3RP1 series

Multifunction Solid State DIN Mount Time Delay Relay

- Available as SPDT or DPDT
- 15 time setting ranges
- .05s - 100hr programmable timing range
- Universal 24-240 VAC/VDC or fixed input types.
- 3A switching current rating
- Fits 35mm DIN track
- Single function, Delay-On available

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.

Standards and Specifications

- IEC 721-3-3 "Ambient conditions"
- IEC 61812-1/DIN VDE 0435 Part 2021 "Solid State Relays, Time Relays"
- IEC 1000 "electromagnetic compatibility"
- IEC 947-5-1: DIN VDE 0660 Part 200 "Low-voltage control circuit devices"

Timing Specifications

Timing Ranges: 0.05 to 1 / 0.15 to 3 / 0.5 to 10 / 1.5 to 30 / 5 to 100 sec.;
0.05 to 1 / 0.15 to 3 / 0.5 to 10 / 1.5 to 30 / 5 to 100 min.;
0.05 to 1 / 0.15 to 3 / 0.5 to 10 / 1.5 to 30 / 5 to 100 hr.
Timing Adjustment: Potentiometer adjustable within selected range.
Tolerance: ±5% of full scale value.
Reset Time: 150 ms.
Minimum On Period: 35 msec.
Repeatability: ± 1%.

Timing Modes

See the following page for a description of timing modes.

Contact Data @ 25°C

Arrangements: 1 Form C (SPDT).
2 Form C (DPDT)
Material: Silver tin oxide.
Rating: 3A @ 250VAC.
Switching Frequency: 2,500 ops./hour.
Electrical Life: 200,000 operations min. at rated load.
Mechanical Life: 30 x 10^6 operations.

Input Data @ 25°C

Voltage: Universal Input Type: 24 - 240V, 50/60 Hz. AC or DC.
Fixed Input Type: 24, 100-127, 200-240AC; 24VDC.
Operating Range: AC: 85 to 110%.
DC: 80 to 125%.
Power Requirement:
Universal Input Type: AC: 6VA.
DC: 2W.

Environmental Data

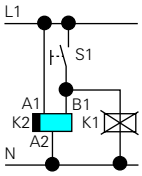
Temperature Range: Storage: -40°C to +80°C.
Operating: -25°C to +60°C.
Protection Category: IP 20 according to EN 60529.

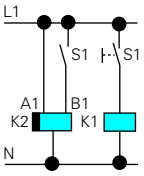
Mechanical Data

Termination: Screw terminal.
Enclosure: Plastic DIN case.
Mounting: 35mm DIN track.
Weight: (3RP1505) 5.29 oz. (150g) approximately.
(3RP1525) 3.88 oz. (110g) approximately.

Configuring

- Changing the timer range and their functions will only be effective when they are carried out in a voltage-free state.
- Trigger input B1 or B3 must only be started when the supply voltage is applied.
- The same potential must be applied to A1 and B1, or A3 and B3. With the two-voltage design, only one voltage range must be connected.
- The triggering of the load paralleled to the start input is not permissible when using AC (see adjacent diagrams).



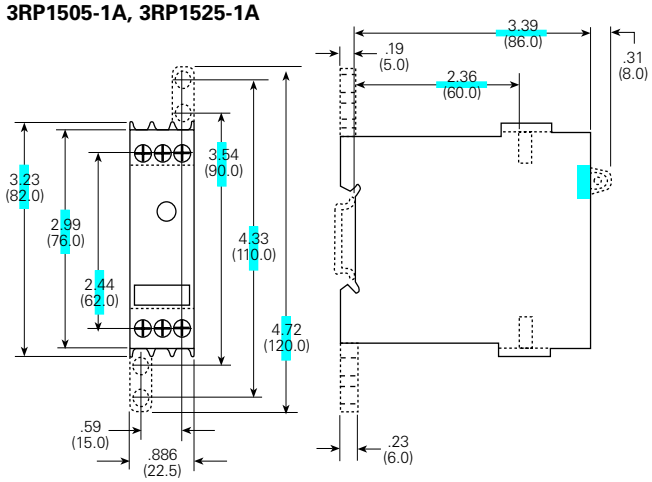


Ordering Information – Authorized distributors are more likely to stock boldface items listed below.

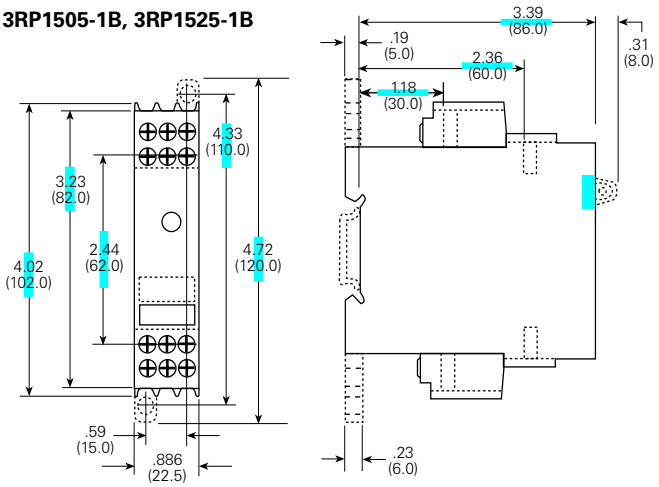
Input Voltage DC	Input Voltage AC	Input Type	Contact Arrang.	Wiring Diagram	Functions	Part Number
3RP1505 Multifunction						
24	24, 100-127	Fixed	SPDT	1 to 8	1 to 8	**3RP15 05-1AQ30**
24	24, 200-240	Fixed	SPDT	1 to 8	1 to 8	**3RP15 05-1AP30**
24	24, 100-127	Fixed	DPDT	9 to 24	9 to 24	**3RP15 05-1BQ30**
24-240	24-240	Universal	DPDT	9 to 24	9 to 24	**3RP15 05-1BW30**
3RP1525 Delay On						
24	24, 100-127	Fixed	SPDT	1	1	**3RP15 25-1AQ30**
24	24, 200-240	Fixed	SPDT	1	1	**3RP15 25-1AP30**
24	24, 100-127	Fixed	DPDT	9	9	**3RP15 25-1BQ30**
24	24, 200-240	Fixed	DPDT	9	9	**3RP15 25-1BP30**

Outline Dimensions

3RP1505-1A, 3RP1525-1A



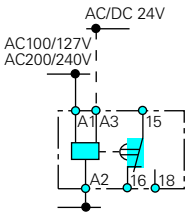
3RP1505-1B, 3RP1525-1B



Wiring Diagram

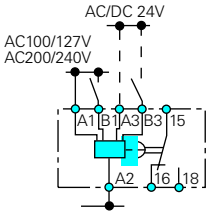
1. On-Delay

3RP1505-1A
3RP1525-1A



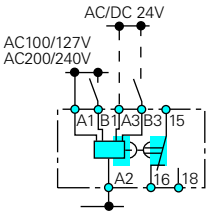
2. Off-Delay With Auxiliary Voltage

3RP1505-1A



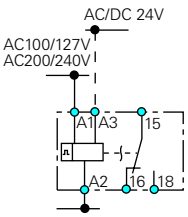
3. On and Off Delay With Auxiliary Voltage

3RP1505-1A



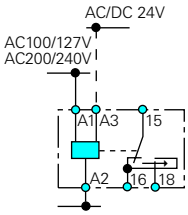
4. Flashing

3RP1505-1A



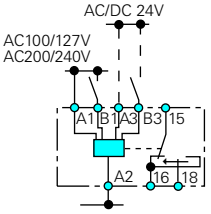
5. Making-Pulse Contact

3RP1505-1A
3RP1525-1A



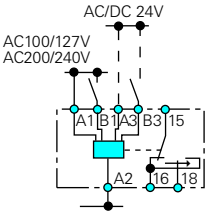
6. Breaking-Pulse Contact With Auxiliary Voltage

3RP1505-1A



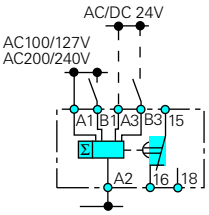
7. Pulse Forming With Auxiliary Voltage

3RP1505-1A



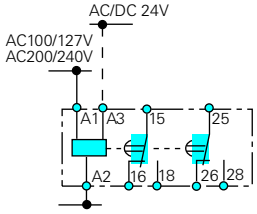
8. Additive On-Delay With Auxiliary Voltage and Instantaneous Contact

3RP1505-1A



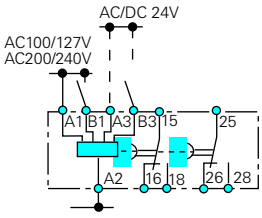
9. On-Delay

3RP1505-1B
3RP1525-1B



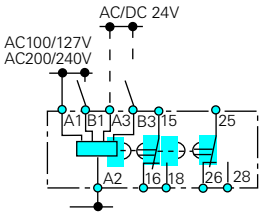
10. Off-Delay With Auxiliary Voltage

3RP1505-1B



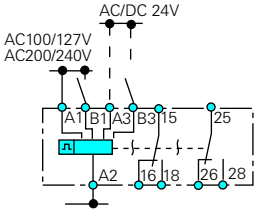
11. On-and Off-Delay With Auxiliary Voltage

3RP1505-1B



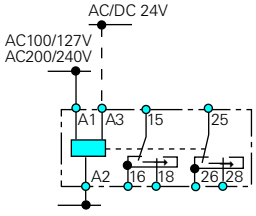
12. Flashing

3RP1505-1B



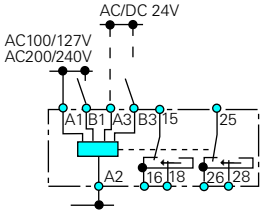
13. Making-Pulse Contact

3RP1505-1B



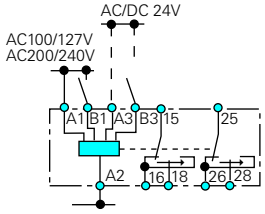
14. Breaking-Pulse Contact With Auxiliary Voltage

3RP1505-1B



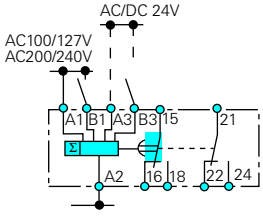
15. Pulse Forming With Auxiliary Voltage

3RP1505-1B



16. Additive On-Delay With Auxiliary Voltage and Instantaneous Contact

3RP1505-1B



Dimensions are shown for reference purposes only.

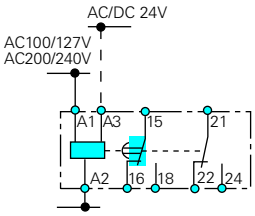
Dimensions are in inches over (millimeters) unless otherwise specified.

Specifications and availability subject to change.

