
LOW VOLTAGE AC DRIVES

ABB machinery drives

ACS355, 0.5 to 30 hp/0.37 to 22 kW



**All your machine building needs
in one drive. ACS355 drives.**

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Introduction to ACS355

ABB machinery drives

The ABB machinery drives are designed to be fast drives to install, parameter-set and commission. Thus saving hours of engineering work. They are highly compact and cost-effective. Equipped with cutting-edge intelligence and safety capability the drives are designed specifically to meet the production and performance needs of system integrators, original equipment manufacturers (OEMs) and panel builders, as well as the requirements of end users in a broad range of applications.

In the ABB machinery drives portfolio, ACS355 represents the micro drive range; meeting requirements like compact size, being optimized for a lower power range, cost-effectiveness, and ease of use. By choosing an ABB machinery drive, machine builders not only get all the clever things inside the drive, but also everything outside it: the entire global ABB. This means a full range of products and services designed to support their business.

Applications

ABB machinery drives are designed to meet the requirements of an extensive range of machinery applications. The drives are ideal for food and beverage, material handling, lifting, textile, printing, rubber and plastics, and woodworking applications.

Highlights

- Exceptionally compact drives and uniform design
- Quick commissioning with application macros and panel assistants
- Safe torque off function (SIL3) as standard
- Sensorless vector control for induction motors and permanent magnet motors up to 599 Hz
- Built-in braking chopper
- Coated boards - all variants
- IP66 product variant for harsh environments and solar pump drive variant available



Compact drives with big drive features

ACS355 drives are designed to maximize your machine's availability with drives that are easy to install and setup.

The drive is highly modular and supports a variety of fieldbus protocols thus providing flexible connectivity. In addition to a broad range of built-in options such as different I/O and communications, a wide selection of external accessories is also available. Wherever your machine is located, the local ABB will be there to support you and your clients.

Flexible performance

Reduce the need for external PLC components with built-in sequence programming providing simple drive control logic. Improve production flow and increase cost savings with built-in features, such as speed compensated stop enabling precision stopping, and patented smooth start for permanent magnet motors.

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.

Compact and uniform design

Compact size, the broadest power range in its class from 0.37 to 22 kW and side-by-side mounting ensure optimized cabinet installation in a wide range of machinery applications, resulting in space and cost savings.

Supported motor types

Same drive can be used for sensorless induction and permanent magnet motor control without a feedback device.



Application-specific product variants

Ensure long life time of equipment and reliable energy supply with a drive for solar pumps including embedded pump-specific features protecting the pump. The high speed variant for spindle applications provides speed controller tuning without use of encoder.

Protection against harsh environments

Increase time and cost savings with NSF certified product variant for IP66/67/69K, UL Type 4X protection classes with no need to design special enclosures for applications that require a high ingress protection against dirt, dust and moisture.

Communication with major automation networks

Optional fieldbus adapters enable connectivity with major industrial automation networks.



Safety

Integrated safe torque off (STO) function up to SIL 3 is a cost-effective and certified solution for safe machine maintenance by fulfilling IEC 61508, EN 62061 and EN ISO 13849-1 standards. The safety function can also be used to implement Emergency Stop without contactors.

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.



Typical applications



Mixer

In mixing applications the drive provides a high starting torque. The silent operation mode adjusts the switching frequency of the drive to a higher level after the high-torque start, resulting in lower audible noise. The FlashDrop tool provides a quick and safe way to configure multiple drives for identical mixer applications.

Conveyor

Production lines often have multiple stages, including conveyors, which need to be efficiently linked with each other to provide high production output. A drive provides smooth start and stop of the conveyor, thereby reducing mechanical stress and lowering maintenance costs.



Packaging machine

Packaging machines often require a drive to provide a high degree of repeatability and accuracy during the packing operation. As such, the ACS355 is well suited for packaging duties and also provides good dynamic and static speed control accuracy. Sequence programming enables the drive to perform sequences of tasks, reducing the need for a PLC. Software features include timer, counter, brake control and jogging – all of which can be used in a packaging machine.



Bottling line

When filling the bottles with liquid, bottling lines require a drive which offers high accuracy. The ACS355 is perfect for this purpose, with its good dynamic and static speed control. When dealing with liquids, the ACS355 with a high protection class (IP66) would also be a good choice.



Winders

The ACS355 offers high static speed accuracy. When dealing with thin strings like in string winders, it is essential to control the winder speed accurately in order to prevent the strings from snapping. Surface winders, on the other hand, require high static speed accuracy to keep control of the material thickness or tension.

How to select a drive

The right drive is extremely easy to select. The following instructions show you how to order the right drive for your application.

Start by identifying the required drive variant and your supply voltage and select the related rating table. Or use ABB's DriveSize dimensioning tool.

Select your drive's order code (drive type) from the rating table based on the load current, or, if it is unknown, select the drive based on your motor's power and current ratings.

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Ratings and types

Rating (P/M) (kW) / (hp)	Type designation	Frame size IP40	Frame size IP46	Type designation
0.37 - 0.75	ACS355-01-0040-2	80	80	...
0.75 - 1.5	ACS355-01-0042-2	81	81	...
1.5 - 2.2	ACS355-01-0042-2	82	82	...
2.2 - 3.0	ACS355-01-0042-2	82	82	...
3.0 - 3.7	ACS355-01-0042-2	80	81	...
3.7 - 4.5	ACS355-01-0042-2	80	81	...
4.5 - 5.5	ACS355-01-0042-2	81	81	...
5.5 - 7.5	ACS355-01-0042-2	81	81	...
7.5 - 10.0	ACS355-01-0042-2	82	82	...
10.0 - 15.0	ACS355-01-0042-2	84	84	...
15.0 - 22.0	ACS355-01-0042-2	84	84	...
22.0 - 30.0	ACS355-01-0042-2	84	84	...
30.0 - 37.0	ACS355-01-0042-2	84	84	...
37.0 - 45.0	ACS355-01-0042-2	84	84	...
45.0 - 55.0	ACS355-01-0042-2	84	84	...
55.0 - 75.0	ACS355-01-0042-2	84	84	...
75.0 - 100.0	ACS355-01-0042-2	84	84	...
100.0 - 150.0	ACS355-01-0042-2	84	84	...
150.0 - 200.0	ACS355-01-0042-2	84	84	...
200.0 - 250.0	ACS355-01-0042-2	84	84	...
250.0 - 300.0	ACS355-01-0042-2	84	84	...
300.0 - 370.0	ACS355-01-0042-2	84	84	...
370.0 - 450.0	ACS355-01-0042-2	84	84	...
450.0 - 550.0	ACS355-01-0042-2	84	84	...
550.0 - 750.0	ACS355-01-0042-2	84	84	...
750.0 - 1000.0	ACS355-01-0042-2	84	84	...

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Options

Options	Ordering code	Description	Fixed	Availability
Protection class	...	NEMA 1 (UL Type 1) (UL, IEC, A2)	MUL1-S1	...
Control panel	3000	Assistant control panel	ACS-CIP-A	...
Power mounting kit	...	Power mounting kit	ACS-LP-KIT	...
Powermounter	3000	Powermounter	3000-S1	...
Filter	K402	Line reactor	FCM-01	...
...

ABB MACHINERY DRIVES, ACS355, CATALOG

Ratings and types

Rating (P/M) (kW) / (hp)	Type designation	Frame size IP40	Frame size IP46	Type designation
0.37 - 0.75	ACS355-01-0040-2	80	80	...
0.75 - 1.5	ACS355-01-0042-2	81	81	...
1.5 - 2.2	ACS355-01-0042-2	82	82	...
2.2 - 3.0	ACS355-01-0042-2	82	82	...
3.0 - 3.7	ACS355-01-0042-2	80	81	...
3.7 - 4.5	ACS355-01-0042-2	80	81	...
4.5 - 5.5	ACS355-01-0042-2	81	81	...
5.5 - 7.5	ACS355-01-0042-2	81	81	...
7.5 - 10.0	ACS355-01-0042-2	82	82	...
10.0 - 15.0	ACS355-01-0042-2	84	84	...
15.0 - 22.0	ACS355-01-0042-2	84	84	...
22.0 - 30.0	ACS355-01-0042-2	84	84	...
30.0 - 37.0	ACS355-01-0042-2	84	84	...
37.0 - 45.0	ACS355-01-0042-2	84	84	...
45.0 - 55.0	ACS355-01-0042-2	84	84	...
55.0 - 75.0	ACS355-01-0042-2	84	84	...
75.0 - 100.0	ACS355-01-0042-2	84	84	...
100.0 - 150.0	ACS355-01-0042-2	84	84	...
150.0 - 200.0	ACS355-01-0042-2	84	84	...
200.0 - 250.0	ACS355-01-0042-2	84	84	...
250.0 - 300.0	ACS355-01-0042-2	84	84	...
300.0 - 370.0	ACS355-01-0042-2	84	84	...
370.0 - 450.0	ACS355-01-0042-2	84	84	...
450.0 - 550.0	ACS355-01-0042-2	84	84	...
550.0 - 750.0	ACS355-01-0042-2	84	84	...
750.0 - 1000.0	ACS355-01-0042-2	84	84	...

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Options

Options	Ordering code	Description	Fixed	Availability
Protection class	...	NEMA 1 (UL Type 1) (UL, IEC, A2)	MUL1-S1	...
Control panel	3000	Assistant control panel	ACS-CIP-A	...
Power mounting kit	...	Power mounting kit	ACS-LP-KIT	...
Powermounter	3000	Powermounter	3000-S1	...
Filter	K402	Line reactor	FCM-01	...
...

Choose your options and add the option codes to the drive's order code. Remember to use a "+" mark before each option code.

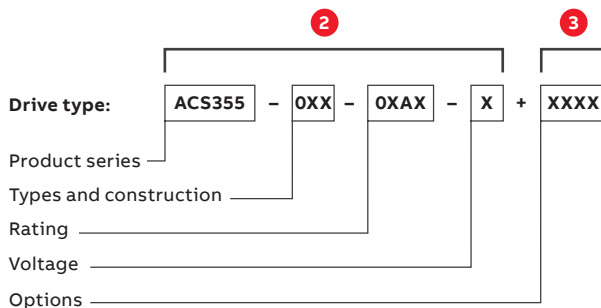


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Options

Selecting options
The options shown in the table are available within the ACS355 range. The ordering code, which is shown in the second column, replaces the XXXX in the type designation. You can order as many options as required, simply by adding the code as necessary.

Options	Ordering code	Description	Fixed	Availability
Protection class	...	NEMA 1 (UL Type 1) (UL, IEC, A2)	MUL1-S1	...
Control panel	3000	Assistant control panel	ACS-CIP-A	...
Power mounting kit	...	Power mounting kit	ACS-LP-KIT	...
Powermounter	3000	Powermounter	3000-S1	...
Filter	K402	Line reactor	FCM-01	...
...

Standard Option, essential To be ordered as a separate item External options not available
 Product variant Not available Available in selected countries IP46/IP47/A, Type 4X protection class

Ratings and types

Ratings IP20/UL Open type/ NEMA 1 option			Type designation	Frame size IP20	Frame size IP66
P_N (hp)	P_N (kW)	I_{2N} (A)			
1-phase AC supply, 200 to 240 V					+B063*
0.5	0.37	2.4	ACS355-01U-02A4-2	R0	-
1.0	0.75	4.7	ACS355-01U-04A7-2	R1	-
1.5	1.1	6.7	ACS355-01U-06A7-2	R1	-
2.0	1.5	7.5	ACS355-01U-07A5-2	R2	-
3.0	2.2	9.8	ACS355-01U-09A8-2	R2	-
3-phase AC supply, 200 to 240 V					+B063*
0.5	0.37	2.4	ACS355-03U-02A4-2	R0	R1
0.75	0.55	3.5	ACS355-03U-03A5-2	R0	R1
1.0	0.75	4.7	ACS355-03U-04A7-2	R1	R1
1.5	1.1	6.7	ACS355-03U-06A7-2	R1	R1
2.0	1.5	7.5	ACS355-03U-07A5-2	R1	R1
3.0	2.2	9.8	ACS355-03U-09A8-2	R2	R3
5.0	4.0	17.6	ACS355-03U-17A6-2	R2	R3
7.5	5.5	24.4	ACS355-03U-24A4-2	R3	-
10.0	7.5	31.0	ACS355-03U-31A0-2	R4	-
15.0	11.0	46.2	ACS355-03U-46A2-2	R4	-
3-phase AC supply, 380 to 480 V					+B063*
0.5	0.37	1.2	ACS355-03U-01A2-4	R0	R1
0.75	0.55	1.9	ACS355-03U-01A9-4	R0	R1
1.0	0.75	2.4	ACS355-03U-02A4-4	R1	R1
1.5	1.1	3.3	ACS355-03U-03A3-4	R1	R1
2.0	1.5	4.1	ACS355-03U-04A1-4	R1	R1
3.0	2.2	5.6	ACS355-03U-05A6-4	R1	R1
5.0	4.0	8.8	ACS355-03U-08A8-4	R1	R1
7.5	5.5	12.5	ACS355-03U-12A5-4	R3	R3
10.0	7.5	15.6	ACS355-03U-15A6-4	R3	R3
15.0	11.0	23.1	ACS355-03U-23A1-4	R3	-
20.0	15.0	31.0	ACS355-03U-31A0-4	R4	-
25.0	18.5	38.0	ACS355-03U-38A0-4	R4	-
30.0	22.0	44.0	ACS355-03U-44A0-4	R4	-

P_N for kW = Typical motor power in 400 V at normal use

P_N for hp = Typical motor power in 460 V at normal use

I_{2N} for A = Continuous rms current. 50% overload is allowed for one minute in ten minutes.

