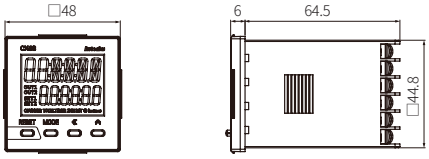
Sold Separately

- Terminal cover: RSA-COVER, RMA-COVER

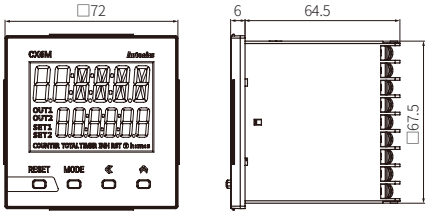
Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.

■ CX6S

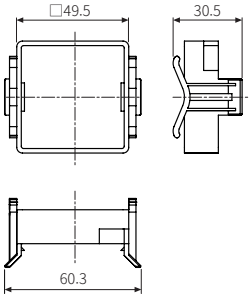


■ CX6M

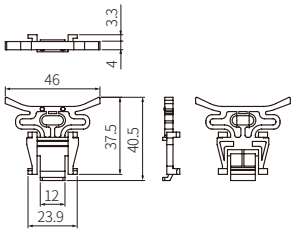


■ Bracket

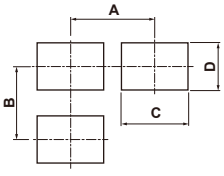
• CX6S



• CX6M



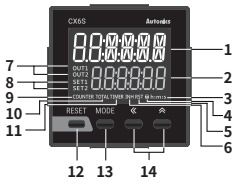
■ Panel cut-out



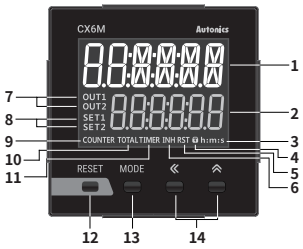
	A	B	C	D
CX6S	≥ 65	≥ 65	$45^{+0.5}_{0}$	$45^{+0.5}_{0}$
CX6M	≥ 91	≥ 91	$68^{+0.7}_{0}$	$68^{+0.7}_{0}$

Unit Descriptions

• CX6S



• CX6M



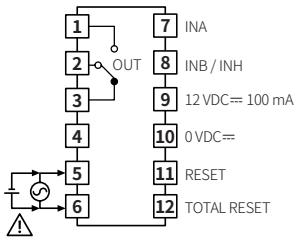
No.	Part name	Name plate	Function
1	Counting value display part (white)	-	RUN mode: Displays counting value, time progress value Counter / Timer parameter group : Displays setting item
2	Setting value display part (green)	-	RUN mode: Displays preset value Counter / Timer parameter group : Displays setting content
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	In timer operation - it turns ON for INB / INH or INHIBIT signal input
7	Output indicator	OUT1, OUT2	Turns ON for the dedicated control output ON
8	Preset value checking, changing indicator (green)	SET, SET1, SET2	Turns ON when checking and changing preset value
9	Counter indicator	COUNTER	Turns ON for ounter operation
10	Total indicator	TOTAL	[CX6□-□P□ model] In total counter display mode, it turns ON with the counter indicator
11	Timer indicator	TIMER	In timer operation - Flashes: time progress / turns ON: stopping time
12	RESET key	[RESET]	Reset the counting value, Reset the total counter counting value
13	MODE key	[MODE]	RUN mode ↔ Counter / Timer parameter group Move to the next when the parameter setting Return to run mode from function setting check mode or preset value change mode
14	Setting key	[◀]	Enter preset value change mode and move digits
		[▲]	Preset value of preset value change mode and setting content of parameter group

Connections

■ CX6S (CX6□-□P□)

• 1-stage preset setting model (CX6S-1P□)

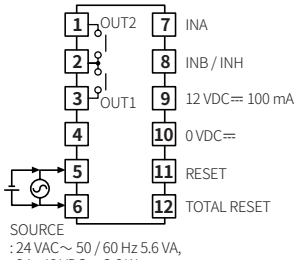
CONTACT OUT
: 250 VAC~ 3 A, 30 VDC⎓ 3 A
RESISTIVE LOAD



SOURCE
: 100 - 240 VAC~ 50 / 60 Hz 6.4 VA
24 VAC~ 50 / 60 Hz 5.5 VA,
24 - 48 VDC⎓ 3.5 W

• 2-stage preset setting model (CX6S-2P2)

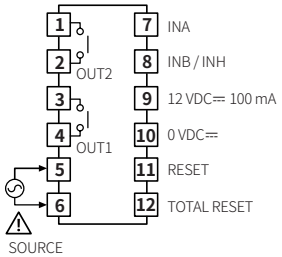
CONTACT OUT1 / OUT2
: 250 VAC~ 3 A, 30 VDC⎓ 3 A
RESISTIVE LOAD



SOURCE
: 24 VAC~ 50 / 60 Hz 5.6 VA,
24 - 48 VDC⎓ 3.6 W

• 2-stage preset setting model (CX6S-2P4)

CONTACT OUT1 / OUT2
: 250 VAC~ 3 A, 30 VDC⎓ 3 A
RESISTIVE LOAD

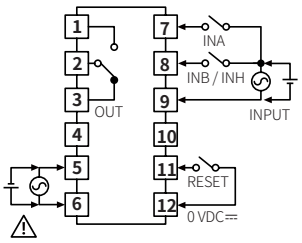


SOURCE
: 100 - 240 VAC~ 50 / 60 Hz 6.7 VA

■ CX6S (CX6□-□P□F)

• 1-stage preset setting model (CX6S-1P□F)

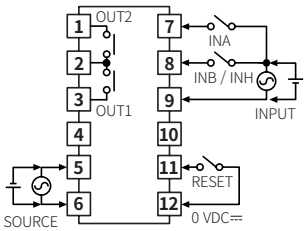
CONTACT OUT
: 250 VAC~ 3 A, 30 VDC⎓ 3 A
RESISTIVE LOAD
SIGNAL INPUT
: 24 - 240 VAC~ 50 / 60 Hz, 24 - 240 VDC⎓



SOURCE
: 100 - 240 VAC~ 50 / 60 Hz 4.2 VA
24 VAC~ 50 / 60 Hz 3.6 VA,
24 - 48 VDC⎓ 2.5 W

• 2-stage preset setting model (CX6S-2P2F)

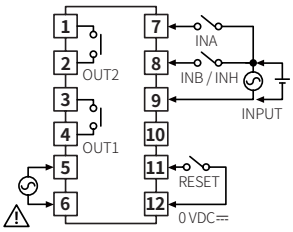
CONTACT OUT1 / OUT2
: 250 VAC~ 3 A, 30 VDC⎓ 3 A
RESISTIVE LOAD
SIGNAL INPUT
: 24 - 240 VAC~ 50 / 60 Hz, 24 - 240 VDC⎓



SOURCE
: 24 VAC~ 50 / 60 Hz 4.0 VA,
24 - 48 VDC⎓ 2.8 W

• 2-stage preset setting model (CX6S-2P4F)

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

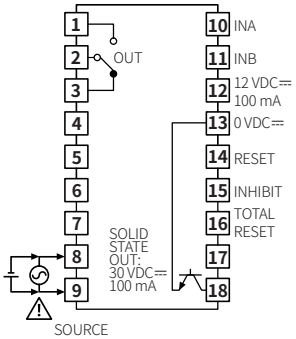


SOURCE
: 100 - 240 VAC~ 50 / 60 Hz 4.9 VA

■ CX6M (CX6□-□P□)

• 1-stage preset setting model (CX6M-1P□)

