

MEDIUM VOLTAGE AC DRIVES

ABB drives

ACS5000

2 to 36 MW



—

**The power you require.
The reliability you expect.**

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The ACS5000 medium voltage drive

High power drive for safe operations

The ACS5000 ensures reliable control of applications that require high powers and makes your operations efficient and safe.

ACS5000 medium voltage drives are engineered drives suitable for high power, high speed or special performance applications such as test stands, marine propulsion and thrusters, rolling mills, SAG and ball mills, large pumps, fans and compressors.

The ACS5000 conforms to operations in many fields, but is particularly suited for the chemical, oil, gas and power generation industries due to its robust design. The drive comes with various industry-specific features, which integrate seamlessly with your system and increase the productivity of your processes.

The compact air-cooled ACS5000 is designed to control standard motors, typically used for applications such as pumps, fans, compressors, mixers, mills and conveyors.

The liquid-cooled ACS5000 drives your high power, high speed or special performance applications such as large pumps, fans, extruders and compressors

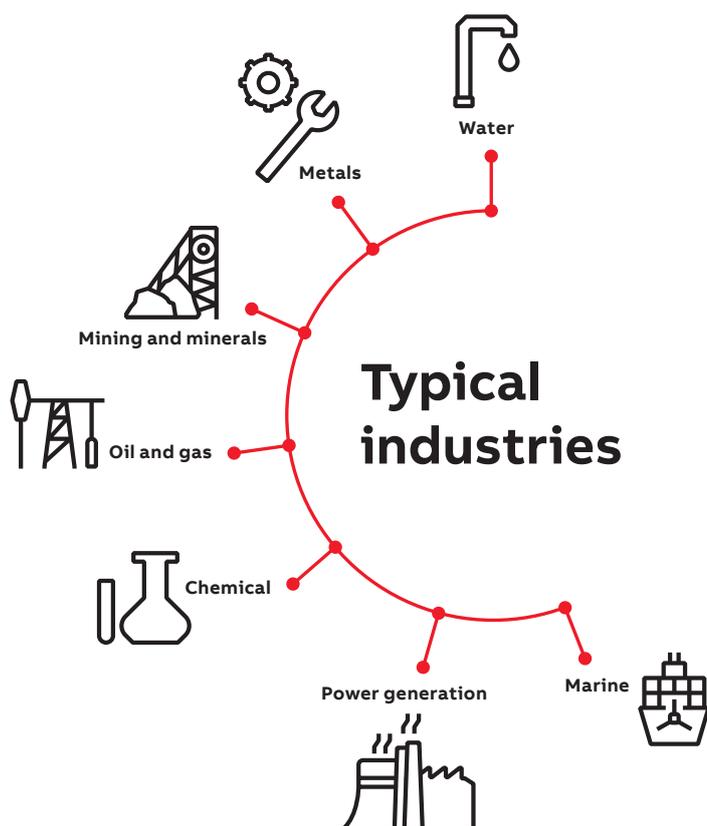
Get more using less

Our medium voltage drives help you to increase your productivity and profitability. Your processes will use only the energy required to carry out the job and no more. Precise control ensures efficient operation with high uptime and optimized use of raw materials. This will all add up to cost and time savings for you.

Reliable, safe performance you can count on

Through the use of quality components and the integration of special features, our drives ensure high process availability and safety for your business. With well-proven drive technology at the heart, your operations will run smoothly and reliably every day.

Due to the ACS5000's advanced arc resistant design, you can be sure of the highest safety levels in your day to day operations for your personnel and equipment.





Benefits that add value

Get a drive solution that meets the requirements of your application and ensures high productivity and optimum performance of your operations. Benefit from the built-in expertise of our medium voltage drives and take your business forward with everything working like clockwork.

Energy efficiency

Our medium voltage drives run your motors based on the demands of your process rather than running them at full speed and ensure optimized power consumption and process efficiency. In this way you can save energy and reduce CO₂ emissions.

High power motor control

The ACS5000 is a reliable solution for controlling induction, synchronous and permanent magnet motors and driving your high power applications such as compressors, pumps and fans.

