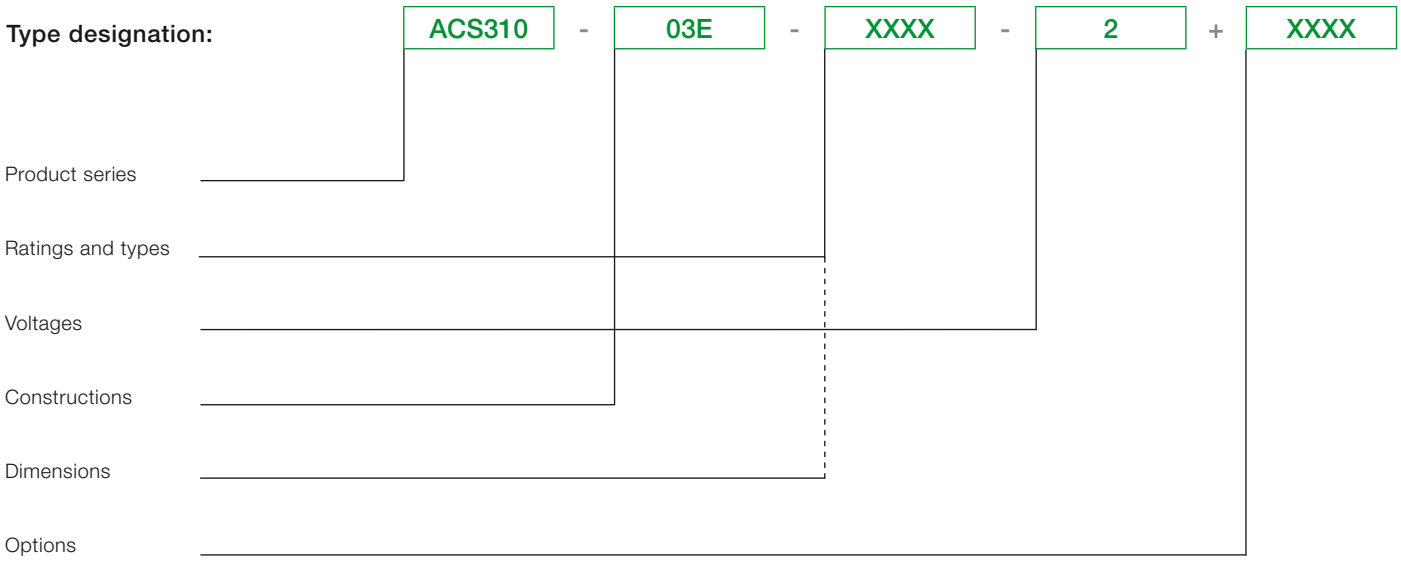
Low voltage AC drives

ABB standard drives
ACS310
0.37 to 22 kW / 0.5 to 30 hp
Catalog

Power and productivity
for a better world™

Selecting and ordering your drive

Build up your own ordering code using the type designation key below or contact your local ABB drives sales office and let them know what you want. Use page 3 as a reference section for more information.



Contents
ABB standard drives, ACS310

ABB standard drives, ACS310
AC drives for pump and fan applications

ACS310	-	03E	-	XXXX	-	2	+	XXXX

ABB standard drives, ACS310, are dedicated to variable torque applications such as booster pumps and centrifugal fans.

The drive's dedicated pump and fan features lower operating costs, boost energy efficiency and reduce CO_2 emissions. Included among these features are built-in PID controllers and PFC (pump and fan control) that varies the drive's performance in response to changes in pressure, flow or other external data.

Among the pre-programmed protection functions is pump cleaning. This prevents pump and pipes clogging by initiating a sequence of forward and reverse runs of the pump to clean the impeller.

Within pumping applications, energy savings up to 50 percent can be achieved compared to direct-on-line motor-driven systems that use mechanical flow control methods. The ABB standard drives provide built-in features for efficient energy management. Energy savings can be easily monitored using the built-in counters that display energy savings in kilowatt hours and saved carbon dioxide emissions. The savings can also be displayed in local currencies.

The compact design and uniform dimensions make cabinet mounting of the drive straightforward, thereby providing a speedy and space saving installation. The ACS310 drives has an embedded Modbus interface for system monitoring that saves the cost of external fileldbus devices and enables to integrate the drives easily with PLC. When combined with preprogrammed application macros, an intuitive user interface and several assistant screens, installation time is further reduced while speeding up parameter setting and drive commissioning.

The ACS310 drives meet the needs of logistical and technical distributors as well as the requirements of end users with pumping and ventilation applications. The drives are supported by one of the most extensive global sales and service networks with presence in over 100 countries.

Highlights

- Powerful set of pump and fan features
- Boosted energy efficiency
- Tailored for cabinet installations
- Clever drive commissioning assistants and convenient user interface
- Worldwide availability and service

Typical applications

The ACS310 drive is specifically designed to meet the variable torque loads demanded by centrifugal fans and pumps. The result is maximum application uptime, reduced maintenance cost and higher energy savings.

A booster pump system is designed to boost supplied water pressure to a predetermined level in water and wastewater plants. The ACS310 drive features pump and fan control (PFC) for use where several parallel pumps are operated together and the required flow rate is variable.

PID control is available to allow the process to accurately maintain a pressure setpoint by adjusting the control outputs, thus allowing for precise control within difficult processes. A sleep & boost function detects slow rotation and runs the pump to boost pressure prior to shutdown. The pressure is continuously monitored and pumping restarts when the pressure falls below the minimum level.

Irrigation systems, whether agricultural, horticultural or those used on golf courses, have a common demand for a reliable and efficient flow of water.

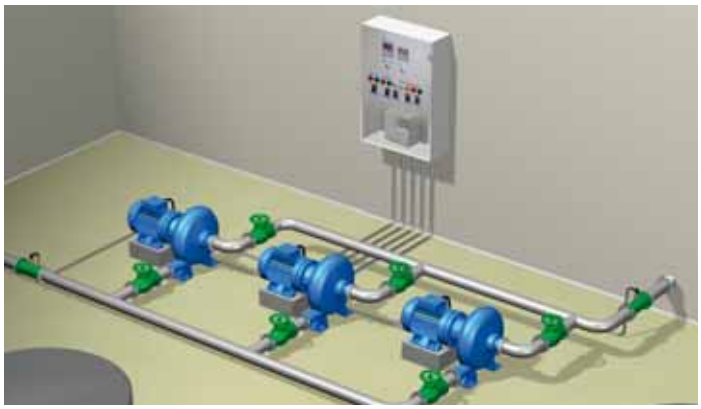
The built-in real-time clock provides true time and date stamps that control the start and stop times of watering based on the daily demand profile.

