Low voltage AC drives

ABB machinery drives
ACS380
0.25 to 7.5 kW/0.37 to 10 hp
Catalog

The ACS380 machinery drives

The ACS380 drives are easy to adapt and configure to machines

The ACS380 drives are made to control constant torque applications such as conveyors, mixers, extruders, winders and overhead cranes in the food and beverage and material handling industries. With ACS380, commissioning is quick and easy thanks to its intuitive control panel. Also, connecting to automation systems is easy thanks to preconfigured fieldbus protocols. On the hardware side, ease of use has been enhanced by having all the essential features built-in as standard. This reduces the need for additional hardware and simplifies drive selection.

Persistent predictability

The ACS380 machinery drive is a robust and compact drive ideal for machine building. It is ready-customized and comes in a power range from 0.25 to 7.5 kW, and voltages from 200 to 240 V (one-phase) and 380 to 480 V (three-phase).

The drive has enclosure class IP20 as standard. ACS380 offers EMC and connectivity variants with built-in EMC filters and/or preconfigured fieldbus protocols for ease of integration and connectivity. This saves a lot of time and money for machine builders using large numbers of drives per year. Typically, there is a fixed space in the machine for automation and motor control, and the drive needs to meet the space restrictions and connectivity requirements (fieldbus, I/O etc.). The ACS380 is a drive that meets a range of customer needs: from easy and quick installation and engineering to customization.

The ACS380 machinery drives are part of ABB's all-compatible drives portfolio. Together with other all-compatible drives they share the same architecture and user interfaces, yet there is an optimal drive for virtually any application. Once you have used one all-compatible drive, you can use them all.

Reliability and consistent high quality

The ACS380 drives have improved durability and reliability in harsh conditions, including coated boards as standard. All drives are tested during production at maximum temperatures with nominal loads. Tests cover both performance and all protective functions. The drives are designed for an ambient temperature of up to 50°C without derating. The drives have in their class a unique 3-phase measurement that gives very reliable earth fault protection. Also, the foil coated control panel offers a good protection against dust and gases and the galvanically isolated fieldbus gives good noise immunity.

Contents

Persistent and adaptable performance

Reliability and persistence for machine building

The ACS380 machinery drives are part of ABB's all-compatible drives portfolio. The drives gives you persistent predictability throughout their whole life cycle. They also offer a wider range of standard and optional features for optimal machine building.

Adaptability at your fingertips
The control panel's icon-based menu helps you set up the drive quickly and effectively. An alphanumeric graphical user panel is available for users, who need it.

Simple to select, install and use
Built-in features such as an EMC filter, a Modbus RTU fieldbus interface and safe torque off functionality simplify drive selection, installation and use. DriveSize helps to select the optimal drive and motor for the application.

Communication with all major automation networks
Preconfigured fieldbus adapters enable connectivity with all major industrial automation networks with minimized effort and complexity.

Designed for maximum reliability
Design features like coated control boards, minimized air flow through the control board section, reliable earth fault protection by 3-phase current measurement and design for 50°C ambient temperature make ACS380 a safe choice for customers expecting high reliability. This is topped up by full load test that is done to every single drive during the production.

Adaptive programming
ACS380 has built-in as standard possibility for adaptive programming that enables customizing the drive software by using either sequential or block programming. This can in some cases even eliminate the need of a separate PLC.

Boosting energy efficiency
Energy optimizer and energy efficiency information help you monitor and save the energy used in your process.

Remote monitoring
With a built-in web server and standalone data logger, NETA-21 remote monitoring tool kit enables worldwide and secure remote access to drive.

Startup and maintenance tool
Drive composer PC tool for startup, configuration, monitoring and process tuning. Automation builder for automation engineering and Drive Manager for single point of commissioning.

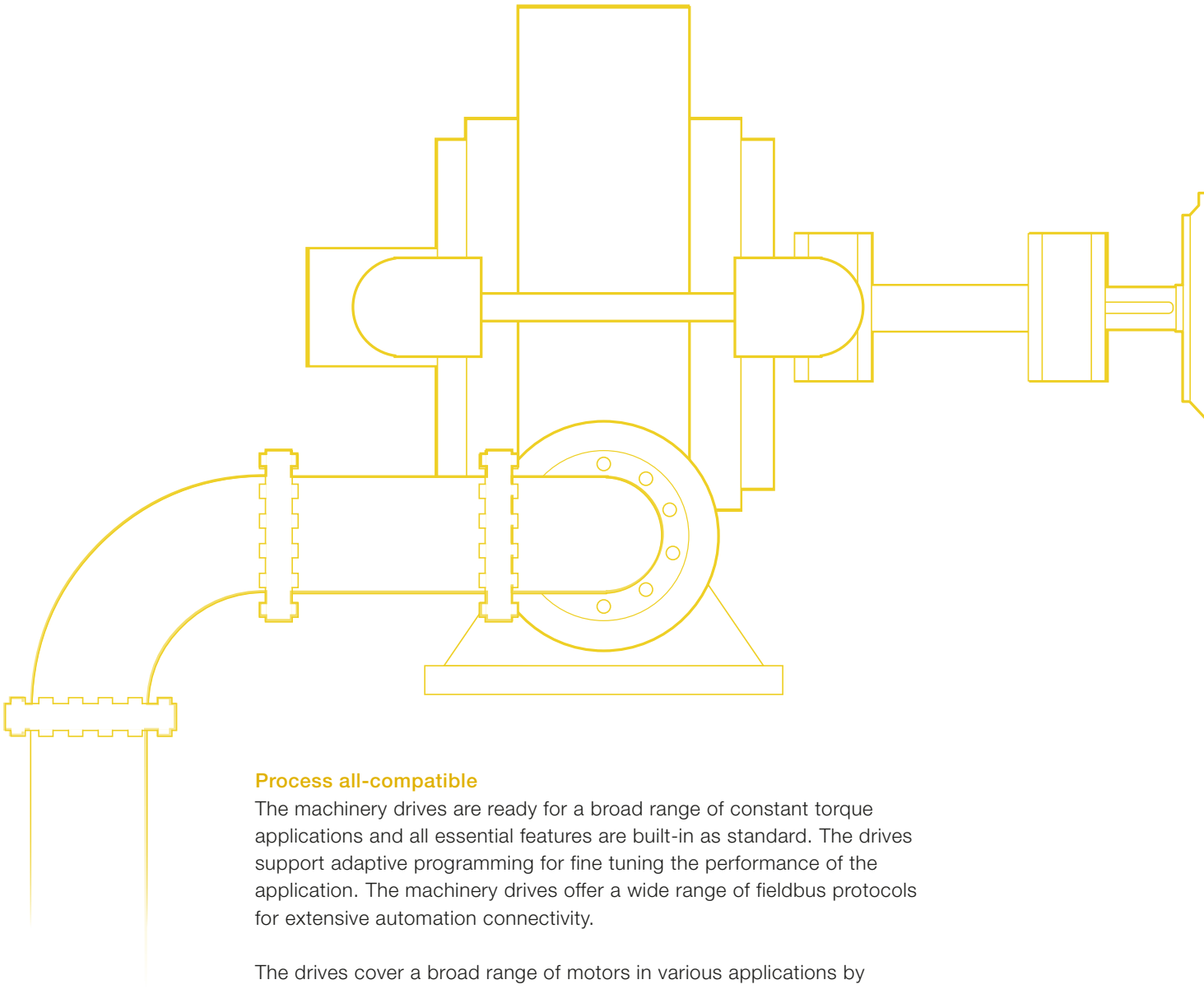
What does all-compatible mean for you?

