

# P88

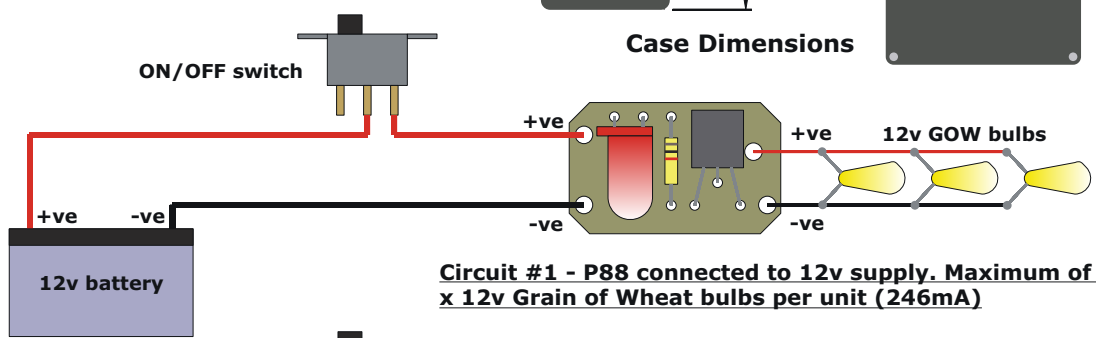
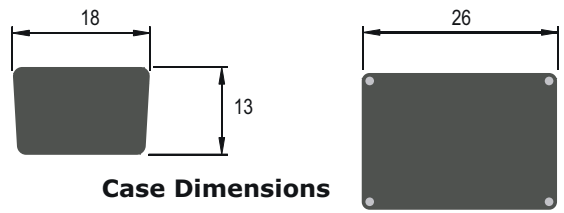
## "pico" miniature 6v - 12v bulb flasher



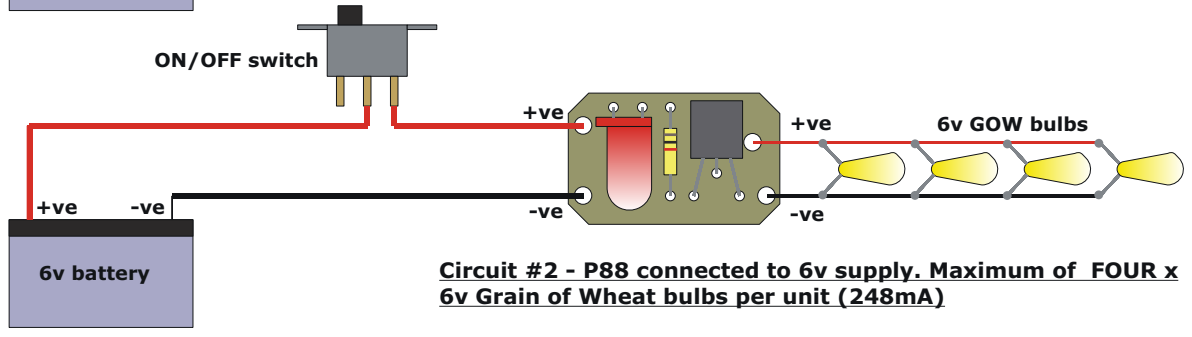
A super-simple flasher for filament bulbs on small models will enable the modeller to drive a sensible current bulb rather than a low-current LED which gives a very narrow viewing angle (basically, it can only be viewed from the top of the LED). The unit will run on a range of voltage from 6 volts to 12 volts. This, and its tiny size and weight will enable it to be used on very small models.

