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**ABSTRACT**

Disclosed herein is a multilevel converter (50) for voltage conversion between a three-phase AC voltage and a DC voltage, comprising three converter arms (58), each having a first end (60) for connecting to a corresponding phase of a three-phase AC voltage source (52) and a second end (62), wherein each converter arm (58) comprises a plurality of sequentially interconnected modules (64), a main energy store (54) having a positive terminal (76) connected or connectable to a positive conduction line (78) and a negative terminal (80), a switching arrangement (84), a control system (92), configured to establish a positive state, in which the negative conduction line (82) is connected with a star point (56) of said three-phase AC voltage source (52) and the positive conduction line (78) is connected with the second end (62) of one or two converter arms (58) to which a positive phase voltage is currently applied, and a negative state, in which the positive conduction line (78) is connected with said star point (56) of said three-phase AC voltage source, and the negative conduction line (82) is connected with the second end (62) of one or two converter arms (58) to which a negative phase voltage is currently applied.