Business all-compatible

Usually, any drive is a justified investment with a short payback time as it helps to lower energy consumption and improve process efficiency.

When you choose an all-compatible machinery drive from ABB, you get more than just a drive.

You get our services to support your business, including our decades of experience in various industries. You will find local ABB offices in over 90 countries and our global value provider network members will be near to you.



Process all-compatible

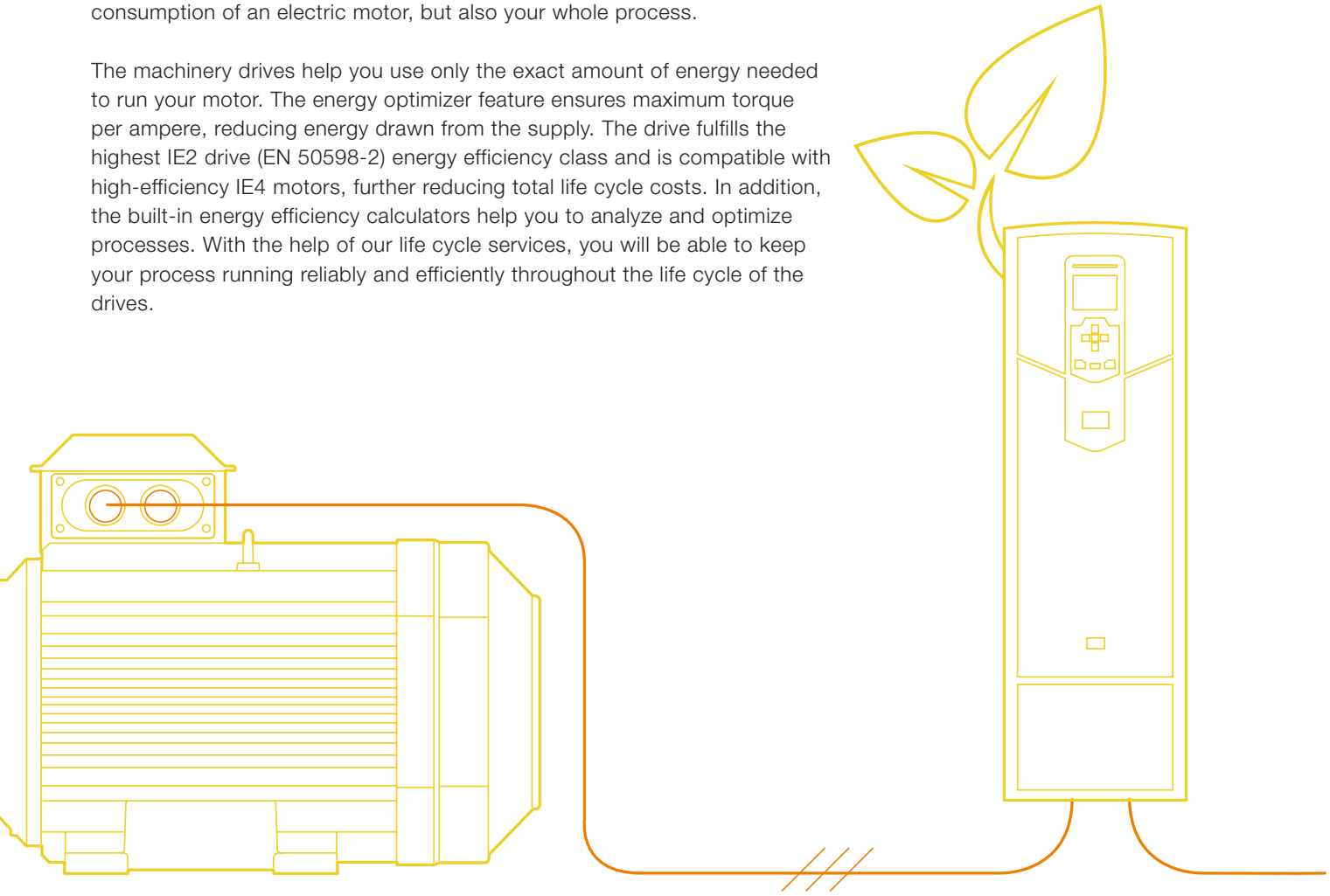
The machinery drives are ready for a broad range of constant torque applications and all essential features are built-in as standard. The drives support adaptive programming for fine tuning the performance of the application. The machinery drives offer a wide range of fieldbus protocols for extensive automation connectivity.

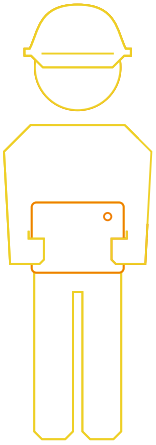
The drives cover a broad range of motors in various applications by providing adaptability and scalability for your machine and increasing its performance. With integrated safety features, you end up having a process which is not only efficient, but safe for both the persons operating the machine and your property.

Environment all-compatible

With ABB and the machinery drives, you are not only optimizing the energy consumption of an electric motor, but also your whole process.

The machinery drives help you use only the exact amount of energy needed to run your motor. The energy optimizer feature ensures maximum torque per ampere, reducing energy drawn from the supply. The drive fulfills the highest IE2 drive (EN 50598-2) energy efficiency class and is compatible with high-efficiency IE4 motors, further reducing total life cycle costs. In addition, the built-in energy efficiency calculators help you to analyze and optimize processes. With the help of our life cycle services, you will be able to keep your process running reliably and efficiently throughout the life cycle of the drives.





Human all-compatible

The machinery drives are designed to save you time and energy during engineering, installation, commissioning and use.