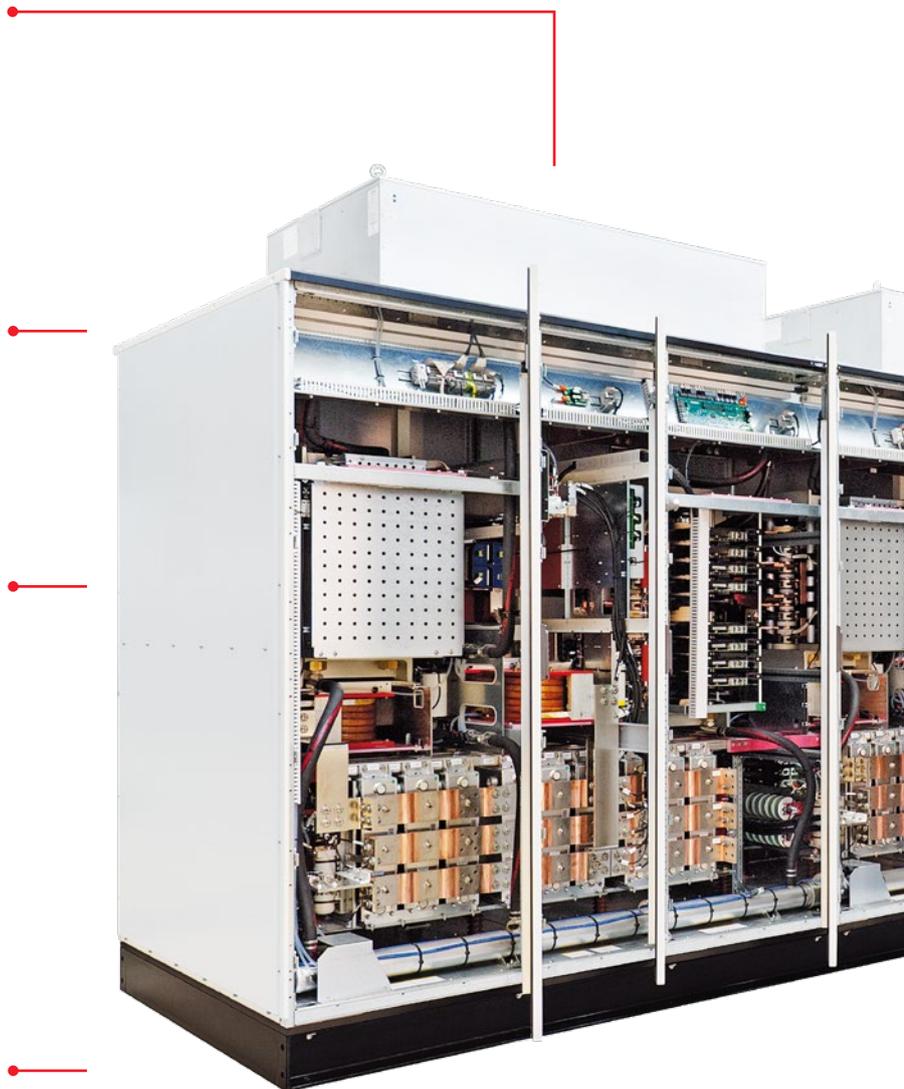
Highest level of personnel safety

Your people and goods are protected from electric arcs thanks to the advanced safety design of the ACS5000. Arcs are detected and eliminated very fast, avoiding production stoppages. Certified functional safety features and a DC grounding switch make your systems safe and reliable.

Robust design

Drive robustness ensures high availability

The robust ACS5000 effortlessly drives your high power applications and controls operations even in harsh environments. Special features such as automatic restart ensure the high availability of your processes.



Powerful and reliable

High reliability through well-proven design

Availability of your operations is ensured thanks to the simple, fuseless design. A low parts count and proven components contribute to high uptime and the long lifetime of your drive. Reliability is further increased with the drive's power loss ride-through function so that you are less dependent on network conditions.

Increased productivity due to precise process control

Reduce your energy consumption and increase process efficiency with ABB's direct torque control (DTC). Drive control is immediate and smooth in any conditions, ensuring optimum output and productivity.

Industry-specific solutions for individual needs

Features designed specifically for the oil and gas and power generation industries allow the ACS5000 to adapt perfectly to your application. Choose from a broad range of configurations to drive your standard and high-speed motors, and optimize your system costs.

Serviceability

Easy access to all components ensures that maintenance of the ACS5000 is simple and smooth. In addition to powerful diagnostic tools, you will profit by convenient remote monitoring.



Driving your high performance applications

Industry-specific solutions make the ACS5000 perfectly suitable to control your applications in the high power range.



Applications

Chemical, oil and gas

Compressors, extruders and pumps

Cement, mining and minerals

Grinding mills, conveyors, crushers, fans and pumps

Metals

Blast furnace blowers, fans and pumps

Power generation

Fans, pumps, gas turbine starters

Water

Pumps

Other applications

Test stands and wind tunnels



Flexible drive system integration

Customized solutions enable a smooth integration of the drive into any industrial environment.

Industry-specific options

The ACS5000 can be easily integrated into your processes and systems, thanks to a broad range of special features particularly tailored to your high power applications.

Open control system

We offer an open communication concept, enabling connection to higher level process controllers. The ACS5000 can be fitted with all major fieldbus adapters for smooth integration, monitoring and controlling of different processes, according to your requirements.

Adapts to your specific needs

Grid compatibility

The ACS5000 can be configured with an external transformer. In addition, the air-cooled type is available with an integrated transformer and the liquid-cooled with a combined transformer.

Flexible liquid cooling

Depending on the availability of cooling liquid, the liquid-cooled ACS5000 can be configured with a combined liquid cooling system of the input transformer and the converter. Even if no cooling liquid is available you can benefit from the high power of the ACS5000 liquid-cooled drive by using closed loop cooling with dedicated air blast coolers or chillers.

Long motor cables

The ACS5000 can also be adapted for applications with very long motor cables.

Commissioning

The commissioning wizard DriveStartup is an advanced tool that simplifies and speeds up commissioning. Standardized parameter sets and trained, certified professionals ensure smooth and fast commissioning.



More efficiency with drive packages

Packaged drive solutions provide you with ultimate efficiency and reliability to optimize your cost of ownership.

All-in-one package

Committed to supporting you in your business, we offer packaged drive solutions for applications in various industries. Customer-specific drive packages including medium voltage converters, motors and transformers can be developed as turnkey solutions meeting your individual requirements.

Matched performance

To ensure design integrity and an optimum match of equipment, ABB products have undergone combined tests ensuring performance predictability for your application.

Single point of contact

The combined power of the ABB offering is geared to deliver on customer expectations. We deliver motor-drive solutions that support your technical and commercial needs, from quotation, through delivery and service, over the entire product life-cycle.

Converter motors

With ABB's motors for your applications you will benefit from high versatility, reliability and simplicity.