Soft pipe filling provides a pump with soft-start, enabling a smooth build-up of flow in pipes while increasing the life time of the pipe work and pumping system.

Level control is used to adjust the filling or emptying of storage tanks. Storage tanks may be located within processes such as pulp and paper for supplying process fluids like wastewater. The drive has signal supervision for level control and a pipe cleaning feature, thereby preventing solids from building up on pumps impellers or the tank walls.

Storage tanks are often mounted in narrow locations, with limited space for components like AC drives. The compact size and various mounting methods of the ACS310 drives enables easy installation and space savings in new installations and retrofits.

Wood drying kilns´ have a high demand for powerful and efficient ventilation to dry out the wood. In wood kilns centrifugal fans and AC drives are used to control the air flow demand. To increase the kilns´ capacity, multiple fans may be controlled via one drive by using the pump and fan control (PFC) feature. At the start of the drying process, the relative humidity is high thus there is a demand for higher air flow rates. As the wood dries out the auxiliary fans may shut-down, thereby saving energy use and reducing maintenance.



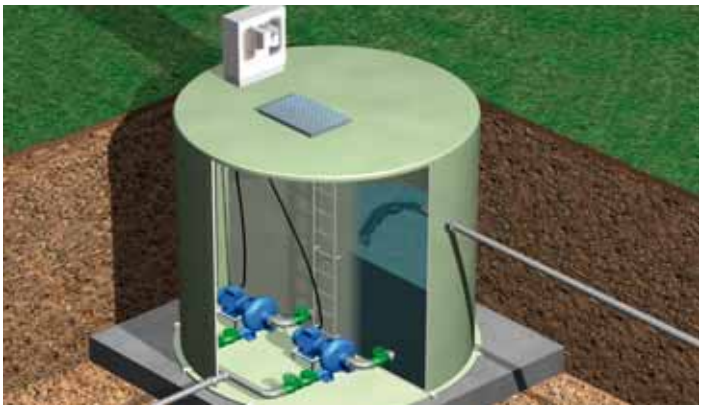


ABB standard drives

ACS310 - 03E - XXXX - 2 + XXXX

Feature	Advantage	Benefit
Pump and fan control (PFC) feature to control pumps and fans in parallel	One drive controls several pumps or fans and eliminates the need for an external programmable logic controller. Reduces motor stress and increases lifetime when auxiliary motors are driven according to the needed pump/fan capacity. Interlock function enables one motor to be disengaged from the mains supply while others continue operating in parallel.	Saves cost of additional drives and external PLC. Longer life for pump or fan system while reducing maintenance time and costs. Maintenance can be carried out safely without stopping process.
Soft pump and fan control feature (SPFC)	Reduces unwanted pressure peaks in pumps and pipelines when an auxiliary motor is started. Reduces inrush current to the power network while connecting new auxiliary motors.	Reduces maintenance costs. Longer life for pump or fan system. Smoother processes.
Pump protection functions	Integrated protection and control with pre-programmed features like pipe cleaning, pipefill, inlet/outlet pressure supervision and detection of under or over load for preventive maintenance. Improves process control and system reliability. Integrates system protection. Smoother processes: improved and optimized system. Longer life for pump and fan system, reduced maintenance costs.	Reduces maintenance costs. Longer life and reliable operation of pump system.
PID controllers	Varies the drive's performance according to the need of the application.	Enhances production output, stability and accuracy.
Embedded Modbus EIA-485 fieldbus interface	No need for external fieldbus options. Integrated and compact design.	Saves costs of external fieldbus devices. Increases reliability.
On/off cooling fan control	Cooling fan rotates only when the drive is running, thereby cooling only when needed.	Silent operation. Improves drive's energy efficiency.
Software controlled phase inversion	Fast and easy way to change the phase order of the motor rotation.	Time savings as there is no need to change the output cable order manually.
Short parameter menu view	Only the most needed drive parameters are shown on the drive's parameter view. Complete parameter view can be changed by setting one parameter.	Time savings as user can quickly see the most important parameters. Fast commissioning of the drive.
Energy optimizer	Improved motor efficiency with intelligent drive control method, especially while operating on partial centrifugal loads.	Boosts energy efficiency due to lower motor currents. Reduces audible noise from the motor.
Energy efficiency counters	Several counters to illustrate saved energy (kWh), carbon-dioxide emissions (CO_2) and cost in local currency.	Shows direct impact on energy bill and helps control operational expenditure (OPEX).
Full output current at 50 °C ambient	Drive can be operated in ambient temperatures up to 50 °C without derating the output current.	Optimized drive dimensioning for wide temperature range.
Load analyzer	Load analyzer saves process data, such as current and torque values, which can be used to analyze the process and dimensioning of the drive and motor.	Optimized dimensioning of the drive, motor and process.
Compact size and flexible mounting options	Drives high power-to-size ratio facilitates efficient cabinet space usage Optimum installation layout. Flexible installation with screw or DIN rail mounting. Drive can be installed sideways or side-by-side.	Space savings.
User interfaces	Assistant control panel with clear alphanumerical dynamic menus, real time clock and 14 languages. Basic panel with numerical display.	Different control panels available according to functionality need.
Maintenance assistant	Monitors consumed energy (kWh), running hours or motor rotation.	Assists in preventive maintenance of the drive, motor or run application.
Commissioning assistants	Easy set up of parameters for PID controllers, real-time clock, serial communication, drive optimizer and drive start-up.	Time savings with reduced need to set the parameters manually. Ensures all required parameters are set.
Drive protection	Motor output and I/O protected against wiring faults. Protection against unstable supply networks. Coated boards as standard.	Latest solution to protect the drive and offer trouble free use and the highest quality.

Ratings and types

ACS310	-	03E	-	XXXX	-	2	+	XXXX

Type designation

This is the unique reference number (shown above and in column 5) that clearly identifies the drive by power rating and frame size. Once the drive's type designation has been selected, the frame size (column 6) can be used to determine the drive dimensions, shown on the next page.

Voltages

ACS310 is available in two voltage ranges:
2 = 200 - 240 V
4 = 380 - 480 V

Insert either "2" or "4", depending on your chosen voltage, into the type designation shown above.

Construction

"03E" within the type designation (shown above) varies depending on the drive phase and EMC filtering. Choose below the one you need.

03 = 3-phase
E = EMC filter connected, 50 Hz frequency
U = EMC filter disconnected, 60 Hz frequency
(In case the filter is required it can easily be connected.)