Wiring Diagrams (continued)

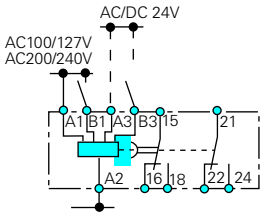
17. On-Delay and Instantaneous Contact

3RP1505-1B



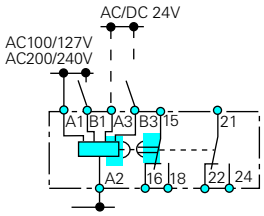
18. Off-Delay With Auxiliary Voltage and Instantaneous Contact

3RP1505-1B



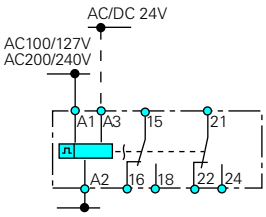
19. On and Off Delay With Auxiliary Voltage and Instantaneous Contact

3RP1505-1B



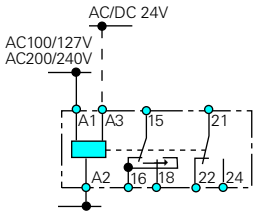
20. Flashing and Instantaneous Contact

3RP1505-1B



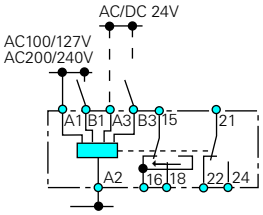
21. Making-Pulse Contact and Instantaneous Contact

3RP1505-1B



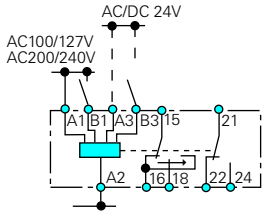
22. Breaking-Pulse Contact With Auxiliary Voltage and Instantaneous Contact

3RP1505-1B



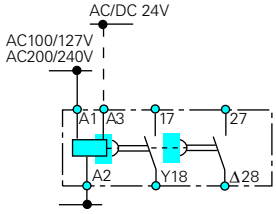
23. Pulse Forming With Auxiliary Voltage and Instantaneous Contact

3RP1505-1B



24. Star-Delta Function

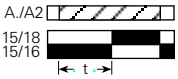
3RP1505-1B



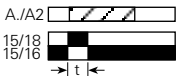
Timing Function Descriptions and Settings

3RP1505-1A

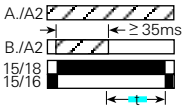
1. On Delay



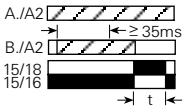
5. Impulse On



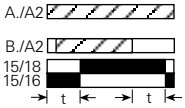
2. Off Delay



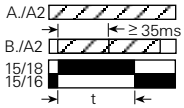
6. Impulse Off



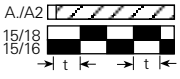
3. On/Off Delay



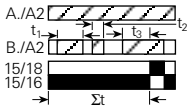
7. Pulse Shaping



4. Flasher

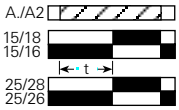


8. Cumulative On Delay

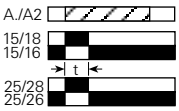


3RP1505-1B

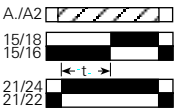
9. On Delay



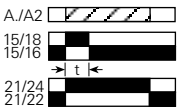
13. Impulse On



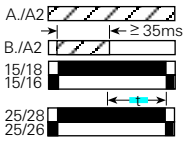
17. On Delay



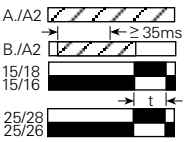
21. Impulse On



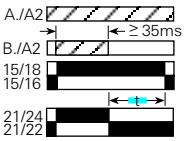
10. Off Delay



14. Impulse Off

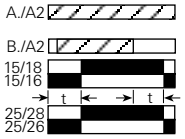


18. Off Delay

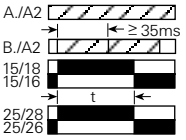


22. Impulse Off

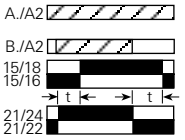
11. On/Off Delay



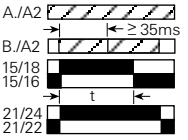
15. Pulse Shaping



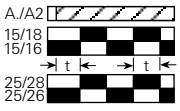
19. On/Off Delay



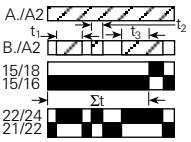
23. Pulse Shaping



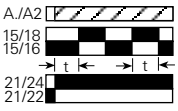
12. Flasher



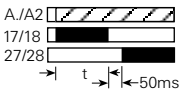
16. Cumulative On Delay



20. Flasher



24. Star/Delta



CB series

CMOS IC Time Delay Relay

- Choice of timing modes
  - Delay on operate
  - Delay on release
  - Interval on with or without control switch
- Knob adjustable
- 10A output relay with SPDT or DPDT contacts
- Various models time from 0.1 sec. to 100 min.

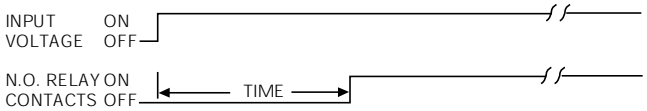
File E22575

File LR15734

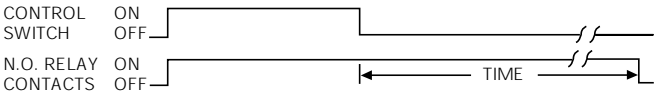
Users should thoroughly review the technical data before selecting a product part number. It is recommended that user also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

Timing Modes

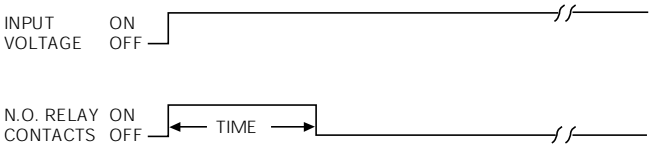
Delay on operate – Delay period begins when input voltage is applied. At the end of the delay period, the relay will operate and will not release until input voltage is removed. Reset occurs when input voltage is reapplied.



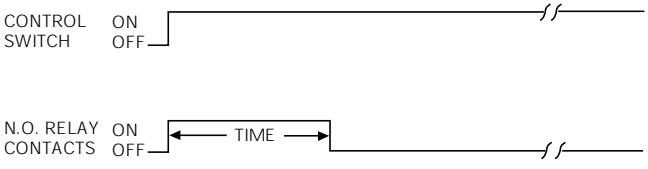
Delay on release – Input voltage must be applied continuously to operate the internal relay. When the control switch is closed, the relay energizes. When the control switch is opened, timing begins. When timing is complete, the relay will de-energize. Time may be reset to zero during timing by closing the control switch.



Interval on (without control switch) – The relay energizes and timing begins when input voltage is applied. At the end of the time delay period the relay will de-energize. Reset is accomplished by removing, then reapplying, the input voltage.



Interval on (with control switch) – Input voltage must be applied continuously to operate the internal relay. The relay energizes and timing begins when the external switch is closed. At the end of the time delay period the relay will de-energize. Reset is accomplished by opening and reclosing the control switch.



Timing Specifications

Timing Ranges: From 0.1 to 1.0 sec. through 10 to 100 min.
Timing Adjustment: Knob adjustable.
Tolerance (for AC units add ±1/2 cycle 60 Hz.):
Knob Adj. Types: –0, +30% of max. specified at high end of timing range; min. specified, or less, at low end.
Fixed Types: ±10%.
Res. Adj. Types: ±10% at high end of timing range; min. specified, or less, at low end.
Delta Time (for AC units add ±1 cycle 60 Hz.): ±10%.
Repeatability (for AC units add ±1 cycle 60 Hz.): ±2%.
Release Time: 60 ms, typ.; 100 ms, max.
Recycle Time: 60 ms, typ.; 100 ms, max.

Contact Data @ 25°C

Arrangements: 2 Form C (DPDT), except 8-pin delay on release model has 1 Form C (SPDT).
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: 500V rms, 60 Hz.
Between All Other Conductors: 500V rms, 60 Hz.

Input Data @ 25°C

Voltage: 24 and 120VAC, and 12 and 24VDC.
Power Requirement: **AC Types:** Typically less than 3 VA.
DC Types: Typically less than 3 W.
Transient Protection: Yes.
Reverse Voltage Protection: Yes.

Input Voltages & Limits @ 25°C

Voltage Type	Nominal Voltage	Minimum Voltage	Maximum Voltage
AC	24 120	20 105	28 130
DC	12 24	11 20	13 32

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:** -55°C to +85°C.
Operating: -10°C to +55°C.

Mechanical Data

Termination: 8- or 11-pin octal style plug.
Enclosure: White plastic case. Knob adjustable types have dial scale for reference only.
Sockets: Models with 8-pin base fit either 27E122 or 27E891 (snap-on) screw terminal sockets. 11-pin types fit either 27E123 or 27E892 (snap-on) screw terminal sockets.
Weight: 6 oz. (170g) approximately.

Ordering Information – Authorized distributors are more likely to stock boldface items listed below.

Delay on Operate Models

Voltage	Time	Adjustment	Wiring Dia.	Part Number
24VAC	0.1 to 10 Sec.	Knob	1	**CB-1041B-30**
	1.8 to 180 Sec			**CB-1042B-30**
120VAC	0.1 to 1 Sec.	Knob	1	**CB-1001B-70**
	0.1 to 5 Sec.			**CB-1002B-70**
	0.1 to 10 Sec.			**CB-1003B-70**
	0.6 to 60 Sec.			**CB-1004B-70**
	1.8 to 180 Sec.			**CB-1005B-70**
	1 to 10 Min.			**CB-1006B-70**
	10 to 100 Min.			**CB-1007B-70**
12VDC	0.1 to 10 Sec.	Knob	1	**CB-1047D-20**
24VDC	0.1 to 1 Sec.	Knob	1	CB-1026D-30
	0.1 to 10 Sec.			**CB-1028D-30**
	0.6 to 60 Sec.			CB-1029D-30
	1.8 to 180 Sec.			CB-1030D-30

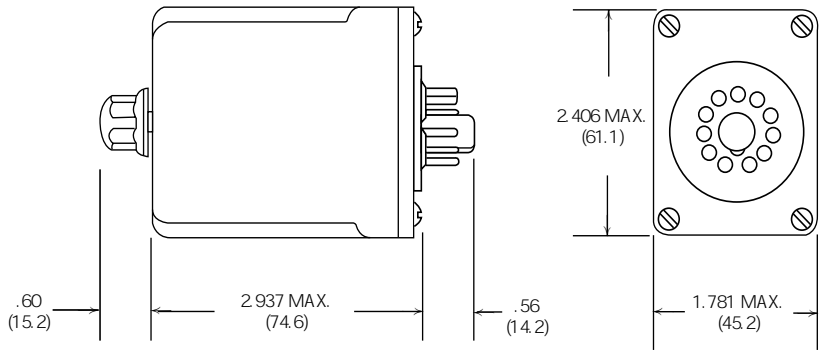
Delay on Release Models

Voltage	Time	Adjustment	Wiring Dia.	Part Number
24VAC	0.1 to 10 Sec.	Knob	3	CB-1045B-38
	1.8 to 180 Sec			**CB-1046B-38**
120VAC	0.1 to 10 Sec.	Knob	3	**CB-1021B-78**
	0.1 to 10 Sec.		5	**CB-1022B-78**
	0.6 to 60 Sec.		3	**CB-1023B-78**
	1.8 to 180 Sec.		3	**CB-1024B-78**
24VDC	0.1 to 10 Sec.	Knob	3	**CB-1038D-38**
	1.8 to 180 Sec.			**CB-1039D-38**

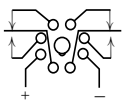
Interval on Models

Voltage	Time	Adjustment	Wiring Dia.	Part Number
24VAC	0.1 to 10 Sec.	Knob	1	**CB-1043B-39**
120VAC	0.1 to 5 Sec.	Knob	1	CB-1011B-79
	0.1 to 10 Sec.		1	CB-1014B-79
	1 to 10 Min.		1	CB-1018B-79
24VDC	0.1 to 5 Sec.	Knob	1	CB-1034D-39
	1.8 to 180 Sec.			CB-1036D-39

Outline Dimensions

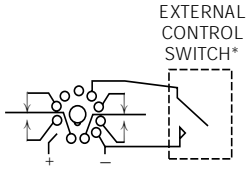


Wiring Diagrams - Bottom Views (pins numbered clockwise from keyway)



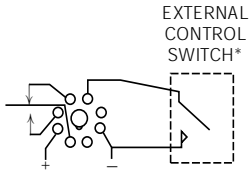
INPUT (DC POLARITY INDICATED)**

Fig. 1
8 Pin



CONTINUOUS SUPPLY INPUT (DC POLARITY INDICATED)**

Fig. 3
11 Pin



CONTINUOUS SUPPLY INPUT (DC POLARITY INDICATED)**

Fig. 5
8 Pin

* If control switch is closed when power is applied, relay will immediately energize. A 50 millisecond minimum switch closure is required. 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.
** **Note:** Input polarity for DC operation. For most reliable operation on AC, connect high side to "+" and low side to "–".