* See page 24 for details on +B063 variant

Type designation

This is the unique reference number (shown in column 4, 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 5) can be used to determine the drive dimensions, shown on page 12.

Voltages

ACS355 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 construction, current rating, voltage, and option and variant codes into the type designation.

Current rating

Current rating represents the rated continuous drive output current inside the drive specification. Motor power stated in the table below states the typical motor power.

Variant code

This code states the factory installed SW variants to the drive. See pages 16 - 19 for details.

Construction

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

01 = 1-phase

03 = 3-phase

U = EMC filter installed but disconnected. This is the standard configuration for drives stocked in the U.S. The "U" indicates that a plastic screw has been inserted in the "EMC" location on the side of the drive. To ground the EMC filter and make it active, remove the plastic screw and replace it with the metal screw provided in the parts bag.

Note: The European variant of the ACS355 drive may have an "E" in the type designation. This indicates the drive has been provided with the metal grounding screw inserted in the "EMC" location.

Technical data

Mains connection	
Voltage and power range	1-phase, 200 to 240 V ± 10% 0.5 to 3 hp (0.37 to 2.2 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
Common DC connection	
Voltage and power range	230 V drives, 325 V ± 15% 400/480 V drives, 540 ± 15% (common DC manual) $P_{max} = P_n$ of the drive
Motor connection	
Voltage	3-phase, from 0 to U_{SUPPLY}
Frequency	0 to 599 Hz
Continuous loading capability (constant torque at a max. ambient temperature of 40 °C)	Rated output current I_{2N}
Overload capacity (at a max. ambient temperature of 40 °C)	1.5 x I_{2N} for 1 minute every 10 minutes At start 1.8 x I_{2N} for 2 s
Switching frequency Selectable	Default 4 kHz 4 to 16 kHz with 4 kHz steps
Acceleration time	0.1 to 1800 s
Deceleration time	0.1 to 1800 s
Braking	Built-in brake chopper as standard
Speed control	
Static accuracy	20% of motor nominal slip
Dynamic accuracy	< 1% s with 100% torque step
Torque control	
Torque step rise time	< 10 ms with nominal torque
Non-linearity	± 5% with nominal torque
Environmental limits	
Ambient temperature	-10 to 40 °C (14 to 104 °F), no frost allowed 50 °C (122 °F) with 10% derating
Altitude	Rated current available at 0 to 1000 m. In altitudes from 1000 to 2000 m (3300 to 13,200 ft) above sea level, the derating is 1% for every 100 m (330 ft). If the installation site is higher than 2000 m (6600 ft) above sea level, please contact your local ABB distributor or office for further information.
Relative humidity	Lower than 95% (without condensation)
Degree of protection	IP20/optional NEMA 1/UL type 1 enclosure IP66/IP67/UL Type 4X as an option up to 7.5 kW, IP69K available for IP66/IP67 variant with compatible cable glands
Enclosure color	NCS 1502-Y, RAL 9002, PMS 420 C
Contamination levels	
Transportation	IEC721-3-3 No conductive dust allowed 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/RCM and EAC RoHS compliant	
Programmable control connections	
Two analog inputs	
Voltage signal	
Unipolar	0 (2) to 10 V, $R_{in} > 312$ k Ω
Bipolar	-10 to 10 V, $R_{in} > 312$ k Ω
Current signal	
Unipolar	0 (4) to 20 mA, $R_{in} = 100$ Ω
Bipolar	-20 to 20 mA, $R_{in} = 100$ Ω
Potentiometer reference value	10 V ± 1% max. 10 mA, $R < 10$ k Ω
Resolution	0.1%
Accuracy	± 2%
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, PNP and NPN, programmable DI5 0 to 16 kHz pulse train 2.4 k Ω	
Input impedance	
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 and Ethernet communication	
Fieldbuses	Plug-in type
Refresh rate	< 10 ms (between drive and fieldbus module)
DeviceNet™	5-pin screw type connector, up to 500 kbit/s baud rate
PROFIBUS DP	9-pin D-connector, up to 12 Mbit/s baud rate
POWERLINK	2 pcs RJ-45 connector, 100 Mbit/s baud rate
ControlNet™	2 pcs 8P8C modular jacks
CANopen®	9-pin D-connector, up to 1 Mbit/s
Modbus RTU	4-pin screw type connector, up to 115 kbit/s baud rate
EtherNet/IP™, Modbus TCP, PROFINET IO	1 RJ45 connector (FENA-01 and -11) or 2 RJ45 connectors (FENA-21). 10/100Mbit/s baud rate
LonWorks®	3-pin screw type connector, up to 78 kbit/s baud rate
EtherCAT®	2 pcs RJ-45 connectors, 100 Mbit/s baud rate
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 2x longer motor cables

Dimensions and weights

Cabinet-mounted drives (IP20/UL Open)

Frame size	IP20/UL Open						Weight (lb)
	H1 (in)	H2 (in)	H3 (in)	W (in)	D1 (in)	D2 (in)	
R0	6.7	8.0	9.4	2.8	6.3	7.4	2.6
R1	6.7	8.0	9.4	2.8	6.3	7.4	2.6
R2	6.7	8.0	9.4	4.1	6.5	7.5	3.3
R3	6.7	8.0	9.3	6.7	6.7	7.7	5.5
R4	7.1	8.0	9.6	10.2	6.7	7.7	9.7

H1 = Height without fastenings and clamping plate

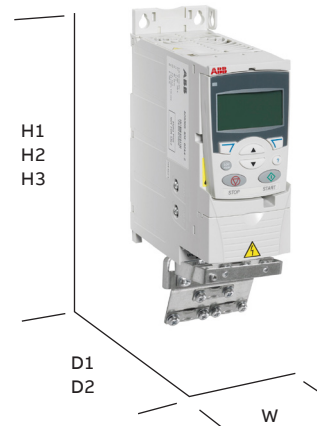
H2 = Height with fastenings but without clamping plate

H3 = Height with fastenings and clamping plate

W = Width

D1 = Standard depth

D2 = Depth with MREL, MPOW or MTAC option



Wall-mounted drives (NEMA 1/UL Type 1)

Frame size	NEMA 1/UL Type 1					Weight (lb)
	H4 (in)	H5 (in)	W (in)	D1 (in)	D2 (in)	
R0	10.1	11.0	2.8	6.7	7.4	3.5
R1	10.1	11.0	2.8	6.7	7.4	3.5
R2	10.1	11.1	4.1	6.7	7.5	4.2
R3	10.2	11.8	6.7	7.0	7.7	6.8
R4	10.6	12.6	10.2	7.0	7.7	11.0

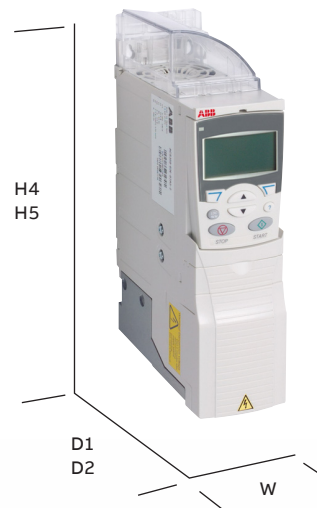
H4 = Height with fastenings and NEMA 1 connection box

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

W = Width

D1 = Standard depth

D2 = Depth with MREL, MPOW or MTAC option



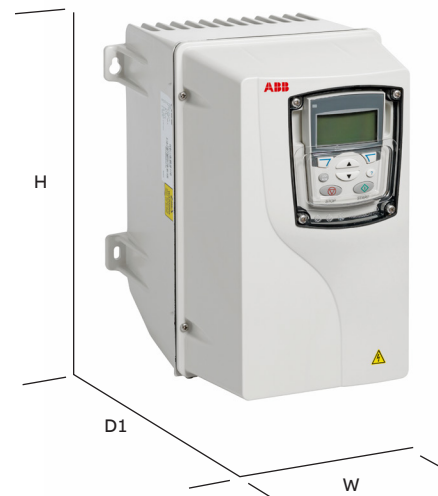
Wall-mounted drives (IP66/IP67/UL Type 4X)

Frame size	IP66/IP67/UL Type 4X			
	H4 (in)	W (in)	D1 (in)	Weight (lb)
R1	12.0	7.7	11.1	16.9
R3	17.2	9.7	10.9	28.6

H = Height

W = Width

D1 = Standard depth



Cooling

Cooling

ACS355 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 40 °C (50 °C with derating). Heat dissipation from IP66/IP67/UL Type 4X drive equals to the IP20 UL Open values. For more specific limits see the Technical specification – Environmental limits in this catalog.

Cooling air flow					
Type designation	Frame size	Heat dissipation		Air flow	
		(W)	BTU/hr ¹⁾	m ³ /h	ft ³ /min
1-phase AC supply, 200 to 240 V					
ACS355-01U-02A4-2	R0	48	163	– ²⁾	– ²⁾
ACS355-01U-04A7-2	R1	72	247	24	14
ACS355-01U-06A7-2	R1	97	333	24	14
ACS355-01U-07A5-2	R2	101	343	21	12
ACS355-01U-09A8-2	R2	124	422	21	12
3-phase AC supply, 200 to 240 V					
ACS355-03U-02A4-2	R0	42	142	– ²⁾	– ²⁾
ACS355-03U-03A5-2	R0	54	183	– ²⁾	– ²⁾
ACS355-03U-04A7-2	R1	64	220	24	14
ACS355-03U-06A7-2	R1	86	295	24	14
ACS355-03U-07A5-2	R1	88	302	21	12
ACS355-03U-09A8-2	R2	111	377	21	12
ACS355-03U-17A6-2	R2	180	613	52	31
ACS355-03U-24A4-2	R3	285	975	71	42
ACS355-03U-31A0-2	R4	328	1119	96	57
ACS355-03U-46A2-2	R4	488	1666	96	57
3-phase AC supply, 380 to 480 V					
ACS355-03U-01A2-4	R0	35	121	– ²⁾	– ²⁾
ACS355-03U-01A9-4	R0	40	138	– ²⁾	– ²⁾
ACS355-03U-02A4-4	R1	50	170	13	8
ACS355-03U-03A3-4	R1	60	204	13	8
ACS355-03U-04A1-4	R1	69	235	13	8
ACS355-03U-05A6-4	R1	90	306	19	11
ACS355-03U-08A8-4	R1	127	433	24	14
ACS355-03U-12A5-4	R3	161	551	52	31
ACS355-03U-15A6-4	R3	204	697	52	31
ACS355-03U-23A1-4	R3	301	1029	71	42
ACS355-03U-31A0-4	R4	408	1393	96	57
ACS355-03U-38A0-4	R4	498	1700	96	57
ACS355-03U-44A0-4	R4	588	2007	96	57

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 (in)	Space below (in)	Space on left/right (in)
All frame sizes	3.0	3.0	0.0
IP66/67 enclosure	3.0	3.0	0.8

Fuses and circuit protection

Fuses or manual motor protectors for circuit protection

Standard fuses or manual motor protectors can be used with ACS355 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, MS165, 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.