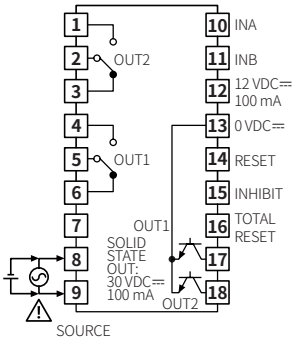
CONTACT OUT
: 250 VAC~ 3 A, 30 VDC⎓ 3 A
RESISTIVE LOAD



SOURCE
: 100 - 240 VAC~ 50 / 60 Hz 7.1 VA
24 VAC~ 50 / 60 Hz 6.2 VA,
24 - 48 VDC⎓ 4 W

• 2-stage preset setting model (CX6M-2P□)

CONTACT OUT1 / OUT2
: 250 VAC~ 3 A, 30 VDC⎓ 3 A
RESISTIVE LOAD

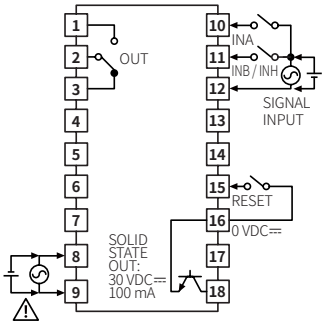


SOURCE
: 100 - 240 VAC~ 50 / 60 Hz 7.5 VA
24 VAC~ 50 / 60 Hz 6.3 VA,
24 - 48 VDC⎓ 4.1 W

■ CX6M (CX6□-□P□F)

• 1-stage preset setting model (CX6M-1P□F)

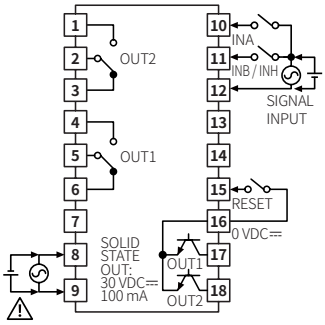
CONTACT OUT
: 250 VAC~ 3 A, 30 VDC⎓ 3 A
RESISTIVE LOAD
SIGNAL INPUT
: 24 - 240 VAC~ 50 / 60Hz, 24 - 240 VDC⎓



SOURCE
: 100 - 240 VAC~ 50 / 60 Hz 4.7 VA
24 VAC~ 50 / 60 Hz 3.9 VA,
24 - 48 VDC⎓ 2.9 W

• 2-stage preset setting model (CX6M-2P□F)

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



SOURCE
: 100 - 240 VAC~ 50 / 60 Hz 5.4 VA
24 VAC~ 50 / 60 Hz 4.5 VA,
24 - 48 VDC⎓ 3.3 W

Specifications

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), 11-segment (the other digits of counting value display: white) LCD			
Character size	W × H (unit: mm)			
Counting value	4.1 × 10.1		6.2 × 15.2	
Setting value	3.3 × 8.1		5 × 12.3	
Counter	Count up, count down, count up / down			
Counting range[01]	-99999 to 999999			
Timer	Count up, count down			
Repeat / SET / voltage / Temp. Error	CX6□-□P□: Power ON Start: ≤ ± 0.01 % ± 0.05 sec Signal ON Start: ≤ ± 0.01 % ± 0.03 sec CX6□-□P□F: Power ON Start: ≤ ± 0.01 % ± 0.08 sec Signal ON Start: ≤ ± 0.01 % ± 0.06 sec			
Input logic (CX6□-□P□)	Voltage input (PNP) - input impedance: 10.8 kΩ, [H]: 5 - 30 VDC⎓, [L]: 0 - 2 VDC⎓ No-voltage input (NPN) - short-circuit impedance: ≤ 1 kΩ, short-circuit residual voltage: ≤ 2 VDC⎓			
Input logic (CX6□-□P□F)	Free voltage input - INA (START), INB (INHIBIT) input, [H]: 24 - 240 VAC~ 50 / 60 Hz / 24 - 240 VDC⎓ [L]: 0 - 10 VAC~ / VDC⎓ No-voltage input - RESET input, short-circuit impedance: ≤ 1 kΩ, short-circuit residual voltage: ≤ 2 VDC⎓			
One-shot output time	0.01 to 99.99 s			
Unit weight (packaged)	Dependent on the model			
CX6□-□P4	≈ 112 g (≈ 157 g)	≈ 117 g (≈ 162 g)	≈ 170 g (≈ 235 g)	≈ 175 g (≈ 240 g)
CX6□-□P4F	≈ 110 g (≈ 155 g)	≈ 115 g (≈ 160 g)	≈ 168 g (≈ 233 g)	≈ 173 g (≈ 238 g)
CX6□-□P2	≈ 111 g (≈ 156 g)	≈ 116 g (≈ 161 g)	≈ 169 g (≈ 234 g)	≈ 174 g (≈ 239 g)
CX6□-□P2F	≈ 109 g (≈ 154 g)	≈ 114 g (≈ 159 g)	≈ 167 g (≈ 232 g)	≈ 172 g (≈ 237 g)
Approval	CE EAC			

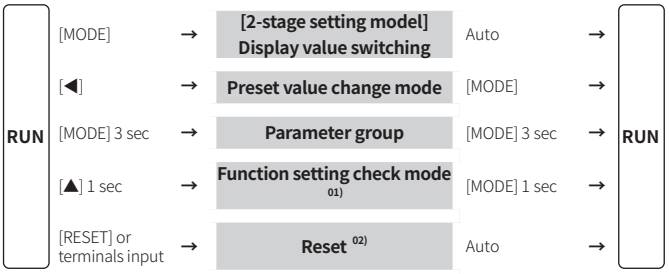
01) It varies depending on the setting of decimal points.

Model	CX6S-□P□□	CX6M-□P□□
Contact control output	Relay	
Type (1-stage)	SPDT (1c) × 1	SPDT (1c) × 1
Type (2-stage)	SPST (1a) × 2	SPDT (1c) × 2
Capacity	≤ 250 VAC~ 3 A, ≤ 30 VDC⎓ 3 A resistive load	≤ 250 VAC~ 3 A, ≤ 30 VDC⎓ 3 A resistive load
Solid-state control output	-	NPN open collector
Type (1-stage)	-	× 1
Type (2-stage)	-	× 2
Capacity	-	≤ 30 VDC⎓, 100 mA

Voltage	AC voltage type	AC / DC voltage type
Power supply	100 - 240 VAC~ ± 10 % 50 / 60 Hz	24 VAC~ ± 10 % 50 / 60 Hz, 24 - 48 VDC⎓ ± 10 %
Power consumption	Dependent on the model	
CX6S-1P□	≤ 6.4 VA	AC: ≤ 5.5 VA, DC: ≤ 3.5 W
CX6S-1P□F	≤ 4.2 VA	AC: ≤ 3.6 VA, DC: ≤ 2.5 W
CX6S-2P□	≤ 6.7 VA	AC: ≤ 5.6 VA, DC: ≤ 3.6 W
CX6S-2P□F	≤ 4.9 VA	AC: ≤ 4.0 VA, DC: ≤ 2.8 W
CX6M-1P□	≤ 7.1 VA	AC: ≤ 6.2 VA, DC: ≤ 4 W
CX6M-1P□F	≤ 4.7 VA	AC: ≤ 3.9 VA, DC: ≤ 2.9 W
CX6M-2P□	≤ 7.5 VA	AC: ≤ 6.3 VA, DC: ≤ 4.1 W
CX6M-2P□F	≤ 5.4 VA	AC: ≤ 4.5 VA, DC: ≤ 3.3 W
External power supply[01]	≤ 12 VDC⎓ ± 10 % 100 mA	
Memory retention	≈ 10 years (non-volatile semiconductor memory type)	
Insulation resistance	≥ 100 MΩ (500 VDC⎓ megger)	
Dielectric strength	3,000 VAC~ 50 / 60 Hz for 1 minute	
Noise immunity	± 2 kV square wave noise (pulse width: 1 μs) by the noise simulator	± 500 V square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	0.75 mm double amplitude at frequency of 10 to 55Hz (for 1 minute) in each X, Y, Z direction for 1 hour	
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55Hz (for 1 minute) in each X, Y, Z direction for 10 minute	
Shock	300 m/s² (≈ 30 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	100 m/s² (≈ 10 G) in each X, Y, Z direction for 3 times	
Relay life cycle	Mechanical: ≥ 5,000,000 operations Electrical: ≥ 100,000 operations	
Ambient temp.	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)	
Ambient humi.	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Protection rating	IP65 (front part, IEC standard)	

01) This is for the CX6□-□P□ model.