When designing a machine, you will have a wide selection of design tools available to support your work. When you select a drive for your machine, you will save time as configuration is straight forward. The different variants of control panels available provide you with a smart way to set up the drive quickly and easily. One glance at the control panel's editable display will show you the status of the drive and its process.

The Drive composer PC tool provides extensive drive monitoring and process tuning capabilities. The Automation Builder is used both for engineering individual industry devices and putting together entire automation projects. It includes the Drive Manager tool, used for single point access to multiple drives in an automation network. The integrated safety functionality saves you time and money in wiring and certification.

Technical data

Mains connection	
Voltage and power range	1-phase, 200 to 240 V, +10%/-15% 0.25 to 2.2 kW 3-phase, 380 to 480 V, +10%/-15% 0.25 to 7.5 kW
Frequency	50/60 Hz ± 5%
Common DC connection	
DC voltage level	-1 types 270 to 325 V ±10% -4 types 485 to 620 V ±10%
Charging circuit	Internal charging circuit
Motor connection	
Voltage	0 to UN, 3-phase
Frequency	0 to 599 Hz
Motor control	Scalar control Vector control
Switching frequency	1 to 12 kHz, default 4 kHz
Dynamic braking	Flux braking (moderate or full) Resistor braking (optional)
Motor control performance	
Speed control performance, open loop	
Static accuracy	20% of motor rated slip
Dynamic accuracy	1%s with 100% torque step
Speed control performance, closed loop	
Static accuracy	0.1% of motor rated speed
Dynamic accuracy	<1%s with 100% torque step
Torque control performance	
Torque step rise time	< 10 ms, rated torque step
Non-linearity	±5% with rated torque

Braking power connection		
Brake chopper		Built-in brake chopper as standard
Brake resistor		External resistor connected to drive

Functional safety	
Built-in safety features	Safe torque off (STO) acc. to EN/IEC61800-5-2: IEC61508 ed2: SIL 3, IEC 61511: SIL 3, IEC 62061: SIL CL 3, EN ISO 13849-1: PL e
Environmental limits	
Ambient temperature	
Transportation and storage	-40 to +70 °C (-40 to +158 °F)
Operation	-10 to +50 °C (14 to 122 °F), with derating up to 60 °C (except R0, which has max temperature of 50 °C)
Cooling method	Air-cooled, dry clean air
Altitude	0 to 4000m, (0 to 13000 ft) for 400V units (see allowed power systems in HW manual) 0 to 2000m, (0 to 6600 ft) for 200V units derating above 1000m (3300 ft)
Relative humidity	5 to 95%, no condensation allowed
Degree of protection	IP20 as standard
Contamination levels	No conductive dust allowed
Storage	IEC 60721-3-1, Class 1C2 (chemical gases)
	Class 1S2 (solid particles)
Transportation	IEC 60721-3-2, Class 2C2 (chemical gases)
	Class 2S2 (solid particles)
Operation	IEC 60721-3-3, Class 3C2 (chemical gases)
	Class 3S2 (solid particles)

Product compliance

CE
Low Voltage Directive 2006/95/EC, EN 61800-5-1: 2007
Machinery Directive 2006/42/EC, EN 61800-5-2: 2007
EMC Directive 2004/108/EC, EN 61800-3: 2004 + A1: 2012
UL, cUL certification
TUV Certification for functional safety
Quality assurance system ISO 9001
Environmental system ISO 14001
Waste electrical and electronic equipment directive (WEEE) 2002/96/EC
RoHS directive 2011/65/EU
EAC

How to select a drive

It is very easy to select the right drive. This is how you build up your own ordering code using the type designation key.

1 **Start with identifying your supply voltage**
This tells you what rating table to use. See page 11.

2 **Choose your motor's power and current rating** from the ratings table on page 11.

P_{Hd} kW	I_{Hd} A
0.25	1.8
0.37	2.4
0.55	3.7
0.75	4.8
1.1	6.9
1.5	7.8
2.2	9.8

3 Select the ordering code for the ACS380 machinery drive by choosing either the standard or the configured variant. Then choose the desired EMC level on page 11.

If the configured variant is selected, choose your fieldbus protocol (page 11) by selecting the correct option code and add the option codes to drive's ordering code.

Type designation

ACS380-04xx-02A4-1
ACS380-04xx-03A7-1
ACS380-04xx-04A8-1
ACS380-04xx-06A9-1
ACS380-04xx-07A8-1
ACS380-04xx-09A8-1
ACS380-04xx-12A2-1

Connectivity types

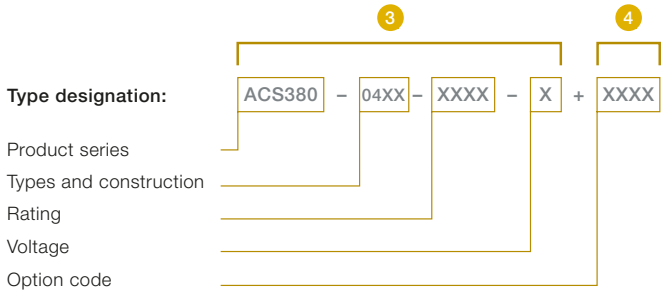
ACS380-04x**S**	Standard variant
ACS380-04x**C**	Configured variant

EMC filtering level

ACS380-040x	EMC category C3 (400 V) or C4 (230 V)
ACS380-042x	EMC category C2

4 **Choose your options** Add the option codes (pages 16 and 18) to the drive's ordering code. Remember to use a "+" mark before each option code.

Option code	Fieldbus protocol	Adapter
+K454	PROFIBUS DP, DPV0/DPV1	FPBA-01-M
+K457	CANopen®	FCAN-01-M
+K469	EtherCAT®	FECA-01-M
+K475	Two port EtherNet/IP™, Modbus TCP, PROFINET IO	FENA-21-M
+K470	Ethernet POWERLINK	FEPL-02



Persistent predictability with ACS380 drives

Built on ABB's common drives architecture, the ACS380 drive module is ideal for machine building that requires motor technologies with powers from 0.25 to 7.5 kW and voltages from 200 to 480 V. With enclosure class IP20 as standard, these modular drives are easy to place inside cabinets for use in industries such as food and beverage, material handling and textile. Typical constant torque applications include mixers, conveyors, cranes and other constant-torque applications in machine building.

Easy to install and use

The compact ACS380 comes in different frame sizes (R0 to R3) and several variants (for both EMC and connectivity use) providing easy installation and commissioning. The drive is remarkably easy to integrate into machine designs as the configured variant of the drive has pre-configured fieldbus protocols (EtherCAT®, PROFIBUS, PROFINET, CANopen®). The standard variant of the drive comes with extensive I/O and built-in Modbus RTU protocols.