Selection table

Type designation	Frame size	IEC fuses	UL fuses	Manual motor protector		Min. Encl. Vol. (cu in) ⁷⁾
		Fuse type Gg ¹⁾ (A)	UL Class T or CC (600V) (A)	Input Amps	MMP Type E ^{3),4)}	
1-phase AC supply, 200 to 240 V						
ACS355-01U-02A4-2	R0	10	10	6.1	MS132-6.3 & S1-M3-25 ³⁾	1152
ACS355-01U-04A7-2	R1	16	20	11	MS165-16	1482
ACS355-01U-06A7-2	R1	16/20 ²⁾	25	16	MS165-20	1482
ACS355-01U-07A5-2	R2	20/25 ²⁾	30	17	MS165-20	1482
ACS355-01U-09A8-2	R2	25/35 ²⁾	35	21	MS165-25	1482
3-phase AC supply, 200 to 240V						
ACS355-03U-02A4-2	R0	10	10	4.3	MS132-6.3 & S1-M3-25 ³⁾	1152
ACS355-03U-03A5-2	R0	10	10	6.1	MS132-6.3 & S1-M3-25 ³⁾	1152
ACS355-03U-04A7-2	R1	10	15	7.6	MS132-10 & S1-M3-25 ³⁾	1152
ACS355-03U-06A7-2	R1	16	15	11.8	MS165-16	1482
ACS355-03U-07A5-2	R1	16	15	12	MS165-16	1482
ACS355-03U-09A8-2	R2	16	20	14.3	MS165-16	1482
ACS355-03U-13A3-2	R2	25	30	22	MS165-25	1482
ACS355-03U-17A6-2	R2	25	35	25	MS165-32	1482
ACS355-03U-24A4-2	R3	63	60	41	MS165-45	1482
ACS355-03U-31A0-2	R4	80	80	50	MS165-65	1482
ACS355-03U-46A2-2	R4	100	100	69	MS495-75E or MS5100-100	1152
3-phase AC supply, 440 to 480V⁶⁾						
ACS355-03U-01A2-4	R0	10	10	1.8	MS132-2.5 & S1-M3-25 ³⁾	1152
ACS355-03U-01A9-4	R0	10	10	3	MS132-4.0 & S1-M3-25 ³⁾	1152
ACS355-03U-02A4-4	R1	10	10	3.4	MS132-4.0 & S1-M3-25 ³⁾	1152
ACS355-03U-03A3-4	R1	10	10	5	MS132-6.3 & S1-M3-25 ³⁾	1152
ACS355-03U-04A1-4	R1	16	15	5.8	MS132-6.3 & S1-M3-25 ³⁾	1152
ACS355-03U-05A6-4	R1	16	15	8	MS132-10 & S1-M3-25 ³⁾	1152
ACS355-03U-07A3-4	R1	16	20	9.7	MS132-10 & S1-M3-25 ³⁾	1152
ACS355-03U-08A8-4	R1	20	25	11	MS165-16	1482
ACS355-03U-12A5-4	R3	25	30	16	MS165-20	1482
ACS355-03U-15A6-4	R3	35	35	18	MS165-20	1482
ACS355-03U-23A1-4	R3	50	50	26	MS165-32	1482
ACS355-03U-31A0-4	R4	80	80	43	MS165-54	1482
ACS355-03U-38A0-4	R4	100	100	51	MS165-65	1482
ACS355-03U-44A0-4	R4	100	100	56	MS165-65	1482

1) According to IEC-60269 standard

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

3) 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.

4) 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, select the next size MMP. (MS132-10 is the highest size in the MS132 frame size to meet Type E at 65kA; next size up is MS165-16.)

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

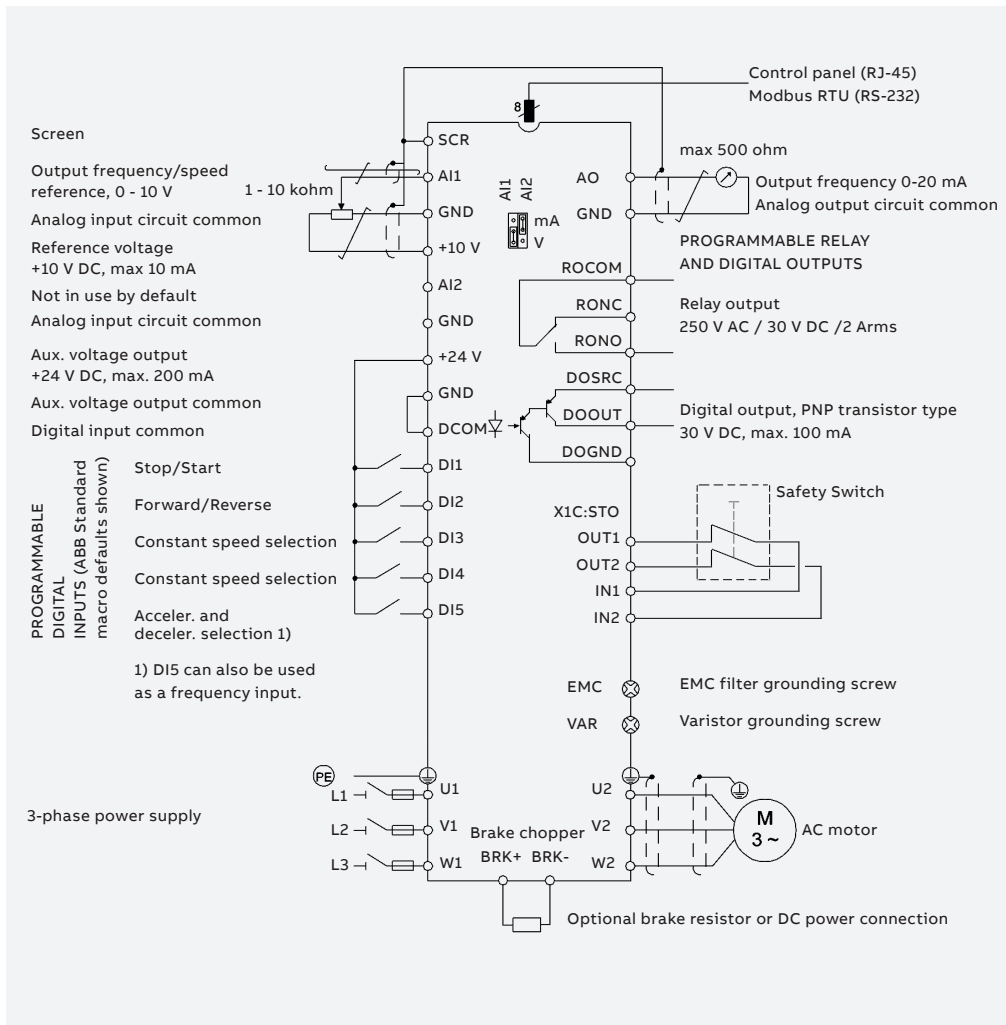
6) 480Y/277V delta systems only: Short-circuit protective devices with slash voltage ratings (e.g. 480Y/277 VAC) can be applied only in solidly grounded networks where the voltage from line-to-ground does not exceed the lower of the two ratings (e.g. 277 V AC), and the voltage from line-to-line does not exceed the higher of the two ratings (e.g. 480 V AC). The lower rating represents the device's interrupting capability per pole.

7) 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. ABB IP20 micro 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.

Control connections



Application macros

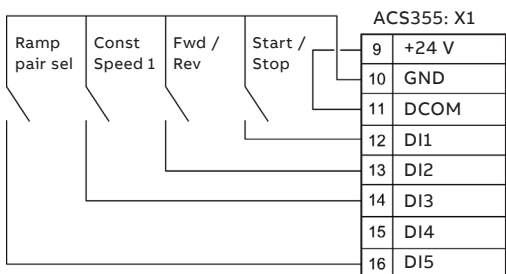
Application macros are preprogrammed parameter sets. While starting up the drive, the user typically selects one of the macros that is best suited for the application. The diagram below gives an overview of ACS355 control connections and shows the default I/O connections for the ABB standard macro.

ABB machinery drives have eight application macros:

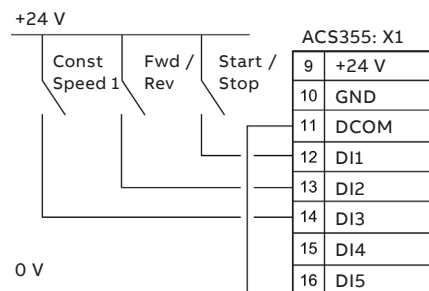
- ABB standard macro
- Torque control macro
- 3-wire macro
- Alternate macro
- AC500 Modbus macro
- Motor potentiometer macro
- Hand/auto macro
- PID control macro

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.

Sinking DI configuration (NPN connected)



Sourcing DI configuration (PNP connected) with external power supply



Control program example

The ACS355 drives have many solutions for common challenges. The following example explains how the COUNTER STOP function operates within a conveyor unloading routine. The function stops the conveyor after a predefined number of boxes have passed the sensor.

The operator starts the conveyor by activating the drive using switch, S. The switch is connected to digital input 1 (DI1). The drive accelerates to a constant speed of 30 Hz with a 1 second ramp time.

Meanwhile a sensor, or proximity switch, P, is connected to digital input 5 (DI5). This sensor generates one pulse, every time a box on the conveyor passes by. When the required number of boxes – in this case 20 – have passed the sensor, the drive stops with a 1 second ramp time.

Parameter settings

Startup data

The correct motor parameters are set within parameter group 99. However, if the current and voltage settings of the motor and drive match, this is not necessary. The ACS355 also features vector control, which can be used by setting the relevant parameters and undertaking an ID run.

Start/Stop/Direction logic

Parameter 1001 EXT1 COMMANDS is set to COUNTER STOP [24]. Under certain conditions the counter output will modify the start/stop signal for stopping.

Constant speed selection

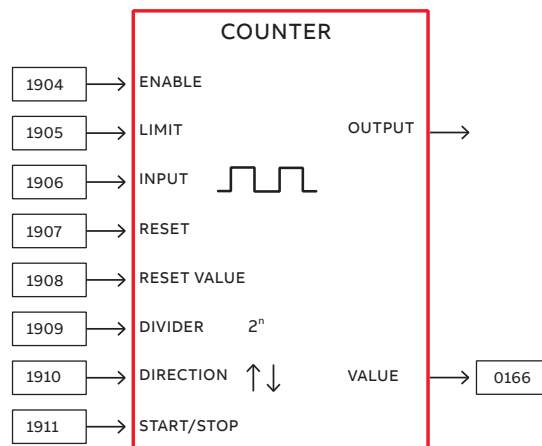
Parameter 1201 CONST SPEED SEL is set to DI1 [1]. Parameter 1202 CONST SPEED 1 acts as a speed reference source when digital input 1 is active.

Parameter 1202 CONST SPEED 1 is set to 30 Hz.

Start/Stop functions

Parameter 2101 START FUNCTION is set to AUTO [1], which is also the default value. If high torque is required for the conveyor to start, settings DC MAGN [2] can be used.

Parameter 2102 STOP FUNCTION is set to RAMP [2]. Thus the drive ramps down to 0 at a stop command.

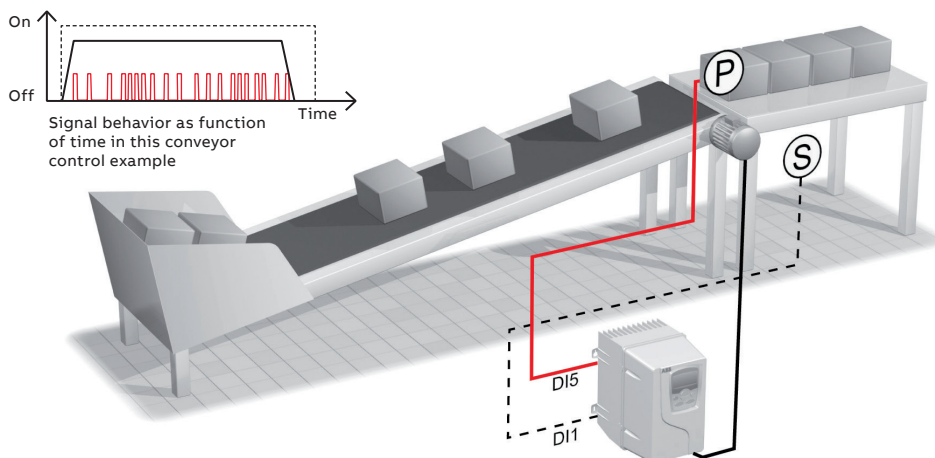


Counter parametrization

Parameter 1904 COUNTER ENABLE is set to DI1 [1]. Counter is enabled now by digital input 1. When digital input 1 is low, the counter is not counting.

Parameter 1905 COUNTER LIMIT is set to 20. In this example the loading station can only hold 20 boxes.

Parameter 1906 COUNTER INPUT is set to PLS IN (DI5) [1] which is also the default value. Pulse counter P is wired to digital input (DI5). This digital input can also handle high frequency pulses up to 10 kHz. If the counter signal edges are swinging, this parameter can be set to FILTERED DI5 [4].