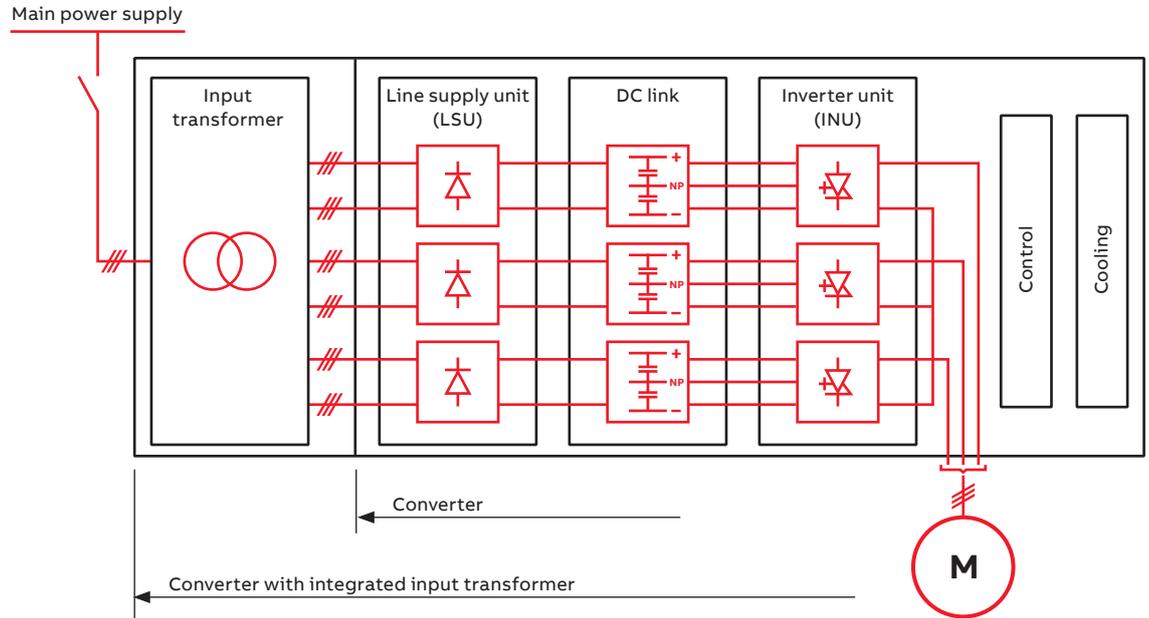
Converter transformers

ABB offers converter transformers for all ratings, as well as for indoor or outdoor mounting. Particularly designed for operation with variable speed drives, the transformer adapts the converter to the supply network and provides a galvanic isolation between drive and supply network.



Robust solution with special features

—
ACS5000 Voltage
Source Inverter
Multilevel-Fuseless
(VSI-MF) topology



Robust drive design

Special control features of the ACS5000 drive allow reliable operation in both weak and unbalanced networks. The drive is available with IP54 enclosure, making it suitable for operations even in harsh environments.

Highest level of personal and equipment safety

Electric arcs represent a hazard source for people and goods. For systems where large and dangerous arc fault currents can occur, special attention is required. Therefore, the high power liquid-cooled ACS5000 is equipped with a superior protection function and ABB's Arc Guard System™. This IAC classified solution assures very fast arc detection and elimination (less than 6 ms) to protect people and equipment.

Certified functional safety features

The ACS5000 is equipped with SIL (safety integrity level) 3 and PL (performance level) e certified functional safety features to allow the design of safe and reliable systems. An integrated grounding switch and electro-mechanical door locks make your operations even safer.

Reliable and efficient components

The combination of well-proven parts and an innovative topology results in a reliable drive solution to control your processes.

IGCT semiconductors

The ACS5000 uses a power semiconductor known as IGCT (Integrated Gate Commutated Thyristor), which is an ideal switch for high-powered medium voltage applications. The use of IGCTs results in a low parts count, providing an efficient and reliable drive.

Long-life DC link capacitors

Advanced, self-healing, environmentally friendly foil capacitors, designed for a long lifetime, are used in the DC link. This technology gives you a clear advantage over unreliable and maintenance intensive designs that are based on electrolytic DC link capacitors.

Fuseless design

The converter design does not require any medium voltage power fuses, which are known to be unreliable, costly and subject to aging. The ACS5000 uses dedicated IGCTs which provide faster and more reliable protection of the drive. This protection scheme responds in less than 25 μ sec, about two hundred times faster than fuses.

Power loss ride-through

A special feature of DTC is its ability to ride through short main supply voltage interruptions so that in most cases the process is not affected.

Motor-friendly output waveform for use with new or existing motors

The ACS5000 topology has an optimum number of switching levels, which provides a multilevel output waveform. This allows the use of standard motors without compromising reliability.

Powerful performance with DTC

Fast, reliable and accurate process control in combination with low energy consumption results in top performance. The ACS5000 drive control platform is ABB's award-winning direct torque control (DTC), resulting in the highest torque and speed performance, as well as the lowest losses ever achieved in medium voltage drives. Control of the drive is immediate and smooth under all conditions, even during high supply voltage and frequency variations.

Industry-specific solutions

The ACS5000 provides you with high configuration flexibility and ensures powerful and application-friendly performance.

Select from the wide range of configurations available for the liquid-cooled ACS5000 in order to meet the specific requirements of your application. Industry-specific features make the drive particularly suitable for the oil and gas and power generation industries.

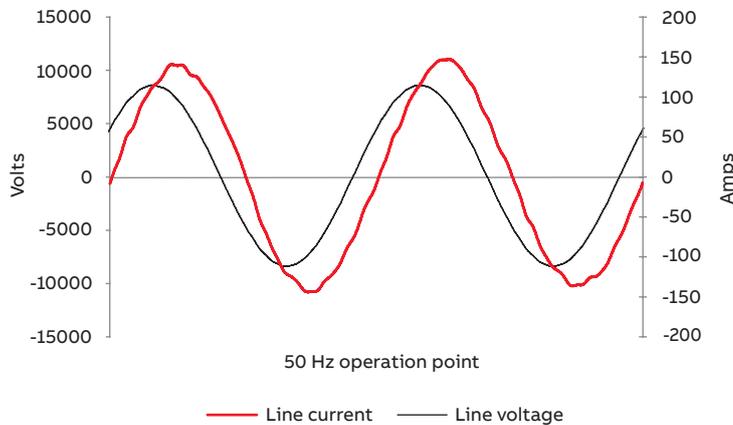
Flexible supply network connection

The drive is equipped with a 36-pulse rectifier meeting the most stringent requirements for current and voltage harmonic distortion as defined by IEEE, IEC and EN. This eliminates the need for costly harmonics analysis or the installation of network filters when applying a new drive.

