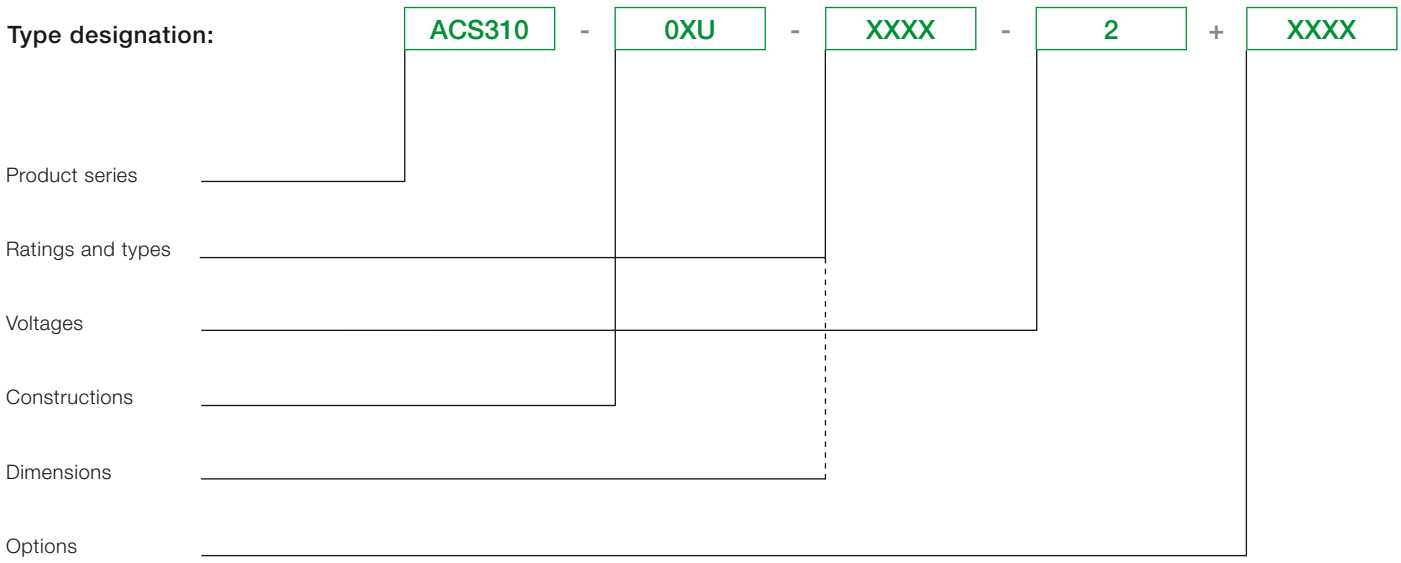
Low voltage AC drives

ABB general purpose drives
ACS310
0.5 to 30 hp/0.37 to 22 kW
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 general purpose drives, ACS310

Introduction to ACS310
AC drives for pump and fan applications

ACS310	-	0XU	-	XXXX	-	2	+	XXXX

ABB general purpose 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 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 speedy and space saving installation. The ACS310 drives have 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.

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.

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.

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 and reducing maintenance.

Main features

ACS310 - 0XU - 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 systems while reducing maintenance time and costs. Maintenance can be carried out safely without stopping the 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 systems. Smoother processes.
Pump protection functions	Integrated protection and control with preprogrammed 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 systems, reduced maintenance costs.	Reduces maintenance costs. Longer life and reliable operation of pump systems.
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 the user quickly sees 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	The drive can be operated in ambient temperatures up to 50 °C without derating the output current.	Optimized drive dimensioning for wide temperature ranges.
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	The high power-to-size ratio of the drive 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 needs.
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 setup of parameters for PID controllers, real-time clock, serial communication, drive optimizer and drive startup.	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	-	0XU	-	XXXX	-	2	+	XXXX

Type designation

This is the unique reference number (shown above and in column 5. left) 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 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

"00U" within the type designation (shown above) varies depending on the drive phase and EMC filtering. Choose below the one you need.

01 = 1-phase
03 = 3-phase

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
5.0	4.0	16.5	15.0	ACS310-03U-50A8-2*	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
4.0	3.0	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

* Re-rated 3-phase drive

[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 - 0XU - XXXX - 2 + XXXX

Mains connection

Voltage and power range	1-phase, 200 to 240 V ± 10% 0.5 to 5 hp (0.37 to 4.0 kW) 3-phase, 200 to 240 V ± 10% 0.5 to 15 hp (0.37 to 11 kW) 3-phase, 380 to 480 V ± 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 1.8 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	14 to 122 °F (-10 to 50 °C), 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

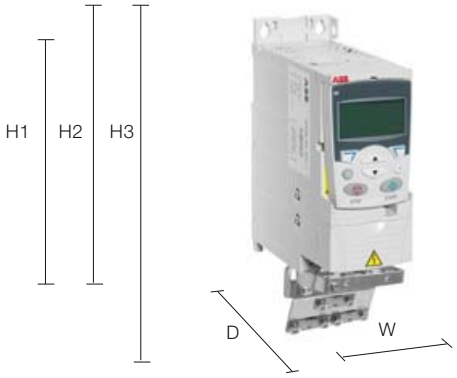
Dimensions and weights

ACS310	-	0XU	-	XXXX	-	2	+	XXXX

Cabinet-mounted drives (IP20 UL open)

Frame size	IP20 UL open					
	H1	H2	H3	W	D	Weight
	in	in	in	in	in	lb
R0	6.65	7.95	9.41	2.76	6.34	2.4
R1	6.65	7.95	9.41	2.76	6.34	2.9
R2	6.65	7.95	9.41	4.13	6.5	3.3
R3	6.65	7.95	9.29	6.65	6.65	6.4
R4	7.13	7.95	9.61	10.24	6.65	9.7

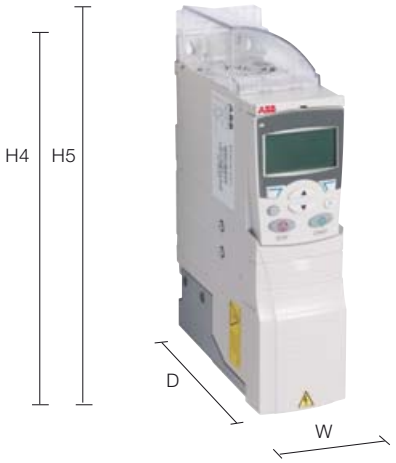
H1 = Height without fastenings and clamping plate
H2 = Height with fastenings but without clamping plate
H3 = Height with fastenings and clamping plate
W = Width
D = Depth



Wall-mounted drives (NEMA 1)

Frame size	NEMA 1				
	H4	H5	W	D	Weight
	in	in	in	in	lb
R0	10.12	11.02	2.76	6.65	3.3
R1	10.12	11.02	2.76	6.65	3.7
R2	10.12	11.1	4.13	6.65	4.2
R3	10.24	11.77	6.65	6.97	7.7
R4	10.63	12.6	10.24	6.97	11

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



Cooling

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.

