

651-8-3000/3001 Microprocessor-Based Multi-Range Solid State Timer



INSTALLATION
INSTRUCTIONS
MARCH 2003
651-0-0000

The Model 651 is a microprocessor-based device capable of performing four different timing modes over three different timing ranges. The timing modes include On-Delay, Off-Delay, On-Delay with momentary Start, and On-Delay with Store Time. The timing ranges allow for delays from 1 millisecond to 199 hours 59 minutes. The timing modes and ranges are selected using a 7 switch DIP assembly located on the inside of the timer.

The time setting is entered through the keyboard located in the timer faceplate while the time value is displayed on the LCD readout. The timer keyboard can be disabled to guard against accidental time changes.

The timer is housed in a standard 15-terminal plug-in round case and will directly replace an existing electro-mechanical or electronic plug-in round case timer. A totally sealed faceplate allows this timer to be used in harsh environments.

Both instantaneous and timed contacts are provided and timers are available for operation on either 120VAC or 240VAC.



SPECIFICATIONS

TIMING RANGES

- 0.001 sec. to 19.999 sec.
- 0.01 sec. to 199.99 sec.
- 0.1 sec. to 1999.9 sec.
- sec. to 199 min., 59 sec.
- 1 min. to 199 hrs., 59 min.

TIMING MODES

- On-Delay or Reverse Start Delay

TIME SETTING

- Front Panel Keypad

TIME REPEAT ACCURACY

- ±0.005 sec.

RESET TIME

- 25 milliseconds

CONTROL VOLTAGE INITIATE TIME

- 25 milliseconds

MEMORY

- Lithium Battery – Replaceable

OPERATING POWER

- 120 or 240VAC, +10%, -20%, 50/60Hz.

POWER CONSUMPTION

- 5.2VA

INSTANTANEOUS RELAY OUTPUT

- 7 Amps Resistive, 240VAC, 2 N.O.
2 N.C. Contacts

TIMED RELAY OUTPUT

- 7 Amps Resistive, 240VAC, 2 N.O.
2 N.C. Contacts

RELAY MECHANICAL LIFE

- 50,000,000 Operations

DISPLAY

- LCD - 4 1/2 Digit, 7/16" High

TERMINATION

- Screw Terminals

MOUNTING

- Plug-in Case

SHORT CIRCUIT PROTECTION

- 1/4 Amp Fuse

TRANSIENT VOLTAGE PROTECTION

- Metal Oxide Varistor

OPERATING TEMPERATURE

- 0°-60°C

UL LISTING

- File No. E104697

C-UL (CANADA) LISTING

- File No. E104697

NEMA RATING

- NEMA 12

TIMING MODE SELECTION

The Model 651 is capable of performing 6 different modes of timing namely; On-Delay, Off-Delay, On-Delay with Momentary Start, and On-Delay with Store Time. The correct mode is selected using switches #5, 6 & 7 on the 7 switch DIP assembly located on the inside of the timer.

S5	S6	S7	TIMING MODE	
0	0	0	1	On-Delay
0	X	0	2	Reverse Start, Delay
X	0	0	3	Momentary Start
X	0	X	4	Accumulator

Note: OFF = Open ON = Closed

See the chart below for the correct switch settings.

ON-DELAY

The supply voltage is applied at all times. When voltage is applied to the control terminal, the instantaneous contacts change state and timing begins. At the completion of the timing period, the timed contacts change state. Reset takes place upon removal of the control voltage.

OFF-DELAY

The supply voltage is applied at all times. When voltage is applied to the control terminal, the instantaneous contacts change state. When the voltage is removed from the control terminal, the instantaneous contacts change back to their original state and timing begins. At the completion of the timing period, the timed contacts change state. Reset takes place when voltage is once again applied to the control terminal.

