



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

⌘ Safety considerations are categorized as follows.

**⚠ 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.

⌘ The symbols used on the product and instruction manual represent the following

⚠ symbol represents caution due to special circumstances in which hazards may occur.

- 1. 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, fire, or economic loss.
- 2. The unit must be installed on a device panel before use.**  
Failure to follow this instruction may result in personal injury or fire.
- 3. Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in electric shock.
- 4. Do not disassemble or modify the unit. Please contact us if necessary.**  
Failure to follow this instruction may result in electric shock or fire.

- 1. Do not use the unit outdoors.**  
Failure to follow this instruction may result in shortening the life cycle of the unit, or electric shock.
- 2. When connecting the power input and output cables, use AWG20 (0.05mm<sup>2</sup>) cables and make sure to tighten the terminal screw bolt above 0.74N·m to 0.90N·m.**  
Failure to follow this instruction may result in fire due to contact failure.
- 3. Use the unit within the rated specifications.**  
Failure to follow this instruction may result in shortening the life cycle of the unit, or fire.
- 4. Do not use loads beyond the rated switching capacity of the relay contact.**  
Failure to follow this instruction may result in insulation failure, contact melt, contact failure, relay broken, or fire.
- 5. Do not use water or oil-based detergent when cleaning the unit. Use dry cloth to clean the unit.**  
Failure to follow this instruction may result in electric shock or fire.
- 6. Do not use the unit where flammable or explosive gas, humidity, direct sunlight, radiant heat vibration, or impact may be present.**  
Failure to follow this instruction may result in fire or explosion.
- 7. Keep dust and wire residue from flowing into the unit.**  
Failure to follow this instruction may result in fire or product damage.

For more information about counter/timer, refer to user manual and user manual for communication. Visit our website ([www.autonics.com](http://www.autonics.com)) and download it.

|          |          |          |   |           |          |                       |                            |
|----------|----------|----------|---|-----------|----------|-----------------------|----------------------------|
| <b>C</b> | <b>T</b> | <b>M</b> | - | <b>2P</b> | <b>4</b> | <b>T</b>              |                            |
|          |          |          |   |           |          |                       | Communication              |
|          |          |          |   |           |          | <b>No-mark</b>        | None                       |
|          |          |          |   |           |          | <b>T</b>              | RS485 communication output |
|          |          |          |   |           |          | <b>Power supply</b>   |                            |
|          |          |          |   |           |          | <b>2</b>              | 24VAC 50/60Hz, 24-48VDC    |
|          |          |          |   |           |          | <b>4</b>              | 100-240VAC 50/60Hz         |
|          |          |          |   |           |          | <b>Output</b>         |                            |
|          |          |          |   |           |          | <b>1P</b>             | 1-stage preset             |
|          |          |          |   |           |          | <b>2P</b>             | 2-stage preset             |
|          |          |          |   |           |          | <b>I<sup>+</sup></b>  | Indicator                  |
|          |          |          |   |           |          | <b>Size</b>           |                            |
|          |          |          |   |           |          | <b>S</b>              | DIN V48×H48mm              |
|          |          |          |   |           |          | <b>V</b>              | DIN W72×H36mm              |
|          |          |          |   |           |          | <b>M</b>              | DIN W72×H72mm              |
|          |          |          |   |           |          | <b>Display digits</b> |                            |
|          |          |          |   |           |          | <b>4</b>              | 9999 (4 digits)            |
|          |          |          |   |           |          | <b>8</b>              | 999999 (8 digits)          |
|          |          |          |   |           |          | <b>Item</b>           |                            |
|          |          |          |   |           |          | <b>CT</b>             | Powder (CT)                |

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

Function setting mode: Displays setting item.

2. **Setting value display command (yellow-green)**  
RUN mode: Displays setting value.  
Function setting mode: Displays setting content.

3. **Key lock indicator (LOCK)**: Turns ON for key lock setting.

4. **Counter indicator (CNT)**: Turns ON for counter operation.

5. **Timer indicator (TMR)**: Flashes (progressing time) or Turns ON (stopping time) for timer operation.

6. **Presets value checking and changing indicator (PS1, PS2)**:  
Turns ON when checking and changing preset value.

7. **Output indicator (OUT1, OUT2)**: Turns ON for the dedicated control output ON.

8. **RST key**  
RUN mode: Press the **RST** key to reset the counting value.  
BATCH counter mode: Press the **RST** key to reset the batch counting value.

