

# Programmable Digital Timer *Eliro*<sup>®</sup>

- Digital 7-Segment display Supply Voltage range of 110-240 VAC
- Input Signal Sensing range of 85-265 VAC/100-265 VDC & 20-60 VAC/DC
- Inbuilt library of 33 functions covering majority applications
- Easy steps to program customized functions
- Suitable for Panel and Base/DIN mounting
- Two separate Channel outputs with selectable Timer modes
- Wide timing range - 0.1 Sec. to 999 Days
- Tamper proof with key lock feature
- Provision to edit Preset time during Run time
- Provision to save two independent functional Profiles (P1 & P2)



## Ordering Information

| Cat. No. | Description                                                                                        |
|----------|----------------------------------------------------------------------------------------------------|
| V7DFTS3  | 110 - 240 VAC, Multi Function Digital Timer - Eliro (33 Functions), 2 C/O                          |
| V7DDSS3  | 110 - 240 VAC, Multi Function Digital Timer - Eliro (33 Functions), 2 C/O, 11 Pin Universal socket |

# Programmable Digital Timer *Eliso*<sup>®</sup>



| Cat. No.                         | V7DFTS3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | V7DDSS3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameters</b>                | <b>Programmable Multi Function Digital Timer</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Timer Description                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Default Functions                | 1) On delay<br>2) On delay constant supply type 2<br>3) On delay constant supply type 3<br>4) On delay (control switch resettable)<br>5) Signal on delay<br>6) Inverted signal on delay<br>7) Inverted signal on delay type 2<br>8) Signal off delay<br>9) Off delay const. supply type 2<br>10) Cyclic on/off<br>11) Cyclic off/on<br>12) Asymmetric cycle pulse start<br>13) Asymmetric recycler pulse start type 2<br>14) Signal on off delay<br>15) Signal on off delay type 2<br>16) Signal off/on (new)<br>17) Impulse on energizing | 18) Impulse on/off<br>19) Accumulative delay on signal<br>20) Accumulative delay on inverted signal<br>21) Accumulative impulse on signal<br>22) Leading edge impulse<br>23) Leading edge impulse 2<br>24) Trailing edge impulse<br>25) Trailing edge impulse 2<br>26) Delayed impulse<br>27) Delayed impulse type 2<br>28) Delayed pulse (constant supply)<br>29) Delayed pulse (remote trig.)<br>30) Delayed pulse (const. supply type 1)<br>31) On pulse (control switch resettable)<br>32) On pulse (supply reset)mode<br>33) Leading edge bi-stable or step relay<br>34) Forward - Reverse Mode with total time<br>35) Forward - Reverse Mode without total time |
| Supply Voltage (Φ)               | 110 - 240 VAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Supply Variation                 | -20% to +10% (of Φ)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Frequency                        | 47-63 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Power Consumption (Max.)         | 9 VA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Timing Range                     | 0.1s to 999 days                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Reset Time/Initiate Time         | 200 ms (Max.) / 100 ms (Max.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Input Signals/Signal Isolation   | High Range: 85-265V AC/ 100-265V DC, Low Range: 24-60V AC/DC / 2 KV                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Signal Sensing Time/ Wait Period | 50ms. (max.) / 100ms @ Power On & for signal based modes only.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Timing Accuracy                  | ± 0.01%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Output                           | Relay Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2 C/O                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                  | Contact Rating                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5A for NO & 3A for NC @ 250VAC/30VDC (Resistive.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                  | Electrical Life                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1x10 <sup>5</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                  | Mechanical Life                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5x10 <sup>6</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Utilization Category             | AC - 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 250V AC/2A, Cos Ø = 0.6, 85°C, 100000 Operations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                  | DC - 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Ue rated voltage V – 24; Ie rated current A – 2.0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Operating Temperature            | -5° C to +55° C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Storage Temperature              | -10° C to +60° C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Humidity (Non Condensing)        | 95% (Rh)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| LED Indication                   | SV (Red) - Set Value; P1/P2 (Red) -P1 Running; Up/Down (Red)-Up Counting; SG (Green)- Signal Present; OP1 (Red)-Relay OP1 ON; OP2 (Red)-Relay OP2 ON;                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Enclosure                        | IP 30 for Housing & front Facial and IP 20 for Terminals                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Dimension (W x H x D) (in mm)    | 48 X 48 X 92.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Weight (unpacked)                | 160 g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Mounting                         | Panel / Flush Mountable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Base / DIN Rail with 11 Pin Universal socket                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Certification                    |                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Degree of Protection             | IP 20 for Terminals, IP 30 for Enclosure, IP 40 for Front side                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## EMI / EMC

