

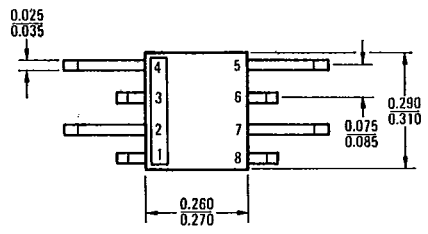
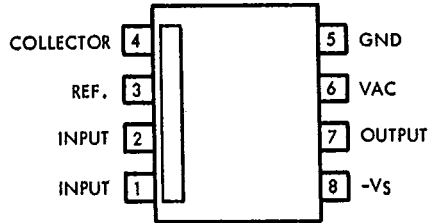


# ECG776

## ZERO VOLTAGE SWITCH

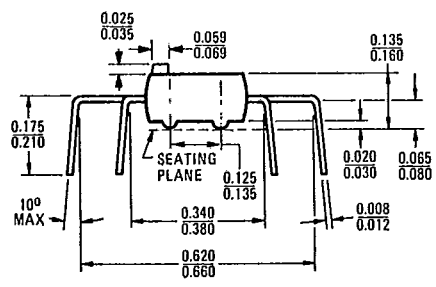
ECG776 is designed for use in ac power switching applications with output drive capable of triggering triacs. Other operational features include:

- A built-in voltage regulator that allows direct ac line operation
- A differential input with dual sensor inputs capable of testing the condition of two external sensors and controlling the gate pulse to a triac accordingly. Hysteresis or proportional control to this section may be added if desired.
- Sensor input "open and short" protection. This insures that the triac will never be turned "on" if either of the sensors are shorted or opened.
- A zero crossing detector that synchronizes the triac gate pulses with the zero crossing of the ac line voltage. This eliminates radio frequency interference (rfi) when used with resistive loads.



**Typical Applications Include:**

- Heater Controls
- Photo Controls
- Threshold Detector
- Lamp Driver
- Valve Control
- ON-OFF Power Controls
- Relay Driver
- Flasher Control



**MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
DC Voltage	V <sub>5-8</sub>	15	Vdc
DC Voltage	V <sub>4-8</sub>	15	Vdc
DC Voltage	V <sub>7-8</sub>	15	Vdc
Power Dissipation @ T <sub>A</sub> = 25°C	P <sub>D</sub>	1.0	Watt
Derate above 25°C	1/θ <sub>JA</sub>	10	mW/°C
Operating Temperature Range	T <sub>A</sub>	-10 to +75	°C
Storage Temperature Range	T <sub>stg</sub>	-55 to +150	°C

ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25° C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
V <sub>S</sub> with Inhibit Output (Sw. 1: A or B)	V <sub>SI</sub>	—	9.0	11	V <sub>dc</sub>
Output Leakage (Sw. 1: A or B)	I <sub>OL</sub>	—	5.0	100	μA
Input Current 1 (Sw. 1: A)	I <sub>1</sub>	—	5.0	15	μA
Input Current 2 (Sw. 1: B)	I <sub>2</sub>	—	5.0	15	μA
Inhibit Threshold (Sw. 1: A or B)	V <sub>TI</sub>	V <sub>ref</sub> +100 mV	V <sub>ref</sub> +10 mV	—	V <sub>dc</sub>
V <sub>S</sub> with Pulse Output (Sw. 1: A or B)	V <sub>SP</sub>	6.0	8.5	—	V <sub>dc</sub>
Peak Output Current (Sw. 1: A or B)	I <sub>OP</sub>	50	—	—	mA
Pulse Threshold (Sw. 1: A or B)	V <sub>TP</sub>	—	V <sub>ref</sub> -10 mV	V <sub>ref</sub> -100 mV	V <sub>dc</sub>
Output Pulse Width (Sw. 1: A or B) (See Figure 1)	τ <sub>A</sub> , τ <sub>B</sub>	—	70	—	μs
Input Short Protection (Sw. 1: A; Sw. 2: B)	I <sub>OS</sub>	—	5.0	100	μA
Input Short Protection (Sw. 1: B; Sw. 2: A)	I <sub>OS</sub>	—	5.0	100	μA