9. **MD key**  
RUN mode: Hold the **MD** key over 3 sec. to enter function setting mode(parameter setting).  
Hold the **MD** key over 5 sec. to enter function setting mode(communication setting).  
Function setting mode: Press the **MD** key to select function setting mode parameter.  
Hold the **MD** key over 3 sec. to return RUN mode.

10. **   key**  
1) ** key**  
RUN mode: Press the **** key to enter preset mode.  
Preset mode: Press the **** key to move preset digits.

2) **  key**  
RUN mode: Hold the ** key** over 1 sec. to enter function setting check mode.  
Preset mode: Used for increasing or decreasing preset value.  
Function setting mode: Changes the setting.  
Function setting check mode: Press the ** key** to move the previous parameter.  
Press the ** key** to the next parameter.

11. ** BA key**  
RUN mode: Press the **RST** key to enter BATCH counter indication mode.

12. **BATCH output indicator (BA.O) (red)**

13. **BATCH preset value checking and changing indicator (BA.S) (yellow-green)**:  
Turns ON when checking and changing BATCH preset value.

Be sure that connection is varied by supporting RS485 communication.

● Connections

○ CTS Series

● CTS-1P□

12VDC 100mA  
INB / INH  
INA

RESET  
OVDC

OUT

25VDC 100mA

NO COM NC  
250VAC 5A  
RESISTIVE LOAD

△ ×1

● CTS-1P□T

12VDC 100mA  
INB / INH  
INA

RESET  
OVDC

OUT

25VDC 5A  
RESISTIVE LOAD

NO COM NC

△ ×1

● CTS-2P□

12VDC 100mA  
INB / INH  
INA

RESET  
OVDC

OUT1  
OUT2

250VAC 5A  
RESISTIVE

250VAC 5A  
RESISTIVE

△ ×1

● CTS-2P□T

12VDC 100mA  
INB / INH  
INA

RESET  
OVDC

OUT1  
OUT2

250VAC 5A  
RESISTIVE

250VAC 5A  
RESISTIVE

△ ×1

● CT6S-□

12VDC 100mA  
INB / INH  
INA

RESET  
OVDC

OUT

△ ×1

● CT6S-□T

12VDC 100mA  
INB / INH  
INA

RESET  
OVDC

OUT

△ ×1

○ CTY Series

● CT6Y-1P□

12VDC 100mA  
INB / INH  
INA

RESET  
OVDC

OUT

25VDC 100mA

NO COM NC  
250VAC 3A  
RESISTIVE LOAD

SOLID STATE OUT  
30VDC 100mA

△ ×1

● CT6Y-1P□T

12VDC 100mA  
INB / INH  
INA

RESET  
OVDC

OUT

25VDC 100mA

NO COM NC  
250VAC 3A  
RESISTIVE LOAD

SOLID STATE OUT  
30VDC 100mA

△ ×1

● CT6Y-2P□

12VDC 100mA  
INB / INH  
INA

RESET  
OVDC

OUT1  
OUT2

25VDC 100mA

NO COM NC  
250VAC 3A  
RESISTIVE LOAD

SOLID STATE OUT  
30VDC 100mA

△ ×1

● CT6Y-2P□T

12VDC 100mA  
INB / INH  
INA

RESET  
OVDC

OUT1  
OUT2

25VDC 100mA

NO COM NC  
250VAC 3A  
RESISTIVE LOAD

SOLID STATE OUT  
30VDC 100mA

△ ×1

● CT6Y-□

12VDC 100mA  
INB / INH  
INA

RESET  
OVDC

OUT

△ ×1

● CT6Y-□T

12VDC 100mA  
INB / INH  
INA

RESET  
OVDC

OUT

△ ×1

| Series                                  | CTS                                                                                                                                                                                                       | CT5                         | CTY                                   | CTM                                 |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------------|-------------------------------------|
| Model                                   | 1-stage preset<br>2-stage preset                                                                                                                                                                          | CT5-1P □□<br>CT5-2P □□      | CT65-1P □□<br>CT6Y-2P □□              | CT6M-1P □□<br>CT6M-2P □□            |
| Indicator                               | —                                                                                                                                                                                                         | CT65-I □□                   | CT6Y-I □□                             | CT6M-I □□                           |
| Display digits                          | 4 digits                                                                                                                                                                                                  | 6 digits                    | 6 digits                              | 6 digits                            |
| Display method                          | 7 segment (counting value: red, setting value: yellow-green)                                                                                                                                              | LED method                  | LED method                            | LED method                          |
| Character                               | Counting value<br>5.5×10mm 4.5×10mm                                                                                                                                                                       | 4.2×9.5mm                   | 6.6×13mm                              | 5×9mm                               |
| Supply [AC] Setting value               | 100 ~ 240VAC 50/60Hz                                                                                                                                                                                      | 24VAC 50/60Hz               | 24~48VDC                              | —                                   |
| Power [AC] voltage                      | 24VAC 50/60Hz                                                                                                                                                                                             | 24~48VDC                    | —                                     | —                                   |
| Permissible voltage range               | 90 to 110% of rated voltage                                                                                                                                                                               | —                           | —                                     | —                                   |
| Power consumption [AC/DC voltage]       | Max. 12VA<br>AC: Max. 10VA, DC: Max. 8W                                                                                                                                                                   | —                           | —                                     | —                                   |
| INA/INB                                 | Selectable 1cps/30cps/1kcp/s/50kcp/s                                                                                                                                                                      | —                           | —                                     | —                                   |
| Max. counting speed                     | 999 999s, 9999 99s, 99999 9s, 999999 9s, 9999999 9s, 99999999 9s, 999999999 9s                                                                                                                            | —                           | —                                     | —                                   |
| Counting range                          | Decimal point up to fifth digit                                                                                                                                                                           | —                           | —                                     | —                                   |
| Scale                                   | 999 to 9999 ~ 999999 to 9999999                                                                                                                                                                           | —                           | —                                     | —                                   |
| Min. signal width                       | RESE signal: Selectable 1ms/20ms                                                                                                                                                                          | —                           | —                                     | —                                   |
| Time range                              | 999 999s, 9999 99s, 99999 9s, 999999 9s, 9999999 9s, 99999999 9s, 999999999 9s                                                                                                                            | —                           | —                                     | —                                   |
| Operation method                        | Count up, Count down, Count Up/Down                                                                                                                                                                       | —                           | —                                     | —                                   |
| Min. signal width                       | INA, INH, RESET signal: Selectable 1ms/20ms                                                                                                                                                               | —                           | —                                     | —                                   |