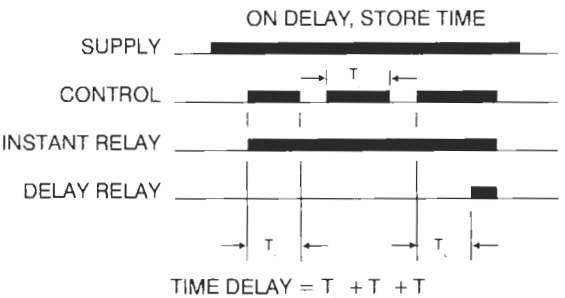
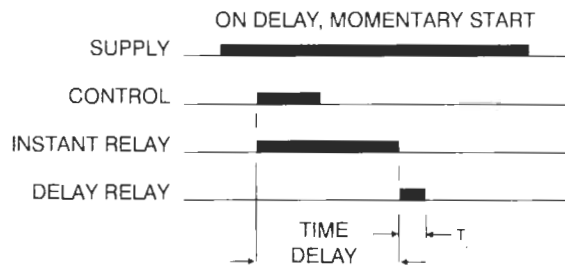
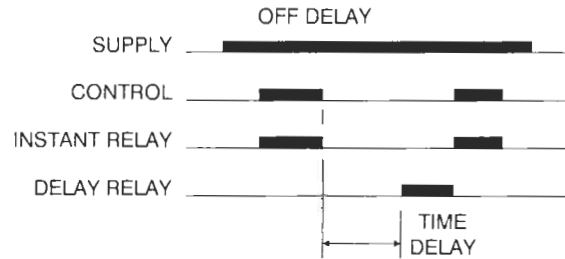
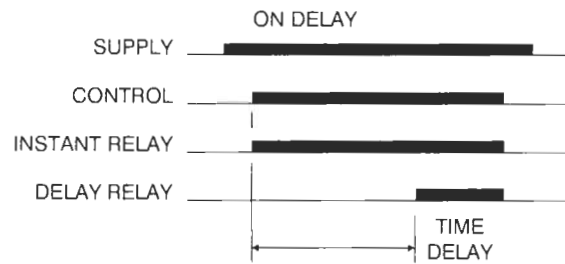
ON-DELAY, MOMENTARY START

The supply voltage is applied at all times. When voltage is applied to the control terminal, the instantaneous contacts change state and timing begins. The control voltage can now be removed. Upon completion of timing, the instantaneous contacts change back to their original state and the delayed contacts change state for a programmable amount of time. The timing interval is controlled by setpoint 1, and the output pulse width is controlled by setpoint 2 (with a time base of .01 sec). If the control is still on at the end of timing, both the instantaneous and delayed contacts remain in their transferred state until reset by removal of the control voltage.

ON-DELAY, STORE TIME

The supply voltage is applied at all times. When voltage is applied to the control terminal, the instantaneous contacts change state and timing begins. If the control voltage is removed before completion of the timing period, the instantaneous contacts remain in their transferred state and the elapsed time is stored. When the control voltage is again applied, timing continues from where it was stored. At the completion of the timing period, the timed contacts change state. Reset takes place upon removal of the control voltage.

TIMING DIAGRAMS



TIMING RANGE SELECTION

The Model 651 allows for the selection of five different timing ranges. While operating in the "Hours:Minutes" range, the ▲ or ▼ will flash to give an indication that timing is taking place. The correct timing range is selected using switches #1, #2 and #3 on the seven switch DIP assembly located on the inside of the timer. See the chart for the correct switch settings.

TIME RANGE SELECTION CHART

SW1	SW2	SW3	TIMING RANGE
OFF	OFF	OFF	0.001 - 19.999 Sec.
OFF	OFF	ON	0.01 - 199.99 Sec.
OFF	ON	OFF	0.1 - 1999.9 Sec.
OFF	ON	ON	1 Sec.-190 Min., 59 Sec.
ON	OFF	OFF	1 Min.-199 Hrs., 59 Sec.

