Excitation and Synchronization
UNITROL® and SYNCHROTACT®
product range
**UNITROL® 6000**

Latest generation of excitation systems based on high performance processor family for all kinds and sizes of synchronous generators and motors. Available as UNITROL® 6000 Light, Medium, Power, X-power and Nuclear.

**UNITROL® 1000**

Indirecte excitation systems series for synchronous generators and motors with exciters. Microprocessor technology and IGBT output stage guarantee a wide application range.

Output current: up to $40 \text{ A}_{\text{DC}}$

Supply voltages: up to $300 \text{ V}_{\text{DC}}$ or $250 \text{ V}_{\text{AC}} (<400 \text{ Hz})

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### MEGATROL combined solution

MEGATROL is a smart and compact solution, combining UNITROL® 6800 SES and MEGADRIVE-LCI static frequency converter (SFC). The use of ABB’s powerful AC 800PEC controller for both systems results in fewer costs for spare parts and training of maintenance staff for the customer. This is an attractive solution for gas turbine, combined cycle and pumped storage power plant applications.

<table>
<thead>
<tr>
<th>MEGATROL range</th>
<th>Typical gas turbine size</th>
<th>Max. SFC start power</th>
<th>Max. field current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light</td>
<td>&lt;120 MW</td>
<td>3.0 MW</td>
<td>1,500 A</td>
</tr>
<tr>
<td>Medium</td>
<td>&lt;200 MW</td>
<td>5.0 MW</td>
<td>2,000 A</td>
</tr>
<tr>
<td>Power</td>
<td>200 – 400 MW</td>
<td>15.5 MW</td>
<td>6,000 A</td>
</tr>
</tbody>
</table>

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### UNITROL® 6000 portfolio outlook

<table>
<thead>
<tr>
<th>Closed-loop control</th>
<th>UNITROL® 6000 Light / Medium</th>
<th>UNITROL® 6000 Power</th>
<th>UNITROL® 6000 X-power</th>
<th>UNITROL® 6000 Nuclear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Backup channel</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Converter module</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes / 5</td>
<td>Yes / 8</td>
</tr>
<tr>
<td>type</td>
<td>No / Yes</td>
<td>No</td>
<td>No</td>
<td>Yes / 8</td>
</tr>
<tr>
<td>Converter redundancy</td>
<td>1+1</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>input data</td>
<td>1+1+(1)</td>
<td>No / Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>1+N-1/max. modules</td>
<td>Yes</td>
<td>Yes / 5</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Max. AC voltage</td>
<td>690 V</td>
<td>1500 V</td>
<td>1500 V</td>
<td>1500 V</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Max. output data</td>
<td>Cont. DC current</td>
<td>2000 A</td>
<td>4000 A</td>
<td>12000 A</td>
</tr>
<tr>
<td>Ceiling voltage</td>
<td>850 V</td>
<td>1900 V</td>
<td>1900 V</td>
<td>1900 V</td>
</tr>
</tbody>
</table>

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2 Excitation and Synchronization | ABB
Software products

**ECT software**  
(Excitation control terminal software)

Excitation control terminal software is a user-friendly tool for operation, monitoring and maintenance of UNITROL® 6000 excitation systems.

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**CMT1000**  
(Commissioning and maintenance tool)

Commissioning and maintenance tool for UNITROL® 1000. Enables controlling, monitoring, maintenance and programming of the product.

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**SMTS Operate**  
(Synchronous machine transient simulation - Real time)

Control terminal for SMTS-RT 6000 synchronous machine simulator. Closed loop real time simulation for UNITROL® 6000 excitation tuning, testing and staff training.

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**SynView**

SynView is used for simple and quick commissioning, as well as for maintenance of SYNCHROTACT® 5 equipment.
SYNCHROTACT® products and systems

**SYNCHROTACT® 5**
- SYNCHROTACT® 5 products are used for automatic and manual synchronization of generators with power networks and for paralleling of synchronous lines. Available types:
  - SYN 5100 simple synchrocheck
  - SYN 5200 synchrocheck with advanced functionality
  - SYN 5201 automatic single-channel synchronizing device with frequency and voltage matching
  - SYN 5202 automatic dual-channel synchronizing device with synchrocheck in series as second channel
  - SYN 5302 redundant automatic dual-channel synchronizing device

**SYNCHROTACT® CSS**
- SYNCHROTACT® CSS (compact synchronizing system) is a standardized, completely wired and tested solution for synchronization of synchronous generators with a network. It uses the proven and reliable SYNCHROTACT®5 devices as the key components. SYNCHROTACT® CSS can be used for fully automatic as well as redundant manual synchronization using the traditional measuring instruments including synchronoscope.

**SYNCHROTACT MSP**
- SYNCHROTACT® MSP (modular synchronizing panel) is a customized synchronizing system. It is used to synchronize generators and to parallel lines.

SYNCHROTACT® MSP includes:
  - Synchronizing system using SYNCHROTACT® 5 devices
  - Electrical measuring and metering system

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**Recommended selection for SYNCHROTACT® 5 products**

**Examples**
- Nuclear power generator 1,000 MVA SYN 5302
- Hydro power generator 300 MVA SYN 5202 + 5200

**Required safety**
- No redundancy
- Redundant manual synchronization
- Redundant automatic synchronization
Excitation systems and synchronizing equipment are allocated to the business unit Power Electronics & MV Drives. ABB’s worldwide presence is built on strong local companies. Local engineering centers (LECs) are based all over the world. They are our expertise centers close to the customer. Like this we ensure that our customers in all industries receive fast and accurate service.

You can find excitation systems LECs in the following countries: Australia, Austria, Brazil, Canada, China, Finland, India, Italy, Poland, South Africa, Spain.

Service

Installation and commissioning
ABB’s certified engineers implement professional installation and commissioning of the equipment according to the application requirements, as well as instruct the user on how to operate the excitation system.

Extension, upgrades and retrofits
We design upgrade and modernization offerings to improve performance and extend installation’s lifetime, ensuring the best possible return on investment.

Engineering and consulting
Professional advice and timely support are available from ABB and its channel partners along the life cycle of the equipment.

Repairs
Remote diagnostics allow ABB to guide the customer through a fast and efficient fault-finding procedure, as well as analyze system’s operation and customer’s processes.

Spares and consumables
We quickly deliver genuine ABB spare parts worldwide. Certified spares guarantee full compatibility and are available throughout the lifetime following the life cycle model.

Maintenance
ABB recommends preventive maintenance throughout the lifetime of excitation systems. Regular service, implemented by certified ABB engineers, ensures maximum availability, minimum repair costs, optimized performance and extended lifetime of your installation.

Training
Standard or customized UNITROL® and SYNCHROTACT® trainings provide service and operation personnel with skills necessary for safe and correct use of ABB products/systems.

ABB life cycle management model

ABB developed the product life cycle management to improve the reliability of operations and support the serviceability of your production assets. All services relating to ABB’s power electronic systems are planned according to this model.