Mode Setting



01) Use [MODE], [▲] key to check the parameter setting.
Counting value display part: Displays setting item.
Setting value display part: Displays setting content.

02) The output is OFF.

Preset Value Change Mode

Even if the mode of preset value change, input operation and output control will continue.
The preset value could be set to 0 and the output of 0 preset value occurs.

- Defaults: SET1 = 1000, SET2 = 5000
- The preset value could not be set to 0 depending on the output operation mode.
  (When setting to 0, the value of setting value display part flashes 3 times.)
- Counting value display part: Displays present value,
  Setting value display part: Displays preset value.
- Setting sequence: SET2 > SET1 > TOTAL* > TOTAL COUNTER RESET*
  1. Press [◀] key to enter 2-stage preset value change mode.
  2. Use [◀], [▲] key to set 2-stage preset value.
  3. Press [MODE] key to enter 1-stage preset value change mode.
  4. Use [◀], [▲] key to set 1-stage preset value.
  5*. Press [MODE] key to confirm the total counter setting.
  6*. Pressing the [MODE] key returns to the operation mode, and pressing the [RESET] key resets the total counter value.
  * appear when the 2-stage preset setting model operates as a counter.

Display value switching of 2-stage preset setting model

■ Counter

Whenever pressing the [MODE] key, each 1-stage preset value, 2-stage preset value, total counter value displays consecutively.

■ Timer - Manual

Whenever pressing the [MODE] key, the setting value display part displays 1-stage preset value, 2-stage preset value in turn.

- In case of output operation mode: OND, OND.1, OND.2, OND.3, it is available.

■ Timer - Auto

1-stage / 2-stage preset value are automatically switched and displayed.

- In case of 1-stage / 2-stage preset setting model & output operation mode: FLK, NFD, NFD.1 or
  2-stage preset setting model & output operation mode: INT.2, it is available.

Parameter Setting

- Some parameters are activated / deactivated depending on the model or setting of other parameters. Refer to the description of each parameter.
- Counter counting / timer progress and output control are performed even when entering the function setting mode from run mode.
- [MODE] key: Saves current setting value and moves to the next parameter.
  [◀] key: Checks fixed value / Changes setting digits.
  [▲] key: Changes setting values.

■ Counter parameter group

Parameter		Mark	Defaults	Setting range	Display condition
C1-1	Counter / Timer 01)	C-t	CoUnt	**COUNT: counter**, TIME: timer	-
C1-2	Input operation mode 01)	INM	Ud-C	[CX6□-□P□ model] UP, UP-1, UP-2, UP-3, DN, DN-1, DN-2, DN-3, UD-A: command input , UD-B: individual input, UD-C: phase difference input	-
			Ud-A	[CX6□-□P□F model] UP, UP-1, UP-2, UP-3, DN, DN-1, DN-2, DN-3, UD-A: command input	-
C1-3	Output operation mode 01)	oUt.M	F	F, N, C, R, K, P, Q, A, S*, T*, D*	*C1-2 Input operation mode: UD-A, UD-B, UD-C
C1-4	Max. Counting speed 01) 02)	CPS	30	[CX6□-□P□ model] 30, 300, 1K, 5K, 1 cps • 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.	C1-3 Output operation mode 03)
C1-5	OUT2 output time 01) 04)	oUt2	HoLd	[2-stage preset setting model] 0.01 to 99.99 sec, Hold • When 10^1 digit is flashing, press [◀] key once and Hold appears.	C1-3 Output operation mode: C, R, K, P, Q, A 05)
C1-6	OUT1 output time 01) 04)	oUt1	00.10		C1-3 Output operation mode: F, N, C, R, K, P, Q, A 05)
C1-7	OUT output time 01) 04)	oUt.t	HoLd	[1-stage preset setting model] 0.01 to 99.99 sec, Hold • When 10^1 digit is flashing, press [◀] key once and Hold appears.	C1-3 Output operation mode: C, R, K, P, Q, A 05)
C1-8	Counting value / preset value decimal point 01)	dP	------	------, -----.-, ----.--, ---.---, --.----, -.----- • Set the decimal point of the number displayed on the front of the product regardless of the prescale value.	-
C1-9	Min. RESET time 02)	rESEt	20	[CX6□-□P□ model] 1, 20 ms	-
C1-10	Input logic 02)	SIG	nPn	[CX6□-□P□ model] NPN, PNP	-
C1-11	Prescale decimal point 01)	SCL.dP	-.-----	-.-----, -----.-, ----.--, ---.---, --.---- • Set the decimal point of the prescale value applied to the count value regardless of the decimal point displayed on the front. • It can not be set smaller than the digits of C1-8 Counting value / preset value decimal point.	-
C1-12	Prescale value 01) 06)	SCL	1.00000	0.00001 to 99999.9	-
C1-13	Total counter	totAL	oFF	[CX6□-□P□ model] ON, OFF • When set to ON, the total counter counting value counts up to 999999 and counts cycles from 0.	-
C1-14	Start Point value 01)	StArt	000000	0.00000 to 999999	C1-2 Input operation mode: UP, UP-1, UP-2, UP-3, UD-A, UD-B, UD-C & C1-13 Total counter: OFF
C1-15	Memorize counting value	dAtA	CLr	CLR: Resets counting value when power is off. REC: Memorizes counting value at the moment of power off. (memory retention)	-
C1-16	Key LOCK	LoCK	L.oFF	L.OFF: Unlock key LOCK LOC.1: Locks [RESET] key LOC.2: Locks [◀], [▲] key LOC.3: Locks [RESET], [◀], [▲] key	-

01) When the setting value of the parameter is changed, all outputs are OFF and reset the current value when returning to the RUN mode.

02) In case of CX6□-□P□F model, C1-4 Max. Counting speed = 20 cps, C1-9 Min. RESET time = 25 ms, C1-10 Input logic = NPN are fixed, so these parameters are not displayed.

03) C1-3 Output operation mode: in case of D, 1, 30, 300, 1k cps selectable.
C1-4 Max. counting speed: 5k, 10k cps & C1-3 Output operation mode: When D is set, the max. counting speed is automatically changed to 30 cps.

04) In case of 1-stage preset setting model, C1-6 OUT1 output time is not displayed, C1-5 OUT2 output time is displayed as OUT.T.

05) For other output operation modes, Hold is fixed.

06) In the case of retained (hold) output, 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.