Ratings				Type designation	Frame size
P_N kW	P_N hp	I_{2N} [1] A	I_{LD} [2] A		
3-phase supply voltage 200 to 240 V units					
0.37	0.5	2.6	2.4	ACS310-03X-02A6-2	R0
0.55	0.75	3.9	3.5	ACS310-03X-03A9-2	R0
0.75	1.0	5.2	4.7	ACS310-03X-05A2-2	R1
1.1	1.5	7.4	6.7	ACS310-03X-07A4-2	R1
1.5	2.0	8.3	7.5	ACS310-03X-08A3-2	R1
2.2	3.0	10.8	9.8	ACS310-03X-10A8-2	R2
3.0	4.0	14.6	13.3	ACS310-03X-14A6-2	R2
4.0	5.0	19.4	17.6	ACS310-03X-19A4-2	R2
5.5	7.5	26.8	24.4	ACS310-03X-26A8-2	R3
7.5	10.0	34.1	31.0	ACS310-03X-34A1-2	R4
11.0	15.0	50.8	46.2	ACS310-03X-50A8-2	R4
3-phase supply voltage 380 to 480 V units					
0.37	0.5	1.3	1.2	ACS310-03X-01A3-4	R0
0.55	0.75	2.1	1.9	ACS310-03X-02A1-4	R0
0.75	1.0	2.6	2.4	ACS310-03X-02A6-4	R1
1.1	1.5	3.6	3.3	ACS310-03X-03A6-4	R1
1.5	2.0	4.5	4.1	ACS310-03X-04A5-4	R1
2.2	3.0	6.2	5.6	ACS310-03X-06A2-4	R1
3.0	4.0	8.0	7.3	ACS310-03X-08A0-4	R1
4.0	5.0	9.7	8.8	ACS310-03X-09A7-4	R1
5.5	7.5	13.8	12.5	ACS310-03X-13A8-4	R3
7.5	10.0	17.2	15.6	ACS310-03X-17A2-4	R3
11.0	15.0	25.4	23.1	ACS310-03X-25A4-4	R3
15.0	20.0	34.1	31	ACS310-03X-34A1-4	R4
18.5	25.0	41.8	38	ACS310-03X-41A8-4	R4
22.0	30.0	48.4	44	ACS310-03X-48A4-4	R4

X within the type code stands for E or U.

[1] I_{2N} maximum continuous output current at ambient temperature of +40 °C. No overloadability, derating 1% for every additional 1 °C up to 50 °C.

[2] I_{LD} continuous output current at max ambient temperature of +50 °C. 10% overloadability for one minute every ten minutes.

Technical data

ACS310 - 03E - XXXX - 2 + XXXX

Mains connection	
Voltage and power range	3-phase, 200 to 240 V ± 10% 0.37 to 11 kW (0.5 to 15 hp) 3-phase, 380 to 480 V ± 10% 0.37 to 22 kW (0.5 to 30 hp)
Frequency	48 to 63 Hz

Motor connection	
Voltage	3-phase, from 0 to U_{supply}
Frequency	0 to 500 Hz
Continuous loading capability	I_{2N} maximum continuous output current at ambient temperature of +40 °C. No overloadability, derating 1% for every additional 1 °C up to 50 °C. I_{LD} continuous output current at max ambient temperature of +50 °C. 10% overloadability for one minute every ten minutes. At start 1.8 x I_{2N} for 2 s
Switching frequency	
Default	4 kHz
Selectable	4 to 16 kHz with 4 kHz steps
Acceleration time	0.1 to 1800 s
Deceleration time	0.1 to 1800 s
Motor control method	Scalar U/f

Environmental limits	
Ambient temperature	-10 to 50 °C (14 to 122 °F), no frost allowed
Altitude	
Output current	Rated current available at 0 to 1000 m (0 to 3281 ft) reduced by 1% per 100 m (328 ft) over 1000 to 2000 m (3281 to 6562 ft)
Relative humidity	Lower than 95% (without condensation)
Degree of protection	IP20 / optional NEMA 1 enclosure
Enclosure colour	NCS 1502-Y, RAL 9002, PMS 420 C
Contamination levels	IEC721-3-3 No conductive dust allowed
Transportation	Class 1C2 (chemical gases) Class 1S2 (solid particles)
Storage	Class 2C2 (chemical gases) Class 2S2 (solid particles)
Operation	Class 3C2 (chemical gases) Class 3S2 (solid particles)

Product compliance

Low Voltage Directive 2006/95/EC
Machinery Directive 2006/42/EC
EMC Directive 2004/108/EC
Quality assurance system ISO 9001
Environmental system ISO 14001
UL, cUL, CE, C-Tick and GOST R approvals
RoHS compliant

Programmable control connections	
Two analog inputs	
Voltage signal	
Unipolar	0 (2) to 10 V, R_{in} > 312 kΩ
Bipolar	-10 to 10 V, R_{in} > 312 kΩ
Current signal	
Unipolar	0 (4) to 20 mA, R_{in} = 100 Ω
Bipolar	-20 to 20 mA, R_{in} = 100 Ω
Resolution	0.1%
Accuracy	± 1%
One analog output	0 (4) to 20 mA, load < 500 Ω
Auxiliary voltage	24 V DC ± 10%, max. 200 mA
Five digital inputs	12 to 24 V DC with internal or external supply, PNP and NPN, pulse train 0 to 16 kHz
Input impedance	2.4 kΩ
One relay output	
Type	NO + NC
Maximum switching voltage	250 V AC/30 V DC
Maximum switching current	0.5 A/30 V DC; 5 A/230 V AC
Maximum continuous current	2 A rms
One digital output	
Type	Transistor output
Maximum switching voltage	30 V DC
Maximum switching current	100 mA/30 V DC, short circuit
Frequency	10 Hz to 16 kHz
Resolution	1 Hz
Accuracy	0.2%

Serial communication	
Fieldbus	Modbus EIA-485, embedded
Cable	Shielded twisted pair, impedance 100 to 150 ohms
Termination	Daisy-chained bus, without dropout lines
Isolation	Bus interface isolated from drive
Transfer rate	1.2 to 76.8 kbit/s
Communication type	Serial, asynchronous, half duplex
Protocol	Modbus

Chokes	
AC input chokes	External option For reducing THD in partial loads and to comply with EN/IEC 61000-3-12
AC output chokes	External option To achieve longer motor cables

