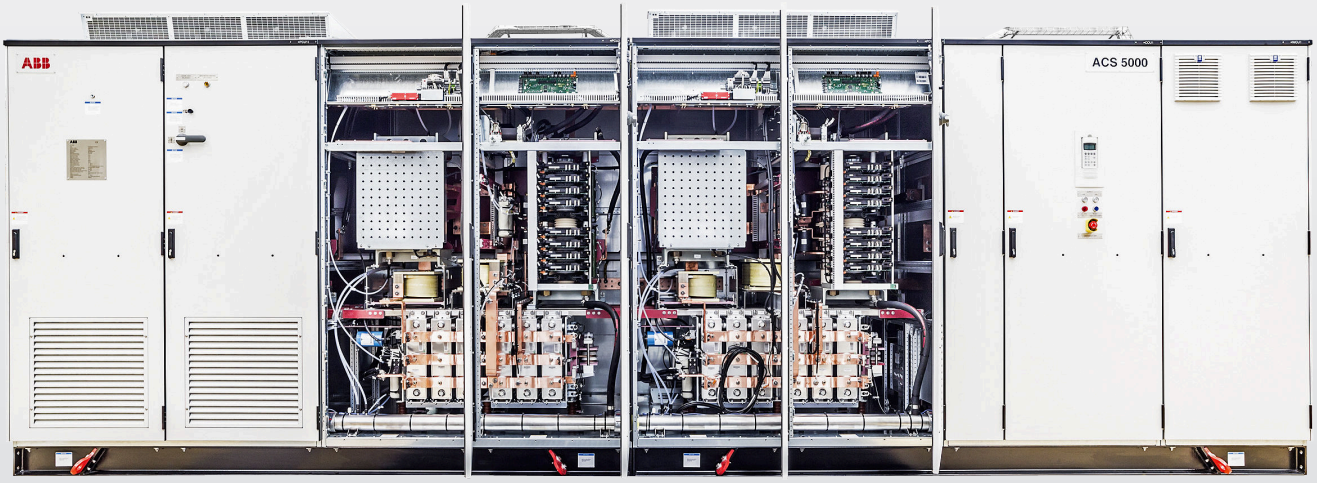
MEDIUM VOLTAGE AC DRIVES

ABB drives

ACS5000 water-cooled
5 to 36 MW



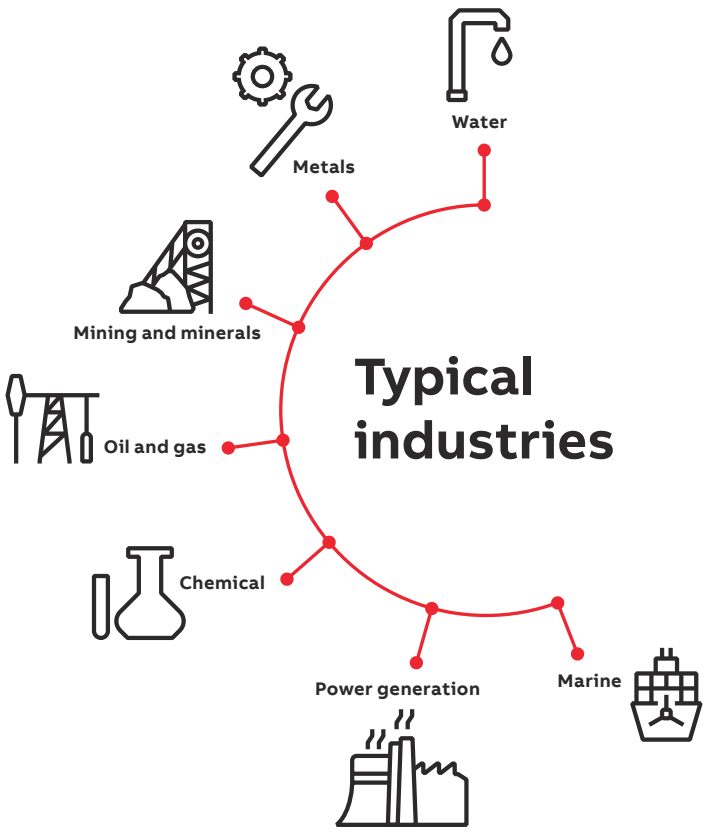
The power you require.
The reliability you expect.