Cooling air flow

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

[1)] BTU/hr = British Thermal Unit per hour. BTU/hr is approximately 0.293 Watts.
[2)] Frame size R0 with free convection cooling.

Free space requirements

Enclosure type	Space above	Space below	Space on left/right
	in	in	in
All frame sizes	2.95	2.95	0

Fuses and circuit protection

Fuses or manual motor protectors for circuit protection

Standard fuses or manual motor protectors can be used with ACS310 drives for branch circuit protection. Use the following table for selecting the correct input 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 alternate 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	UL fuses		Manual motor protector		
		Fuse type Gg * [A]	UL class T or CC (600 V) [A] [min]	[max]	MMP Type E [1) 2)]	Trip current setting [A]	Minimum enclosure vol. [5)] [cu in]
1-phase AC supply, 200 to 240 V							
ACS310-01U-02A4-2	R0	10	6	10	MS132-6.3 & S1-M3-25 [3)]	6.1	1152
ACS310-01U-04A7-2	R1	16	10	20	MS451-16E	11.4	1152
ACS310-01U-06A7-2	R1	16/20 [6)]	15	25	MS451-20E	16.1	1152
ACS310-01U-07A5-2	R2	20/25 [6)]	15	30	MS451-20E	16.8	---
ACS310-01U-09A8-2	R2	25/35 [6)]	15	35	MS451-25E	21.0	---
ACS310-03U-50A8-2 **	R4	100	100	100	MS495-90E	76.0	---
3-phase AC supply, 200 to 240 V							
ACS310-03U-02A6-2	R0	10	3	10	MS132-6.3 & S1-M3-25 [3)]	4.7	1152
ACS310-03U-03A9-2	R0	10	6	10	MS132-10 & S1-M3-25 [3)]	6.7	1152
ACS310-03U-05A2-2	R1	10	6	15	MS132-10 & S1-M3-25 [3)]	8.4	1152
ACS310-03U-07A4-2	R1	16	10	15	MS451-16E	13.0	1152
ACS310-03U-08A3-2	R1	16	10	15	MS451-16E	13.2	1152
ACS310-03U-10A8-2	R2	16	15	20	MS451-20E	15.7	---
ACS310-03U-19A4-2	R2	25	20	35	MS451-32E	27.3	---
ACS310-03U-26A8-2	R3	63	30	60	MS451-50E	45.0	---
ACS310-03U-34A1-2	R4	80	35	80	MS495-63E	55.0	---
ACS310-03U-50A8-2	R4	100	50	100	MS495-90E	76.0	---
3-phase AC supply, 380 to 415 V [4)]							
ACS310-03U-01A3-4	R0	10	2	10	MS132-2.5 & S1-M3-25 [3)]	2.4	1152
ACS310-03U-02A1-4	R0	10	2	10	MS132-6.3 & S1-M3-25 [3)]	4.0	1152
ACS310-03U-02A6-4	R1	10	3	10	MS132-6.3 & S1-M3-25 [3)]	4.5	1152
ACS310-03U-03A6-4	R1	10	3	10	MS132-10 & S1-M3-25 [3)]	6.6	1152
ACS310-03U-04A5-4	R1	16	6	15	MS132-10 & S1-M3-25 [3)]	7.6	1152
ACS310-03U-06A2-4	R1	16	6	15	MS451-16E	10.6	1152
ACS310-03U-09A7-4	R1	20	10	25	MS451-20E	15.0	1152
ACS310-03U-13A8-4	R3	25	10	30	MS451-25E	20.7	---
ACS310-03U-17A2-4	R3	35	15	35	MS451-32E	24.3	---
ACS310-03U-25A4-4	R3	50	20	50	MS451-40E	34.0	---
ACS310-03U-34A1-4	R4	80	25	80	MS495-63E	57.0	---
ACS310-03U-41A8-4	R4	100	30	100	MS495-75E	67.0	---
ACS310-03U-48A4-4	R4	100	35	100	MS495-90E	74.0	---
3-phase AC supply, 440 to 480 V [4)]							
ACS310-03U-01A3-4	R0	10	2	10	MS132-2.5 & S1-M3-25 [3)]	2.0	1152
ACS310-03U-02A1-4	R0	10	2	10	MS132-4.0 & S1-M3-25 [3)]	3.3	1152
ACS310-03U-02A6-4	R1	10	3	10	MS132-6.3 & S1-M3-25 [3)]	3.8	1152
ACS310-03U-03A6-4	R1	10	3	10	MS132-6.3 & S1-M3-25 [3)]	5.5	1152
ACS310-03U-04A5-4	R1	16	6	15	MS132-10 & S1-M3-25 [3)]	6.3	1152
ACS310-03U-06A2-4	R1	16	6	15	MS132-10 & S1-M3-25 [3)]	8.8	1152
ACS310-03U-09A7-4	R1	20	10	25	MS451-16E	12.0	1152
ACS310-03U-13A8-4	R3	25	10	30	MS451-20E	17.0	---
ACS310-03U-17A2-4	R3	35	15	35	MS451-25E	20.0	---
ACS310-03U-25A4-4	R3	50	20	50	MS451-32E	28.0	---
ACS310-03U-34A1-4	R4	80	25	80	MS451-50E	48.0	---
ACS310-03X-41A8-4	R4	100	30	100	MS495-63E	56.0	---
ACS310-03X-48A4-4	R4	100	35	100	MS495-63E	61.0	---

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.

** Rerate of 3-Ph, 240 V drive

[1)] All manual motor protectors listed are Type E self-protected up to 65 kA. See ABB publication AC1010 for complete technical data on ABB Type E manual motor protectors.

[2)] 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 the MS451-16E)"

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

[4)] MMP ratings for 480Y/277 V only.

[5)] 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.