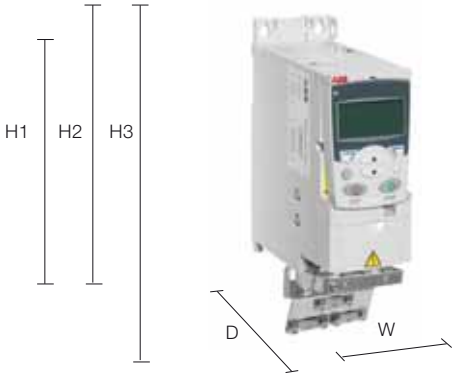
Dimensions and weights

ACS310	-	03E	-	XXXX	-	2	+	XXXX

Cabinet-mounted drives (IP20 UL open)

Frame size	IP20 UL open					
	H1 mm	H2 mm	H3 mm	W mm	D mm	Weight kg
R0	169	202	239	70	161	1.1
R1	169	202	239	70	161	1.3
R2	169	202	239	105	165	1.5
R3	169	202	236	169	169	2.9
R4	181	202	244	260	169	4.4

H1 = Height without fastenings and clamping plate
H2 = Height with fastenings but without clamping plate
H3 = Height with fastenings and clamping plate
H4 = Height with fastenings and NEMA 1 connection box
H5 = Height with fastenings, NEMA 1 connection box and hood
W = Width
D = Depth



Wall-mounted drives (NEMA 1)

Frame size	NEMA 1				
	H4 mm	H5 mm	W mm	D mm	Weight kg
R0	257	280	70	169	1.5
R1	257	280	70	169	1.7
R2	257	282	105	169	1.9
R3	260	299	169	177	3.5
R4	270	320	260	177	5.0

H4 = Height with fastenings and NEMA 1 connection box
H5 = Height with fastenings, NEMA 1 connection box and hood
W = Width
D = Depth

Cooling and fuses

Cooling

ACS310 is fitted with cooling fans as standard. The cooling air must be free from corrosive substances and must not be above the maximum ambient temperature of 50 °C. For more specific limits see the Technical data - Environmental limits in this catalogue.

Fuses

Standard fuses can be used with ABB standard drives. For input fuse connections see table below.

Cooling air flow

Type designation	Frame size	Heat dissipation		Air flow	
		[W]	BTU/hr[1)]	m^3/h	ft^3/min
3-phase supply voltage 200 to 240 V units					
ACS310-03X-02A6-2	R0	42	142	-*)	-*)
ACS310-03X-03A9-2	R0	54	183	-*)	-*)
ACS310-03X-05A2-2	R1	64	220	24	14
ACS310-03X-07A4-2	R1	86	295	24	14
ACS310-03X-08A3-2	R1	88	302	21	12
ACS310-03X-10A8-2	R2	111	377	21	12
ACS310-03X-14A6-2	R2	140	476	52	31
ACS310-03X-19A4-2	R2	180	613	52	31
ACS310-03X-26A8-2	R3	285	975	71	42
ACS310-03X-34A1-2	R4	328	1119	96	57
ACS310-03X-50A8-2	R4	488	1666	96	57
3-phase supply voltage 380 to 480 V units					
ACS310-03X-01A3-4	R0	35	121	-*)	-*)
ACS310-03X-02A1-4	R0	40	138	-*)	-*)
ACS310-03X-02A6-4	R1	50	170	13	8
ACS310-03X-03A6-4	R1	60	204	13	8
ACS310-03X-04A5-4	R1	69	235	13	8
ACS310-03X-06A2-4	R1	90	306	19	11
ACS310-03X-08A0-4	R1	107	364	24	14
ACS310-03X-09A7-4	R1	127	433	24	14
ACS310-03X-13A8-4	R3	161	551	52	31
ACS310-03X-17A2-4	R3	204	697	52	31
ACS310-03X-25A4-4	R3	301	1029	71	42
ACS310-03X-34A1-4	R4	408	1393	96	57
ACS310-03X-41A8-4	R4	498	1700	96	57
ACS310-03X-48A4-4	R4	588	2007	96	57

X within the type code stands for E or U.
*) Frame size R0 with free convection cooling.

Selection table

Type designation	Frame size	IEC Fuses		UL Fuses	
		[A]	Fuse type*)	[A]	Fuse type*)
3-phase supply voltage 200 to 240 V units					
ACS310-03X-02A6-2	R0	10	gG	10	UL class T
ACS310-03X-03A9-2	R0	10	gG	10	UL class T
ACS310-03X-05A2-2	R1	10	gG	15	UL class T
ACS310-03X-07A4-2	R1	16	gG	15	UL class T
ACS310-03X-08A3-2	R1	16	gG	15	UL class T
ACS310-03X-10A8-2	R2	16	gG	20	UL class T
ACS310-03X-14A6-2	R2	25	gG	30	UL class T
ACS310-03X-19A4-2	R2	25	gG	35	UL class T
ACS310-03X-26A8-2	R3	63	gG	60	UL class T
ACS310-03X-34A1-2	R4	80	gG	80	UL class T
ACS310-03X-50A8-2	R4	100	gG	100	UL class T
3-phase supply voltage 380 to 480 V units					
ACS310-03X-01A3-4	R0	10	gG	10	UL class T
ACS310-03X-02A1-4	R0	10	gG	10	UL class T
ACS310-03X-02A6-4	R1	10	gG	10	UL class T
ACS310-03X-03A6-4	R1	10	gG	10	UL class T
ACS310-03X-04A5-4	R1	16	gG	15	UL class T
ACS310-03X-06A2-4	R1	16	gG	15	UL class T
ACS310-03X-08A0-4	R1	16	gG	20	UL class T
ACS310-03X-09A7-4	R1	20	gG	25	UL class T
ACS310-03X-13A8-4	R3	25	gG	30	UL class T
ACS310-03X-17A2-4	R3	35	gG	35	UL class T
ACS310-03X-25A4-4	R3	50	gG	50	UL class T
ACS310-03X-34A1-4	R4	80	gG	80	UL class T
ACS310-03X-41A8-4	R4	100	gG	100	UL class T
ACS310-03X-48A4-4	R4	100	gG	100	UL class T

X within the type code stands for E or U.
*) According to IEC-60269 standard.

