A power conversion system includes an engine coupled to drive an alternator, a rectifier circuit, and an ignition controller. The alternator includes a stator and a rotor that cooperate when driven to provide a current supplied to the rectifier circuit. The rectifier circuit provides output power having a voltage. The ignition controller supplies energy to the spark plug of the engine. If the voltage exceeds a predetermined limit, the ignition controller supplies less energy to the spark plug to decrease engine drive. The stator may include several windings (or a tapped winding) and the system further includes an engine throttle controller and a winding control circuit. The winding control circuit selectively couples one or more windings of the plurality (or one or more turns of a tapped winding) to the rectifier circuit. The winding control circuit cooperates with a throttle controller to facilitate provision of a predetermined output power with a relatively low engine RPM for noise abatement.
### INTERNATIONAL SEARCH REPORT

**A. CLASSIFICATION OF SUBJECT MATTER**

<table>
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<tr>
<th>IPC</th>
<th>H02P9/04</th>
<th>F02B63/04</th>
<th>F02P9/00</th>
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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):

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<tr>
<th>IPC</th>
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<th>H02P</th>
<th>F02B</th>
<th>F02D</th>
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</table>

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

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

PAJ, EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tbody>
<tr>
<td>X</td>
<td>US 5 703 410 A (MAEKAWA) 30 December 1997 (1997-12-30) column 13, line 20 -column 14, line 60 figures</td>
<td>1,9</td>
</tr>
<tr>
<td>E</td>
<td>WO 01/12967 A (COLEMATE POWERMATE) 22 February 2001 (2001-02-22) page 19, line 23 -page 20, line 11; figures</td>
<td>1-4,9</td>
</tr>
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</table>

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:
  - "A" document defining the general state of the art which is not considered to be of particular relevance
  - "E" earlier document but published on or after the international filing date
  - "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  - "O" document referring to an oral disclosure, use, exhibition or other means
  - "P" document published prior to the international filing date but later than the priority date claimed

*"I" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

*"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

*"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

*"A" document member of the same patent family

**Date of the actual completion of the international search**

23 November 2001

**Date of mailing of the international search report**

**Date of mailing of the international search report**

23 November 2001

**Name and mailing address of the ISA**

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epos nl,
Fax: (+31-70) 340-3016

**Authorized officer**

KOOSJMAN F.G.M.
## Box I  Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
   because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
   because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
   because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II  Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:  

4. ☑ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:  
   1–9

**Remark on Protest**

☐ The additional search fees were accompanied by the applicant’s protest.

☐ No protest accompanied the payment of additional search fees.
This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-9
   Power conversion system using the ignition control system for limiting the output voltage.

   1.1. Claims: 1-4
       coils layout

   1.2. Claims: 1 2 5-8
       electrical circuit with a silicon controlled rectifier

   1.3. Claim: 9
       using a rectifier circuit

2. Claims: 10-14 17-20
   Engine throttle controller and winding control circuit

3. Claim: 15
   winding controller

Please note that all inventions mentioned under item 1, although not necessarily linked by a common inventive concept, could be searched without effort justifying an additional fee.
<table>
<thead>
<tr>
<th>Patent document cited in search report</th>
<th>Publication date</th>
<th>Patent family member(s)</th>
<th>Publication date</th>
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<tr>
<td>US 4661761 A</td>
<td>28-04-1987</td>
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<td>JP 8205596 A</td>
<td>09-08-1996</td>
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<td>22-02-2001</td>
<td>AU 6638400 A</td>
<td>13-03-2001</td>
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Form PCT/ISA/210 (patent family annex) (July 1999)