

LOW VOLTAGE AC DRIVES

# **ABB general purpose drives**

ACS310, 0.5 to 30 hp/0.37 to 22 kW



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**Make wise savings with your pump and fan applications. ACS310 drives.**

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# ACS310 drives for a wide range of variable torque applications

ABB general purpose drive, ACS310 is easy to select and easy to use. It is enough for most basic applications with no high overload demands. ACS310 is suitable for wide range of variable torque applications and simple machines.

The drive's dedicated pump and fan features lower operating costs, boost energy efficiency and reduces CO<sub>2</sub> 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 pipe clogging by initiating a sequence of forward and reverse runs of the pump to clean the impeller.

Within pumping applications, energy savings can be up to 50 percent, compared to direct-on-line motor-driven systems that use mechanical flow control methods. The ABB general purpose 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 fast and space saving installation. The ACS310 drives have an embedded Modbus interface for system monitoring that saves the cost of external fieldbus 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 OEMs, 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
- Motor noise smoothing
- Worldwide availability and service
- Conformal coated boards



# 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.

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

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.

## **Multiple pump systems**

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.

**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. 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 and reducing maintenance.

# Essentials inside for basic applications

ACS310 drives are simple and easy with all essentials included for applications with no high overload demand.

**Compact design with flexible mounting options saves space and installation time. Short menus and preprogrammed macros makes commissioning fast and easy. The drives powerful set of pump and fan features reduce mechanical stress and thus maintenance costs. Within pumping applications, energy savings of up to 50% can be achieved compared to direct-on-line motor-driven systems that use mechanical flow control methods. Wherever your machine is located, the local ABB will be there to support you and your clients.**

## Multi-pump and -fan control

One drive controls several pumps or fans and eliminates the need for an external programmable logic controller. One pump is drive controlled and auxiliary pumps are on/off controlled. This reduces the motor stress and increase 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.

## Quick and easy commissioning

Predefined I/O configurations for application macros and built-in assistants speed up commissioning of the drive, allowing you to concentrate on your business.

## Robust design and quality

ACS310 has coated control boards to increase robustness. Automatic fault reset to ensure uninterrupted operation. And protection against unstable supply networks.

## Energy optimizer

Intelligent drive control method improving the energy efficiency and system operation, especially while operating on partial centrifugal loads.

## Load analyzer

Built-in statistical tool that saves process data, such as current and torque values, which can be used to analyze and optimize the process. It can also be used for following system behavior before and after any system modifications.



### Compact and space saving design

Compact size, with power range from 0.37 to 22 kW and flexible mounting possibilities ensure optimized installation in a wide range of applications, resulting in space and cost savings.

### Powerful set of pump and fan features

Integrated and preprogrammed features like pump cleaning, pipefill, inlet/outlet pressure supervision and detection of under or overload improve system reliability and lifetime. Built-in PFC feature can eliminate the need for an external programmable logic controller (PLC).

### Internal Modbus EIA-485 connection

Built-in terminals and connectivity for Modbus RTU as standard enables the system control and monitoring in the most user friendly and cost effective way.

### Relay extension module MREL-01

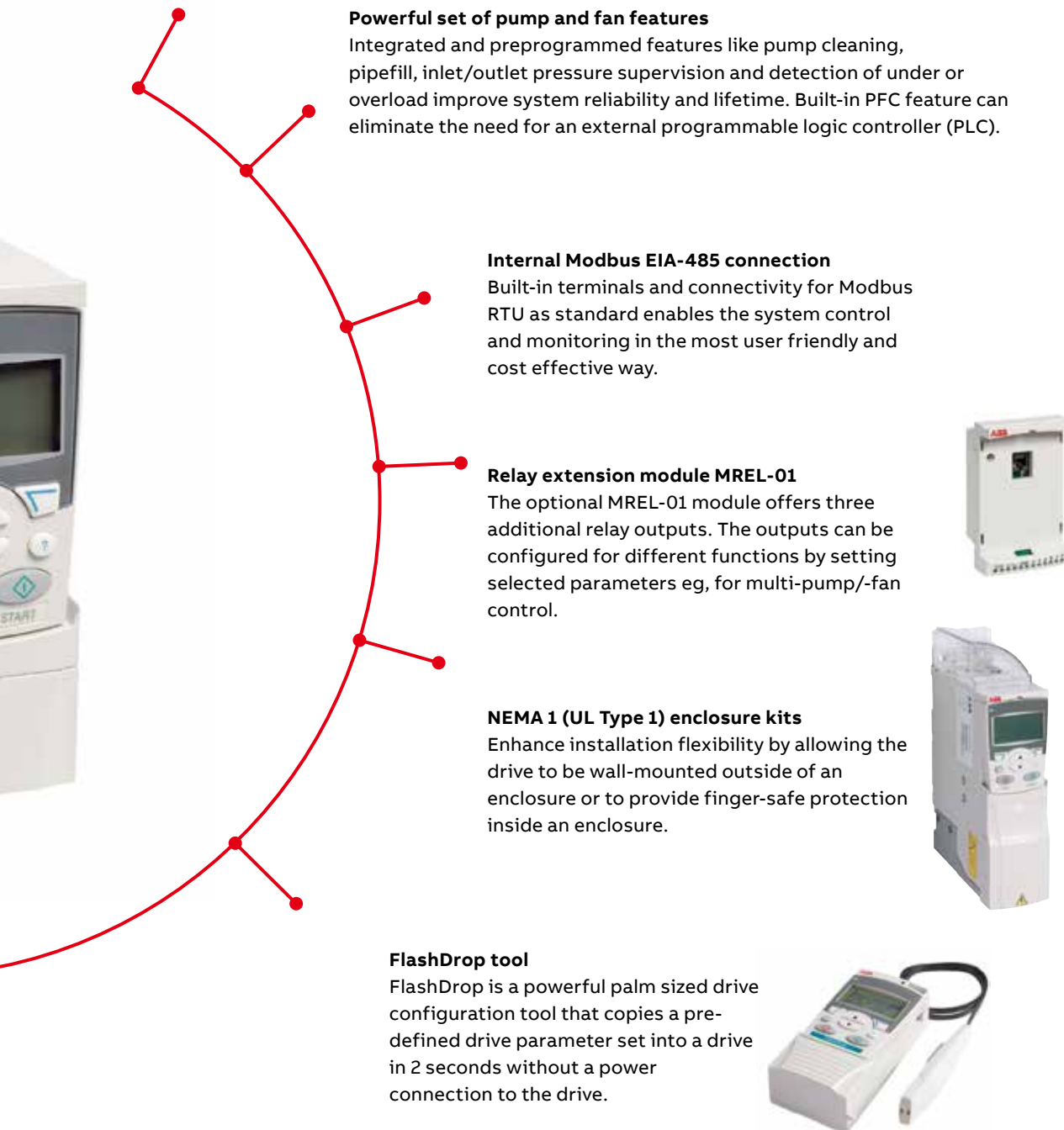
The optional MREL-01 module offers three additional relay outputs. The outputs can be configured for different functions by setting selected parameters eg, for multi-pump/-fan control.

### NEMA 1 (UL Type 1) enclosure kits

Enhance installation flexibility by allowing the drive to be wall-mounted outside of an enclosure or to provide finger-safe protection inside an enclosure.

### FlashDrop tool

FlashDrop is a powerful palm sized drive configuration tool that copies a pre-defined drive parameter set into a drive in 2 seconds without a power connection to the drive.



## 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.

Start with identifying your supply voltage.  
This tells you what rating table to use.  
See page 10.

Choose your motor's power and current rating from the ratings table on page 10.

Select your drive's ordering code from the rating table based on your motor's nominal power rating.

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ABB GENERAL PURPOSE DRIVES, ACS309, AC510, CATALOG

# Ratings and types

P <sub>nom</sub>	Motor				Type designation	Power class
	P <sub>nom</sub>	U <sub>n</sub>	I <sub>n</sub>	C <sub>u</sub> <sup>1)</sup>		
<b>1-phase supply, 500 to 440 V</b>						
0.37	0.37	0.37	0.37	0.37	ACS309-01-0004-0	0
0.75	0.75	0.75	0.75	0.75	ACS309-01-0008-0	1
1.5	1.5	0.7	0.7	0.7	ACS309-01-0016-0	2
2.2	2.2	1.5	0.7	0.7	ACS309-01-0022-0	3
3.0	3.0	2.0	0.7	0.7	ACS309-01-0030-0	4
4.0	4.0	2.0	0.8	0.8	ACS309-01-0040-0	5
<b>1-phase supply, 500 to 440 V</b>						
0.37	0.37	0.37	0.37	0.37	ACS309-03-0004-0	0
0.75	0.75	0.75	0.75	0.75	ACS309-03-0008-0	1
1.5	1.5	0.7	0.7	0.7	ACS309-03-0016-0	2
2.2	2.2	0.8	0.7	0.7	ACS309-03-0022-0	3
3.0	3.0	1.0	0.7	0.7	ACS309-03-0030-0	4
4.0	4.0	1.0	0.8	0.8	ACS309-03-0040-0	5
5.5	5.5	1.0	0.8	0.8	ACS309-03-0055-0	6
7.5	7.5	1.0	0.8	0.8	ACS309-03-0075-0	7
11.0	11.0	1.0	0.8	0.8	ACS309-03-0110-0	8
<b>1-phase supply, 500 to 440 V</b>						
0.37	0.37	0.37	0.37	0.37	ACS309-05-0004-0	0
0.75	0.75	0.75	0.75	0.75	ACS309-05-0008-0	1
1.5	1.5	0.7	0.7	0.7	ACS309-05-0016-0	2
2.2	2.2	0.8	0.7	0.7	ACS309-05-0022-0	3
3.0	3.0	1.0	0.7	0.7	ACS309-05-0030-0	4
4.0	4.0	1.0	0.8	0.8	ACS309-05-0040-0	5
5.5	5.5	1.0	0.8	0.8	ACS309-05-0055-0	6
7.5	7.5	1.0	0.8	0.8	ACS309-05-0075-0	7
11.0	11.0	1.0	0.8	0.8	ACS309-05-0110-0	8
15.0	15.0	1.0	0.8	0.8	ACS309-05-0150-0	9
22.0	22.0	0.8	0.8	0.8	ACS309-05-0220-0	10

## Type designation

This is the unique reference number (shown in column 6) that clearly identifies your drive by current rating and frame size. Also, the drive's type designation has been selected, the frame size (columns 8) can be used to determine the drive dimensions, shown on page 12.

