

Autonics LCD Display Counter/Timer

CX SERIES

INSTRUCTION MANUAL

Thank you for choosing our Autonics product. Please read the following safety considerations before use.

Safety Considerations

- Warning: Failure to follow these instructions may result in serious injury or death.
 - Caution: Failure to follow these instructions may result in personal injury or product damage.
- Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.
 - Install on a device panel to use.
 - Do not connect, repair, or inspect the unit while connected to a power source.
 - Check connections before wiring.
 - Do not disassemble or modify the unit.

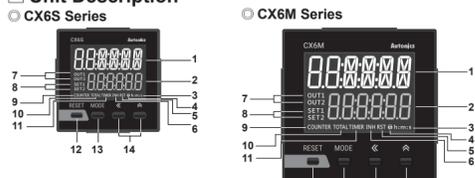
Manual

For the detail information and instructions, please refer to user manual and be sure to follow cautions. Visit our homepage (www.autonics.com) to download manuals.

Ordering Information

Model	CX6S-1P	CX6S-2P	CX6M-1P	CX6M-2P
Signal input method	1: PNP	2: NPN	1: PNP	2: NPN
Power supply	2	2	2	2
Output	4	4	4	4
Size	2P	2P	2P	2P
Display digit	6	6	6	6
Item	CX	CX	CX	CX

Unit Description



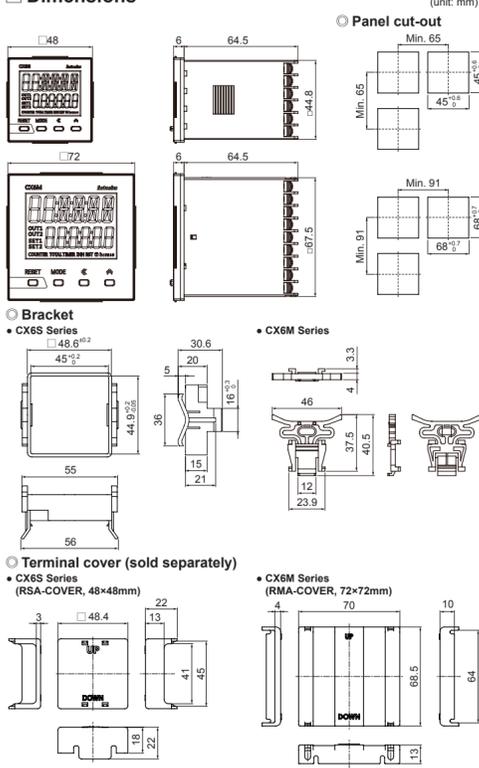
- Counting value display component (red)
- Setting value display component (green)
- Time unit indicator (h:m:s)
- Key lock indicator (KL)
- Reset indicator (RST)
- INH indicator (INH)
- Output indicator (OUT1, OUT2)
- SV checking and changing indicator (SET, SET1, SET2)
- COUNTER indicator (COUNTER)
- TOTAL indicator (TOTAL)
- TIMER indicator (TIMER)
- RESET key
- MODE key
- FUNCTION key
- UP/DOWN key
- REPEAT key
- SET key
- ERROR key
- TEMP key