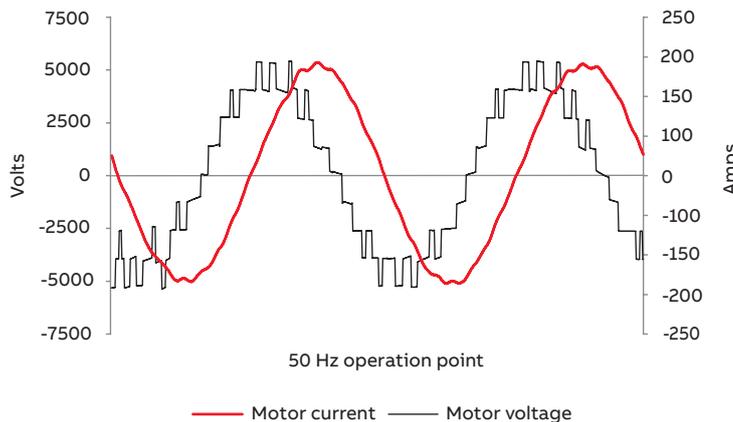
The air-cooled ACS5000 can be connected to an external or integrated transformer. The use of an external input transformer will minimize the heat losses into the electrical room, eliminating the need for additional ventilation systems. When operating the drive with an integrated transformer, installation and commissioning is particularly simple and fast.

To optimize the installation effort, the liquid-cooled ACS5000 is available as 18-pulse or combined transformer configuration.

Line current and voltage



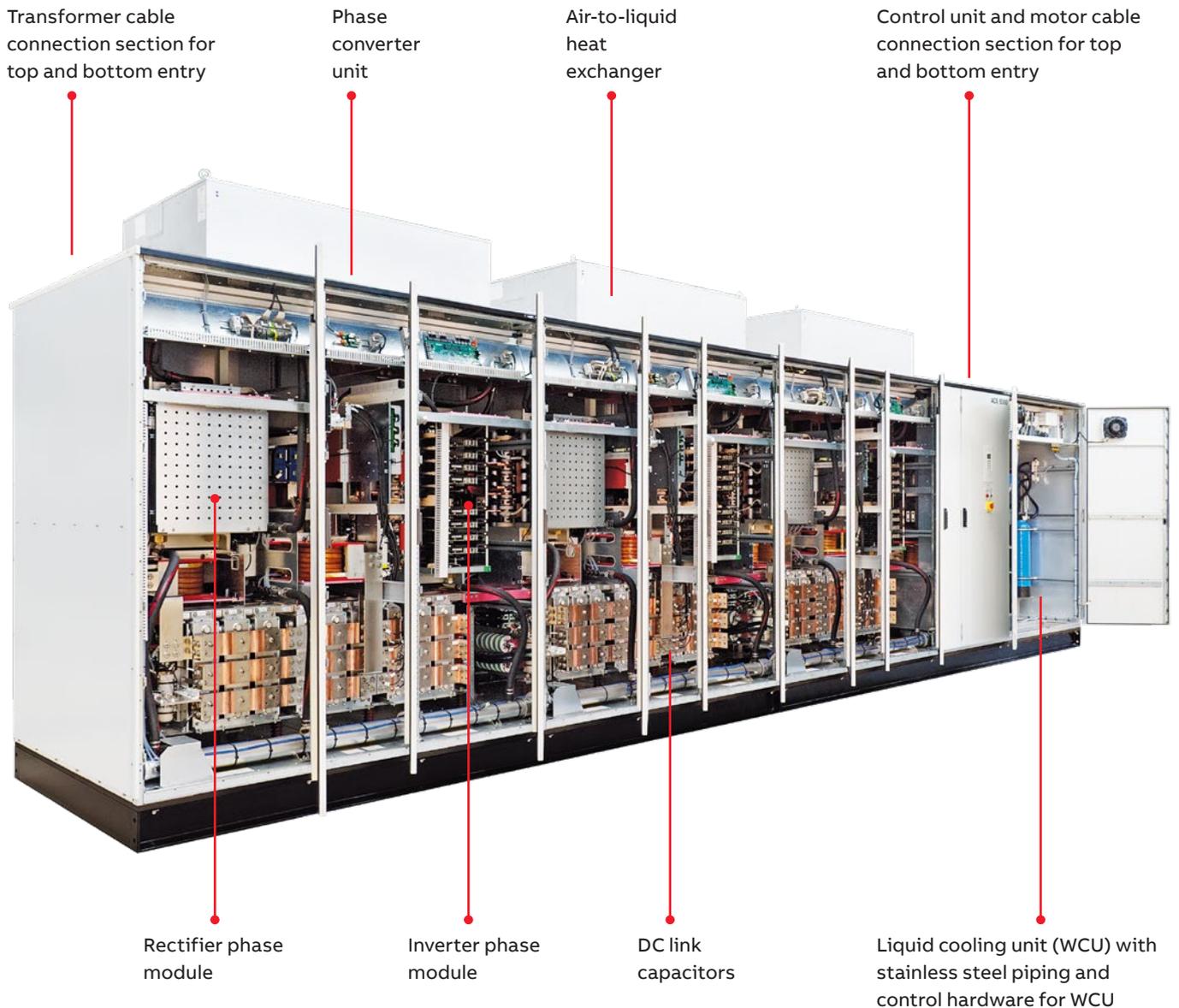
Motor current and voltage



Liquid-cooled, 5 to 36 MW

Thanks to liquid cooling and a sealed cabinet, you can reduce energy and ventilation costs. High reliability is ensured thanks to a minimized part count.

