ACS6080 drives
Your right choice for high performance applications
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ACS6080 drives

The new ACS6080 medium voltage drives are tailored to meet the needs of demanding applications that require high dynamic performance, precision, reliability and safety. On top of ABB's new MP³C control technology, the drive provides easy-to-use interfaces to simplify operation and ABB Ability™ remote condition monitoring to ensure the drive is accessible and maintainable anywhere in the world.

The accomplished expert for heavy industries offers you unlimited possibilities of configurations to drive both single- and multi-motor applications. Industry-specific functions and unique features ensure reliable control of your processes and systems.
ACS6080 drives
Based on long-term experience and in-depth knowledge

> 45 years experience

1969
AC drive development started

1985
Megastar 3-level PWM MV drive with vector control

1993
Self-healing capacitors

1995
Direct Torque Control (DTC)

1997
ACS1000 first IGCT-based MV drive

1999
ACS6000 first MV multidrive with PEBB technology

2005
ACS5000 first MV drive with VSI-MF topology

2009
ACS2000 MV drive for direct-to-line connection

2012
ACS5000 second generation
Power extension 13.8 kV

2014
ACS580MV introduction in China

2017
ACS6080 all-compatible MV multidrive
ACS6080 drives
Complementing our broad portfolio of drive solutions

Energy efficiency – emission reduction

ACS580MV
Applications:
• pumps, fans
Segments:
• Infrastructure, water, HVAC
• Auxiliary applications in heavy industry, metals, cement, power generation, ..
Focus:
• Non-specification driven
• Non-critical applications (can run without drive in bypass mode)
• Capex – energy savings made affordable

ACS5000 / LCI
Applications:
• Large compressors, pumps, fans, GT starters
Segments:
• Oil & gas
• Power generation
• Water
Focus:
• High power
• High reliability and availability
• Highest level of personal safety

ACS1000 / ACS2000
Applications:
• Pumps, fans, mills, conveyors, extruders, mixers, hoists, ..
Segments:
• Mining, Cement
• Oil&gas, petrochem
• Marine, offshore
• Power generation, water
Focus:
• Flexible to configure for the specific needs
• High reliability and availability
• Highest level of personal safety

ACS6080 / PCS6000
Applications:
• Mills, conveyors, propulsion, wind mills, hoists, ..
Segments:
• Metals, mining, marine
• Test stands, special applications
• Renewable power generation
Focus:
• Flexible to configure for specific needs
• High performance
• High reliability and availability
• Highest level of personal safety

Process Control

Segments:
• Infrastructure, water, HVAC
• Auxiliary applications in heavy industry, metals, cement, power generation, ..

Focus:
• Non-specification driven
• Non-critical applications (can run without drive in bypass mode)
• Capex – energy savings made affordable
ACS6080 drives
At a glance

**Highlights**

- Voltage source inverter, 3-level neutral point clamped topology
- Voltage range: 2.3-3.3kV
- Power range: up to 36 MW
- Common DC bus for single and multi-motor operation and energy recuperation
- Based on ABB’s well proven IGCT semiconductor platform
ACS6080 drives
At a glance

**Highlights**

- MP³C control technology for exceptionally high torque, speed performance and motor friendliness
- Control any type of motor: synchronous, asynchronous and permanent magnet
- Line Supply Unit (LSU) for two-quadrant operation with a constant power factor of 0.95 over the whole speed range
- Active Rectifier Unit (ARU) for four-quadrant operation and reduced harmonics, adjustable power factor
ACS6080 Drives

Product overview

Active Rectifier Unit (ARU)
Self-commutated, 6-pulse, 3-level voltage source inverter with IGCT technology to rectify the line voltage from AC to DC

Terminal and Control Unit
Contains the power terminals and the control swing frame

Inverter Unit (INU)
Self-commutated, 6-pulse, 3-level voltage source inverter with IGCT technology to invert the voltage from DC to AC

Capacitor Bank Unit
DC capacitors for smoothing the intermediate DC voltage

Water Cooling Unit
Supplies deionized water for cooling the main power components
ACS6080 drives
The right choice for high performance applications

**Modularity and flexibility**
- Built to order - every drive is tailored to fulfill your needs
- 2 or 4 quadrant, single or multi motor, wide range of customer-specific options in a very compact design

**Performance and usability**
- New MP³C control technology
- Part of the ABB drives all-compatible portfolio
- Smooth integration and easier operation throughout your entire installation

**Highest level of safety**
- Arc resistant design with fast arc elimination
- Integrated DC grounding switch
- Electromechanically interlocked doors
- Certified functional safety