■ Timer parameter group

Parameter		Mark	Defaults	Setting range	Display condition
T1-1	Counter / Timer [01]	C-t	CoUnt	COUNT: counter, **TIME: timer**	-
T1-2	UP / DOWN mode [01]	U-d	UP	UP: 0 → setting time DN: setting time → 0	-
T1-3	Output operation mode [01]	oUt.M	ond	[1-stage preset setting model] OND, OND.1, OND.2, OND.3, FLK, FLK.1, FLK.2, INT, INT.1, OFD, NFD, NFD.1, INTG, TOTAL [02], ONT.D	-
				[2-stage preset setting model] OND, OND.1, OND.2, OND.3, FLK, FLK.1, FLK.2, INT, INT.1, INT.2, OFD, NFD, NFD.1, INTG, TOTAL [02], ONT.D	
T1-4	Time range [01]	t.RnG	See below		T1-3 Output operation mode: OND, OND.1, OND.2, OND.3, FLK.1, FLK.2, INT, INT.1, INT.2, OFD, INTG, TOTAL, ONT.D
T1-5	Output ON time range [01] [03]	oN.RnG	See below		T1-3 Output operation mode: FLK, NFD, NFD.1
T1-6	Output OFF time range [01] [03]	oFF.RnG	See below		
T1-7	OUT2 output time [01] [04]	oUt2	Hold	[2-stage preset setting model] 0.01 to 99.99 sec, Hold • When 10^1 digit is flashing, press [◀] key once and Hold appears.	T1-3 Output operation mode: OND, OND.1, OND.2, OND.3
T1-8	OUT1 output time [01] [04]	oUt1	00.10		-
T1-9	OUT output time [01] [04]	oUt.t	Hold	[1-stage preset setting model] 0.01 to 99.99 sec, Hold • When 10^1 digit is flashing, press [◀] key once and Hold appears.	-
T1-10	Input logic [05]	SIG	nPn	[CX6□-□P□ model] NPN, PNP	-
T1-11	Input signal time [05]	IN-t	20	[CX6□-□P□ model] 1, 20 ms • Min. signal width of INA, RESET, INHIBIT, TOTAL RESET signal	-
T1-12	Memorize counting value	dAtA	Clr	CLR: Resets counting value when power is off. REC: Memorizes counting value at the moment of power off. (memory retention)	-
T1-13	Key LOCK	LoCK	L.oFF	L.OFF: Unlock key LOCK LOC.1: Locks [RESET] key LOC.2: Locks [◀], [▲] key LOC.3: Locks [RESET], [◀], [▲] key	-

Counting value display part	Setting value display part	Range
s (defaults)	999.999	0.001s to 999.999s
s	9999.99	0.01s to 9999.99s
s	99999.9	0.1s to 99999.9s
s	999999	1s to 999999s
m : s	99:59.99	0.01s to 99m59.99s
m : s	999:59.9	0.1s to 999m59.9s
m : s	9999:59	1s to 9999m59s
m	99999.9	0.1m to 99999.9m
m	999999	1m to 999999m
h : m : s	99:59:59	1m to 99h59m59s
h : m	9999:59	1m to 9999h59m
h	99999.9	0.1h to 99999.9h

01) When the setting value of the parameter is changed, all outputs are OFF and reset the current value when returning to the RUN mode.
02) For CX6□-□P□ model.
03) T.ON, T.OFF setting values indicate the ON / OFF time range of OUT2 / OUT.
04) In case of T1-3 Output operation mode: FLK.1, FLK.2, INTG, or T1-3 Output operation mode of 1-stage preset setting model: OND, OND.1, OND.2,OND.3, T1-8 OUT1 output time is not displayed, T1-7 OUT2 output time is displayed as OUT.T.
05) In case of CX6□-□P□F model, T1-10 Input logic = NPN, T1-11 Input signal time = 25 ms are fixed, so these parameters are not displayed.

Error Display and Output Operation

- When error occurs, the output turns OFF.
- When setting 1-stage preset value = 0, OUT1 output turns OFF.
  In case of 2-stage preset value < 1-stage preset value, OUT1 output is ignored and only OUT2 output operates.

Display	Description	Troubleshooting
Err0	Preset value = 0	Change the preset value anything but 0.

Output Operation Mode

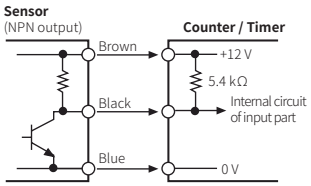
For the detailed timing chart for operation output mode, refer to the manual.

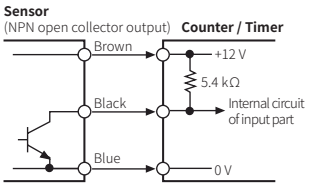
Input Connections

- Input: CP1, CP2 (INHIBIT), SET
- Max. counting speed in the contact input: 1 or 30 cps setting (counter)

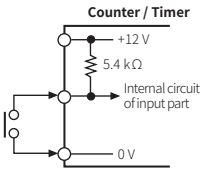
■ No-voltage (NPN) input

• Solid-state input



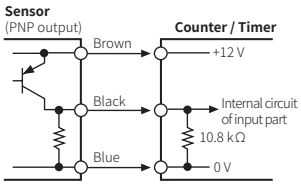


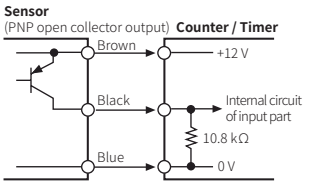
• Contact input



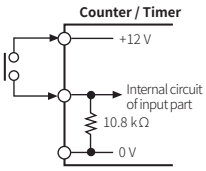
■ voltage (PNP) input

• Solid-state input



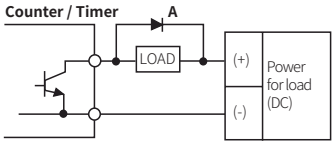


• Contact input



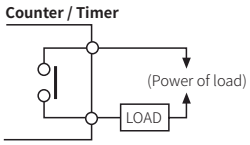
Output Connections

• Solid-state output



A: When using inductive load (relay etc.), surge absorber (diode, varistor etc.) must be connected between both sides of the load.

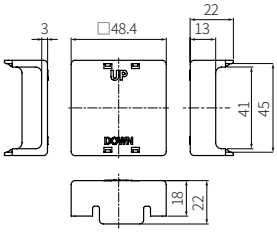
• Contact output



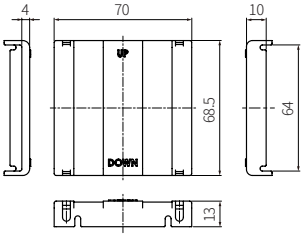
Sold Separately: Terminal Cover

- Unit: mm, For the detailed drawings, follow the Autonics website.

RSA-COVER: DIN W48 × H48



RMA-COVER: DIN W72 × H72



Description of Function

■ Zero blanking (timer)

PV is displayed with zero blanking for the highest unit.
- E.g.) When time range is 99m59.99s and PV is 00m04.05s.
  Display value: 0:04.05

■ Start Point (counter)

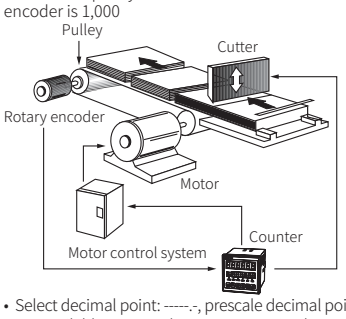
This function is that start at initial value set at Start Point value.
- When reset is applied, the present value is initialized to Start Point value.
- After Count Up at output operation mode: C, R, P, Q, present value starts at Start Point value.
- If you change the start point value and return to RUN mode, the present value is changed to the start point value.
- If the Start Point value is changed in the function setting mode, the present value is reset.
- Start Point value setting range is linked to C1-8 Counting value / preset value decimal point position.

■ Prescale (counter)

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.
- 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.