Specifications

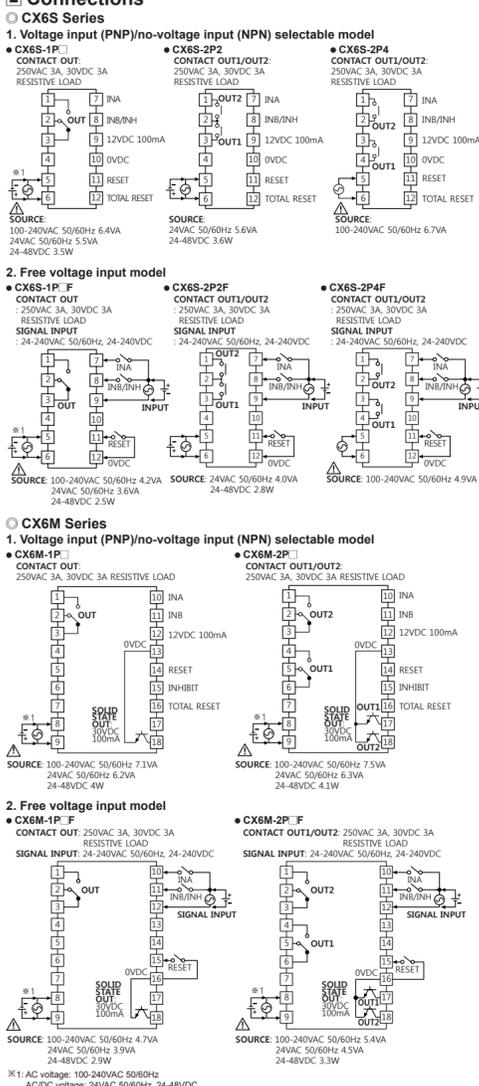
Model	CX6S-1P	CX6S-2P	CX6M-1P	CX6M-2P
Display digits	6-digit	6-digit	6-digit	6-digit
Display method	7-segment (1st, 2nd digits of counting value display; white, setting value display; green) LCD method	7-segment (1st, 2nd digits of counting value display; white, setting value display; green) LCD method	11-segment (the other digits of counting value display; white) LCD method	11-segment (the other digits of counting value display; white) LCD method
Character size (W×H)	4.1×10.1mm	6.2×15.2mm	6.2×15.2mm	6.2×15.2mm
Power supply	AC voltage: 100-240VAC ~ 50/60Hz	AC voltage: 100-240VAC ~ 50/60Hz	AC voltage: 100-240VAC ~ 50/60Hz	AC voltage: 100-240VAC ~ 50/60Hz
Permissible voltage range	90 to 110% of rated voltage	90 to 110% of rated voltage	90 to 110% of rated voltage	90 to 110% of rated voltage
AC voltage	Max. 6.4VA	Max. 6.7VA	Max. 7.1VA	Max. 7.5VA
DC voltage	Max. 4.2VA	Max. 4.9VA	Max. 4.7VA	Max. 5.4VA
AC/DC voltage	AC: max. 5.5VA	AC: max. 5.8VA	AC: max. 6.2VA	AC: max. 6.3VA
DC/DC voltage	DC: max. 3.5W	DC: max. 3.6W	DC: max. 4.1W	DC: max. 4.1W
Max. IN/INH current	AC: max. 3.6VA	AC: max. 4.0VA	AC: max. 3.9VA	AC: max. 4.5VA
Max. IN/INH counting speed	AC: max. 2.5W	DC: max. 2.8W	DC: max. 2.9W	DC: max. 3.3W
Counting range	99999 to 999999	99999 to 999999	99999 to 999999	99999 to 999999
Scale	Decimal point up to fifth digit	Decimal point up to fifth digit	Decimal point up to fifth digit	Decimal point up to fifth digit
Min. signal	RESET: TOTAL RESET signal: selectable among 1ms/20ms	RESET: TOTAL RESET signal: selectable among 1ms/20ms	RESET: TOTAL RESET signal: selectable among 1ms/20ms	RESET: TOTAL RESET signal: selectable among 1ms/20ms
Time range	999.999s, 9999.99s, 99999.9s, 999999.9s, 99m59.99s, 99m59.99s, 99m59.99s, 99m59.99s, 99m59.99s, 99m59.99s	999.999s, 9999.99s, 99999.9s, 999999.9s, 99m59.99s, 99m59.99s, 99m59.99s, 99m59.99s, 99m59.99s, 99m59.99s	999.999s, 9999.99s, 99999.9s, 999999.9s, 99m59.99s, 99m59.99s, 99m59.99s, 99m59.99s, 99m59.99s, 99m59.99s	999.999s, 9999.99s, 99999.9s, 999999.9s, 99m59.99s, 99m59.99s, 99m59.99s, 99m59.99s, 99m59.99s, 99m59.99s
Operation mode	Up, Down	Up, Down	Up, Down	Up, Down
Min. signal	INA, INHIBIT, RESET, TOTAL RESET signal: selectable among 1ms/20ms	INA, INHIBIT, RESET, TOTAL RESET signal: selectable among 1ms/20ms	INA, INHIBIT, RESET, TOTAL RESET signal: selectable among 1ms/20ms	INA, INHIBIT, RESET, TOTAL RESET signal: selectable among 1ms/20ms
Repeat error	Repeat error: In case of power ON start: max. ±0.01% ±0.05s	Repeat error: In case of power ON start: max. ±0.01% ±0.05s	Repeat error: In case of power ON start: max. ±0.01% ±0.05s	Repeat error: In case of power ON start: max. ±0.01% ±0.05s