CD series

CMOS IC Time Delay Relay

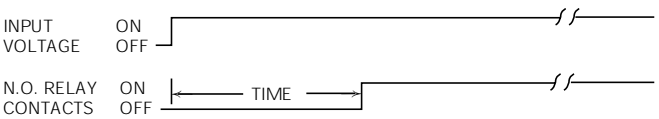
- 1% Repeatability
- Operates from -40°C to +55°C
- Delay on operate or delay on release timing modes
- Fixed, knob or resistor adjustable types
  - Calibrated dial on knob adjustable types
- 10A output relay with SPDT or DPDT contacts
- Various models time from 0.1 to 180 sec.

File E22575
File LR15734

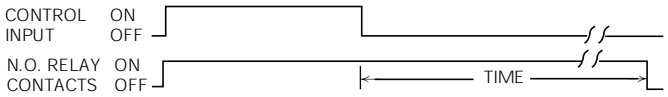
Users should thoroughly review the technical data before selecting a product part number. It is recommended that user also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

Timing Modes

Delay on operate – Delay period begins when input voltage is applied. At the end of the delay period, the relay will operate and will not release until input voltage is removed. Reset occurs when input voltage is reapplied.



Delay on release – Input voltage must be applied continuously to operate the internal relay. When control Input is applied, the relay energizes. When control input is removed, timing begins. When timing is complete, the relay will de-energize. Time may be reset to zero during timing by reapplying control input.



Timing Specifications

Timing Ranges: From 0.1 to 180 sec.
Timing Adjustment: Fixed, external resistor and knob adjustable.
Tolerance (for AC units add ±1/2 cycle 60 Hz.):
Knob Adj. Types: ±5% of max. specified at high end of timing range; min. specified, or less, at low end; ±10% full scale.
Fixed Types: ±5%.
Res. Adj. Types: ±5% at high end of timing range; min. specified, or less, at low end.
Delta Time (for AC units add ±1 cycle 60 Hz.): ±5%.
Repeatability (for AC units add ±1 cycle 60 Hz.): ±1%.
Release Time: 45 ms, typ.; 60 ms, max.
Recycle Time: 45 ms, typ.; 60 ms, max.

Contact Data @ 25°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: 500V rms, 60 Hz.
Between All Other Conductors: 500V rms, 60 Hz.

Input Data @ 25°C

Voltage: 24 & 120VAC and 12 through 110VDC.
Power Requirement: **AC Types:** Typically less than 3 VA.
DC Types: Typically less than 3 W.
Transient Protection: Yes.
Reverse Voltage Protection: Yes.

Input Voltages & Limits @ 25°C

Voltage Type	Nominal Voltage	Minimum Voltage	Maximum Voltage
AC	24	20	28
	120	105	130
DC	12	11	13
	24	20	32
	48	41	55
	110	95	125

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:** -55°C to +85°C.
Operating: -40°C to +55°C.

Mechanical Data

Termination: 8- or 11-pin octal style plug.
Enclosure: Yellow plastic case. Knob adjustable types have dial scale calibrated in seconds ±5%.
Sockets: Models with 8-pin base fit either 27E122 or 27E891 (snap-on) screw terminal sockets. 11-pin types fit either 27E123 or 27E892 (snap-on) screw terminal sockets.
Weight: 8 oz. (227g) approximately.

Ordering Information – Authorized distributors are more likely to stock boldface items listed below.

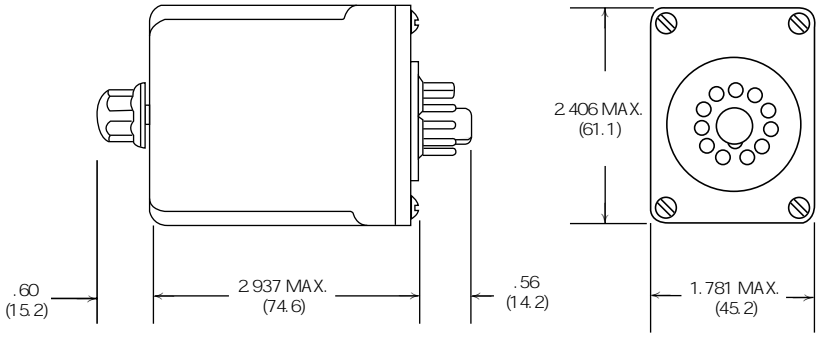
Delay on Operate Models

Voltage	Time	Adjustment	Wiring Dia.	Part Number
120VAC	0.1 to 1 Sec.	Knob	1	**CDB-38-70001**
	0.1 to 5 Sec.			**CDB-38-70002**
	0.1 to 10 Sec.			**CDB-38-70003**
	0.3 to 30 Sec.			**CDB-38-70006**
	0.6 to 60 Sec.			**CDB-38-70004**
	1.8 to 180 Sec.			**CDB-38-70005**
120VAC	1 Sec.	Fixed		**CDA-38-70012**
120VAC	0.1 to 1 Sec.	Resistor	2	CDF-38-70001
	0.1 to 5 Sec.			**CDF-38-70002**
	0.1 to 10 Sec.			CDF-38-70003
24VDC	0.1 to 10 Sec.	Knob	1	**CDD-38-30003**
	0.6 to 60 Sec.			**CDD-38-30004**
	1.8 to 180 Sec.			**CDD-38-30005**
48VDC	0.6 to 60 Sec.	Knob	1	CDD-38-40002
110VDC	0.1 to 1 Sec.	Knob	1	CDD-38-60004
	0.1 to 10 Sec.			CDD-38-60001
	0.6 to 60 Sec.			CDD-38-60002
	1.8 to 180 Sec.			CDD-38-60003

Delay on Release Models

Voltage	Time	Adjustment	Wiring Dia.	Part Number
120VAC	0.1 to 1 Sec.	Knob	3	**CDB-38-70016**
	0.1 to 5 Sec.			**CDB-38-70091**
	0.1 to 10 Sec.			**CDB-38-70014**
	0.3 to 30 Sec.			**CDB-38-70092**
	0.6 to 60 Sec.			**CDB-38-70012**
	1.8 to 180 Sec.			**CDB-38-70015**
120VAC	1 Sec.	Fixed	3	CDA-38-70025
12VDC	180 Sec.	Fixed	3	CDC-38-20026
24VDC	0.1 to 10 Sec.	Knob	3	**CDD-38-30014**
	0.6 to 60 Sec.			**CDD-38-30012**
	1.8 to 180 Sec.			**CDD-38-30008**

Outline Dimensions



Wiring Diagrams – Bottom Views (pins numbered clockwise from keyway)

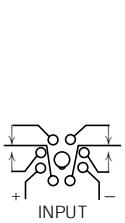


Fig. 1
8 Pin

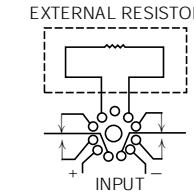


Fig. 2
11 Pin

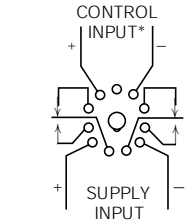


Fig. 3
11 Pin

* If control input is applied when supply input is applied, relay will immediately energize. A 50 millisecond minimum control pulse is required.
** **Note** Input polarity for DC operation. For most reliable operation on AC, connect high side to "+" and low side to "–".

External Resistor Selection Chart

See External Resistor Selection Charts at beginning of Time Delay Relay section of this Databook.

CG series

CMOS IC Time Delay Relay

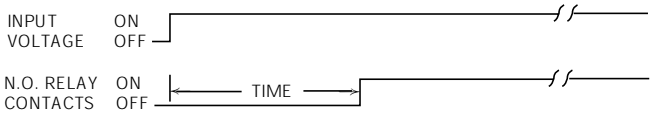
- Repeatability to .05%
- Choice of timing modes
  - Delay on operate
  - Delay on release
  - Interval on
- Knob adjustable
- 10A output relay with DPDT contacts
- Various models time from 0.5 sec. to 100 min.

File E22575
File LR15734

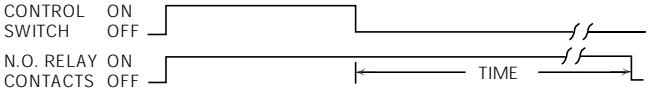
Users should thoroughly review the technical data before selecting a product part number. It is recommended that user also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

Timing Modes

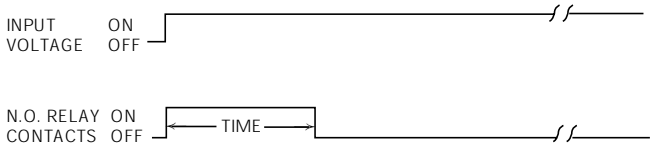
Delay on operate – Delay period begins when input voltage is applied. At the end of the delay period, the relay will operate and will not release until input voltage is removed. Reset occurs when input voltage is reapplied.



Delay on release – Input voltage must be applied continuously to operate the internal relay. When the control switch is closed, the relay energizes. When the control switch is opened, timing begins. When timing is complete, the relay will de-energize. Time may be reset to zero during timing by closing the control switch.



Interval on – The relay energizes and timing begins when input voltage is applied. At the end of the time delay period the relay will de-energize. Reset is accomplished by removing, then reapplying, the input voltage.



Timing Specifications

Timing Ranges: From 0.5 to 5.0 sec. through 10 to 100 min.
Timing Adjustment: Knob adjustable.
Tolerance (for AC units add ±1/2 cycle 60 Hz.):
Knob Adj. Types: –0, +10% of max. specified at high end of timing range; +0, –10% of min. specified at low end.
Delta Time (for AC units add ±1 cycle 60 Hz.): ±2%, typ.; ±5%, max.
Repeatability (including first cycle of operation):
AC: ±0.1%, typ.; ±0.5%, max.; but not less than ±16 ms.
DC: ±0.05% typ.; ±0.1% max.; but not less than ±3 ms.
Release Time: 30 ms, typ.; 45 ms, max.
Recycle Time: **AC:** 40 ms, typ.; 60 ms, max.
DC: 30 ms, typ.; 45 ms, max.