Free space requirements

Enclosure type	Space above mm	Space below mm	Space on left/right mm
All frame sizes	75	75	0

Control connections

ACS310	-	03E	-	XXXX	-	2	+	XXXX

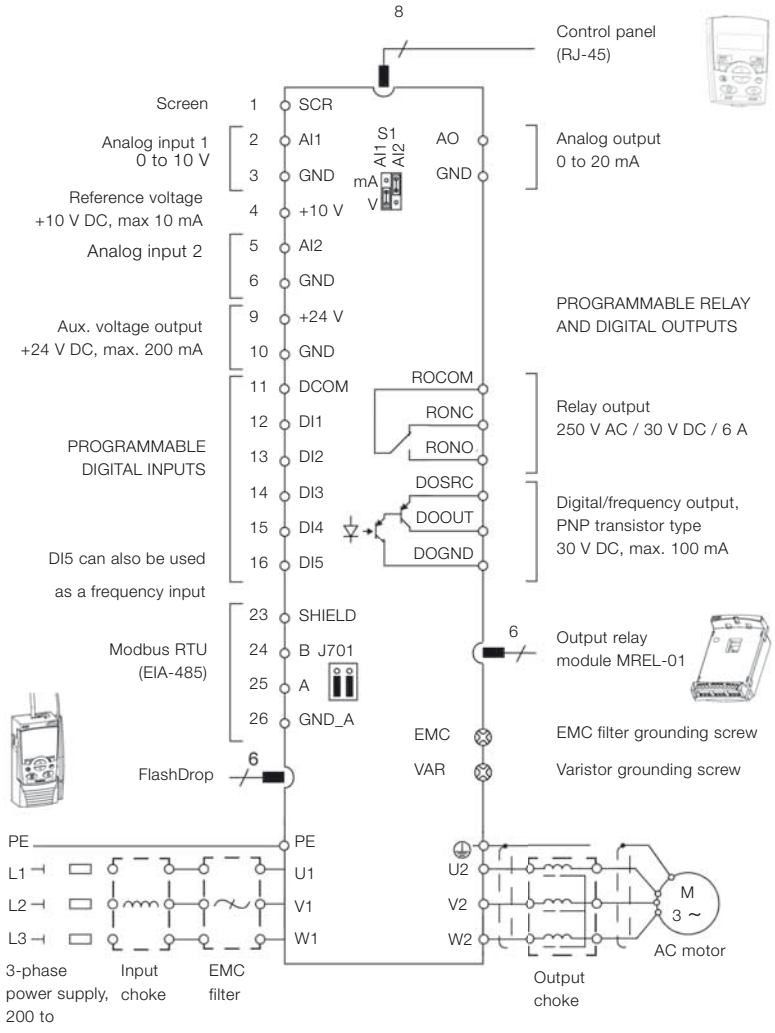
Application macros

Application macros are preprogrammed parameter sets. While starting up the drive, the user typically selects one of the macros that is best suited for the application. The diagram below gives an overview of ACS310 control connections and shows the default I/O connections for the ABB standard macro.

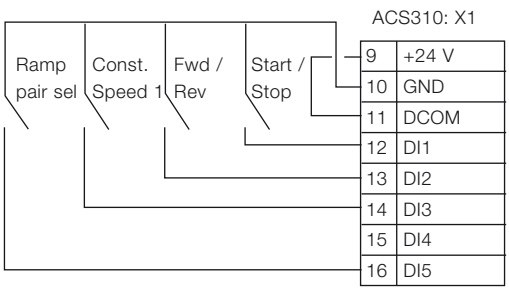
- ABB Standard macro
- 3-wire macro
- Alternative macro
- Motor potentiometer
- Hand/auto macro
- PID control macro
- PFC control macro
- SPFC control macro

In addition to the standard macros the user can create three user macros. The user macro allows the user to save the parameter settings for later use.

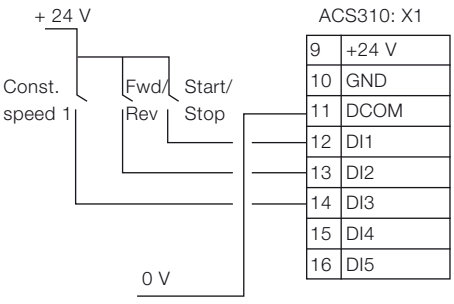
The diagram below gives an overview of ACS310 control connections. Please refer to the ACS310 user's manual for more detailed information.



Typical I/O connections



DI configuration NPN connected (sink)



DI configuration PNP connected (source) with external power supply

Options

ACS310	-	03E	-	XXXX	-	2	+	XXXX

How to select options

The options shown in the table below are available within the ACS310 range. The control panels have an associated 4-figure option code, which is shown in the second column. It is this code that replaces J400 in the type code above.

Options	Ordering code	Description	Model
Protection class	*)	NEMA 1/UL type 1 (R0, R1, R2)	MUL1-R1
	*)	NEMA 1/UL type 1 (R3)	MUL1-R3
	*)	NEMA 1/UL type 1 (R4)	MUL1-R4
Control panel	J400	Assistant control panel	ACS-CP-A
	J404	Basic control panel	ACS-CP-C
Panel mounting kit	*)	Panel mounting kit	ACS/H-CP-EXT
	*)	Panel holder mounting kit	OPMP-01
Extension modules	L511	Relay output extension module. Option includes three (3) additional relay outputs.	MREL-01
Tools	*)	FlashDrop tool	MFDT-01
	*)	DriveWindow Light	DriveWindow Light
External options	*)	Input chokes	
	*)	EMC filters	
	*)	Output chokes	
Remote monitoring	*)	Ethernet adapter	SREA-01

*) = Ordering with a separate MRP code number.

1) The ACS310 is compatible with ACS-CP-C basic control panel Rev M or later.

2) The ACS310 is compatible with ACS-CP-A assistant control panel Rev E or later. (New panel series manufactured since 2007 with serial number XYYWWRXXXX, where year Y = 7 or greater and revision R = E, F, G, …)

Options
Interfaces

ACS310	-	03E	-	XXXX	-	2	+	XXXX

User interface

Panel cover
The purpose of the panel cover is to protect the drive's connection surfaces.The ACS310 drive is delivered with a panel cover as standard. In addition there are two alternative control panels available as options.

Basic control panel
The basic control panel features a single line numeric display. The panel can be used to control the drive, set parameter values or copy them from one drive to another.

Assistant control panel
The assistant control panel features a multilingual alphanumeric display for easy drive programming. The control panel has various assistants and an built-in help function to guide the user. It includes a real time clock, which can be used during fault logging and in controlling the drive, such as start/stop. The control panel can be used for copying parameters for back up or for downloading to another drive. A large graphical display and soft keys make it extremely easy to navigate.

Panel mounting kits
To attach the control panel to the outside of a larger enclosure, two panel mounting kits are available. A simple and cost-efficient installation is possible with the ACS/H-CP-EXT kit, while the OPMP-01 kit provides a more user-friendly solution, including a panel platform that enables the panel to be removed in the same way as a drive-mounted panel. The panel mounting kits include all hardware required, including 3 meters extension cables and installation instructions.