| Repeat error                            | —                                                                                                                                                                                                         | —                           | —                                     | —                                   |
| Set error                               | In case of power ON start: Max. ±0.01% ±0.05                                                                                                                                                              | —                           | —                                     | —                                   |
| Voltage error                           | In case of signal start: Max. ±0.01% ±0.03                                                                                                                                                                | —                           | —                                     | —                                   |
| Temp. error                             | —                                                                                                                                                                                                         | —                           | —                                     | —                                   |
| Input method                            | Selectable voltage input or non-voltage input [voltage input]-impedance: 5.4kΩ, [IH]-5.30VDC, [L]-0.2VDC [non-voltage input]-short-circuit impedance: Max. 1kΩ, short-circuit residual voltage: Max. 2VDC | —                           | —                                     | —                                   |
| One-shot output time                    | 0.01s to 99.99s setting                                                                                                                                                                                   | —                           | —                                     | —                                   |
| Standard Comm.                          | Standard Comm.                                                                                                                                                                                            | Standard Comm.              | Standard Comm.                        | Standard Comm.                      |
| Contact output                          | 1-stage<br>SPDT(tc): 1                                                                                                                                                                                    | 2-stage<br>SPST(tc): 2      | 2-stage<br>SPST(tc): 1, SPDPST(tc): 1 | 2-stage<br>SPST(tc): 1, SPDT(tc): 1 |
| Control output                          | 1-stage<br>2-stage                                                                                                                                                                                        | 1-stage<br>2-stage          | 1-stage<br>2-stage                    | 1-stage<br>2-stage                  |
| Solid state output (NPN open collector) | 1-stage<br>2-stage                                                                                                                                                                                        | 1-stage<br>2-stage          | 1-stage<br>2-stage                    | 1-stage<br>2-stage                  |
| Max. 30VDC, 100mA                       | —                                                                                                                                                                                                         | —                           | —                                     | —                                   |
| External power supply                   | Max. 12VDC ±10%, 100mA                                                                                                                                                                                    | —                           | —                                     | —                                   |
| Memory retention                        | Approx. 10 years (non-volatile memory)                                                                                                                                                                    | —                           | —                                     | —                                   |
| Insulation resistance                   | Over. 100MΩ (at 500VDC megger)                                                                                                                                                                            | —                           | —                                     | —                                   |
| Dielectric strength                     | 2.000VAC 50/60Hz for 1 min.                                                                                                                                                                               | —                           | —                                     | —                                   |
| Noise resistance                        | Square-wave noise by noise simulator (pulse width 1μs) ±2kV 0.75mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each X, Y, Z direction for 1 hour                                                 | —                           | —                                     | —                                   |
| Vibration                               | 0.5mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each X, Y, Z direction for 10 minutes                                                                                                          | —                           | —                                     | —                                   |
| Shock                                   | 300m/s <sup>2</sup> (approx. 30G) in each X, Y, Z direction for 3 times                                                                                                                                   | —                           | —                                     | —                                   |
| Relay life cycle                        | 100m/s <sup>2</sup> (approx. 10G) in each X, Y, Z direction for 3 times                                                                                                                                   | —                           | —                                     | —                                   |
| Malfunction                             | Min. 10,000,000 operations                                                                                                                                                                                | —                           | —                                     | —                                   |
| Protection structure                    | Min. 100,000 operations                                                                                                                                                                                   | —                           | —                                     | —                                   |
| IP65 (front part, IEC standards)        | —                                                                                                                                                                                                         | —                           | —                                     | —                                   |
| Environment                             | -10 to 55°C, storage: -25 to 65°C                                                                                                                                                                         | —                           | —                                     | —                                   |
| Ambient humi.                           | 35 to 85%RH, storage: 35 to 85%RH                                                                                                                                                                         | —                           | —                                     | —                                   |
| Approval                                | CE, RoHS                                                                                                                                                                                                  | —                           | —                                     | —                                   |
| Weight                                  | Approx. 212g (approx. 159g)                                                                                                                                                                               | Approx. 228g (approx. 140g) | Approx. 228g (approx. 140g)           | Approx. 322g (approx. 252g)         |