Maximum voltage  
Minimum voltage  
Maximum current

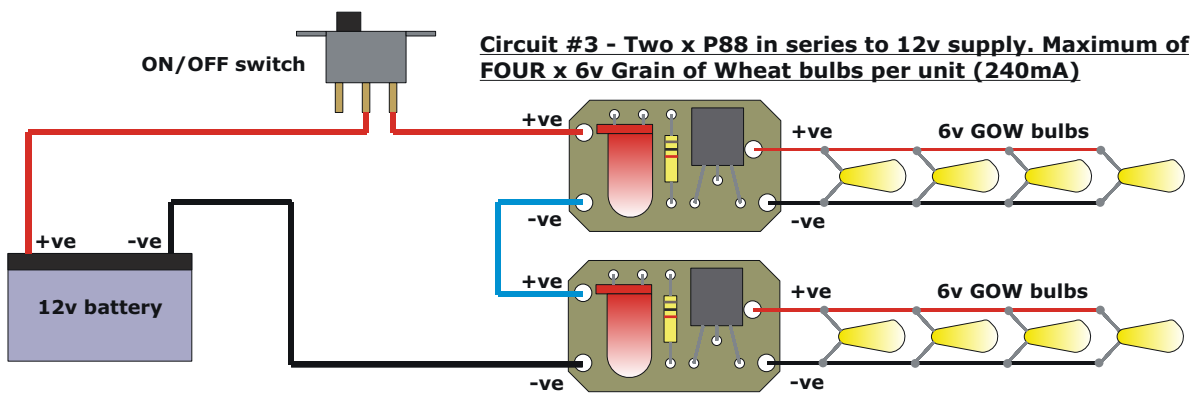
14 volts  
6 volts  
250ma (1/4 amp)



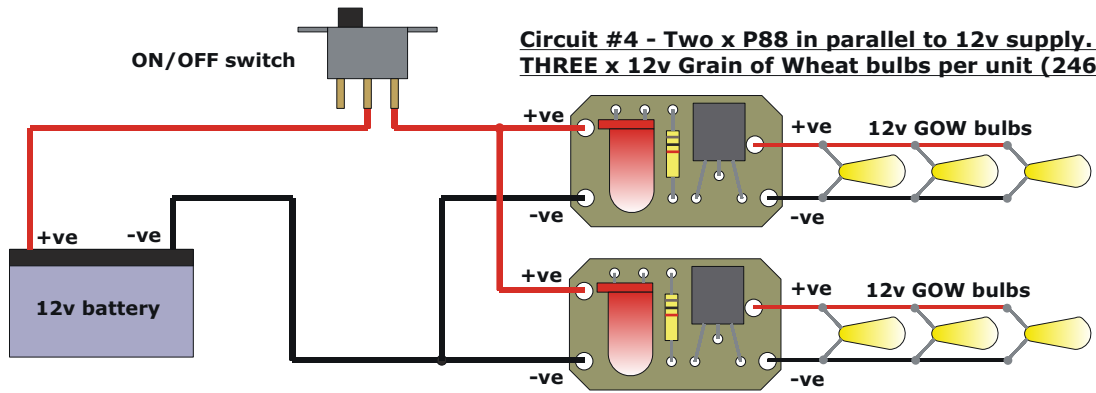
**Circuit #1 - P88 connected to 12v supply. Maximum of THREE x 12v Grain of Wheat bulbs per unit (246mA)**



**Circuit #2 - P88 connected to 6v supply. Maximum of FOUR x 6v Grain of Wheat bulbs per unit (248mA)**



**Circuit #3 - Two x P88 in series to 12v supply. Maximum of FOUR x 6v Grain of Wheat bulbs per unit (240mA)**



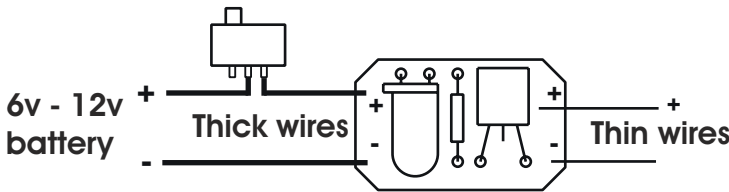
**Circuit #4 - Two x P88 in parallel to 12v supply. Maximum of THREE x 12v Grain of Wheat bulbs per unit (246mA)**

**P88**

**"pico" miniature 6v - 12v bulb flasher**

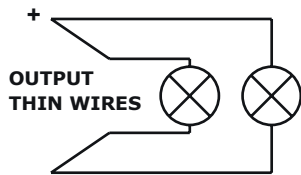


A super-simple flasher for filament bulbs on small models will enable the modeller to drive a sensible-current bulb rather than a low-current LED which gives a very narrow viewing angle (basically, it can only be viewed from the top of the LED). The unit will run on a battery from 6 volts to 12 volts. This, and its tiny size and weight will enable it to be used on very small models.