Protection and installation

NEMA 1 kit
The NEMA 1 kit includes a connection box for finger protection, conduit tube installation, and a hood for protection against dirt and dust.

Terminal cover
The terminal cover is for protection of the I/O connections.

Clamping plates
The clamping plates are used for protection against electrical disturbances. The clamping plates with the clamps are included in the drive package as standard.

Panel cover (included as standard)

Basic control panel

Assistant control panel

Panel holder mounting kit OPMP-01

NEMA 1 kit

Terminal cover
(included as standard)

Clamping plates
(included as standard)

Options
Interfaces

ACS310	-	03E	-	XXXX	-	2	+	XXXX

Serial communication

The embedded Modbus EIA-485 fieldbus brings connectivity to major automation systems. A single twisted pair cable avoids large amounts of conventional cabling, thereby reducing costs and increasing system reliability.

Modbus TCP to Modbus RTU gateway

Additionally SREA-01 Ethernet adapter offers Modbus TCP to Modbus RTU gateway functionality which enables Modbus TCP connectivity to ACS310. Please refer to SREA-01 user's guide for more detailed information.

Extension module

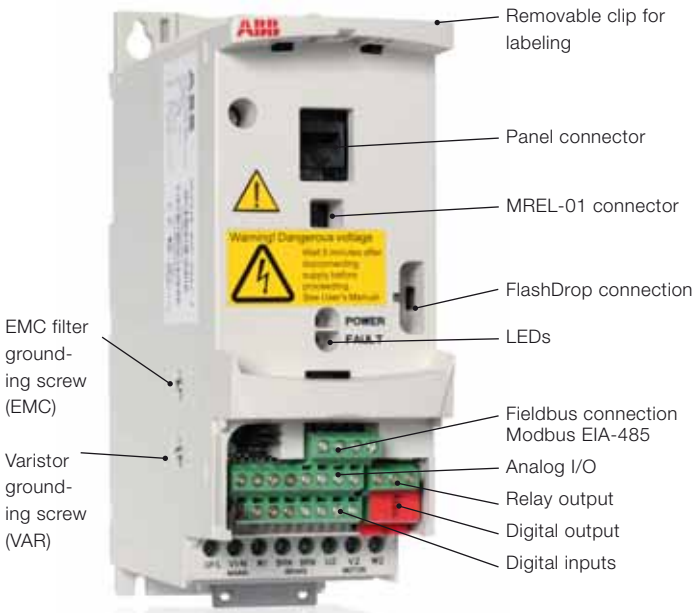
MREL-01

ACS310 has one relay output as standard. The optional MREL-01 module offers three additional relay outputs. The outputs can be configured for different functions by setting selected parameters.

SREA-01 Ethernet adapter

SREA-01 Ethernet adapter with remote monitoring access can send process data, data logs and event messages independently, without a PLC or a dedicated on-site computer. It has an internal web server for configuration and drive access.

In remote locations without qualified service people on-site it is vital to be able to monitor the drive remotely. Monitoring and diagnostics routines can be easily implemented with ABB's remote monitoring tool. Remote monitoring tool enables to connect multiple drives to Ethernet, to collect operational data from the process and sent the collected data to a central location for process monitoring and further analysis.

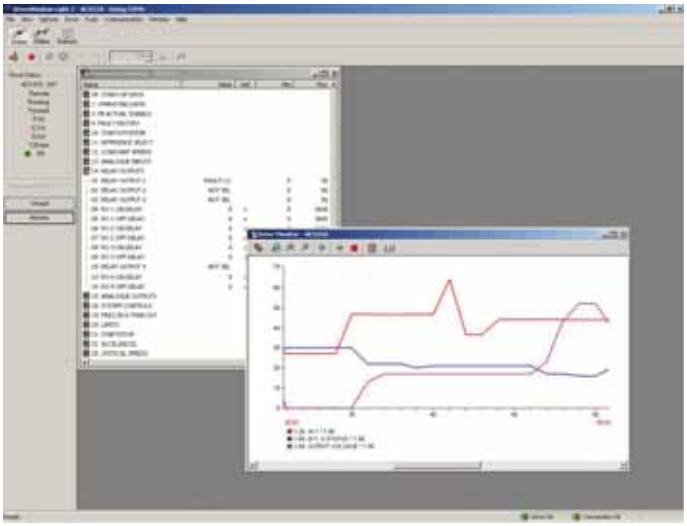


Extension module MREL-01

SREA-01 Ethernet adapter

Options
Software tools

A separate order line and type designation is required for any of these software tool options.



DriveWindow Light

DriveWindow Light is an easy-to-use start-up and maintenance tool for ACS310 drives. It can be used in an offline mode, which enables parameter setting at the office even before going to the actual site. The parameter browser enables viewing, editing and saving of parameters. The parameter comparison feature makes it possible to compare parameter values between the drive and saved parameter files. With the parameter subset you can create your own parameter sets. Controlling the drive is one of the features in DriveWindow Light. With this software tool, you can monitor up to four signals simultaneously. This can be done in both graphical and numerical format. DriveWindow Light version 2.9 or later is compatible with ACS310 drives.

Start-up wizards

Start-up wizards make the setting of parameters easy. Simply launch the wizard, select an appropriate assistant e.g. for setting analog outputs, and all parameters related to this function are shown together with help pictures.

Highlights

- Editing, saving and downloading parameters
- Graphical and numerical signal monitoring
- Drive control
- Start-up wizards

DriveWindow Light requirements

- Windows NT/2000/XP/Vista/Windows 7
- Serial port from a PC
- Control panel connector

Options
External

A separate order line and type designation is required for any of these external options.

FlashDrop tool

FlashDrop is a powerful palm sized tool for fast and easy parameter selecting and setting. It gives the possibility to hide selected parameters to protect the machine. Only the parameters needed in the application are shown. The tool can copy parameters between two drives or between a PC and a drive. All the above can be done without a power connection to the drive – in fact, it is not even necessary to unpack the drive.

FlashDrop tool

DrivePM

DrivePM (Drive parameter manager) is a tool to create, edit and copy parameter sets for FlashDrop. For each parameter/group the user has a possibility to hide it, which means that the drive user does not see the parameter/group at all. DrivePM version 1.2 is compatible with ACS310 drives.

DrivePM requirements

- Windows 2000/XP/Vista/Windows 7
- Serial port from a PC

FlashDrop package includes

- FlashDrop tool
- DrivePM software on a CD-rom
- User's manual in English and in pdf-format on the CD-rom
- Cable OPCA-02 for connection between the PC and FlashDrop tool
- Battery charger

Options
External

A separate order line and type designation is required for any of these external options.