Liquid-cooled ACS5000,
18 MVA, 6.9 kV



Air-cooled, 2 to 7 MW

Cost optimization and simple system integration is possible with the air-cooled ACS5000.

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Air-cooled ACS5000 for operation with integrated input transformer, 7 MVA, 6.9 kV

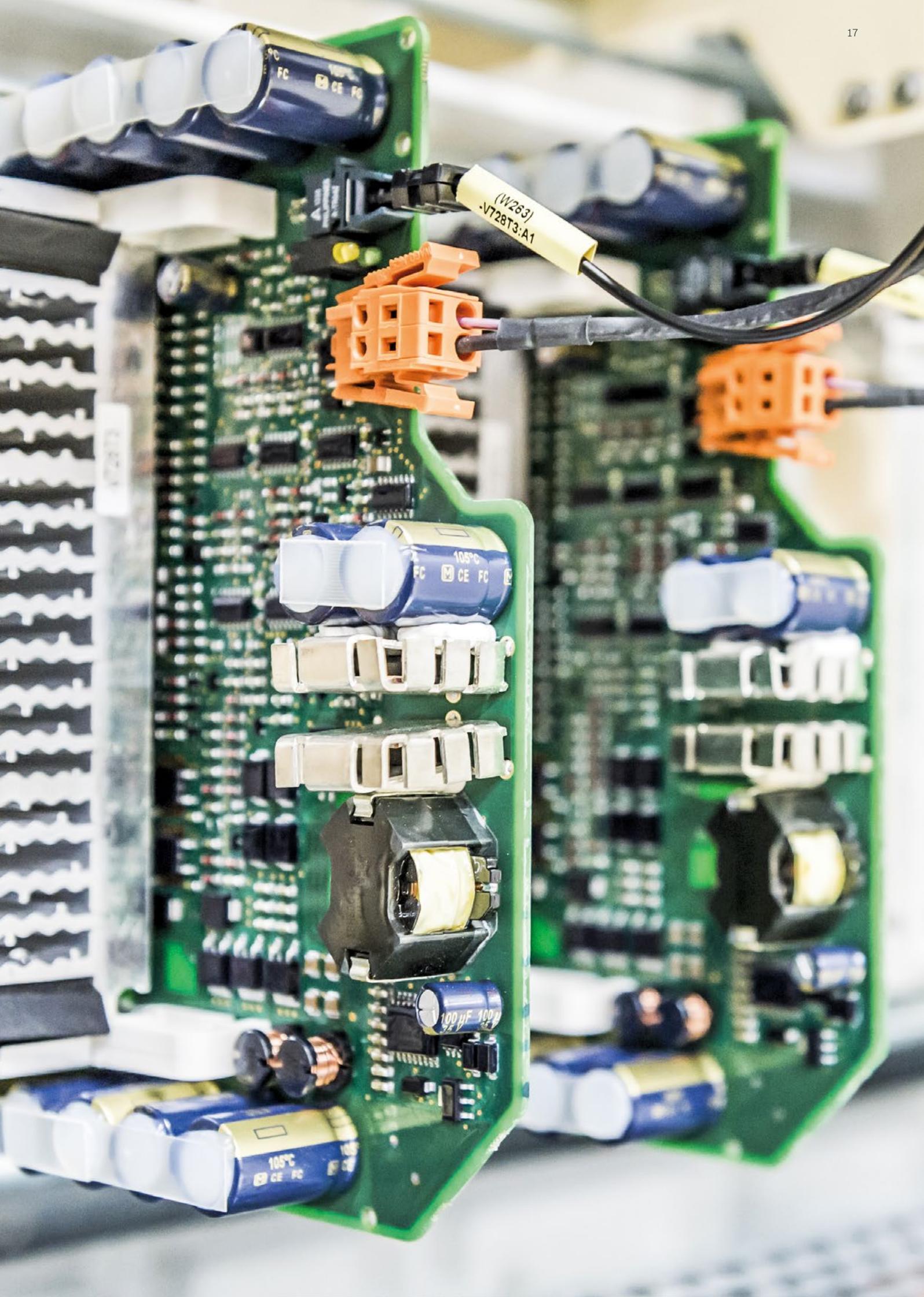


User-friendly drive control panel for local operation

- Keypad with multi-language display
- Main supply on/off push buttons
- Emergency off push button

Technical data

Input	
Input configuration	36-pulse diode rectifier. Optionally 18-pulse for frames 1 and 2 for liquid-cooled ACS5000.
Input voltage	Input to diode rectifier: 1920 to 1980 V, 3700 to 3960 V Input to integrated transformer: 4.16 to 13.8 kV
Input voltage variation	±10% without derating +20%/-30% with derating
Input frequency	50/60 Hz
Input frequency variation	<5%
Input power factor	>0.96
Input harmonics	IEC 61000-2-4 and IEEE 519 compliant
Auxiliary voltage	Control (optional): 110 V DC, 220 V DC or 110 to 240 V AC 50/60 Hz Auxiliary: 380 to 480 V AC 50/60 Hz, 3-phase 500 to 690 V AC 50/60 Hz, 3-phase (for liquid-cooled only)
Output	
Output power	2000 to 36000 kW (higher on request)
Output voltage	6.0 to 6.9 kV (4.0 to 4.16 kV with derating)
Output frequency	0 to 250 Hz
Motor type	Induction, synchronous and permanent magnet
Efficiency of converter	>98.5%
Mechanical	
Enclosure	Standard air-cooled: IP21 Standard liquid-cooled: IP42 Optional air-cooled: IP42 Optional liquid-cooled: IP54
Cable entry	Top/bottom
Environmental	
Altitude	2000 m.a.s.l. (higher with derating)
Ambient air temperature	+1 to +40 °C (lower and higher with derating)
External cooling liquid temperature	+5 to +32 °C (lower and higher with derating)
Noise	Liquid-cooled: ≤75 dB(A) Air-cooled: ≤85 dB(A)
Cooling type	Air, liquid
Standards	EN, IEC, CE, (optional CSA)