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

Control connections

ACS310	-	0XU	-	XXXX	-	2	+	XXXX

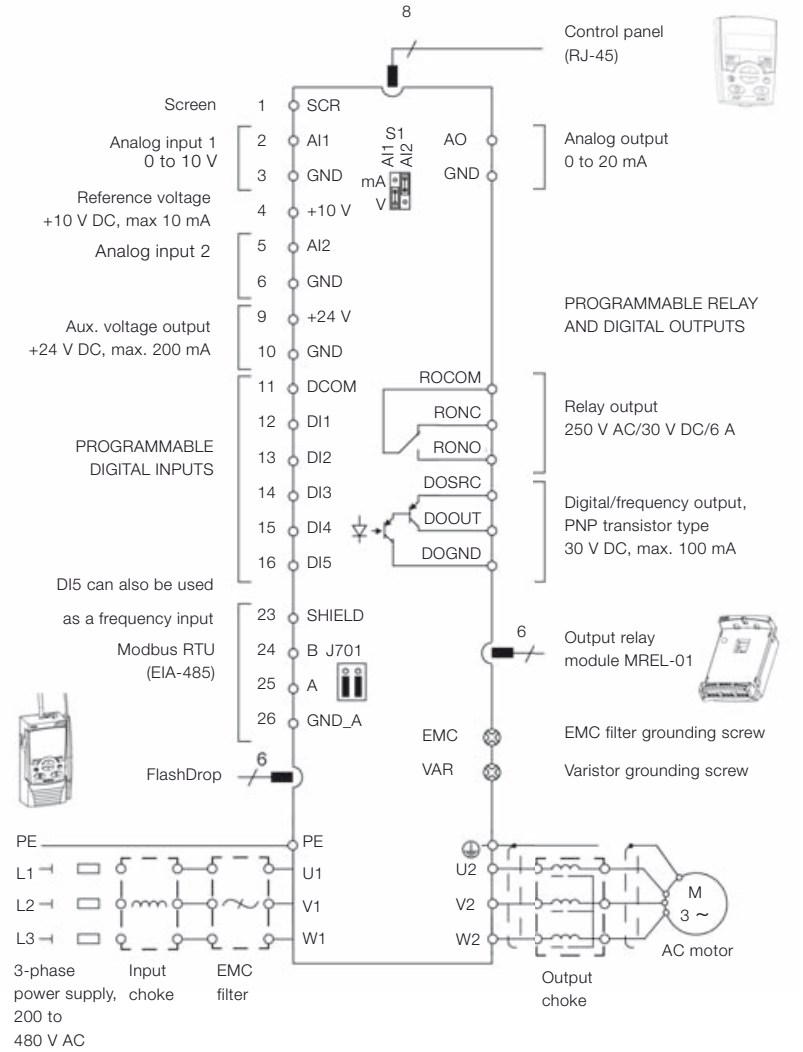
Application macros

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.

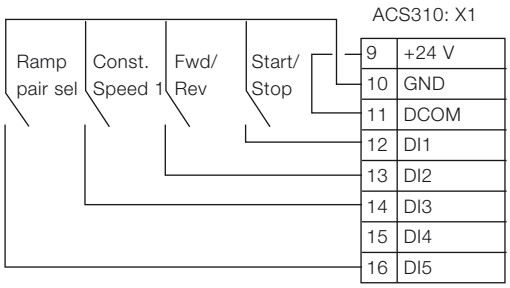
- ABB standard macro
- 3-wire macro
- Alternative macro
- Motor potentiometer
- Hand/auto macro
- PID control macro
- PFC control macro
- SPFC control macro

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.

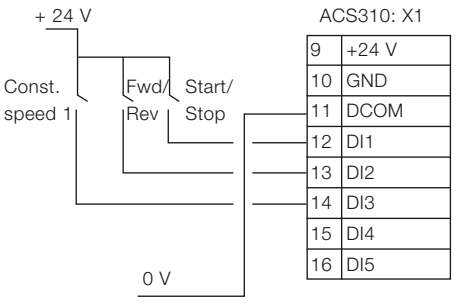
The diagram below gives an overview of ACS310 control connections. Please refer to the ACS310 user's manual for more detailed information.



Typical I/O connections



DI configuration NPN connected (sink)



DI configuration PNP connected (source) with external power supply

Options

ACS310	-	0XU	-	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 XXXX 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	
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
User interfaces

ACS310	-	0XU	-	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 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, 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
User interfaces

ACS310	-	0XU	-	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

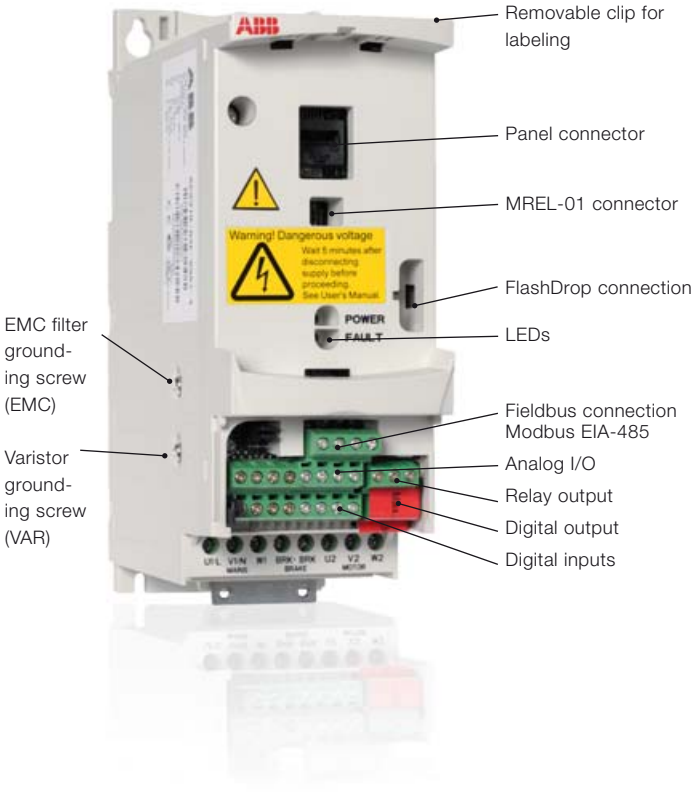
MREL-01

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. The remote monitoring tool enables to connect multiple drives to Ethernet, to collect operational data from the process and send 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 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

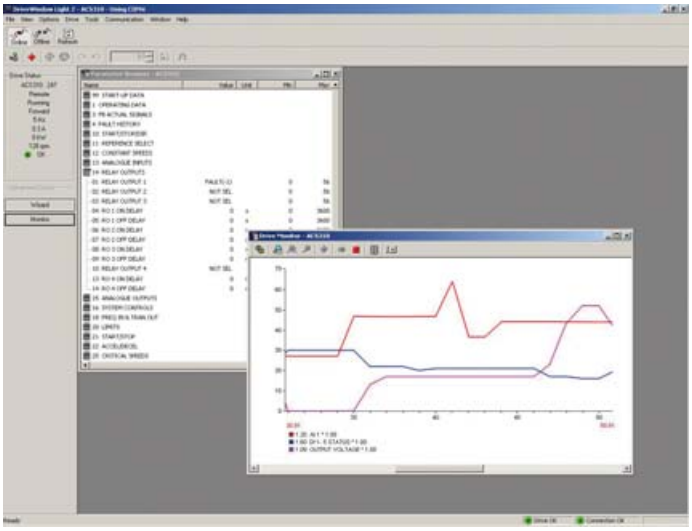
Startup wizards make the setting of parameters easy. Simply launch the wizard, select an appropriate assistant eg, for setting analog outputs, and all parameters related to this function are shown together with help pictures.

Highlights

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

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.