Parameter 1907 COUNTER RESET is set to DI1 (INV) [-1]. When digital input 1 is low, the counter is reset to a value determined by parameter 1908 COUNTER RES VAL.

Parameter 1908 COUNTER RES VAL is set to zero, which is also the default value. The counter, in this example, runs from 0 to 20.

Parameter 1909 COUNT DIVIDER is set to zero, which is also the default value. This value is used to divide high frequency pulse numbers to lower values. For example a 1024 pulse incremental encoder would give 1024 pulses in one revolution. When using count divider 10 (2 to the power of 10) the counter would count up by 1 after 1024 pulses.

Parameter 1910 COUNT DIRECTION is set to UP [0], which is also the default value.

Parameter 1911 CNTR S/S COMMAND is set to DI1 [1]. Digital input 1 acts as the drive start command. Due to the setting of parameter 1001 EXT1 COMMANDS, the drive stops when the counter limit has been reached or digital input 1 goes low.

The counter's actual value can now be seen from signal 0166.

Acceleration and deceleration settings

Parameter 2201 ACC/DEC 1/2 SEL is set to NOT SEL [0]. Only one ramp is used in this application, thereby ramp changing is disabled.

Parameter 2202 ACCELER TIME 1 is set to 1s.

Parameter 2203 DECELER TIME 2 is set to 1s.

ACS355 control program functions

ACS355 control program provides the following functions:

- Counter start and stop
- Timer start and stop

- Speed compensated stop
- 3 independent supervision functions
- Automatic restart function
- 2 sets of ramping times
- S-curve for ramping
- 7 constant speeds
- 3 critical speed ranges
- Maintenance triggers
- Timed functions
- Configurable fault/protection functions
- 2 process PID functions
- PID sleep function
- PID trim function
- Mechanical brake control
- 8 state sequence programming
- 2 sets of user parameter sets
- Safe torque off
- Parameter lock

The ACS355 features the following motor control functions:

- Current, torque, speed and frequency limits
- Under- and overvoltage controllers
- Starting to the rotating machine
- Linear, squared and user defined U/f curves for scalar control
- IR compensation for scalar control
- Flux optimization for energy saving
- Flux braking for improved ramping down
- Drive temperature controlled switching frequency control
- Motor noise smoothing
- Sensorless vector control for induction motors
- Sensorless vector control for permanent magnet motors
- Smooth starting function for permanent magnet motors
- PID speed controller in vector controlled mode
- Acceleration compensation
- Speed controller auto tune
- Stand-alone and rotating motor identification runs
- Optional speed feed back for closed loop vector control



Control program variants

High speed application +N826

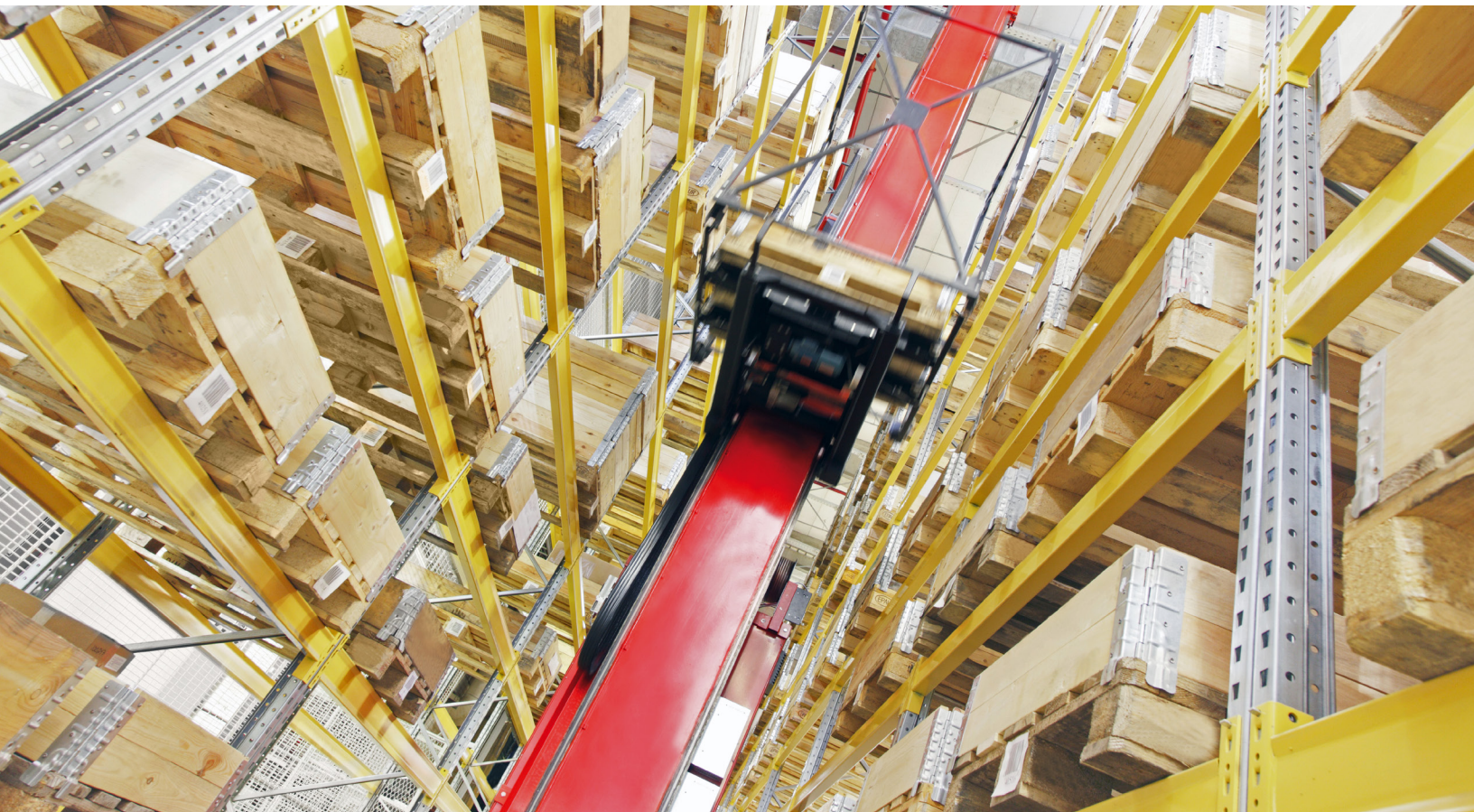
ACS355 high speed variant offers possibility to run the motor up to 1400 Hz in scalar mode or up to 32000 rpm in vector control mode. Both asynchronous motors and permanent magnet synchronous motors can be run without encoder. This firmware variant features speed controller tuning for different tools used in the spindle, as well as up to six user sets which can be used to

store for example acceleration and deceleration times. These make the drive suitable for spindle applications such as polishing, grinding and carving applications in glass, metal, plastic and wood working industries.

Following table shows the recommended drive selection parameters when using the drive with high speed motors.

Motor rated frequency range (Hz)	Minimum switching frequency	Recommended switching frequency	Switching frequency control (2607)	Minimum derating		Recommended derating		Max ambient temperature	
				200 V drive	400 V drive	200 V drive	400 V drive		
0	300 to 600	4 kHz	8 kHz	0 = ON (LOAD)	No derating	No derating	90%	75%	40
300	800 to 1000	8 kHz	12 kHz	1 = ON	90%	75%	80%	50%	30
800	1400	12 kHz	12 kHz	1 = ON	80%	50%	80%	50%	30





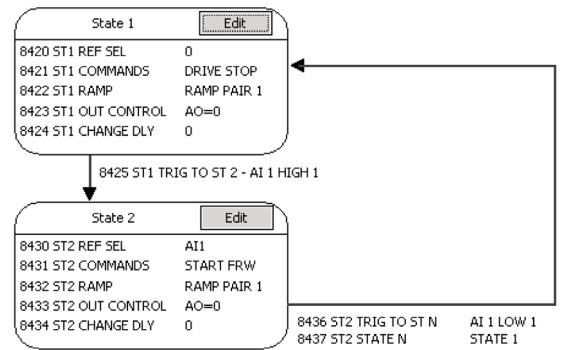
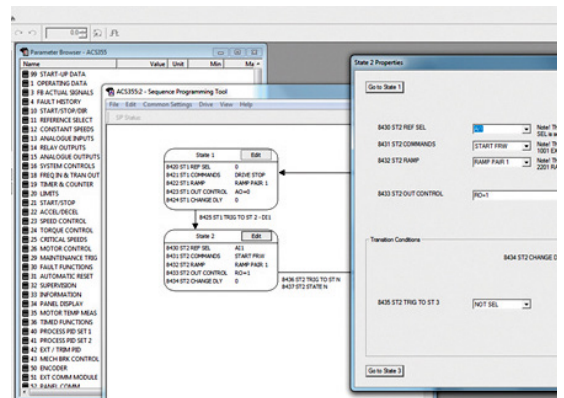
Enhanced sequence programming +N830

ACS355 enhanced sequence programming variant extends sequence programming up to 16 states with additional features. The program enables simple point-to-point positioning with 4 different targets when driving towards counter targets.

Transitions between the states can be controlled with IO and also from the fieldbus. It is possible to limit the torque and speed inside the state in addition to the existing control out of the state such as controlling the relay or analog output signal. Using relay extension module enables control of all 4 relays.

The firmware variant suits best to applications requiring repeatability or fixed driving sequences. Such applications are barriers in traffic control, automatic warehouse conveyors, assembly line conveyors and lifting equipment.

Enhanced sequence programming is at its best when programmed and commissioned with DriveWindowLight software offering graphical interface to each sequence state and its controls.



**Low ambient start +N828**

ACS355 low ambient start variant extends the minimum starting temperature to -39 degrees Celsius. This was done by reevaluating and adjusting the drive's low temperature thermal fault set point to -40 degrees Celsius.

This firmware variant also adds a motor heating feature. With motor heating feature enabled, a percentage of nominal motor current is DC inject into the motor windings when the drive is stopped but still powered. This DC current is used to keep the internal temperature of the motor and drive above ambient.

Operators and control systems are notified that the motor and drive still is being supplied with current by an alarm that is annunciated on the operator's panel or through the communication bus.

Combine the ACS355 +N828 drive with an AC500-XC to provide a Drive and PLC combination good to -40C.

Product variants

High protection class drive +B063

A range of ABB machinery drives with IP66 protection is designed for applications exposed to dust, moisture and cleaning chemicals such as screws, mixers, pumps, fans and conveyors. Typical industries that benefit from the drive include food and beverage, textile, ceramics, pulp and paper, water and wastewater, printing and rubber and plastics.

The heat sink's cooling fins are completely open from top to bottom, which allows easy washing to

ensure no dirt adheres to the surfaces. Assistant control panel housed within a plastic window is designed to resist moist and dusty atmospheres. Furthermore, the cooling fan is located inside the drive, thereby eliminating the need for an external cooling fan and the subsequent maintenance of external moving parts.

The drive's hygienic design and use of materials meeting current hygiene standards, means that the drive traps no bacteria and can withstand frequent washing. The drive is certified by NSF.

Mains connection, high protection class drive	
Voltage and power range	3-phase, 200 to 240 V \pm 10% 0.5 to 5 hp (0.37 to 4 kW) 3-phase, 380 to 480 V \pm 10% 0.5 to 10 hp (0.37 to 7.5 kW)
Common DC	Cannot be used with high degree protection class
Environmental limits, high protection class drive	
Ambient temperature	-10 to 40 °C (14 to 104 °F), no frost allowed
Degree of protection	IP66/IP67/UL Type 4X, indoor use only IP69K with compatible cable glands
Product compliance, high protection class drive	
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/RCM and EAC approvals	
RoHS compliant	
NSF Certified	
DIN40050-9 (IP69K)	



Ratings IP66/IP67/UL Type 4X			Type designation	Frame size
P_N (hp)	P_N (kW)	I_{2N} (A)		
1-phase AC supply, 200 to 240 V *				
0.5	0.37	3.5	ACS355-03U-06A7-2+B063(+F278)	R1
1.0	0.75	4.9	ACS355-03X-06A7-2+B063(+F278)	R1
2.0	1.5	102	ACS355-03X-07A5-2+B063(+F278)	R1
3-phase AC supply, 200 to 240 V				
0.5	0.37	2.4	ACS355-03X-02A4-2 + B063(+F278)	R1
0.75	0.55	3.5	ACS355-03X-03A5-2 + B063(+F278)	R1
1.0	0.75	4.7	ACS355-03X-04A7-2 + B063(+F278)	R1
1.5	1.1	6.7	ACS355-03X-06A7-2 + B063(+F278)	R1
2.0	1.5	7.5	ACS355-03X-07A5-2 + B063(+F278)	R1
3.0	2.2	9.8	ACS355-03X-09A8-2 + B063(+F278)	R3
4.0	3.0	13.3	ACS355-03X-13A3-2 + B063(+F278)	R3
5.0	4.0	17.6	ACS355-03X-17A6-2 + B063(+F278)	R3
3-phase AC supply, 380 to 480 V				
0.5	0.37	1.2	ACS355-03X-01A2-4 + B063(+F278)	R1
0.75	0.55	1.9	ACS355-03X-01A9-4 + B063(+F278)	R1
1.0	0.75	2.4	ACS355-03X-02A4-4 + B063(+F278)	R1
1.5	1.1	3.3	ACS355-03X-03A3-4 + B063(+F278)	R1
2.0	1.5	4.1	ACS355-03X-04A1-4 + B063(+F278)	R1
3.0	2.2	5.6	ACS355-03X-05A6-4 + B063(+F278)	R1
4.0	3.0	7.3	ACS355-03X-07A3-4 + B063(+F278)	R1
5.0	4.0	8.8	ACS355-03X-08A8-4 + B063(+F278)	R1
7.5	5.5	12.5	ACS355-03X-12A5-4 + B063(+F278)	R3
10.0	7.5	15.6	ACS355-03X-15A6-4 + B063(+F278)	R3

X within the type designation stands for E or U.