## Voltage

ACS309 is available in two voltage ranges:  
2 - 200 to 240 V  
3 - 380 to 480 V

Insert either "0" or "4", depending on your chosen voltage, into the type designation shown above.

## Construction

"3" or "5" refers to the drive design (shown above) varies depending on the drive frame and EMC filtering. Choose the one that you need.

## 01 - 5-phase

0 - 5-phase  
4 - EMC filter connected, 50 Hz frequency

0 - 5-phase  
4 - EMC filter disconnected, 50 Hz frequency  
(In case the filter is required it can easily be connected)

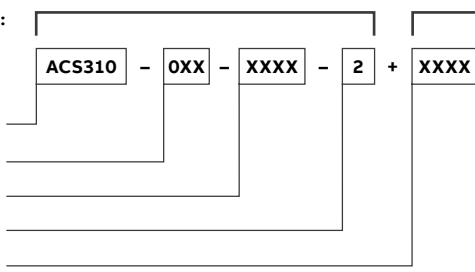
<sup>1)</sup> maximum ambient temperature at an ambient temperature of 40 °C.  
<sup>2)</sup> air-ventilating, depending on the motor temperature.  
<sup>3)</sup> continuous ambient current at an ambient temperature of 40 °C.  
<sup>4)</sup> air-ventilating, the air velocity may be limited.

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Choose your options (on pages 18 to 24) and add the option codes to driver's ordering code. Remember to use a "+" mark before each option code.

Type designation:

Product series  
Constructions  
Rating and types  
Voltage  
Options



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ABB GENERAL PURPOSE DRIVES, ACSH1, CATALOG

# Ratings and types

Rating		Type designation		Power class
$I_{n, 25}$	$I_{n, 40}$	$I_{n, 25}$	$I_{n, 40}$	
<b>2-pulse AC supply, 400 V to 480 V</b>				
0.37	0.5	ACS110-01-00A0-0	0.37	0.5
0.75	1.0	ACS110-01-00A0-0	0.75	1.0
1.5	2.2	ACS110-01-00A0-0	1.5	2.2
3.0	4.0	ACS110-01-00A0-0	3.0	4.0
5.5	7.5	ACS110-01-00A0-0	5.5	7.5
11	15	ACS110-01-00A0-0	11	15
<b>2-pulse AC supply, 400 V to 480 V</b>				
0.37	0.5	2.6	2.6	ACS110-01-00A0-0
0.75	1.0	5.2	5.2	ACS110-01-00A0-0
1.5	2.2	10.4	10.4	ACS110-01-00A0-0
3.0	4.0	20.8	20.8	ACS110-01-00A0-0
5.5	7.5	41.6	41.6	ACS110-01-00A0-0
11	15	83.2	83.2	ACS110-01-00A0-0
22	30	166.4	166.4	ACS110-01-00A0-0
37	50	277.6	277.6	ACS110-01-00A0-0
40	55	184	176	ACS110-01-00A0-0
75	100	368	264	ACS110-01-00A0-0
110	150	552	396	ACS110-01-00A0-0
165	220	832	594	ACS110-01-00A0-0
220	300	1112	792	ACS110-01-00A0-0
<b>2-pulse AC supply, 400 V to 480 V</b>				
0.37	0.5	1.3	1.9	ACS110-01-00A1-0
0.75	1.0	2.6	3.8	ACS110-01-00A1-0
1.5	2.2	5.2	7.6	ACS110-01-00A1-0
3.0	4.0	10.4	15.2	ACS110-01-00A1-0
5.5	7.5	20.8	30.4	ACS110-01-00A1-0
11	15	41.6	60.8	ACS110-01-00A1-0
15	20	45.1	61	ACS110-01-00A1-0
22	30	67.7	91.2	ACS110-01-00A1-0
37	50	101	137	ACS110-01-00A1-0
40	55	80	113	ACS110-01-00A1-0
75	100	160	226	ACS110-01-00A1-0
110	150	240	339	ACS110-01-00A1-0
165	220	360	508	ACS110-01-00A1-0
220	300	480	677	ACS110-01-00A1-0
300	400	600	846	ACS110-01-00A1-0
400	500	800	1128	ACS110-01-00A1-0
500	600	1000	1404	ACS110-01-00A1-0
600	700	1200	1680	ACS110-01-00A1-0
700	800	1400	1960	ACS110-01-00A1-0
800	900	1600	2240	ACS110-01-00A1-0
900	1000	1800	2520	ACS110-01-00A1-0
1000	1100	2000	2800	ACS110-01-00A1-0
1100	1200	2200	3080	ACS110-01-00A1-0
1200	1300	2400	3360	ACS110-01-00A1-0
1300	1400	2600	3640	ACS110-01-00A1-0
1400	1500	2800	3920	ACS110-01-00A1-0
1500	1600	3000	4200	ACS110-01-00A1-0
1600	1700	3200	4480	ACS110-01-00A1-0
1700	1800	3400	4760	ACS110-01-00A1-0
1800	1900	3600	5040	ACS110-01-00A1-0
1900	2000	3800	5320	ACS110-01-00A1-0
2000	2100	4000	5600	ACS110-01-00A1-0
2100				

$I_{n, 25}$ : maximum continuous output current at ambient temperature of +40 °C.  
 $I_{n, 40}$ : maximum continuous output current at ambient temperature of +40 °C.  
 $I_{n, 25}$ : maximum continuous output current at ambient temperature of +40 °C.  
 $I_{n, 40}$ : maximum continuous output current at ambient temperature of +40 °C.

## Type designation

This is the unique reference number (shown in column 5, right) that clearly identifies the drive by current 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 page 12.

## Voltage

ACSH1 is available in two voltage ranges:  
 230 to 240 V  
 480 to 480 V

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

## Construction

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

### 0 = 1-phase

0 = 2-phase

0 = 3-phase

0 = 4-phase

0 = 5-phase

0 = 6-phase

0 = 7-phase

0 = 8-phase

0 = 9-phase

0 = 10-phase

0 = 11-phase

0 = 12-phase

0 = 13-phase

0 = 14-phase

0 = 15-phase

0 = 16-phase

0 = 17-phase

0 = 18-phase

0 = 19-phase

0 = 20-phase

0 = 21-phase

0 = 22-phase

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Page 18



# Ratings and types

Ratings				Type designation	Frame size
$P_N$ (hp)	$P_N$ (kW)	$I_{2N}^{1)}$ (A)	$I_{LD}^{2)}$ (A)		
1-phase AC supply, 200 to 240 V					
0.5	0.37	2.4	2.3	ACS310-01U-02A4-2	R0
1.0	0.75	4.7	4.5	ACS310-01U-04A7-2	R1
1.5	1.1	6.7	6.5	ACS310-01U-06A7-2	R1
2.0	1.5	7.5	7.2	ACS310-01U-07A5-2	R2
3.0	2.2	9.8	9.4	ACS310-01U-09A8-2	R2
4.0	5.0	15	16.5	ACS310-03U-50A8-2 <sup>3</sup>	R4
3-phase AC supply, 200 to 240 V					
0.5	0.37	2.6	2.4	ACS310-03U-02A6-2	R0
0.75	0.55	3.9	3.5	ACS310-03U-03A9-2	R0
1.0	0.75	5.2	4.7	ACS310-03U-05A2-2	R1
1.5	1.1	7.4	6.7	ACS310-03U-07A4-2	R1
2.0	1.5	8.3	7.5	ACS310-03U-08A3-2	R1
3.0	2.2	10.8	9.8	ACS310-03U-10A8-2	R2
5.0	4.0	19.4	17.6	ACS310-03U-19A4-2	R2
7.5	5.5	26.8	24.4	ACS310-03U-26A8-2	R3
10.0	7.5	34.1	31.0	ACS310-03U-34A1-2	R4
15.0	11.0	50.8	46.2	ACS310-03U-50A8-2	R4
3-phase AC supply, 380 to 480 V					
0.5	0.37	1.3	1.2	ACS310-03U-01A3-4	R0
0.75	0.55	2.1	1.9	ACS310-03U-02A1-4	R0
1.0	0.75	2.6	2.4	ACS310-03U-02A6-4	R1
1.5	1.1	3.6	3.3	ACS310-03U-03A6-4	R1
2.0	1.5	4.5	4.1	ACS310-03U-04A5-4	R1
3.0	2.2	6.2	5.6	ACS310-03U-06A2-4	R1
5.0	4.0	9.7	8.8	ACS310-03U-09A7-4	R1
7.5	5.5	13.8	12.5	ACS310-03U-13A8-4	R3
10.0	7.5	17.2	15.6	ACS310-03U-17A2-4	R3
15.0	11.0	25.4	23.1	ACS310-03U-25A4-4	R3
20.0	15.0	34.1	31	ACS310-03U-34A1-4	R4
25.0	18.5	41.8	38	ACS310-03U-41A8-4	R4
30.0	22.0	48.4	44	ACS310-03U-48A4-4	R4

<sup>1)</sup>  $I_{2N}$  maximum continuous output current at ambient temperature of +40 °C.  
No overloadability, derating 1% for every additional 1 °C up to +50 °C.

<sup>2)</sup>  $I_{LD}$  continuous output current at max ambient temperature of +50 °C.  
10% overloadability for one minute every ten minutes.

<sup>3)</sup> Re-rated 3-phase drive

## Type designation

This is the unique reference number (shown in column 5, right) that clearly identifies your drive by current 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 page 12.

## Voltages

ACS310 is available in two voltage ranges:

**2** = 200 to 240 V

**4** = 380 to 480 V

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

## Construction

"01X" and "03X" within the type designation varies depending on the drive phase and EMC filtering. Choose the one you need below.

**01** = 1-phase

**03** = 3-phase

**E** = EMC filter connected, 50 Hz frequency

The European variant of the ACS310 will have an "E" in the type code indicating the EMC filter is connected with a metal grounding screw in the EMC port

**U** = EMC filter disconnected, 60 Hz frequency

The standard configuration of the ACS310 for drives stocked in the U.S. will have a "U" in the type code, indicating there is a nylon screw in the "EMC" port to disconnect the filter. A metal screw is provided in the parts bag to replace the nylon screw and connect the EMC filter.

