## CNT series



## Timing and Counting Modes

See the following page for a complete description of all programmable timing and counting modes.

## Timing Specifications

Timing Ranges: 0.1 to 99.9 / 1 to $999 \mathrm{sec} . ; 0.1$ to 99.9 / 1 to 999 min.; 0.1 to 99.9 / 1 to 999 / 10 to $9,990 \mathrm{hr}$.

Timing Adjustment: Digital adjustment via thumbwheel switches.
Tolerance: $\pm 0.5 \% \pm 0.05 \mathrm{sec}$.
Delta Time (for AC units add $\pm \mathbf{1}$ cycle 60 Hz.$): \pm 0.1 \% \pm 0.05 \mathrm{sec}$.
Repeatability (Including first cycle of operation.): $\pm 0.1 \% \pm 0.05 \mathrm{sec}$.
Reset Time (power interruption): 45 ms , typ.; 60 ms , max.
Minimum Pulse Width, Control: 50 ms .
Recycle Time: 45 ms , typ.; 60 ms , max.

## Counting Specifications

Maximum Count: 1 to $999 ; 10$ to $9,990(\div 10) ; 100$ to $99,900(\div 100)$.
Maximum Count Rate: 100 counts per second.
Mimumum Pulse Width:Count (Control): 3 ms .; Reset: 3 ms .
Available Counting Functions: Operate at preset count and release at preset count.

## Contact Data @ $\mathbf{2 5}^{\circ} \mathrm{C}$

Arrangements: 2 Form C (DPDT).
Material: Silver-cadmium oxide alloy.
Rating: 10A @ 30VDC or 277VAC, resistive; 1/2 HP @ 250VAC; 1/3 HP @ 120VAC.
Expected Mechanical Life: 10 million operations.
Expected Electrical Life: 100,000 operations, min., at rated load.
Initial Dielectric Strength
Between Open Contacts: $1,000 \mathrm{~V}$ rms, 60 Hz .
Between All Other Conductors: $1,500 \mathrm{~V} \mathrm{rms}, 60 \mathrm{~Hz}$.
Ordering Information - Authorized distributors are more lik
Universal Input Model

| Input Voltage | Part Number |
| :---: | :---: |
| 24-240VACNDC | CNT-35-96 |
| Fixed Input Models |  |
| Input Voltage | Part Number |
| 12VDC | CNT-35-26 |
| 120VAC | CNT-35-76 |

## Outline Dimensions



## Multifunction, Digital Time Delay Relay/ Counter

- 10 programmable timing modes +2 counting modes
- 0.1 sec . to 9,990 hr. programmable timing range
- 1 to 99,900 counting range
- LCD digital display
- Universal (24-240VACNDC) and fixed input types
- 10A output relay with DPDT contacts
- Thumbwheel switches for programming

PI File E22575

## (18) File LR15734

Users should thoroughly review the technical data before selecting a product part number. It is recommended that user also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

## Input Data @ $\mathbf{2 5}^{\circ} \mathrm{C}$

Voltage: Universal Input Type: $24-240 \mathrm{~V} \pm 15 \%, 50 / 60 \mathrm{~Hz}$. AC or DC.
Fixed Input Types: $120 \mathrm{VAC} \pm 15 \%, 50 / 60 \mathrm{~Hz}$ and 12VDC.
Power Requirement:
Universal Input Type: 10VA @ 240VAC; 5VA @ 120VAC; 1VA @ 24VAC.
10W @ 240VDC; 5W @120VDC; 1W @ 24VDC.
Fixed Input Types: 3VA @120VAC; 3W @12VDC.
Transient Protection: Yes.
Reverse Voltage Protection: Yes.
Input Voltages \& Limits @ $\mathbf{2 5}^{\circ} \mathrm{C}$

| Input <br> Type | Nominal <br> Voltage | Minimum <br> Voltage | Maximum <br> Voltage |
| :---: | :---: | :---: | :---: |
| Universal | $24-240 \mathrm{VACNDC}$ | 20.4 VACNDC | 276 VACNDC |
| Fixed | 120 VAC | 102 VAC | 138 VAC |
|  | 12 VDC | 10.2 VDC | 13.8 VDC |

Note: DC voltage must be filtered (5\% p-p ripple max. at nom. voltage). AC models will operate on 50 or 60 Hz .

## Environmental Data

Temperature Range: Storage: $-20^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$.
Operating: $-10^{\circ} \mathrm{C}$ to $+55^{\circ} \mathrm{C}$.
Humidity: 85\% relative humidity, non-condensing.

## Mechanical Data

Termination: 11-pin octal style plug.
Enclosure: Beige plastic 1/16 DIN case.
Sockets: Fits either 27E123 or 27E892 (snap-on) screw terminal sockets.
Weight: 4.3 oz . (122g) approximately.
External Control: CONTROL, RESET: Active on contact closure or solid state switch closure to RETURN, 0-1.0VDC maximum voltage level (see wiring diagrams for interface circuits.