※1: The weight includes packaging. The weight in parentheses is for unit only.  
 ※: Environment resistance is rated at non freezing or condensation.

|                      |                                                    |
|----------------------|----------------------------------------------------|
| Interface            | Modbus RTU with 16-bit CRC                         |
| Comm. protocol       | RS485                                              |
| Connection type      | Compliance with EIA RS485                          |
| Application standard | 31 units (address: 1 to 127)                       |
| Max. connection      | Two-wire half duplex                               |
| Comm. type           | Asynchronous                                       |
| Synchronous method   | Asynchronous                                       |
| Comm. distance       | Max. 800m                                          |
| Comm. speed          | 2400, 4800, 9600(factory default), 19200, 38400bps |
| Comm. response time  | 5 to 99ms (factory default: 20ms)                  |
| Start bit            | 1-bit (fixed)                                      |
| Data bit             | 8-bit (fixed)                                      |
| Parity bit           | None(factory default), Even, Odd                   |
| Stop bit             | 1, 2-bit (factory default: 2-bit)                  |

※It is recommended to use communication converter, RS485 to Serial converter(SCM-38), sold separately.  
 ※USB to RS485 converter(SCM-US48), sold separately). Please use a proper twist pair for RS485

**CTS Series**

□148

90

40

Min. 62

Min. 55

45.5"

45.5"

• Bracket

45.4

61

4.2

3.9

4.1

7.4

15

4.5

32.2

48

47.8

61

• Panel cut-out

Min. 91

Min. 40

68"

68"

91.5"

**CTY Series**

□172

90

36

6

77

30

• Bracket

60

30

4

3.7

4

• Panel cut-out

Min. 91

Min. 40

68"

68"

91.5"

**CTM Series**

□86

67

10

86

67

• Bracket

68

67

1

23

3.4

• Panel cut-out

Min. 91

Min. 91

68"

68"

91.5"

**• CT6M-2P□□**  
 12VDC 100mA INHIBIT<sup>-</sup> RESET BATCH RESET  
 INHIBIT<sup>-</sup> RESET OUT OUT 30VDC 30VDC  
 INHIBIT<sup>-</sup> RESET OUT OUT 30VDC 30VDC  
 28VDC 100mA 28VDC 5A 30VDC 100mA  
 RESISTIVE LOAD RESISTIVE LOAD RESISTIVE LOAD RESISTIVE LOAD

**• CT6M-1P□**  
 12VDC 100mA INHIBIT<sup>-</sup> RESET BATCH RESET  
 INHIBIT<sup>-</sup> RESET OUT OUT 30VDC 30VDC  
 INHIBIT<sup>-</sup> RESET OUT OUT 30VDC 30VDC  
 28VDC 100mA 28VDC 5A 30VDC 100mA  
 RESISTIVE LOAD RESISTIVE LOAD RESISTIVE LOAD RESISTIVE LOAD

**• CT6M-2P□**  
 12VDC 100mA INHIBIT<sup>-</sup> RESET BATCH RESET  
 INHIBIT<sup>-</sup> RESET OUT OUT 30VDC 30VDC  
 INHIBIT<sup>-</sup> RESET OUT OUT 30VDC 30VDC  
 28VDC 100mA 28VDC 5A 30VDC 100mA  
 RESISTIVE LOAD RESISTIVE LOAD RESISTIVE LOAD RESISTIVE LOAD