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105°C
FC CE FC

100µF 100V

105°C
FC CE FC

Ratings, types and voltages

ACS5000 air-cooled

Motor data			Type code ³⁾	Power (kVA)	Converter data			
Nominal ratings ²⁾					With external transformer		With integrated transformer	
(kW) ¹⁾	(hp) ¹⁾	(A)			Length (mm)	Weight (kg)	Length (mm)	Weight (kg)
6000 V								
1500	2010	170	ACS5000-060-A01A-x6-010	1800	3300	3000	5700	7700
1800	2410	210	ACS5000-060-A01B-x6-010	2200	3300	3000	5700	7700
2000	2680	240	ACS5000-060-A01C-x6-010	2500	3300	3000	5700	7700
2500	3350	290	ACS5000-060-A01D-x6-010	3000	3300	3000	6000	9200
2800	3750	315	ACS5000-060-A02A-x6-010	3300	3700	4000	6400	10200
3150	4220	355	ACS5000-060-A02B-x6-010	3700	3700	4000	6700	11200
3550	4760	400	ACS5000-060-A02C-x6-010	4200	3700	4000	6700	11200
4000	5360	440	ACS5000-060-A02D-x6-010	4600	3700	4000	6700	11200
4500	6030	510	ACS5000-060-A02E-x6-010	5300	3700	4000	6700	15500
5000	6700	585	ACS5000-060-A02F-x6-010	6000	3700	4000	6700	15500
6600 V								
1600	2140	170	ACS5000-066-A01A-x6-010	1900	3300	3000	5700	7700
2000	2680	210	ACS5000-066-A01B-x6-010	2400	3300	3000	5700	7700
2250	3020	240	ACS5000-066-A01C-x6-010	2800	3300	3000	6000	9200
2500	3350	290	ACS5000-066-A01D-x6-010	3300	3300	3000	6000	9200
2800	3750	315	ACS5000-066-A02A-x6-010	3600	3700	4000	6400	10200
3150	4220	355	ACS5000-066-A02B-x6-010	4100	3700	4000	6700	11200
3550	4760	400	ACS5000-066-A02C-x6-010	4600	3700	4000	6700	11200
4000	5360	440	ACS5000-066-A02D-x6-010	5000	3700	4000	6700	15500
4500	6030	510	ACS5000-066-A02E-x6-010	5800	3700	4000	6700	15500
5600	7500	585	ACS5000-066-A02F-x6-010	6700	3700	4000	6700	15500
6900 V								
1600	2140	170	ACS5000-069-A01A-x6-010	2000	3300	3000	5700	7700
2000	2680	210	ACS5000-069-A01B-x6-010	2500	3300	3000	5700	7700
2250	3020	240	ACS5000-069-A01C-x6-010	2900	3300	3000	6000	9200
2800	3750	290	ACS5000-069-A01D-x6-010	3500	3300	3000	6000	9200
3150	4220	315	ACS5000-069-A02A-x6-010	3700	3700	4000	6700	10200
3550	4760	355	ACS5000-069-A02B-x6-010	4200	3700	4000	6700	11200
4000	5360	400	ACS5000-069-A02C-x6-010	4800	3700	4000	6700	11200
4500	6030	440	ACS5000-069-A02D-x6-010	5200	3700	4000	6700	15500
5000	6700	510	ACS5000-069-A02E-x6-010	6100	3700	4000	6700	15500
6000	8040	585	ACS5000-069-A02F-x6-010	7000	3700	4000	6700	15500

¹⁾ Indicative information referring to typical 4-pole induction motor under nominal supply voltage conditions.

²⁾ Nominal rating for no-overload operation

³⁾ 'x' indicates the different input transformer configurations

E – for external transformer

J – for integrated transformer

Dimensions:

• Height

- 2360 mm cabinet height
- 2815 mm including cooling fans
- 2935 mm including redundant cooling fans