# Technical data

Mains connection	
Voltage and power range	1-phase, 200 to 240 V $\pm$ 10% 0.5 to 5 hp (0.37 to 4 kW) 3-phase, 200 to 240 V $\pm$ 10% 0.5 to 15 hp (0.37 to 11 kW) 3-phase, 380 to 480 V $\pm$ 10% 0.5 to 30 hp (0.37 to 22 kW)
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 1.6 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 +40 °C (14 to 104 °F) without derating, +40 to 50 °C (104 to 122 °F) with derating, no frost allowed
Altitude	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)
Output current	
Relative humidity	Lower than 95% (without condensation)
Degree of protection	IP20/optional NEMA 1 enclosure
Enclosure color	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, EAC, and RCM approvals	
RoHS compliant	

Programmable control connections	
Two analog inputs	
Voltage signal	
Unipolar	0 (2) to 10 V, $R_{in} > 312 \text{ k}\Omega$
Bipolar	-10 to 10 V, $R_{in} > 312 \text{ k}\Omega$
Current signal	
Unipolar	0 (4) to 20 mA, $R_{in} = 100 \Omega$
Bipolar	-20 to 20 mA, $R_{in} = 100 \Omega$
Potentiometer reference value	10 V $\pm$ 1% max. 10 mA, $R < 10 \text{ k}\Omega$
Resolution	0.1%
Accuracy	$\pm$ 2%
One analog output	0 (4) to 20 mA, load $< 500 \Omega$
Auxiliary voltage	24 V DC $\pm$ 10%, max. 200 mA
Five digital inputs	12 to 24 V, PNP and NPN, programmable DI5 0 to 16 kHz pulse train
Input impedance	2.4 k $\Omega$
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 protected
Frequency	10 Hz to 16 kHz
Resolution	1 Hz
Accuracy	0.2%
Serial communication	
Fieldbuses	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

## Cabinet-mounted drives (IP20/UL open)

Frame size	IP20/UL Open											
	H1		H2		H3		W		D		Weight	
	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
R0	6.7	169	8	202	9.4	239	2.8	70	6.3	161	2.6	1.2
R1	6.7	169	8	202	9.4	239	2.8	70	6.3	161	2.6	1.2
R2	6.7	169	8	202	9.4	239	4.1	105	6.5	165	3.3	1.5
R3	6.7	169	8	202	9.3	236	6.7	169	6.7	169	5.5	2.5
R4	7.1	181	8	202	9.6	244	10.2	260	6.7	169	9.7	4.4

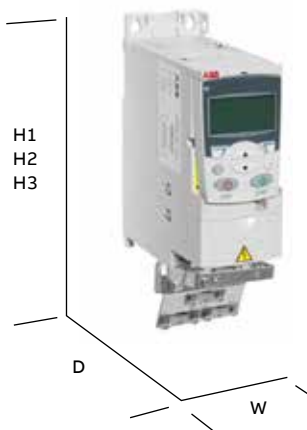
H1 = Height without fastenings and clamping plate

H2 = Height with fastenings but without clamping plate

H3 = Height with fastenings and clamping plate

W = Width

D = Depth



## Wall-mounted drives (NEMA 1)

Frame size	NEMA 1/UL Type 1											
	H4		H5		W		D1		D2		Weight	
	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
R0	10.1	257	11	280	2.8	70	6.7	169	7.4	187	3.5	1.6
R1	10.1	257	11	280	2.8	70	6.7	169	7.4	187	3.5	1.6
R2	10.1	257	11.1	282	4.1	105	6.7	169	7.5	191	4.2	1.9
R3	10.2	260	11.8	299	6.7	169	7	177	7.7	195	6.8	3.1
R4	10.6	270	12.6	320	10.2	260	7	177	7.7	195	11	5.0

H4 = Height with fastenings and NEMA 1 connection box

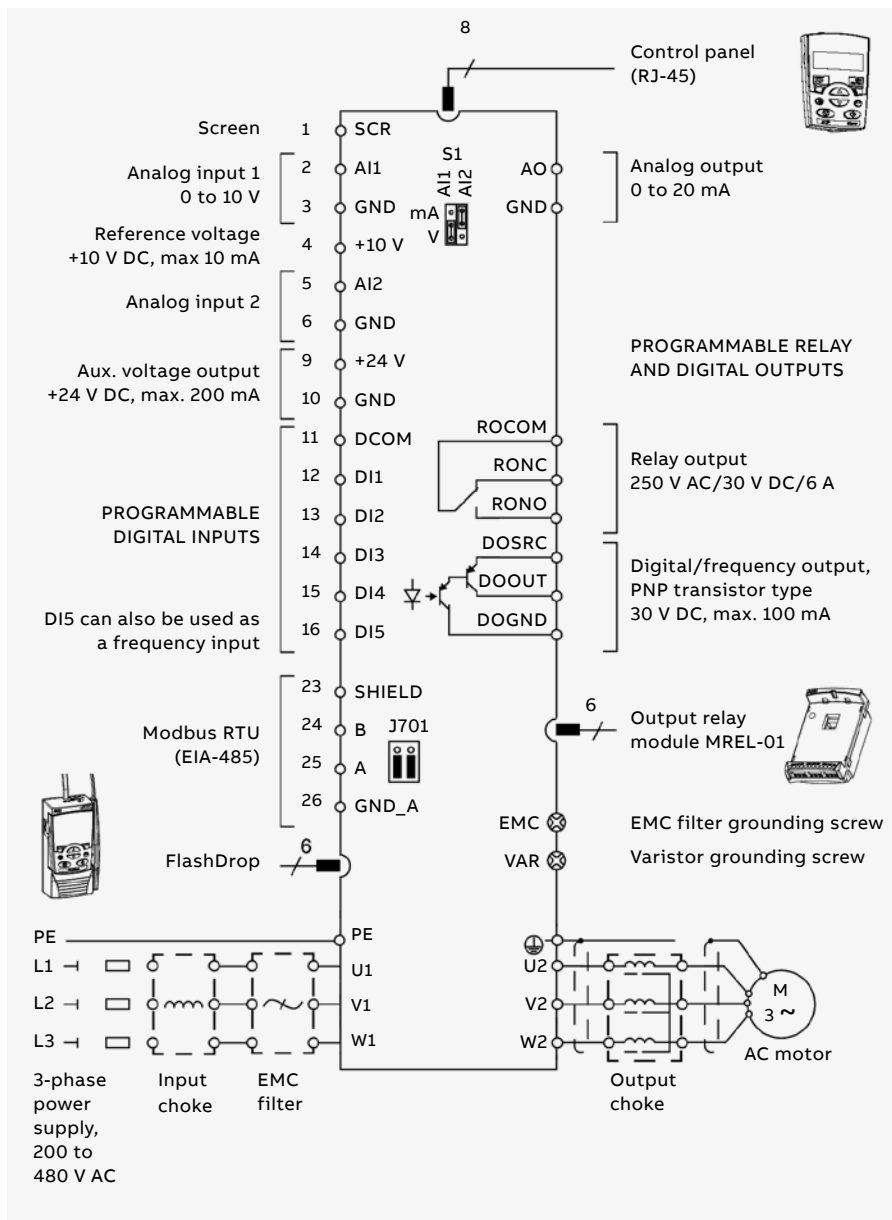
H5 = Height with fastenings, NEMA 1 connection box and hood

W = Width

D = Depth



# Control connections



## 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 gives an overview of ACS310 control connections and shows the default I/O connections for the ABB standard macro.

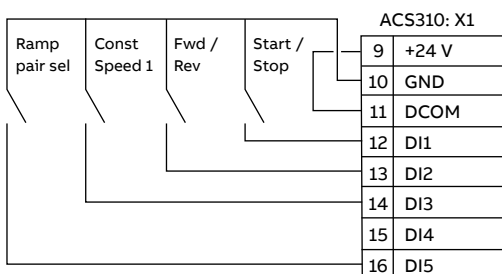
- ABB standard macro
- 3-wire macro
- Alternative macro
- Motor potentiometer
- Hand/auto macro
- PID control macro
- PFC control macro
- SPFC control macro
- Modbus application macro

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.

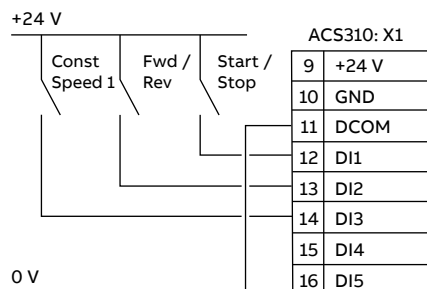
The diagram below gives an overview of ACS310 control connections. Please refer to the ACS310 user's manual for more detailed information.

## Typical I/O connections

### DI configuration NPN connected (sink)



### DI configuration PNP connected (source) with external power supply



# Fuse and circuit protection

## Fuses or manual motor protection for circuit protection

Standard fuses or manual motor protectors can be used with ACS150 drives for branch circuit protection. Use the following table for selecting the correct fuse or protector for each drive.

### Manual motor protectors

ABB UL file E211945 Volume 1, Section 4 lists the ABB Type E manual motor protectors MS132 & S1-M3-25, MS451-xxE, MS495-xxE as an alternative to UL classified fuses as a means of branch circuit protection. This is in accordance with the National Electrical Code (NEC).

When the correct ABB Type E manual motor protector is selected from the table and used for branch circuit protection the drive is suitable for use in a circuit capable of delivering not more than 65 kA RMS symmetrical amperes at the drive maximum rated voltage.

Drives with and without NEMA 1 enclosure kits are included in the UL file. The MMP selections in the table are also valid for drives having a NEMA 1 enclosure kit installed.