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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, 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.

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.


ACS 5000

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 CO_2 emissions.

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

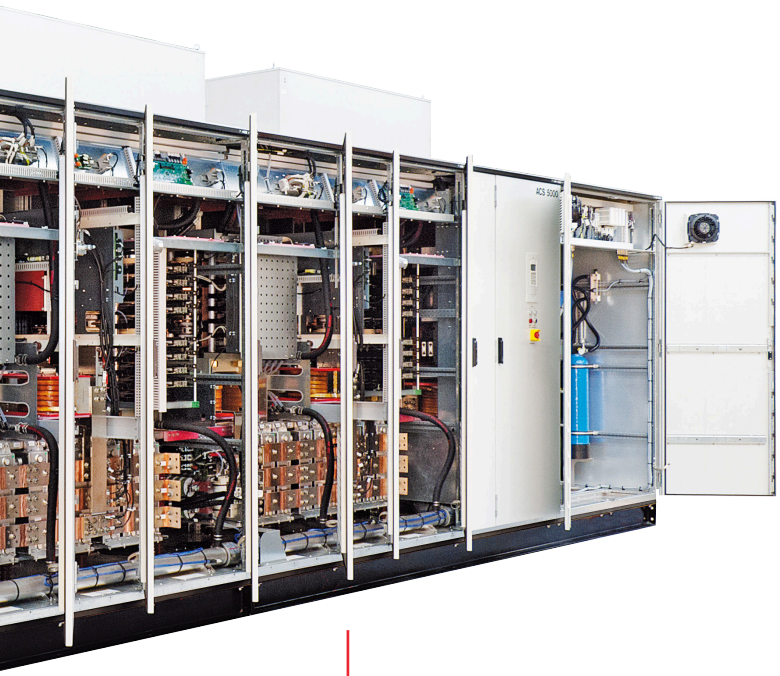
Highest level of personnel safety
Your people and goods are protected from electric arcs thanks to the advanced safety design of the ACS5000. Arcs are detected and eliminated very fast, avoiding production stoppages. Certified functional safety features and a DC grounding switch make your systems safe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

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 connection
The ACS5000 can be configured with an external transformer and 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.

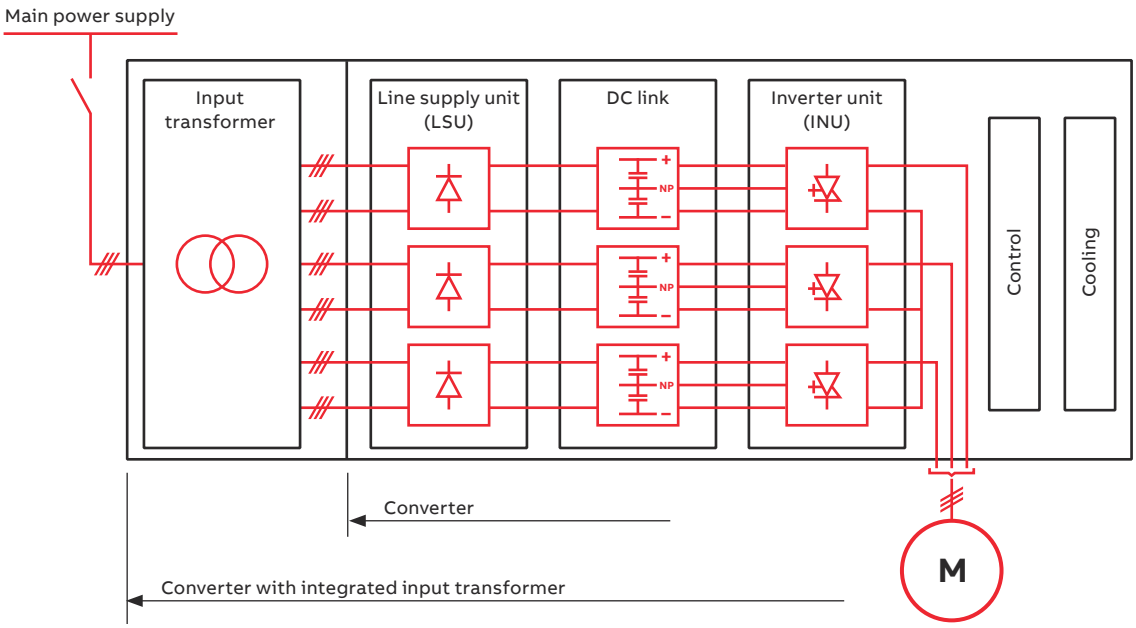
Converter motors
With ABB's motors for your applications you will benefit from high versatility, reliability and simplicity.