Set error	Set error: In case of signal ON start: max. ±0.01% ±0.03s	Set error: In case of signal ON start: max. ±0.01% ±0.03s	Set error: In case of signal ON start: max. ±0.01% ±0.03s	Set error: In case of signal ON start: max. ±0.01% ±0.03s
Voltage error	Voltage error: In case of power ON start: max. ±0.01% ±0.08s	Voltage error: In case of power ON start: max. ±0.01% ±0.08s	Voltage error: In case of power ON start: max. ±0.01% ±0.08s	Voltage error: In case of power ON start: max. ±0.01% ±0.08s
Temp. error	Temp. error: In case of signal ON start: max. ±0.01% ±0.08s	Temp. error: In case of signal ON start: max. ±0.01% ±0.08s	Temp. error: In case of signal ON start: max. ±0.01% ±0.08s	Temp. error: In case of signal ON start: max. ±0.01% ±0.08s
Input method	Selectable among voltage input (PNP)/no-voltage input (NPN) [Voltage input (PNP)]: short-circuit residual voltage: max. 2VDC [No-voltage input (NPN)]: short-circuit impedance: max. 1kΩ, short-circuit residual voltage: max. 2VDC [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	Selectable among voltage input (PNP)/no-voltage input (NPN) [Voltage input (PNP)]: short-circuit residual voltage: max. 2VDC [No-voltage input (NPN)]: short-circuit impedance: max. 1kΩ, short-circuit residual voltage: max. 2VDC [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	Selectable among voltage input (PNP)/no-voltage input (NPN) [Voltage input (PNP)]: short-circuit residual voltage: max. 2VDC [No-voltage input (NPN)]: short-circuit impedance: max. 1kΩ, short-circuit residual voltage: max. 2VDC [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	Selectable among voltage input (PNP)/no-voltage input (NPN) [Voltage input (PNP)]: short-circuit residual voltage: max. 2VDC [No-voltage input (NPN)]: short-circuit impedance: max. 1kΩ, short-circuit residual voltage: max. 2VDC [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	0.01 to 99.99s setting	0.01 to 99.99s setting	0.01 to 99.99s setting
Contact	Type: SPDT (1c): 1, SPST (1a): 2, SPDT (1c): 1, SPDT (1c): 2	Type: SPDT (1c): 1, SPST (1a): 2, SPDT (1c): 1, SPDT (1c): 2	Type: SPDT (1c): 1, SPST (1a): 2, SPDT (1c): 1, SPDT (1c): 2	Type: SPDT (1c): 1, SPST (1a): 2, SPDT (1c): 1, SPDT (1c): 2
Capacity	Max. 250VAC ~ 3A, 30VDC ~ 3A resistive load	Max. 250VAC ~ 3A, 30VDC ~ 3A resistive load	Max. 250VAC ~ 3A, 30VDC ~ 3A resistive load	Max. 250VAC ~ 3A, 30VDC ~ 3A resistive load
External power supply	Approx. 12VDC ±10%, 100mA	Approx. 12VDC ±10%, 100mA	Approx. 12VDC ±10%, 100mA	Approx. 12VDC ±10%, 100mA