**• CT6M-1□**  
 12VDC 100mA INHIBIT<sup>-</sup> RESET BATCH RESET  
 INHIBIT<sup>-</sup> RESET OUT OUT 30VDC 30VDC  
 INHIBIT<sup>-</sup> RESET OUT OUT 30VDC 30VDC  
 28VDC 100mA 28VDC 5A 30VDC 100mA  
 RESISTIVE LOAD RESISTIVE LOAD RESISTIVE LOAD RESISTIVE LOAD

**• CT6M-1□□**  
 12VDC 100mA INHIBIT<sup>-</sup> RESET BATCH RESET  
 INHIBIT<sup>-</sup> RESET OUT OUT 30VDC 30VDC  
 INHIBIT<sup>-</sup> RESET OUT OUT 30VDC 30VDC  
 28VDC 100mA 28VDC 5A 30VDC 100mA  
 RESISTIVE LOAD RESISTIVE LOAD RESISTIVE LOAD RESISTIVE LOAD

※1: AC Voltage: 100-240VAC 50/60Hz  
 AC/DC Voltage: 24-48VDC, 24VAC 50/60Hz  
 ※2: Counter operation: If INHIBIT signal is applied, count input will be prohibited.  
 Timer operation: If INHIBIT signal is applied, time progressing will stop (HOLD).

## 2. Input logic selection[No-voltage input(NPN)/Voltage input(PNP)]

### CTS Series

- The power must be cut off.
- Squeeze toward ❶ and pull toward ❷ as the figure. (CTS/CTY Series)
- Select input type by using input logic switch (SW1) inside Counter/Timer.
- Push a case in the opposite direction of ❸.
- Then supply the power to counter/timer.

**• CTM**  
 Voltage input(NPN) No-voltage input(NPN)  
 PNP NPN PNP NPN

**• CTY**  
 No-voltage input(NPN) Voltage input(PNP)  
 NPN PNP NPN PNP

Turn Off the power before changing input logic (PNP/NPN)

Turn Off the power before changing input logic (PNP/NPN)

[illegible][illegible]

**1. Parameter setting**      [key: Moves the settings.]    [key: Changes the settings]

| Parameter                        | Setting                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Counter/Timer<br>[C-T]           | 6 digits type      X[Cdn]: Counter<br>tAE: Timer<br><br>                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Time range<br>[H:S:nI/nI<br>SEC] | • 6 digits type<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Up/Down mode<br>[U-d]            | • 6 digits type<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Indication mode<br>[SPSA]        | XUsed for the indicator type only.<br>XIt is added that the feature which set the setting time when selecting Hold or on/d.<br><br>XUsed for the indicator type only.<br>X[L-]: Reset value when power is off.<br>X[F-]: Memorizes time value at the moment of power off.                                                                                                                                                                                                       |
| Memory protection<br>[pts-i]     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Output mode<br>[OUT2]            | • Set one-shot output time of OUT2.<br>• Setting range: 0.01 to 99.99sec., Hold.<br>• When 1st digit is flashing, press the [key] once and Hold appears.<br>• Set one-shot output time of OUT1.<br>• Setting range: 0.01 to 99.99sec., Hold.<br>• When 1st digit is flashing, press the [key] once and Hold appears.<br>• Set one-shot output time of OUT.<br>• Setting range: 0.01 to 99.99sec., Hold.<br>• When 1st digit is flashing, press the [key] once and Hold appears. |
| Input logic<br>[S/G]             | nPn: No-voltage input, PnP: Voltage input<br>XCheck input logic value (PNP, NPN).<br>i ← 2D, XCTSCTY: Set min. width of INA, INH, RESET signal unit; ms.<br>XCTM: Set min. width of INA, RESET, INHIBIT, BATCH RESET signal.                                                                                                                                                                                                                                                    |
| Key lock<br>[L-oK]               | LoffF ← Lc1 I LoffUnlock keys, key lock indicator turns OFF<br>Lc1 F: Looks RST key, key lock indicator turns ON<br>Lc2 F: Looks [key], [key], key lock indicator turns ON<br>Lc3 F: Looks RST [key], [key], key lock indicator turns ON                                                                                                                                                                                                                                        |

X1: When output mode is FLc1, FLc2, nI, on/d, and, on/d, 1, 2, 2, 2 of 1-stage preset model, ouT1 does not appear. The output time of ouT1 is displayed as ouT2.