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

FlashDrop tool

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	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]
1-phase AC supply, 200 to 240 V							
ACS310-01U-02A4-2	R0	RFI-11	10	30	-	30	30
ACS310-01U-04A7-2	R1	RFI-12	10	30	50	30	50
ACS310-01U-06A7-2	R1	RFI-12	10	30	50	30	50
ACS310-01U-07A5-2	R2	RFI-13	10	30	50	30	50
ACS310-01U-09A8-2	R2	RFI-13	10	30	50	30	50
ACS310-03U-50A8-2	R4	RFI-34	10	30	50	30	50
3-phase AC supply, 200 to 240 V							
ACS310-03U-02A6-2	R0	RFI-32	10	30	-	30	30
ACS310-03U-03A9-2	R0	RFI-32	10	30	-	30	30
ACS310-03U-05A2-2	R1	RFI-32	10	30	50	30	50
ACS310-03U-07A4-2	R1	RFI-32	10	30	50	30	50
ACS310-03U-08A3-2	R1	RFI-32	10	30	50	30	50
ACS310-03U-10A8-2	R2	RFI-32	10	30	50	30	50
ACS310-03U-19A4-2	R2	RFI-33	10	30	50	30	50
ACS310-03U-26A8-2	R3	RFI-34	10	30	50	30	50
ACS310-03U-34A1-2	R4	RFI-34	10	30	50	30	50
ACS310-03U-50A8-2	R4	RFI-34	10	30	50	30	50
3-phase AC supply, 380 to 480 V							
ACS310-03U-01A3-4	R0	RFI-32	30	30	-	30	30
ACS310-03U-02A1-4	R0	RFI-32	30	30	-	30	30
ACS310-03U-02A6-4	R1	RFI-32	50	50	50	30	50
ACS310-03U-03A6-4	R1	RFI-32	50	50	50	30	50
ACS310-03U-04A5-4	R1	RFI-32	50	50	50	30	50
ACS310-03U-06A2-4	R1	RFI-32	50	50	50	30	50
ACS310-03U-09A7-4	R1	RFI-32	50	50	50	30	50
ACS310-03U-13A8-4	R3	RFI-33	40	40	40	30	50
ACS310-03U-17A2-4	R3	RFI-33	40	40	40	30	50
ACS310-03U-25A4-4	R3	RFI-33	40	40	40	30	50
ACS310-03U-34A1-4	R4	RFI-34	-	30	-	30	50
ACS310-03U-41A8-4	R4	RFI-34	-	30	-	30	50
ACS310-03U-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.

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.

If any of the following conditions exist use of at least a 3% line reactor is recommended.

1. Installation has voltage spikes in excess of 6000 V peak or lightening strikes.
2. Installation has switched power factor correction capacitors.
3. Installation has power interruptions or voltage sags in excess of 200 V AC.
4. When the distribution system kVA is more than 10 times larger than the drive kVA .

Features:

Open, UL Type 1 and UL Type 3R construction with connection terminals. 3% and 5% impedance rating at rated current.

Drive input current with and without input reactor

Type	Input without reactor		Input with 5% reactor	
	I_{1N}	I_{1N} (480V)	I_{1N}	I_{1N} (480V)
	A	A	A	A
Single phase drive - 200-240 V applications				
ACS310-01U-02A4-2	6.1	---	4.6	---
ACS310-01U-04A7-2	11.4	---	9.4	---
ACS310-01U-06A7-2	16.1	---	13.6	---
ACS310-01U-07A5-2	16.8	---	14.6	---
ACS310-01U-09A8-2	21.0	---	18.7	---
ACS310-03U-50A8-2*	76.0	---	63.3	
Three phase drive - 200-240 V applications				
ACS310-03U-02A6-2	4.7	---	2.6	---
ACS310-03U-03A9-2	6.7	---	3.6	---
ACS310-03U-05A2-2	8.4	---	4.8	---
ACS310-03U-07A4-2	13.0	---	7.2	---
ACS310-03U-08A3-2	13.2	---	8.2	---
ACS310-03U-10A8-2	15.7	---	11.0	---
ACS310-03U-14A6-2	23.9	---	14.0	---
ACS310-03U-19A4-2	27.3	---	18.0	---
ACS310-03U-26A8-2	45.0	---	27.0	---
ACS310-03U-34A1-2	55.0	---	34.0	---
ACS310-03U-50A8-2	76.0	---	47.0	---
Three phase drive - 380-480 V applications				
ACS310-03U-01A3-4	2.4	2.0	1.3	1.1
ACS310-03U-02A1-4	4.0	3.3	2.0	1.7
ACS310-03U-02A6-4	4.5	3.8	2.5	2.1
ACS310-03U-03A6-4	6.6	5.5	3.5	2.9
ACS310-03U-04A5-4	7.6	6.3	3.8	3.2
ACS310-03U-06A2-4	10.6	8.8	5.3	4.4
ACS310-03U-08A0-4	12.8	10.6	6.8	5.7
ACS310-03U-09A7-4	15.0	12.5	8.6	7.2
ACS310-03U-13A8-4	20.7	17.2	12.3	10.3
ACS310-03U-17A2-4	24.3	20.3	13.0	10.8
ACS310-03U-25A4-4	34.0	28.3	20.0	16.7
ACS310-03U-34A1-4	57.2	47.7	27.0	22.5
ACS310-03U-41A8-4	67.1	55.9	34.9	29.1
ACS310-03U-48A4-4	73.7	61.4	41.6	34.7

* Derated 3-phase drive

Input reactors, high impedance

Input reactors for single phase 200-240 V applications (connect to terminals A and C)

Drive part # ACS310-01U-	HP ND	Input/ output current	KDR UR 5%, open, not UL	KDR 5%, NEMA 1, not UL	KDR 5%, UL listed, open			
			Part number	Part number	Part number	Watts	Dimensions (HxWxD)	Weight
02A4-2	0.5	2.4	KDRA25H	KDRA26HC1	KDRULA25H	23.6	4x4.18x3.75	4
04A7-2	1	4.7	KDRA26H	KDRB25HC1	KDRULA26H	30.5	4x4.18x3.75	4
06A7-2	1.5	6.7	KDRB25H	KDRB26HC1	KDRULB25H	53.1	5x6x4	8
07A5-2	2	7.5	KDRB25H	KDRB26HC1	KDRULB25H	53.1	5x6x4	8
09A8-2	3	9.8	KDRB25H	KDRB26HC1	KDRULB25H	53.1	5x6x4	8
03U-50A8-2	5	16.5	KDRD22H	KDRD22HC2	KDRULD22H	107.8	5.75x7.2x4.25	12