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 liquid-cooled type is available with a closed loop cooling arrangement making it independent on the ambient temperature. This allows a high degree of protection provided by the enclosure ensuring limited dust ingress making it suitable for operation even in harsh environment.

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 safety integrity level and performance level 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.

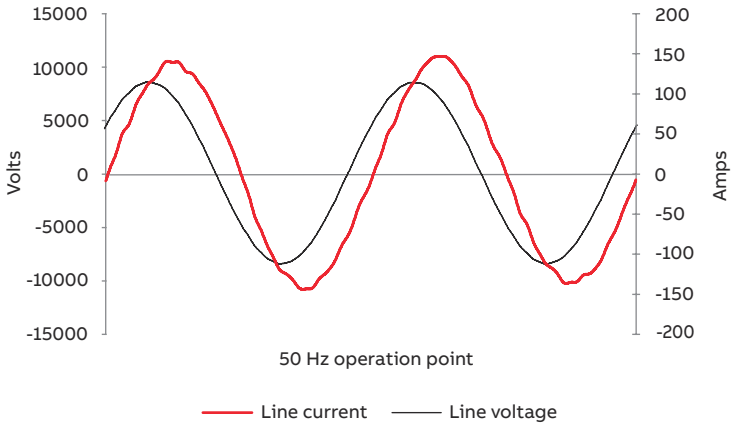
Long-life DC link capacitors
Advanced, self-healing, environmentally friendly foil capacitors, designed for a long lifetime, are used in the DC link. This technology gives you a clear advantage over unreliable and maintenance intensive designs that are based on electrolytic DC link capacitors.

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 µsec, about two hundred times faster than fuses.

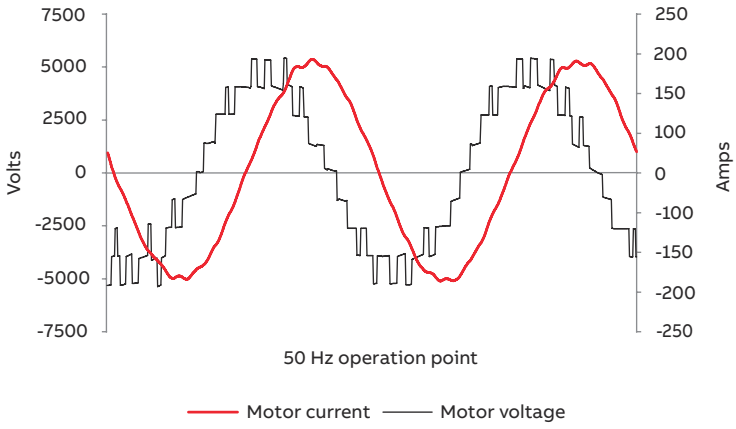
Power loss ride-through
A special feature of DTC is its ability to ride through short main supply voltage interruptions so that in most cases the process is not affected.

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.

Line current and voltage



Motor current and voltage



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.