• Application

Diameter of pulley connected with encoder is 22 mm, the number of pulses by 1 rotation of encoder is 1,000



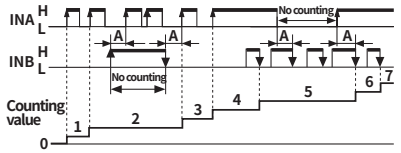
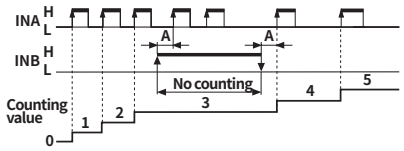
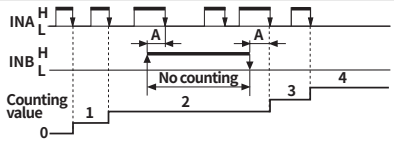
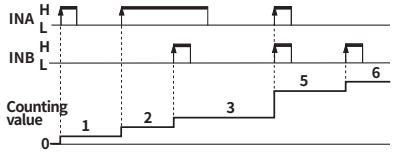
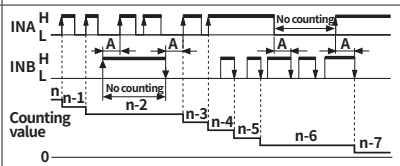
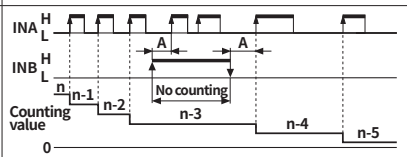
$$\text{Prescale value} = \frac{\pi \times \text{Diameter of pulley}}{\text{The number of pulses by 1 rotation of encoder}} = \frac{3.1416 \times 22}{1000} = 0.069 \text{ mm / pulse}$$

- Select decimal point: -----.-, prescale decimal point: ---.--- and set prescale value: 0.069, it is available to control conveyor position by 0.1 mm unit.

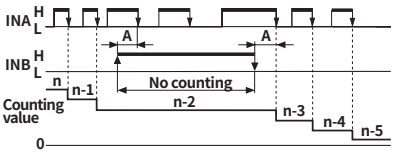
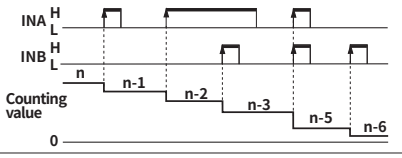
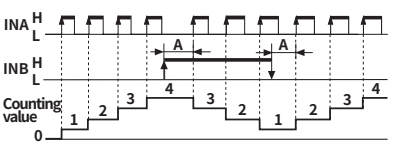
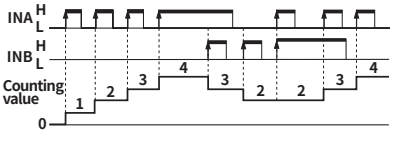
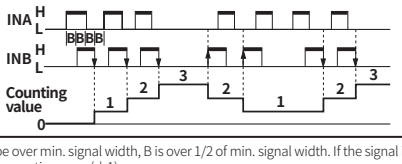
Counter Operation

■ Input operation mode

Rising: ⌐ / Falling: ¬

Mode	Counting chart 01)	Operation description
UP		• INA: Counting input INB: No counting input • INB: Counting input INA: No counting input
UP - 1		When INA input signal is rising, it counts. • INA: Counting input INB: No counting input
UP - 2		When INA input signal is falling, it counts. • INA: Counting input INB: No counting input
UP - 3		When INA and INB input signals are rising, it counts. • INA: Counting input INB: Counting input
DN		• INA: Counting input INB: No counting input • INB: Counting input INA: No counting input
DN - 1		When INA input signal is rising, it counts. • INA: Counting input INB: No counting input

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

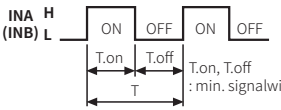
Mode	Counting chart 01)	Operation description
DN - 2		When INA input signal is falling, it counts. • INA: Counting input INB: No counting input
DN - 3		When INA and INB input signals are rising, it counts. • INA: Counting input INB: Counting input
UD - A : command input		INB: In case of L, count up INB: In case of H, count down • INA: Counting input INB: Counting command input
UD - B : individual input		When INA and INB input signals are rising at the same time, it maintains previous counting value. • INA: Up counting input INB: Down counting input
UD - C : phase different input		When connecting encoder output A, B phase with counter input INA and INB, set input operation mode as UD-C.

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

• Min. signal width by counting speed

Counting speed [cps 01)]	Min. signal width [ms]	
	CX6□-□P□	CX6□-□P□F
1	500	-
30	16.7	
300	1.67	
1 k	0.5	
5 k	0.1	
20	-	25

01) 1 cps = 1 Hz



• H,L of the counting chart

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

■ Output operation mode

Out output of 1-stage preset model operates as same with the OUT2 output of 2-stage preset model.
OUT1 output of 2-stage preset model is operated One-shot output or retained (Hold) output. (except S, T, D of input operation mode)
OUT1 output could be set to 0 in all modes and 0 value output turns ON.
OUT2 output could not set to 0 in output operation mode: C, R, P, Q.

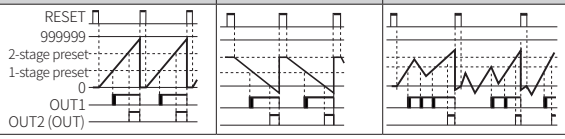
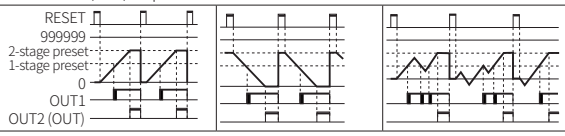
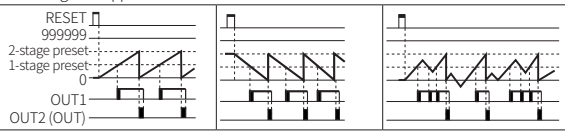
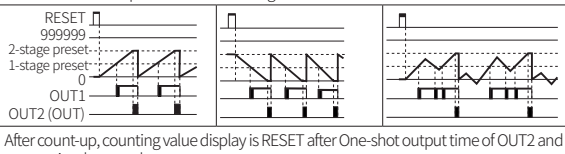
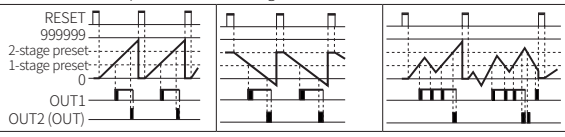
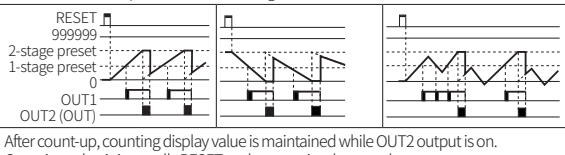
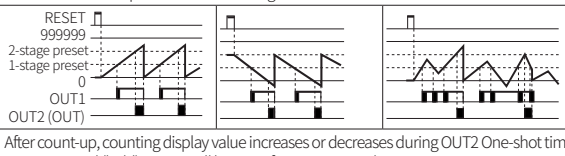
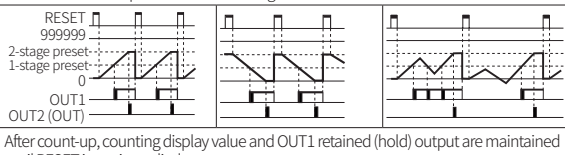
• Output type

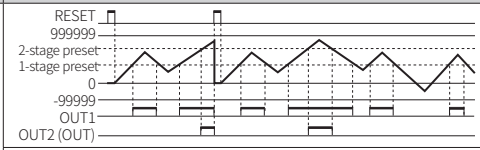
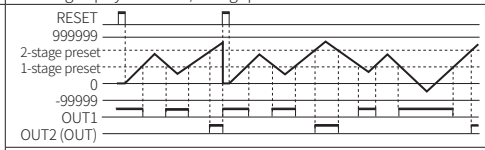
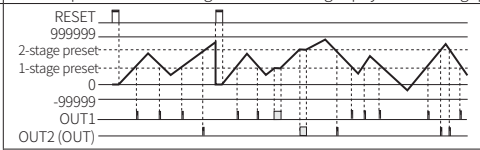
One-shot output
Retained (hold) output