P_N for kW = Typical motor power in 400 V at normal use

P_N for hp = Typical motor power in 460 V at normal use

I_{2N} for A = Continuous rms current. 50% overload is allowed for one minute in ten minutes.

* Re-rated 3ph drives

(+F278) = Optional disconnect

Dimensions on page 12

Solar pump drive +N827

Solar pump system consists of a pump, photo voltaic (PV) panel system fitted to provide enough voltage and power to the pump, and solar pump drive converting the PV energy of DC voltage and DC current suitable for AC motor. Pump is very often submersible pump where motor is integrated to the pump itself.

ABB solar pump drive is environmentally friendly, with a long lifetime and low maintenance costs. It is independent from the grid and produces no pollution or noise. Typical applications are irrigation, community water supply, fish farming and agriculture.

This variant offers maximum power point tracking algorithm to maximize the solar panel output as well as water pumping specific functions such as dry running detection and flow calculation.



Ratings			Type designation	Frame size IP20	Typical losses W*)	MPPT voltage range		DC voltage range	
P _N (hp)	P _N (kW)	I _{2N} (A)				Min	Max	Min **)	Max ***)
1-phase AC supply, 125 to 400 V DC or 200 to 240 V									
0.5	0.37	4.7	ACS355-01E-04A7-2	R1	48	243	400	150	420
1.0	0.75	6.7	ACS355-01E-06A7-2	R1	68	243	400	150	420
1.5	1.1	7.5	ACS355-01E-07A5-2	R2	71	243	400	150	420
2.0	1.5	9.8	ACS355-01E-09A8-2	R2	90	243	400	150	420
3-phase AC supply, 125 to 400 V DC or 200 to 240 V									
0.5	0.37	3.5	ACS355-03E-03A5-2	R0	33	243	400	150	420
0.75	0.55	4.7	ACS355-03E-04A7-2	R1	41	243	400	150	420
1.0	0.75	6.7	ACS355-03E-06A7-2	R1	59	243	400	150	420
1.5	1.0	7.5	ACS355-03E-07A5-2	R1	61	243	400	150	420
2.0	1.5	9.8	ACS355-03E-09A8-2	R2	79	243	400	150	420
3.0	2.2	13.3	ACS355-03E-13A3-2	R2	50	243	400	150	420
4.0	3.0	17.6	ACS355-03E-17A6-2	R2	135	243	400	150	420
5.0	4.0	24.4	ACS355-03E-24A4-2	R3	219	243	400	150	420
7.5	5.5	31.0	ACS355-03E-31A0-2	R4	252	243	400	150	420
10.0	7.5	46.2	ACS355-03X-46A2-2	R4	380	243	400	150	420
3-phase AC supply, 250 to 800 V DC or 380 to 480 V									
0.5	0.37	1.9	ACS355-03E-01A9-4	R0	22	460	800	250	840
0.75	0.55	2.4	ACS355-03E-02A4-4	R1	28	460	800	250	840
1.0	0.75	3.3	ACS355-03E-03A3-4	R1	36	460	800	250	840
1.5	1.1	4.1	ACS355-03E-04A1-4	R1	43	460	800	250	840
2.0	1.5	5.6	ACS355-03E-05A6-4	R1	60	460	800	250	840
3.0	2.2	7.3	ACS355-03E-07A3-4	R1	75	460	800	250	840
4.0	3.0	8.8	ACS355-03E-08A8-4	R1	91	460	800	250	840
5.0	4.0	12.5	ACS355-03E-12A5-4	R3	119	460	800	250	840
7.5	5.5	15.6	ACS355-03E-15A6-4	R3	153	460	800	250	840
10.0	7.5	23.1	ACS355-03E-23A1-4	R3	232	460	800	250	840
15.0	11.0	31.0	ACS355-03E-31A0-4	R4	316	460	800	250	840
20.0	15.0	38.0	ACS355-03E-38A0-4	R4	388	460	800	250	840
25.0	18.5	44.0	ACS355-03E-44A0-4	R4	460	460	800	250	840

*) This is typical maximum losses of drive with basic control panel running at rated power at rated speed at rated conditions.

**) Operation is started with minimum voltage, but 100% AC current cannot be achieved before voltage is equal or higher than minimum MPPT voltage.

***) Panel open circuit voltage should be dimensioned so that it will never in any conditions exceed this level.

Options

Selecting options

The options shown in the table are available within the ACS355 range. The ordering code, which is shown in the second column,

replaces the XXXX in the type designation. You can order as many options as required, simply by extending the code as necessary.

Options	Ordering code	Description	Model	Availability	
				IP20 drive	IP66/67 drive
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	■	–
	B063	IP66/IP67/UL type 4X enclosure		–	■
Control panel (choose one option only)	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	□	–
Potentiometer	J402	Potentiometer	MPOT-01	□	–
Fieldbus (choose one option only)	K451	DeviceNet™	FDNA-01	□	□
	K452	LonWorks®	FLON-01	□	□
	K454	PROFIBUS DP	FPBA-01	□	□
	K457	CANopen®	FCAN-01	□	□
	K458	Modbus RTU	FMBA-01	□	□
	K462	ControlNet™	FCNA-01	□	□
	K466	1 port EtherNet/IP™, Modbus TCP, PROFINET IO	FENA-01	□	□
	K469	EtherCAT®	FECA-01	□	□
	*)	RS-485/Modbus	FRSA-00		
	K470	POWERLINK	FEPL-02	□	□
	K473	1 port EtherNet/IP™, Modbus TCP, PROFINET IO	FENA-11	□	□
	K475	2 port EtherNet/IP™, Modbus TCP, PROFINET IO	FENA-21	□	□
	*)	20 pack PROFIBUS DP for machinery drives	FPBA-01-M	□	□
	*)	20 pack CANopen for machinery drives	FCAN-01-M	□	□
Extension modules (choose one option only)	L502	Speed encoder module	MTAC-01	□	–
	L511	Relay output module	MREL-01	□	–
	G406	Auxiliary power extension module	MPOW-01	□	–
High protection class options	H376	Cable gland kit (IP66/IP67/UL Type 4X)		–	□
	F278	Input switch kit (factory installed variant)		–	□
Pressure compensation	C169	Pressure compensation valve		–	□
Tools	*)	FlashDrop tool	MFD-01	□	□
	*)	DriveWindow Light	DriveWindow Light	□	□
External options	*)	Input chokes		□	□ ¹⁾
	*)	EMC filters		□	□ ¹⁾
	*)	Braking resistors		□	□ ¹⁾
	*)	Output chokes		□	□ ¹⁾
	N826	High Speed Application		■	■
	N827	Solar pump drive		■	–
	N828	Low ambient start		■	■
N830	Enhanced sequence programming		■	■	

● = Standard
■ = Product variant

□ = Option, external
– = Not available

*) = To be ordered as a separate item.
**) = Available in selected countries.

¹⁾ External options not available in IP66/IP67/UL Type 4X protection class.

Options Interface

User interfaces

Panel cover

The purpose of the panel cover is to protect the drive's connection surfaces. The ACS355 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 the 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 a built-in help function to guide the user. It includes a real time clock, which can be used during fault logging and in controlling the drive, such as start/stop. The control panel can be used for copying parameters for back up or for downloading to another drive. A large graphical display and soft keys make it extremely easy to navigate. The drive with IP66/IP67 enclosure has the assistant control panel as standard.

Potentiometer

Potentiometer MPOT-01 with two switches: start/stop and forward/reverse. Polarity is selected with DIP switches. No external power source is needed for the potentiometer.

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.



01



02



03



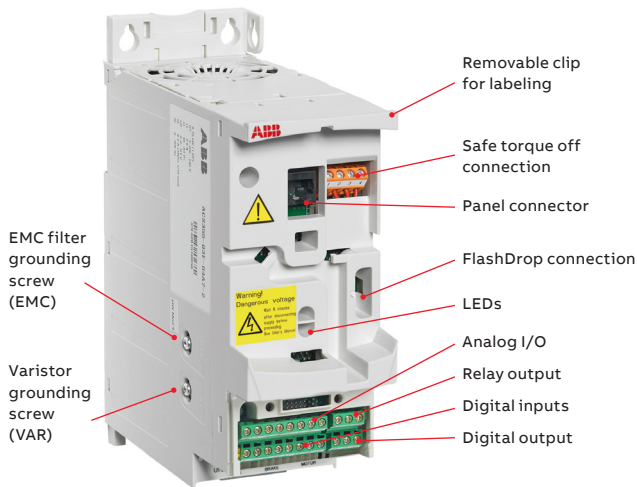
04



05

- 01 Panel cover (included as standard)
- 02 Basic control panel
- 03 Assistant control panel
- 04 Potentiometer
- 05 Panel holder mounting kit OPMP-01

Options Interface



— 01 Fieldbus module
— 02 NEMA 1/UL type 1 kit
— 03 Extension module MTAC-01



Machine interfaces

The plug-in fieldbus modules bring connectivity to major automation systems. A single twisted pair cable avoids large amounts of conventional cabling, thereby reducing costs and increasing system reliability.

ACS355 supports the following fieldbus options:

- CANopen®
- ControlNet™
- DeviceNet™
- EtherCAT®
- EtherNet/IP™
- LonWorks®
- Modbus RTU
- Modbus TCP
- PROFIBUS DP
- PROFINET IO
- POWERLINK

Extension modules

MREL-01

ACS355 has one relay output as standard. The optional MREL-01 module offers three additional relay outputs, which can be configured for different functions with parameters.

MTAC-01

The optional MTAC-01 module offers pulse encoder interface for speed measurement.

MPOW-01

The optional auxiliary power module MPOW-01 enables the drive control circuitry to be operated under all conditions.

Protection and installation

NEMA 1/UL Type 1 kit

The NEMA 1/UL Type 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 clamps are included in the drive package as standard.

Options

Software tools

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

Automation Builder

Automation Builder is an integrated programming, maintenance and simulation environment for PLCs, safety products, robots, motion products, drives and control panels. It combines the proven ABB tools RobotStudio, Drive Manager, Mint WorkBench, Panel Builder and succeeds Control Builder Plus, and enables use in IEC 61131-3, PLCopen, C/ C++, RAPID and MINT programming languages.

Automation Builder minimizes your efforts for managing project code and data with common data storage, single project archive, time saving

library blocks for device integration, and a common software installer. The software includes easy to use libraries for applications in wind, water, solar, drives, motion, robotics and safety.

Making a joint backup with Automation Builder helps you to secure and restore your applications. Download Automation Builder from www.abb.com/automationbuilder for 30 days test license.

Drive Manager

Drive Manager offers machine builders and system integrators a device tool to configure and monitor ABB's low voltage AC drives and AC500 PLCs. The software is included in the Automation Builder engineering environment. Engineering drives and PLCs in one environment simplifies work, and saves commissioning time and cost.



Options

Software tools

Drive Manager for SIMATIC (DM4S-01)

Drive Manager for SIMATIC is a plug-in device tool that can be easily installed into the SIMATIC STEP 7 engineering environment and TIA Portal. It utilizes the TCI interface of the SIMATIC PLC to communicate with the drives connected to PROFIBUS or PROFINET network. The setup enables engineering ABB's low voltage AC drives from the SIMATIC environment without the need for a separate ABB specific PC tool.

