Overview of Excitation Equipment

Static Excitation Equipment for gas turbines
February 16th, 2006
Overview of Excitation Equipment engineered by PG P412

P412 provides excitation system solutions for the whole range of generator output.

<table>
<thead>
<tr>
<th>Generator Output</th>
<th>0.01</th>
<th>0.1</th>
<th>1</th>
<th>10</th>
<th>100</th>
<th>1000 MVA</th>
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<tbody>
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<td>SIPOL</td>
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<td>RG3</td>
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<td>THYRISIEM®</td>
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<td>THYRIPART®</td>
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<td>THYRIPOL ® / SEMIPO (APC)</td>
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Excitation Systems for Generators with rotating Exciters

Static Excitation System with Compounding Source

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<tr>
<th>Application Range</th>
<th>Extended Application Range</th>
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<tr>
<td>Blue</td>
<td>Green</td>
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Engineering of Static Excitation Equipment
Overview of Excitation Equipment engineered by PG P412

SIPOL – Transistorized excitation systems

Application:
Small industrial, steam and hydro power stations up to 30 MVA

Power section: SIMOVERT MASTERDRIVE

Output: up to 15A (20A / 10s)
Overview of Excitation Equipment engineered by PG P412

SIPOL – Transistorized excitation systems

Engineering of Static Excitation Equipment
RG3-T4 – Transistorized excitation systems

Application:
Industrial, steam and hydro power stations up to 500 MVA

Power section: SIMOVERT MASTERDRIVE
Output: up to 130A
Overview of Excitation Equipment engineered by PG P412

RG3-T4 – Transistorized excitation systems
Thyrisiem DD – Thyristorized excitation systems

Application:
Steam power stations (fossil and nuclear) up to 1900 MVA

Power section:
SITOR thyristor assembly
Output: up to 150 A

Engineering of Static Excitation Equipment
Thyrisiem DD – Thyristorised excitation systems

Digital Control System Simadyn D
Overview of Excitation Equipment engineered by PG P412

Thyripart – systems for self-excitation

Application:
Industrial applications with high reliability (large drives); emergency diesel units,

Power section:
Voltage and current transformer, B6U bridge, SIMOVERT MASTERDRIVE output up to 1000 A
Overview of Excitation Equipment engineered by PG P412

Thyripart – systems for self-excitation

Principle diagram of the basic excitation

Current- and Voltage transformer (example)

Control board inside the transistor power part

Power Circuit

Control Circuit

Engineering of Static Excitation Equipment
Thyripol – thyristorised excitation systems

Application:
Synchronous generators and reactive power machines;
Hydro, GT, steam and nuclear power stations

Power section: thyristor assembly
Output up to 8000 A
Overview of Excitation Equipment engineered by PG P412

Thyripol – thyristorised excitation systems (A&D LD)

Control Section

Redundant Power Section
Overview of Excitation Equipment engineered by PG P412

Semipol – thyristorised excitation systems (Alstom Power Conversion / APC)

Example:
Priolo Gargallo
2 x 288 MVA Generator

Specification:
Startup Frequency
Converter:
Rated Power: 5 MW
AC Voltage: 2000 V

Excitation:
Excitation Current: 1220 A
Excitation Voltage: 354 V
AC Input: 660 V
Thyristor bridges: 3 x 50% with redundant fans.

Operator side
Semipol – thyristorised excitation systems (Alstom Power Conversion / APC)

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