Drive part # ACS310-01U-	HP ND	Input/ output current	KDR 5%, UL type 1 enclosure				KDR 5%, UL type 3R enclosure			
			Part number	Watts	Dimensions (HxWxD)	Weight	Part number	Watts	Dimensions (HxWxD)	Weight
02A4-2	0.5	2.4	KDRULA25HE01	23.6	12.25x12.5x6.75	14.5	KDRULA25HE3R	23.6	11.5x10x12	19
04A7-2	1	4.7	KDRULA26HE01	30.5	12.25x12.5x6.75	14.5	KDRULA26HE3R	30.5	11.5x10x12	19
06A7-2	1.5	6.7	KDRULB25HE01	53.1	12.25x12.5x6.75	18.5	KDRULB25HE3R	53.1	11.5x10x12	23
07A5-2	2	7.5	KDRULB25HE01	53.1	12.25x12.5x6.75	18.5	KDRULB25HE3R	53.1	11.5x10x12	23
09A8-2	3	9.8	KDRULB25HE01	53.1	12.25x12.5x6.75	18.5	KDRULB25HE3R	53.1	11.5x10x12	23
03U-50A8-2	5	16.5	KDRULD22HE01	107.8	12.25x12.5x6.75	22.5	KDRULD22HE3R	107.8	11.5x10x12	27

Input reactors for three phase 200-240 V applications

Drive part # ACS310-03U-	HP ND	Input/ output current	KDR UR 5%, open, not UL	KDR 5%, NEMA 1, not UL	KDR 5%, UL listed, open			
			Part number	Part number	Part number	Watts	Dimensions (HxWxD)	Weight
02A6-2	0.5	2.6	KDRA54H	KDRA54HC1	KDRULA54H	14	4x4.18x3.75	4
03A9-2	0.75	3.9	KDRA53H	KDRA53HC1	KDRULA53H	16.8	4x4.18x3.75	4
05A2-2	1	5.2	KDRA25H	KDRA25HC1	KDRULA25H	23.6	4x4.18x3.75	4
07A4-2	1.5	7.4	KDRA27H	KDRA8LC1	KDRULA27H	30.6	4x4.18x3.75	4
08A3-2	2	8.3	KDRA26H	KDRA1LC1	KDRULA26H	30.5	4x4.18x3.75	4
10A8-2	3	10.8	KDRA28H	KDRA2LC1	KDRULA28H	43.1	4x4.18x3.75	4
19A4-2	5	19.4	KDRB25H	KDRA3LC1	KDRULB25H	53.1	5x6x4	8
26A8-2	7.5	26.8	KDRB26H	KDRA4LC1	KDRULB26H	66.5	5x6x4	8
34A1-2	10	34.1	KDRD21H	KDRA5LC1	KDRULD21H	91.8	5.75x7.2x4.25	12
50A8-2	15	50.8	KDRD22H	KDRD22HC2	KDRULD22H	107.8	5.75x7.2x4.25	12

Drive part # ACS310-03U-	HP ND	Input/ output current	KDR 5%, UL type 1 enclosure				KDR 5%, UL type 3R enclosure			
			Part number	Watts	Dimensions (HxWxD)	Weight	Part number	Watts	Dimensions (HxWxD)	Weight
02A6-2	0.5	2.6	KDRULA54HE01	14	12.25x12.5x6.75	14.5	KDRULA54HE3R	14	11.5x10x12	19
03A9-2	0.75	3.9	KDRULA53HE01	16.8	12.25x12.5x6.75	14.5	KDRULA53HE3R	16.8	11.5x10x12	19
05A2-2	1	5.2	KDRULA25HE01	23.6	12.25x12.5x6.75	14.5	KDRULA25HE3R	23.6	11.5x10x12	19
07A4-2	1.5	7.4	KDRULA27HE01	30.6	12.25x12.5x6.75	14.5	KDRULA27HE3R	30.6	11.5x10x12	19
08A3-2	2	8.3	KDRULA26HE01	30.5	12.25x12.5x6.75	14.5	KDRULA26HE3R	30.5	11.5x10x12	19
10A8-2	3	10.8	KDRULA28HE01	43.1	12.25x12.5x6.75	14.5	KDRULA28HE3R	43.1	11.5x10x12	19
19A4-2	5	19.4	KDRULB25HE01	53.1	12.25x12.5x6.75	18.5	KDRULB25HE3R	53.1	11.5x10x12	23
26A8-2	7.5	26.8	KDRULB26HE01	66.5	12.25x12.5x6.75	18.5	KDRULB26HE3R	66.5	11.5x10x12	23
34A1-2	10	34.1	KDRULD21HE01	91.8	12.25x12.5x6.75	22.5	KDRULD21HE3R	91.8	11.5x10x12	27
50A8-2	15	50.8	KDRULD22HE01	107.8	12.25x12.5x6.75	22.5	KDRULD22HE3R	107.8	11.5x10x12	27

Input reactors, high impedance

Input reactors for three phase 380-480 V applications

Drive part # ACS310-03U-	HP ND	Input/ output current	KDR UR 5%, open, not UL	KDR 5%, NEMA 1, not UL	KDR 5%, UL listed, open			
			Part number	Part number	Part number	Watts	Dimensions (HxWxD)	Weight
01A3-4	0.5	1.3	KDRA6H	KDRA6HC1	KDRULA6H	9	4x4.18x3.75	4
02A1-4	0.75	2.1	KDRA7H	KDRA7HC1	KDRULA7H	15	4x4.18x3.75	4
02A6-4	1	2.6	KDRA8H	KDRA8HC1	KDRULA8H	12	4x4.18x3.75	4
03A6-4	1.5	3.6	KDRA9H	KDRA9HC1	KDRULA9H	23	4x4.18x3.75	4
04A5-4	2	4.5	KDRA1H	KDRA1HC1	KDRULA1H	33	4x4.18x3.75	4
06A2-4	3	6.2	KDRA2H	KDRA2HC1	KDRULA2H	38	4x4.18x3.75	4
09A7-4	5	9.7	KDRA3H	KDRA3HC1	KDRULA3H	80	4x4.18x3.75	4
13A8-4	7.5	13.8	KDRA4H	KDRA4HC1	KDRULA4H	77	4x4.18x3.75	5
17A2-4	10	17.2	KDRA5H	KDRA5HC1	KDRULA5H	111	4x4.18x3.75	5
25A4-4	15	25.4	KDRB2H	KDRB2HC1	KDRULB2H	133	5x6x4	7
34A1-4	20	34.1	KDRC3H	KDRC3HC2	KDRULC3H	108	5.75x7.2x5	15
41A8-4	25	41.8	KDRC1H	KDRC1HC2	KDRULC1H	112	5.75x7.2x5	15
48A4-4	30	48.4	KDRE2H	KDRE2HC2	KDRULE2H	141	5.75x7.2x5	16