Note: OFF = Open ON = Closed

KEYPAD LOCKOUT SELECTION

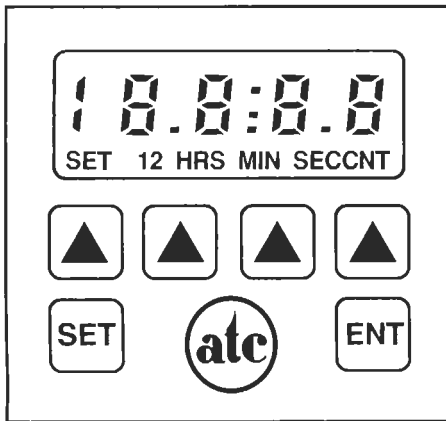
The Keypad can be disabled to guard against accidental changes by using switch #4 on the seven switch DIP assembly located on the inside of the timer. See the chart below for the correct switch setting.

SW4	KEYPAD LOCKOUT
OFF	Keypad Enabled
ON	Keypad Disabled

Note: OFF = Open ON = Closed

PROGRAMMING THE TIME

After the timing mode and the timing range have both been selected, the proper time delay value can now be programmed.



The Model 651-8-3000 is equipped with a 10-year life, replaceable lithium battery and can be programmed without an outside power source. To program push the "SET" button and the display will illuminate the timing range selected. Four dashes will also appear indicating that no set point is presently programmed. Depress the "SET" key a second time and the word "SET" will now be illuminated on the display along with four zeros. The desired time value is now entered using the four increment keys. Each key controls its own digit with the exception of the left increment key which is used to set the left most 1 and 1/2 digits on the display (these increment to 19 before returning to 0). With a timing range of "MIN:SEC" or "HR:MIN", the digit to the right of the colon will roll over from 5 to 0. Holding a key depressed for longer than 1 second causes the digit to automatically increment at the rate of 2 numbers per second until released. When the digits on the display correspond to the desired time value, pressing the "ENT" key will enter that value into the memory.

The set point can be changed without interrupting the timing cycle by following the normal programming procedure. This new value will then be used on the next timing cycle.

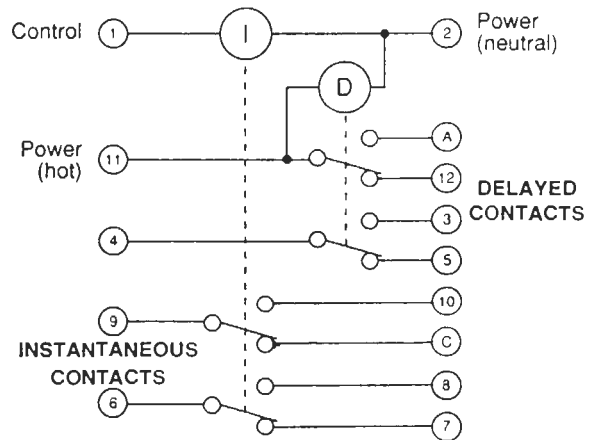
The set point can also be viewed without interrupting the timing cycle by depressing the "SET" key. Press the "ENT" key to return the display to the time remaining.

If the keypad lockout is enabled, you can still view the set point by depressing the "SET" key but the set point cannot be changed using the increment keys. To indicate that the keypad is locked while a programmed value is being viewed, the display alternates the numerical value with the word "LOC".