Memory retention	Approx. 10 years (non-volatile memory)	Approx. 10 years (non-volatile memory)	Approx. 10 years (non-volatile memory)	Approx. 10 years (non-volatile memory)
Insulation resistance	Over 100MΩ (at 50VDC megger)	Over 100MΩ (at 50VDC megger)	Over 100MΩ (at 50VDC megger)	Over 100MΩ (at 50VDC megger)
Dielectric strength	3.00VAC/50Hz for 1 min	3.00VAC/50Hz for 1 min	3.00VAC/50Hz for 1 min	3.00VAC/50Hz for 1 min
Noise immunity	Square-wave noise by noise simulator (pulse width 1μs) ±2kV	Square-wave noise by noise simulator (pulse width 1μs) ±2kV	Square-wave noise by noise simulator (pulse width 1μs) ±2kV	Square-wave noise by noise simulator (pulse width 1μs) ±2kV
Mechanical	0.75mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 1 hour	0.75mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 1 hour	0.75mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 1 hour	0.75mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 1 hour
Vibration	5mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 minutes	5mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 minutes	5mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 minutes	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	Mechanical: 300m/s² (approx. 30G) in each X, Y, Z direction for 3 times	Mechanical: 300m/s² (approx. 30G) in each X, Y, Z direction for 3 times	Mechanical: 300m/s² (approx. 30G) in each X, Y, Z direction for 3 times
Relay life cycle	Mechanical: Min. 5,000,000 operations	Mechanical: Min. 5,000,000 operations	Mechanical: Min. 5,000,000 operations	Mechanical: Min. 5,000,000 operations
Protection structure	Front part: IP50 (IEC standard)	Front part: IP50 (IEC standard)	Front part: IP50 (IEC standard)	Front part: IP50 (IEC standard)
Environment	Ambient temp.: -10 to 55°C, storage: -25 to 65°C	Ambient temp.: -10 to 55°C, storage: -25 to 65°C	Ambient temp.: -10 to 55°C, storage: -25 to 65°C	Ambient temp.: -10 to 55°C, storage: -25 to 65°C
Approval	CE	CE	CE	CE
AC voltage	CX6S-1P: Approx. 157g (approx. 117g)	CX6S-2P: Approx. 162g (approx. 117g)	CX6M-1P: Approx. 235g (approx. 170g)	CX6M-2P: Approx. 240g (approx. 175g)
AC/DC voltage	CX6S-1P: Approx. 155g (approx. 115g)	CX6S-2P: Approx. 160g (approx. 115g)	CX6M-1P: Approx. 233g (approx. 168g)	CX6M-2P: Approx. 238g (approx. 173g)
AC/DC voltage	CX6S-1P: Approx. 156g (approx. 116g)	CX6S-2P: Approx. 161g (approx. 116g)	CX6M-1P: Approx. 234g (approx. 169g)	CX6M-2P: Approx. 239g (approx. 174g)
AC/DC voltage	CX6S-1P: Approx. 154g (approx. 109g)	CX6S-2P: Approx. 159g (approx. 114g)	CX6M-1P: Approx. 232g (approx. 167g)	CX6M-2P: Approx. 237g (approx. 172g)