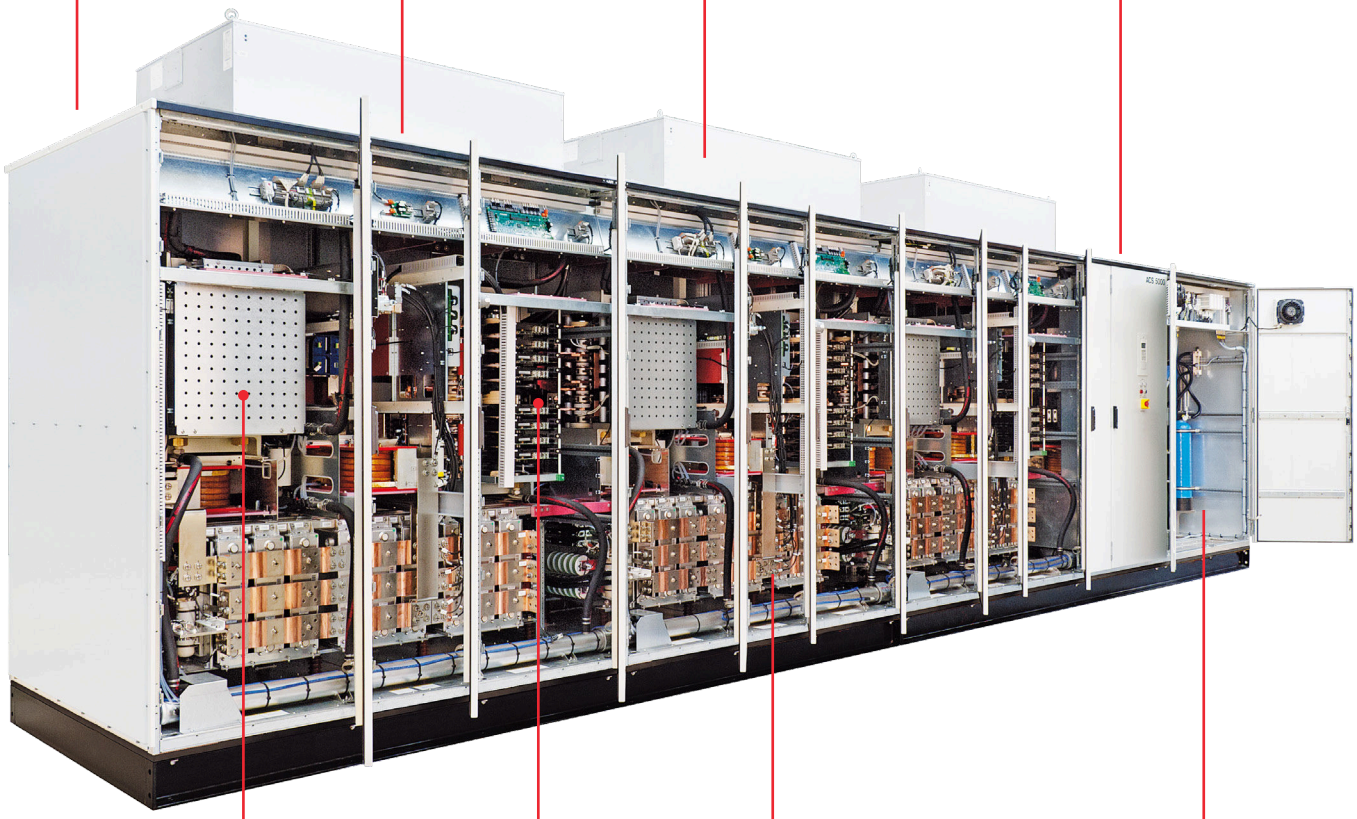
Flexible supply network connection
The drive is equipped with a 36-pulse rectifier meeting the most stringent requirements for current and voltage harmonic distortion as defined by IEEE, IEC and EN. This eliminates the need for costly harmonics analysis or the installation of network filters when applying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