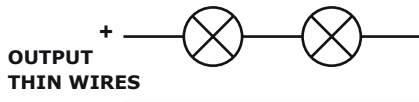


Maximum current  
Input connection  
Output connection  
Case dimensions

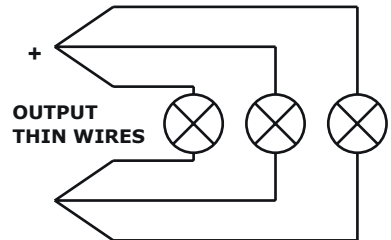
250ma (1/4 amp)  
Thick red and black wires  
Thin red and black wires  
26mm x 18mm x 13mm



TWO BULBS PER OUTPUT  
BULB VOLTAGE = BATTERY VOLTAGE  
(E.G IF BATTERY VOLTAGE = 6V  
THEN BULBS SHOULD BE 6V EACH)



TWO 6V BULBS IN SERIES = 12V  
IF BULB RATING IS 100mA THEN  
TOTAL CURRENT = 100 mA



THREE BULBS PER OUTPUT  
BULB VOLTAGE = BATTERY VOLTAGE  
(E.G IF BATTERY VOLTAGE = 6V  
THEN BULBS SHOULD BE 6V EACH)

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**P88 micro-miniature Bulb Flasher**  
**Instructions for Kit version**

**TOOLS**

For construction you will require a soldering iron (anything between 15 to 30 Watts with a thin pointed bit) and flux cored solder (22 SWG recommended). A small pair of wire cutters to trim wires covers all the tool requirements plus, of course, a good level of lighting.

**PCB**

The PCB for this project is made from the finest glass fibre material and is fully prepared. It requires no further work.

**PARTS**

The PCB has an insulated (Component Side) and a tinned track side. Components are mounted on the insulated side and soldered on the track side.

Only three parts need to be soldered to the PCB, a resistor R1, an LED IC1 & a MOSFET transistor Q1.

The tiny rod with coloured bands and two wires is resistor R1. It can be fitted either way round. The red LED IC1 has a flat on one side of the moulding; it also has one lead longer than the other. The flat side is clearly marked on the drawing.

The small grey plastic part with three leads is a transistor (ZN2106A). Note the curved edges on one face of the moulding. Bend it as per the drawing. NOTE that the curved corners are nearest the PCB surface when you fit and solder it.

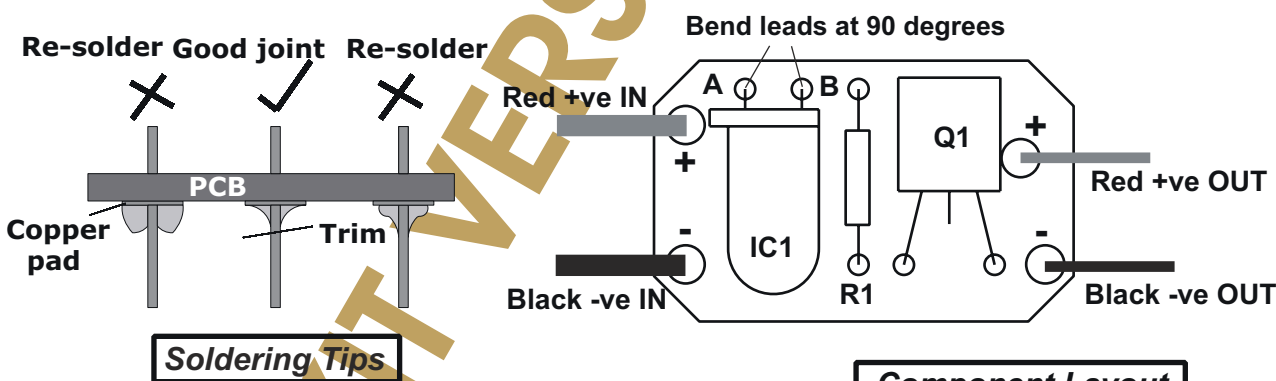
**CONSTRUCTION & TESTING**

The PCB has a plain insulated side which is where the components are mounted, and a side with soldered tracks which is where the components are soldered.

Note the Component Mounting Detail drawing. This will identify the way the components should be fitted to the PCB. The spare wire should be cut off after each item has been soldered.

Connect as shown. The THICK red and black wires go from battery to PCB, while the THIN red and black wires go from PCB to bulb (or bulbs).

The bulb you use will need to be the same voltage rating (or greater) as the battery you use.



**PARTS LIST**

- IC1 RED LED with flashing IC built in
- R1 1K Ohm x 1/8 Watt resistor
- Q1 ZN2106A transistor
- PCB P87 type
- CASE Rx2003 with screws