※1: This is for the voltage input (PNP)/no-voltage input (NPN) selectable model (CX6S-□□□).
 ※2: The weight includes packaging. The weight in parenthesis is for unit only.
 ※3: Environment resistance is rated at no freezing or condensation.
 ※4: The above specifications are subject to change and some models may be discontinued without notice.
 ※5: Be sure to follow cautions written in the instruction manual, user manual and the technical descriptions (catalog, homepage).

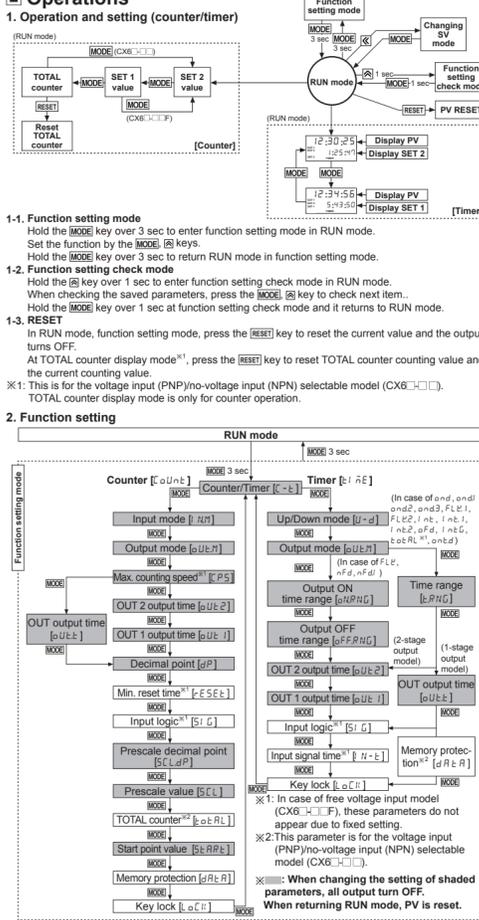
Dimensions



Connections



Operations

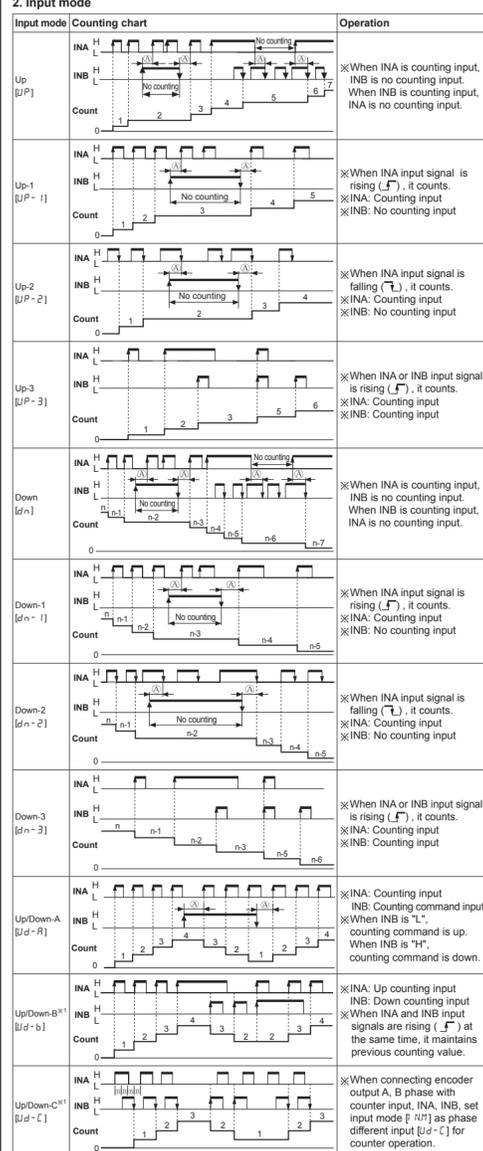


Counter Mode

Parameter	Parameter setting value
Counter/Timer [C-T]	CoUNT ← Et AE (Count: Counter, Et AE: Timer)
Input mode [I-NP]	UP → UP-1 → UP-2 → UP-3 → dn → dn-1 → dn-2 → dn-3 Ud-C ← Ud-b ← Ud-a ← dn-3 → dn-2 → dn-1
Output mode [O-UT]	Input mode is UP-1, UP-2, UP-3 or dn-1, dn-2, dn-3. Input mode is Ud-A, Ud-b, Ud-C. F → n → C → r → v → P → Q → R → S → t → d
Max. counting speed [FPS]	30 → 300 → 1k → 5k → 10k
OUT 1 output time [OUT1]	※Set one-shot output time of OUT 2. ※Setting range: 0.01 to 99.99 sec. ※When output mode is F, n, 5, t, d, this parameter does not appear. (fixed as HOLD)
OUT 2 output time [OUT2]	※Set one-shot output time of OUT 1. ※Setting range: 0.01 to 99.99 sec, Hold ※When number of tens digit is flashing, press the [H] key once and HoLD appears. (fixed as HOLD)
OUT output time [OUT]	※Setting range: 0.01 to 99.99 sec ※When output mode is F, n, 5, t, d, this parameter does not appear. (fixed as HOLD)
Decimal point [pP]	※Decimal point is applied to PV and SV.
Min. reset time [rESEt]	1 → 20, unit: ms ※Set min. width of external reset signal input.
Input logic [Si C]	nPn: No-voltage input, PnP: Voltage input
Prescale decimal point [SCLp]	※Decimal point of prescale should not set smaller than decimal point [pP].
Prescale value [SCL]	※Setting range: 0.0001 to 99999.9 ※Setting range of prescale is linked with prescale decimal point [SCLp] setting.
TOTAL counter [E-aEtRL]	an → oFF
Start point value [E-aRPt]	※Setting range of start point value is linked with decimal point [pP] setting. (0.0000 to 999999) ※When input mode is dn, dn-1, dn-2, this parameter does not appear. ※When total count function is ON, this parameter does not appear.
Memory protection [rERt]	CLr → rEC ※CLr: Resets the counting value when power OFF. rEC: Maintains the counting value when power OFF. (memory protection)
Key lock [LoCk]	LoFF → LoC1 → LoC2 LoC1: Locks [H] key, key lock indicator turns ON LoC2: Locks [H] key, key lock indicator turns ON LoC3: Locks [H] key, key lock indicator turns ON