**Reliability and availability**
- ABB Ability™ condition monitoring for drives to monitor your drive condition every time, every where.
- Low parts count and fuseless design - ABB IGCT technology confirmed to be the best choice for high power applications
## ACS6080 drives

Benefits that add value to your operations

### Benefits and features

<table>
<thead>
<tr>
<th>Tailor-made solutions</th>
<th>Highest level of personal safety</th>
<th>High reliability and availability</th>
<th>Increase productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Configurable for single-, multi-motor and redundant configurations</td>
<td>- Arc resistant design (certified by 3rd party) with fast arc elimination</td>
<td>- Each configuration consists of very well-proven components and simple power circuit</td>
<td>- Part of ABB drives All-compatible family</td>
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<tr>
<td>- The modules can be arranged according to the required output power, motor configuration and process needs</td>
<td>- Integrated DC grounding switch</td>
<td>- Low part count</td>
<td>- Smoother integration and easier operation throughout your entire installation</td>
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<td>- Very compact and standardized design for reduced footprint</td>
<td>- Electromechanically interlocked doors to all MV compartments</td>
<td>- Fuseless design</td>
<td>- Best-in-class control in terms of dynamic performance and power quality</td>
</tr>
<tr>
<td>- Flexible layout can be straight in line or fitted into the installation room with U, L or back-to-back setups</td>
<td>- Certified functional safety features (E-off, E-stop, Safe Stop 1, STO, POUS)</td>
<td>- Self healing capacitors</td>
<td>- Precise process control</td>
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<td></td>
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<td>- Redundant configurations</td>
<td>- Dynamic performances</td>
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<td></td>
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<td>- ABB Ability and cloud connection for remote condition monitoring and remote assistance</td>
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Modularity and flexibility
ACS6080 drives
Customized solutions based on a modular design

Taking your business forward with everything working like clockwork

Engineered and designed to meet your specific needs

- Build from a set of standardized modules
- Easy integration into any industrial environment
- High constant power factor
- Reactive power compensation to avoid reactive power penalties
- Low network harmonics
- Wide range of industry-specific options
- Compliant with various industry-specific certifications
- Easy and smooth power upgrades to minimize your CAPEX
Modular drive system
Arranged according to your process needs

Mini ACS6080
- ~5 MVA
- <5 meters long
- Delivered as one unit

Maxi ACS6080
- >30 MVA power
- >30 meters long
- Delivered in up to 10 transport units

Easier than you think thanks to “building block” system
Basic types of configurations

Maximum flexibility

- For synchronous, induction and permanent magnet motors
- Commonly used in applications which require large, independent and decentralized drives

Single-motor drive

Multi-motor drive

- For multiple synchronous, induction or permanent magnet motors or a combination of any types
- Up to eight motors can be linked to a common DC bus in order to provide the optimum configuration

Redundant drive

- For motors with two winding systems
- Single drives can be configured to allow various schemes for redundancy offering greater availability of the drive system
Highest level of safety
ACS6080 drives
Highest safety for your people and equipment
Arc resistant design with fast arc elimination

Description

Electric arcs represent a hazard source for people and equipment.

ACS6080 offers the highest possible level of personnel safety by detecting the arc and eliminating before it even occurs. ACS6080 drive come with an arc proof design and is certified according to IAC (internal arc classification).

ACS6080 can be equipped with ABB’s Arc Guard System™ for even a superior protection function.

No compromises
## Arc proof classes
Personnel safety & equipment availability

<table>
<thead>
<tr>
<th>ARC PROOF CLASS</th>
<th>PERSONNEL SAFETY BASED ON</th>
<th>EQUIPMENT DAMAGE IN CASE OF ARC</th>
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<tr>
<td></td>
<td>ARC PREVENTION</td>
<td>SEVERE</td>
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<td>CLASS I</td>
<td>BASED ON DESIGN ACC. TO</td>
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<td>IEC 60146-1-1</td>
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<td></td>
<td>IEC 61800-4</td>
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<tr>
<td>CLASS II</td>
<td>BASED ON ARC RESISTANT</td>
<td>SEVERE</td>
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<td></td>
<td>ENCLOSURE</td>
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<tr>
<td>CLASS III</td>
<td>BASED ON HV-FUSES</td>
<td>MODERATE</td>
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<td>CLASS IV</td>
<td>BASED ON PROTECTION FIRING</td>
<td>NEGLIGIBLE</td>
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<td></td>
<td>AND/OR FAST DETECTION</td>
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<th>Non-ABB Medium Voltage Drives</th>
<th>ACS6080</th>
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<tbody>
<tr>
<td>CERTIFIED SAFE FOR PERSONNEL</td>
<td>ACC. TO IEC 62271-200:1AC AFLR</td>
<td></td>
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<tr>
<td>ARC PREVENTION + PROTECTION</td>
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<td></td>
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<tr>
<td>ARC PREVENTION + ELIMINATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARC PREVENTION + FAST ELIMINATION</td>
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### Arc Fault Safety

