



Solid State Timers and Controllers

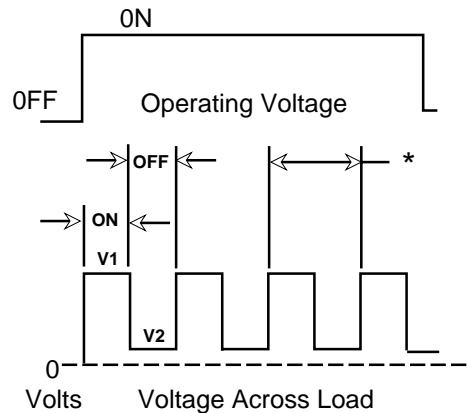
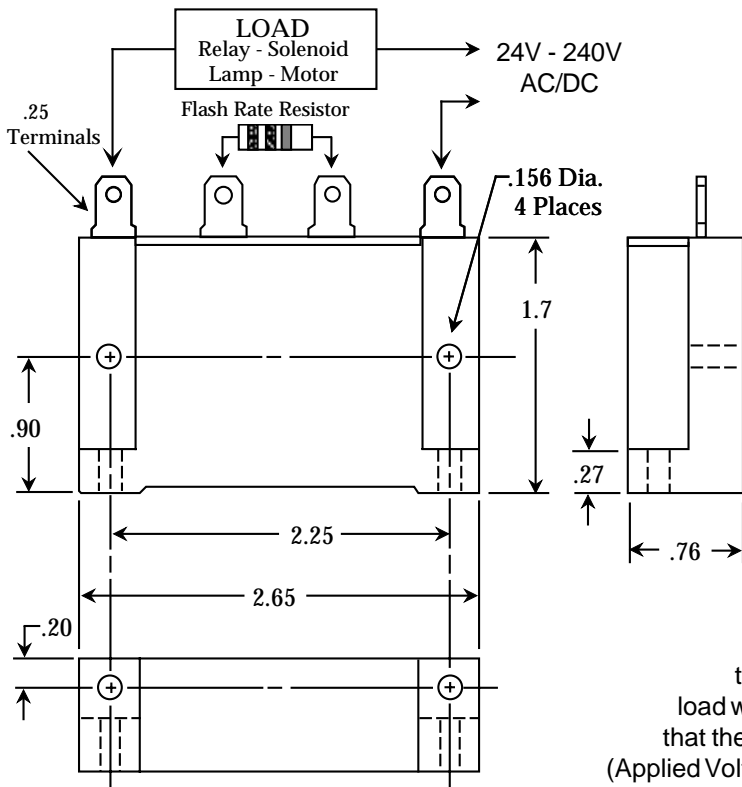


438UF

Universal Flasher

The Model 438UF is an in-line solid state timing device that performs as a two terminal flasher, or a 50% repeat cycle timer. When connected in series with a load circuit, the 438UF will turn the load circuit ON and OFF at a 50% duty cycle at the flashing rate determined by the value of an external resistor. The flash rate can be made to vary from 30 flashes per minute (1 every 2 seconds) to 1 flash every 2000 seconds. The full flash rate range can be set with an external resistor ranging from 0 ohms to 10 meg ohms. The 438UF operates at voltages ranging from 24 to 240 volts AC or DC, and services inductive load circuits, as well as lamp circuits. Load rating is .25A maximum.

Mechanical & Wiring Timing Diagram



V1 = Operating Voltage - 10 Volts
 V2 = 3mA x Load Resistance
 * Timing Period of one cycle determine from timing curve

How The 438UF Works

When the operating voltage is applied to the series combination of the 438UF and the load circuit, the 438UF turns ON, and the load will be energized. It is important to understand that the load current that flows is determined by the (Applied Voltage - 10 volts) divided by the load resistance.

The 10 volts is the maximum voltage that will be dropped across the 438UF at any operating voltage. As an example: a 440Ω (ohm) relay coil that would normally draw 250mA at 110V DC will now only be permitted to draw 227mA. This is determined by the voltage across the relay which becomes 110 - 10, or 100V DC (V1). At 100V, the current becomes 100V/440Ω = 227mA. At the end of the ON portion of the flashing cycle, the 438UF turns OFF, but leakage current continues to flow. This leakage current can be as high as 3mA. This would cause the relay to have 3mA x 440Ω = 1.32V (V2) across it. Always make certain that the dropout voltage of the load circuit is below the voltage caused by the residual leakage current. At the end of the OFF portion of the flashing cycle, the load turns back ON. This action continues for as long as operating voltage is applied. The time of the ON portion of the cycle will always be equal to the time of the OFF portion of the cycle. In this manner, the 438UF can also be used as a repeat cycle timer if the application can withstand the 50% duty cycle restriction. The *External Resistor Timing Curve* illustrates the value of the external resistor that will produce a given flashing period.