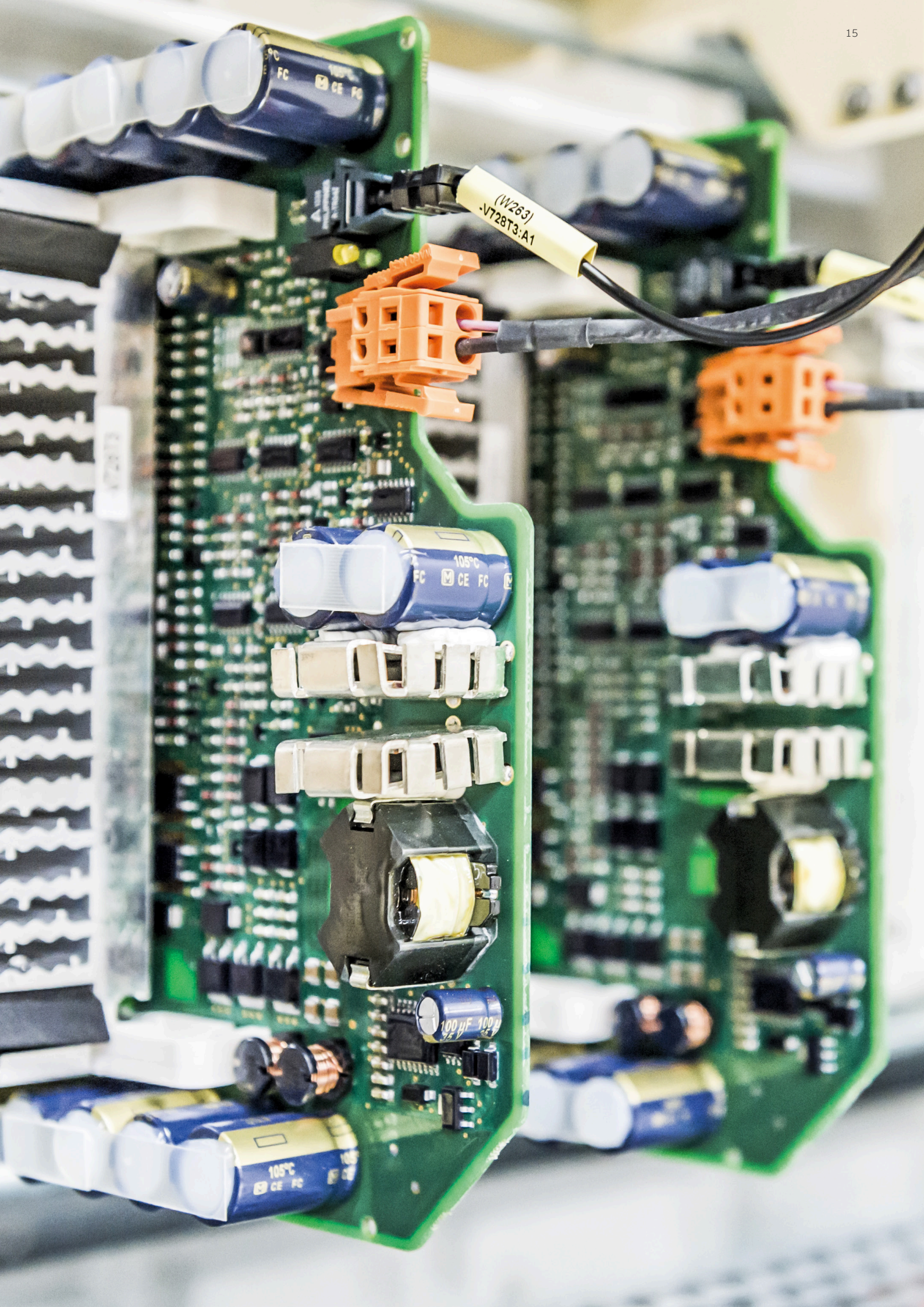
To optimize the installation effort, the liquid-cooled ACS5000 is available as 18-pulse or combined transformer configuration.