One-shot output

Retained (hold) output

Coincidence output

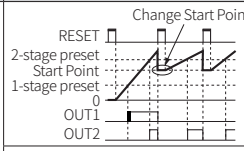
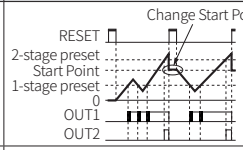
Mode	Output operation description in input operation mode		
	UP, UP-1/2/3	DN, DN-1/2/3	UD-A/B/C
F			
	After count-up, counting display value increases or decreases until RESET signal is applied and retained (hold) output is maintained.		
N			
	After count-up, counting display value and retained (hold) output are maintained until RESET signal is applied.		
C			
	When count-up, counting display value will be RESET and count simultaneously. OUT1 retained (hold) output will be OFF after OUT2 One-shot output time. • The One-shot output time of OUT1 is regardless of OUT2.		
R			
	After count-up, counting value display is RESET after One-shot output time of OUT2 and it counts simultaneously. OUT1 retained (hold) output will be OFF after OUT2 One-shot output time. • The One-shot output time of OUT1 is regardless of OUT2.		
K			
	After count-up, counting display value increases or decreases until RESET signal is applied. OUT1 retained (hold) output will be OFF after OUT2 One-shot output time. • The One-shot output time of OUT1 is regardless of OUT2.		
P			
	After count-up, counting display value is maintained while OUT2 output is on. Counting value is internally RESET and counts simultaneously. When OUT2 is OFF, displays counting value while OUT2 is ON, and it increases or decreases. OUT1 retained (hold) output will be OFF after OUT2 One-shot output time. • The One-shot output time of OUT1 is regardless of OUT2.		
Q			
	After count-up, counting display value increases or decreases during OUT2 One-shot time. OUT1 retained (hold) output will be OFF after OUT2 One-shot output time. • The One-shot output time of OUT1 is regardless of OUT2.		
A			
	After count-up, counting display value and OUT1 retained (hold) output are maintained until RESET input is applied. • The One-shot output time of OUT1 is regardless of OUT2.		

Mode	Output operation description in input operation mode
	UD-A/B/C
S	
	OUT1 / 2 keep ON state in following condition: Counting display value ≥ 1 / 2-stage preset value
T	
	OUT1 output is off: counting display value ≥ 1-stage preset value. OUT1 keeps ON state when 1-stage preset value = 0. OUT2 keeps ON state in following condition: counting display value ≥ 2-stage preset value
D	
	OUT1 / 2 are ON only when counting display value = 1 / 2-stage preset value. • When setting 1 kcps 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.

■ Output operation for other conditions

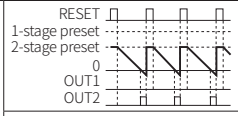
01. Output operation for the relation of Start Point value, PRESET value

• Output operation description: 2-stage preset value > Start Point = 1-stage preset value
In case of UP, UP-1, UP-2, UP-3, UD-A, UD-B, UD-C mode, output of OUT1 turns ON when RESET ON to OFF.
• Output operation description: 2-stage preset value > Start Point > 1-stage preset value

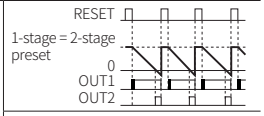
Mode	Counting chart and output operation description	
	Input operation mode = UP, UP-1/2/3	Input operation mode = UD-A/B/C
F		
	OUT1 does not execute. OUT2 occurs when reaching 2-stage preset value.	Count down and OUT1 occurs when reaching 1-stage preset value.

02. 1-stage preset value ≥ 2-stage preset value (input operation mode: DN, DN-1, DN-2)

• Output operation description:
1-stage preset value > 2-stage preset value

Mode	Input operation mode = DN, DN-1/2/3
F	
	OUT1 does not execute.

• Output operation description:
1-stage preset value = 2-stage preset value

Mode	Input operation mode = DN, DN-1/2/3
F	
	OUT1 occurs when RESET OFF.

Timer Operation

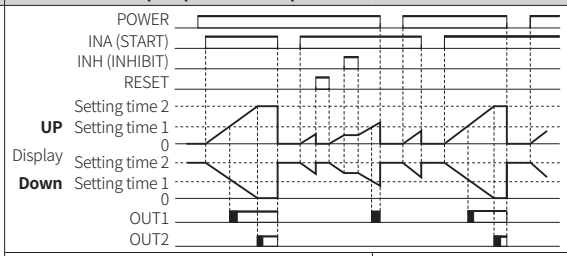
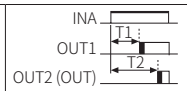
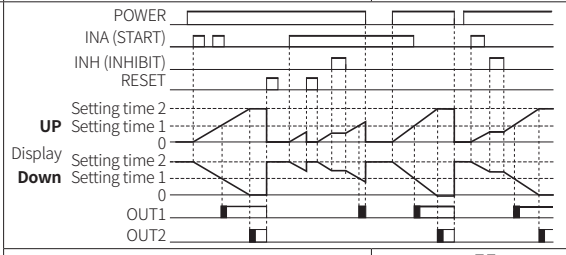
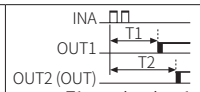
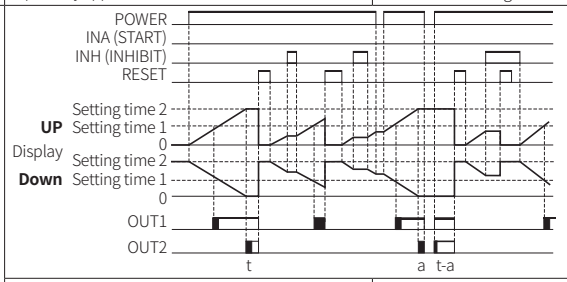
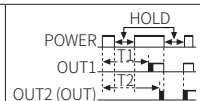
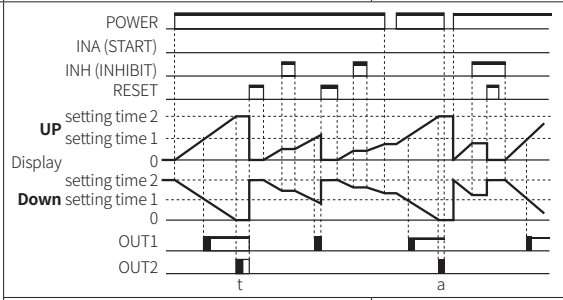
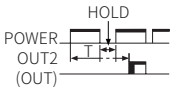
■ Output operation mode

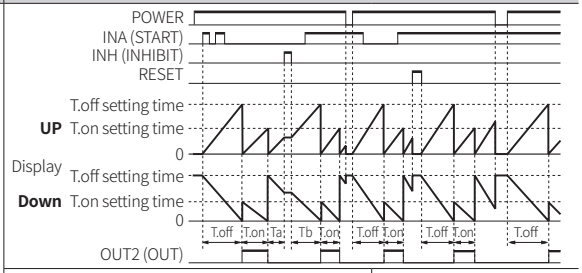
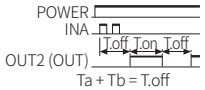
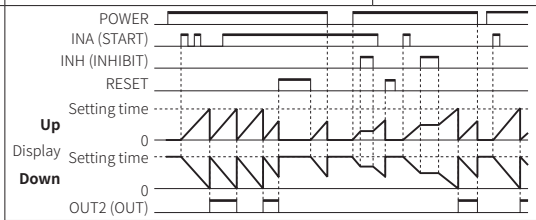
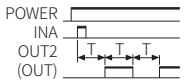
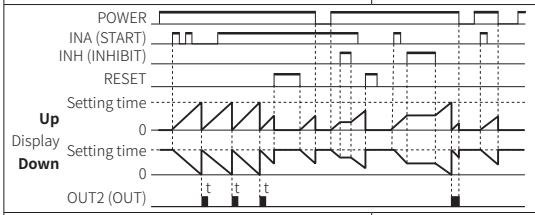
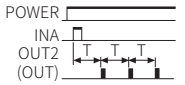
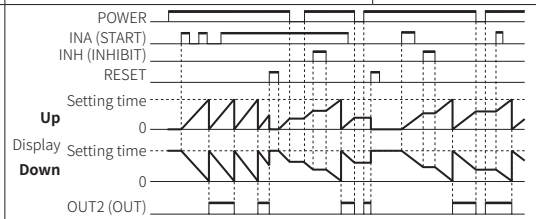
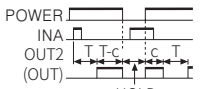
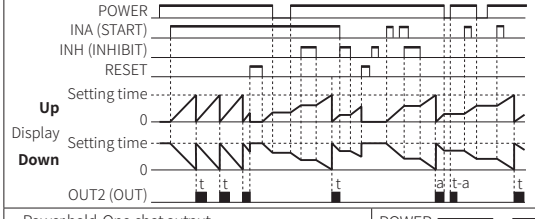
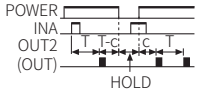
Power reset: There is no memory retention.
Initialize the display value and output state when power on again.
Power hold: There is memory retention.
Memorize the display value at the moment of power off, restoring the memorized display value and output state when power on gain.