Function block library

ABB offers a function block library to enable easy integration of ABB low voltage drives in the SIMATIC S7 environment. The function block library is available from the ABB website (document number: 3AUA0000099358). The ZIP package includes manuals, examples and GSD files that can be imported to the SIMATIC S7 environment.

Ready-made features to your advantage

Drive Manager for SIMATIC offers several useful features that simplify the setup of ABB low voltage drives used in combination with SIMATIC S7 PLCs including:

- Network connection over PROFIBUS and PROFINET (single point of access) both locally and remotely
- Online and offline configuration of drives
- Monitoring of drive actual values
- Export to/import from the drive dedicated PC tools
- Saving drive parameter settings within the SIMATIC PLC project
- Remote connection to drives via PLC for diagnostics, parameterization, oscilloscope

Remote use

DriveManager for AC500 and SIMATIC S7 PLCs also enables remote use of drives, PLCs and HMI panels. "Plug-and-play" ready 2G/3G/4G mobile solution with dynamic IP address management and VPN tunneling makes

commissioning easier without any PC softwares. Remote connection to all functionalities of PLCs and HMIs includes:

- Remote connection to drives via PLC for diagnostics, parameterization, oscilloscope
- Data reading/writing
- Online and offline programming
- Extensive fault diagnostics
- Controlled update of firmware
- Download/upload of logged data on SD card
- Web Server
- FTP

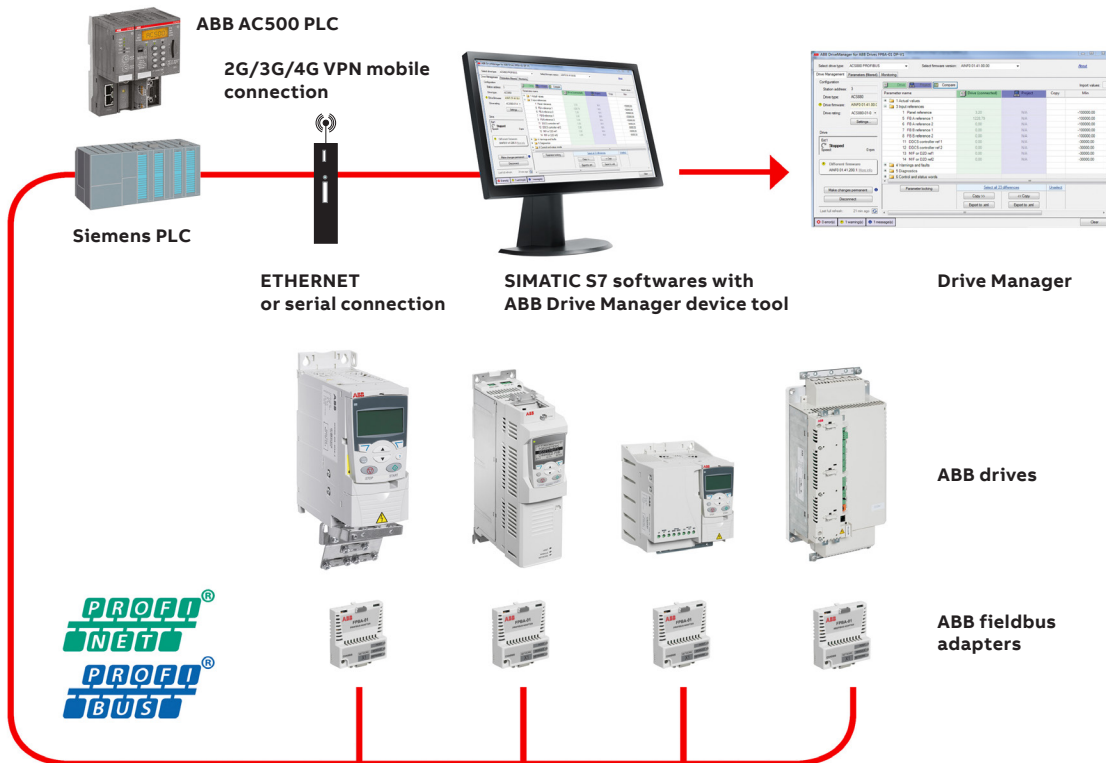
DriveWindow Light

DriveWindow Light is an easy-to-use commissioning and maintenance tool for ACS355 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 of the drive is naturally 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. Any signal can be set to stop the monitoring from a predefined level.

Sequence programming tool

DriveWindow Light allows the user to visually build and manipulate sequence programming parameters that are loaded into the ACS355. The programming is done in a graphical editor which displays each sequence step and its transitions as an individual block. Sequence programming enables application specific programming with up to 8 configurable sequences. This new and easy way to preset sequences reduces the need for an external programmable logic control (PLC).

In simple applications an external PLC can be left out.



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

- Graphical sequence programming tool for ACS355
- Editing, saving and downloading parameters
- Graphical and numerical signal monitoring
- Drive control
- Startup wizards

DriveWindow Light requirements

- Windows NT/2000/XP/Vista/7
- Free serial port from a PC
- Free control panel connector

Sequence programming example: radio button

In this example, analog input AI1 will start the motor at a fixed speed. This function is useful when the drive is operated using only a potentiometer. The motor speed is proportional to the analog input when analog input level is higher than the fixed level. In this case separate start and stop commands are not needed.

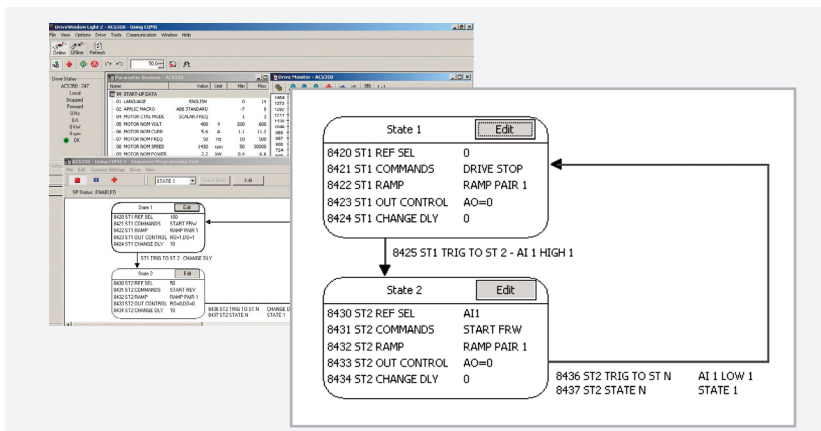
The analog input level is monitored using the ACS355's supervision function. Supervision function status is set as a transition rule between the two states of the sequence program.

In state 1 the drive is in stand-by, monitoring the AI1 level. In state 2 the drive starts in the forward direction and its reference is from AI1. In state 2, the supervision function monitors the AI1 level.

If the value falls below the set limit, the sequence program makes a transition to state 1 and the drive is stopped.

There are two ramp pairs from which different ramping times can be selected within each state. It is also possible within the sequence program to control the analog output, digital output and relay output independently.

Supervision function, AI1 scaling to speed reference, and ramp times, can be set independent of the sequence program.





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 the FlashDrop tool. 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 requirements

- Windows 2000/XP/Vista/7
- Free serial port from a PC

FlashDrop package includes

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

Options

External

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

EMC filters

The ACS355'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 ACS355-	Frame size	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						
01U-02A4-2	R0	10	30	–	30	30
01U-04A7-2	R1	10	30	50	30	50
01U-06A7-2	R1	10	30	50	30	50
01U-07A5-2	R2	10	30	50	30	50
01U-09A8-2	R2	10	30	50	30	50
3-phase AC supply, 200 to 240 V						
03U-02A4-2	R0	10	30	–	30	30
03U-03A5-2	R0	10	30	–	30	30
03U-04A7-2	R1	10	30	50	30	50
03U-06A7-2	R1	10	30	50	30	50
03U-07A5-2	R1	10	30	50	30	50
03U-09A8-2	R2	10	30	50	30	50
03U-13A3-2	R2	10	30	50	30	50
03U-17A6-2	R2	10	30	50	30	50
03U-24A4-2	R3	10	30	50	30	50
03U-31A0-2	R4	10	30	50	30	50
03U-46A2-2	R4	10	30	50	30	50
3-phase AC supply, 380 to 480 V						
03U-01A2-4	R0	30	30	–	30	30
03U-01A9-4	R0	30	30	–	30	30
03U-02A4-4	R1	50	50	50	30	50
03U-03A3-4	R1	50	50	50	30	50
03U-04A1-4	R1	50	50	50	30	50
03U-05A6-4	R1	50	50	50	30	50
03U-07A3-4	R1	50	50	50	30	50
03U-08A8-4	R1	50	50	50	30	50
03U-12A5-4	R3	40	40	40	30	50
03U-15A6-4	R3	40	40	40	30	50
03U-23A1-4	R3	40	40	40	30	50
03U-31A0-4	R4	–	30	–	30	50
03U-38A0-4	R4	–	30	–	30	50
03U-44A0-4	R4	–	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.

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 st environment, unrestricted distribution
Category C2	Group 1 Class A	1 st environment, restricted distribution
Category C3	Group 2 Class A	2 nd environment, unrestricted distribution
Category C4	Not applicable	2 nd environment, restricted distribution

Options

Resistors

Dynamic Braking Using the Built-in Braking Chopper (Transistor)

All ACS355 drives include a built-in brake chopper for use with a braking resistor to perform dynamic braking. No separate option kits need to be selected, no additional panel space is required, no additional installation time is needed to assemble a brake chopper. No separate fuses in the brake circuit are

required if the mains cable is protected with fuses and no mains cable/fuse overrating takes place. Use the following tables to select the correct brake resistor for your application. Either compact CR type resistors (for smaller drives) or standard enclosed resistor packages are available. For more information regarding the selection of other braking resistors and the limits of the built-in brake chopper, see the ACS355 User Manual 3AUA00000661 Brake resistor selection tables

Single Phase 200-240V applications, stopping duty only

Type CR Resistors (available for the small Hp drives as listed below)

Drive Part No. ACS355-01U-	Hp	Duty Cycle=3sec on/27sec off			Duty Cycle=10sec on/50sec off		
		CR Part No. ¹	Ohms	Watts	CR Part No. ¹	Ohms	Watts
02A4-2	0.5	P14494-CR-02	200	100	P14494-CR-02	200	100
04A7-2	1	P14494-CR-04	100	100	P14494-CR-04	100	100
06A7-2	1.5	P14494-CR-04	100	100	P14494-CR-11	100	150
07A5-2	2	P14494-CR-04	100	100	P14494-CR-16	100	200
09A8-2	3	P14494-CR-12	50	150	P14494-CR-24	50	300

Drive Part No. ACS355-01U-	Hp	Duty Cycle=30sec on/180sec off			Duty Cycle=60sec on/180sec off		
		CR Part No. ¹	Ohms	Watts	CR Part No. ¹	Ohms	Watts
02A4-2	0.5	P14494-CR-02	200	100	P14494-CR-02	200	100
04A7-2	1	P14494-CR-11	100	150	P14494-CR-16	100	200
06A7-2	1.5	P14494-CR-16	100	200	P14494-CR-22	100	300
07A5-2	2	P14494-CR-22	100	300	P14494-CR-30	100	400
09A8-2	3	P14494-CR-32	50	400	---	---	---

Standard Enclosed Resistor Packages

Drive Part No. ACS355-01U-	Hp	Duty Cycle=3sec on/27sec off			Duty Cycle=10sec on/50sec off		
		Resistor Part No. ¹	Ohms	Watts	Resistor Part No. ¹	Ohms	Watts
02A4-2	0.5	P14494-19	75	300	P14494-19	75	300
04A7-2	1	P14494-24	45	300	P14494-24	45	300
06A7-2	1.5	P14494-24	45	300	P14494-24	45	300
07A5-2	2	P14494-31	35	300	P14494-31	35	300
09A8-2	3	P14494-31	35	300	P14494-31	35	300

Drive Part No. ACS355-01U-	Hp	Duty Cycle=30sec on/180sec off			Duty Cycle=60sec on/180sec off		
		Resistor Part No. ¹	Ohms	Watts	Resistor Part No. ¹	Ohms	Watts
02A4-2	0.5	P14494-19	75	300	P14494-19	75	300
04A7-2	1	P14494-24	45	300	P14494-24	45	300
06A7-2	1.5	P14494-24	45	300	P14494-24	45	300
07A5-2	2	P14494-31	35	300	P14494-32	35	820
09A8-2	3	P14494-32	35	820	P14494-32	35	820

NOTES:

1. To determine resistor type, dimensions and weights refer to Resistor Technical Data Tables.

Options

Resistors

Three Phase 200-240V applications, stopping duty only

Type CR Resistors (available for the small Hp drives as listed below)

Drive Part No. ACS355-03U-	Hp	Duty Cycle=3sec on/27sec off			Duty Cycle=10sec on/50sec off		
		CR Part No. ¹	Ohms	Watts	CR Part No. ¹	Ohms	Watts
02A4-2	0.5	P14494-CR-02	200	100	P14494-CR-02	200	100
03A5-2	0.75	P14494-CR-04	100	100	P14494-CR-04	100	100
04A7-2	1	P14494-CR-04	100	100	P14494-CR-04	100	100
06A7-2	1.5	P14494-CR-04	100	100	P14494-CR-11	100	150
07A5-2	2	P14494-CR-06	50	100	P14494-CR-18	50	200
09A8-2	3	P14494-CR-12	50	150	P14494-CR-24	50	300
17A6-2	5	P14494-CR-26	40	300	P14494-CR-34	40	400

Drive Part No. ACS355-03U-	Hp	Duty Cycle=30sec on/180sec off			Duty Cycle=60sec on/180sec off		
		CR Part No. ¹	Ohms	Watts	CR Part No. ¹	Ohms	Watts
02A4-2	0.5	P14494-CR-02	200.0	100	P14494-CR-02	200.0	100
03A5-2	0.75	P14494-CR-04	100.0	100	P14494-CR-11	100.0	150
04A7-2	1	P14494-CR-11	100.0	150	P14494-CR-16	100.0	200
06A7-2	1.5	P14494-CR-16	100.0	200	P14494-CR-22	100.0	300
07A5-2	2	P14494-CR-24	50.0	300	P14494-CR-32	50.0	400
09A8-2	3	P14494-CR-32	50.0	400	---	---	---

Standard Enclosed Resistor Packages

Drive Part No. ACS355-03U-	Hp	Duty Cycle=3sec on/27sec off			Duty Cycle=10sec on/50sec off		
		Resistor Part No. ¹	Ohms	Watts	Resistor Part No. ¹	Ohms	Watts
02A4-2	0.5	P14494-19	75.0	300	P14494-19	75.0	300
03A5-2	0.75	P14494-19	75.0	300	P14494-19	75.0	300
04A7-2	1	P14494-24	45.0	300	P14494-24	45.0	300
06A7-2	1.5	P14494-24	45.0	300	P14494-24	45.0	300
07A5-2	2	P14494-31	35.0	300	P14494-31	35.0	300
09A8-2	3	P14494-31	35.0	300	P14494-31	35.0	300
17A6-2	5	P14494-31	35.0	300	P14494-32	35.0	820
24A4-2	7.5	P14494-39	21.0	400	P14494-40	21.0	750
31A0-2	10	P14494-46	15.0	750	P14494-47	15.0	1150
46A2-2	15	P14494-56	10.0	720	P14494-57	10.0	1250

Drive Part No. ACS355-03U-	Hp	Duty Cycle=30sec on/180sec off			Duty Cycle=60sec on/180sec off		
		Resistor Part No. ¹	Ohms	Watts	Resistor Part No. ¹	Ohms	Watts
02A4-2	0.5	P14494-19	75.0	300	P14494-19	75.0	300
03A5-2	0.75	P14494-19	75.0	300	P14494-19	75.0	300
04A7-2	1	P14494-24	45.0	300	P14494-24	45.0	300
06A7-2	1.5	P14494-24	45.0	300	P14494-24	45.0	300
07A5-2	2	P14494-31	35.0	300	P14494-32	35.0	820
09A8-2	3	P14494-32	35.0	820	P14494-32	35.0	820
17A6-2	5	P14494-32	35.0	820	P14494-33	35.0	1200
24A4-2	7.5	P14494-41	21.0	1050	P14494-42	21.0	1500
31A0-2	10	P14494-48	15.0	1550	P14494-49	15.0	2160
46A2-2	15	P14494-58	10.0	1800	P14494-59	10.0	3600

NOTES:

1. To determine resistor type, dimensions and weights refer to Resistor Technical Data Tables.

Options

Resistors

Three Phase 380-480V applications, stopping duty only

Type CR Resistors (available for the small Hp drives as listed below)

Drive Part No. ACS355-03U-	Hp	Duty Cycle=3sec on/27sec off			Duty Cycle=10sec on/50sec off		
		CR Part No. ¹	Ohms	Watts	CR Part No. ¹	Ohms	Watts
01A2-4	0.5	P14494-CR-01	500.0	100	P14494-CR-01	500.0	100
01A9-4	0.75	P14494-CR-01	500.0	100	P14494-CR-01	500.0	100
02A4-4	1	P14494-CR-02	200.0	100	P14494-CR-02	200.0	100
03A3-4	1.5	P14494-CR-02	200.0	100	P14494-CR-09	200.0	150
04A1-4	2	P14494-CR-03	150.0	100	P14494-CR-15	150.0	200
05A6-4	3	P14494-CR-11	100.0	150	P14494-CR-22	100.0	300
08A8-4	5	P14494-CR-22	100.0	300	P14494-CR-30	100.0	400
12A5-4	8	P14494-CR-32	50.0	400	---	---	---

Drive Part No. ACS355-03U-	Hp	Duty Cycle=30sec on/180sec off			Duty Cycle=60sec on/180sec off		
		CR Part No. ¹	Ohms	Watts	CR Part No. ¹	Ohms	Watts
01A2-4	0.5	P14494-CR-01	500	100	P14494-CR-01	500	100
01A9-4	0.75	P14494-CR-01	500	100	P14494-CR-07	500	150
02A4-4	1	P14494-CR-09	200	150	P14494-CR-14	200	200
03A3-4	1.5	P14494-CR-14	200	200	P14494-CR-20	200	300
04A1-4	2	P14494-CR-21	150	300	P14494-CR-29	150	400
05A6-4	3	P14494-CR-30	100	400	---	---	---

Standard Enclosed Resistor Packages

Drive Part No. ACS150/355-03U-	Hp	Duty Cycle=3sec on/27sec off			Duty Cycle=10sec on/50sec off		
		Resistor Part No. ¹	Ohms	Watts	Resistor Part No. ¹	Ohms	Watts
01A2-4	0.5	P14494-10	350.0	200	P14494-10	350.0	200
01A9-4	0.75	P14494-11	250.0	300	P14494-11	250.0	300
02A4-4	1	P14494-11	250.0	300	P14494-11	250.0	300
03A3-4	1.5	P14494-13	200.0	300	P14494-13	200.0	300
04A1-4	2	P14494-15	150.0	300	P14494-15	150.0	300
05A6-4	3	P14494-15	150.0	300	P14494-15	150.0	300
08A8-4	5	P14494-19	75.0	300	P14494-20	75.0	600
12A5-4	7.5	P14494-25	45.0	800	P14494-25	45.0	800
15A6-4	10	P14494-25	45.0	800	P14494-26	45.0	1260
23A1-4	15	P14494-32	35.0	820	P14494-33	35.0	1200
31A0-4	20	P14494-41	21.0	1050	P14494-43	21.0	2000
38A0-4	25	P14494-47	15.0	1150	P14494-49	15.0	2160
44A0-4	30	P14494-48	15.0	1550	P14494-50	15.0	2450

Drive Part No. ACS150/355-03U-	Hp	Duty Cycle=30sec on/180sec off			Duty Cycle=60sec on/180sec off		
		Resistor Part No. ¹	Ohms	Watts	Resistor Part No. ¹	Ohms	Watts
01A2-4	0.5	P14494-10	350.0	200	P14494-10	350.0	200
01A9-4	0.75	P14494-11	250.0	300	P14494-11	250.0	300
02A4-4	1	P14494-11	250.0	300	P14494-11	250.0	300
03A3-4	1.5	P14494-13	200.0	300	P14494-13	200.0	300
04A1-4	2	P14494-15	150.0	300	P14494-16	150.0	600
05A6-4	3	P14494-16	150.0	600	P14494-16	150.0	600
08A8-4	5	P14494-20	75.0	600	P14494-21	75.0	1000
12A5-4	7.5	P14494-26	45.0	1260	P14494-27	45.0	1920
15A6-4	10	P14494-26	45.0	1260	P14494-27	45.0	1920
23A1-4	15	P14494-38	35.0	1865	P14494-36	35.0	3600
31A0-4	20	P14494-44	21.0	2600	P14494-45	21.0	4400
38A0-4	25	P14494-53	15.0	3600	P14494-54	15.0	5000
44A0-4	30	P14494-53	15.0	3600	P14494-55	15.0	6000

NOTES:

1. To determine resistor type, dimensions and weights refer to Resistor Technical Data Tables.

Resistors

Technical data

Part Number	Ohms	Watts	Enclosure	Dimensions WxDxH (in)	Weight (lb)
P14494-10	350	200	GCE1	12W x 5D x 5H	8
P14494-11	250	300	GCE1	12W x 5D x 5H	7
P14494-12	250	600	GCE2	12W x 7D x 5H	10
P14494-13	200	300	GCE1	12W x 5D x 5H	7
P14494-14	200	600	GCE2	12W x 7D x 5H	10
P14494-15	150	300	GCE1	12W x 5D x 5H	7
P14494-16	150	600	GCE2	12W x 7D x 5H	10
P14494-17	150	900	GCE3	12W x 10D x 5H	13
P14494-18	150	1200	GCE4	12W x 13D x 5H	16
P14494-19	75	300	GCE1	12W x 5D x 5H	7
P14494-20	75	600	GCE2	12W x 7D x 5H	10
P14494-21	75	1000	GCE3	12W x 10D x 5H	13
P14494-22	80	1600	GCE4	12W x 13D x 5H	16
P14494-23	80	2400	GCE6	19W x 10D x 5H	20
P14494-24	45	300	GCE1	12W x 5D x 5H	7
P14494-25	45	800	GCE2	12W x 7D x 5H	10
P14494-26	45	1260	GCE3	12W x 10D x 5H	13
P14494-27	45	1920	GCE5	12W x 16D x 5H	18
P14494-28	45	2450	GCE8	19W x 13D x 5H	24
P14494-29	45	3200	GCE8	19W x 13D x 5H	25
P14494-30	45	4400	GCE12	26.5W x 13D x 5H	32
P14494-31	35	300	GCE1	12W x 5D x 5H	7
P14494-32	35	820	GCE2	12W x 7D x 5H	10
P14494-33	35	1200	GCE3	12W x 10D x 5H	13
P14494-34	35	1600	GCE4	12W x 13D x 5H	16
P14494-35	35	2500	GCE8	19W x 13D x 5H	24
P14494-36	35	3600	GCE9	26.5W x 10D x 5H	28
P14494-37	35	6200	GCE15	26.5W x 16D x 5H	32
P14494-38	35	1865	GCE5	12W x 16D x 5H	18
P14494-39	21	400	GCE1	12W x 5D x 5H	7
P14494-40	21	750	GCE2	12W x 7D x 5H	10
P14494-41	21	1050	GCE3	12W x 10D x 5H	13
P14494-42	21	1500	GCE4	12W x 13D x 5H	16
P14494-43	21	2000	GCE5	12W x 16D x 5H	18
P14494-44	21	2600	GCE8	19W x 13D x 5H	24
P14494-45	21	4400	GCE9	26.5W x 10D x 5H	23
P14494-46	15	750	GCE2	12W x 7D x 5H	10
P14494-47	15	1150	GCE3	12W x 10D x 5H	13
P14494-48	15	1550	GCE4	12W x 13D x 5H	16
P14494-49	15	2160	GCE6	19W x 10D x 5H	20
P14494-50	15	2450	GCE8	19W x 13D x 5H	24
P14494-51	15	2700	GCE8	19W x 13D x 5H	24
P14494-52	15	3150	GCE8	19W x 13D x 5H	25
P14494-53	15	3600	GCE6	19W x 10D x 5H	19
P14494-54	15	5000	GCE9	26.5W x 10D x 5H	23
P14494-55	15	6000	GCE12	26.5W x 13D x 5H	31
P14494-56	10	720	GCE2	12W x 7D x 5H	10
P14494-57	10	1250	GCE3	12W x 10D x 5H	13
P14494-58	10	1800	GCE5	12W x 16D x 5H	18
P14494-59	10	3600	GCE6	19W x 10D x 5H	19