Type designation	Frame size	IEC fuses Fuse type Gg* [A]	UL fuses UL class T or CC (600 V) [A]	Manual motor protector MMP Type E <sup>1) 2)</sup>	Trip current setting [A]	Minimum enclosure vol. <sup>3)</sup> [cu in]
<b>1-phase AC supply, 200 to 240 V</b>						
ACS310-01U-02A4-2	R0	10	10	MS132-6.3 & S1-M3-25 <sup>3)</sup>	6.1	1152
ACS310-01U-04A7-2	R1	16	20	MS165-16	11.4	1482
ACS310-01U-06A7-2	R1	16/20 <sup>6)</sup>	25	MS 165 - 20	16 . 1	1482
ACS310-01U-07A5-2	R2	20/25 <sup>6)</sup>	30	MS 165 - 20	16 . 8	1482
ACS310-01U-09A8-2	R2	25/35 <sup>6)</sup>	35	MS 165 -25	21 . 0	1482
<b>3-phase AC supply, 200 to 240 V</b>						
ACS310-03U-02A6-2	R0	10	10	MS132-6.3 & S1-M3-25 <sup>3)</sup>	4.7	1152
ACS310-03U-03A9-2	R0	10	10	MS132-10 & S1-M3-25 <sup>3)</sup>	6.7	1152
ACS310-03U-05A2-2	R1	10	15	MS132-10 & S1-M3-25 <sup>3)</sup>	8.4	1152
ACS310-03U-07A4-2	R1	16	15	MS165-16	13	1482
ACS310-03U-08A3-2	R1	16	15	MS165-16	13.2	1482
ACS310-03U-10A8-2	R2	16	20	MS165-20	15.7	1482
ACS310-03U-19A4-2	R2	25	35	MS165-32	27.3	1482
ACS310-03U-26A8-2	R3	63	60	MS165-54	45	1482
ACS310-03U-34A1-2	R4	80	80	MS165-65	55	1482
ACS310-03U-50A8-2	R4	100	100	MS495-90E / MS5100-100	76	1482
<b>3-phase AC supply, 440 to 480 V <sup>4)</sup></b>						
ACS310-03U-01A3-4	R0	10	10	MS132-2.5 & S1-M-25 <sup>3)</sup>	2	1152
ACS310-03U-02A1-4	R0	10	10	MS132-4 & S1-M3-25 <sup>3)</sup>	3.3	1152
ACS310-03U-02A6-4	R1	10	10	MS132-6.3 & S1-M3-25 <sup>3)</sup>	3.8	1152
ACS310-03U-03A6-4	R1	10	10	MS132-6.3 & S1-M3-25 <sup>3)</sup>	5.5	1152
ACS310-03U-04A5-4	R1	16	15	MS132-10 & S1-M3-25 <sup>3)</sup>	6.3	1152
ACS310-03U-06A2-4	R1	16	15	MS132-10 & S1-M3-25 <sup>3)</sup>	8.8	1152
ACS310-03U-09A7-4	R1	20	25	MS165-16	12	1482
ACS310-03U-13A8-4	R3	25	30	MS165-20	17	1482
ACS310-03U-17A2-4	R3	35	35	MS165-25	20	1482
ACS310-03U-25A4-4	R3	50	50	MS165-32	28	1482
ACS310-03U-34A1-4	R4	80	80	MS165-54	48	1482
ACS310-03U-41A8-4	R4	100	100	MS165-65	56	1482
ACS310-03U-48A4-4	R4	100	100	MS165-65	61	1482

Other fuse types can be used if they meet the ratings and the melting curve of the fuse does not exceed the melting curve of the fuse mentioned in this table.

\* According to IEC-60269 standard

<sup>1)</sup> All manual motor protectors listed are Type E self-protected up to 65 kA. See ABB publication 2CDC131085M0201 – Manual Motor Starters – North American Applications for complete technical data on the ABB Type E manual motor protectors. In order for these manual motor protectors to be used for branch circuit protection, they must be UL listed Type E manual motor protectors, otherwise they can be used only as an At Motor Disconnect. "At Motor Disconnect" is a disconnect just ahead of the motor on the load side of the panel.

<sup>2)</sup> Manual motor protectors may require adjusting the trip limit from the factory setting at or above the drive input Amps to avoid nuisance tripping. If the manual motor protector is set to the maximum current trip level and nuisance tripping is occurring, then select the next size MMP. (MS132-10 is the highest size in MS132 frame size to meet Type E at 65 kA; the next size up is MS165-16.)

<sup>3)</sup> Requires use of the S1-M3-25 line side feeder terminal with the manual motor protector to meet type E self protection class.

<sup>4)</sup> 480Y/277V delta systems only: Short circuit protective devices with slash voltage ratings (e.g. 480Y/277 VAC) can be applied only in solidly grounded networks where the voltage from line-to-ground does not exceed the lower of the two ratings (e.g. 277 V AC), and the voltage from line-to-line does not exceed the higher of the two ratings (e.g. 480 V AC). The lower rating represents the device's interrupting capability per pole.

<sup>5)</sup> Minimum enclosure volume is specified in the UL listing for R0 & R1 frame drives when applied with the ABB Type E MMP shown in the table. ACS310 drives are intended to be mounted in an enclosure unless a NEMA 1 kit is added. For all drives, the enclosure must be sized to accommodate the specific thermal considerations of the application as well as provide free space for cooling. See the applicable ABB User Manual for free space requirements.

<sup>6)</sup> If 50% overload capacity is needed, use the bigger fuse alternative.



# Cooling

## Cooling

AACS310 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 catalog.

### Cooling air flow

Type designation	Frame size	Heat dissipation		Air flow	
		(W)	BTU/hr <sup>1)</sup>	m <sup>3</sup> /h	ft <sup>3</sup> /min
1-phase AC supply, 200 to 240 V					
ACS310-01U-02A4-2	R0	48	163	— <sup>2)</sup>	— <sup>2)</sup>
ACS310-01U-04A7-2	R1	72	247	24	14
ACS310-01U-06A7-2	R1	97	333	24	14
ACS310-01U-07A5-2	R2	101	343	21	12
ACS310-01U-09A8-2	R2	124	422	21	12
3-phase AC supply, 200 to 240 V					
ACS310-03U-02A6-2	R0	42	142	— <sup>2)</sup>	— <sup>2)</sup>
ACS310-03U-03A9-2	R0	54	183	— <sup>2)</sup>	— <sup>2)</sup>
ACS310-03U-05A2-2	R1	64	220	24	14
ACS310-03U-07A4-2	R1	86	295	24	14
ACS310-03U-08A3-2	R1	88	302	21	12
ACS310-03U-10A8-2	R2	111	377	21	12
ACS310-03U-19A4-2	R2	180	613	52	31
ACS310-03U-26A8-2	R3	285	975	71	42
ACS310-03U-34A1-2	R4	328	1119	96	57
ACS310-03U-50A8-2	R4	488	1666	96	57
3-phase AC supply, 380 to 480 V					
ACS310-03U-01A3-4	R0	35	121	— <sup>2)</sup>	— <sup>2)</sup>
ACS310-03U-02A1-4	R0	40	138	— <sup>2)</sup>	— <sup>2)</sup>
ACS310-03U-02A6-4	R1	50	170	13	8
ACS310-03U-03A6-4	R1	60	204	13	8
ACS310-03U-04A5-4	R1	69	235	13	8
ACS310-03U-06A2-4	R1	90	306	19	11
ACS310-03U-09A7-4	R1	127	433	24	14
ACS310-03U-13A8-4	R3	161	551	52	31
ACS310-03U-17A2-4	R3	204	697	52	31
ACS310-03U-25A4-4	R3	301	1029	71	42
ACS310-03U-34A1-4	R4	408	1393	96	57
ACS310-03U-41A8-4	R4	498	1700	96	57
ACS310-03U-48A4-4	R4	588	2007	96	57

<sup>1)</sup> BTU/hr = British Thermal Unit per hour. BTU/hr is approximately 0.293 Watts.

<sup>2)</sup> Frame size R0 with free convection cooling.

### Free space requirements

Enclosure type	Space above (mm)		Space below (mm)		Space on left/right (mm)	
All frame sizes	2.9	75	2.9	75	0	0

# EMC - electromagnetic compatibility

## 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	Cable length <sup>1)</sup> with external EMC filter						Cable length <sup>1)</sup> without external EMC filter			
		C1		C2		C3		C3		C4	
		ft	m	ft	m	ft	m	ft	m	ft	m
1-phase AC supply, 200 to 240 V											
01X-02A4-2	R0	32.8	10	98.4	30	–	–	98.4	30	98.4	30
01X-04A7-2	R1	32.8	10	98.4	30	164	50	98.4	30	164	50
01X-06A7-2	R1	32.8	10	98.4	30	164	50	98.4	30	164	50
01X-07A5-2	R2	32.8	10	98.4	30	164	50	98.4	30	164	50
01X-09A8-2	R2	32.8	10	98.4	30	164	50	98.4	30	164	50
3-phase AC supply, 200 to 240 V											
03X-02A6-2	R0	32.8	10	98.4	30	–	–	98.4	30	98.4	30
03X-03A9-2	R0	32.8	10	98.4	30	–	–	98.4	30	98.4	30
03X-05A2-2	R1	32.8	10	98.4	30	164	50	98.4	30	164	50
03X-07A4-2	R1	32.8	10	98.4	30	164	50	98.4	30	164	50
03X-08A3-2	R1	32.8	10	98.4	30	164	50	98.4	30	164	50
03X-10A8-2	R2	32.8	10	98.4	30	164	50	98.4	30	164	50
03X-19A4-2	R2	32.8	10	98.4	30	164	50	98.4	30	164	50
03X-26A8-2	R3	32.8	10	98.4	30	164	50	98.4	30	164	50
03X-34A1-2	R4	32.8	10	98.4	30	164	50	98.4	30	164	50
03X-50A8-2	R4	32.8	10	98.4	30	164	50	98.4	30	164	50
3-phase AC supply, 380 to 480 V											
03X-01A3-4	R0	98.4	30	98.4	30	–	–	98.4	30	98.4	30
03X-02A1-4	R0	98.4	30	98.4	30	–	–	98.4	30	98.4	30
03X-02A6-4	R1	164	50	164	50	164	50	98.4	30	164	50
03X-03A6-4	R1	164	50	164	50	164	50	98.4	30	164	50
03X-04A5-4	R1	164	50	164	50	164	50	98.4	30	164	50
03X-06A2-4	R1	164	50	164	50	164	50	98.4	30	164	50
03X-09A7-4	R1	164	50	164	50	164	50	98.4	30	164	50
03X-13A8-4	R3	131.2	40	131.2	40	131.2	40	98.4	30	164	50
03X-17A2-4	R3	131.2	40	131.2	40	131.2	40	98.4	30	164	50
03X-25A4-4	R3	131.2	40	131.2	40	131.2	40	98.4	30	164	50
03X-34A1-4	R4	–	–	98.4	30	–	–	98.4	30	164	50
03X-41A8-4	R4	–	–	98.4	30	–	–	98.4	30	164	50
03X-48A4-4	R4	–	–	98.4	30	–	–	98.4	30	164	50

## 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	1 <sup>st</sup> environment, unrestricted distribution
Category C2	Group 1 Class A	1 <sup>st</sup> environment, restricted distribution
Category C3	Group 2 Class A	2 <sup>nd</sup> environment, unrestricted distribution
Category C4	Not applicable	2 <sup>nd</sup> environment, restricted distribution

<sup>1)</sup> 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.

