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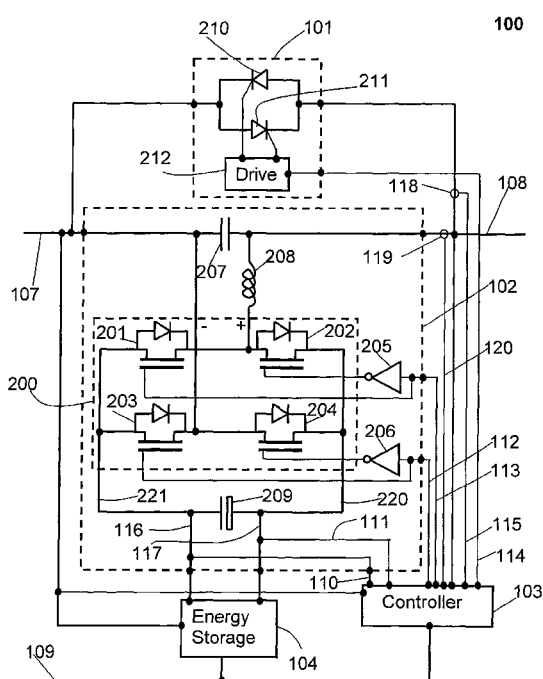
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- (71) Applicant (for all designated States except US): **SP SYSTEMS PTE LTD** [SG/SG]; 396 Alexandra Road, #03-01 BP Tower, Singapore 119954 (SG).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **LI HONG, Qun** [CN/SG]; Block 32, Tebans Gardens Road, #05-353, Singapore 600032 (SG). **HEE, Pak, Khian** [SG/SG]; #16-10 Whampoa South, Block 49, Singapore 330049 (SG). **SOH, Siew, Cheong** [SG/SG]; #14-69 Marine Vista 2, Singapore 449026 (SG).
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(54) Title: DYNAMIC SERIES VOLTAGE COMPENSATOR WITH CURRENT SHARING STATIC SWITCH



(57) Abstract: A dynamic series voltage compensator (100) for compensating voltage dips in a power line is described. The compensator (100) includes a current sharing static switch (101), a series injection inverter (102), an energy storage unit (104) and a system controller (103). The current sharing static switch (101) includes a pair of anti-parallel thyristors (210) and (211). The series injection inverter includes 4 IGBTs (201), (202), (203) and (204) that form a full bridge of switching devices (200). The system controller (103) monitors the input voltage to determine if voltage compensation is required and monitors the output to determine how much compensation is required. Under normal power line operating condition, that is when no voltage compensation is required, the load current is shared between the current sharing static switch (101) and the series injection inverter (102) by controlling the conduction angle of thyristors (210) and (211). While the current sharing static switch (101) is conductive, the inverter (102) is also controlled to do toggle switching such that no voltage compensation is performed. The toggle switching of the series injection inverter (102) and conduction angle control of current sharing static switch (101) are used to prove the functionality of switching devices of the inverter (102) and the current sharing static switch (101). When there is a voltage dip in the power line, the current sharing static switch (101) is immediately turned off by force commutation, and the inverter (102) carries out the compensation. As the voltage drop across the compensator (100) is controlled to a very low value during normal power line operating conditions, the compensator (100) has very high operation efficiency. Due to the small amount of current flowing through the inverter (102) under the normal power line operating condition; the switching devices (201), (202), (203) and (204) and the filter (207) and (208) of the inverter (102) may be rated low. Thus a high efficient, lightweight and small dynamic series voltage compensator (100) is disclosed.

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