Other highlights

- reliability thanks to e.g. advanced coatings, cooling management and protections
- an icon based basic control panel as standard, an alphanumerical, graphical assistant control panel as an option
- good motor control thanks to the 3-phase current measurement
- easy integration by preconfigured fieldbus protocols
- speed feedback from the motor available as an option
- adaptive programming giving the possibility for free block or sequence programming
- part of the ABB's all-compatible product portfolio
- controlling of a broad range of motors from permanent magnet and asynchronous motors to synchronous reluctance motors
- safe torque off (STO) built-in as standard

The built-in icon based control panel interface for easy commissioning and configuration

ACS380 ratings, types and voltages

U_N = 200 V (range 200 to 240 V). The power ratings are valid at nominal voltage 200 V (0.25 to 3.0 kW)

Heavy-duty use		Maximum output current	Light-overload use		Nominal ratings		Type designation	Frame size
P_{Hd} kW	I_{Hd} A	I_{max} A	P_{Ld} kW	I_{Ld} A	P_N kW	I_N A		
0.25	1.8	3.2	0.37	2.3	0.37	2.4	ACS380-04xx-02A4-1	R0
0.37	2.4	4.3	0.55	3.5	0.55	3.7	ACS380-04xx-03A7-1	R0
0.55	3.7	6.7	0.75	4.6	0.75	4.8	ACS380-04xx-04A8-1	R1
0.75	4.8	8.6	1.1	6.6	1.1	6.9	ACS380-04xx-06A9-1	R1
1.1	6.9	12.4	1.5	7.4	1.5	7.8	ACS380-04xx-07A8-1	R1
1.5	7.8	14.0	2.2	9.3	2.2	9.8	ACS380-04xx-09A8-1	R2
2.2	9.8	17.6	3.0	11.6	3.0	12.2	ACS380-04xx-12A2-1	R2

U_N = 400 V (range 380 to 480 V). The power ratings are valid at nominal voltage 400 V (0.37 to 11 kW)

Heavy-duty use		Maximum output current	Light-overload use		Nominal ratings		Type designation	Frame size
P_{Hd} kW	I_{Hd} A	I_{max} A	P_{Ld} kW	I_{Ld} A	P_N kW	I_N A		
0.37	1.2	2.2	0.55	1.7	0.55	1.8	ACS380-04xx-01A8-4	R0
0.55	1.8	3.2	0.75	2.5	0.75	2.6	ACS380-04xx-02A6-4	R1
0.75	2.6	4.7	1.1	3.1	1.1	3.3	ACS380-04xx-03A3-4	R1
1.1	3.3	5.9	1.5	3.8	1.5	4	ACS380-04xx-04A0-4	R1
1.5	4	7.2	2.2	5.3	2.2	5.6	ACS380-04xx-05A6-4	R1
2.2	5.6	10.1	3	6.8	3	7.2	ACS380-04xx-07A2-4	R1
3	7.2	13	4	8.9	4	9.4	ACS380-04xx-09A4-4	R1
4	9.4	16.9	5.5	12	5.5	12.6	ACS380-04xx-12A6-4	R2
5.5	12.6	22.7	7.5	16.2	7.5	17	ACS380-04xx-17A0-4	R3
7.5	17	30.6	11	23.8	11	25	ACS380-04xx-25A0-4	R3

Dimensions

Frames IP20	Height	Width	Depth	Weight
	mm	mm	mm	kg
R0	220	70	174	1.4
R1	220	70	174	1.6
R2	220	95	174	1.9
R3	220	169	174	3.0

Ordering variants

Connectivity type	
ACS380-04x**S**	I/O and Modbus -variant
ACS380-04x**C**	Configured variant
ACS380-04x**C**-xxxx-x+K454	PROFIBUS DP protocol configured
ACS380-04x**C**-xxxx-x+K457	CANopen® protocol configured
ACS380-04x**C**-xxxx-x+K469	EtherCAT® protocol configured
ACS380-04x**C**-xxxx-x+K475	Profinet I/O protocol configured. Ethernet/IP™ and Modbus TCP also built-in.
ACS380-040x**C**-xxxx-x+K470	Ethernet POWERLINK variant
EMC filtering level	
ACS380-040x	EMC category C3 (400 V) or C4 (230 V)
ACS380-042x	EMC category C2

Nominal ratings	
I_N	Rated current available continuously without overloadability at 50 °C.
P_N	Typical motor power in no-overload use.
Maximum output current	
I_{max}	Maximum output current. Available for 2 seconds at start, then as long as allowed by drive temperature.
Heavy-duty use	
I_{Hd}	Continuous current allowing 150% I_{Ld} for 1 minute every 10 minutes at 50 °C.
P_{Hd}	Typical motor power in heavy-duty use.
Light-overload use	
I_{Ld}	Continuous current allowing 110% I_{Ld} for 1 minute every 10 minutes at 50 °C.
P_{Ld}	Typical motor power in light-overload use.

The ratings apply at 50 °C ambient temperatures.
For derating at higher altitudes, temperatures or switching frequencies, see the user's HW manual, document code: 3AXD50000029274

Connectivity and flexibility to meet your needs

When designing a machine, all necessary devices have to be compatible with each other to form a high-performing system level solution. Devices such as drives, programmable logic controllers (PLCs), motors, human machine interfaces (HMIs), fieldbuses, safety functions and connectivity need to be integrated seamlessly into one common system and to provide reliability, cost efficiency and flexibility for the entire design process.

All-compatible machinery drives

ABB's machinery drives have hundreds of hours of testing behind them. They are proven, meeting the high standards required for industrial automation. They connect smoothly to PLCs through a wide range of available fieldbus protocols, enabling fast and secure communication between them. On the motor connection side, ACS380 can control virtually any type of motor optimally, saving energy and the environment at the same time. On the human interface side, there are various options for various needs. The options vary from the integrated icon-based user interface to advanced alphabetic multilingual graphical control panels and full scale touchscreen HMIs for an optimized user experience.

Preconfigured fieldbus protocols

Preconfigured fieldbus protocols allow easy and fast commissioning directly from the PLC.

Reliable solution

ABB machinery drives form with other automation devices a reliable and rapid connection that saves time and money for the machine builder. Still, as everything is compatible, there must be flexibility to optimize the functionality of the machine. ABB also offers support and maintenance services throughout the life cycle of the drives in the machine.