# Control program example

One of the ACS310's integrated pump and fan features is soft pump and fan control (SPFC), which is used for pump and fan alternation applications where lower pressure peaks are desirable when a new auxiliary motor is connected on-line. The following example explains how ACS310 can operate up to 4 to 5 pumps or fans in parallel based on the capacity demand. In this example, we use three parallel pumps to maintain pressure in the pipelines.

The drive controls the motor of pump 1, varying the motor speed to control the pump capacity. This motor is the speed regulated motor. When the demand exceeds that of the first motor's, the drive automatically starts an auxiliary pump. The speed of the first pump is adjusted so that the actual value follows the process reference.

## Parameter settings

Before starting the configuration, ensure that the drive has been installed properly and that the electrical connections are complete. Connection example can be found from ACS310 User's manual.

## Startup data

The correct motor parameters are set within parameter group 99. Then select SPFC control macro using parameter 9902. This software macro updates the defined list of parameter values to their default values.

## Pump and fan control parameters

Parameters can be found in parameter group 81. First change Short menu to Long from parameter 1611 in group 16. This shows the full parameter group list including group 81.

## Frequency limits to start and stop auxiliary motors

Parameter 8109 START FREQ 1 is set to 50 Hz, which is also the default value. Since we have in this example also another auxiliary motor, parameter 8110 START FREQ 2 is set to 50 Hz for the second auxiliary motor. To stop an auxiliary motor we set parameters 8112 LOW FREQ 1 and 8113 LOW FREQ 2 to 25 Hz.

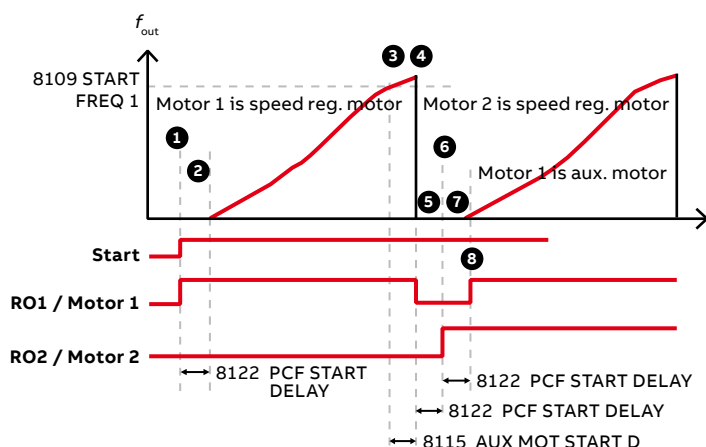
## Auxiliary motors start and stop delay

Delay stabilizes the contactors before starting or stopping a motor.

Parameter 8115 AUX MOT START D is left to its default value 5 s.

Parameter 8116 AUX MOT STOP D is left to its default value 20 s.





### Number of auxiliary motors and motors in total

Parameter 8117 NR OF AUX MOT is set to 2.

Parameter 8127 MOTORS is set to 3.

### Autochange functionality for SPFC

The Autochange functionality for SPFC equalizes duty time between multiple motors, when auxiliary motors are not running. The time interval between motor changes is managed with parameter 8118.

### Interlocks

Interlock detects if any of the pumps are unavailable and starts the next available pump, when used. Set parameter 8120 INTERLOCKS to take input from DI3 in this example (depends of the number of interlocks and how they are connected).

### Start delay for speed controlled motor

Parameter 8122 PFC START DELAY is left to its default value 0.5 s.

### Enabling pump and fan control

Parameter 8123 PFC ENABLE is set to 3 (SPFC + AUTOCHANGE)

### Relay configuration

Relay configuration depends how many and how the motors are connected.

**Note!** The macro SPFC already sets Transistor output parameter 1805 DO SIGNAL to PFC as an additional relay output which is connected.

- Parameter 1401 RELAY OUTPUT 1 is set to PFC
- Parameter 1402 RELAY OUTPUT 2 is set to PFC

1. Hand: 0...10 V → 0...50 Hz.  
PID/PFC: 0...10 V → 0...100% PID setpoint.
2. 360 degree grounding under a clamp.
3. The signal source must be powered externally. See the manufacturer's instructions.

Default I/O settings		
X1A		
1	SCR	Signal cable shield (screen)
2	AI1	Ext. ref. 1 (Hand) / Ext. ref. 2 (PID/PFC): 0...10 V <sup>1)</sup>
3	GND	Analog input circuit common
4	+10 V	Reference voltage: +10 V DC, max. 10 mA
5	AI2	Process actual value: 4...20 mA <sup>3)</sup>
6	GND	Analog input circuit common
7	AO	Output frequency value: 0...20 mA
8	GND	Analog output circuit common
9	+24 V	Auxiliary voltage output: +24 V DC, max. 200 mA
10	GND	Auxiliary voltage output common
11	DCOM	Digital input common
12	DI1	Stop (0) / Start (1) (Hand)
13	DI2	Hand (0) / PID/PFC (1) control selection
14	DI3	Interlock: Deactivation always stops the drive
15	DI4	Interlock: Deactivation stops constant speed motor
16	DI5	Stop (0) / Start (1) (PID/PFC)
X1B		
17	ROCOM	Relay output 1 PFC
18	RONC	
19	RONO	
20	DOSRC	Digital output, max. 100 mA PFC
21	DOOUT	
22	DOGND	

# Options

## User interfaces

- 01 Panel cover (included as standard)
- 02 Basic control panel
- 03 Assistant control panel
- 04 Panel holder mounting kit OPMP-01
- 05 NEMA 1 kit
- 06 Terminal cover (included as standard)
- 07 Clamping plates (included as standard)



### 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 at 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 eg, 3 m 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.

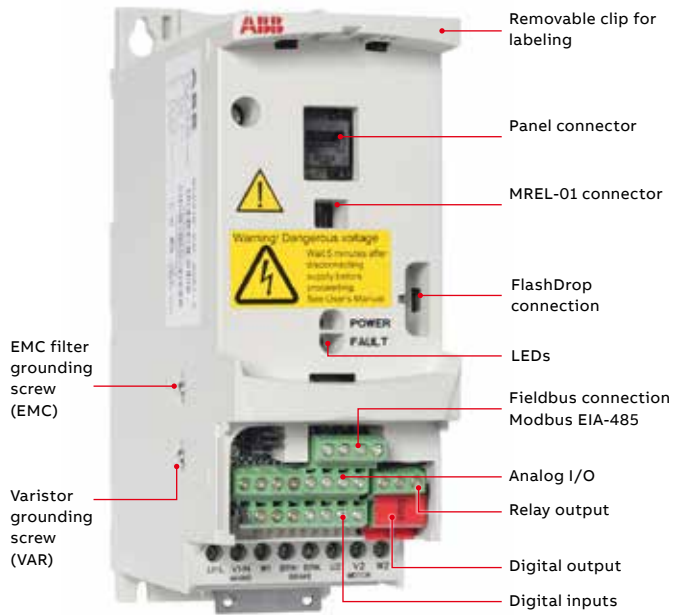
#### Clamping plates

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



# Options

## User interfaces



### 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.

### 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.

01 Extension module MREL-01



# Options

## External

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

01 FlashDrop tool

### 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.

### 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.

### FlashDrop package includes

- FlashDrop tool
- DrivePM software
- User's manual in English
- Cable OPCA-02 for connection between the PC and FlashDrop tool
- Battery charger



01

# Options

## Software tools

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

### DriveWindow Light

DriveWindow Light is an easy-to-use startup 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.

### Startup wizards

Startup wizards make the setting of parameters easy. Simply launch the wizard, select an appropriate assistant eg, 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
- Startup wizards



# Input reactors

## Applications

Line side power conditioning for AC motor controls to prevent unwanted harmonics and nuisance drive trips as well as to prevent excess current during line disturbances that can damage power semi-conductors. There should be a minimum impedance associated with the drive using either AC or DC magnetics. In many applications, this impedance can come from a supply transformer, or if long enough, the supply cable themselves. In most cases, however, the use of an additional input reactor is recommended.

## Features

UL Listed Open, UL Listed Type 1 and UL Listed Type 3R construction with connection terminals. 3% and 5% impedance rating at rated current. UL Listed reactors below 80A include lugs. Lugs are not included with reactor above 80A.

## Drive input current with and without input reactor

### Input Reactors for Single Phase 200-240V applications (connect to terminals A and C)

Type code	Frame Size	HP P <sub>N</sub>	Drive Input Current @ 200V	Drive Input current @ 200V with 5% choke
ACS310-01U-02A4-2	R0	0.5	6.1	4.5
ACS310-01U-04A7-2	R1	1	11.4	8.1
ACS310-01U-06A7-2	R1	1.5	16.1	11
ACS310-01U-07A5-2	R2	2	16.8	12
ACS310-01U-09A8-2	R2	3	21	15

### Input Reactors for Three Phase 200-240V applications

Type code	Frame Size	HP P <sub>N</sub>	Drive Input Current @ 200V	Drive Input current @ 200V with 5% choke
ACS310-03U-02A6-2	R0	0.5	4.7	2.6
ACS310-03U-03A9-2	R0	0.75	6.7	3.6
ACS310-03U-05A2-2	R1	1	8.4	4.8
ACS310-03U-07A4-2	R1	1.5	13.0	7.2
ACS310-03U-08A3-2	R1	2	13.2	8.2
ACS310-03U-10A8-2	R2	3	15.7	11
ACS310-03U-19A4-2	R2	5	27.3	18
ACS310-03U-26A8-2	R3	7.5	45	27
ACS310-03U-34A1-2	R4	10	55	34
ACS310-03U-50A8-2	R4	15	76	47

### Input Reactors for Three Phase 380-480V applications

Type code	Frame Size	HP P <sub>N</sub>	Drive Input Current @ 480V	Drive Input current @ 480V with 5% choke
ACS310-03U-01A3-4	R0	0.5	2.0	1.1
ACS310-03U-02A1-4	R0	0.75	3.3	1.7
ACS310-03U-02A6-4	R1	1	3.8	2.1
ACS310-03U-03A6-4	R1	1.5	5.5	2.9
ACS310-03U-04A5-4	R1	2	6.3	3.2
ACS310-03U-06A2-4	R1	3	8.8	4.4
ACS310-03U-09A7-4	R1	5	12.5	7.2
ACS310-03U-13A8-4	R3	7.5	17.2	10.3
ACS310-03U-17A2-4	R3	10	20.3	10.8
ACS310-03U-25A4-4	R3	15	28.3	16.7
ACS310-03U-34A1-4	R4	20	47.7	22.5
ACS310-03U-41A8-4	R4	25	55.9	29.1
ACS310-03U-48A4-4	R4	30	61.4	34.7

P<sub>N</sub> = Nominal motor power

I<sub>IN</sub> = Input current at nominal load (100%), +40C ambient

<sup>1</sup> Calculated. Assumes no system impedance.