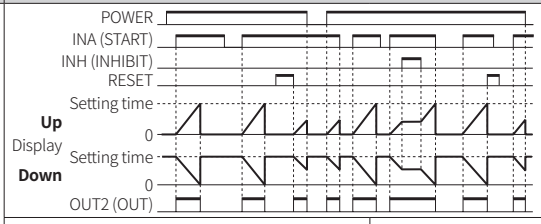
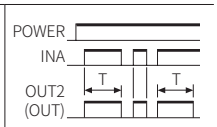
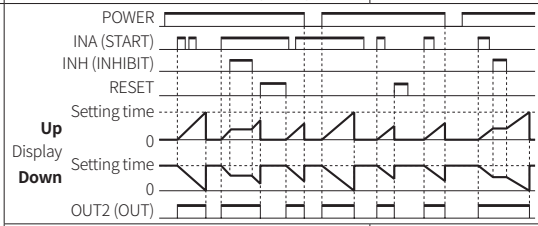
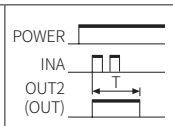
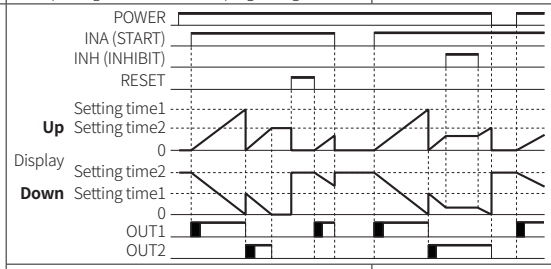
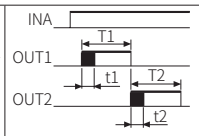
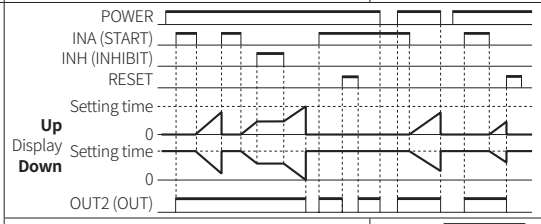
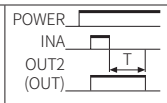
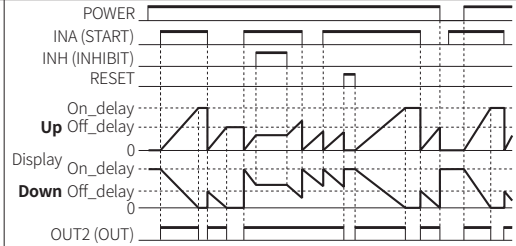
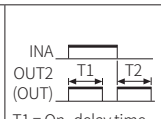
• Output type

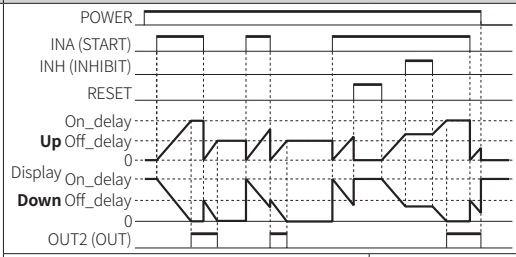
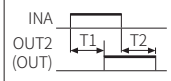
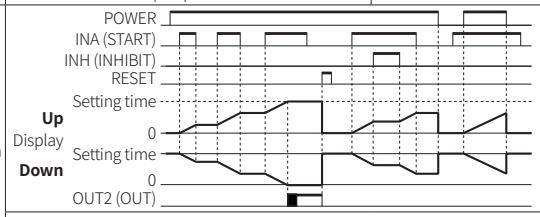
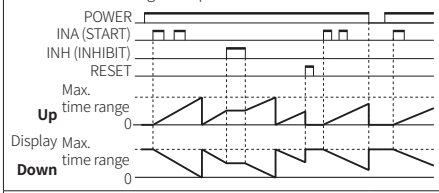
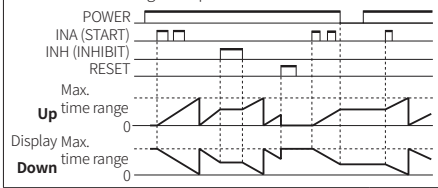
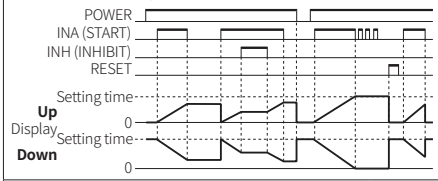
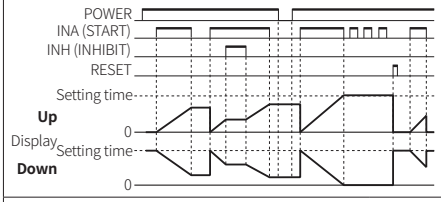
One-shot output
Retained (hold) output

One-shot output Retained (hold) output

Mode	Time chart and output operation description
OND (Signal on delay)	 • Power reset Time starts when INA input is ON. Time is RESET during INA input is OFF. When INA input is ON: Power on time start operates, Reset off time start operates.  T1 = setting time 1 T2 = setting time 2
OND.1 (Signal on delay 1)	 • Power reset Time starts when INA input is ON. When INA input is ON: Power on time start operates, Reset off time start operates. Only the first signal is valid in case INA input signal is repeatedly applied.  T1 = setting time 1 T2 = setting time 2
OND.2 (Power on delay)	 • Power hold Power on time start (no INA function) Time is RESET when RESET is ON. Time starts when RESET ON → OFF.  T1 = setting time 1 T2 = setting time 2
OND.3 (Power on delay 3)	 • Power hold / reset Power on time start (no INA function) Time is RESET when RESET is ON. Time starts when RESET ON → OFF. When the power is turned on, if the setting time is reached, auto reset is performed. 