Standard software with versatile features

Commissioning easier than ever before
The icon-based control panel of the ACS380 is intuitive and easy to use for basic operation, settings and fault tracking. The optional all-compatible assistant control panels have a clear and intuitive multilingual graphical user interface as well as different assistants to make the drive easy to set up and use. This saves on commissioning and learning time.

Optimized motor control
ACS380 drives offer sophisticated process control in scalar and vector control modes. The drive supports a wide range of motors, including induction and permanent magnet motors. Many embedded protection and other features improve performance of the motor and process.

Flying start
Flying start is available for scalar and vector control modes. Catching a running motor, enabled by the flying start feature, is often required in applications with long freewheeling times.

Load profile
The load profile feature collects drive values to a log such as current. The log shows how the drive is operating and enables you to analyze and optimize the application.

Reduced motor noise
The drive reduces motor noise by spreading the switching frequencies over a user-specified range. The user can define the used switching frequency to optimize the motor noise. As a result, the drive maximizes the actual used switching frequency based on thermal measurement. A higher used switching frequency reduces motor noise at low load without limiting full current at maximum load.

Optimized energy use
The machinery drives come with features that help you save and manage energy. The energy optimizer feature operates in scalar and vector control modes ensuring maximum torque per ampere and reducing energy drawn from the supply. You can monitor the hourly, daily and cumulative energy consumption via kWh counters. When the drive replaces other control methods (e.g., throttling), you can follow how much energy, CO_2 emissions or money you are saving and see how fast the drive brings you a return on investment.

Easy diagnostics for trouble-free operation
The external remote control panel's (the assistant control panel) diagnostics menu enables you to effectively analyze and resolve issues regarding why the drive is performing as it is - running, stopped or running at the present speed. Active faults, warnings and event logs are shown in the menu. The menu shows if there are any active limitations to the drive operation and gives instructions on how to resolve them. The Drive composer PC tool offers more detailed diagnosis and signal monitoring. The entry level PC tool is available for free via the ABB website (www.abb.com).

Adapt the drive and machine to run optimally
Adaptive programming with sequence and block programming possibilitites offers an easy alternative for simple programming needs. It is embedded inside the software of the drive and is especially handy when there is a need to distribute some of the machine’s control logic to the drive. Adaptive programming brings savings when the drive is adjusted to control the application optimally. The Drive composer pro PC tool is used for setting up adaptive programming.

PC tool for drive monitoring and process tuning capabilities

The Drive composer PC tool offers fast and harmonized setup, commissioning, and monitoring for the whole all-compatible drives portfolio. The free version of the tool provides startup and maintenance capabilities, and gathers all drive information such as parameter loggers, faults, backups and event lists into a support diagnostics file with a single mouse click. This provides faster fault tracking, shortens downtime and reduces operational and maintenance costs.

Using the BCBL-01 cable, the PC can be connected directly to the RJ-45 panel port on the top of the ACS380 drive. When using the the assistant control panel, the Drive composer tool is connected to the drive using the mini USB connection on the panel. All drive information such as parameter loggers, faults, backups and event lists are gathered into a support diagnostics file with a single mouse click. This provides faster fault tracking, shortens downtime and reduces operational and maintenance costs.

Drive composer pro offers extended functionality

Drive composer pro provides additional features such as custom parameter windows, graphical control diagrams of the drive's configuration and improved monitoring and diagnostics. The control diagrams save users from browsing long lists of parameters and help to set the drive's logic quickly and easily. The tool has fast monitoring capabilities of multiple signals from several drives in the panel bus. Full backup and restore functions are also included.

Safe configuration for unpowered drives

Cold configuration adapter CCA-01 provides a serial communication interface for unpowered ACS380 drives, among other selected drives. With the adapter, safety isolation of both serial communication and control board power supply is possible. The power supply is taken from a PC USB port.

Remote monitoring option

Ordering code	Description	Type designation
3AXD50000019865	Cold configurator adapter, packed kit	CCA-01

Remote monitoring access worldwide

The remote monitoring tool, NETA-21, gives easy access to the drive via the Internet or local Ethernet network. NETA-21 comes with a built-in web server. Compatible with standard web browsers, it ensures easy access to a web-based user interface. Through the web interface, the user can configure drive parameters, monitor drive log data, load levels, run time, energy consumption, I/O data and bearing temperatures of the motor connected to the drive.

Remote monitoring option

Ordering code	Description	Type designation
3AUA0000094517	2 x panel bus interface, 2 x 32 = max. 64 drives 2 x Ethernet interface SD memory card USB port for WLAN/3G	NETA-21

Drive commissioning and adaptable use with your control panel

Almost anyone can set up and commission the machinery drive using available control panels. The ACS380 comes with the integrated icon based control panel as standard. You do not need to know any drive parameters as the control panel helps you to set up the essential settings quickly and get the drive into action. In addition, ACS380 supports the assistant control panel (AP-I, AP-S or AP-W).

Easy drive setup

- The assistant control panel offers a settings menu with embedded assistants providing a smart and quick way to set up the drive.
- The integrated icon based control panel in the ACS380 makes drive setup fast and easy.
- Each setting for both control panels is clearly named or shown with an icon by its function, such as motor, ramp or limit settings.

Simplified process monitoring

- One glance at the assistant control panel's editable display will show the status of the drive and its processes.
- See how the electrical terminals are configured, what is the actual status and get a quick access to the related settings from the I/O menu.
- Add information eg, to I/O signals, customize fault and warning messages or give the drive a unique name with the assistant control panel’s text editor.
- Connect the PC tool to the drive through the USB connector on the assistant control panel.

Simplified drive maintenance

- Faults or warnings are quickly resolved in the assistant control panel provides context sensitive guidance and troubleshooting instructions.
- Automatic backup and restore functions in the assistant control panel (with name, date and content).

Control panel options

Control panel mounting platforms are available for mounting the optional assistant control panel e.g. on the cabinet door. There are two different platform variants: one for flush mounting and another one for surface mounting.

Ordering code	Description	Type designation
3AUA0000088311	Assistant control panel	ACS-AP-I
3AUA0000064884	Assistant control panel	ACS-AP-S
3AXD0000025965	Assistant control panel with bluetooth interface	ACS-AP-W
3AXD0000028828	Basic control panel	ACS-BP-S
3AUA0000108878	Control panel mounting platform (flush mounted)	DPMP-01
3AXD0000009374	Control panel mounting platform (surface mounted)	DPMP-02

Flexible connectivity to automation networks

A fieldbus enables communication between drives and PLC systems, I/O devices and the process. Fieldbus communication reduces wiring costs when compared with traditional hard wired input/output connections. Fieldbus systems also offer the ability to gather large amounts of data, which can then be utilized for improving the performance or safety of the machine.

