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SWUDC Series TDR

… **Solid state CMOS digital circuitry**
… **Four timing modes: Delay on operate; delay on release; delay on operate & release; and interval or one-shot**
… **DPDT (2 form C) isolated 10 ampere relay contacts**
… **Timing selection: Binary coded Dip Switch with knob adjustable potentiometer**
… **User selectable timing ranges covering 0.1 secs. to 77.5 hours.**
… **UL File #E96739 (M)**
… **CSA File #LR62586**

Timing Mode:

The SWUDC Series time delay relay operates in any one of four timing modes, user selected by means of 2 sections (S8, S9) of a 9 position Dip Switch (the other 7 sections control timing). These modes are as follows: Delay on operate, delay on release, delay on operate and release, interval or one-shot. An external switch may be used to provide trigger control of the time delay cycle.

Timing Diagrams & Modes:

Delay On Operate:

Two operation methods:

1) With external switch closed: delay on operate timing cycle begins upon application of input power. The relay contacts transfer at the end of the delay period and will remain transferred until input voltage is removed. Reset occurs when input voltage is removed.

2) With external switch open: delay on operate timing cycle begins after the application of input power and the closure of the external switch. Upon switch closure the relay contacts transfer at the end of the delay period and will remain transferred until the input voltage is removed. Reset occurs when input voltage is removed.
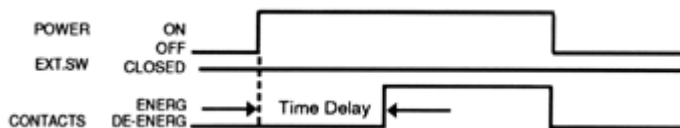
Delay On Release:

Two operation methods:

1) With external switch closed: Upon application of input voltage relay contacts transfer
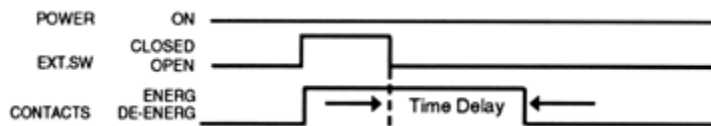
immediately. The timing cycle will begin when the external switch is opened. When the timing cycle is completed the relay contacts will release. The timing cycle may be reset to zero during the timing cycle by closing the external switch.

2) With external switch open: Upon application of input voltage and the closure of the external switch the relay contacts transfer immediately. The timing cycle will begin when the external switch is opened. When the timing cycle is completed the relay contacts will release. The timing cycle may be reset to zero during the timing cycle by closing the external switch.

Delay On Operate and Release:

With the external switch open input voltage is applied. With the closure of the external switch the delay on operate timing cycle begins and the relay contacts will transfer at the end of the delay period. With the re-opening of the external switch the delay on release timing cycle will begin and the relay contacts will transfer at the end of the delay period.
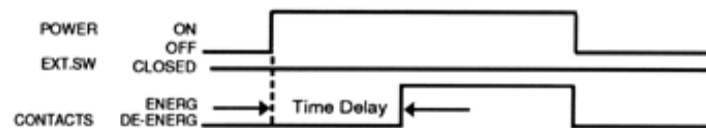
Interval or One-shot:

With the external switch closed input power is applied. The relay contacts transfer immediately and the interval or one-shot timing cycle begins. When the timing cycle is completed the relay contacts will release. The timing cycle may be reset to zero during the timing cycle by removing input power.
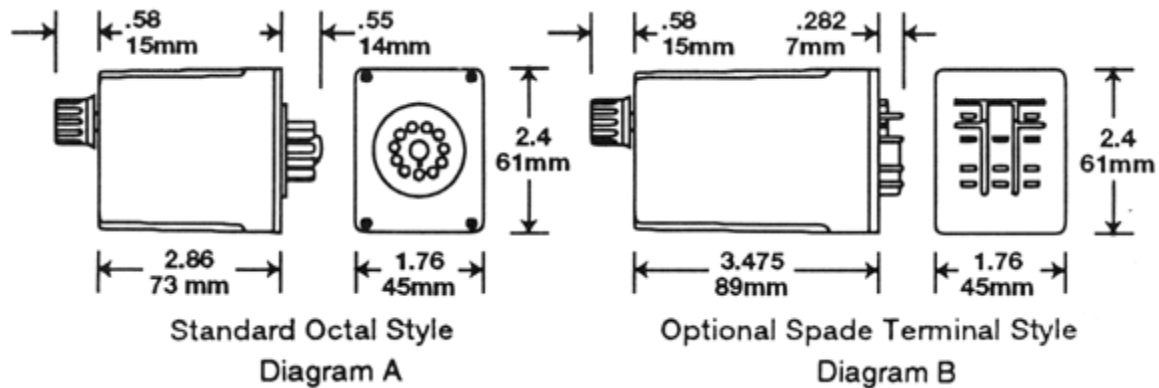
Outline Dimensions:

Standard Octal Style
Diagram A

Optional Spade Terminal Style
Diagram B

Contact Information:
Arrangement: 2 form C (DPDT) - Diagram C
Contact Material: Silver - Cadmium Oxide
Rating (Resistive): 10A @ 240V AC Resistive, 15A @ 30V DC Resistive, 15A @ 120V AC Resistive, 1/3 HP @ 120V AC, 1/2 HP @ 250V AC
Expected Life @ 25°C: 10 Million operations, Mechanical 100,000 operations minimum at rated loads.

Environmental Information:
Temperature Range: Storage: -60°C to +105°C (-76°F to +221°F) Operating: -45°C to +70°C (-49°F to +158°F)

Mechanical Information:
Termination: 11-pin Octal Style Plug or 11-pin spade terminals. (Diagram C&D).
Enclosure: White plastic case with a dial scale for knob adjustment, reference only. LSWUDC version has a black case.
Weight: 4 oz (114g) approx.

Initial Dielectric Strength:
Between open contacts: 1000V RMS, Between adjacent contacts: 1500V RMS, Between contacts & coil: 1500V RMS.

Input Information:
Voltage: 12V - AC or DC, 24V - AC or DC, 48V DC, 110V DC, 120V AC. **Other voltages available.**
Power Requirement: AC inputs: 3 VA or less, DC inputs: 3 Watts or less.
Transient Protection: 1 JOULE MOV
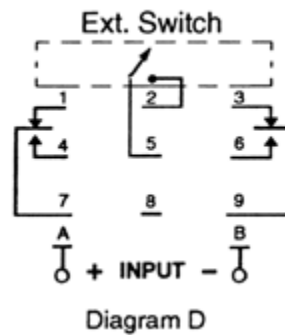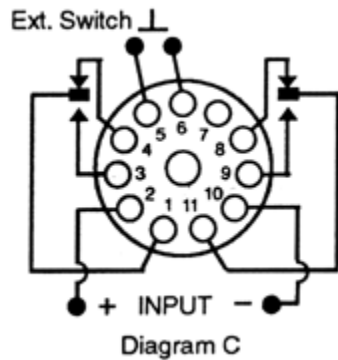Polarity Protection: On DC inputs - Yes

Input Voltages & Limits:

Nominal	Minimum	Maximum
12V AC	10V	14V
24V AC	20V	28V
120V AC	105V	130V
12V DC	11V	14V
24V DC	20V	32V
48V DC	41V	55V
110V DC	95V	125V

Wiring Diagrams:

Diagram C

Diagram D

Time Delay Selection Procedure:
The SWUDC has four basic timing ranges selectable by means of two sections of a Dip
Switch (S1 & S2). These ranges represent a starting point from which the user, utilizing
Dip Switch positions S3 - S7, customizes narrower timing range to suit his/her timing
application. This custom timing range is knob adjustable with a 5:1 vernier control.

How To Select A Time Delay:
1) Determining The Appropriate Timing Range
Set Dip Switch positions S1 & S2 as follows for the four basic timing ranges.

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Time Delay Range	Switch Position	
	S1	S2
A: .1 sec. to 15.5 secs.	On	On
B: 10 secs. to 25 mins.	Off	On
C: 10 mins. to 25 hrs.	On	Off
D: 30 mins. to 77.5 hrs.	Off	On

*Choose the range which most narrowly incorporates the time delay you desire. e.g. for 180 secs. Choose range B and set S1 to Off and S2 to On.