Input chokes

An input choke smooths the wave shape of mains current and reduces total harmonic distortion (THD). Together with the input choke, the ACS310 is designed to fulfill the requirements of the harmonics standard EN/IEC 61000-3-12. In addition, the input choke provides improved protection against mains voltage transients.

Type designation ACS310-	Frame size	Input choke	I_{1N} without choke [A]	I_{1N} with choke [1] [A]	I_{TH} [A]	L [mH]
3-phase supply voltage 200 to 240 V units						
03X-02A6-2	R0	CHK-01	4.7	2.6	4.2	6.4
03X-03A9-2	R0	CHK-02	6.7	3.5	7.6	4.6
03X-05A2-2	R1	CHK-03	8.4	4.2	13	2.7
03X-07A4-2	R1	CHK-03	13	6.1	13	2.7
03X-08A3-2	R1	CHK-04	13.2	6.9	22	1.5
03X-10A8-2	R2	CHK-04	15.7	9.2	22	1.5
03X-14A6-2	R2	CHK-04	23.9	13	22	1.5
03X-19A4-2	R2	CHK-04	27.3	13.3	22	1.5
03X-26A8-2	R3	CHK-06	45	20.9	47	0.7
03X-34A1-2	R4	CHK-06	55	26.2	47	0.7
03X-50A8-2	R4	CHK-06	76	41	47	0.7
3-phase supply voltage 380 to 480 V units						
03X-01A3-4	R0	CHK-01	2.4	1.3	4.2	6.4
03X-02A1-4	R0	CHK-01	4.9	2	4.2	6.4
03X-02A6-4	R1	CHK-01	4.5	2.5	4.2	6.4
03X-03A6-4	R1	CHK-01	6.6	3.5	4.2	6.4
03X-04A5-4	R1	CHK-02	7.6	3.8	7.6	4.6
03X-06A2-4	R1	CHK-02	10.6	5.3	7.6	4.6
03X-08A0-4	R1	CHK-02	12.8	6.8	7.6	4.6
03X-09A7-4	R1	CHK-03	15	8.6	13	2.7
03X-13A8-4	R3	CHK-03	20.7	12.3	13	2.7
03X-17A2-4	R3	CHK-04	24.3	12.6	22	1.5
03X-25A4-4	R3	CHK-04	34	19.5	22	1.5
03X-34A1-4	R4	CHK-05	57	27.2	33	1.1
03X-41A8-4	R4	CHK-06	67	35.2	47	0.7
03X-48A4-4	R4	CHK-06	74	42	47	0.7

[1] Values at 50 Hz/230 V and at 50 Hz/400 V power supplies

I_{1N} = Nominal input current
I_{TH} = Nominal choke thermal current
L = Choke inductance

Output chokes

An output choke decreases du/dt on the output and filters current spikes caused by voltage spikes. With an output choke it is possible to increase the motor cable length which could be otherwise limited due to a temperature increase resulting from current spikes and electromagnetic performance.

Type designation ACS310-	Frame size	Output choke	Cable length [m]
3-phase supply voltage 200 to 240 V units			
03X-02A6-2	R0	ACS-CHK-B3	60
03X-03A9-2	R0	ACS-CHK-B3	60
03X-05A2-2	R1	ACS-CHK-B3	100
03X-07A4-2	R1	ACS-CHK-C3	100
03X-08A3-2	R1	ACS-CHK-C3	100
03X-10A8-2	R2	ACS-CHK-C3	100
03X-14A6-2	R2	NOCH-0016-6x	100
03X-19A4-2	R2	NOCH-0016-6x	100
03X-26A8-2	R3	NOCH-0030-6x	100
03X-34A1-2	R4	NOCH-0030-6x	100
03X-50A8-2	R4	NOCH-0070-6x	100
3-phase supply voltage 380 to 480 V units			
03X-01A3-4	R0	ACS-CHK-B3	60
03X-02A1-4	R0	ACS-CHK-B3	60
03X-02A6-4	R1	ACS-CHK-B3	100
03X-03A6-4	R1	ACS-CHK-B3	100
03X-04A5-4	R1	ACS-CHK-C3	100
03X-06A2-4	R1	ACS-CHK-C3	100
03X-08A0-4	R1	NOCH-0016-6x	100
03X-09A7-4	R1	NOCH-0016-6x	100
03X-13A8-4	R3	NOCH-0016-6x	100
03X-17A2-4	R3	NOCH-0016-6x	100
03X-25A4-4	R3	NOCH-0030-6x	100
03X-34A1-4	R4	NOCH-0030-6x	100
03X-41A8-4	R4	NOCH-0030-6x	100
03X-48A4-4	R4	NOCH-0070-6x	100

Options
External

A separate order line and type designation is required for any of these external options.

EMC filters

The ACS310's internal EMC filter is designed to meet category C3 requirements of EN/IEC 61800-3 standard. External EMC filters are used to enhance the drives electromagnetic performance in conjunction with its internal filtering. Maximum motor cable length depends on required electromagnetic performance, according to the table below.

Type designation ACS310-	Frame size	Filter type	Cable length[1] with external EMC filter			Cable length[1] without external EMC filter	
			C1 [m]	C2 [m]	C3 [m]	C3 [m]	C4 [m]
3-phase supply voltage 200 to 240 V units							
03X-02A6-2	R0	RFI-32	10	30	-	30	30
03X-03A9-2	R0	RFI-32	10	30	-	30	30
03X-05A2-2	R1	RFI-32	10	30	50	30	50
03X-07A4-2	R1	RFI-32	10	30	50	30	50
03X-08A3-2	R1	RFI-32	10	30	50	30	50
03X-10A8-2	R2	RFI-32	10	30	50	30	50
03X-14A6-2	R2	RFI-33	10	30	50	30	50
03X-19A4-2	R2	RFI-33	10	30	50	30	50
03X-26A8-2	R3	RFI-34	10	30	50	30	50
03X-34A1-2	R4	RFI-34	10	30	50	30	50
03X-50A8-2	R4	RFI-34	10	30	50	30	50
3-phase supply voltage 380 to 480 V units							
03X-01A3-4	R0	RFI-32	30	30	-	30	30
03X-02A1-4	R0	RFI-32	30	30	-	30	30
03X-02A6-4	R1	RFI-32	50	50	50	30	50
03X-03A6-4	R1	RFI-32	50	50	50	30	50
03X-04A5-4	R1	RFI-32	50	50	50	30	50
03X-06A2-4	R1	RFI-32	50	50	50	30	50
03X-08A0-4	R1	RFI-32	50	50	50	30	50
03X-09A7-4	R1	RFI-32	50	50	50	30	50
03X-13A8-4	R3	RFI-33	40	40	40	30	50
03X-17A2-4	R3	RFI-33	40	40	40	30	50
03X-25A4-4	R3	RFI-33	40	40	40	30	50
03X-34A1-4	R4	RFI-34	-	30	-	30	50
03X-41A8-4	R4	RFI-34	-	30	-	30	50
03X-48A4-4	R4	RFI-34	-	30	-	30	50

[1] Internal EMC filter must be connected with the EMC screw in the drive. When the filter is not connected the C4 maximum cable lengths are allowed to be used.