When output mode is on/d, on/d, on/d, 1, nI, 2, 2, 2, 1 appears.

X2: 1, nI, 2, 2 mode is available only for 2-stage preset model.

**Timer '0' time setting**  **Retained output** 

**2-2. Timer output mode for '0' time setting** [*on\_d*, *and\_1*, *on\_d2*, *nFd*, *nFd\_1*]

**A. OND (Signal On Delay) mode** [*on\_d*]

- Set '0' for setting time 1.



**B. OND.1 (Signal ON Delay 1) mode** [*and\_1*]

- Set '0' for setting time 1.



**C. OND.2 (Power ON Delay) mode** [*on\_d2*]

- Set '0' for setting time 1.



**D. NFD (ON-OFF Delay) mode** [*nFd*]

- Set '0' for Off\_Delay setting time.



**E. NFD.1 (ON-OFF Delay 1) mode** [*nFd\_1*]

- Set '0' for Off\_Delay setting time.



**F. NFD.2 (ON-OFF Delay 2) mode** [*nFd\_2*]

- Set '0' for Off\_Delay setting time.



| Parameter setting                                                                                                                               |                                                                                                                                                                                             | ( key: Moves the settings.) ( key: Changes the settings)                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parameter                                                                                                                                       | Setting                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                         |
| Counter<br>Timer [C-] t                                                                                                                         | C0 <u>u</u> -n ←→ t-1 nE                                                                                                                                                                    | ※C0 <u>u</u> n: Counter<br>t-1 nE: Timer                                                                                                                                                                                                                                                                |
| Input mode<br>[In]                                                                                                                              | Ud-C → U → UP-1 → I → UP-2 → U → dn-1 → dn-2 → Ud-R → Ud-b                                                                                                                                  |                                                                                                                                                                                                                                                                                                         |
| Output mode<br>[oUtA]                                                                                                                           | • Input mode is UP-, UP-1, UP-2 or dn-, dn-1, dn-2.<br>F → n → C → R<br>• Input mode is Ud-R, Ud-b, Ud-C.<br>F → n → C → R → I → U → d → b → t → e → d                                      |                                                                                                                                                                                                                                                                                                         |
| Indication mode<br>[dSPa]                                                                                                                       | ※If max. counting speed is 5Kcps, and output mode is d-, max. counting speed is automatically changed as 30cps, factory default.<br>• In case of the indicator type<br>H o L d ←→ b o t R L | ※In case of the indicator type, indication mode selection [dSPa] is displayed.<br>※The added function to set the preset value when selecting HOLD.                                                                                                                                                      |
| Max. counting speed<br>[CPS]                                                                                                                    | 30 → 1k → 5k → 10k → 1M →                                                                                                                                                                   | ※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.<br>※When output mode is d-, set max. counting speed one among 1cps, 30cps, or 1kcps.                                                                                            |
| OUT2 output time*1<br>[oU2 t]                                                                                                                   |                                                                                                                                                                                             | ※Set one-shot output time of OUT2.                                                                                                                                                                                                                                                                      |
| OUT1 output time*1<br>[oU1 t]                                                                                                                   |                                                                                                                                                                                             | ※Setting range: 0.01 to 99.99sec.<br>※When input mode is F, n, S, b, d, oU2 does not appear. (fixed as HOLD)                                                                                                                                                                                            |
| OUT1 output time*1<br>[oU1 t]                                                                                                                   |                                                                                                                                                                                             | ※Set one-shot output time of OUT1.   ※Setting range: 0.01 to 99.99sec., Hold.<br>※When 1st digit is flashing, press the [] key once and H o L d appears.                                                                                                                                                |
| OUT1 output time*1<br>[oU1 t]                                                                                                                   |                                                                                                                                                                                             | ※When input mode is S, b, d, oU1 does not appear. (fixed as HOLD)<br>※Setting range: 0.01 to 99.99sec.<br>※When input mode is F, n, S, b, d, oU2 does not appear. (fixed as HOLD)                                                                                                                       |
| Decimal point**<br>[.]                                                                                                                          |                                                                                                                                                                                             | • 6 digits type<br>↑ ↓ ↑ ↓ ↑ ↓<br>• 4 digits type<br>↑ ↓ ↑ ↓                  ※Decimal point is locked to counting value and setting value.                                                                                                                                                             |
| Min. reset time [S-] t                                                                                                                          | I → → 2Q, unit: ms.                                                                                                                                                                         | ※Set min. width of external reset signal input.                                                                                                                                                                                                                                                         |
| Input logic [S-] C                                                                                                                              | N P N - No-voltage input, P N P : Voltage input<br>※Check input logic value (PNP, NPN).                                                                                                     |                                                                                                                                                                                                                                                                                                         |
| Presetable decimal point*1<br>[ScDp]                                                                                                            |                                                                                                                                                                                             | • 6 digits type<br>↑ ↓ ↑ ↓ ↑ ↓<br>• 4 digits type<br>↑ ↓ ↑ ↓                  ※Decimal point of presetable should not set smaller than decimal point [dP].                                                                                                                                              |
| Presetable start point<br>[Start point]                                                                                                         |                                                                                                                                                                                             | ※Setting range of presetable value<br>6 digits type: 0.00001 to 99999.9, 4 digits type: 0.001 to 999.9<br>※Setting range (linked with decimal point [dP])<br>6 digits type: 0.00001 to 99999.9, 4 digits type: 0.001 to 9999<br>※When input mode is dn-, dn-1, dn-2, start point value does not appear. |
| Memory protection<br>[dPtR]                                                                                                                     | CLr → → EC                                                                                                                                                                                  | ※CLr: Resets the counting value when power OFF.<br>※EC: Maintains the counting value when power OFF. (memory protection)                                                                                                                                                                                |
| Key lock [L-] k                                                                                                                                 | L o F f → L o C i                                                                                                                                                                           | ※L o F f: Unlock keys, key lock indicator turns OFF<br>↑ ↓       L o C i : Locks [] key, key lock indicator turns ON<br>↑ ↓       L o C 2 : Locks [] key, key lock indicator turns ON<br>↑ ↓       L o C 3 : Locks [] key, key lock indicator turns ON                                                  |
| ※1: For 7-stage preset mode, oU2 does not appear. The output time of oU2-E is displayed as oU2-E.X2: Decimal point and presetable decimal point |                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                         |
| ※2: Decimal point: Set the decimal point for display value regardless of presetable value.                                                      |                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                         |
| ※3: Presetable decimal point: Set the decimal point for presetable value of counting value regardless of decimal point of display value.        |                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                         |

