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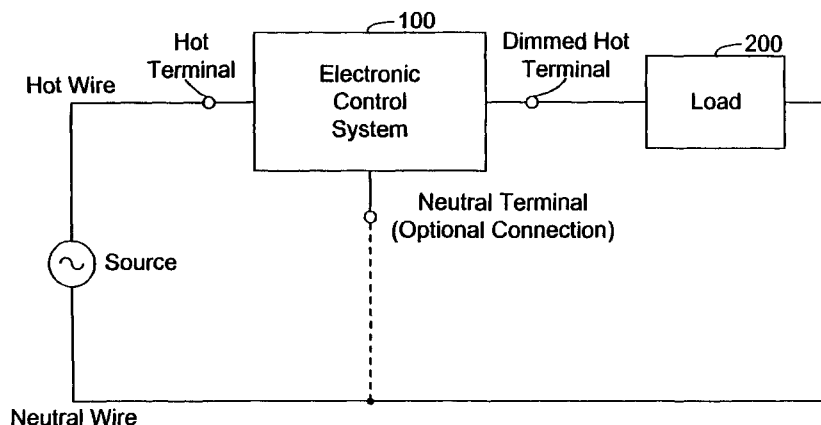
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(54) Title: ELECTRONIC CONTROL SYSTEMS AND METHODS



(57) Abstract: An apparatus in an electronic control system allows two or three wire operations. A power supply (150) can supply power to the enclosed circuitry in both two and three wire installations. Two separate zero cross detectors are used such that timing information can be collected in both two and three wire installations. Both zero cross detectors (110) are monitored and are used to automatically configure the electronic control. Over voltage circuitry senses an over voltage condition across a MOSFET which is in the off state and turns the MOSFET on so that it desirably will not reach the avalanche region. Over current circuitry senses when the current through the MOSFETs has exceeded a predetermined current threshold and then turns the MOSFETs off so they do not exceed the MOSFETs' safe operating area (SOA) curve. Latching circuitry (120) is employed to keep the protection circuitry in effect even after a fault condition has cleared. Lockout circuitry (130) is used to prevent one protection circuit from tripping after the other circuit has already tripped from a fault condition. The protection circuitry output is desirably configured such that it can bypass and override the normal turn on and turn off impedance and act virtually directly on the gates of the MOSFETs. Preferably, the system has a high efficiency switching type power supply in parallel with a low frequency controllably conductive device.



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