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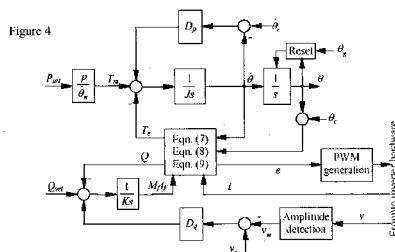
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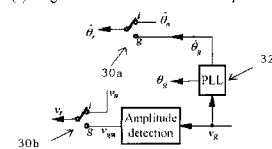
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[Continued on next page]

(54) **Title:** STATIC SYNCHRONOUS GENERATORS



(a) Regulation of real and reactive power



(b) Provision of references, e.g., via PLL

(57) **Abstract:** The invention is concerned with a device and a method for controlling an inverter associated with a power source, which typically will be a distributed power source. The role of an inverter is to modulate the electrical power output, e.g. to provide a three phase AC electrical output at suitable voltage, where the output is to be supplied to a conventional power distribution, grid. The invention involves modelling the behaviour of a synchronous electrical generator. Variables represent the angular position and rotational speed of the virtual rotor (14) of this virtual synchronous generator. The torque electromagnetically exerted on the rotor is calculated from a measured inverter output current, and from a variable representing excitation current in the rotor. Allowing for this and for a notional drive torque applied to the virtual rotor (which in the physical analogue would be supplied by some prime mover such as an engine), as well as for the virtual inertia of the rotor, the angular speed of the virtual rotor is calculated. Using the angular position and rotational speed of the virtual rotor, and allowing for the aforementioned excitation current, it is possible to obtain the cmf induced in stators of the virtual generator. On this basis a control signal is generated which causes the inverter to produce an AC output corresponding to that which would be provided by the virtual synchronous generator. A synchronous generator must be regulated, as too must the virtual synchronous generator of the present invention. To this end, the invention provides a feedback loop in which deviation of the rotational speed of the virtual generator rotor from a reference angular speed is detected and is used to adjust the virtual drive torque, thereby to regulate the rotational speed of the rotor and hence the frequency of the AC output and the real power supplied by it.

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. H02P9/02 H02P9/14 H02P9/30
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H02P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	US 2006/268587 A1 (VEENSTRA MARTIN [CH]) 30 November 2006 (2006-11-30) figures 1-12 -----	1-23
Y	WO 2007/066182 A1 (TOYOTA MOTOR CO LTD [JP]; SATO RYOJI [JP]) 14 June 2007 (2007-06-14) figures 1-12 -----	1-23
Y	US 2008/116842 A1 (CHENG BING [US] ET AL) 22 May 2008 (2008-05-22) figures 1-9 -----	1-23
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INTERNATIONAL SEARCH REPORT

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International application No

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