Low leakage current filters

Low leakage current filters are ideal for installations where residual current devices (RCD) are required and leakage current needs to be below 30 mA.

Type designation ACS310-	Frame size	Filter type	Cable length[1] with LRFI filter
			C2 [m]
Low leakage current filters, 3-phase supply voltage 400 V units			
03X-01A3-4	R0	LRFI-31	10
03X-02A1-4	R0	LRFI-31	10
03X-02A6-4	R1	LRFI-31	10
03X-03A6-4	R1	LRFI-31	10
03X-04A5-4	R1	LRFI-31	10
03X-06A2-4	R1	LRFI-31	10
03X-08A0-4	R1	LRFI-32	10
03X-09A7-4	R1	LRFI-32	10

[1] Internal EMC filter must be disconnected by removing the EMC screw from the drive.

EMC standards in general

EN 61800-3 (2004), product standard	EN 55011, product family standard for industrial, scientific and medical (ISM) equipment	EN 61800-3/A11 (2000), product standard
Category C1	Group 1 Class B	1st environment, unrestricted distribution
Category C2	Group 1 Class A	1st environment, restricted distribution
Category C3	Group 2 Class A	2nd environment, unrestricted distribution
Category C4	Not applicable	2nd environment, restricted distribution

Services

All industries face a common goal: to maximize their production output at the lowest possible cost, while maintaining the highest quality end products. One of ABB's key objectives is to maximize the uptime of its customers' processes by ensuring optimum lifetime of all ABB products in a predictable, safe and low cost manner.

The services offered for ABB low voltage drives span the entire value chain, from the moment a customer makes the first inquiry through to disposal and recycling of the drive. Throughout the value chain, ABB provides training and learning, technical support and contracts. All of this is supported by one of the most extensive global drive sales and service networks.

Maximizing return on investment

At the heart of ABB's services is its drive life cycle management model. All services available for ABB low voltage drives are planned according to this model. For customers it is easy to see which services are available at which phase.

Drive specific maintenance schedules are also based on this four-phase model. Thus, a customer knows precisely the timing of the part replacements plus all other maintenance related actions. The model also helps the customer when deciding about upgrades, retrofits and replacements.

Professional management of the drive's life cycle maximizes the return on any investment in ABB low voltage drives.

ABB drive life cycle management model

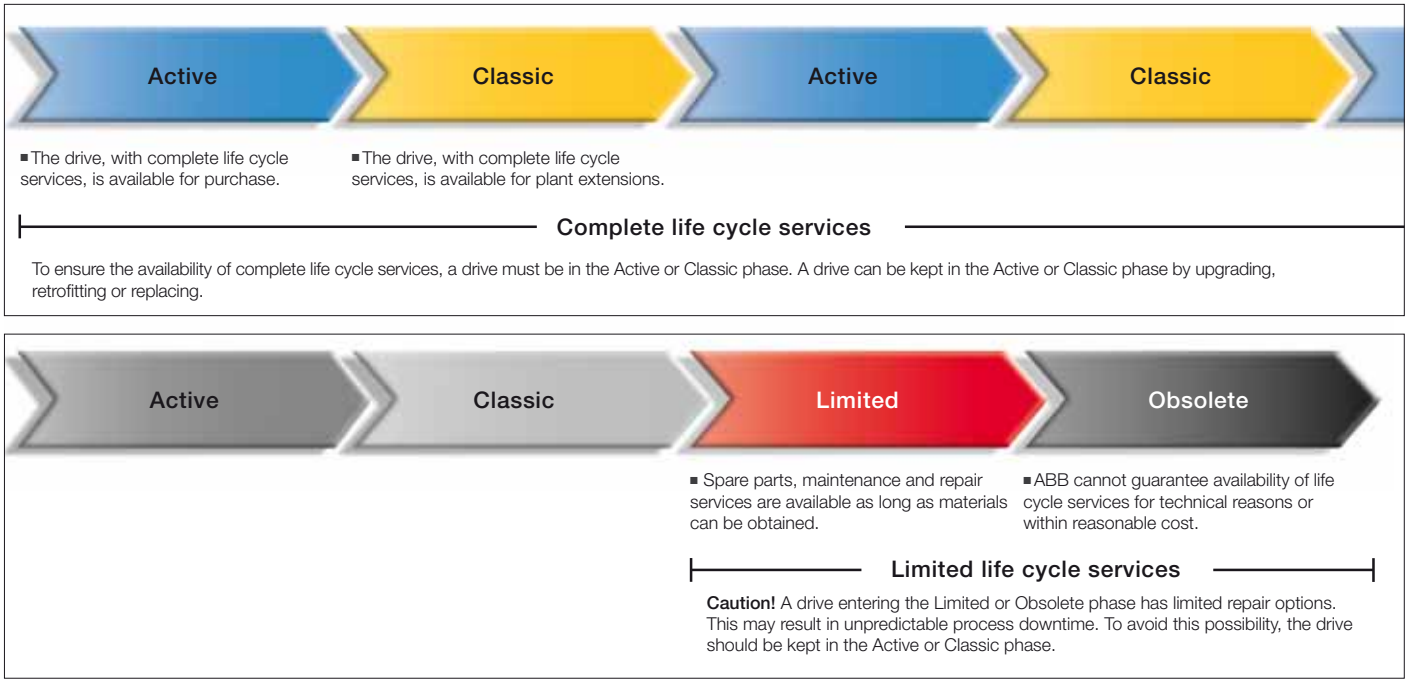


ABB follows a four-phase model for managing drive life cycles, which brings enhanced customer support and improved efficiency.

Examples of life cycle services are: selection and dimensioning, installation and commissioning, preventive and corrective maintenance, remote services, spare part services, training and learning, technical support, upgrade and retrofit, replacement and recycling.

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