|                                   |                |
|-----------------------------------|----------------|
| Harmonic Current Emissions        | IEC 61000-3-2  |
| ESD                               | IEC 61000-4-2  |
| Radiated Susceptibility           | IEC 61000-4-3  |
| Electrical Fast Transients        | IEC 61000-4-4  |
| Surges                            | IEC 61000-4-5  |
| Conducted Susceptibility          | IEC 61000-4-6  |
| Voltage Dips & Interruptions (AC) | IEC 61000-4-11 |
| Voltage Dips & Interruptions (DC) | IEC 61000-4-29 |
| Conducted Emission                | CISPR 14-1     |
| Radiated Emission                 | CISPR 14-1     |

## Environmental

|                      |                |
|----------------------|----------------|
| Cold Heat            | IEC 60068-2-1  |
| Dry Heat             | IEC 60068-2-2  |
| Vibration            | IEC 60068-2-6  |
| Repetitive Shock     | IEC 60068-2-27 |
| Non-Repetitive Shock | IEC 60068-2-27 |

# Programmable Digital Timer *Eliso*<sup>®</sup>



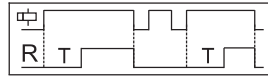
## FUNCTIONAL DIAGRAMS

⏻ : Supply Voltage, S: Input Signal, R: Relay Output

T: Preset Time, TON: Preset ON Time, TOFF: Preset OFF Time, T-a: Timing Break Before completion

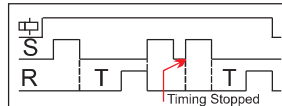
### ON DELAY [00]

On application of supply voltage, the preset time duration (T) starts. On completion of the preset time, the output is switched ON and remains ON till the supply voltage is present.



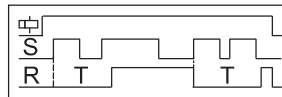
### ON DELAY CONSTANT SUPPLY TYPE 2 [01]

Timing will commence when the supply is present and input signal is not applied. After the time period has elapsed, output is switched ON. If signal is applied then the timing period stops. Timing will restart only when signal is removed. Therefore there are two methods this timer can be controlled, either by application or removal of signal input and with the interruption of the supply voltage to the timer with signal removal.



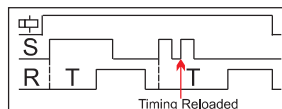
### ON DELAY CONSTANT SUPPLY TYPE 3 [02]

A permanent supply is required. The timing period starts when the signal is applied and will continue irrespective of any further changes to signal input. After the time period has elapsed output is switched ON. Signal change has no effect during timing period. To reset the timer, signal must be removed and then applied.



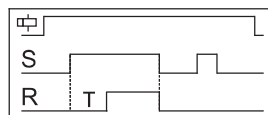
### ON DELAY (CONTROL SWITCH RESETTABLE) [03]

When the supply is connected and signal is applied, the timing function starts. If signal is removed and applied during the preset timing then timing is restarted and output stays OFF. After preset time has elapsed the output is ON.



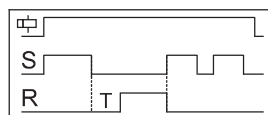
### SIGNAL ON DELAY [04]

On application of input signal, the preset time duration (T) starts. On completion of the preset time, the output is switched ON and remains ON till the input signal is present.



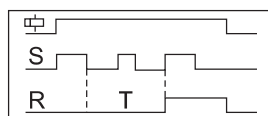
### INVERTED SIGNAL ON DELAY [05]

On application of supply voltage, the preset time duration (T) starts. When input signal is applied, the timing pauses & resumes only when the signal is removed. On completion of the preset time, the output is switched ON.