<sup>2</sup> Or equivalent system impedance

\*Derated 3-phase drive

Consult User Manual 3AUA0000044201 for more detailed information

# Input reactors - high impedance

## Input Reactors for Single Phase 200-240V applications (connect to terminals A and C)

Drive Part # ACS310-01U-	HP PN	Drive Input Current @ 200V	KDR 5%, UL Listed, Open				KDR 5%, UL Type 1 Enclosure				KDR 5%, UL Type 3R Enclosure			
			Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight
02A4-2	0.5	6.1	KDRMA8L1	30.6	3.63x4.45x1.78	4	KDRMA8L1E01	30.6	12.25x12.5x6.75	14.5	KDRMA8L1E3R1	30.6	11.5x10x12	19
04A7-2	1	11.4	KDRAA3L2	44.5	4.44x4.25x2.64	3	KDRAA3L2E01	44.5	12.25x12.5x6.75	14	KDRAA3L2E3R1	44.5	11.5x10x12	18
06A7-2	1.5	16.1	KDRB25H	53.1	5.00x6.00x4.00	8	KDRB25HE01	53.1	12.25x12.5x6.75	19	KDRB25HE3R	53.1	11.5x10x12	23
07A5-2	2	16.8	KDRB25H	53.1	5.00 x 6.00 x 4.00	8	KDRB25HE01	53.1	12.25x12.5x6.75	19	KDRB25HE3R	53.1	11.5x10x12	23
09A8-2	3	21	KDRB26H	66.5	5.00 x 6.00 x 4.00	8	KDRB26HE01	66.5	12.25x12.5x6.75	19	KDRB26HE3R	66.5	11.5x10x12	23

## Input Reactors for Three Phase 200-240V applications

Drive Part # ACS310-01U-	HP PN	Drive Input Current @ 200V	KDR 5%, UL Listed, Open				KDR 5%, UL Type 1 Enclosure				KDR 5%, UL Type 3R Enclosure			
			Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight
02A6-2	0.5	4.7	KDRMA6L1	26.4	3.63x4.45x1.78	2	KDRMA6L1E01	26.4	12.25x12.5x6.75	13	KDRMA6L1E3R1	26.4	11.5x10x12	17
03A9-2	0.75	6.7	KDRMA8L1	30.6	3.63x4.45x1.78	4	KDRMA8L1E01	30.6	12.25x12.5x6.75	14.5	KDRMA8L1E3R1	30.6	11.5x10x12	19
05A2-2	1	8.4	KDRAA6L2	39.2	4.44x4.25x2.64	3	KDRAA6L2E01	39.2	12.25x12.5x6.75	14	KDRAA6L2E3R1	39.2	11.5x10x12	18
07A4-2	1.5	13.0	KDRAA3L2	44.5	4.44x4.25x2.64	3	KDRAA3L2E01	44.5	12.25x12.5x6.75	14	KDRAA3L2E3R1	44.5	11.5x10x12	19
08A3-2	2	13.2	KDRMA26H1	32	3.63x4.45x1.78	2	KDRMA26H1E01	32	12.3x12.5x6.75	12	KDRMA26H1E3R1	32	11.5x10x12	16
10A8-2	3	15.7	KDRAA28H2	42	4.44x4.25x2.64	3	KDRAA28H2E01	42	12.3x12.5x6.75	14	KDRAA28H2E3R1	42	11.5x10x12	18
19A4-2	5	27.3	KDRB25H	53.1	5.00 x 6.00 x 4.00	8	KDRB25HE01	53.1	12.25x12.5x6.75	14.5	KDRB25HE3R	53.1	11.5x10x12	23
26A8-2	7.5	45	KDRB26H	66.5	5.00 x 6.00 x 4.00	8	KDRB26HE01	66.5	12.25x12.5x6.75	18.5	KDRB26HE3R	66.5	11.5x10x12	23
34A1-2	10	55	KDRD21H	91.8	5.75 x 7.20 x 4.25	12	KDRD21HE01	91.8	12.25x12.5x6.75	22.5	KDRD21HE3R	91.8	11.5x10x12	27
50A8-2	15	76	KDRD22H	107.8	5.75 x 7.20 x 4.25	12	KDRD22HE01	107.8	12.25x12.5x6.75	22.5	KDRD22HE3R	107.8	11.5x10x12	27

## Input Reactors for Three Phase 380-480V applications

Drive Part # ACS310-01U-	HP PN	Drive Input Current @ 480V	KDR 5%, UL Listed, Open				KDR 5%, UL Type 1 Enclosure				KDR 5%, UL Type 3R Enclosure			
			Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight
01A3-4	0.5	2.0	KDRMA3H1	14.3	3.63x4.45x1.78	2	KDRMA3H1E01	14.3	12.25x12.5x6.75	12	KDRMA3H1E3R1	14.3	11.5x10x12	17
02A1-4	0.75	3.3	KDRMA4H1	19.3	3.63x4.45x1.78	2	KDRMA4H1E01	19.3	12.25x12.5x6.75	12	KDRMA4H1E3R1	19.3	11.5x10x12	17
02A6-4	1	3.8	KDRMA5H1	26.7	3.63x4.45x1.78	2	KDRMA5H1E01	26.7	12.25x12.5x6.75	12	KDRMA5H1E3R1	26.7	11.5x10x12	17
03A6-4	1.5	5.5	KDRMA6H1	30	3.63x4.45x1.78	2	KDRMA6H1E01	30	12.25x12.5x6.75	12	KDRMA6H1E3R1	30	11.5x10x12	17
04A5-4	2	6.3	KDRAA1H2	45	4.44x4.25x2.64	3	KDRAA1H2E01	45	12.25x12.5x6.75	14	KDRAA1H2E3R1	45	11.5x10x12	18
06A2-4	3	8.8	KDRAA2H2	41.8	4.44x4.25x2.64	4	KDRAA2H2E01	41.8	12.25x12.5x6.75	14	KDRAA2H2E3R1	41.8	11.5x10x12	18
09A7-4	5	12.5	KDRAA3H2	66	4.44x4.25x2.64	4	KDRAA3H2E01	66	12.25x12.5x6.75	13	KDRAA3H2E3R1	66	11.5x10x12	19
13A8-4	7.5	17.2	KDRAA4H2	70	4.44x4.25x2.64	4	KDRAA4H2E01	70	12.25x12.5x6.75	14	KDRAA4H2E3R1	70	11.5x10x12	19
17A2-4	10	20.3	KDRAA5H2	98	4.44x4.25x2.64	4	KDRAA5H2E01	98	12.3x12.5x6.75	14	KDRAA5H2E3R1	98	11.5x10x12	19
25A4-4	15	28.3	KDRB2H	133	5.0 X 6.0 X 4.0	7	KDRB2HE01	133	12.25x12.5x6.75	17.5	KDRB2HE3R	133	11.5x10x12	22
34A1-4	20	47.7	KDRC3H	108	5.75 X 7.20 X 5.00	15	KDRC3HE01	108	12.25x12.5x6.75	25.5	KDRC3HE3R	108	11.5x10x12	22
41A8-4	25	55.9	KDRC1H	112	5.75 x 7.20 x 5.00	15	KDRC1HE01	112	12.25x12.5x6.75	25.5	KDRC1HE3R	112	11.5x10x12	30
48A4-4	30	61.4	KDRE2H	141	5.75 x 7.20 x 5.00	16	KDRE2HE01	141	12.25x12.5x6.75	25.5	KDRE2HE3R	141	11.5x10x12	30

All KDR resistors in sizes that match with ACS310 drives include lugs, no separate lug kits are required



# Input reactors - low impedance

## Input Reactors for Single Phase 200-240V applications (connect to terminals A and C)

Drive Part # ACS310-01U-	HP ND	Drive Input Current @ 200V	KDR 3%, UL Listed, Open				KDR 3%, UL Type 1 Enclosure				KDR 3%, UL Type 3R Enclosure			
			Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight
02A4-2	0.5	6.1	KDRMA8L1	30.6	3.63x4.45x1.78	4	KDRMA8L1E01	30.6	12.25x12.5x6.75	12	KDRMA8L1E3R1	30.6	11.5x10x12	17
04A7-2	1	11.4	KDRAA3L2	4405	4.44x4.25x2.64	3	KDRAA3L2E01	4405	12.25x12.5x6.75	14	KDRAA3L2E3R1	4405	11.5x10x12	18
06A7-2	1.5	16.1	KDRAA4L2	62.9	4.44 x 4.25 x 2.64	4	KDRAA4L2E01	62.9	12.25x12.5x6.75	14	KDRAA4L2E3R1	62.9	11.5x10x12	18
07A5-2	2	16.8	KDRB22L	38	5.00 x 6.00 x 4.00	8	KDRB22LE01	38	12.25x12.5x6.75	18.5	KDRB22LE3R	38	11.5x10x12	23
09A8-2	3	21	KDRB22L	38	5.00 x 6.00 x 4.00	8	KDRB22LE01	38	12.25x12.5x6.75	18.5	KDRB22LE3R	38	11.5x10x12	23