2) Calculating The Multiplier For The Desired Time Delay
Dip Switch positions S3 - S7 are used to set the multiplier which will customize your time delay range. The values for these settings are as follows:

Switch Position	Multiplier Value
S3	16
S4	8
S5	4
S6	2
S7	1
Total =	31

The Formula
Once you have chosen the appropriate basic timing range, perform the following calculations - (to clarify the steps use the desired time delay of 180 secs. as an example):
A) For 180 seconds select range B (10 secs. to 25 mins.).
B) Divide the desired time delay (180 secs.) by the minimum time of the selected range. (minimum time in range B is 10 secs.) 180/10 = 18. Always convert to the same time units (min., sec., hrs.) when dividing.
C) The multiplier is equal to 1/2 of this quotient - 180/10 = 18. 18/2 = 9, therefore the multiplier for 180 seconds is 9 and the user must set switches S3- S7 as follows:

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Switch Position	Multiplier Value		Selected:
S3	16	Off	
S4	8	On	
S5	4	Off	8
S6	2	Off	
S7	1	On	1
	Multiplier =		9

*Select the on positions which add up to the multiplier.

The multiplier is always the closest number equal to half the quotient. This formula will give you a 5:1 vernier knob adjustable timing range with the user desired time delay as the middle of the timing range. The approximate maximum of any timing range the user selects is always 2x the desired timing e.g. 2 x 180 = 360 secs. The maximum of the selected range will be 360 secs. To determine the approximate minimum setting of the timing range, simply divide the maximum setting by 5. e.g. 360/5 = 72 secs. Therefore, as per our example, to get a time delay of 180 secs the switch positions will be as follows:

S1	S2	S3	S4	S5	S6	S7
Off	On	Off	On	Off	Off	On

User will have a time delay range of 72 secs - 360 secs.

SWUDC Timing Mode Operating Instructions:
The Amperite SWUDC Time Delay Relay operates in any one of four modes. These are user selectable by means of setting S8 and S9 of the nine positions Dip Switch. The modes and switch positions are as follows:

Mode	Switch Position	
	S8	S9
Delay on operate	Off	On
Delay on release	On	Off

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Delay on operate and release	Off	Off
Interval or One-shot	On	On

Operating procedure for each mode:
The following is a thumbnail sketch of each mode and its operation.

Delay On Operate:
Two Methods
1) Closed External Switch. Apply power. Relay contacts transfer after time delay.
2) Open External Switch. Apply power. Close external switch Delay time starts after switch is closed and relay contacts transfer at the end of the delay time.

Delay On Release:
Two Methods
1) Closed External Switch. Apply power. Relay contacts transfer immediately. Open external switch. Time delay begins, and relay contacts release after delay is completed.
2) Open External Switch. Apply power. Close external switch. Relay contacts transfer. Open external switch to start time delay. Relay contacts release after completion of time delay.

Delay On Operate and Release:
Open External Switch. Apply power. Close external switch. Delay on operate time delay starts and relay contacts transfer at the end of the delay time. Open external switch. Delay on release time delay starts and relay contacts release after completion of the delay time.
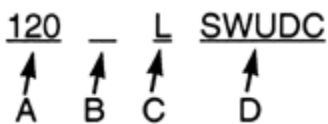
Interval or one-shot:
Close External Switch. Apply power. Relay contacts transfer immediately. At the end of the delay time the relay contacts release.

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Ordering Information:
Definition of a part number for the Amperite SWUDC Series Time Delay Relay.
Example:

```
120  _  L  SWUDC
 ↑   ↑  ↑    ↑
 A   B  C    D
```

A: Denotes nominal input voltage. Voltages Available: 12V - AC or DC, 24V - AC or

DC, 48V DC, 110V DC, 120V AC. **Custom Voltages are available.**

B: For custom voltages only - denotes type of input current required for operation: A = AC - Alternating Current, D = DC - Direct Current

C: Enter "L" if optional 11-pin spade terminals are required, (Diagrams B & D).

D: Denotes DPDT (2 form C) 10 ampere CMOS four timing mode SWUDC Series Time Delay Relay with binary coded nine position Dip Switch & built in potentiometer.

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