※1: For voltage input (PNP), no-voltage input (NPN) model (CX6S-□□□).
 ※2: For free voltage input model (CX6S-1P□□□), these parameters do not appear due to fixed setting.
 ※3: For 1-stage setting model (CX6S-1P□□□), OUT 1 does not appear.
 The OUT 2 output time is displayed as OUT 2.
 ※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 regardless of display value.

Input mode

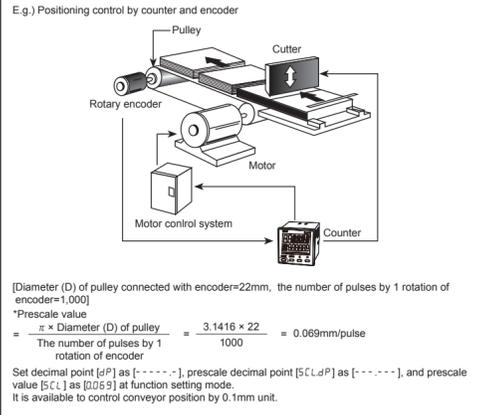


※1: This is for the voltage input (PNP)/no-voltage input (NPN) selectable model (CX6S-□□□).
 ※2: A: over min. signal width, B: over than 1/2 of min. signal width.
 If the signal is smaller than these width, it may cause counting error (±1).

Character	Voltage (PNP)	No-voltage (NPN)	CX6S-□□□	CX6M-□□□
H	5-30VDC	Short	1cps 30cps 300cps	1cps 30cps 300cps
L	0-2VDC	Open	1kcps 5kcps	1kcps 5kcps

3. Prescale function

This function is to set and displayed actual length, liquid, position, etc. It is called "prescale value" for measured length, liquid, 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.