The ACS380 configured variant is compatible with a wide range of fieldbus protocols. Fieldbus modules preconfigure drive parameter settings at power-up to allow programming directly from the PLC. The optional fieldbus adapter can be easily mounted on the drive. The ACS380 standard variant comes with built-in Modbus RTU protocol.

Drive monitoring

A set of drive parameters and/or actual signals, such as torque, speed, current, etc., can be selected for cyclic data transfer, providing fast data access.

Drive diagnostics

Accurate and reliable diagnostic information can be obtained through the alarm, limit and fault words, giving easy interfacing with plantwide HMIs.

Cabling

Substituting the large amount of conventional drive control cabling and wiring with a single cable reduces costs and increases system reliability and flexibility.

Design

The use of fieldbus control reduces engineering time at installation due to the modular structure of the hardware and software and the simplicity of the connections to the drives.

Commissioning and assembly

The modular machine configuration allows precommissioning of single machine sections and provides easy and fast assembly of the complete installation.

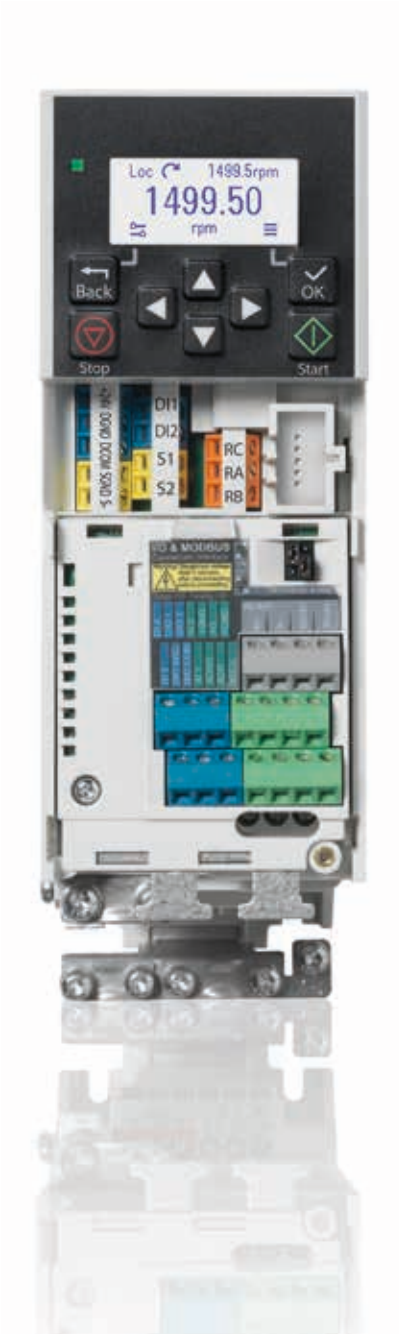
Universal communication with ABB fieldbus adapters

The machinery drives support the following fieldbus protocols:

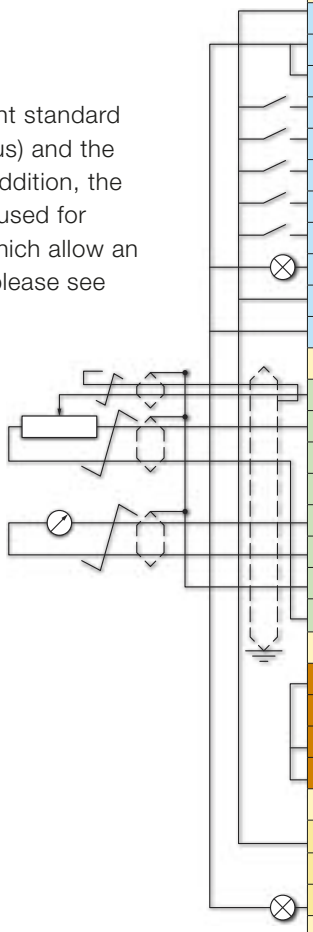
Option code	Fieldbus protocol	Adapter
+K454	PROFIBUS DP, DPV0/DPV1	FPBA-01-M
+K457	CANopen®	FCAN-01-M
+K469	EtherCAT®	FECA-01-M
+K475	Two port EtherNet/IP™, Modbus TCP, PROFINET IO	FENA-21-M
+K470	Ethernet POWERLINK	FEPL-02

Standard interface and extensions for ACS380 machinery drives

The ACS380 machinery drives offer two different standard interfaces: the standard variant (I/O and Modbus) and the configured variant with different interfaces. In addition, the drive has one option slot available that can be used for speed feedback, relay extensions or options which allow an external +24 V supply. For further information please see the ACS380 hardware and firmware manuals.

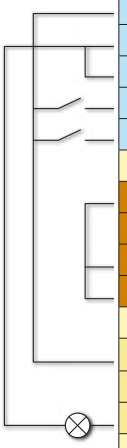


Default I/O connections of standard variant



Terminals	Descriptions
	Aux. voltage output and digital connections
+24 V	Aux. voltage output +24 V DC, max. 250 mA
DGND	Aux. voltage output common
DCOM	Digital input common for all
DI 1	Digital input 1: Stop (0)/Start (1)
DI 2	Digital input 2: Forward (0)/Reverse (1)
DI 3	Digital input 3: Speed selection
DI 4	Digital input 4: Speed selection
DIO 1	Digital input function: Ramp set 1 (0)/Ramp set 2 (1)
DIO 2	Digital output function: Ready to run (0)/Not ready (1)
DIO SRC	Signal cable shield (screen)
DIO COM	Digital input common for all
	Reference voltage and analog I/O
AI 1	Output frequency/Speed reference (0...10 V)
AGND	Analog input circuit common
AI 2	Not configured
AGND	Analog input circuit common
AO	Output frequency (0...20 mA)
AGND	Analog output circuit common
SCR	Signal cable shield (screen)
+10 V	Reference voltage
	Safe torque off (STO)
S+	Safe torque-off function. Connected at factory. Drive starts only when both circuits are closed. Refer to Safe torque off function in the hardware manual.
SGND	
S 1	
S 2	
	Relay output
RC	No fault [Fault (-1)]
RA	
RB	
	EIA-485 Modbus RTU
B+	Embedded Modbus RTU (EIA-485)
A-	
BGND	
Shield	
Termination	

Default connections of configured variant



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SGND	
S 1	
S 2	
	Relay output
RC	Fault (-1)
RA	250 V AC/30 V DC
RB	2 A
	Extension module connections
DSUB9	PROFIBUS +K454
DSUB9	CANopen® +K457
RJ-45 x2	EtherCAT® +K469
RJ-45 x2	PROFINET +K475
	Ethernet/IP™
	ModbusTCP

Input/output, extension and feedback modules for increased connectivity

Standard input and output of ACS380 machinery drives can be extended by using optional input/output extension modules. The modules are easily installed in the extension slots located in the drive. It is also possible to use an optional speed feedback module that supports TTL and HTL pulse encoders.