Mode	Time chart and output operation description
FLK (Flicker)	 • Power reset Time starts when INA input is ON. When INA input is ON: Power on time start operates, Reset off time start operates. Output turns OFF from INA input turn ON to T.off setting time, turns ON for the T.on setting time repeatedly. In case of using the contact output, min. setting time must be set over 100 ms.  Ta + Tb = T.off T.off, T.on must be set individually
FLK.1 (Flicker 1)	 • Power reset, retained (hold) output Time starts when INA input is ON. When INA input is ON: Power on time start operates, Reset off time start operates. Only the first signal is valid in case INA input signal is repeatedly applied. In case of using the contact output, min. setting time must be set over 100 ms.  T = setting time  • Power reset, One-shot output Time starts when INA input is ON. When INA input is ON: Power on time start operates, Reset off time start operates. Only the first signal is valid in case INA input signal is repeatedly applied. In case of using the contact output, min. setting time must be set over 100 ms.  T = setting time
FLK.2 (Flicker 2)	 • Power hold, retained (hold) output Time starts when INA input is ON. When INA input is ON: Power on time start operates, Reset off time start operates. Control output will be reversed when it reaches to setting time. But, at the initial Start, OUT2 control output is OFF. n case of using the contact output, min. setting time must be set over 100 ms.  T = setting time  • Power hold, One-shot output Time starts when INA input is ON. When INA input is ON: Power on time start operates, Reset off time start operates. In case of using the contact output, min. setting time must be set over 100 ms.  T = setting time

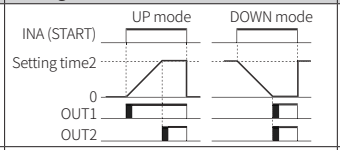
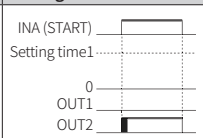
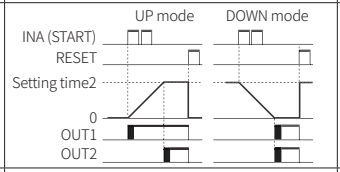
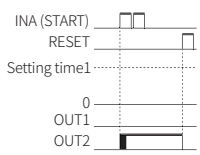
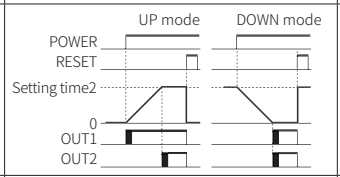
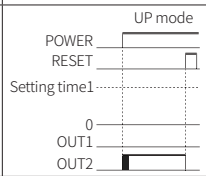
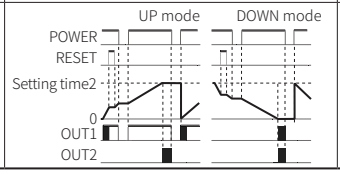
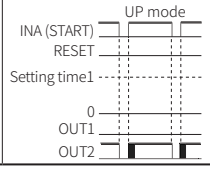
Mode	Time chart and output operation description
INT (Interval)	 • Power reset Control output turns ON and time starts when INA signal turns ON. Time is RESET when INA input is OFF. When INA input is ON: Power on time start operates, Reset off time start operates. When reaching the setting time, Auto reset is activated. Control output is ON when Time is progressing.  T = setting time
INT.1 (Interval 1)	 • Power reset Control output turns ON and time starts when INA input is ON. When INA input is ON: Power on time start operates, Reset off time start operates. When reaching the setting time, Auto reset is activated. Control output is ON when Time is progressing. INA input is ignored while time is progressing.  T = setting time
INT.2 (Interval 2)	 • Power reset Time starts when INA input is ON. OUT1 is ON during T1 (hold) or t1 time. RESET when INA input is OFF. When reaching the setting time 1, the progressed time is reset. OUT2 is ON during T2 (hold) or t2 time. • Output turns OFF when reaching the setting time even if One-shot time is longer than the setting time.  T1 = setting time 1 T2 = setting time 2 t1 = One-shot 1 t2 = One-shot 2
OFD (Signal off delay)	 • Power reset If INA input is ON, control output remains ON. (except when power is off and reset is on) When INA input is OFF, time progresses. When reaching the setting time, Auto reset is activated.  T = setting time
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. If INA input is OFF within On_Delay time, step 2 starts again. If INA input is ON within Off_Delay time, step 1 starts again.  T1 = On_delay time T2 = Off_delay time

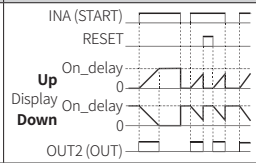
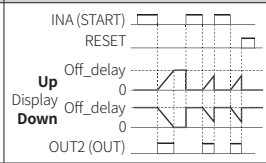
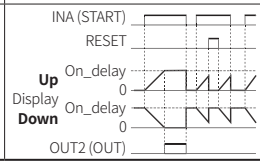
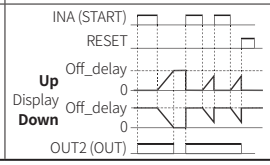
Mode	Time chart and output operation description
NFD.1 (On-Off delay 1)	 • Power reset 1) When INA input turns ON, time progresses and output turns ON after On_Delay time. 2) When INA input turns OFF, time progresses and output turns OFF after Off_Delay time. If INA input turns OFF within On_Delay time, output will turn ON and step2 operate. If INA input turns ON within Off_Delay time, output will turn OFF and step1 operate.  T1 = On_delay time T2 = Off_delay time
INTG (Integration time)	 • Power reset Time is progressing during INA input is ON. Time stops during INA input is OFF. Control output is ON when reaching the setting time.
TOTAL	• Memorize counting value parameter = CLR  • Memorize counting value parameter = REC  Time starts when INA input is ON. Time is RESET when RESET is ON. Time stops during INHIBIT input is ON.
ONT.D (On time display)	• Memorize counting value parameter = CLR  • Memorize counting value parameter = REC  • ON time display mode of INA input. Time is RESET and auto start when RESET is ON. Time stops during INA input is OFF. CX6□-□P□F flashes the progressed time in case of 'setting time < progressed time' at the point of INA input OFF, and stops until RESET input occurs.

■ 0 time setting

- It is available to set in output operation mode: OND, OND.1, OND.2, OND.3, NFD, NFD.1.
- Output type

One-shot output
Retained (hold) output
One-shot output
Retained (hold) output

Mode	Time chart at 0 time setting and operation description	
	Setting time 1 = 0	Setting time 2 = 0
OND		
OND.1		
OND.2		
OND.3		

Mode	Time chart at 0 time setting and operation description	
	Off_delay setting time = 0	On_delay setting time = 0
NFD		
NFD.1		

■ Setting when 1-stage preset value > 2-stage preset value

- Output operation mode: OND, OND.1, OND.2, OND.3
  UP mode: OUT1 output does not turn ON.
  DOWN mode: OUT1 output does not turn ON.
  In 1-stage preset value = 2-stage preset value, when Start signal is applied, OUT1 turns ON immediately.

Segment Table

The segments displayed on the product indicate the following meanings. It may differ depending on the product.

7 segment			
0	0	I	I
1	1	J	J
2	2	K	K
3	3	L	L
4	4	M	M
5	5	N	N
6	6	O	O
7	7	P	P
8	8	Q	Q
9	9	R	R
A	A	S	S
b	B	T	T
C	C	U	U
d	D	V	V
E	E	W	W
F	F	X	X
G	G	Y	Y
H	H	Z	Z

11 segment			
0	0	I	I
1	1	J	J
2	2	K	K
3	3	L	L
4	4	M	M
5	5	N	N
6	6	O	O
7	7	P	P
8	8	Q	Q
9	9	R	R
A	A	S	S
b	B	T	T
C	C	U	U
d	D	V	V
E	E	W	W
F	F	X	X
G	G	Y	Y
H	H	Z	Z

12 segment			
0	0	I	I
1	1	J	J
2	2	K	K
3	3	L	L
4	4	M	M
5	5	N	N
6	6	O	O
7	7	P	P
8	8	Q	Q
9	9	R	R
A	A	S	S
b	B	T	T
C	C	U	U
d	D	V	V
E	E	W	W
F	F	X	X
G	G	Y	Y
H	H	Z	Z

16 segment			
0	0	I	I
1	1	J	J
2	2	K	K
3	3	L	L
4	4	M	M
5	5	N	N
6	6	O	O
7	7	P	P
8	8	Q	Q
9	9	R	R
A	A	S	S
b	B	T	T
C	C	U	U
d	D	V	V
E	E	W	W
F	F	X	X
G	G	Y	Y
H	H	Z	Z