Drive part # ACS310-03U-	HP ND	Input/ output current	KDR 5%, UL type 1 enclosure				KDR 5%, UL type 3R enclosure			
			Part number	Watts	Dimensions (HxWxD)	Weight	Part number	Watts	Dimensions (HxWxD)	Weight
01A3-4	0.5	1.3	KDRULA6HE01	9	12.25x12.5x6.75	13.5	KDRULA6HE3R	9	11.5x10x12	19
02A1-4	0.75	2.1	KDRULA7HE01	15	12.25x12.5x6.75	14.5	KDRULA7HE3R	15	11.5x10x12	19
02A6-4	1	2.6	KDRULA8HE01	12	12.25x12.5x6.75	14.5	KDRULA8HE3R	12	11.5x10x12	19
03A6-4	1.5	3.6	KDRULA9HE01	23	12.25x12.5x6.75	14.5	KDRULA9HE3R	23	11.5x10x12	19
04A5-4	2	4.5	KDRULA1HE01	33	12.25x12.5x6.75	14.5	KDRULA1HE3R	33	11.5x10x12	19
06A2-4	3	6.2	KDRULA2HE01	38	12.25x12.5x6.75	14.5	KDRULA2HE3R	38	11.5x10x12	19
09A7-4	5	9.7	KDRULA3HE01	80	12.25x12.5x6.75	14.5	KDRULA3HE3R	80	11.5x10x12	19
13A8-4	7.5	13.8	KDRULA4HE01	77	12.25x12.5x6.75	15.5	KDRULA4HE3R	77	11.5x10x12	20
17A2-4	10	17.2	KDRULA5HE01	111	12.25x12.5x6.75	15.5	KDRULA5HE3R	111	11.5x10x12	20
25A4-4	15	25.4	KDRULB2HE01	133	12.25x12.5x6.75	17.5	KDRULB2HE3R	133	11.5x10x12	22
34A1-4	20	34.1	KDRULC3HE01	108	12.25x12.5x6.75	25.5	KDRULC3HE3R	108	11.5x10x12	30
41A8-4	25	41.8	KDRULC1HE01	112	12.25x12.5x6.75	25.5	KDRULC1HE3R	112	11.5x10x12	30
48A4-4	30	48.4	KDRULE2HE01	141	12.25x12.5x6.75	26.5	KDRULE2HE3R	141	11.5x10x12	31

Input reactors, low impedance

Input reactors for single phase 200-240 V applications (connect to terminals A and C)

Drive part # ACS310-01U-	HP ND	Input/ output current	KDR UR 3%, open, not UL	KDR 3%, NEMA 1, not UL	KDR 3%, UL listed, open			
			Part number	Part number	Part number	Watts	Dimensions (HxWxD)	Weight
02A4-2	0.5	2.4	KDRA25L	KDRA25LC1	KDRULA25L	11	4x4.18x3.75	4
04A7-2	1	4.7	KDRA27L	KDRA27LC1	KDRULA27L	21	4x4.18x3.75	4
06A7-2	1.5	6.7	KDRA28L	KDRB22LC1	KDRULA28L	29	4x4.18x3.75	4
07A5-2	2	7.5	KDRB22L	KDRB22LC1	KDRULB22L	38	5x6x4	8
09A8-2	3	9.8	KDRB22L	KDRB22LC1	KDRULB22L	38	5x6x4	8
03U-50A8-2	5	16.5	KDRD24L	KDRA28HC1	KDRULD24L	85	5.75x7.2x4.25	12

Drive part # ACS310-01U-	HP ND	Input/ output current	KDR 3%, UL type 1 enclosure				KDR 3%, UL type 3R enclosure			
			Part number	Watts	Dimensions (HxWxD)	Weight	Part number	Watts	Dimensions (HxWxD)	Weight
02A4-2	0.5	2.4	KDRULA25LE01	11	12.25x12.5x6.75	14.5	KDRULA25LE3R	11	11.5x10x12	19
04A7-2	1	4.7	KDRULA27LE01	21	12.25x12.5x6.75	14.5	KDRULA27LE3R	21	11.5x10x12	19
06A7-2	1.5	6.7	KDRULA28LE01	29	12.25x12.5x6.75	18.5	KDRULA28LE3R	29	11.5x10x12	19
07A5-2	2	7.5	KDRULB22LE01	38	12.25x12.5x6.75	18.5	KDRULB22LE3R	38	11.5x10x12	23
09A8-2	3	9.8	KDRULB22LE01	38	12.25x12.5x6.75	18.5	KDRULB22LE3R	38	11.5x10x12	23
03U-50A8-2	5	16.5	KDRULD24LE01	85	12.25x12.5x6.75	22.5	KDRULD24LE3R	85	11.5x10x12	27

Input reactors for three phase 200-240 V applications

Drive part # ACS310-03U-	HP ND	Input/ output current	KDR UR 3%, open, not UL	KDR 3%, NEMA 1, not UL	KDR 3%, UL listed, open			
			Part number	Part number	Part number	Watts	Dimensions (HxWxD)	Weight
02A6-2	0.5	2.6	KDRA54L	KDRA27LC1	KDRULA54L	7	4x4.18x3.75	4
03A9-2	0.75	3.9	KDRA53L	KDRA28LC1	KDRULA53L	12	4x4.18x3.75	4
05A2-2	1	5.2	KDRA25L	KDRB22LC1	KDRULA25L	11	4x4.18x3.75	4
07A4-2	1.5	7.4	KDRA26L	KDRA26LC1	KDRULA26L	18	4x4.18x3.75	4
08A3-2	2	8.3	KDRA27L	KDRA27LC1	KDRULA27L	21	4x4.18x3.75	4
10A8-2	3	10.8	KDRA28L	KDRA28LC1	KDRULA28L	29	4x4.18x3.75	4
19A4-2	5	19.4	KDRB22L	KDRA54HC1	KDRULB22L	38	5x6x4	8
26A8-2	7.5	26.8	KDRB23L	KDRA25HC1	KDRULB23L	48	5x6x4	8
34A1-2	10	34.1	KDRD25L	KDRA26HC1	KDRULD25L	64	5.75x7.2x4.25	12
50A8-2	15	50.8	KDRD24L	KDRA28HC1	KDRULD24L	85	5.75x7.2x4.25	12

Drive part # ACS310-03U-	HP ND	Input/ output current	KDR 3%, UL type 1 enclosure				KDR 3%, UL type 3R enclosure			
			Part number	Watts	Dimensions (HxWxD)	Weight	Part number	Watts	Dimensions (HxWxD)	Weight
02A6-2	0.5	2.6	KDRULA54LE01	7	12.25x12.5x6.75	14.5	KDRULA54LE3R	7	11.5x10x12	19
03A9-2	0.75	3.9	KDRULA53LE01	12	12.25x12.5x6.75	14.5	KDRULA53LE3R	12	11.5x10x12	19
05A2-2	1	5.2	KDRULA25LE01	11	12.25x12.5x6.75	14.5	KDRULA25LE3R	11	11.5x10x12	19
07A4-2	1.5	7.4	KDRULA26LE01	18	12.25x12.5x6.75	14.5	KDRULA26LE3R	18	11.5x10x12	19
08A3-2	2	8.3	KDRULA27LE01	21	12.25x12.5x6.75	14.5	KDRULA27LE3R	21	11.5x10x12	19
10A8-2	3	10.8	KDRULA28LE01	29	12.25x12.5x6.75	18.5	KDRULA28LE3R	29	11.5x10x12	19
19A4-2	5	19.4	KDRULB22LE01	38	12.25x12.5x6.75	18.5	KDRULB22LE3R	38	11.5x10x12	23
26A8-2	7.5	26.8	KDRULB23LE01	48	12.25x12.5x6.75	18.5	KDRULB23LE3R	48	11.5x10x12	23
34A1-2	10	34.1	KDRULD25LE01	64	12.25x12.5x6.75	22.5	KDRULD25LE3R	64	11.5x10x12	27
50A8-2	15	50.8	KDRULD24LE01	85	12.25x12.5x6.75	22.5	KDRULD24LE3R	85	11.5x10x12	27

Input reactors, low impedance

Input reactors for three phase 380-480 V applications

Drive part # ACS310-03U-	HP ND	Input/ output current	KDR UR 5%, open, not UL	KDR 5%, NEMA 1, not UL	KDR 5%, UL listed, open			
			Part number	Part number	Part number	Watts	Dimensions (HxWxD)	Weight
01A3-4	0.5	1.3	KDRA6L	KDRA6LC1	KDRULA6L	5.6	4X4.18X3.75	4
02A1-4	0.75	2.1	KDRA7L	KDRA7LC1	KDRULA7L	10	4x4.18x3.75	4
02A6-4	1	2.6	KDRA8L	KDRA8LC1	KDRULA8L	10.4	4x4.18x3.75	4
03A6-4	1.5	3.6	KDRA9L	KDRA9LC1	KDRULA9L	17	4x4.18x3.75	4
04A5-4	2	4.5	KDRA1L	KDRA1LC1	KDRULA1L	19	4x4.18x3.75	4
06A2-4	3	6.2	KDRA2L	KDRA2LC1	KDRULA2L	23	4x4.18x3.75	4
09A7-4	5	9.7	KDRA3L	KDRA3LC1	KDRULA3L	49	4x4.18x3.75	4
13A8-4	7.5	13.8	KDRA4L	KDRA4LC1	KDRULA4L	40	4x4.18x3.75	4
17A2-4	10	17.2	KDRA5L	KDRA5LC1	KDRULA5L	64	4x4.18x3.75	5
25A4-4	15	25.4	KDRB2L	KDRB2LC1	KDRULB2L	65	5x6x4	8
34A1-4	20	34.1	KDRB1L	KDRB1LC1	KDRULB1L	79	5x6x4	8
41A8-4	25	41.8	KDRD1L	KDRD1LC2	KDRULD1L	96	5.75x7.2x4.25	10
48A4-4	30	48.4	KDRD2L	KDRD2LC2	KDRULD2L	105	5.75x7.2x4.25	10

Drive part # ACS310-03U-	HP ND	Input/ output current	KDR 5%, UL type 1 enclosure				KDR 5%, UL type 3R enclosure			
			Part number	Watts	Dimensions (HxWxD)	Weight	Part number	Watts	Dimensions (HxWxD)	Weight
01A3-4	0.5	1.3	KDRULA6LE01	5.6	12.25x12.5x6.75	14.5	KDRULA6LE3R	5.6	11.5x10x12	19
02A1-4	0.75	2.1	KDRULA7LE01	10	12.25x12.5x6.75	14.5	KDRULA7LE3R	10	11.5x10x12	19
02A6-4	1	2.6	KDRULA8LE01	10.4	12.25x12.5x6.75	14.5	KDRULA8LE3R	10.4	11.5x10x12	19
03A6-4	1.5	3.6	KDRULA9LE01	17	12.25x12.5x6.75	14.5	KDRULA9LE3R	17	11.5x10x12	19
04A5-4	2	4.5	KDRULA1LE01	19	12.25x12.5x6.75	14.5	KDRULA1LE3R	19	11.5x10x12	19
06A2-4	3	6.2	KDRULA2LE01	23	12.25x12.5x6.75	14.5	KDRULA2LE3R	23	11.5x10x12	19
09A7-4	5	9.7	KDRULA3LE01	49	12.25x12.5x6.75	14.5	KDRULA3LE3R	49	11.5x10x12	19
13A8-4	7.5	13.8	KDRULA4LE01	40	12.25x12.5x6.75	14.5	KDRULA4LE3R	40	11.5x10x12	19
17A2-4	10	17.2	KDRULA5LE01	64	12.25x12.5x6.75	14.5	KDRULA5LE3R	64	11.5x10x12	19
25A4-4	15	25.4	KDRULB2LE01	65	12.25x12.5x6.75	18.5	KDRULB2LE3R	65	11.5x10x12	23
34A1-4	20	34.1	KDRULB1LE01	79	12.25x12.5x6.75	18.5	KDRULB1LE3R	79	11.5x10x12	23
41A8-4	25	41.8	KDRULD1LE01	96	12.25x12.5x6.75	20.5	KDRULD1LE3R	96	11.5x10x12	25
48A4-4	30	48.4	KDRULD2LE01	105	12.25x12.5x6.75	20.5	KDRULD2LE3R	105	11.5x10x12	25

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 enough,

Features:
UL Open, UL type 1 and UL 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 60 Hz.

Output filters for single phase 200-240 V applications

Drive part # ACS310-01U-	HP ND	Input/ output current	V1K UL open				V1K UL type 1 enclosure				V1k UL type 3R enclosure			
			Part number	Watts	Dimensions (HxWxD)	Weight	Part number	Watts	Dimensions (HxWxD)	Weight	Part number	Watts	Dimensions (HxWxD)	Weight
02A4-2	0.5	2.4	V1K3A00	75	9.00x5.50x7.25	8	V1K3A01	75	9.00x5.50x10.00	11	V1K3A03	75	11.45x10.00x12.00	25
04A7-2	1	4.7	V1K6A00	80	9.00x5.50x7.25	8	V1K6A01	80	9.00x5.50x10.00	11	V1K6A03	80	11.45x10.00x12.00	25
06A7-2	1.5	6.7	V1K6A00	80	9.00x5.50x7.25	8	V1K6A01	80	9.00x5.50x10.00	11	V1K6A03	80	11.45x10.00x12.00	25
07A5-2	2	7.5	V1K8A00	90	9.00x5.50x7.25	8	V1K8A01	90	9.00x5.50x10.00	11	V1K8A03	90	11.45x10.00x12.00	25
09A8-2	3	9.8	V1K12A00	95	9.00x5.50x7.25	8	V1K12A01	95	9.00x5.50x10.00	11	V1K12A03	95	11.45x10.00x12.00	25
03U-50A8-2	5	16.5	V1K45A00	135	12.00x8.00x9.00	17	V1K45A01	135	12.00x8.00x11.50	23	V1K45A03	135	19.18x15.62x19.50	56