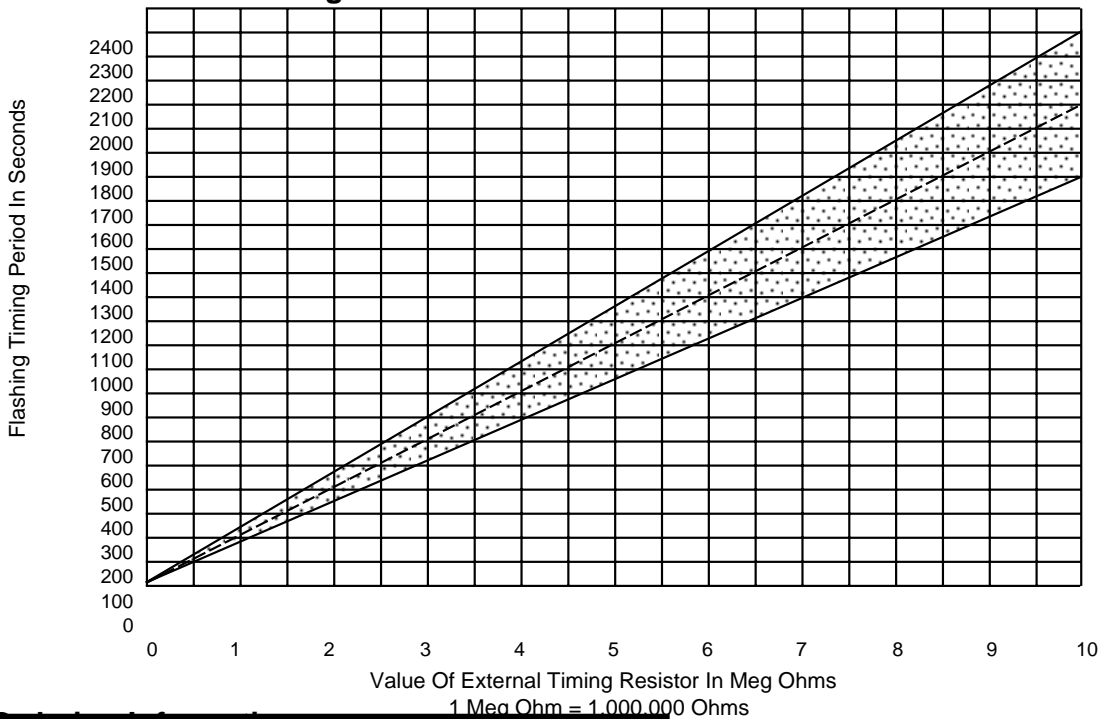
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Specifications



- Operating Voltage:** 24V - 240V AC/DC 50/60Hz.
- Timing Mode:** Flasher - Load turns ON for 50% of the timing cycle as determined by the value of the external timing resistor.
- Period Timing Range:** External resistor control from 2 to 2000 seconds will establish the time of a single period. Within the period, the load is ON for 50% of the time. 0 Ω to 10 Meg Ω covers specified flashing range.
- Timing Adjustment:** 0 Ω to 10 Meg Ω covers specified flashing range.
- Timing Resistor Rating:** 1/4 watt maximum.
- Timing Tolerance:** $\pm 15\%$ of calculated resistor vs timing value.
- Timing Variation:** $\pm 2\%$ at any combination of operating voltage and temperature.
- Repeatability Of Flashing Period:** $\pm 1\%$ nominal.
- Recycle Time:** 200 milliseconds.
- Output Rating:** .25A inductive with inrush current to 8 amperes for 8 milliseconds.
- Output Voltage Drop in "ON" State:** 10 volts max. voltage drop across the 438UF during the ON portion of the flashing period at any operating voltage and load current to .25A.
- Leakage Current in "OFF" State:** 3 milliamperes maximum at any operating voltage and load circuit.
- Transient Protection:** Maximum transient voltage protection is 6000 volts as delivered through a source resistance of 30 ohms with a maximum duration of 8.3 milliseconds.
- Operating Temperature:** -20°C to $+85^{\circ}\text{C}$
- Humidity:** 95% condensing
- Terminations:** Four (4) .25 Faston type.
- Data Sheet Revision Date:** March 15, 2000

External Resistor Timing Curve



438UF	2- 2000	24V - 240V AC/DC
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