## Input Reactors for Three Phase 200-240V applications

Drive Part # ACS310-01U-	HP ND	Drive Input Current @ 200V	KDR 3%, UL Listed, Open				KDR 3%, UL Type 1 Enclosure				KDR 3%, UL Type 3R Enclosure			
			Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight
02A6-2	0.5	4.7	KDRMA8L1	30.6	3.63x4.45x1.78	4	KDRMA8L1E01	30.6	12.25x12.5x6.75	12	KDRMA8L1E3R1	30.6	11.5x10x12	17
03A9-2	0.75	6.7	KDRAA3L2	44.5	4.44x4.25x2.64	3	KDRAA3L2E01	44.5	12.25x12.5x6.75	14	KDRAA3L2E3R1	44.5	11.5x10x12	18
05A2-2	1	8.4	KDRAA4L2	62.9	4.44x4.25x2.64	4	KDRAA4L2E01	62.9	12.25x12.5x6.75	14	KDRAA4L2E3R1	62.9	11.5x10x12	19
07A4-2	1.5	13.0	KDRAA4L2	62.9	4.44x4.25x2.64	4	KDRAA4L2E01	62.9	12.25x12.5x6.75	14	KDRAA4L2E3R1	62.9	11.5x10x12	19
08A3-2	2	13.2	KDRMA27L1	27	3.63x4.45x1.78	2	KDRMA27L1E01	27	12.25x12.5x6.75	12	KDRMA27L1E3R1	27	11.5x10x12	17
10A8-2	3	15.7	KDRAA28L2	42	4.44x4.25x2.64	3	KDRAA28L2E01	42	12.25x12.5x6.75	14	KDRAA28L2E3R1	42	11.5x10x12	18
19A4-2	5	27.3	KDRB22L	38	5.00 x 6.00 x 4.00	8	KDRB22LE01	38	12.25x12.5x6.75	18.5	KDRB22LE3R	38	11.5x10x12	23
26A8-2	7.5	45.0	KDRB23L	48	5.00 x 6.00 x 4.00	8	KDRB23LE01	48	12.25x12.5x6.75	18.5	KDRB23LE3R	48	11.5x10x12	23
34A1-2	10	55.0	KDRD25L	64	5.75x7.2x4.25	12	KDRD25LE01	64	12.25x12.5x6.75	22.5	KDRD25LE3R	64	11.5x10x12	27
50A8-2	15	76.0	KDRD24L	85	5.75 x 7.20 x 4.25	12	KDRD24LE01	85	12.25x12.5x6.75	22.5	KDRD24LE3R	85	11.5x10x12	27

## Input Reactors for Three Phase 380-480V applications

Drive Part # ACS310-01U-	HP ND	Drive Input Current @ 480V	KDR 3%, UL Listed, Open				KDR 3%, UL Type 1 Enclosure				KDR 3%, UL Type 3R Enclosure			
			Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight
01A3-4	0.5	2.0	KDRMA3L1	9.7	3.63x4.45x1.78	2	KDRMA3L1E01	9.7	12.25x12.5x6.75	12	KDRMA3L1E3R1	9.7	11.5x10x12	17
02A1-4	0.75	3.3	KDRMA4L1	12.2	3.63x4.45x1.78	2	KDRMA4L1E01	12.2	12.25x12.5x6.75	12	KDRMA4L1E3R1	12.2	11.5x10x12	17
02A6-4	1	3.8	KDRMA5L1	25.2	3.63x4.45x1.78	2	KDRMA5L1E01	25.2	12.25x12.5x6.75	12	KDRMA5L1E3R1	25.2	11.5x10x12	17
03A6-4	1.5	5.5	KDRMA6L1	26.4	3.63x4.45x1.78	2	KDRMA6L1E01	26.4	12.25x12.5x6.75	12	KDRMA6L1E3R1	26.4	11.5x10x12	17
04A5-4	2	6.3	KDRMA7L1	23.5	3.63x4.45x1.78	2	KDRMA7L1E01	23.5	12.25x12.5x6.75	12	KDRMA7L1E3R1	23.5	11.5x10x12	17
06A2-4	3	8.8	KDRMA8L1	30.6	3.63x4.45x1.78	2	KDRMA8L1E01	30.6	12.25x12.5x6.75	12	KDRMA8L1E3R1	30.6	11.5x10x12	17
09A7-4	5	12.5	KDRAA3L2	48.8	4.44x4.25x2.64	3	KDRAA3L2E01	48.8	12.25x12.5x6.75	14	KDRAA3L2E3R1	48.8	11.5x10x12	18
13A8-4	7.5	17.2	KDRAA4L2	62.9	4.55x4.25 x2.64	4	KDRAA4L2E01	62.9	12.25x12.5x6.75	14	KDRAA4L2E3R1	62.9	11.5x10x12	18
17A2-4	10	20.3	KDRAA5L2	77	4.44x4.25 x2.64	4	KDRAA5L2E01	77	12.25x12.5x6.75	14	KDRAA5L2E3R1	77	11.5x10x12	18
25A4-4	15	28.3	KDRB2L	65	5.00 x 6.00 x 4.00	8	KDRB2LE01	65	12.25x12.5x6.75	18.5	KDRB2LE3R	65	11.5x10x12	23
34A1-4	20	47.7	KDRB1L	79	5.00x6.00x4.00	8	KDRB1LE01	79	12.25x12.5x6.75	18.5	KDRB1LE3R	79	11.5x10x12	23
41A8-4	25	55.9	KDRD1L	96	5.75 x 7.20 x 4.25	10	KDRD1LE01	96	12.25x12.5x6.75	20.5	KDRD1LE3R	96	11.5x10x12	25
48A4-4	30	61.4	KDRD2L	105	5.75 x 7.20 x 4.25	10	KDRD2LE01	105	12.25x12.5x6.75	20.5	KDRD2LE3R	105	11.5x10x12	25

All KDR resistors in sizes that match with ACS310 drives include lugs, no separate lug kits are required

# dv/dt output filters

## Applications

V1k Output Filters provide motor protection by limiting voltage spikes to 1,000 volts, or below, for long motor cable applications. Greatly extends the life of the motor and cable for all applications up to 1000 feet. For multi-motor applications note that motor lead length is cumulative and the 1000 foot limit still applies. 30% reduction in common mode current.

## Features

UL Listed Open, UL Listed Type 1 and UL Listed Type 3R construction with connection terminals.

**Note:** The drives internal EMC filter must remain disconnected when using these filters. When applying these output filters the drive output frequency is limited to 60Hz.

## Output Filters for Single Phase 200-240V applications

Drive Part No. ACS310-01U-	HP ND	Output Current	V1k UL Open				V1k UL Type 1 Enclosure				V1k UL Type 3R Enclosure			
			Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight
02A4-2	0.5	2.4	V1K3A00	75	9 x 5.5 x 7.25	8	V1K3A01	75	9 x 5.5 x 10	11	V1K3A03	75	11.45 x 10 x 12	25
04A7-2	1	4.7	V1K6A00	80	9 x 5.5 x 7.25	8	V1K6A01	80	9 x 5.5 x 10	11	V1K6A03	80	11.45 x 10 x 12	25
06A7-2	1.5	6.7	V1K8A00	90	9 x 5.5 x 7.25	8	V1K8A01	90	9 x 5.5 x 10	11	V1K8A03	90	11.45 x 10 x 12	25
07A5-2	2	7.5	V1K8A00	90	9 x 5.5 x 7.25	8	V1K8A01	90	9 x 5.5 x 10	11	V1K8A03	90	11.45 x 10 x 12	25
09A8-2	3	9.8	V1K12A00	95	9 x 5.5 x 7.25	8	V1K12A01	95	9 x 5.5 x 10	11	V1K12A03	95	11.45 x 10 x 12	25

## Output Filters for Three Phase 200-240V applications

Drive Part No. ACS380-040x-	HP ND	Output Current	V1k UL Open				V1k UL Type 1				V1k UL Type 3R			
			Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight
02A6-2	0.5	2.6	V1K3A00	75	9 x 5.5 x 7.25	8	V1K3A01	75	9 x 5.5 x 10	11	V1K3A03	75	11.45 x 10 x 12	25
03A9-2	0.75	3.9	V1K4A00	75	9 x 5.5 x 7.25	8	V1K4A01	75	9 x 5.5 x 10	11	V1K4A03	75	11.45 x 10 x 12	25
05A2-2	1	5.2	V1K6A00	80	9 x 5.5 x 7.25	8	V1K6A01	80	9 x 5.5 x 10	11	V1K6A03	80	11.45 x 10 x 12	25
07A4-2	1.5	7.4	V1K8A00	90	9 x 5.5 x 7.25	8	V1K8A01	90	9 x 5.5 x 10	11	V1K8A03	90	11.45 x 10 x 12	25
08A3-2	2	8.3	V1K12A00	95	9 x 5.5 x 7.25	8	V1K12A01	95	9 x 5.5 x 10	11	V1K12A03	95	11.45 x 10 x 12	25
10A8-2	3	10.8	V1K12A00	95	9 x 5.5 x 7.25	8	V1K12A01	95	9 x 5.5 x 10	11	V1K12A03	95	11.45 x 10 x 12	25
19A4-2	5	19.4	V1K21A00	110	9 x 5.5 x 8.25	12	V1K21A01	110	9 x 5.5 x 10	15	V1K21A03	110	11.45 x 10 x 12	29
26A8-2	7.5	26.8	V1K27A00	110	9 x 5.5 x 8.25	14	V1K27A01	110	9 x 5.5 x 10	15	V1K27A03	110	19.18 x 15.62 x 19.5	29
34A1-2	10	34.1	V1K35A00	130	12 x 8 x 9	17	V1K35A01	130	12 x 8 x 11.5	23	V1K35A03	130	19.18 x 15.62 x 19.5	56
50A8-2	15	50.8	V1K55A00	145	12 x 8 x 9	23	V1K55A01	145	12 x 8 x 11.5	23	V1K55A03	145	19.18 x 15.62 x 19.5	56