**ABB’s approach - the 4 safety classes**

<table>
<thead>
<tr>
<th>CLASS I</th>
<th>CLASS II</th>
<th>CLASS III</th>
<th>CLASS IV</th>
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<tbody>
<tr>
<td>protection based on arc prevention</td>
<td>protection based on arc resistant cabinet structure</td>
<td>protection based on external arc fault limitation and elimination</td>
<td>fast arc elimination</td>
</tr>
</tbody>
</table>

- **Design of insulation systems in accordance with relevant IEC and NEMA standards to prevent arcs and provide personnel safety**
- **Class I is not a certified arc resistant design, it is mainly focusing of arc fault prevention**
- **The cabinet is designed** to withstand the pressure of an arc flash
- **Arc fault is contained in the cabinet or guided through pressure relief vents**
- **The drive will be face severe damage after an event**

- **HV Fuses** are applied externally to the drive in order to limit the arc fault current to less than half cycle of the fundamental AC frequency (<10ms in case of 50Hz supply)
- **This method is only used to reach arc resistant designs for MV drives connected without external drive transformer to the mains** (integrated transformer solutions and DTL solutions)
- **This is a ABB patented method, ABB MV drives “protection firing” system. The arc fault is detected and converted into a non severe bolted short circuit**
- **For an even faster detection and elimination an optical ABB arc fault detection system is available**
- **Provides highest level of personal safety and the equipment remains undamaged and can be immediately restarted after inspection and elimination of the arc ignition cause**

<table>
<thead>
<tr>
<th>Non-ABB Medium Voltage Drives</th>
<th>ACS6080</th>
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</thead>
<tbody>
<tr>
<td>Arc resistant design</td>
<td></td>
</tr>
<tr>
<td>IAC Certified according IEC62271-200</td>
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</tbody>
</table>
Certified functional safety features
For a safe and reliable system integration into your process

The ACS6080 is equipped with safety integrity level 3 (SIL3) and performance level e (PL e) and provides the following safety functions:

- Emergency off - stop category 0 according to IEC 60204-1
- Emergency stop - stop category 1 according to IEC 60204-1
- Safe torque-off (STO) - according to IEC 61800-5-2
Door interlocking system
Integrated DC grounding switch and door interlock

The grounding switch is a safety switch to ground the DC bus of the drive. When the Drive is grounded the door safety switches of the medium voltage units are released and the doors can be opened.

It is electromechanically interlocked with a discharge monitoring circuit that prevents the switch from closing when the DC-link capacitors are still charged.

Grounding the drive is only possible after main power supply is disconnected and the DC link has been discharged.
High performance and usability
ACS6080 drives
Part of ABB`s all-compatible drives portfolio

Learn it once – use it everywhere

Same control interface
- Easy navigation and monitoring
- Harmonized parameters and common shared functions
- Built-in USB connection to the PC tool

Free entry level PC tool
- Quick and harmonized access to drive settings
- Flexible monitoring capabilities
- Diagnostics support with one mouse click
- Additional settings in Pro version

Universal connectivity
- Same fieldbus options
- Same customer interface

Technical and commercial documentation
- Same FW manual layout
- Same controller development system
**MP³C control technology**
Best in class motor control

<table>
<thead>
<tr>
<th>Your benefits</th>
<th>Thru drive train optimization</th>
<th>With the most advanced control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced CAPEX</td>
<td>Exceptionally motor friendly – high impact on motor temperature, vibration, noise and ultimately on lifetime</td>
<td>Up to 50% reduction of current distortion</td>
</tr>
<tr>
<td>Lower initial investment costs</td>
<td>Smaller motor frame for same power</td>
<td>Up to 50% reduction of switching frequency</td>
</tr>
<tr>
<td>System cost optimization (Drive / motor / gearbox)</td>
<td>Decrease gearbox ratio for suitable applications</td>
<td>Up to 50% increase of output speed</td>
</tr>
<tr>
<td>Reduced OPEX</td>
<td>Higher system efficiency by decreased losses in the motor and in the drive</td>
<td>Up to 10% increase in output power</td>
</tr>
<tr>
<td>Lower running costs</td>
<td>Higher drive output power</td>
<td></td>
</tr>
<tr>
<td>Lower maintenance costs</td>
<td>Higher drive efficiency</td>
<td></td>
</tr>
</tbody>
</table>

