

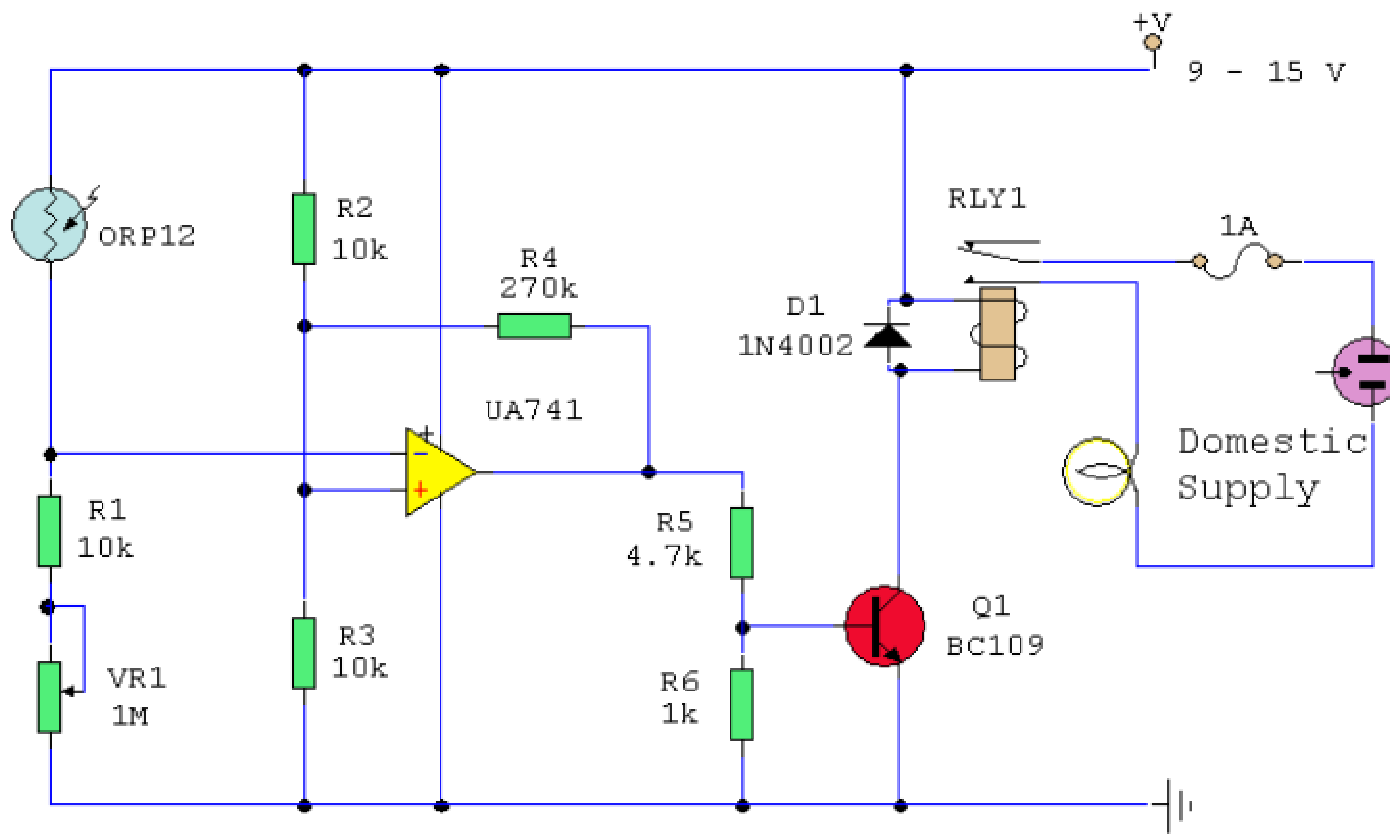
Dark Activated Switch

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Description:

This circuit will activate a relay when light falls to a preset level. Light level can be adjusted with VR1 and the relay contacts may be used to operate an external light or buzzer.



Notes:

The light sensor used is the ORP12 photocell. In bright light the resistance of the ORP12 can be as low as 80 ohm and at 50lux (darkness) the resistance increases to over 1 Mohm. The 1M control should provide a

wide range for light intensities, if not its value may be increased. The op-amp senses the voltage difference between pins 2 and 3. The control VR1 is adjusted so that the relay is off, the output of the op-amp will be around 2 Volts. When light falls, the resistance of the photocell increases and the difference in input voltage is amplified by the op-amp, the output will swing towards full supply and drive the transistor and relay. The 270k resistor provides a small amount of hysteresis, so that the circuit switches on and off with slightly different light levels. This eliminates relay chatter. Take great care if you decide to wire the relay to activate a mains lamp. Make sure the relay contacts provide adequate isolation and have ample rating for the load.

Parts List:

ORP12 Photocell (1)

RLY1: 12VSPDT (1)

U1: UA741 (1)

Q1: BC109 NPN (1)

D1: 1N4002 DIODE (1)

F1: 1A (1)

VR1: 1M RESISTOR (1)

ORP12: 500K RESISTOR (1)

R1,R3,R2: 10k RESISTOR (3)

R5: 4.7k RESISTOR (1)

R6: 1k RESISTOR (1)

R4: 270k RESISTOR (1)

Return to [Switching Circuits](#)