## Output Filters for Three Phase 380-480V applications

Drive Part No. ACS380-040x-	HP ND	Output Current	V1k UL Open				V1k UL Type 1				V1k UL Type 3R			
			Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight	Part Number	Watts Loss	Dimensions (HxWxD)	Weight
01A3-4	0.5	1.3	V1K2A00	75	9 x 5.5 x 7.25	8	V1K2A01	75	9 x 5.5 x 10	11	V1K2A03	11	11.45 x 10 x 12	25
02A1-4	0.75	2.1	V1K3A00	75	9 x 5.5 x 7.25	8	V1K3A01	75	9 x 5.5 x 10	11	V1K3A03	75	11.45 x 10 x 12	25
02A6-4	1	2.6	V1K3A00	75	9 x 5.5 x 7.25	8	V1K3A01	75	9 x 5.5 x 10	11	V1K3A03	11	11.45 x 10 x 12	25
03A6-4	1.5	3.6	V1K4A00	75	9 x 5.5 x 7.25	8	V1K4A01	75	9 x 5.5 x 10	11	V1K4A03	75	11.45 x 10 x 12	25
04A5-4	2	4.5	V1K6A00	80	9 x 5.5 x 7.25	8	V1K6A01	80	9 x 5.5 x 10	11	V1K6A03	80	11.45 x 10 x 12	25
06A2-4	3	6.2	V1K8A00	90	9 x 5.5 x 7.25	8	V1K8A01	90	9 x 5.5 x 10	11	V1K8A03	90	11.45 x 10 x 12	25
09A7-4	5	9.7	V1K12A00	95	9 x 5.5 x 7.25	8	V1K12A01	95	9 x 5.5 x 10	11	V1K12A03	95	11.45 x 10 x 12	25
13A8-4	7.5	13.8	V1K16A00	95	9 x 5.5 x 8.25	12	V1K16A01	95	9 x 5.5 x 10	15	V1K16A03	15	11.45 x 10 x 12	29
17A2-4	10	17.2	V1K18A00	110	9 x 5.5 x 8.25	12	V1K18A01	110	9 x 5.5 x 10	15	V1K18A03	110	11.45 x 10 x 12	25
25A4-4	15	25.4	V1K27A00	110	9 x 5.5 x 8.25	14	V1K27A01	110	9 x 5.5 x 10	15	V1K27A03	110	19.18 x 15.62 x 19.5	29
34A1-4	20	34.1	V1K35A00	130	12 x 8 x 9	17	V1K35A01	130	12 x 8 x 11.5	23	V1K35A03	130	19.18 x 15.62 x 19.5	56
41A8-4	25	41.8	V1K45A00	135	12 x 8 x 9	17	V1K45A01	135	12 x 8 x 11.5	23	V1K45A03	135	19.18 x 15.62 x 19.5	56
48A4-4	30	48.4	V1K55A00	145	12 x 8 x 9	23	V1K55A01	145	12 x 8 x 11.5	23	V1K55A03	145	19.18 x 15.62 x 19.5	56

# ABB product offering

## ABB micro drives

ABB micro drives are designed to be incorporated into a wide variety of machines such as mixers, conveyors, fans or pumps or anywhere where a fixed speed motor needs connect with a variable speed motor. The ABB micro drives meet the requirements of OEMs, machinery builders and panel builders. These drives are widely available through the ABB distribution network. The drives are easy to select and provide a range of built-in features as standard. For more information, please visit [abb.com/drives](http://abb.com/drives).



## ABB general purpose drives

ABB general purpose drives are ideal in situations where there is a need for a drive that is easy to install, commission and use. They are designed to offer control over a broad range of standard drive applications and have a wide range of built-in features simplifying all operations. For more information, please visit [abb.com/drives](http://abb.com/drives).



## ABB's Programmable Logic Controllers PLCs

The AC500, AC500-eCo, AC500-S and AC500-XC scalable PLC ranges provide solutions for small, middle and high-end applications. Our AC500 PLC platform offers different performance levels and is the ideal choice for high availability, extreme environments or safety solutions. Our AC500 PLC platform offers interoperability and compatibility in hardware and software from compact PLCs up to high end and safety PLCs. For more information, please visit [abb.com/plc](http://abb.com/plc).





### Control panels

The CP600-eCo and CP600 HMI control panels offer a wide range of features and functionalities for maximum operability. ABB control panels are distinguished by their robustness and easy usability, providing all the relevant information from production plants and machines at a single touch. For more information, please visit [abb.com/plc](http://abb.com/plc).



### Automation Builder engineering suite

Automation Builder integrates engineering and maintenance for PLC, Drives, Motion, HMI and Robotics. Automation Builder is an integrated software suite for machine builders and system integrators wanting to automate their machines and systems in a productive way. Automation Builder combines the proven ABB tools RobotStudio, Drive Manager, Drive Composer Pro, Mint WorkBench, Panel Builder and succeeds Control Builder Plus. Build solutions with drive application programming (IEC 61131-3), drive management, configuration and diagnosis with common process data editor, and drive engineering in Drive Composer Pro. Download Automation Builder from [abb.com/automationbuilder](http://abb.com/automationbuilder).



### AC motors

ABB's low voltage AC motors are designed to save energy, reduce operating costs and enable demanding motor applications to perform reliably and without unscheduled downtime. General performance motors combine convenience and easy handling seamlessly with ABB's engineering expertise. Process performance motors provide the most comprehensive, versatile set of motors for the process industries and heavy-duty applications. For more information, please visit [abb.com/motors&generators](http://abb.com/motors&generators).

# Compact AC500-eCo PLC with ACS310

ABB's programmable logic controller AC500-eCo can be used for controlling and monitoring the system, for applications that require complex control logic and when several drives are connected together through Modbus link.

## Compact design saves installation space

- The compact size of the PLC and drive provides flexibility when integrating into existing or new system designs.
- AC500-eCo is an economical, entry level PLC for stand-alone solutions and equipment control. It saves space due to on-board digital and analog I/O. AC500-eCo is easy to program and provides six programming languages.

## Flexible system expansion

When the system requirements expand, ABB's wide product range provides a flexible and cost-efficient way to meet the system's growing needs.

AC500-eCo belongs to the AC500 PLC platform. AC500 is a scalable and modular platform which can be combined and flexibly expanded to suit either decentralized or centralized configurations.

Automation Builder, the programming tool for AC500, is based on IEC 61131-3 standard. Automation Builder is used for the entire AC500 PLC platform. Automation Builder easily allows to change the CPU in an existing configuration to fit the CPU type to the performance need of the application.

Ready-made communication and control blocks for AC500-eCo and AC500 PLC range are available, supporting a wide range of ABB's low voltage AC drives.

## Benefits

- Control of a motor in minutes
- Cost-efficient system expansion, since the same application program can be used for the entire AC500 PLC platform
- Fast commissioning with ready-made Modbus macro





# A lifetime of peak performance

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

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

## ABB drives life cycle phases explained:

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

### Keeping you informed

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

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.

# Services to match your needs

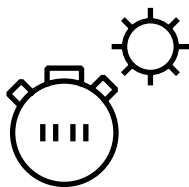
Your service needs depend on your operation, life cycle of your equipment and business priorities. We have identified our customers' four most common needs and defined service options to satisfy them. What is your choice to keep your drives at peak performance?

## Is uptime your priority?

Keep your drives running with precisely planned and executed maintenance.

### Example services include:

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



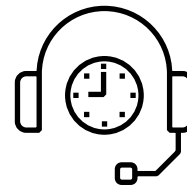
### Operational efficiency

## Is rapid response a key consideration?

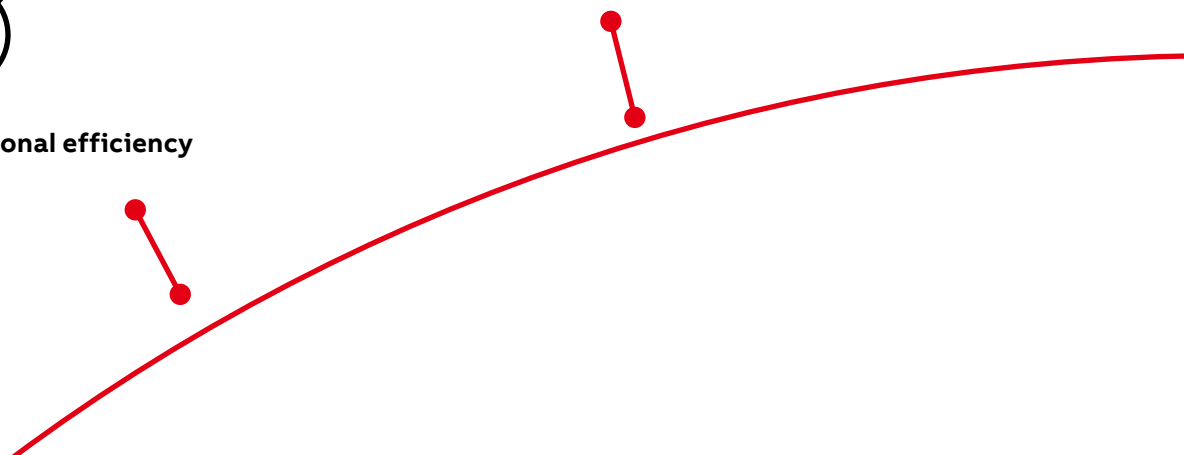
If your drives require immediate action, our global network is at your service.

### Example services include:

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



### Rapid response



# Drives service

## Your choice, your future

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

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

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

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

### Your choice, your business efficiency

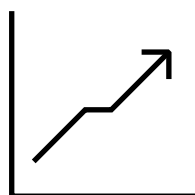
ABB Drive Care agreement lets you focus on your core business. A selection of predefined service options matching your needs provides optimal, more reliable performance, extended drive lifetime and improved cost control. So you can reduce the risk of unplanned downtime and find it easier to budget for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

### Need to extend your assets' lifetime?

Maximize your drive's lifetime with our services.

#### Example services include:

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



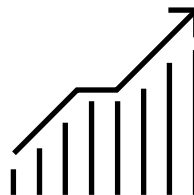
Life cycle management

### Is performance most critical to your operation?

Get optimal performance out of your machinery and systems.

#### Example services include:

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



Performance improvement

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

**[abb.com/drives](http://abb.com/drives)**

**[abb.com/drivespartners](http://abb.com/drivespartners)**

**[abb.com/plc](http://abb.com/plc)**

**[abb.com/automationbuilder](http://abb.com/automationbuilder)**

ACS310 how-to video:

