

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: Please observe all safety considerations for safe and proper product operation to avoid hazards.
 - 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.

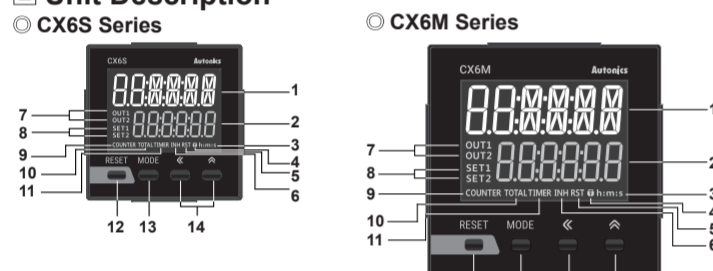
Caution

- When connecting the power input and relay output, use AWG 20 (0.50mm²) cable or over, and tighten the terminal screw with a tightening torque of 0.74 to 0.90N·m.
- Use the unit within the rated specifications.
- Use the unit within the rated specifications.
- 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.
- Keep metal chip, dust, and wire residue from flowing into the unit.

Ordering Information

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

Unit Description



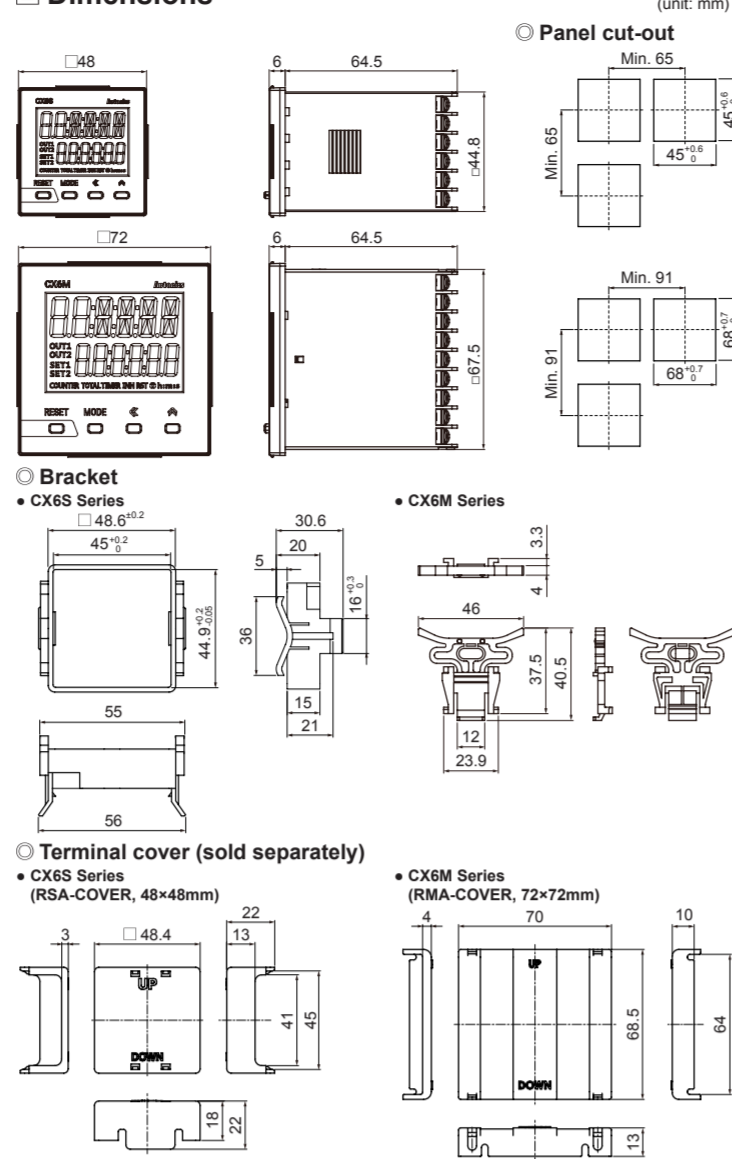
- Counting value display component (red) RUN mode: Displays counting value for counter operation or time progress value for timer operation. Function setting mode: Displays parameter setting value.
- Setting value display component (green) RUN mode: Displays setting value. Function setting mode: Displays parameter setting value.
- Time unit indicator (h-m-s): Turns ON for time unit for timer.
- Key lock indicator (LK): Turns ON for key lock setting.
- Reset input indicator (RST): Turns ON for reset key input or reset signal input.
- 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 INH/INH signal input.) For free voltage input model (CX6-□□□□), it turns ON for INH/INH signal input for timer.
- Output indicator (OUT1, OUT2): Turns ON for the dedicated control output ON.
- SV checking and changing indicator (SET, SET1, SET2) (green) Turns ON when checking and changing SV.
- COUNTER indicator (COUNTER): Turns ON for counter operation.
- TOTAL indicator (TOTAL) In case of TOTAL counter display mode, it turns ON with the COUNTER indicator.
- TIMER indicator (TIMER) Flashes (progressing time) or Turns ON (stopping time) for timer operation.
- 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: Press the **RESET** key to reset the counting value of TOTAL counter.
- MODE key RUN mode: Hold the **MODE** key over 3 sec to enter function setting mode. Press the **MODE** key to select SV (SET2)/SV1 (SET1)/TOTAL counter 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.
- Key key RUN mode: Press the **KEY** key to change SV (SET, SET1, SET2) digits. Changing SV mode: Press the **KEY** key to change digits.
- Key key Changing SV mode: Increases SV. Function setting mode: Changes the settings.

Specifications

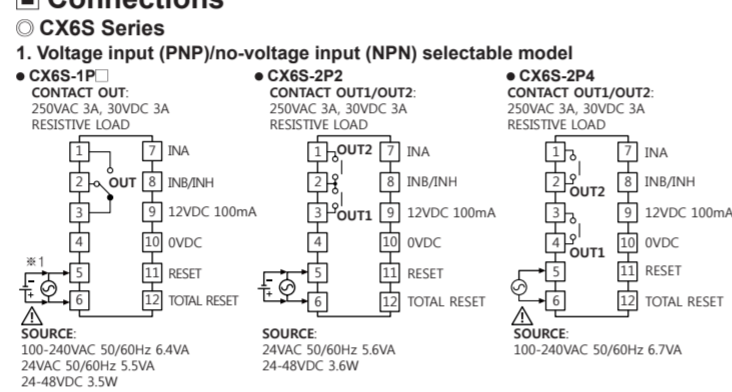
Model	CX6S-1P	CX6S-2P	CX6M-1P	CX6M-2P
Display digits	6-digit	6-digit	6-digit	6-digit
Display method	7-segment (1st, 2nd digits of counting value display: white, setting value display: green) LCD method	11-segment (the other digits of counting value display: white) LCD method, Operation display part: yellow 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, Operation display part: yellow LCD method
Character size (W×H)	4.1×10.1mm	6.2×15.2mm	4.1×10.1mm	6.2×15.2mm
Power supply	AC voltage: 100-240VAC ~ 50/60Hz AC/DC voltage: 24VAC ~ 50/60Hz; 24-48VDC	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Permissible voltage range	90 to 110% of rated voltage	AC: max. 5.5VA DC: max. 3.5W	AC: max. 5.8VA DC: max. 3.6W	AC: max. 6.3VA DC: max. 4.1W
Max. INH/INH counting speed	CX6-□□□ Selectable among 1cps/30cps/300cps/1kcps/5kcps	AC: max. 3.6VA DC: max. 2.5W	AC: max. 4.0VA DC: max. 2.9W	AC: max. 4.5VA DC: max. 3.3W
Scale	Counting range: 99999 to 999999	AC: max. 3.9VA DC: max. 2.9W	AC: max. 4.3VA DC: max. 3.1W	AC: max. 4.8VA DC: max. 3.5W
Time range	0.01 to 99.99s setting	AC: max. 5.2VA DC: max. 3.4W	AC: max. 5.6VA DC: max. 3.7W	AC: max. 6.1VA DC: max. 4.2W
Operation mode	Up, Down	AC: max. 5.8VA DC: max. 3.8W	AC: max. 6.2VA DC: max. 4.1W	AC: max. 6.7VA DC: max. 4.6W
Min. signal	CX6-□□□ INH, INHIBIT, RESET, TOTAL, RESET signal: selectable among 1ms/20ms	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Repeat error	CX6-□□□ In case of power ON start: max. ±0.01% ±0.05s	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Set error	CX6-□□□ In case of signal ON start: max. ±0.01% ±0.03s	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Voltage error	CX6-□□□ In case of power ON start: max. ±0.01% ±0.08s	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Temp. error	CX6-□□□ In case of signal ON start: max. ±0.01% ±0.08s	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Input method	CX6-□□□ 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, [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	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
One-shot output time	0.01 to 99.99s setting	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Control	Contact Type: SPDT (1c): 1 SPST (1a): 2 SPDT (1c): 1 SPDT (1c): 2	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Output	Capacity: Max. 250VAC ~ 3A, 30VDC ~ 3A resistive load	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
External power supply	Approx. 10VDC ±10%, 100mA	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Memory retention	Approx. 10 years (non-volatile memory)	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Insulation resistance	Over 100MΩ (at 50VDC megger)	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Dielectric strength	3.00VAC 50/60Hz for 1 min	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Noise immunity	AC voltage: Square-wave noise by noise simulator (pulse width 1μs) ±2kV DC voltage: Square-wave noise by noise simulator (pulse width 1μs) ±500V	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Vibration	Mechanical: 0.75mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 1 hour Electrical: 5mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 minutes	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Shock	Mechanical: 300m/s ² (approx. 30G) in each X, Y, Z direction for 3 times Malfunction: 100m/s ² (approx. 10G) in each X, Y, Z direction for 3 times	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Relay life cycle	Mechanical: Min. 5,000,000 operations Electrical: Min. 100,000 operations	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Protection structure	Front part: IP50 (IEC standard)	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Environment	Ambient temp.: -10 to 55°C, storage: -25 to 65°C Ambient humi.: 35 to 85%RH, storage: 35 to 85%RH	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
Approval	CE	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
AC voltage	CX6-□□□ Approx. 157g (approx. 117g)	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
AC/DC voltage	CX6-□□□ Approx. 155g (approx. 115g)	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
AC/DC voltage	CX6-□□□ Approx. 156g (approx. 116g)	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA
AC/DC voltage	CX6-□□□ Approx. 154g (approx. 114g)	AC: max. 6.4VA DC: max. 4.2VA	AC: max. 6.7VA DC: max. 4.7VA	AC: max. 7.1VA DC: max. 5.4VA

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

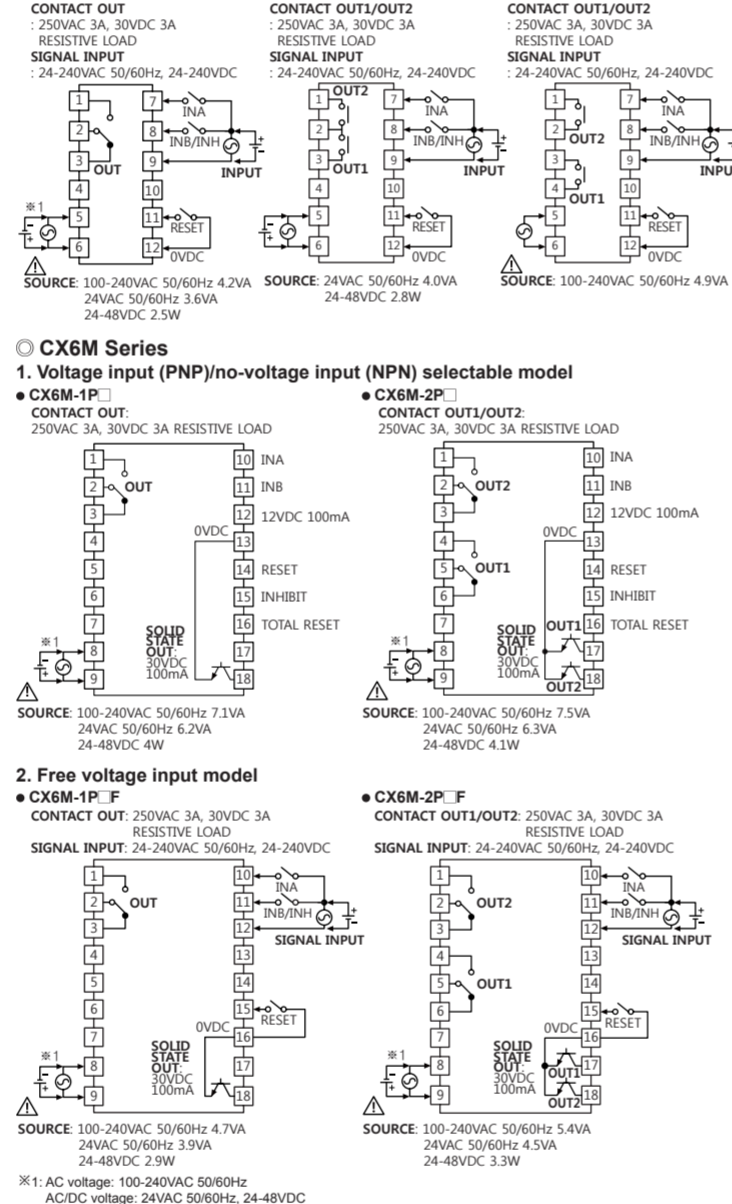
Dimensions



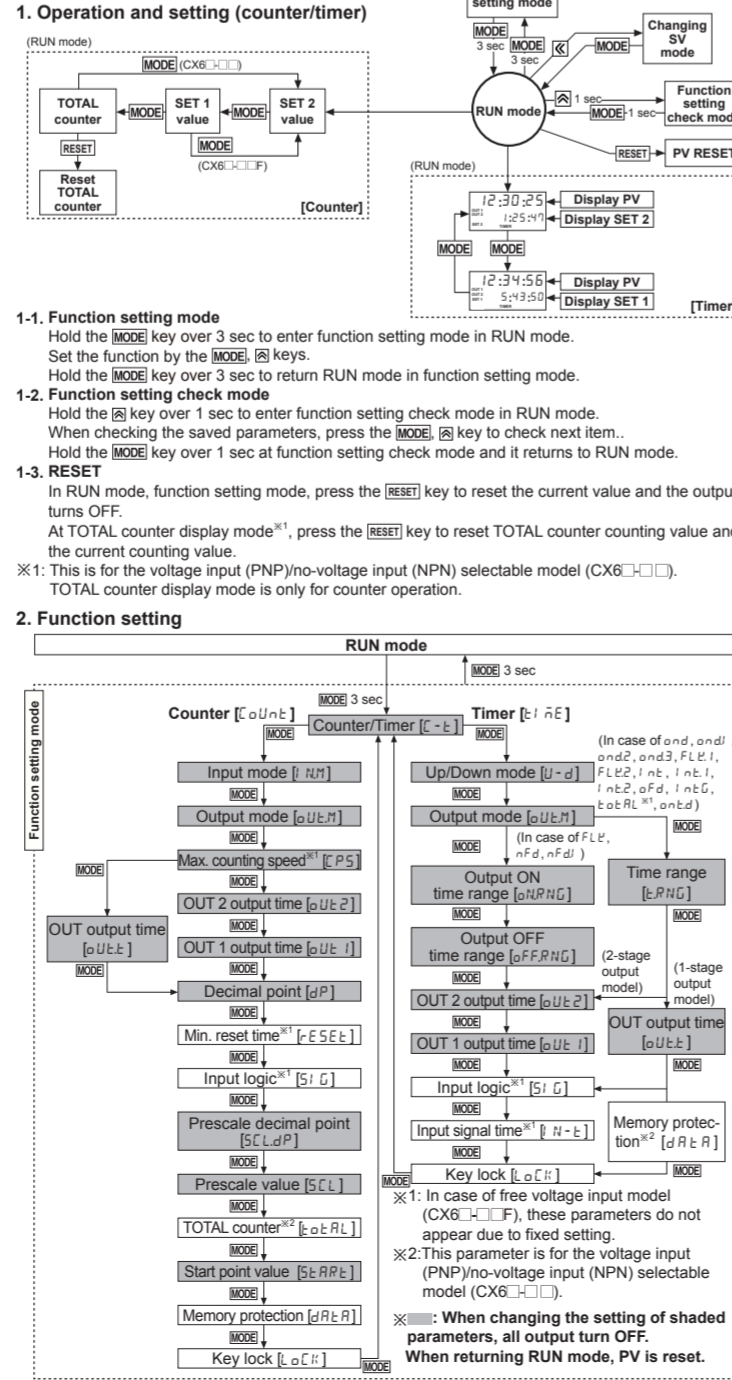
Connections



Operations



Operations

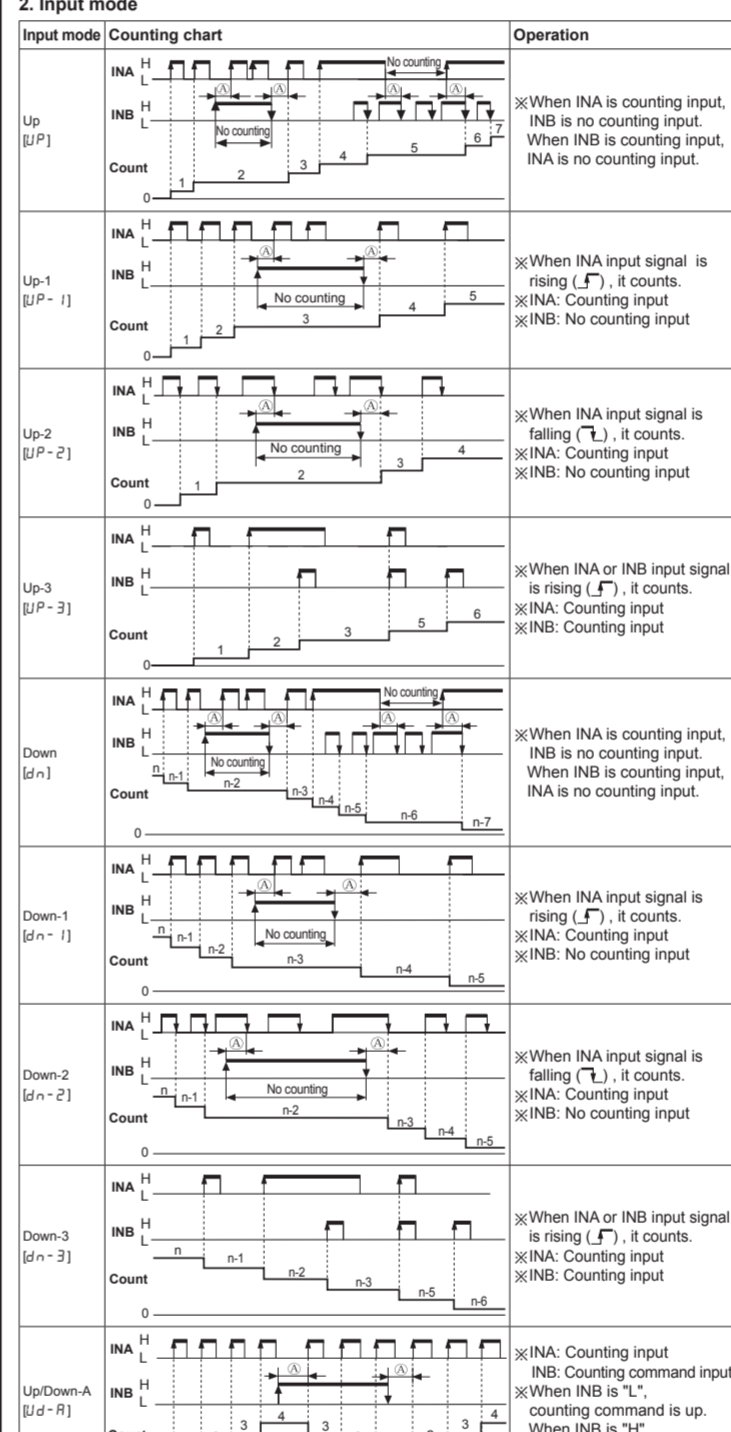


Counter Mode

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 → Ud-1 → Ud-2 → Ud-3 → P → P-1 → P-2 → P-3 *Input mode is UP-1, UP-2, UP-3 or dn-1, dn-2, dn-3. *Input mode is Ud-1, Ud-2, Ud-3, P, P-1, P-2, P-3. *If max. counting speed is 5kcps, and output mode is d, max. counting speed is automatically changed as 30cps, factory default.
Output mode [O-UT]	*Input mode is Ud-R, Ud-b*1, Ud-C*1 F → n → C → r → v → P → Q → R → S → t → d *Max. counting speed is 5kcps. 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.
Max. counting speed [P-PS]	30 → 300 → 1k → 5k → 10k *Set one-shot output time of OUT-2. *Setting range: 00.01 to 99.99 sec. *When output mode is F, n, 5, t, d, this parameter does not appear. (fixed as HOLD)
OUT 1 output time [O-U1]	*Set one-shot output time of OUT 1. *Setting range: 00.01 to 99.99 sec, Hold *When number of tens digit is flashing, press the KEY key once and Hold appears. *When output mode is S, t, d, this parameter does not appear. (fixed as HOLD)
OUT 2 output time [O-U2]	*Set one-shot output time of OUT 2. *Setting range: 00.01 to 99.99 sec, Hold *When number of tens digit is flashing, press the KEY key once and Hold appears. *When output mode is S, t, d, this parameter does not appear. (fixed as HOLD)
OUT 1 output time [O-U1]	*Set one-shot output time of OUT 1. *Setting range: 00.01 to 99.99 sec, Hold *When number of tens digit is flashing, press the KEY key once and Hold appears. *When output mode is S, t, d, this parameter does not appear. (fixed as HOLD)
OUT 2 output time [O-U2]	*Set one-shot output time of OUT 2. *Setting range: 00.01 to 99.99 sec, Hold *When number of tens digit is flashing, press the KEY key once and Hold appears. *When output mode is S, t, d, this parameter does not appear. (fixed as HOLD)
Decimal point [d-P]	*Decimal point is applied to PV and SV. *Prescale decimal point is linked with prescale decimal point [S-LdP] setting.
Min. reset time [F-ESEt]	*Set min. width of external reset signal input. *Prescale decimal point is linked with prescale decimal point [S-LdP] setting.
Input logic [S-G]	nPn: No-voltage input, PnP: Voltage input *Prescale decimal point is linked with prescale decimal point [S-LdP] setting.
Start point value [E-APt]	*Setting range: 0.0000 to 99999.9 *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 [R-RE]	CLr ← r ← EC *CLr: Resets the counting value when power OFF. *r: Maintains the counting value when power OFF. (memory protection)
Key lock [LoCk]	LoFF → LoC1 → LoC2 LoC1: Locks KEY key, key lock indicator turns ON LoC2: Locks KEY key, key lock indicator turns ON LoC3: Locks KEY key, key lock indicator turns ON

※1: For voltage input (PNP), no-voltage input (NPN) model (CX6-□□□).
 ※2: For free voltage input model (CX6-□□□□), these parameters do not appear due to fixed setting.
 ※3: For 1-stage setting model (CX6-1P□□□), 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 of counting value regardless of display value.

Input mode



Factory Default

Parameter	Factory default	CX6-□□□	CX6-□□□
1/N	Ud-C	Ud-R	Ud-F
oUTt (oUTt*1)	Hold d (fixed)	Hold d (fixed)	Hold d (fixed)
oUTt I*1	00.10	00.10	00.10
oUTt I*2	00.10	00.10	00.10
oUTt I*3	00.10	00.10	00.10
oUTt I*4	00.10	00.10	00.10
oUTt I*5	00.10	00.10	00.10
oUTt I*6	00.10	00.10	00.10
oUTt I*7	00.10	00.10	00.10
oUTt I*8	00.10	00.10	00.10
oUTt I*9	00.10	00.10	00.10
oUTt I*10	00.10	00.10	00.10
oUTt I*11	00.10	00.10	00.10
oUTt I*12	00.10	00.10	00.10
oUTt I*13	00.10	00.10	00.10
oUTt I*14	00.10	00.10	00.10
oUTt I*15	00.10	00.10	00.10
oUTt I*16	00.10	00.10	00.10
oUTt I*17	00.10	00.10	00.10
oUTt I*18	00.10	00.10	00.10
oUTt I*19	00.10	00.10	00.10
oUTt I*20	00.10	00.10	00.10
oUTt I*21	00.10	00.10	00.10
oUTt I*22	00.10	00.10	00.10
oUTt I*23	00.10	00.10	00.10
oUTt I*24	00.10	00.10	00.10
oUTt I*25	00.10	00.10	00.10
oUTt I*26	00.10	00.10	00.10
oUTt I*27	00.10	00.10	00.10
oUTt I*28	00.10	00.10	00.10
oUTt I*29	00.10	00.10	00.10
oUTt I*30	00.10	00.10	00.10
oUTt I*31	00.10	00.10	00.10
oUTt I*32	00.10	00.10	00.10
oUTt I*33	00.10	00.10	00.10
oUTt I*34	00.10	00.10	00.10
oUTt I*35	00.10	00.10	00.10
oUTt I*36	00.10	00.10	00.10
oUTt I*37	00.10	00.10	00.10
oUTt I*38	00.10	00.10	00.10
oUTt I*39	00.10	00.10	00.10
oUTt I*40	00.10	00.10	00.10
oUTt I*41	00.10	00.10	00.10
oUTt I*42	00.10	00.10	00.10
oUTt I*43	00.10	00.10	00.10
oUTt I*44	00.10	00.10	00.10
oUTt I*45	00.10	00.10	00.10
oUTt I*46	00.10	00.10	00.10
oUTt I*47	00.10	00.10	00.10
oUTt I*48	00.10	00.10	00.10
oUTt I*49	00.10	00.10	00.10
oUTt I*50	00.10	00.10	00.10

※1: For 1-stage setting model (CX6-1P□□□), OUT 1 does not appear.
 ※2: This is for the voltage input (PNP)/no-voltage input (NPN) selectable model (CX6-□□□).

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 color 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.
- 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.
 (a) Indoors (in the environment condition rated in "Specifications")
 (b) Altitude max. 2,000m
 (c) Pollution degree 2
 (d) Installation category II