FIGURE 1 -- OUTPUT PULSE DEFINITION

FIGURE 2 -- CIRCUIT SCHEMATIC

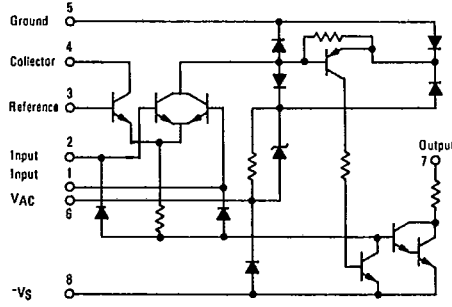
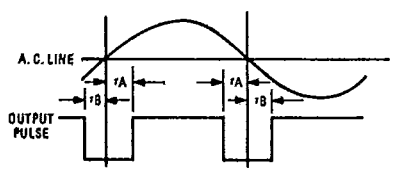


FIGURE 3 -- CIRCUIT FOR MEASURING OUTPUT PULSE WIDTH versus SOURCE RESISTANCE

Suggested circuit to vary output pulse width by value of R<sub>S</sub> (See Figure 4)

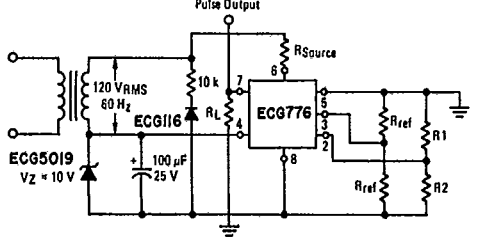
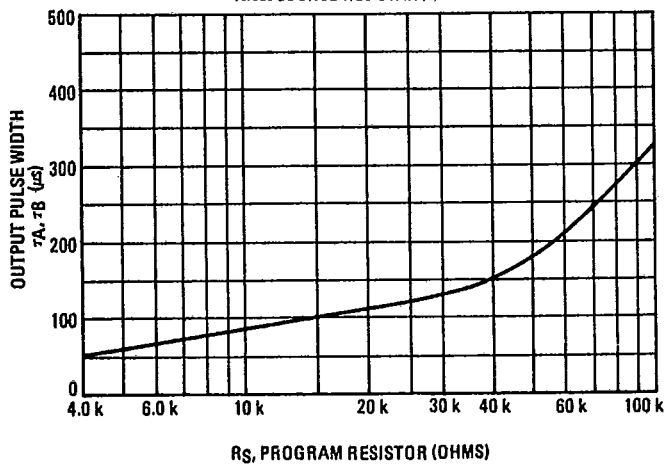
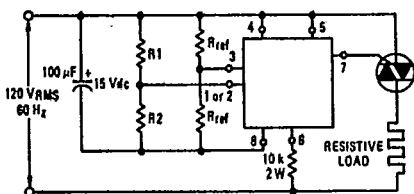


FIGURE 4 - OUTPUT PULSE WIDTH  
vs SOURCE RESISTANCE



TYPICAL ZERO VOLTAGE SWITCH APPLICATIONS FOR TRIAC CONTROL

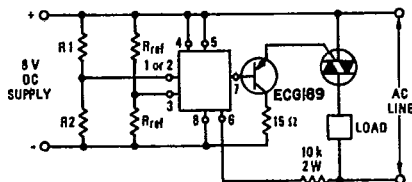
FIGURE 5 - TRIAC CONTROL CIRCUIT



R1 or R2 is an external sensor  
Basic triac trigger circuit utilizing the zero crossing detector and the input comparator to control the gate of the triac.

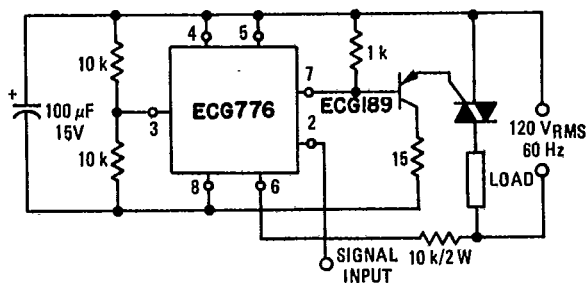
R2 must be the external sensor for the internal short and open protection to be operative.

FIGURE 6 - TRIAC CONTROL CIRCUIT  
WITH CURRENT BOOST UTILIZING  
DC SUPPLY



R1 or R2 is an external sensor  
Basic DC trigger application using the input comparator to control a PNP capable of furnishing gate drive of approximately 0.5 Amp.

FIGURE 7 - TRIAC CONTROL CIRCUIT WITH CURRENT BOOST UTILIZING AC SUPPLY



Zero crossing triac control circuit for gate current requirements greater than 50 mA.