• Depth

- 1100 mm
- 1300 mm for integrated transformer with power >5000 kVA

Ratings, types and voltages

ACS5000 liquid-cooled

Motor data			Type code ³⁾	Power (kVA)	Converter data			
Nominal ratings ²⁾					With external transformer		With combined transformer ⁴⁾	
(kW) ¹⁾	(hp) ¹⁾	(A)			Length (mm)	Weight (kg)	Length (mm)	Weight (kg)
6000 V								
6830	9150	670	ACS5000-060-W01A-xy-010	7000	7130	6800	8530	8650
8480	11360	840	ACS5000-060-W01B-xy-010	8700	7130	6800	8530	8650
10140	13590	1000	ACS5000-060-W01C-xy-010	10400	7130	6800	8530	8650
11154	14949	1100	ACS5000-060-W01D-xy-010	11440	7130	6800	8530	8650
12680	16990	1250	ACS5000-060-W02A-xy-010	13000	9130	9700	9730	10450
15210	20380	1500	ACS5000-060-W02B-xy-010	15600	9130	9700	9730	10450
17750	23790	1750	ACS5000-060-W03A-E6-010	18200	13430	12200	n.a.	n.a.
20280	27180	2000	ACS5000-060-W03B-E6-010	20800	13430	12200	n.a.	n.a.
23300	31220	2300	ACS5000-060-W04A-E6-010	23900	15830	16500	n.a.	n.a.
25350	33970	2500	ACS5000-060-W04B-E6-010	26000	15830	16500	n.a.	n.a.
30420	40760	3000	ACS5000-060-W04C-E6-010	31200	15830	16500	n.a.	n.a.
6600 V								
7510	10060	670	ACS5000-066-W01A-xy-010	7700	7130	6800	8530	8650
9360	12540	840	ACS5000-066-W01B-xy-010	9600	7130	6800	8530	8650
11120	14900	1000	ACS5000-066-W01C-xy-010	11400	7130	6800	8530	8650
12232	16390	1100	ACS5000-066-W01D-xy-010	12540	7130	6800	8530	8650
13940	18680	1250	ACS5000-066-W02A-xy-010	14300	9130	9700	9730	10450
16670	22340	1500	ACS5000-066-W02B-xy-010	17100	9130	9700	9730	10450
19500	26130	1750	ACS5000-066-W03A-E6-010	20000	13430	12200	n.a.	n.a.
22330	29920	2000	ACS5000-066-W03B-E6-010	22900	13430	12200	n.a.	n.a.
25640	34360	2300	ACS5000-066-W04A-E6-010	26300	15830	16500	n.a.	n.a.
27890	37370	2500	ACS5000-066-W04B-E6-010	28600	15830	16500	n.a.	n.a.
33440	44810	3000	ACS5000-066-W04C-E6-010	34300	15830	16500	n.a.	n.a.
6900 V								
7800	10450	670	ACS5000-069-W01A-xy-010	8000	7130	6800	8530	8650
9750	13070	840	ACS5000-069-W01B-xy-010	10000	7130	6800	8530	8650
11700	15680	1000	ACS5000-069-W01C-xy-010	12000	7130	6800	8530	8650
12870	17248	1100	ACS5000-069-W01D-xy-010	13200	7130	6800	8530	8650
14530	19470	1250	ACS5000-069-W02A-xy-010	14900	9130	9700	9730	10450
17450	23380	1500	ACS5000-069-W02B-xy-010	17900	9130	9700	9730	10450
20380	27310	1750	ACS5000-069-W03A-E6-010	20900	13430	12200	n.a.	n.a.
23300	31220	2000	ACS5000-069-W03B-E6-010	23900	13430	12200	n.a.	n.a.
26810	35930	2300	ACS5000-069-W04A-E6-010	27500	15830	16500	n.a.	n.a.
29150	39060	2500	ACS5000-069-W04B-E6-010	29900	15830	16500	n.a.	n.a.
35000	46900	3000	ACS5000-069-W04C-E6-010	35900	15830	16500	n.a.	n.a.

¹⁾ Indicative information referring to typical 4-pole induction motor under nominal supply voltage conditions.

²⁾ Nominal rating for no-overload operation

³⁾ ,x' indicates the different converter types

E – for external transformer

J – for integrated transformer

,y' indicates different rectifier types:

- 3 - 18-pulse

- 6 - 36-pulse

Note: C3 is not available.

⁴⁾ In combined transformer configuration the cooling system of the input transformer is connected to the cooling liquid system of the converter and the system has a common cooling liquid pump in the converter. The length and weight do not include the input transformer part. The combined transformer is available only for a 36-pulse rectifier.

Dimensions:

• Height

- 2363 mm cabinet height
- 2752 mm including cooling units
- 2774 mm including cooling units and mechanical design for offshore applications

• Depth

- 1600 mm

Services to match your needs

Your service needs depend on your operation, life cycle of your equipment and business priorities. We have identified our customers' four most common needs and defined service options to satisfy them. What is your choice to keep your drives at peak performance?

Is uptime your priority?

Keep your drives running with precisely planned and executed maintenance.

Example services include:

- ABB Ability™ Life Cycle Assessment
- Installation and Commissioning
- Spare Parts
- Preventive Maintenance
- Reconditioning
- ABB Drive Care agreement
- Drive Exchange



Operational efficiency

Is rapid response a key consideration?

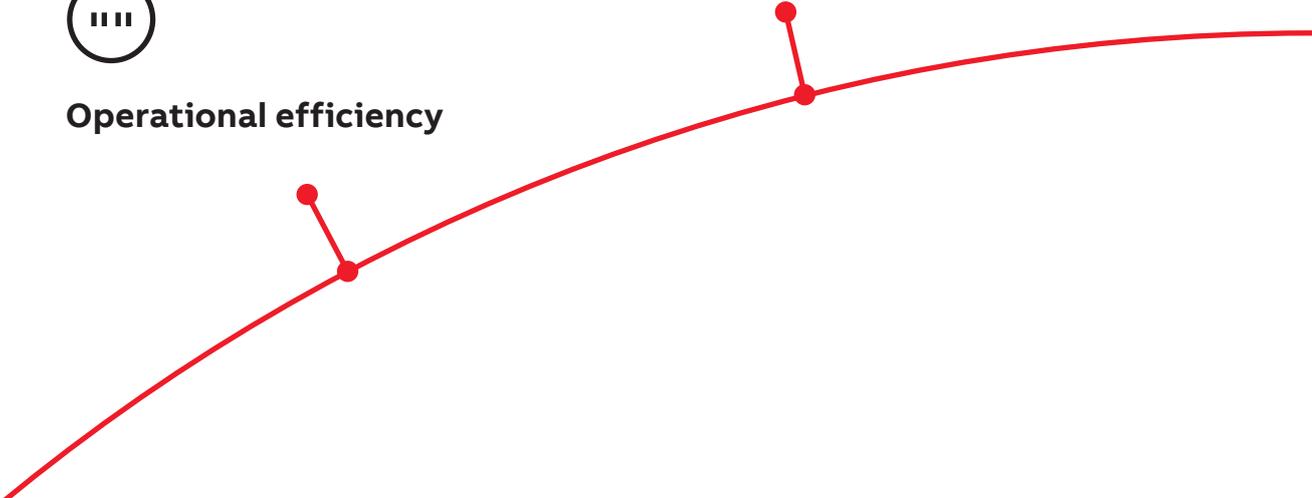
If your drives require immediate action, our global network is at your service.