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.

—
ACS5000 water-cooled,
18 MVA, 6.9 kV




(W263)
-V728T3:A1
105°C
FC
CE
100 µF

Technical data

Input	
Input configuration	36-pulse diode rectifier. Optionally 18-pulse for frames 1.
Input voltage	Input to diode rectifier: 1920 to 1980 V, 3700 to 3960 V
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
Output	
Output power	5000 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 and synchronous
Efficiency of converter	>98.5%
Mechanical	
Enclosure	Standard liquid-cooled: IP42
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	≤75 dB(A)
Cooling type	Liquid
Standards	EN, IEC, CE, (optional CSA, UL)

Ratings, types and voltages
ACS5000 water-cooled

Motor data			Converter data					
Nominal ratings [2]			Type code [3]	Power	With external transformer		With combined transformer [4]	
(kW) [1]	(hp) [1]	(A)		(kVA)	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.
22330	30000	2200	ACS5000-060-W03C-E6-010	22900	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.
24570	32950	2200	ACS5000-066-W03C-E6-010	25200	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.
25640	34380	2200	ACS5000-069-W03C-E6-010	26300	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

ABB Ability™ Digital Powertrain
Condition monitoring for powertrains



Accurate, real-time information about powertrain events. When you have the facts, you can make the right decisions.

ABB Ability™ Condition Monitoring for powertrains gives you self-service access to the ABB Ability™ Digital Powertrain portal. It provides real-time, fact-based insight into your powertrain assets, such as drives and motors, via KPIs and signal data, to identify irregularities before they become problems. This helps you make proactive decisions, built on real-time information – and saves you money!

The service can be tailored to fit your needs
Our standard package gives you industry leading monitoring capabilities – whether you want to view the drive status through ABB's Internet portal or integrate this data with your existing monitoring systems.

The standard package includes the following services:
- Self-service condition monitoring
- Alarm Management
- Asset Health
- Team Support
- Backup Management

The standard package can be supplemented with optional services:
- Offline Data Collection
- Expert Reports
- Remote Assistance
- Plug & Play Connectivity
- Monitoring Service

Solid fact-based decision making
Get the facts, and the history, to help run your operations better and more safely.

Always stay one step ahead of problems
Recognize early signs of possible failures and assess the risks, before they turn into serious operational issues.

Find the root cause of process issues
Remotely access data from ABB drives built-in sensors to track the cause of problems. Get back to smooth operation quickly with data back-ups.

Remotely analyze and optimize drives
Get critical drive information anywhere anytime – even in difficult to access sites, or when a site visit is impossible.