**Lowest CAPEX and OPEX for your drive system**
Powerful performance

Network robustness
Operation in unbalanced network (up to 25% asymmetry) possible without loss of performance

Power loss ride through
Ride through capability for supply voltage dips down to zero

Automatic restart and flying start
Automatic restart after a power loss possible (programmable)
Catches a spinning load and smoothly takes it back to set speed
Smooth and simple system integration

Start up and Commissioning

Easy commissioning and start up with newest Drive Composer PC Tool

ACS6080 in multidrive configuration for a faster installation than equivalent number of single drives

Plug-and-Play in your automation system

Variety of networks can be connected – industry's best support with wide range of fieldbus adapters
The fieldbus adapter modules can be easily plugged-in and automatically installed

Applicable standards

Compliance with the most stringent requirements for current and voltage harmonic distortion

- EN, IEEE, IEC
- Marine standards optional
Minimize operational and maintenance costs
Drive Composer PC tool

Harmonized setup, commissioning and monitoring

Offers harmonized services for the whole drives portfolio

All drive information as parameter loggers, faults, backups and event lists are gathered with a single mouse click

Provides very fast fault tracking, shortens downtime and minimizes operational and maintenance costs

Free version for startup and maintenance capability
Pro version with custom advanced features, control diagram of the drive’s configuration and safety settings

Adaptive programming can be used to customize further the operation of your drive
Reliability and availability
ACS6080 drives
Reliability and availability at the core of your application
Well-proven ABB IGCT-technology

Low parts count and best-in-quality components

The main modules of the drive are the active rectifier (ARU) and inverter (INU) modules. In order to maximize reliability each ARU and INU have identical layout and equipment.

Their core are the very compact and well proven power modules based on ABB IGCT-semiconductors.

IGCT semiconductors provide high efficiency and reliability, they are the ideal switch for high power application, still proven to be the most robust devices on the market.
Reliability and availability at the core of your application

Easy service and maintenance

**Low parts count and best-in-quality components**

Fuseless design for better overall reliability and fast startups after safety interruptions

Lower lifetime costs and higher reliability is assured by advanced, environmental friendly, oil-filled foil capacitors which have a substantially longer lifetime than electrolytic capacitor (10 vs 3 years)

Redundant design: the cooling equipment is available with redundant pumps for increased availability

Easy exchangeable power modules: you can replace the new stack in less than half an hour

Front access to all components - easy of service and possibility to place against the wall
ABB Drives Services
Long-term commitment to maintain your assets
You choose, we respond. Globally and locally.

ABB is a reliable service partner

- Over 600 ABB field service engineers
- Services in more than 60 countries
- 500 service partners
- 30 service workshops
- 40 years providing services for drives
- Covered by closest Regional Service Center

Global Service Center (4)
Regional Service Center (8)
ABB or partner service
ABB Drives service portfolio
Services matching your needs

Your needs

Rapid response
We promise fast and flexible service response to restore your production or process to full working order within the agreed timeframe.

Lifecycle management
We provide you powerful tools and our knowledge base to analyze, optimize and extend the lifecycle of your drives.

Performance improvements
We help you optimize the availability and efficiency of your equipment and improve the profitability of your assets.

Operational excellence
We offer you a strategic partnership in improving productivity, safety, cost and energy efficiency of your equipment.

Our services

Service Agreements - ABB Drive Care

- Training
- Installation and Commissioning
- Spares and Consumables
- Maintenance
- Repairs
- Engineering and Consulting
- Advanced Services
- Extensions, Upgrades and Retrofits
- End-of-Life Services
- Replacements
### Our approach to lifecycle management

#### Being committed
We are committed to serve customers throughout the entire lifecycle of the drive.

At the heart of drive services is a four-phase product lifecycle management model. This model defines the availability of the product and the availability of lifecycle support throughout the product lifespan.

#### 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.

<table>
<thead>
<tr>
<th>Product</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Active</strong></td>
<td>Full Lifecycle support is guaranteed. Full Lifecycle support is guaranteed.</td>
</tr>
<tr>
<td><strong>Classic</strong></td>
<td>Full Lifecycle support is guaranteed. Product enhancements may be available through modernization services.</td>
</tr>
<tr>
<td><strong>Limited</strong></td>
<td>Limited lifecycle support is available. Spare parts availability is limited to available stock.</td>
</tr>
<tr>
<td><strong>Obsolete</strong></td>
<td>Replacement and end-of-life services are available.</td>
</tr>
</tbody>
</table>

Full range of life cycle services and support | Limited range of life cycle services and support | Replacement and end-of-life services

- **Serial production has ceased.** Product may be available for plant extensions, as a spare or for installed base renewal.
- **Product is no longer available.**
- **Product is no longer available.** Replacement and end-of-life services are available.
Digital-aided on-site services

ABB Drives’ digital-aided on-site services makes sure that your drive is serviced efficiently and effectively.