Extension module options

Option code	Description	Type designation
+L534	External 24 C DC	BAPO-01
+L511	External relay option (4xRO)	BREL-01

Feedback interface module options

Option code	Connections	Option
+L535	Encoder interface + External 24 V DC	BTAC-02

Brake options

Brake chopper
The brake chopper is built-in as standard for the ACS380. It not only controls braking, but also supervises system status and detects failures such as brake resistor and resistor cable short-circuits, chopper short-circuit, and calculated resistor over-temperature.

Control of the mechanical brake
Mechanical brake control is integrated into the ACS380 machinery drives. It uses state machine logic to control brake opening, closing, holding, wait and delay to integrate complex brake operation into the application.

Brake resistor
The brake resistors are separately available for the ACS380. Resistors other than the standard option resistors may be used, provided that the specified resistance value is within the specified limits and that the heat dissipation capacity of the resistor is sufficient for the drive application (see hardware manual). No separate fuses in the brake circuit are required if the conditions for e.g., the mains cable is protected with fuses and no mains cable/fuse overrating takes place.

EMC – electromagnetic compatibility

The ACS380 machinery drives are equipped with a built-in filter to reduce high frequency emissions. Low EMC filters (C3 for 200V and C4 for 400V) are standard on ACS380-040X drives. High EMC filters (C2 for all voltages) are denoted by type codes ACS380-042X.

EMC standards
The EMC product standard (EN 61800-3) covers the specific EMC requirements stated for drives (tested with motor and cable) within the EU. EMC standards such as EN 55011 or EN 61000-6-3/4 are applicable to industrial and domestic equipment and systems including components inside the drive. Drive units complying with the requirements of EN 61800-3 are compliant with comparable categories in EN 55011 and EN 61000-6-3/4, but not necessarily vice versa. EN 55011 and EN 61000-6-3/4 do not specify cable length or require a motor to be connected as a load. The emission limits are comparable to EMC standards according to the table below.

Domestic environments versus public low voltage networks
The first environment includes domestic premises. It also includes establishments directly connected without an intermediate transformer to a low voltage power supply network that supplies buildings used for domestic purposes. The second environment includes all establishments directly connected to public low voltage power supply networks.

Comparison of EMC standards

EMC according to EN 61800-3 product standard	EN 61800-3 product standard	EN 55011, product family standard for industrial, scientific and medical (ISM) equipment	EN 61000-6-4, generic emission standard for industrial environments	EN 61000-6-3, generic emission standard for residential, commercial and light-industrial environment
1st environment, unrestricted distribution	Category C1	Group 1, Class B	Not applicable	Applicable
1st environment, restricted distribution	Category C2	Group 1, Class A	Applicable	Not applicable
2nd environment, unrestricted distribution	Category C3	Group 2, Class A	Not applicable	Not applicable
2nd environment, restricted distribution	Category C4	Not applicable	Not applicable	Not applicable

Need a motor? This is our offering.

Our machinery drives control virtually any type of AC motor including induction, permanent magnet, servo and synchronous reluctance motors. Our adaptable machinery drives ensure an energy efficient and reliable motor controller with significant cost savings for the user.

Machinery drives and induction motors form a reliable combination

Induction motors are used throughout the industry in several types of industry applications which demand robust and high enclosure motor and drive solutions. The ACS380 machinery drives fit perfectly together with this type of motor, used in a wide range of industrial environments.

Machinery drives and permanent magnet motors for smooth operation

Permanent magnet technology is often used for improved motor characteristics such as energy efficiency, compactness and control performance. Actual characteristics between different permanent magnet motors can vary considerably. Machinery drives can control ABB's and most other permanent magnet motors in an efficient way.

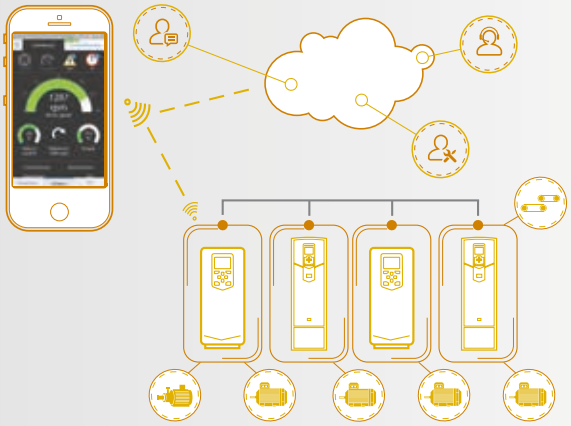
Machinery drives and IE4 synchronous reluctance motors for a package with high efficiency

Combining the machinery drives control technology with our synchronous reluctance (SynRM) motors provides an IE4 motor and drive package that gives you great energy savings benefits. The key is in the rotor design. The synchronous reluctance rotor replaces the traditional induction rotor and requires no permanent magnets. ABB has tested the SynRM motor and drive packages and produced manufacturer's statements providing verified system (drive and motor efficiency).

Save time, ease troubleshooting and improve drive performance with ABB smartphone apps

Better connectivity and user experience with Drivetune

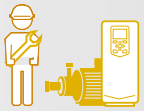
Easy and fast access to product information and support



Manage your drives and the process lines and machines they control

Easy access to cloud-based drive and process information from anywhere via an online connection

Start up, commission and tune your drive and application



Simplified user guidance with instant access to drive status and configuration

Performance optimization via drive troubleshooting features and fast support

Services and support on the go with Drivebase

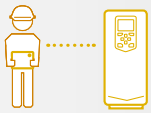
Search for support documents and contacts

Maintain and service all your installed drives on one or multiple sites

Get 6 months extra warranty for free by registering your drive with the Drivebase app