Customers can configure powertrains and customize the digital service plan

1 Choose one or more assets you want to protect

2 Install the connectivity device

3 Activate access to the Condition Monitoring basic feature

4 Pick optional features and customize

5 Start monitoring

6 Enjoy the customized service

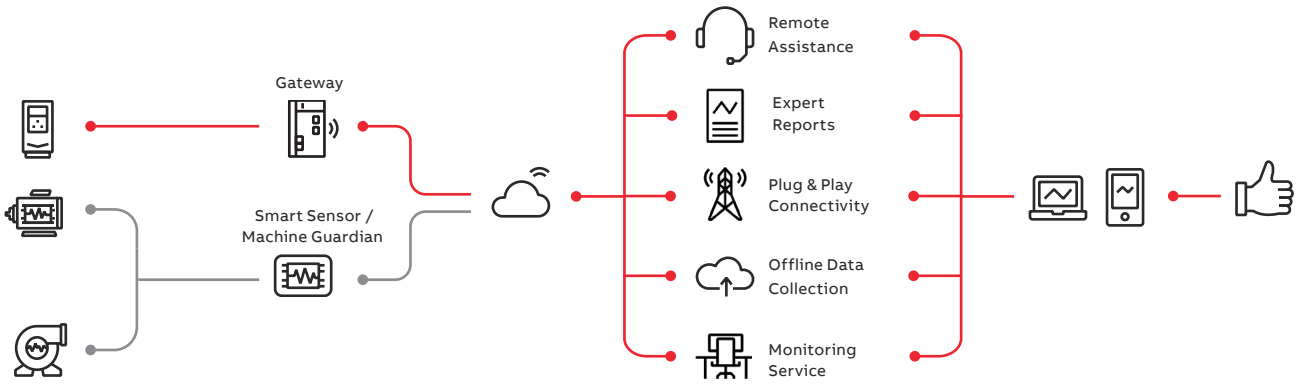
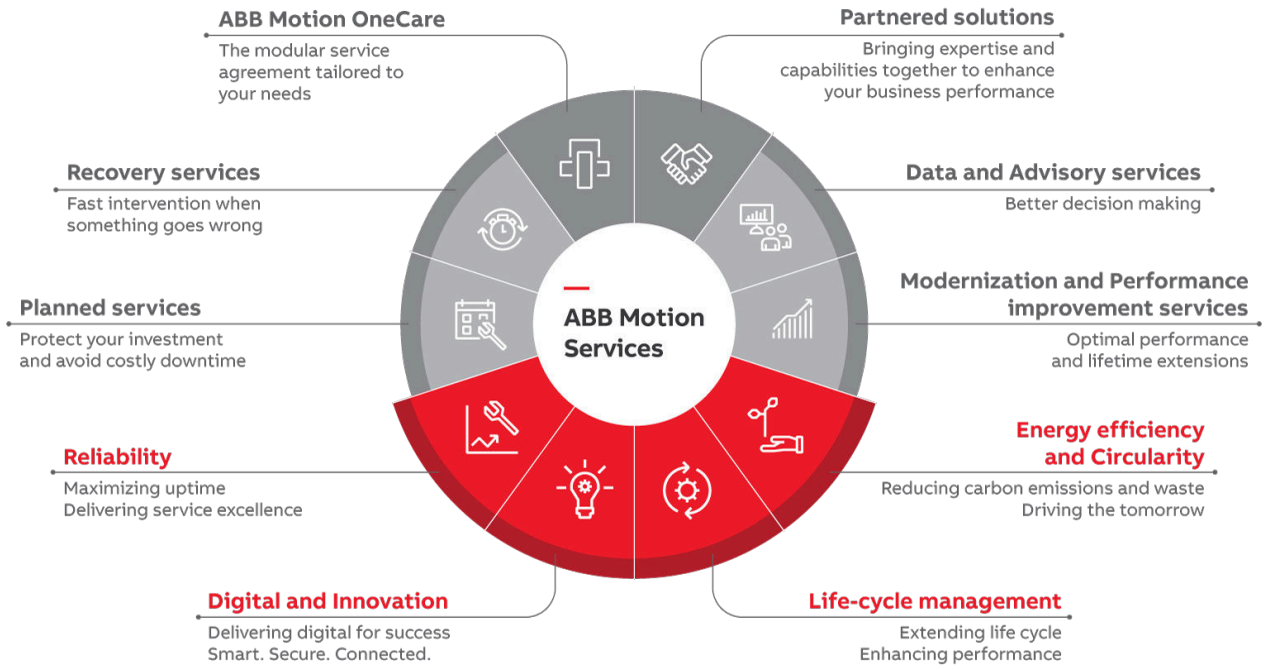




ABB Motion Services

ABB Motion Services helps customers around the globe by maximizing uptime, extending product life-cycle, and enhancing the performance and energy efficiency of electrical motion solutions. We enable innovation and success through digitalization by securely connecting and monitoring our customers' motors and drives, increasing operational uptime, and improving efficiency. We make the difference for our customers and partners every day by keeping their operations running profitably, safely and reliably.



OUR EXPERTISE
YOUR ADVANTAGE

A lifetime of peak performance

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

The benefit for you is clear information about the status of your drives and the exact 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, the availability of product and services, the life-cycle plan, and recommended actions.

Notes

Additional information
We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

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