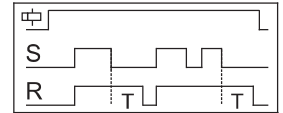
### INVERTED SIGNAL ON DELAY-TYPE 2 [06]

Timing starts only upon signal 'S' transition high to low. During timing or after completion of Time (i.e. relay on), any signal transition is ignored. To reset the timer supply has to be interrupted.



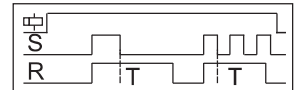
### SIGNAL OFF DELAY [07]

On application of supply voltage and input signal, the output is switched ON. When the signal is removed the preset time duration commences & the output is switched OFF at the end of the time duration.



### OFF DELAY CONST. SUPPLY TYPE 2 [08]

A permanent supply is required. When the input signal is applied the output is switched ON immediately. When input signal is removed the timing period starts. After the time period has elapsed output is switched OFF. Once the timing period has started further actions of input signal will have no effect. However once the timing cycle has been completed the process may be started again applying input signal. While the timer is executing the only way to reset the timer is to interrupt the supply.



### CYCLIC ON/OFF {ON start, (Sym, Asym)} [09]

On application of supply voltage, the output is initially switched ON for the preset 'ON' time duration (TON) after which it is switched OFF for the preset 'OFF' time duration (TOFF). This cycle repeats and continues till the supply is present.



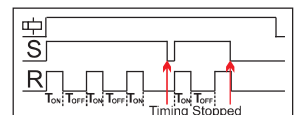
### CYCLIC OFF/ON {OFF Start, (Sym, Asym)} [10]

On application of supply voltage, the output is initially switched OFF for the preset 'OFF' time duration (TOFF) after which it is switched ON for the preset 'ON' time duration (TON). This cycle repeats and continues till the supply is present.



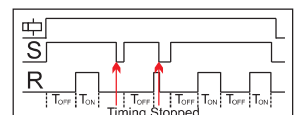
### ASYMMETRIC CYCLE PULSE START [11]

A permanent supply is required. The timer function is triggered by the input signal. When input signal applied the output is switched ON while the first preset time period (TON) elapses. Once this time period (TON) has elapsed output is switched OFF for the second preset time period (TOFF) period. Once this second time period (TOFF) had elapsed then output switched ON and the cycle will start from the beginning again. If input signal is removed during timing (TON or TOFF) the cycle will stop and output is switched OFF, cycle will start with output ON state when the input signal applied again.



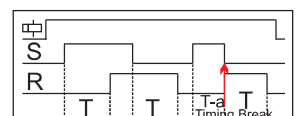
### ASYMMETRIC RECycler PULSE START TYPE 2 [12]

A permanent supply is required. The timer function is triggered by input signal. When input signal is applied the output is switched OFF while the first preset time period (TOFF) elapses. Once this time period (TOFF) has elapsed output is switched ON for the second preset time period (TON). Once this second time period (TON) had elapsed then output is switched OFF and the cycle will start from the beginning again. If input signal is removed during timing (TON or TOFF) the cycle will stop and output is switched OFF, cycle will start with output OFF state when the input signal applied again.



### SIGNAL ON OFF DELAY [13]

On application of signal the preset time (T) starts. After this preset time has elapsed, output is switched ON. During this timing, if signal is removed then output is switched ON immediately and OFF delay is started. Once this time period has elapsed the output is switched OFF. During this OFF delay if signal is reapplied the output switched OFF immediately and ON Delay restarted.



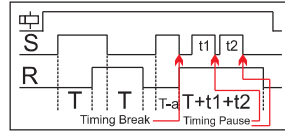
# Programmable Digital Timer *Eliso*<sup>®</sup>



## FUNCTIONAL DIAGRAMS

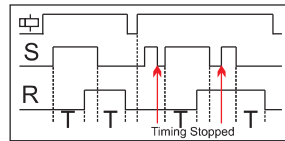
### SIGNAL ON OFF DELAY TYPE 2 [14]

On application of signal the preset time (T) starts. After this preset time has elapsed, output is switched ON. During this timing, if signal is removed then output is switched ON immediately and preset timing is restarted. Removing the signal during this timing suspends timing but does not reset the time sequence. Timing will resume immediately when signal is applied. Therefore, total time taken before the delayed contact changes state is the preset time plus any time that the signal is removed. Once this time period has elapsed the output is switched OFF.