Access your product and service information in the cloud from anywhere

Access your drive's diagnostics data

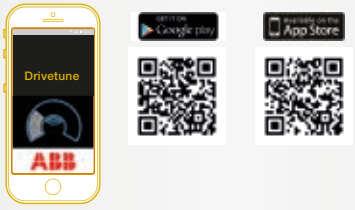


Push notifications for critical product and service updates

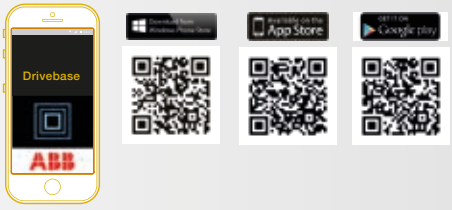
Access information anywhere

Download the apps using the QR codes below or directly from the app stores

Drivetune for commissioning and managing drives



Drivebase for ensured reliability and reduced downtime on production sites

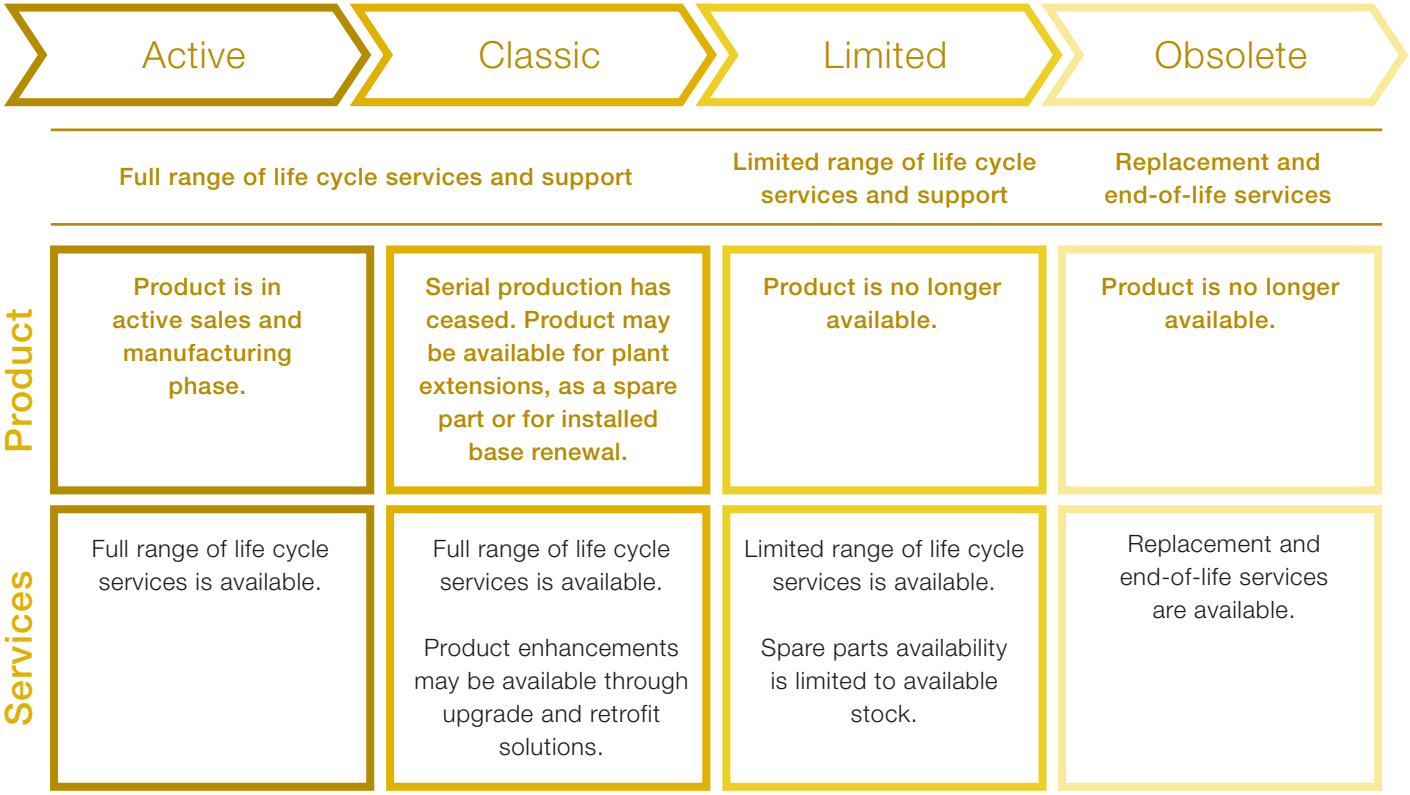


Drives service
A lifetime of peak performance

You are 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 the 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:



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.

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 with no room for 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.

Your choice, your business efficiency
The 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.

We can help you more by knowing where you are!
Register your drive at www.abb.com/drivereg for extended warranty options and other benefits.

Service to match your needs

Your service needs depend on your operation, the 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:
- ✓ Life Cycle Assessment
- ✓ Installation and Commissioning
- ✓ Spare Parts
- ✓ Preventive Maintenance
- ✓ ABB Drive Care agreement

Is rapid response a key consideration?

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

Example services include:
- ✓ Technical Support
- ✓ Drive Exchange
- ✓ On-site Repair
- ✓ Response time agreements

Need to extend your assets' lifetime?

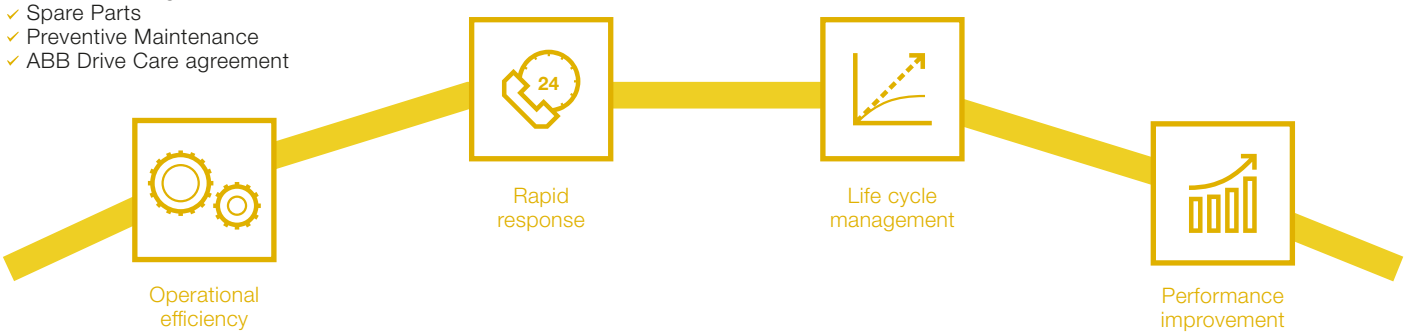
Maximize your drive's lifetime with our services.

Example services include:
- ✓ Life Cycle Assessment
- ✓ Replacement, Disposal and Recycling

Is performance most critical to your operation?

Get optimal performance out of your machinery and systems.

Example services include:
- ✓ Training



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