Fits $1.77 \times 1.77(45 \times 45)$ Panel cutout reference purposes only.
to stock boldface items listed below.

| Accessories | Name |  |
| :--- | :---: | :---: |
| Part Number | Description |  |
| SSA-24C667 | Mounting Clip | Ratchet-fit clip slides onto CNT from behind <br> to secure CNT in panel mount applications. |
| SSA-24C668 | Protective Cover | Clear, flexible cover slips snugly over bezel of <br> CNT to help protect against dust and moisture. <br> Durable cover also helps prevent inadvertant <br> changes of programming switch settings. |

## Wiring Diagrams (Bottom Views)

## (pins numbered clockwise from keyway)

EXTERNAL CONTROL SWITCHES**


* Note: Input polarity for DC operation. For most reliable operation on AC, connect high side to " + " and low side to " - "
** Important: A dry circuit switch is recommended. A "dry circuit" switch is one rated to reliably switch currents of less than 50mA. Use of a switch rated for other than dry circuit may result in failure of the time delay relay to function properly.
Specifications and availability


## Protective Cover \& Mounting Clip Dimensions

SSA-24C668
Protective Cover


SSA-24C667
Mounting Clip


## Programming Switch Diagram



## Timer Function Descriptions

## A . Delay On Operate

Output relay turned on at end of programmed time interval which is started by CONTROL input or power-on with CONTROL on. Relay turned off by RESET input until next cycle is started. With CONTROL on, turning RESET off restarts timing

## B. Delay On Release

Output relay turned on with CONTROL input and remains on for programmed time interval following removal of CONTROL. During time interval after release of CONTROL, RESET tums relay off until cycle restarted with reapplication of CONTROL. With CONTROL on, relay is held off while RESET is activated.

## C. Interval On

Output relay turned on for programmed time interval by CONTROL or poweron with CONTROL on. RESET tums relay off until next cycle is started, and does not restart timing when RESET is removed.

## D. Control-Off Interval On

Output relay turned on for programmed time interval by tum-off of CON-
TROL. RESET turns relay off until next cycle is started, and does not restart timing when RESET is removed.

## E. Recycle

Output relay turned on at end of programmed time interval which is started by momentary CONTROL input or power-on with CONTROL on. Relay stays on for equal time interval, then turns off and cycle is repeated on a freerunning basis until terminated by momentary RESET, turning relay off. With CONTROL on, turning RESET off restarts cycle.

## F. Single Cycle

Output relay turned on at end of programmed time interval which is
started by momentary CONTROL input or power-on with CONTROL on. Relay stays on for equal time interval, then turns off. RESET terminates timing and turns relay off. Turning RESET off does not restart timing.

## G. Control On-Off Interval On (Watch Dog Timer)

Output relay turned on and programmed time interval started or restarted by change of CONTROL input. RESET turns relay off and stops timing. Turning RESET off does not restart timing.

## H. Control On-Off Delay

Output relay turned on at end of programmed timing interval which is started or restarted by change of CONTROL input. If relay is on, turn-off of relay occurs at end of programmed time interval which is started or restarted by change of CONTROL input. RESET turns relay off and stops timing. Turning RESET off does not restart timing.

## I. Pulse

Output relay turned on at end of programmed time interval, which is started by CONTROL input, for 0.5 second duration, and continues in pulsed mode at programmed time interval with fixed 0.5 second on-time. Turning CONTROL off tums relay off and stops timing. RESET turns relay off and inhibits operation. With CONTROL on, removal of RESET restarts timing.

## J. Cumulative Delay On Operate

Output relay turned on at completion of total accumulate CONTROL input duration equal to programmed time. Turning CONTROL off before accumulation of programmed time results in measured time total being held until CONTROL is again turned on and total programmed time value is reached. RESET input resets time value to zero and turns relay off if energized. Turning RESET off restarts timing if CONTROL is on.

## Counter Function Descriptions

## CO - Operate at Preset Count - Normal Mode

After initializing by momentary activation of RESET input, each on/off signal at COUNT (CONTROL) input increments displayed count in upcounting manner from initial 000 value until preset count, set by thumbwheel switches, is reached and output relay tums on. Additional inputs continue to increment displayed count. Continued counting past maximum count (999) results in a "wrap-around" effect to 000, followed by contrinued up-counting. Activation of RESET input turns relay off and resets count to zero.

## CR - Release at Preset Count - Normal Mode

Initializing by momentary activation of RESET input tums relay on. Operation is similar to CO (Operate at Preset Count) except relay turns off at a preset count.

## CO or CR - Divide-by-10 Mode

Operation is as described previously, except count is incremented for every 10 on/off input signals for a maximum presettable count of 9,990.

## CO or CR - Divide-by-100 Mode

Operation is as described previously, except count is incremented for every 100 on/off input signals for a maximum presettable count of 99,900.