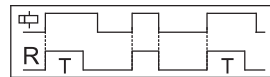
### SIGNAL OFF/ON [15]

On application of input signal, the preset delay time period (T) starts. During this timing if signal is removed then timing is stopped and timing will be restarted when signal applied again. After this time period has elapsed output is switched ON. On removal of input signal, the preset time period starts again & the output is switched OFF when the preset time duration is complete. Output stays OFF until supply voltage has been interrupted.



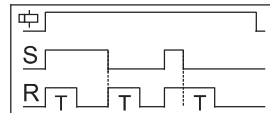
### IMPULSE ON ENERGIZING [16]

On application of supply voltage, the output is instantly switched ON for the preset time duration (T) after which it is switched OFF.



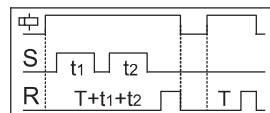
### IMPULSE ON/OFF [17]

On application or removal of input signal, the output is switched ON & the preset time duration (T) starts. On completion of the time duration the output is switched OFF. When timing commences, changing the state of the input signal resets the time.



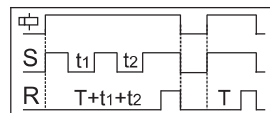
### ACCUMULATIVE DELAY ON SIGNAL [18]

On application of supply voltage, the preset timing duration commences. When input signal is applied, the timing pauses and resumes only when the input signal is removed. The output is switched ON at the end of the preset time duration (T).



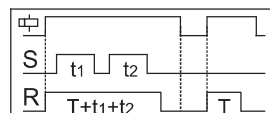
### ACCUMULATIVE DELAY ON INVERTED SIGNAL [19]

On application of supply voltage and input signal, the preset timing duration commences. When the signal is removed the timing pauses and resumes when the signal is applied. The output is switched ON at the end of the preset time duration (T).



### ACCUMULATIVE IMPULSE ON SIGNAL [20]

On application of supply voltage the output is switched ON & the preset timing duration commences. When the signal is applied the timing pauses and resumes when the signal is removed. The output is switched OFF at the end of the preset time duration (T).

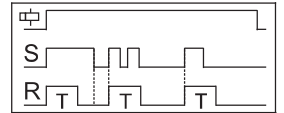


⏻: Supply Voltage, S: Input Signal, R: Relay Output

T: Preset Time, TON: Preset ON Time, TOFF: Preset OFF Time

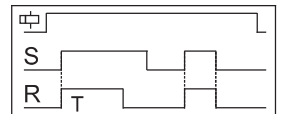
### LEADING EDGE IMPULSE1 [21]

On application of input signal the output is immediately switched ON. The output remains ON for the preset time duration (T) after which it is switched OFF. If the input signal is removed during the preset time, the output remains unaffected.



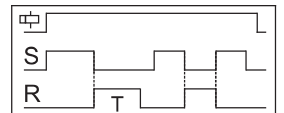
### LEADING EDGE IMPULSE2 [22]

On application of input signal the output is immediately switched ON. The output remains ON for the preset time duration (T) after which it is switched OFF. If the input signal is removed during the preset time, the output is immediately switched OFF.



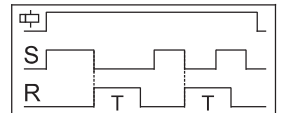
### TRAILING EDGE IMPULSE1 [23]

When the input signal to the timer is removed, the output is immediately switched ON for the preset time duration (T) after which it is switched OFF. If the input signal is applied during the preset time, the output is immediately switched OFF.



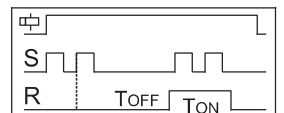
### TRAILING EDGE IMPULSE2 [24]

When the input signal to the timer is removed, the output is immediately switched ON for the preset time duration (T) after which it is switched OFF. If the input signal is applied during the preset time, the output remains unaffected.