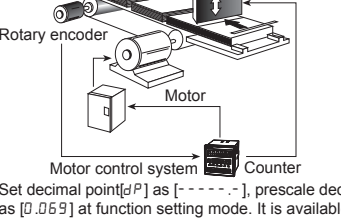
| Input                          | Timing | Operation                                                                                                                                                                         |
|--------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $uP$<br>[Up]                   |        | ※When INA is counting input,<br>INB is not counting input.<br>When INB is counting input,<br>INA is not counting input.                                                           |
| $uP - 1$<br>[Up-1]             |        | ※When INA input signal is<br>rising ( $\uparrow$ ), it counts.<br>※INA: Counting input<br>※INB: No counting input                                                                 |
| $uP - 2$<br>[Up-2]             |        | ※When INA input signal is<br>falling ( $\downarrow$ ), it counts.<br>※INA: Counting input<br>※INB: No counting input                                                              |
| $dn$<br>[Down]                 |        | ※When INA is counting input,<br>INB is not counting input.<br>When INB is counting input,<br>INA is not counting input.                                                           |
| $dn - 1$<br>[Down-1]           |        | ※When INA input signal is<br>rising ( $\uparrow$ ), it counts.<br>※INA: Counting input<br>※INB: No counting input                                                                 |
| $dn - 2$<br>[Down-2]           |        | ※When INA input signal is<br>falling ( $\downarrow$ ), it counts.<br>※INA: Counting input<br>※INB: No counting input                                                              |
| $ud-R$<br>[Up/Down-A]          |        | ※INA: Counting input<br>INB: Counting command<br>input<br>※When INB is "L", counting<br>command is "down".<br>When INB is "H", it is<br>counting command is down                  |
| $ud-b \times 1$<br>[Up/Down-B] |        | ※INA: Up counting input<br>INB: Down counting input<br>※When INA and INB input<br>signals are rising ( $\uparrow$ ) at<br>the same time, it maintains<br>previous counting value. |
| $ud-C \times 1$<br>[Up/Down-C] |        | ※When connecting encoder<br>output A, B phase with<br>counter input, INA, INB, set<br>input mode $\phi$ [H] as phase<br>difference input [ $uP - C$ ]<br>for counter operation.   |

※1: For selectable no-voltage input (PNP),  
voltage input (NPN) mode.