Timer Mode

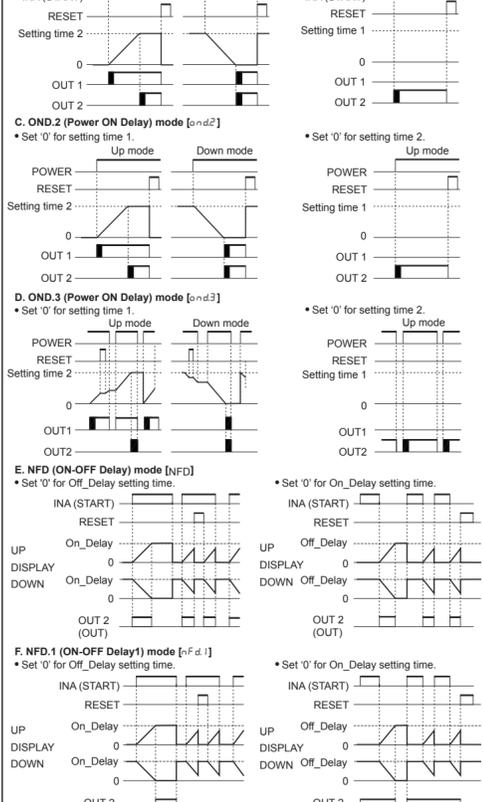
Parameter	Parameter setting value
Counter/Timer [C-T]	CoUNT ← Et AE (Count: Counter, Et AE: Timer)
Up/Down mode [U-D]	UP → dn ※UP: Time progresses from '0' to the setting time. ※dn: Time progresses from the setting time to '0'.
Output mode [O-UT]	on → and1 → and2 → and3 → FLt → FLt2 → FLt3 → nE onb → boRL → nE → nE2 → nE3 → nE4 → nE5 → nE6 → nE7 → nE8 → nE9 → nE10
Time range [E-PRG]	999.999 → 9999.99 → 99999.9 → 999999.9 → 99.9999 → 999.9999
Output ON TIME range [e-PRG]	99999.9 → 9999.99 → 999.99 → 99.99 → 9.99 → 0.99
Output OFF TIME range [e-PRG]	99999.9 → 9999.99 → 999.99 → 99.99 → 9.99 → 0.99
OUT 2 output time [OUT2]	※Set one-shot output time of OUT 2. ※Setting range: 0.01 to 99.99 sec, Hold ※When number of tens digit is flashing, press the [H] key once and HoLD appears.
OUT 1 output time [OUT1]	※Set one-shot output time of OUT 1. ※Setting range: 0.01 to 99.99 sec, Hold ※When number of tens digit is flashing, press the [H] key once and HoLD appears.
OUT output time [OUT]	※Setting range: 0.01 to 99.99 sec, Hold ※When number of tens digit is flashing, press the [H] key once and HoLD appears.
Input logic [Si C]	nPn: No-voltage input, PnP: Voltage input
Input signal time [I-NP]	1 → 20, unit: ms ※Set min. width of INA, INHIBIT, RESET, TOTAL RESET signal
Memory protection [rERt]	CLr → rEC ※CLr: Resets the counting value when power OFF. rEC: Maintains the counting value when power OFF. (memory protection)
Key lock [LoCk]	LoFF → LoC1 → LoC2 LoC1: Locks [H] key, key lock indicator turns OFF LoC2: Locks [H] key, key lock indicator turns ON LoC3: Locks [H] key, key lock indicator turns ON

※1: This is for the voltage input (PNP)/no-voltage input (NPN) selectable model (CX6S-□□□).
 ※2: In case of 1-stage setting model (CX6S-1P□□□), OUT 1 output time does not appear.
 ※3: In case of free voltage input mode (CX6S-1P□□□), this parameter does not appear due to fixed setting.

2. Timer '0' time setting

2-1. Timer output mode for '0' time setting (and, and1, and2, and3, nF, nF, d)

2-2. Operations by output mode ('0' time setting)



Factory Default

Parameter	Factory default	CX6S-□□□	CX6M-□□□
1/N	U-D-C	U-D	U-D
oUTt	F	F	F
CPs	30	30	30
oUTt (oUTt ⁿ)	HoLD (fixed)	HoLD (fixed)	HoLD (fixed)
oUTt I ⁿ	0.010	0.010	0.010
oUTt	-----	-----	-----
rESEt	20ms	20ms	20ms
Si G	nPn	nPn	nPn
SCLp	-----	-----	-----
SCL	0.0000	0.0000	0.0000
boRL	oFF	oFF	oFF
SrRPt	0.0000	0.0000	0.0000
ErRL	CLr	CLr	CLr
U-d	oP	oP	oP
oUTt	oP	oP	oP
oUTt	oP	oP	oP
oUTt (oUTt ⁿ)	HoLD	HoLD	HoLD
oUTt I ⁿ	0.010	0.010	0.010
E-PRG	99999.9s	99999.9s	99999.9s
Si G ²	nPn	---	---
1/N-E	20ms	---	---
LoCk	LoFF	LoFF	LoFF
SET1	1000	1000	1000
SET2	5000	5000	5000

※1: For 1-stage setting model (CX6S-1P□□□), OUT 1 does not appear.
 ※2: This is for the voltage input (PNP)/no-voltage input (NPN) selectable model (CX6S-□□□).

Error Display and Output Operation

Error Display	Error description	Troubleshooting
Err 0	Setting value is 0.	Change the setting value anything but 0.

※When error occurs, the output turns OFF.
 ※When '1st setting value is set as 0 (zero), OUT 1 maintains OFF.
 ※When 2nd setting value is smaller than 1st setting value, 1st setting value is ignored and only OUT2 output operates.
 ※Indicator model does not have error display function.

Cautions during Use

- Follow instructions 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.