ACS 5000
1.5 MW – 32 MW, 6.0 – 6.9 kV
ACS 5000

- Medium to high powered single drive, 1.5 – 32 MW
  - Air cooled: 1.5 – 7 MW
  - Water cooled: 5 – 32 MW
- Partial overlap in power of air- and water-cooled ACS 5000 for greatest possible customer choice
- Suitable for standard induction, synchronous and permanent magnet motors up to 6.9 kV
Features and benefits

- High system efficiency due to multilevel-fuseless topology, IGCTs and DTC
- High reliability due to low parts count
- Optimal network friendliness due to 36-pulse configuration
- Modular design for optimum configurations
- High level of personal safety and drive availability due to superior arc protection
- Low cost of ownership due to high efficiency and simplified installation, commissioning and maintenance
- Fast and accurate control performance due to DTC
- Available with integrated or separate input transformer
## Primary fields of application

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<td>Grinding mills, conveyors, fans and pumps</td>
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<td>Pulp and paper</td>
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<td>Other applications</td>
<td>Test stands and wind tunnels</td>
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VSI-MF topology

- Voltage Source Inverter Multilevel-Fuseless (VSI-MF)
  - Multilevel
    - Multilevel switching for an output waveform, which allows the use of standard motors
  - Fuseless
    - ACS 5000 uses IGCTs for fast and reliable protection of power components instead of unreliable medium voltage power fuses
ACS 5000 air cooled
1.5 – 7 MW

Electromechanically interlocked doors for safety

User-friendly control panel for local operation
- Keypad with multi-language display
- Main supply on/off pushbuttons
- Emergency off pushbutton
ACS 5000 air cooled
With integrated transformer
ACS 5000 water cooled
5 – 32 MW

- Electromechanically interlocked doors for safety
- Grounding switches for safety
- User-friendly control panel for local operation
  - Keypad with multi-language display
  - Main supply on/off pushbuttons
  - Emergency off pushbutton
ACS 5000 water cooled
5 – 32 MW

- Transformer cable connection section for top and bottom entry
- Phase converter unit
- Air-to-water heat exchanger
- Control unit and motor cable connection section for top and bottom entry
- Rectifier phase module
- Inverter phase module
- DC-link capacitors
- Water cooling unit (WCU) with stainless steel piping and control hardware for WCU
Transformer flexibility

For highest transformer flexibility, the ACS 5000 is available with an integrated or a separate input transformer

- Integrated input transformer
  - Simple and quick installation and commissioning

- Separate input transformer
  - Minimal need for air-conditioning when placed outside the electrical room
Reliability

- 5-level VSI topology
  - Less complex, robust and efficient topology
- IGCT semiconductors
  - An ideal switch for high-powered medium voltage applications
  - Low parts count
  - High efficiency and reliability
- Fuseless design
  - Faster and better protection than medium voltage power fuses
- Long-life capacitors
  - Advanced, environmental friendly, oil-filled foil capacitors have a substantially longer lifetime than electrolytic capacitors
  - Lower lifetime costs
High level of personal safety
Arc protection

- Electric arcs represent a hazard source for people and goods

- High-power water-cooled ACS 5000 is equipped with superior protection function and ABB’s Arc Guard System™
  - Very fast arc protection and elimination (less than 6 ms); IAC classified
  - Protects people and equipment
  - Eliminates unnecessary production stops
Motor friendly

- The ACS 5000 has an optimum number of switching levels, which provides a multilevel output waveform
- Standard motors up to 6.9 kV can be used
Network friendly

- 36-pulse rectifier design
  - Guarantees compliance with all common standards for line harmonics, such as
    - IEEE
    - IEC
    - EN
  - Eliminates the need for costly harmonic analysis
  - No need for installation of line filters
Powerful performance

- Power loss ride through
  - One second (i.e. 50 / 60 cycles) ride through capability for supply voltage dips down to zero
- Flying start and automatic restart
  - Catches a spinning load and smoothly takes it back to set speed
- Flux optimization
  - Reduction of motor losses under part load operation
- Critical speed avoidance bands
  - Skips operation at critical speeds
Powerful performance Direct Torque Control (DTC)

- Provides fast, accurate and stepless control from zero to full speed
- Full torque with optimal speed accuracy over the whole speed range
- Negligible low torque ripple
- Minimal inverter switching losses at maximal control performance
- No speed encoders needed

Typical torque response (t) of a DTC drive, compared with flux vector control and open loop pulse width modulation (PWM)
Smooth and simple system integration
Control system

- Commissioning
- Fast installation, minimizing customer’s downtime
- Connection to higher-level process controllers
  - Flexible hardware I/Os for remote control, allowing easy customization
  - Large variety of available fieldbus interfaces
- Applicable standards
  - Compliance with most stringent requirements for current and voltage harmonic distortion (EN, IEEE, IEC)
DriveWare, the tools to increase productivity

The ACS 5000 incorporates the same set of user-friendly tools as other drives of the ACS drives family.

DriveOPC
- for communication between ABB drives and customer’s Windows® applications

DriveWindow
- Advanced, easy-to-use tool for commissioning and maintenance of ABB drive systems
- Remote diagnostics and monitoring of ABB drives

DriveMonitor™ (option)
- Remote and real-time monitoring and diagnostics of ABB drives from any location in the world
DriveMonitor™
Intelligent monitoring and control

Benefits

- Early diagnostics to avoid costly repairs
- Reduction of process-critical faults
- Optimization of maintenance costs and schedule
- Predictive (when necessary) instead of preventive (time based) maintenance
- Optimization of process performance
- Easier root cause analysis – reduced Mean Time To Repair (MTTR)
Maintenance

- Reliable, well-proven components
  - Minimized parts count through VSI-MF topology results in increased reliability
  - Extended Mean Time Between Failures (MTBF) and improved availability
- Easy front access to the drive’s components
- Redundant cooling
  - Redundant fans or pumps for increased availability
ACS 5000 for induction or synchronous motors

- Induction motors
  - High versatility and reliability
  - Power range: up to 27 MW
  - Typically used for applications such as pumps, fans, compressors, conveyors

- Synchronous motors
  - Typically considered for higher power ratings
  - Wide field weakening and efficiency
Testing

ABB is committed to ensuring the reliability of every drive they deliver.

Every ACS 5000 undergoes a load test driving a medium voltage motor with load, in order to subject it to ‘real life’ operating conditions, before shipping it to customer’s site.
Worldwide service and support

- Supervision of installation and commissioning
- Local support
- Worldwide service network
- Spare parts and logistics network
- Training
- Remote diagnostics
- 24 x 365 support line
- Customized maintenance contracts
Power and productivity for a better world™