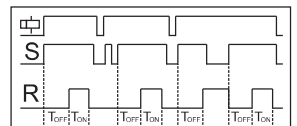
### DELAYED IMPULSE [25]

On application of input signal, the preset 'OFF' time duration (TOFF) starts. The output is switched ON at the end of the preset 'OFF' time duration & the preset 'ON' time duration commences irrespective of signal level and remains ON till the completion of 'TON'.



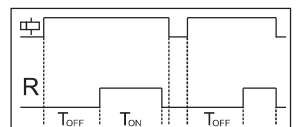
### DELAYED IMPULSE TYPE 2 [26]

A permanent supply is required. When signal is applied the output will remain OFF while the first preset time period (TOFF) elapses. Once this time period has elapsed the output is switched ON for the second preset time period (TON). Once this second time period (TON) had elapsed then output is switched OFF and cycle stops. Output stays OFF until supply voltage has been interrupted. During timing period (TON or TOFF) if signal is removed then output is switched OFF and the cycle stops, cycle will start with output OFF state when the input signal applied again.



### DELAYED PULSE (CONSTANT SUPPLY) POWER BASED [27]

The timing period (TOFF) starts when the supply is applied to the timer. After the preset has elapsed output is switched ON for the preset pulse (TON) duration. To reset the timer the supply has to be interrupted. If this interruption occurs during the pulsed output (TON) then the output is switched OFF and the timer will reset.



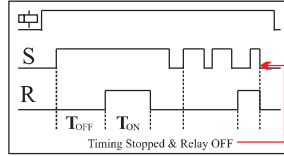
# Programmable Digital Timer *Eliso*<sup>®</sup>



## FUNCTIONAL DIAGRAMS

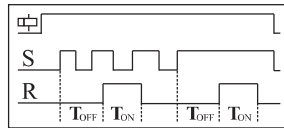
### DELAYED PULSE (REMOTE TRIG.) [28]

The timing period (TOFF) will start when input signal is applied with the supply connected. After preset time (TOFF) has elapsed the output is switched ON for the per-selected pulse (TON) duration. To reset the timer either input signal needs to be removed or supply has to interrupt. If this action occurs during the pulsed output cycle (TON) then output is switched OFF and the timer will reset.



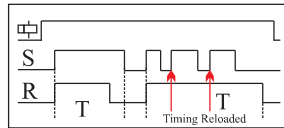
### DELAYED PULSE (CONST. SUPPLY TYPE 1) [29]

Supply to the unit must be continuous. On application of input signal the time period 'TOFF' starts to run. On completion of 'TOFF', the relay output is switched ON immediately and the time period 'TON' starts to run. On completion of 'TON' the output is switched OFF. The input signal has no effect until 'TOFF' + 'TON' have completely expired.



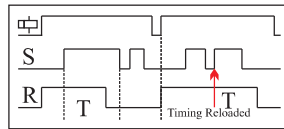
### ON PULSE (CONTROL SWITCH RESETTABLE) / WATCH DOG TYPE [30]

When the supply is connected and signal is applied, output is switched ON and the timing function starts. If signal is removed and applied during the preset timing then timing is restarted and output stays ON. After preset time (TON) has elapsed the output is switched OFF.



### ON PULSE (SUPPLY RESET)[31]

On application of supply voltage the output is switched ON. The first pulse of input signal starts the preset time period. Receiving pulses during the time period extends it and output stays ON. Receiving no signal pulses during the time period completes it and output is switched OFF. Output stays OFF until supply voltage has been interrupted.

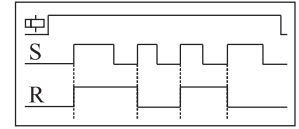


☐: Supply Voltage, S: Input Signal, R: Relay Output

T: Preset Time, TON: Preset ON Time, TOFF: Preset OFF Time

### LEADING EDGE BI-STABLE OR STEP RELAY [32]

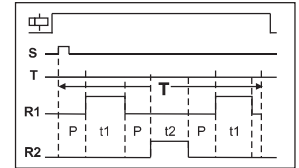
After every signal, the output contact changes their states, alternately switching from open to close and vice versa.