Our service engineers have always latest equipment information at hand, including:

– Service history
– Service instructions
– Recommended services

Customer support - Follow the sun

ABB Drives’ customer support is close to customer site, provided in local language and guarantees quick response time.

Regional sales and technical customer support hubs located around the world are offering service around the clock and every day of the year.

Our follow-the sun concept ensures

– Unified high-quality support for all countries
– Quick response time as service is provided in the same time zone
– Effective escalation of issues
– Seamless flow of support
– Possibility to purchase 24x7 remote assistance

myABB – Your gateway to services

Find the right information, saving time & money

– Installed base information
– Quick and easy access to expert contacts
– One-stop-shop for drive-specific parts

Optimize capital outlays & operational budgets

– Identify upgrades and replacement
– Set maintenance and make end of life decisions

Plan maintenance operations and minimize downtime

– Review recommended service options
– Explore service history
– Access product and technical documentation

Make the right operational decisions

– Identify relevant training offerings
– Retrieve latest maintenance information and updates
– Review your equipment criticality
Modernization & consultancy

Highlights

Upgrade to latest technology
Benefit from technology improvements and incorporate our latest innovation. ABB Drives has defined a well-conceived modernization & migration path for the entire product portfolio. Choose from various options in order to...

- Manage component obsolescence
- Minimize operational risks
- Secure reliability and improve performance
- Improve usability & safety
- Ensure lifecycle support and services
- Extend the lifetime of your drive system

Control Upgrade service
ABB offers the possibility to migrate your ACS6000 drives to the ACS6080 all-compatible platform. Thus upgraded your drive system will benefit of all latest features and services.

Drive system consulting
ABB provides consultation with leading-edge drive system expertise to help you develop customized solutions to optimize your drive system assets.

- Failure mode and effect analysis
  FMEA is a specific method to measure and evaluate the robustness of a drive system, design or process for potential failure mechanisms.

- Electromechanical system interaction study
  With this expert analysis electromechanical interaction of drive-train is studied in order to provide guidance for system design.
**ABB Ability™ for Drives**

Digitalization opens new opportunities

**Smart, connected drives...**

...send data to secure cloud...

...where analysis turns data into knowledge...

**Knowledge turns into predictive actions**

- Key performance indicators show where to focus the actions.
- Detailed report gives more information on the issue.
- Expert can recommend and support the actions needed.
- Condition based predictive alerts ease follow up.

Detailed report gives more information on the issue.
ABB Ability™ for Drives

Highlights

**ABB Ability™ Remote Assistance for Drives**

- Remote connectivity
- Expert support upon request

**ABB Ability™ Condition Monitoring for Drives**

- Remote or Local connectivity
- Condition Monitoring Portal

Rapid solution in case of problems

Should a fault be detected within a drive, ABB specialist provides rapid support by using the drive’s data which is stored remotely.

Alerts and information, for customer to react

ABB Ability Condition Monitoring for Drives is a service that delivers you accurate, real-time information about drive condition and events to ensure your equipment is available, reliable and maintainable.
**Initial Care – More than warranty**

Initial Care is a free of charge service available to a newly purchased ABB Medium Voltage Drive during the first year of the warranty period.

It complements the warranty support with ABB Ability™ for Drives, including…

- ABB Ability™ Remote Assistance for Drives
- ABB Ability™ Remote Condition Monitoring for Drives

Explore ABB’s digital offering free of charge for a limited time of one year and decide afterwards, whether you want to enter the ABB Ability™ contract.

<table>
<thead>
<tr>
<th>ABB Drives Warranty Condition</th>
<th>ABB Ability™ for Drives</th>
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<tbody>
<tr>
<td>Initial Care</td>
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</table>

**Complete Care – Long-term lifecycle agreement**

ABB Drive Care agreement is designed to let you focus on your core business. With a fixed-price lifecycle agreement matching your needs you gain efficiency in handling routine and emergency maintenance and have improved cost control.

ABB Drives Complete Care contract includes:

- Maintenance & repair parts
- Labor for on-site service actions
- Biennial on-site inspection
- ABB Ability™ Remote Assistance for Drives

**Service budget**

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