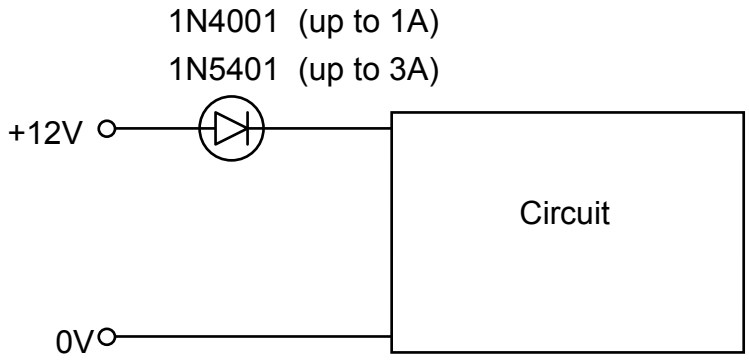
No Loss Polarity Protector.

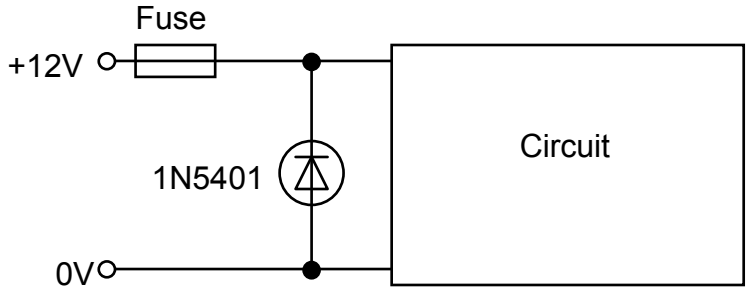
Standard diode circuits for polarity protection are shown below.

Series diode.



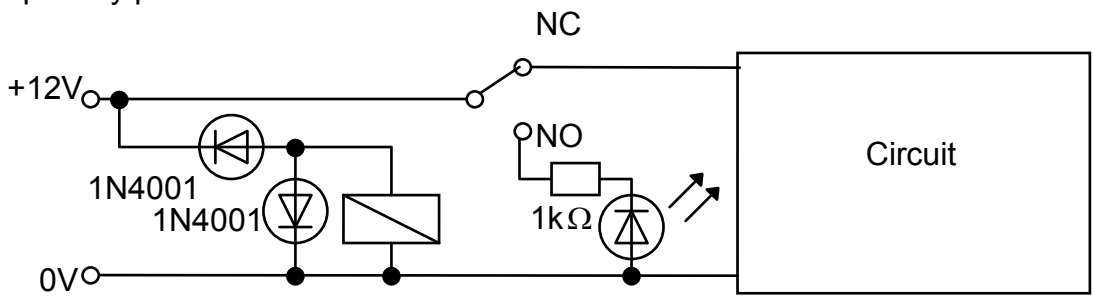
This method suffers from the disadvantage that there will be around 1V lost across the diode.

Parallel diode.



This method suffers from the disadvantage that the power supply is short circuited, if reverse connected, and relies on the fuse failing to protect the power supply.

No loss polarity protection



The relay has a 12V coil and 5A contacts. Under normal conditions, current flows through the normally closed relay contacts to the circuit.
When reverse connected, the diode in series with the relay coil conducts, operating the relay and disconnecting power from the circuit. An optional LED, connected to the normally open contacts can be used to provide an indication of the problem.
The diode connected in parallel with the relay coil prevents any large induced voltage, when the power is disconnected.