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

T<sub>on</sub>, T<sub>off</sub>: Min. signal width

| Character | (PNP)   | (NPN) | 1cps  | 500ms  |
|-----------|---------|-------|-------|--------|
| H         | 5-30VDC | Short | 30cps | 16.7ms |
| L         | 0-2VDC  | Open  | 5kcps | 0.5ms  |
|           |         |       | 1kcps | 0.1ms  |



Rotary encoder

Motor

Motor control system

Counter

Set decimal point [P] as [-----], prescale decimal point [SCdP] as [-----], prescale value [5CL] as [0 to 65] at function setting. It is available to control conveyor position by 0.1mm unit.

rotation of encoder=1,000

Prescale value

$$= \frac{\pi \times \text{Diameter (D) of pulley}}{\text{rotation of encoder}}$$

The number of pulses by 1 rotation of encoder

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

$$= 0.0698\text{mm/pulse}$$

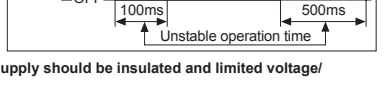
## ■ Factory Default

|              | Parameter    | Factory default                                                  | Parameter   | Factory default                                      |
|--------------|--------------|------------------------------------------------------------------|-------------|------------------------------------------------------|
| Counter      | oUtA         | F                                                                | 5I G        | nPn                                                  |
|              | oUtR         | tAtRL                                                            | 5CLdP       | 6 digits type: - - - - -<br>4 digits type: - - - - - |
|              | CP5          | 30                                                               | 5CL         | 6 digits type: 1.00000<br>4 digits type: 1.000       |
|              | oUtZ (oUtZ)  | Hold (fixed)                                                     | 5tRt        | 00000                                                |
| Timer        | oUtI         | 00.0                                                             | dRtR        | CLr                                                  |
|              | dP           |                                                                  |             |                                                      |
|              | HoUr/ri nSEC | 6 digits type: 0.00 Is-999.999s<br>4 digits type: 0.00 Is-9.999s | oUtZ (oUtZ) | HoId                                                 |
|              | UP           |                                                                  | oUtI        | 00.00                                                |
| Com. General | dRtR         | CLr                                                              | 5I G        | nPn                                                  |
|              | oUtA         | oNd                                                              | I nB        | 20                                                   |
|              | CLC          | LoFF                                                             |             |                                                      |
|              | PS1          | 1000                                                             |             |                                                      |
|              | PS2          | 5000                                                             |             |                                                      |
|              | dRdR         | 00.0                                                             | 5tP         | 2                                                    |
|              | bP5          | 96                                                               | 5tRt        | 20                                                   |
|              | Pr5L         | nonE                                                             | oNtZ        | EnR                                                  |

## ■ Cautions During Use

- 1. Power ON/OFF**  
The inner circuit voltage rises within 100ms after supplying the power to the unit. The input is unavailable at this period. Be sure that the inner circuit voltage drops within 500ms after turning off the power.
- 2. In case of 24VAC / 24-48VDC model, power supply should be insulated and limited voltage/current or Class 2 power supply device.**
- 3. Input signal line**  
① Shorten the cable from the sensor to the unit.  
② Wire the input signal line separately from power line.
- 4. Input logic selection**  
Before selecting input logic, must cut off the power to the counter/unit. Select the input logic following the instruction.
- 5. Count counting input (counter operation)**  
If counting speed for counter is high speed mode (1k, 5k, 10kps) and counting input is contact, it may cause input signal error by chattering of contact switching.
- 6. Testing dielectric voltage or insulation resistance when the unit is installed at control panel**  
① Disconnect the unit from the circuit of control panel.      ② Short all terminals of the unit.
- 7. Use the use unit in the following environments.**  
① Environments with high vibration or shock.  
② Environments with strong alkali or strong acid materials  
③ Environments with exposure to direct sunlight  
④ Near machinery which produce strong magnetic force or electric noise
- 8. This product may be used in the following environments**  
① Dinders      ② Max. altitude: 2,000m  
③ Pollution degree 2      ④ Installation category II

✗ **Failure to follow these instructions may result in product damage.**



Power-ON  
OFF

100ms

500ms

Unstable operation time

## ■ Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- SSR/Power Controllers
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connector/Socket
- Switching Mode Power Supplies
- Control Switches/Amps/Buzzers
- Relays/Relays & Cables
- Stepper Motors/Drivers/Motor Controllers
- Linear Motion Control
- Field Network Devices
- Label Marking System (Fiber, Co., Niyang)
- Laser Welding/Cutting System
- Temperature Transducers
- Temperature/Humidity Transducers
- SSR/Power Controllers
- Timers
- Panel Meters
- Counters
- Relays/Power (Rate) Meters
- Display Units
- Sensor Controllers

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