Contact Data @ 25°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: 500V rms, 60 Hz.
Between All Other Conductors: 500V rms, 60 Hz.

Input Data @ 25°C

Voltage: 120VAC and 24VDC.
Power Requirement: **AC Types:** Typically less than 3 VA.
DC Types: Typically less than 3 W.
Transient Protection: Yes.
Reverse Voltage Protection: Yes.

Input Voltages & Limits @25°C

Voltage Type	Nominal Voltage	Minimum Voltage	Maximum Voltage
AC	120	105	130
DC	24	20	32

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:** -40°C to +85°C.
Operating: -10°C to +55°C.

Mechanical Data

Termination: 8- or 11-pin octal style plug.
Enclosure: Yellow plastic case. Knob adjustable types have dial scale for reference only.
Sockets: Models with 8-pin base fit either 27E122 or 27E891 (snap-on) screw terminal sockets. 11-pin types fit either 27E123 or 27E892 (snap-on) screw terminal sockets.
Weight: 8 oz. (227g) approximately.

Ordering Information – Authorized distributors are more likely to stock boldface items listed below.

Delay on Operate Models

Voltage	Time	Adjustment	Wiring Dia.	Part Number
120VAC	0.5 to 5 Min.	Knob	1	CGB-38-70005M
	1 to 10 Min.			**CGB-38-70010M**
	5 to 50 Min.			**CGB-38-70050M**
	10 to 100 Min.			CGB-38-70100M
24VDC	5 to 50 Min.	Knob	1	CGD-38-30050M

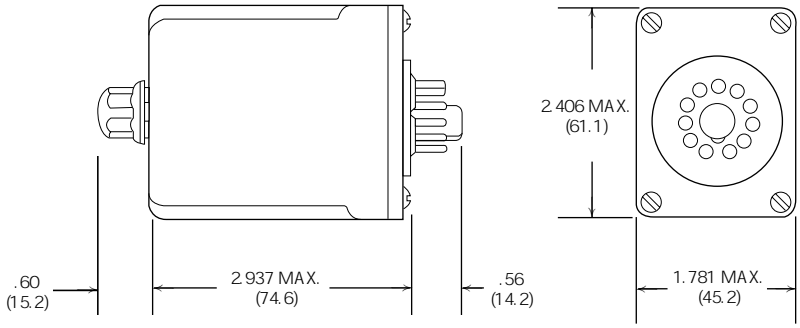
Delay on Release Models

Voltage	Time	Adjustment	Wiring Dia.	Part Number
120VAC	1 to 10 Min.	Knob	2	**CGB-38-78010M**
	5 to 50 Min.			**CGB-38-78050M**

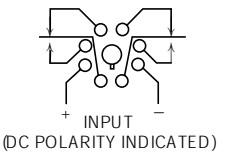
Interval on Models

Voltage	Time	Adjustment	Wiring Dia.	Part Number
120VAC	0.5 to 5 Sec.	Knob	1	CGB-38-79005S
	1 to 10 Min.			**CGB-38-79010M**
24VDC	1 to 10 Min.	Knob	1	**CGD-38-39010M**

Outline Dimensions

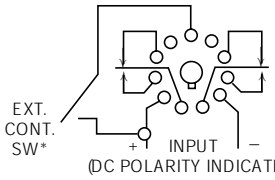


Wiring Diagrams – Bottom Views (pins numbered clockwise from keyway)



(DC POLARITY INDICATED)

Fig.1
8 Pin



(DC POLARITY INDICATED)

Fig.2
11 Pin

* If control switch is closed when power is applied, relay will immediately energize. A 50 millisecond minimum switch closure is required. IMPORTANT: a dry circuit switch is recommemded. 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.
** **Note:** input polarity for DC operation. For most reliable operation on AC, connect high side to "+" and low side to "–".

CH series

Mid- To Low-Priced CMOS IC Time Delay Relay

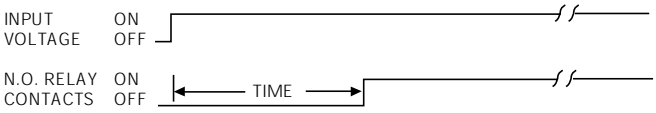
- Choice of timing modes
  - Delay on operate
  - Delay on release
  - Interval on
- Fixed or knob adjustable types
- 10A output relay with DPDT contacts
- Various models time from 1 to 180 sec.

File E22575
File LR15734

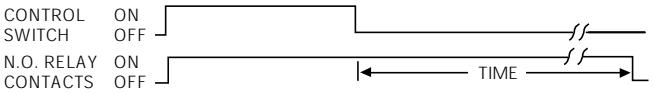
Users should thoroughly review the technical data before selecting a product part number. It is recommended that user also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

Timing Modes

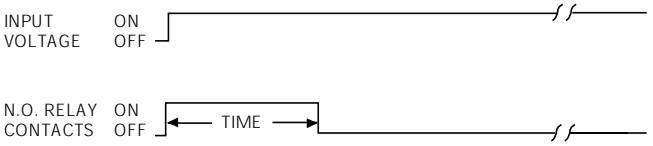
Delay on operate – Delay period begins when input voltage is applied. At the end of the delay period, the relay will operate and will not release until input voltage is removed. Reset occurs when input voltage is reapplied.



Delay on release – Input voltage must be applied continuously to operate the internal relay. When the control switch is closed, the relay energizes. When the control switch is opened, timing begins. When timing is complete, the relay will de-energize. Time may be reset to zero during timing by closing the control switch.



Interval on – The relay energizes and timing begins when input voltage is applied. At the end of the time delay period the relay will de-energize. Reset is accomplished by removing, then reapplying, the input voltage.



Timing Specifications

Timing Ranges: From 1 to 180 sec.
Timing Adjustment: Fixed and knob adjustable.
Tolerance (for AC units add ±1/2 cycle 60 Hz.):
Knob Adj. Types: –0, +20% of max. specified at high end of timing range; min. specified, or less, at low end.
Fixed Types: ±5%.
Res. Adj. Types: ±5% at high end of timing range; min. specified, or less, at low end.
Delta Time (for AC units add ±1 cycle 60 Hz.): ±10%.
Repeatability (for AC units add ±1 cycle 60 Hz.): ±2%.
Release Time: 125 ms, typ.; 200 ms, max.
Recycle Time: 125 ms, typ.; 200 ms, max.

Contact Data @ 25°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: 500V rms, 60 Hz.
Between All Other Conductors: 500V rms, 60 Hz.

Input Data @ 25°C

Voltage: 24 through 240VAC and 24VDC.
Power Requirement: **AC Types:** Typically less than 3 VA.
DC Types: Typically less than 3 W.
Transient Protection: Yes.
Reverse Voltage Protection: Yes.

Input Voltages & Limits @ 25°C

Voltage Type	Nominal Voltage	Minimum Voltage	Maximum Voltage
AC	24 120 240	20 105 210	28 130 260
DC	24	20	32

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:** -55°C to +85°C.
Operating: -10°C to +55°C.

Mechanical Data

Termination: 8- or 11-pin octal style plug.
Enclosure: White plastic case. Knob adjustable types have dial scale for reference only.
Sockets: Models with 8-pin base fit either 27E122 or 27E891 (snap-on) screw terminal sockets. 11-pin types fit either 27E123 or 27E892 (snap-on) screw terminal sockets.
Weight: 6 oz. (170g) approximately.

Ordering Information – Authorized distributors are more likely to stock boldface items listed below.

Delay on Operate Models

Voltage	Time	Adjustment	Wiring Dia.	Part Number
24VAC	1 to 10 Sec. 1 to 180 Sec.	Knob	1	**CHB-38-30001** **CHB-38-30003**
120VAC	1 to 10 Sec. 1 to 60 Sec. 1 to 180 Sec.	Knob	1	**CHB-38-70001** **CHB-38-70002** **CHB-38-70003**
120VAC	10 Sec.	Fixed	1	**CHA-38-70001**
240VAC	1 to 10 Sec.	Knob	1	**CHB-38-80001**
24VDC	1 to 10 Sec. 1 to 60 Sec. 1 to 180 Sec.	Knob	1	**CHD-38-30001** CHD-38-30002 **CHD-38-30003**

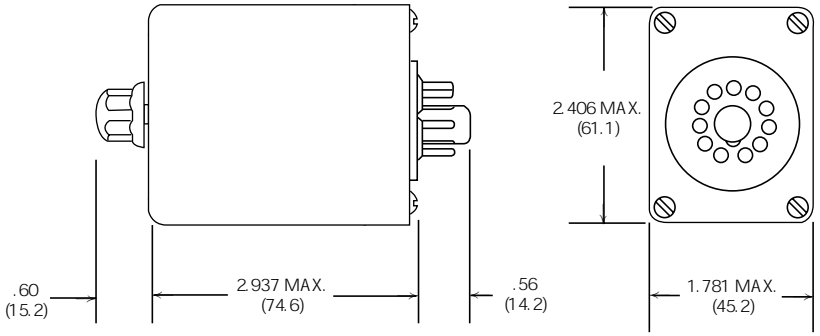
Delay on Release Models

Voltage	Time	Adjustment	Wiring Dia.	Part Number
24VAC	1 to 10 Sec.	Knob	3	CHB-38-30011
120VAC	1 to 10 Sec. 1 to 60 Sec. 1 to 180 Sec.	Knob	3	**CHB-38-70011** **CHB-38-70012** **CHB-38-70013**
24VDC	1 to 10 Sec. 1 to 180 Sec.	Knob	3	CHD-38-30011 CHD-38-30013

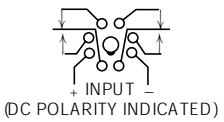
Interval on Models

Voltage	Time	Adjustment	Wiring Dia.	Part Number
120VAC	1 to 10 Sec. 1 to 60 Sec. 1 to 180 Sec.	Knob	1	**CHB-38-70021** **CHB-38-70022** **CHB-38-70023**
24VDC	1 to 10 Sec.	Knob	1	**CHD-38-30021**

Outline Dimensions

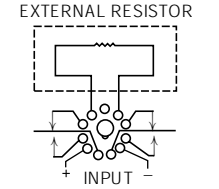


Wiring Diagrams – Bottom Views (pins numbered clockwise from keyway)



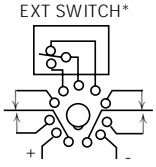
(DC POLARITY INDICATED)

Fig. 1
8 Pin



(DC POLARITY INDICATED)

Fig. 2
11 Pin



AC INPUT

Fig. 3
11 Pin

* If control switch is closed when power is applied, relay will immediately energize. A 50 millisecond minimum switch closure is required. 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.
**** Note:** Input polarity for DC operation. For most reliable operation on AC, connect high side to "+" and low side to "–".