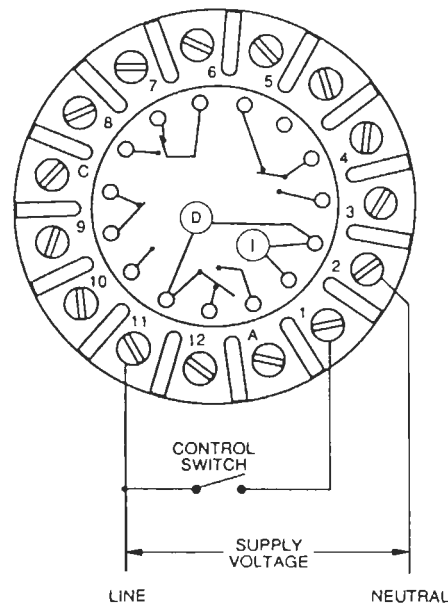
POWER FAILURE

If all power is lost during a timing cycle, the instantaneous contacts will transfer back to their original state. When power is restored, the timer will reset back to the set point if programmed for "standard start" or continue from the point of power interruption if programmed to "reverse start". The timer set point will be maintained.

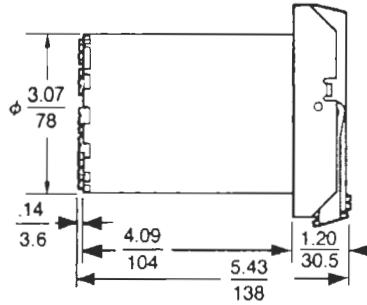
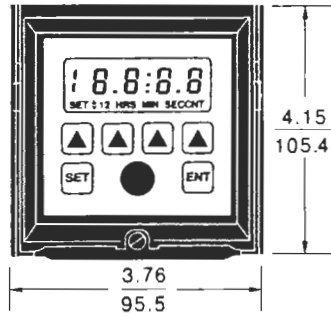
INTERNAL SCHEMATIC



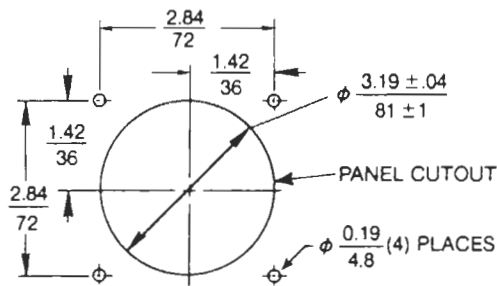
WIRING CONNECTIONS



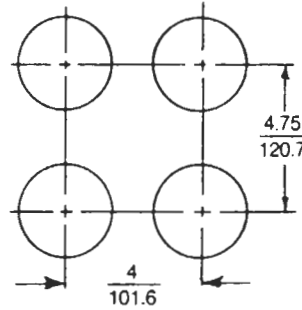
EXTERNAL DIMENSIONS



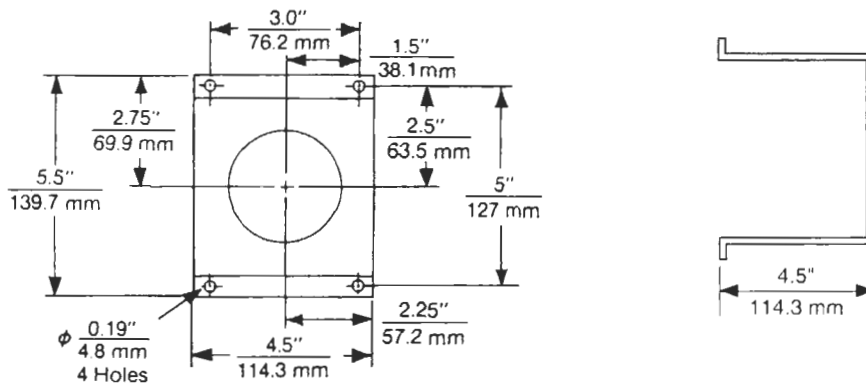
MOUNTING DIMENSIONS



**MINIMUM DIMENSIONS-
MULTIPLE MOUNTINGS**



MODEL 600-3-3950-SURFACE MOUNTING BRACKET



ORDERING INFORMATION

Part Number	Description
651-8-3000	Timer 120 VAC
651-8-3001	Timer 240 VAC
652-3-0130	Battery - Lithium Replacement
651-3-0128	Gasket 1/8" Thick
651-3-0129	Gasket 1/4" Thick