Example services include:

- Technical Support
- On-site Repair
- ABB Ability™ Remote Assistance
- Response time agreements
- Training



Rapid response



Drives service

Your choice, your future

The future of your drives depends on the service you choose.

Whatever you choose, it should be a well-informed decision. No guesswork. We have the expertise and experience to help you find and implement the right service for your drive equipment. You can start by asking yourself these two critical questions:

- Why should my drive be serviced?
- What would my optimal service options be?

From here, you have our guidance and full support along the course you take, throughout the entire lifetime of your drives.

Need to extend your assets' lifetime?

Maximize your drive's lifetime with our services.

Example services include:

- ABB Ability™ Life Cycle Assessment
- Upgrades, Retrofits and Modernization
- Replacement, Disposal and Recycling



Life cycle management

Your choice, your business efficiency

ABB Drive Care agreement lets you focus on your core business. A selection of predefined service options matching your needs provides optimal, more reliable performance, extended drive lifetime and improved cost control. So you can reduce the risk of unplanned downtime and find it easier to budget for maintenance.

Is performance most critical to your operation?

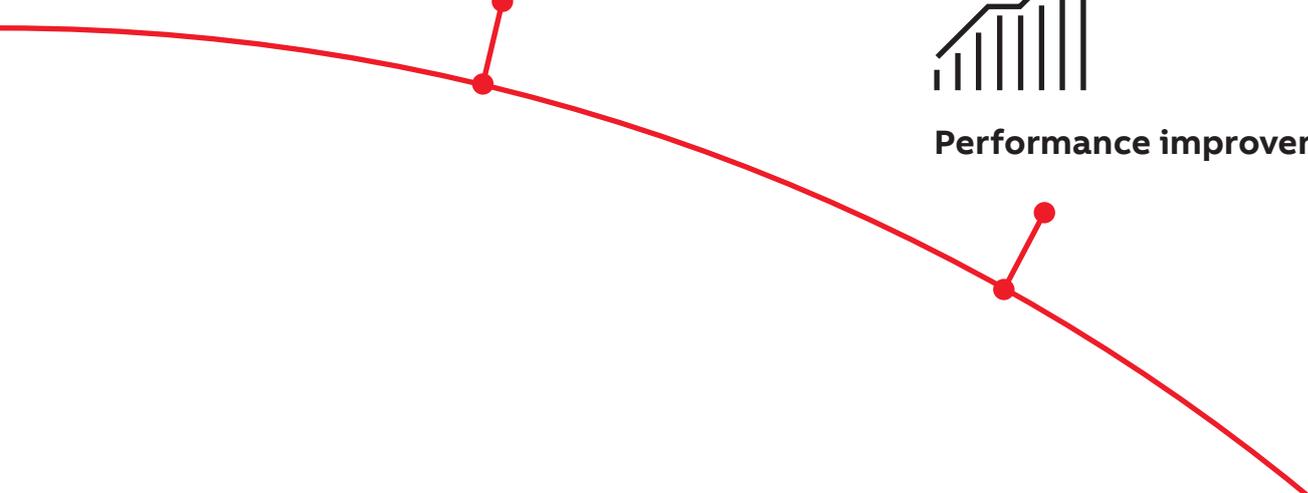
Get optimal performance out of your machinery and systems.

Example services include:

- ABB Ability™ Remote Services
- Engineering and Consulting
- Inspection and Diagnostics
- Upgrades, Retrofits and Modernization
- Workshop Repair
- Tailored services



Performance improvement



A lifetime of peak performance

You're in control of every life cycle phase of your drives. At the heart of drive services is a four-phase product life cycle management model. This model defines the services recommended and available throughout drives lifespan.

Now it's easy for you to see the exact service and maintenance available for your drives.

ABB drives life cycle phases explained:



Full range of life cycle services and support

Limited range of life cycle services and support

Replacement and end-of-life services

Product	Product is in active sales and manufacturing phase.	Serial production has ceased. Product may be available for plant extensions, as a spare part or for installed base renewal.	Product is no longer available.	Product is no longer available.
	Services	Full range of life cycle services is available. Product enhancements may be available through upgrade and retrofit solutions.	Limited range of life cycle services is available. Spare parts availability is limited to available stock.	Replacement and end-of-life services are available.

Keeping you informed

We notify you every step of the way using life cycle status statements and announcements.

Your benefit is clear information about your drives' status and precise services available. It helps you plan the preferred service actions ahead of time and make sure that continuous support is always available.

Step 1

Life Cycle Status Announcement

Provides early information about the upcoming life cycle phase change and how it affects the availability of services.

Step 2

Life Cycle Status Statement

Provides information about the drive's current life cycle status, availability of product and services, life cycle plan and recommended actions.

ABB Ability™ Condition Monitoring for drives



ABB Ability™ Condition Monitoring for Drives is a service that delivers you accurate, real-time information about drive events to ensure your equipment is available, reliable and maintainable. When you have the facts, you can make the right decisions.



Make best decisions

You know your process, we know the drives. Our monitoring system provides you with data and information from the drives for your best decisions.



Reduce the risks

You have the information when needed most. Our monitoring system is continuously collecting data for you to set warning limits and to trouble-shoot potential problems.



Available on your need

You can combine Remote Assistance Service with Condition Monitoring. Our experts will always be on hand to consult with you.



Check the service availability for your drive types with your local ABB representative.

Need help?

Contact ABB or third party channel company.

abb.com/drives/services

abb.com/searchchannels



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For more information, please contact
your local ABB representative or visit

abb.com/drives

abb.com/drivespartners

abb.com/motors&generators