Output filters for three phase 200-240 V applications

Drive part # ACS310-03U-	HP ND	Input/ output current	V1K UL open				V1K UL type 1 enclosure				V1k UL type 3R enclosure			
			Part number	Watts	Dimensions (HxWxD)	Weight	Part number	Watts	Dimensions (HxWxD)	Weight	Part number	Watts	Dimensions (HxWxD)	Weight
02A6-2	0.5	2.6	V1K3A00	75	9.00x5.50x7.25	8	V1K3A01	75	9.00x5.50x10.00	11	V1K3A03	75	11.45x10.00x12.00	25
03A9-2	0.75	3.9	V1K4A00	75	9.00x5.50x7.25	8	V1K4A01	75	9.00x5.50x10.00	11	V1K4A03	75	11.45x10.00x12.00	25
05A2-2	1	5.2	V1K6A00	80	9.00x5.50x7.25	8	V1K6A01	80	9.00x5.50x10.00	11	V1K6A03	80	11.45x10.00x12.00	25
07A4-2	1.5	7.4	V1K8A00	80	9.00x5.50x7.25	8	V1K6A01	80	9.00x5.50x10.00	11	V1K6A03	80	11.45x10.00x12.00	25
08A3-2	2	8.3	V1K8A00	90	9.00x5.50x7.25	8	V1K8A01	90	9.00x5.50x10.00	11	V1K8A03	90	11.45x10.00x12.00	25
10A8-2	3	10.8	V1K12A00	95	9.00x5.50x7.25	8	V1K12A01	95	9.00x5.50x10.00	11	V1K12A03	95	11.45x10.00x12.00	25
19A4-2	5	19.4	V1K18A00	110	9.00x5.50x8.25	12	V1K18A01	110	9.00x5.50x10.00	15	V1K18A03	110	11.45x10.00x12.00	25
26A8-2	7.5	26.8	V1K25A00	110	9.00x5.50x8.25	12	V1K25A01	110	9.00x5.50x10.00	15	V1K25A03	110	11.45x10.00x12.00	29
34A1-2	10	34.1	V1K35A00	130	12.00x8.00x9.00	17	V1K35A01	130	12.00x8.00x11.50	23	V1K35A03	130	19.18x15.62x19.50	56
50A8-2	15	50.8	V1K45A00	135	12.00x8.00x9.00	17	V1K45A01	135	12.00x8.00x11.50	23	V1K45A03	135	19.18x15.62x19.50	56

Output filters for three phase 380-480 V applications

Drive part # ACS310-03U-	HP ND	Input/ output current	V1K UL open				V1K UL type 1 enclosure				V1k UL type 3R enclosure			
			Part number	Watts	Dimensions (HxWxD)	Weight	Part number	Watts	Dimensions (HxWxD)	Weight	Part number	Watts	Dimensions (HxWxD)	Weight
01A3-4	0.5	1.3	V1K2A00	75	9.00x5.50x7.25	8	V1K2A01	75	9.00x5.50x10.00	11	V1K2A03	11	11.45x10.00x12.00	25
02A1-4	0.75	2.1	V1K2A00	75	9.00x5.50x7.25	8	V1K2A01	75	9.00x5.50x10.00	11	V1K2A03	11	11.45x10.00x12.00	25
02A6-4	1	2.6	V1K3A00	75	9.00x5.50x7.25	8	V1K3A01	75	9.00x5.50x10.00	11	V1K3A03	11	11.45x10.00x12.00	25
03A6-4	1.5	3.6	V1K3A00	75	9.00x5.50x7.25	8	V1K3A01	75	9.00x5.50x10.00	11	V1K3A03	11	11.45x10.00x12.00	25
04A5-4	2	4.5	V1K4A00	75	9.00x5.50x7.25	8	V1K4A01	75	9.00x5.50x10.00	11	V1K4A03	11	11.45x10.00x12.00	25
06A2-4	3	6.2	V1K6A00	80	9.00x5.50x7.25	8	V1K6A01	80	9.00x5.50x10.00	11	V1K6A03	11	11.45x10.00x12.00	25
09A7-4	5	9.7	V1K8A00	90	9.00x5.50x7.25	8	V1K8A01	90	9.00x5.50x10.00	11	V1K8A03	11	11.45x10.00x12.00	25
13A8-4	7.5	13.8	V1K12A00	95	9.00x5.50x7.25	8	V1K12A01	95	9.00x5.50x10.00	11	V1K12A03	11	11.45x10.00x12.00	25
17A2-4	10	17.2	V1K16A00	95	9.00x5.50x8.25	12	V1K16A01	95	9.00x5.50x10.00	15	V1K16A03	15	11.45x10.00x12.00	29
25A4-4	15	25.4	V1K25A00	110	9.00x5.50x8.25	12	V1K25A01	110	9.00x5.50x10.00	15	V1K25A03	110	11.45x10.00x12.00	29
34A1-4	20	34.1	V1K27A00	110	9.00x5.50x8.25	14	V1K27A01	110	9.00x5.50x10.00	15	V1K27A03	110	19.18x15.62x19.50	29
41A8-4	25	41.8	V1K35A00	130	12.00x8.00x9.00	17	V1K35A01	130	12.00x8.00x11.50	23	V1K35A03	130	19.18x15.62x19.50	56
48A4-4	30	48.4	V1K45A00	135	12.00x8.00x9.00	17	V1K45A01	135	12.00x8.00x11.50	23	V1K45A03	135	19.18x15.62x19.50	56

Taking care of your drives, caring about your business

Whether a drive is a part of the product you sell or a component in your production process, reliable and efficient drive operation is key. You will find support from your first meeting with ABB to the drive installation, commissioning and maintenance, all the way up to the eventual drive replacement and recycling. With offices in over 90 countries, we are well placed to offer you technical advice and local support.

Installation and commissioning

We offer accurate advice and timely support before and during installation. ABB-certified engineers or third-party channel companies can adjust the drive parameters to meet the precise demands of the application.

Preventive Maintenance

ABB recommends regular preventive maintenance of drives throughout their lifetime to ensure maximum availability and minimum unplanned repair costs.

Drive preventive maintenance consists of annual drive inspections and component replacements according to product specific maintenance schedules.

Fast and reliable global delivery and support

ABB drives, spare parts and services are available worldwide and can be purchased through the dedicated global service and support network. More than 1400 companies, located throughout the world and able to serve you locally as well as provide you technical support. These companies include ABB's own offices and authorized third party channel companies

Check your local ABB contact from **www.abb.com/searchchannels**

Training services

To enhance personnel's product knowledge, and, with that, improve plant safety and availability we offer a selection of on-line courses. Check for more information about ABB's training centers and the courses from **www.abb.com/abbuniversity**.

Maintenance intervals

If installed in an appropriate environment, the drive requires very little maintenance. The table lists the routine maintenance intervals recommended by ABB.

Maintenance	Interval
Reforming of capacitors	Every year when stored
Check of dustiness, corrosion and temperature	Every year
Cooling fan replacement (frame sizes R1 to R2)	Every three years
Check and tightening of the power terminals	Every six years

Consult your local ABB drives service representative for more details on the maintenance or visit **www.abb.com/drives**.

Notes

Notes

Contact us

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

www.abb.com/drives

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