### FORWARD- REVERSE MODE WITH TOTAL TIME [33]

On application of supply & input signal the pause time P starts after this output t1 is switched ON again it will take the pause time and output t2 is switched ON.

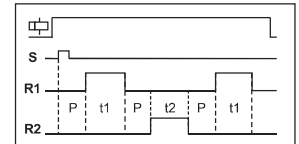
Note: This mode and total time duration should 'RELOAD' when Signal transition occurs From low to high. In this case, RELOAD means it restarts the cycle.



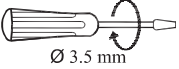
### FORWARD- REVERSE MODE WITHOUT TOTAL TIME [34]

On application of supply & input signal the pause time P starts after this output t1 is switched ON again it will take the pause time and output t2 is switched ON. This mode will be continued, till the supply is Present to the device.

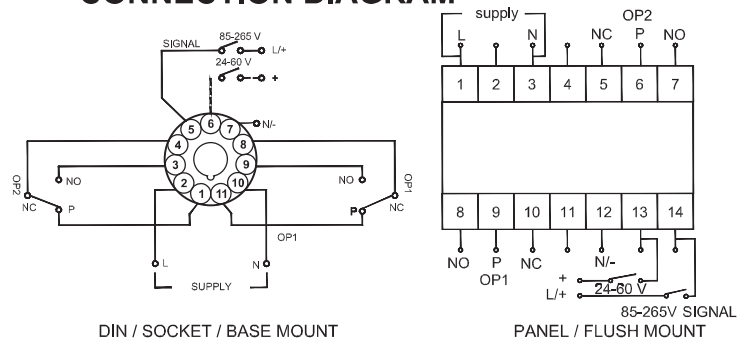
Note: This mode should 'RELOAD' when Signal transition occurs From low to high. In this case, RELOAD means it restarts the cycle.



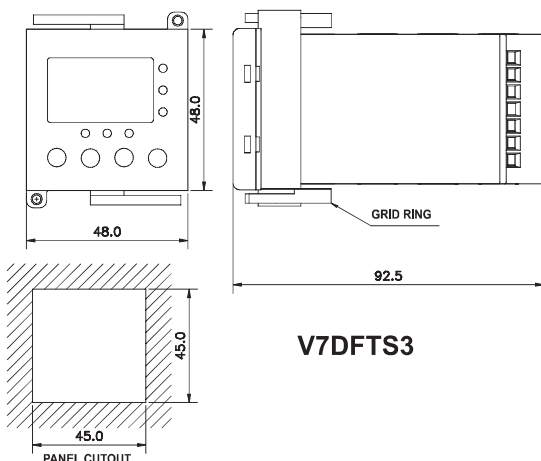
## TERMINAL TORQUE & CAPACITY

|                                                                                     |                                             |
|-------------------------------------------------------------------------------------|---------------------------------------------|
|  | 0.50 N.m (4.5 Lb.in)                        |
|  | 1 x 1.5 mm <sup>2</sup> Solid/Stranded Wire |
| AWG                                                                                 | 1 x 26 to 14                                |

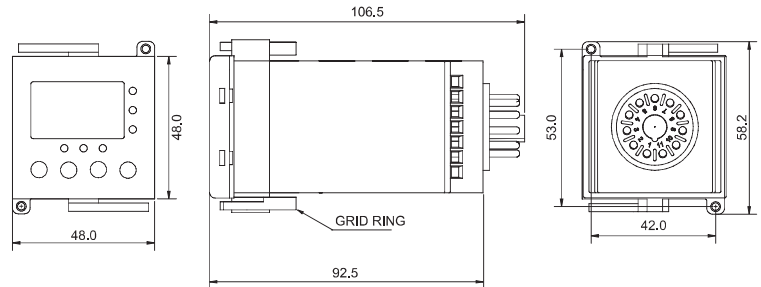
## CONNECTION DIAGRAM



## MOUNTING DIMENSIONS (mm)



V7DFTS3



V7DDSS3