CL-CU series

Compact Time Delay Relay

- Delay on operate timing mode
- Fixed, knob or resistor adjustable types
- 10A output relay with DPDT contacts
- Variety of mounting options
- Various models time from 0.1 to 120 sec.
- No timing cycle interrupt transfer (CL only)

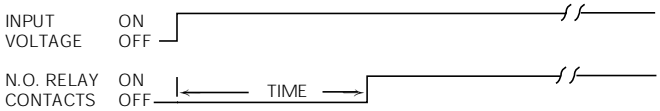
File E22575

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.

Timing Mode

Delay on operate – Delay period begins when input voltage is applied. At the end of the delay period, the relay will operate and will not release until input voltage is removed. Reset occurs when input voltage is reapplied.



CL Timing Specifications

Timing Ranges: From 0.1 to 1.0 sec. through 1.2 to 120 sec.
Timing Adjustment: Fixed, external resistor and knob adjustable.
Tolerance (for AC units add ±1/2 cycle 60 Hz.):
Knob Adj. Types: –0, +20% of max. specified at high end of timing range; min. specified, or less, at low end.
Fixed Types: ±5%.
Res. Adj. Types: ±10% at high end of timing range; min. specified, or less, at low end.
Repeatability (for AC units add ±1 cycle 60 Hz.): ±3%.
Release Time: 100 ms, typ.; 150 ms, max.
Recycle Time: 100 ms, typ.; 150 ms, max.

CU Timing Specifications

Timing Ranges: From 1.0 to 10 sec. through 1.0 to 120 sec.
Timing Adjustment: Fixed, external resistor and knob adjustable.
Tolerance (for AC units add ±1/2 cycle 60 Hz.):
Knob Adj. Types: –0, +20% of max. specified at high end of timing range; min. specified, or less, at low end.
Fixed Types: ±5%.
Res. Adj. Types: ±10% at high end of timing range; min. specified, or less, at low end.
Repeatability (for AC units add ±1 cycle 60 Hz.): ±3%.
Release Time: 150 ms, typ.; 225 ms, max.
Recycle Time: 150 ms, typ.; 225 ms, max.

Note: On CU types the switching contact may momentarily transfer if the timing interval is interrupted. CL types have no timing cycle interrupt transfer.

Contact Data @ 25°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: 500V rms, 60 Hz.
Between All Other Conductors: 500V rms, 60 Hz.

Input Data @ 25°C

Voltage: 24 & 120VAC and 12 & 24VDC.
Power Requirement: AC Types: Typically less than 3 VA.
DC Types: Typically less than 3 W.
Transient Protection: Yes.
Reverse Voltage Protection: Yes.

Input Voltages & Limits @ 25°C

Voltage Type	Nominal Voltage	Minimum Voltage	Maximum Voltage
AC	24 120	20 105	28 130
DC	12 24	11 20	13 32

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:** -55°C to +85°C.
Operating: -10°C to +55°C.

Mechanical Data

Termination: 0.187 in. (4.75mm) quick-connect.
Enclosure: Yellow plastic case (see outline drawings for various options). Knob adjustable types have dial scale for reference only.
Sockets: Solder, printed circuit and screw terminal sockets available.
Weight: 3.5 oz. (99g) approximately.

CL Ordering Information – Authorized distributors are more likely to stock boldface items listed below.

Voltage	Time	Adjustment	Wiring Dia.	Part Number
24VAC	0.1 to 10 Sec.	Knob	1	**CLB-51-30010**
24VAC	0.1 to 10 Sec.	Resistor	2	CLF-42-30010
120VAC	0.1 to 10 Sec. 0.3 to 30 Sec. 1.2 to 120 Sec.	Knob	1	**CLB-51-70010** **CLB-51-70030** **CLB-51-70120**
120VAC	3 Sec. 30 Sec.	Fixed	1	CLA-41-70003 CLA-41-70030
120VAC	0.1 to 10 Sec. 0.1 to 10 Sec. 1.2 to 120 Sec.	Resistor	2	**CLF-41-70010** **CLF-42-70010** CLF-41-70120

Voltage	Time	Adjustment	Wiring Dia.	Part Number
12VDC	0.1 to 10 Sec.	Knob	1	CLD-51-20010
12VDC	10 Sec.	Fixed	1	CLC-41-20010
12VDC	1.2 to 120 Sec.	Resistor	2	CLH-41-20120
24VDC	5 Sec.	Fixed	1	CLC-41-30005
24VDC	0.1 to 10 Sec. 0.3 to 30 Sec. 0.1 to 10 Sec.	Resistor	2	**CLH-41-30010** CLH-41-30030 CLH-45-30010

41 style models (e.g. CLA-**41**-70010) have plain case.
42 style models (e.g. CLF-**42**-70010) have bracket mount case.
45 style models (e.g. CLH-**45**-30010) have bracket mount case with test button.
51 style models (e.g. CLB-**51**-30010) have plain case with knob.

CU Ordering Information – Authorized distributors are more likely to stock boldface items listed below.

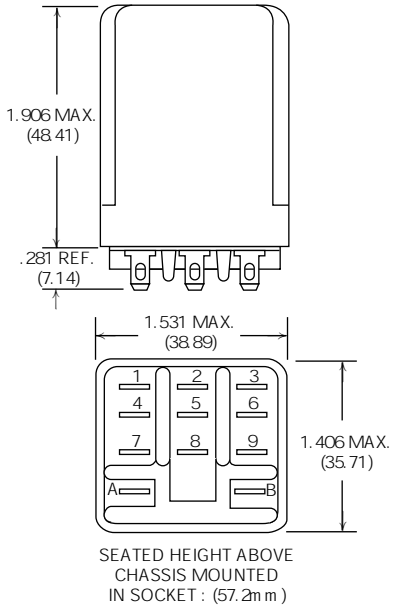
Voltage	Time	Adjustment	Wiring Dia.	Part Number
24VAC	10 Sec.	Fixed	1	**CUA-41-30010**
24VAC	1 to 10 Sec.	Resistor	2	**CUF-41-30010**
	1 to 10 Sec.			CUF-42-30010
120VAC	1 to 10 Sec.	Knob	1	**CUB-51-70010**
	1 to 30 Sec.			**CUB-51-70030**
	1 to 60 Sec.			**CUB-51-70060**
	1 to 120 Sec.			**CUB-51-70120**
120VAC	1 Sec.	Fixed	1	**CUA-41-70001**
	3 Sec.			**CUA-41-70003**
	3 Sec.			CUA-42-70003
	5 Sec.			**CUA-41-70005**
	10 Sec.			**CUA-41-70010**
	10 Sec.			CUA-42-70010
	30 Sec.			CUA-42-70030
	120 Sec.			CUA-41-70120

Voltage	Time	Adjustment	Wiring Dia.	Part Number
120VAC	1 to 10 Sec.	Resistor	2	**CUF-41-70010**
	1 to 10 Sec.			**CUF-42-70010**
	1 to 30 Sec.			**CUF-41-70030**
	1 to 120 Sec.			**CUF-41-70120**
	1 to 120 Sec.			**CUF-42-70120**
24VDC	1 to 10 Sec.	Resistor	2	**CUH-41-30010**
	1 to 10 Sec.			**CUH-42-30010**
	1 to 120 Sec.			**CUH-41-30120**
	1 to 120 Sec.			CUH-42-30120

41 style models (e.g. CUA-**41**-70010) have plain case.
42 style models (e.g. CUA-**42**-70010) have bracket mount case.
51 style models (e.g. CUB-**51**-70010) have plain case with knob.

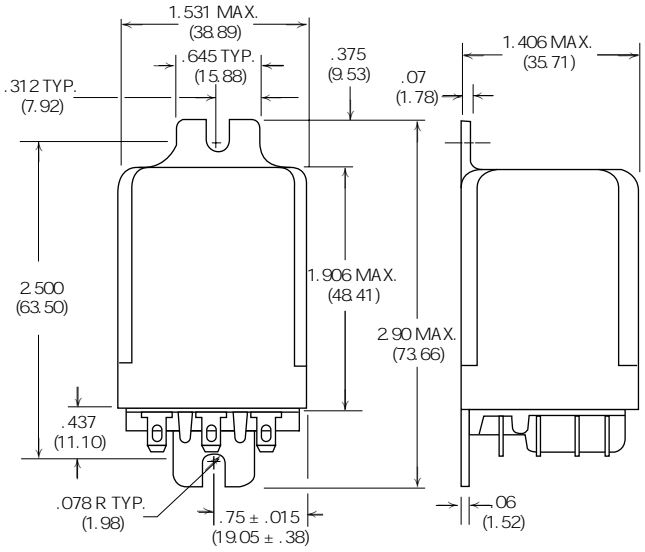
Outline Dimensions

41 Style

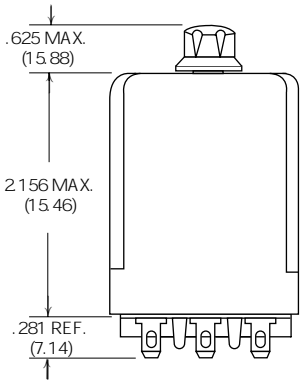


SEATED HEIGHT ABOVE
CHASSIS MOUNTED
IN SOCKET : (57.2mm)

42 & 45 Style

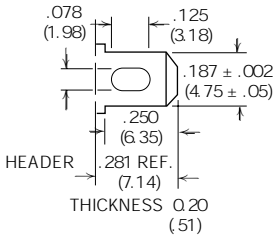


51 Style

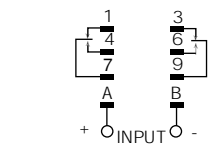


Terminal Dimensions

.187" (4.74mm)
Quick Connect/Solder

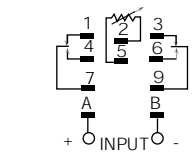


Wiring Diagrams – Bottom Views



(DC DC POLARITY INDICATED) **

Fig. 1



(DC POLARITY INDICATED) **

Fig. 2

** **Note:** Input polarity for DC operation. For most reliable operation on AC, connect high side to "+" and low side to "–".

External Resistor Selection Chart

See External Resistor Selection Charts at beginning of Time Delay Relay section of this Databook.

CK series

Mid-Priced CMOS IC Time Delay Relay

- Choice of timing modes
  - Delay on operate
  - Delay on release
  - Delay on dropout (no input required during timing)
  - Interval on
- Knob or resistor adjustable types
- 10A output relay with DPDT contacts
- Various models time from 0.1 to 180 sec.

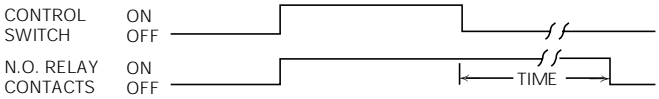
File E22575
File LR15734

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.

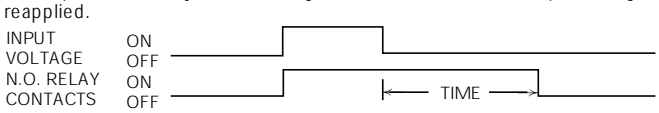
Timing Modes

Delay on operate – Delay period begins when input voltage is applied. At the end of the delay period, the relay will operate and will not release until input voltage is removed. Reset occurs when input voltage is reapplied.

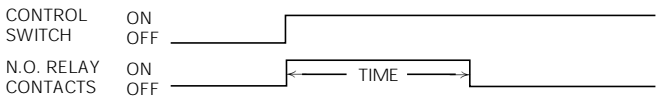
Delay on release – Input voltage must be applied continuously to operate the internal relay. When the control switch is closed, the relay energizes. When the control switch is opened, timing begins. When timing is complete, the relay will de-energize. Time may be reset to zero during timing by closing the control switch.



Delay on dropout – The relay operates immediately upon application of input voltage. Timing begins when input voltage is removed. When timing is complete, the relay will de-energize. Reset occurs when input voltage is reapplied.



Interval on (with control switch) – Input voltage must be applied continuously to operate the internal relay. The relay energizes and timing begins when the external switch is closed. At the end of the time delay period the relay will de-energize. Reset is accomplished by opening and reclosing the control switch.



Timing Specifications

Timing Ranges: From 0.1 to 180 sec.
Timing Adjustment: External resistor and knob adjustable.
Tolerance (for AC units add ±1/2 cycle 60 Hz.):
Knob Adj. Types: –0, +20% of max. specified at high end of timing range; min. specified, or less, at low end.
Fixed Types: ±5%.
Res. Adj. Types: ±5% at high end of timing range; min. specified, or less, at low end.
Delta Time (for AC units add ±1 cycle 60 Hz.): ±10%.
Repeatability (for AC units add ±1 cycle 60 Hz.): ±2%.
Release Time: 60 ms, typ.; 100 ms, max.
Recycle Time: 60 ms, typ.; 100 ms, max.

Contact Data @ 25°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: 500V rms, 60 Hz.
Between All Other Conductors: 500V rms, 60 Hz.

Input Data @ 25°C

Voltage: 24 & 120VAC and 12 & 24VDC.
Power Requirement: **AC Types:** Typically less than 3 VA.
DC Types: Typically less than 3 W.
Initiate Time: Delay on dropout timers must have input voltage applied for a minimum of three seconds for dropout function to be guaranteed.
Transient Protection: Yes.
Reverse Voltage Protection: Yes.

Input Voltages & Limits @ 25°C

Voltage Type	Nominal Voltage	Minimum Voltage	Maximum Voltage
AC	24 120	20 105	28 130
DC	12 24	11 20	13 32

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:** -55°C to +85°C.
Operating: -10°C to +55°C.

Mechanical Data

Termination: 8- or 11-pin octal style plug.
Enclosure: White plastic case. Knob adjustable types have dial scale for reference only.
Sockets: Models with 8-pin base fit either 27E122 or 27E891 (snap-on) screw terminal sockets. 11-pin types fit either 27E123 or 27E892 (snap-on) screw terminal sockets.
Weight: 6 oz. (170g) approximately.

Dimensions are shown for reference purposes only.
Dimensions are in inches over (millimeters) unless otherwise specified.
Specifications and availability subject to change.
www.tycoelectronics.com
Technical support:
Refer to inside back cover.

Ordering Information – Authorized distributors are more likely to stock boldface items listed below.

Delay On Operate Models

Voltage	Time	Adjustment	Wiring Dia.	Part Number
24VAC	0.1 to 10 Sec.	Knob	1	**CKB-38-30010**
120VAC	0.1 to 10 Sec. 0.6 to 60 Sec. 1.2 to 120 Sec. 1.8 to 180 Sec.	Knob	1	**CKB-38-70010** **CKB-38-70060** **CKB-38-70120** CKB-38-70180
120VAC	0.1 to 10 Sec.	Resistor	2	**CKF-38-70010**
12VDC	0.1 to 10 Sec.	Knob	1	**CKD-38-20010**

Delay On Release Models

Voltage	Time	Adjustment	Wiring Dia.	Part Number
120VAC	0.1 to 10 Sec. 0.6 to 60 Sec. 1.8 to 180 Sec.	Knob	3	**CKB-38-78010** CKB-38-78060 CKB-38-78180
120VAC	0.1 to 10 Sec.	Resistor	4	**CKF-38-78010**
24VDC	0.1 to 10 Sec.	Resistor	4	CKH-38-38010

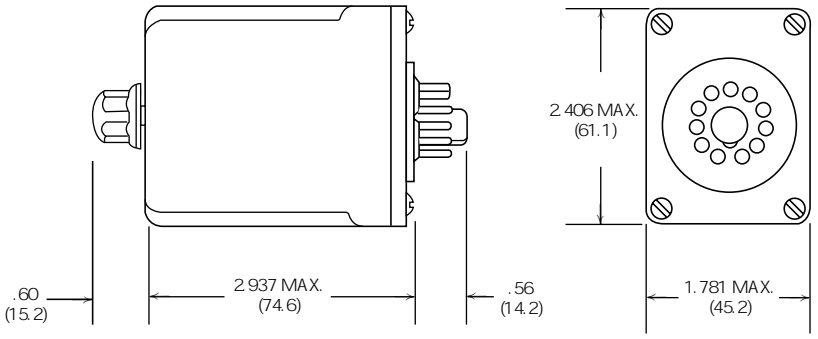
Delay On Dropout Models

Voltage	Time	Adjustment	Wiring Dia.	Part Number
24VAC	0.1 to 10 Sec. 0.6 to 60 Sec.	Knob	1	**CKB-38-37010** CKB-38-37060
120VAC	0.1 to 10 Sec. 0.6 to 60 Sec. 1.2 to 120 Sec.	Knob	1	**CKB-38-77010** **CKB-38-77060** **CKB-38-77120**

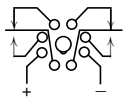
Interval On Models

Voltage	Time	Adjustment	Wiring Dia.	Part Number
120VAC	0.1 to 10 Sec.	Knob	3	**CKB-38-79010**

Outline Dimensions

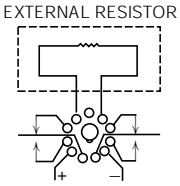


Wiring Diagrams – Bottom Views (pins numbered clockwise from keyway)



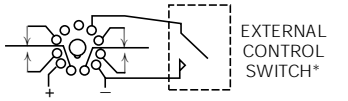
INPUT
(DC POLARITY INDICATED)**

Fig.1
8 Pin



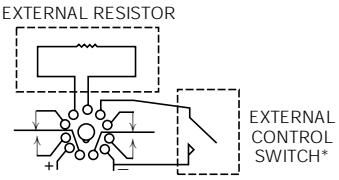
INPUT
(DC POLARITY INDICATED)**

Fig. 2
11 Pin



CONTINUOUS
SUPPLY
INPUT
(DC POLARITY INDICATED)**

Fig. 3
11 Pin



CONTINUOUS
SUPPLY
INPUT
(DC POLARITY INDICATED)**

Fig. 4
11 Pin

* If control switch is closed when power is applied, relay will immediately energize. A 50 millisecond minimum switch closure is required. 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.
** **Note:** Input polarity for DC operation. For most reliable operation on AC, connect high side to "+" and low side to "–".

External Resistor Chart

See External Resistor Selection Charts at beginning of Time Delay Relay section of this Databook.

CN1 series

On Delay, Time Delay Relay For Plug-In or Panel Mounting

- 0.1 sec. to 9,990 hr. timing range
- Fixed input type (120VAC ± 15%)
- 10A output relay with DPDT contacts
- 1/16 DIN style enclosure with 8-pin plug-in base
- Thumbwheel switches for programming delay time

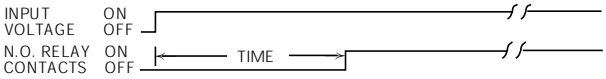
File E22575

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.

Timing Function

On Delay – Output relay turns on at the end of a programmed time interval which is started by applying input voltage. LED flashes when output relay is off and is on continuously when the output relay is on. Removal of input voltage turns off output relay. Reapplying input voltage resets the unit.



Timing Specifications

Timing Ranges: 0.1 to 99.9/1 to 999 sec.;
0.1 to 99.9/1 to 999 min.;
0.1 to 99.9/1 to 999/10 to 9,990 hr.
Timing Adjustment: Digital adjustment via thumbwheel switches.
Tolerance: ± 0.05% ± 0.04 sec.*
Repeatability (Including first cycle of operation.): < ± .05% ± 0.04 sec.*
Reset Time (power interruption): 45 ms, typ.; 60 ms, max.

* Timing is synchronized with input voltage frequency. Accuracy is dependent on input voltage frequency. Tolerance shows maximum variation from utility companies.

Contact Data @ 25°C

Arrangement: 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 Output Poles: 1,500V rms, 60 Hz.
Between Input and Output: 1,500V rms, 60Hz.

Input Data @ 25°C

Voltage: 120VAC ±15%, 60 Hz.
Power Requirement: 3VA @ 120VAC.
Transient Protection: 13 Joule MOV.

Input Voltage & Limits

Nominal Voltage	Minimum Voltage	Maximum Voltage
120VAC	102VAC	138VAC

Environmental Data

Temperature Range: **Storage:** -40°C to +85°C.
Operating: -10°C to +55°C.
Humidity: 85% relative humidity, non-condensing.

Mechanical Data

Termination: 8-pin octal style plug.
Enclosure: Black plastic 1/16 DIN (48mm x 48mm) case.
Sockets: Fits either 27E122 or 27E891 (snap-on) screw terminal sockets.
Weight: 4.3 oz. (122g) approximate.

Ordering Information – Authorized distributors are more likely to stock boldface items listed below.

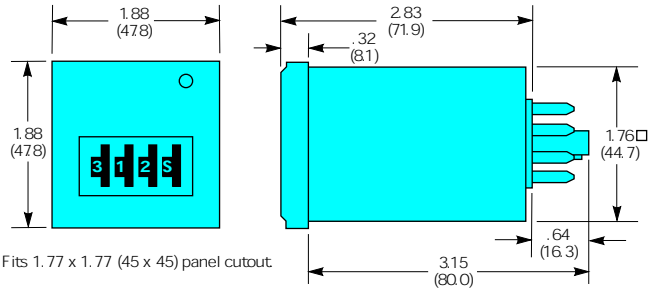
Time Delay Relay

Input Voltage	Part Number
120VAC	**CN1**

Accessory

Part Number	Name	Description
SSA-24C667	Mounting Clip	Ratchet-fit clip slides onto CN1 from behind to secure CN1 in panel mount applications.

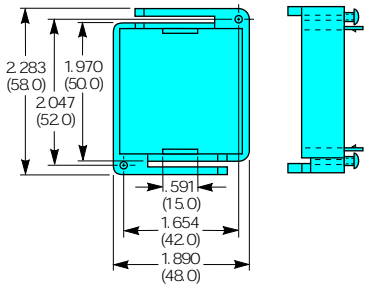
Outline Dimensions



Fits 1.77 x 1.77 (45 x 45) panel cutout.

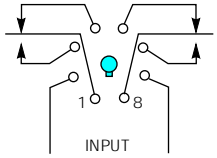
Mounting Clip Dimensions

SSA-24C667
Mounting Clip



Wiring Diagram (Bottom View)

(pins numbered clockwise from keyway)



Time Base

.1 S	= 1/10 Seconds	Timing Range 0.1 to 99.9 Seconds
S	= Seconds	Timing Range 1 to 999 Seconds
.1 M	= 1/10 Minutes	Timing Range 0.1 to 99.9 Minutes
M	= Minutes	Timing Range 1 to 999 Minutes
.1 H	= 1/10 Hours	Timing Range 0.1 to 99.9 Hours
H	= Hours	Timing Range 1 to 999 Hours
10 H	= 10 Hours	Timing Range 10 to 9990 Hours

CNM5 series

Multifunction Time Delay Relay For Plug-In or Panel Mounting

- Five timing functions selectable via rotary switch
- 0.1 sec. to 9,990 hr. timing range
- Fixed input type (120VAC ± 15%)
- 10A output relay with DPDT contacts
- 1/16 DIN style enclosure with 11-pin plug-in base
- Thumbwheel switches for programming delay time

File E22575

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.

Timing Functions

See the following page for a complete description of timing functions.

Timing Specifications

Timing Ranges: 0.1 to 99.9 /1 to 999 sec.;
0.1 to 99.9 /1 to 999 min.;
0.1 to 99.9 /1 to 999 /10 to 9,990 hr.
Timing Adjustment: Digital adjustment via thumbwheel switches.
Tolerance: ±0.05% ±0.04 sec.*
Repeatability (Including first cycle of operation.): < ±0.05% ±0.04 sec.*
Reset Time (power interruption): 45 ms, typ.; 60 ms, max.
Minimum Pulse Width, Control: 50 ms.

* Timing is synchronized with input voltage frequency. Accuracy is dependent on input voltage frequency. Tolerance shows maximum variation from utility companies.

Contact Data @ 25°C

Arrangement: 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 Output Poles: 1,500V rms, 60 Hz.
Between Input and Output: 1,500V rms, 60Hz.

Input Data @ 25°C

Voltage: 120VAC ±15%, 60 Hz.
Power Requirement: 3VA @ 120VAC.
Transient Protection: 13 Joule MOV.

Input Voltage & Limits

Nominal Voltage	Minimum Voltage	Maximum Voltage
120VAC	102VAC	138VAC

Environmental Data

Temperature Range: **Storage:** -40°C to +85°C.
Operating: -10°C to +55°C.
Humidity: 85% relative humidity, non-condensing.

Mechanical Data

Termination: 11-pin octal style plug.
Enclosure: Black plastic 1/16 DIN (48mm x 48mm) case.
Sockets: Fits either 27E123 or 27E892 (snap-on) screw terminal sockets.
Weight: 4.3 oz. (122g) approximate.

Ordering Information – Authorized distributors are more likely to stock boldface items listed below.

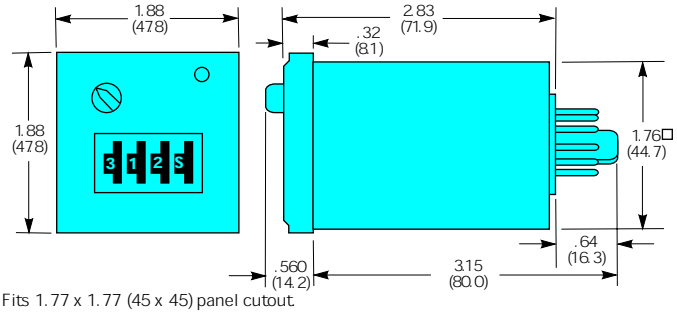
Time Delay Relay

Input Voltage	Part Number
120VAC	**CNM5**

Accessory

Part Number	Name	Description
SSA-24C667	Mounting Clip	Ratchet-fit clip slides onto CNM5 from behind to secure CNM5 in panel mount applications.

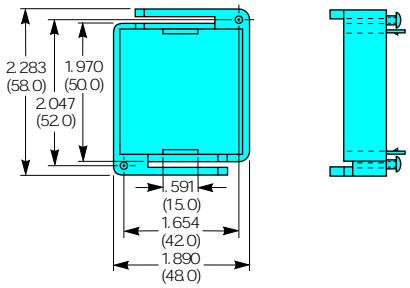
Outline Dimensions



Fits 1.77 x 1.77 (45 x 45) panel cutout.

Mounting Clip Dimensions

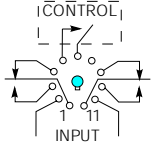
SSA-24C667
Mounting Clip



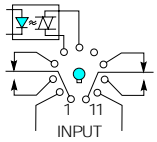
Wiring Diagrams (Bottom Views)

(pins numbered clockwise from keyway)

EXTERNAL CONTROL SWITCH**

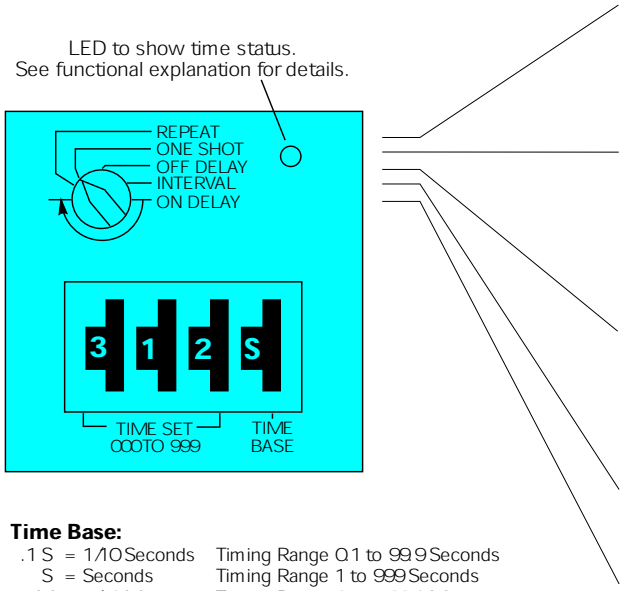


Optional Solid State Input Interface



** **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.

Timer Function Descriptions



Time Base:

.1 S	= 1/10 Seconds	Timing Range 0.1 to 99.9 Seconds
S	= Seconds	Timing Range 1 to 999 Seconds
.1 M	= 1/10 Minutes	Timing Range 0.1 to 99.9 Minutes
M	= Minutes	Timing Range 1 to 999 Minutes
.1 H	= 1/10 Hours	Timing Range 0.1 to 99.9 Hours
H	= Hours	Timing Range 1 to 999 Hours
10 H	= 10 Hours	Timing Range 10 to 9990 Hours

Repeat: Output relay is turned on at end of programmed time interval which is started by application of input power. Relay stays on for equal time interval, then turns off and cycle is repeated on a free-running basis with equal on and off times until terminated by removal of input power. LED is flashing when output relay is off and on continuously when the relay is on. Applying CONTROL input during timing will have no effect on timing or the state of the relay.

One Shot: Output relay is turned on by applying CONTROL input with input voltage present or application of input voltage with the CONTROL input on. Immediately upon either, timing is initiated with the output relay turning off at the completion of the selected time interval. Applying CONTROL input after time out will reset the timer, turn on the output relay and initiate another time interval. LED is on continuously when output relay is off and flashes when the relay is on. Applying CONTROL input during timing will have no effect on timing or the state of the relay.

Off Delay: Output relay is turned on by applying CONTROL input with input voltage present or application of input voltage with the CONTROL input on. The time interval will be started by removing the CONTROL input with the output relay turning off at completion of the time interval. Reapplying the CONTROL during timing will reset the time to zero and inhibit timing until removed. LED is off when CONTROL input is on, flashing during timing and on continuously when the output relay is off.

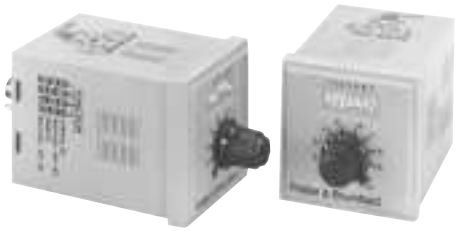
Interval: Output relay is turned on for a programmed time interval by applying input voltage. LED flashes when output relay is on and is on continuously when the output relay is off. Applying CONTROL input will have no effect on timing or the state of the relay.

On Delay: Output relay is off for a programmed time interval which is started by applying input voltage. LED flashes when output relay is off and is on continuously when the output relay is on. Applying CONTROL input will have no effect on timing or the state of the relay.

CNS series

Multifunction Time Delay Relay

- 8 programmable timing modes (4 on 8-pin models)
- 0.1 sec. to 100 min. programmable timing range
- Universal (24-240VAC/VDC) and fixed input types
- 10A output relay with DPDT contacts
- DIP switch selection of timing mode and range
- Knob and dial scale for setting actual delay time



File E22575
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.

Timing Modes

See the following page for a complete description of timing modes.

Timing Specifications

Timing Ranges: 0.1 to 1.0 /1.0 to 10 /10 to 100 sec.;
0.1 to 1.0 /1.0 to 10 /10 to 100 min.
Timing Adjustment: Knob adjustable within selected range.
Tolerance: –0, +20% of max. specified at high end of timing range; min. specified, or less, at low end.
Delta Time (for AC units add ±1 cycle 60 Hz.): ±10%.
Repeatability (Including first cycle of operation.): ±2% (for AC units add ±1 cycle 60 Hz.).
Reset Time (power interruption): 45 ms, typ.; 60 ms, max.
Minimum Pulse Width, Control: 50 ms.
Recycle Time: 45 ms, typ.; 60 ms, max.

Contact Data @ 25°C

Arrangements: 2 Form C (DPDT).
Material: Silver-cadmium oxide alloy.
Rating: 10 A @ 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: 1,000V rms, 60 Hz.
Between All Other Conductors: 1,500V rms, 60 Hz.

Input Data @ 25°C

Voltage: Universal Input Type: 24 - 240V ±15%, 50/60 Hz. AC or DC.
Fixed Input Type: 120VAC ±15%, 50/60 Hz.
Power Requirement:
Universal Input Type: 10VA @ 240VAC; 5VA @ 120VAC; 1VA @ 24VAC.
10W @ 240VDC; 5W @ 120VDC; 1W @ 24VDC.
Fixed Input Type: 3VA @ 120VAC.
Transient Protection: Yes.
Reverse Voltage Protection: Yes.

Input Voltages and Limits @ 25°C

Input Type	Nominal Voltage	Minimum Voltage	Maximum Voltage
Universal	24-240VAC/VDC	20.4VAC/VDC	276VAC/VDC
Fixed	120VAC	102VAC	138VAC

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°C to +70°C.
Operating: -10°C to +55°C.
Humidity: 85% relative humidity, non-condensing.

Mechanical Data

Termination: 8- or 11-pin octal style plug.
Enclosure: Beige plastic 1/16 DIN case. Dial scale provided for knob adjustment reference.
Sockets: Models with 8-pin base fit either 27E122 or 27E891 (snap-on) screw terminal sockets. 11-pin types fit either 27E123 or 27E892 (snap-on) screw terminal sockets.
Weight: 4.3 oz. (122g) approximately.

Ordering Information – Authorized distributors are more likely to stock boldface items listed below.

Universal Input Models

Input Voltage	Timing Functions	No. of Pins	Wiring Dia.	Part Number
24-240VAC/VDC	4	8	1	**CNS-35-92**
24-240VAC/VDC	8	11	2	**CNS-35-96**

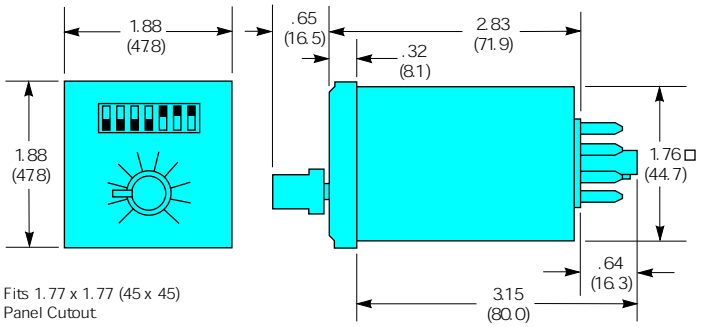
Fixed Input Models

Input Voltage	Timing Functions	No. of Pins	Wiring Dia.	Part Number
120VAC	4	8	1	**CNS-35-72**
120VAC	8	11	2	**CNS-35-76**

Accessory

Part Number	Name	Description
SSA-24C667	Mounting Clip	Ratchet-fit clip slides onto CNS from behind to secure CNS in panel mount applications.

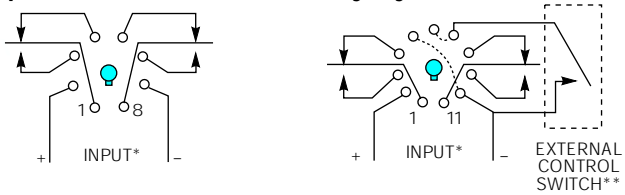
Outline Dimensions



Fits 1.77 x 1.77 (45 x 45)
Panel Cutout

Wiring Diagrams (Bottom Views)

(pins numbered clockwise from keyway)



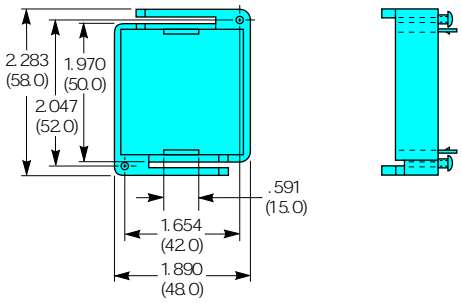
* **Note:** Input polarity for DC operation. For most reliable operation on AC, connect high side to "+" and low side to "–".

** **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.

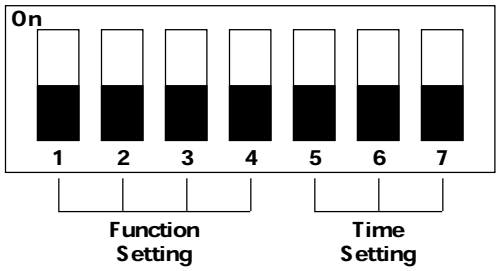
The dotted lines shown between pins on 11-pin diagram indicate internal connections.

Mounting Clip Dimensions

SSA-24C667
Mouting Clip



DIP Switch Layout



Note: The solid black blocks in the DIP switch diagrams indicate the switch positions. For example, all the switches are "off" in the diagram above.

Timing Range Switch Settings

DIP Switch Setting (5 6 7)	Timing Range	DIP Switch Setting (5 6 7)	Timing Range
■ □ □	0.1 - 1.0 Second	□ ■ ■	0.1 - 1.0 Minute
■ ■ □	1.0 - 10 Seconds	□ ■ □	1.0 - 10 Minutes
■ □ ■	10 - 100 Seconds	□ □ ■	10 - 100 Minutes

Timing Function Descriptions and Switch Settings

8 Or 11 Pin

Delay on Operate

72 & 92 - Output relay is energized at the completion of the time interval which is initiated by the application of input voltage.
76 & 96 - Same as the above except, closing the control switch after time out will de-energize the relay and reset the timer. Opening the switch will initiate another time interval. Closing the control switch during timing will reset the time to zero and inhibit timing until opened again.

Interval On (Input Controlled)

72 & 92 - Output relay is energized by the application of input voltage. The time interval is initiated at the same time with the relay de-energizing at the completion of the time interval.
76 & 96 - Same as above. Closing the control switch will have no effect on timing or the state of the relay.

Recycler (Initially Off)

72 & 92 - Output relay will begin cycling at a 50% duty cycle with the application of input power. The initial state of the relay will be de-energized.
76 & 96 - Same as the above except, closing the control switch will de-energize the relay and inhibit timing until it is once again opened, at which time it will start from zero time.

Recycler (Initially On)

72 & 92 - Output relay will begin cycling at a 50% duty cycle with the application of input power. The initial state of the relay will be energized.
76 & 96 - Same as the above except, closing the control switch will energize the relay and inhibit timing until it is once again opened, at which time it will start from zero time.

11 Pin Only

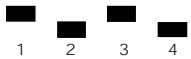
Delay on Release

76 & 96 - Output relay is energized by the closing of the control switch with the input applied or the application of input voltage with the control switch already closed. The time interval will be initiated by the opening of the control switch with the relay de-energizing at the completion of the time interval. Closing the control switch after time out will energize the relay in preparation for another time interval. Closing the control switch during timing will reset the time to zero and inhibit timing until opened again.

Inverted Delay on Release

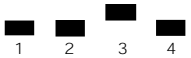
72 & 92 - No Time Delay - Instantly On
76 & 96 - Output relay will energize with the application of the input voltage when the control switch is open. Control switch closing will de-energize the relay. A timing interval will be initiated with the opening of the control switch, at the completion of which the relay willenergize. With the control switch closed upon application of input voltage, the relay will wait until the control switch is opened to initiate a time interval after which the relay will energize. Closing of the control switch during timing will reset the time to zero and inhibit timing until opened again.

Interval On (Switch Controlled)



76 & 96 - Output relay is energized by the application of input voltage with the control switch closed or the closing of the control switch with the input applied. Immediately upon either, timing is initiated with the relay de-energizing at the completion of the time interval. Closing the control switch after time out will reset the timer, energize the relay, and initiate another time interval. Closing the control switch during timing will have no effect on timing or the state of the relay.

Interval Off



76 & 96 - Output relay will initially be energized with the application of the input voltage when the control switch is open. Control switch closing will de-energize the relay and start a time interval. At the completion of the time interval, the relay will energize. With the control switch closed upon application of input voltage, a time interval will be initiated after which the relay will energize. Closing of the control switch during timing will have no effect on timing or the state of the relay.

CNT series

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 (24-240VAC/DC) and fixed input types
- 10A output relay with DPDT contacts
- Thumbwheel switches for programming

File E22575

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.

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 sec.; 0.1 to 99.9/1 to 999 min.; 0.1 to 99.9/1 to 999/10 to 9,990 hr.
Timing Adjustment: Digital adjustment via thumbwheel switches.
Tolerance: ±0.5% ±0.05 sec.
Delta Time (for AC units add ±1 cycle 60Hz.): ±0.1% ±0.05 sec.
Repeatability (Including first cycle of operation.): ±0.1% ±0.05 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 (÷10); 100 to 99,900 (÷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 @ 25°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: 1,000V rms, 60 Hz.
Between All Other Conductors: 1,500V rms, 60Hz.

Input Data @ 25°C

Voltage: Universal Input Type: 24 - 240V ±15%, 50/60 Hz. AC or DC.
Fixed Input Types: 120VAC ±15%, 50/60 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 @ 25°C

Input Type	Nominal Voltage	Minimum Voltage	Maximum Voltage
Universal	24-240VAC/VDC	20.4VAC/VDC	276VAC/VDC
Fixed	120VAC	102VAC	138VAC
	12VDC	10.2VDC	13.8VDC

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°C to +70°C.
Operating: -10°C to +55°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.

Ordering Information – Authorized distributors are more likely to stock boldface items listed below.

Universal Input Model

Input Voltage	Part Number
24-240VAC/VDC	**CNT-35-96**

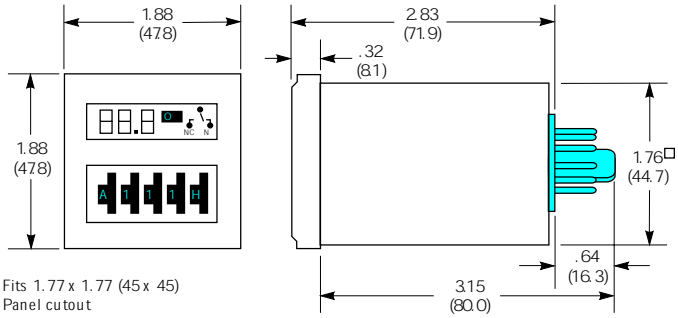
Fixed Input Models

Input Voltage	Part Number
12VDC	**CNT-35-26**
120VAC	**CNT-35-76**

Accessories

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

Outline Dimensions



Fits 1.77 x 1.77 (45 x 45) Panel cutout

Wiring Diagrams (Bottom Views)

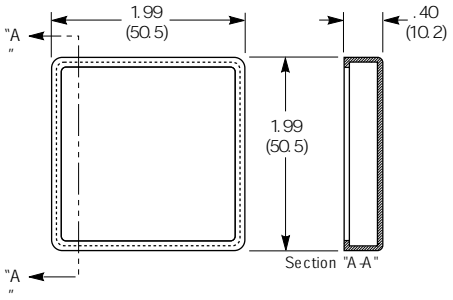
(pins numbered clockwise from keyway)

* **Note:** Input polarity for DC operation. For most reliable operation on AC, connect high side to "+" and low side to "–".

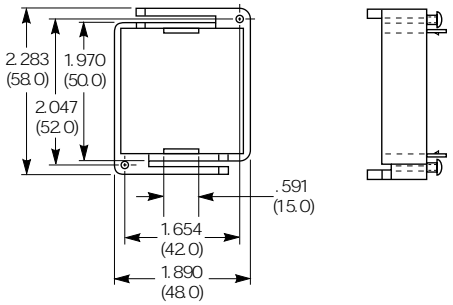
** **Important:** A dry circuit switch is recommended. A "dry circuit" switch is one rated to reliably switch currents of less than 50mA. Use of a switch rated for other than dry circuit may result in failure of the time delay relay to function properly.

Protective Cover & Mounting Clip Dimensions

SSA-24C668
Protective Cover



SSA-24C667
Mounting Clip



Programming Switch Diagram

With this setting, the relay would operate after a delay period of 214 seconds.

A	2	1	4	S

Function Select:

Timer Mode:
A = Delay On Operate
B = Delay On Release
C = Interval On
D = Control-Off Interval On
E = Recycle
F = Single Cycle
G = Control On-Off Interval On
H = Control On-Off Delay
I = Pulse
J = Cumulative Delay On Operate

Counter Mode: B = Divide by 10 C = Divide by 100 A & D-J = Normal Count

Time/Counter Setting: 001 to 999

Time Base/Counter Mode Select:

Time Base: .1S = 0.1 to 99.9 Sec. .1M = 0.1 to 99.9 Min. .1H = 0.1 to 99.9 Hrs. 10H = 10 to 9990 Hrs.
S = 1 to 999 Sec. M = 1 to 999 Min. H = 1 to 999 Hrs.

Counter Mode: CO = Operate at Preset Count CR = Release at Preset Count

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 turns 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 power-on with CONTROL on. RESET turns 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 turn-off of CONTROL. 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 free-running 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 turns 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 turns 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 turns 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.