Part Number	Ohms	Watts	Enclosure	Dimensions WxDxH (in)	Weight (lb)
P14494-CR-01	500	100	CR100	6W x 1.5D x 0.75H	1
P14494-CR-02	200	100	CR100	6W x 1.5D x 0.75H	1
P14494-CR-03	150	100	CR100	6W x 1.5D x 0.75H	1
P14494-CR-04	100	100	CR100	6W x 1.5D x 0.75H	1
P14494-CR-05	75	100	CR100	6W x 1.5D x 0.75H	1
P14494-CR-06	50	100	CR100	6W x 1.5D x 0.75H	1
P14494-CR-07	500	150	CR150	9W x 1.5D x 0.75H	1
P14494-CR-08	250	150	CR150	9W x 1.5D x 0.75H	1
P14494-CR-09	200	150	CR150	9W x 1.5D x 0.75H	1
P14494-CR-10	150	150	CR150	9W x 1.5D x 0.75H	1
P14494-CR-11	100	150	CR150	9W x 1.5D x 0.75H	1
P14494-CR-12	50	150	CR150	9W x 1.5D x 0.75H	1
P14494-CR-13	250	200	CR200	6W x 3D x 1.5H	2
P14494-CR-14	200	200	CR200	6W x 3D x 1.5H	2
P14494-CR-15	150	200	CR200	6W x 3D x 1.5H	2
P14494-CR-16	100	200	CR200	6W x 3D x 1.5H	2
P14494-CR-17	75	200	CR200	6W x 3D x 1.5H	2
P14494-CR-18	50	200	CR200	6W x 3D x 1.5H	1
P14494-CR-19	250	300	CR300	9W x 3D x 1.5H	3
P14494-CR-20	200	300	CR300	9W x 3D x 1.5H	3
P14494-CR-21	150	300	CR300	9W x 3D x 1.5H	3
P14494-CR-22	100	300	CR300	9W x 3D x 1.5H	3
P14494-CR-23	75	300	CR300	9W x 3D x 1.5H	3
P14494-CR-24	50	300	CR300	9W x 3D x 1.5H	3
P14494-CR-25	45	300	CR300	9W x 3D x 1.5H	3
P14494-CR-26	40	300	CR300	9W x 3D x 1.5H	3
P14494-CR-27	250	400	CR400	12W x 3D x 1.5H	4
P14494-CR-28	200	400	CR400	12W x 3D x 1.5H	4
P14494-CR-29	150	400	CR400	12W x 3D x 1.5H	4
P14494-CR-30	100	400	CR400	12W x 3D x 1.5H	4
P14494-CR-31	75	400	CR400	12W x 3D x 1.5H	4
P14494-CR-32	50	400	CR400	12W x 3D x 1.5H	4
P14494-CR-33	45	400	CR400	12W x 3D x 1.5H	4
P14494-CR-34	40	400	CR400	12W x 3D x 1.5H	4

Resistors

Installation instructions

CONSTRUCTION: Powerohm braking resistors consists of smooth-wound, wire-wound or edge-wound type resistor coils mounted in ventilated enclosures. All current carrying components used to manufacture our resistor coils including the elements and terminals are stainless steel for maximum corrosion resistance. Standard enclosures will be mill galvanized with terminals factory wired to a terminal block and normally closed thermal switch. Braking resistors are available with a variety of options such as special enclosure finishes and outdoor ratings.

INSPECTION: Upon receipt of your Powerohm Braking Resistor, be sure to inspect the unit carefully for any shipping damage. After unpacking, check the unit for loose, broken, bent or otherwise damaged parts due to shipping. Report any shipping damage immediately to the freight carrier. Be sure to verify that the part number and ratings listed on the nameplate conform to the order specification. The ohm rating listed on the nameplate is critical (too low of an ohm value may cause damage to the drive).

INSTALLATION:

IMPORTANT: The National Electric Code (NEC) and local regulations govern the installation and wiring of electrical equipment such as braking resistors. DC power wiring, AC power wiring, control wiring and conduit must be installed in accordance with these codes.

Powerohm braking assemblies cool by natural convection causing hot air to rise vertically from the enclosure. Braking resistors should be mounted in a well ventilated location free of any combustible materials or equipment affected by heat. Units should be installed with at least 24 inches of free space above the enclosure top and 6 inches of free space surrounding the enclosure sides. If necessary, units can be mounted on spacers or channels to limit heat from conducting from the resistor enclosure to its mounting surface.

Braking resistor enclosures 28 inches or less in width, can be mounted vertically or horizontally. If the unit is mounted vertically, it is important that the resistor coils remain in a horizontal position. Also, if a thermal switch is included with the unit, position the equipment so the switch remains near the top of the enclosure. See below for vertical mounting details.

Smaller 28 inch wide enclosures have convenient conduit knockouts for easy connection. Remove the proper knockout after determining a suitable entry point. Larger units may require field punching for conduit entry. It is preferable to

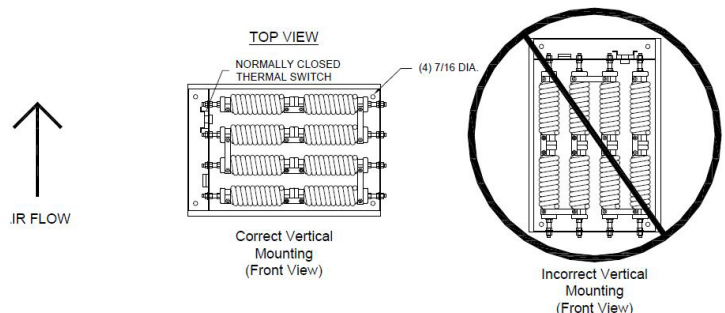
route conduit near the bottom of the resistor enclosure. After attaching conduit, pull wiring into the enclosure for connection to resistor. If connecting directly to the terminals on the resistor elements, it is necessary to use high temperature silicon or Teflon wire rated 200°C. Try to route wiring along the bottom of the enclosure and avoid running the wiring across the top or near the resistor elements. Units are supplied with either #10, 3/8 or 1/2 inch terminal hardware. If you choose to use the factory installed terminal block, then you may connect to it using standard 90°C rated wire. Be sure to properly ground the resistor enclosure to prevent electrical shock.

A normally closed thermal switch is included with the unit, featuring 3/4 inch quick connect terminals.

After installing and wiring to your Powerohm Braking Resistor, return the ventilated cover to its proper position. Securely tighten cover hardware (do not exceed 20 inch-pounds of torque).

MAINTENANCE: Periodically check the unit for loose connections and an accumulation of dust or dirt on the inside and outside of the resistor enclosure. Be sure to allow the unit to cool before servicing (contact may result in burn injury). Remove all power before servicing unit to avoid electrical shock. Allow at least one minute after input power has been removed for the bus voltage to discharge. Electric shock can cause injury or death. Resistor elements should not glow red under normal operating conditions. If the resistor elements glow red you may need a higher rated braking resistor.

TECHNICAL SUPPORT: If you have any questions about your braking resistor, contact Powerohm for assistance at (800) 838-4694.



Resistors

Type CR case resistors

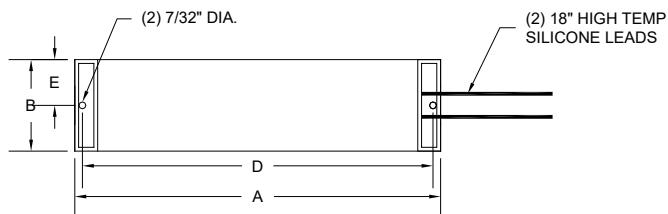
Overview

Powerohm's Type CR resistors are manufactured with quality components for superior performance and increased life expectancy. Our case resistors feature a nickel-chromium wire helically wound, then placed inside a ceramic fixture and inserted into a corrosion resistant aluminum case. Each coil end is terminated to high temperature wire leads and encapsulated with a ceramic potting material. The result is a resistor element electrically isolated, but thermally bound to the outer case to allow the element heat to transfer to the metallic case and efficiently cool. The units are supplied with 18" wire leads, and the case is machined to include two mounting holes for easy installation.

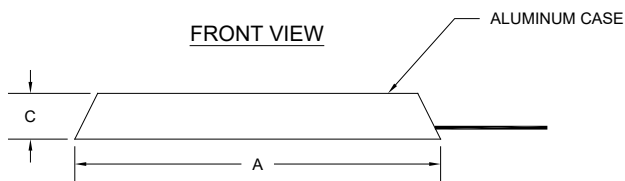
Electrical Ratings & Dimensions of Standard Size Case Resistors

Wattage	Dimension (in)				
	A	B	C	D	E
100	6	1-1/2	3/4	5-1/2	3/4
150	9	1-1/2	3/4	8-1/2	3/4
200	6	3	1-1/2	5-1/2	1-1/2
300	9	3	1-1/2	8-1/2	1-1/2
400	12	3	1-1/2	11-1/2	1-1/2

TOP VIEW



FRONT VIEW



Resistors

Type GCE resistors

Overview

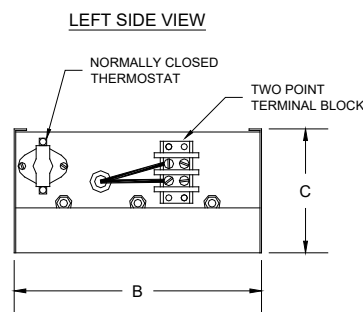
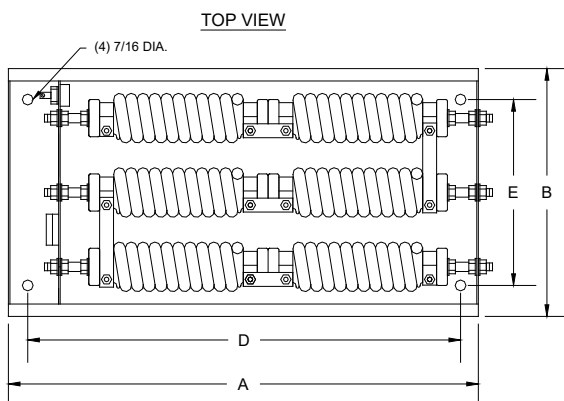
The type GCE enclosures are heavy gage screened enclosures featuring a solid bottom and a built-in wiring compartment separated from the resistor assembly. The resistors are factory wired to a terminal block mounted in this compartment using high temperature Teflon or silicone wire. The terminal compartment also houses a normally closed thermal switch used for detecting resistor temperature overloads. During installation, standard 90°C rated wire is routed into the compartment through the removable 1/2 inch conduit knockouts and connected to the factory wired terminal block.

Our standard unit includes a screened cover which is CNC punched to obtain maximum cooling and professional

aesthetics. Mounting holes are located inside the enclosure and can be easily accessed by removing the cover. Resistor coils are interconnected using stainless steel bus bars, producing a corrosion resistant current path to withstand nearly any harsh industrial environment. The standard finish is galvanized, but an optional powder coated, aluminum or stainless steel finish is available upon request. As shown in the table below, the size of the enclosure will vary depending on the number of resistor coils required for your application. Units are available with louvered covers; add “-W” to the part number and note that the ‘A’ and ‘B’ dimensions will increase by an inch. Please do not hesitate to call the factory if you need assistance.

GCE Enclosure Dimensions and Coil Options

Part No.	Max. No. WR Coils	Max No. SXR, VR or ER	Dimensions (in)				
			A	B	C	D	E
GCE1	1	(1) Size 2	12	5	5	10-1/2	---
GCE2	2	(2) Size 2	12	7	5	10-1/2	4-1/2
GCE3	3	(3) Size 2	12	10	5	10-1/2	7-1/2
GCE4	4	(4) Size 2	12	13	5	10-1/2	10-1/2
GCE5	5	(5) Size 2	12	16	5	10-1/2	13-1/2
GCE6	6	(3) Size 5	19	10	5	17-1/2	7-1/2
GCE8	8	(4) Size 5	19	13	5	17-1/2	10-1/2
GCE9	9	(3) Size 7	26-1/2	10	5	25	7-1/2
GCE10	10	(5) Size 5	19	16	5	17-1/2	13-1/2
GCE12	12	(4) Size 7	26-1/2	13	5	25	10-1/2
GCE15	15	(5) Size 7	26-1/2	16	5	25	13-1/2



Reactors

High or low impedance

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:
- Installation has voltage spikes in excess of 6000V peak or lightning strikes.
- Installation has switched power factor correction capacitors.
- Installation has power interruptions or voltage sags in excess of 200Vac.
- 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.



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

Drive Part # ACS355-01U-	Frame size	HP ND	Drive Input Current @ 200V	Drive Input current @ 200V with 5% choke	Drive Output Current I _{2N}
02A4-2	R0	0.5	6.1	4.5	2.4
04A7-2	R1	1	11	8.1	4.7
06A7-2	R1	1.5	16	11	6.7
07A5-2	R1	2	17	12	7.5
09A8-2	R2	3	21	15	9.8

Input Reactors for Three Phase 200-240V applications

Type code	Frame size	HP ND	Drive Input Current @ 200V	Drive Input current @ 200V with 5% choke	Drive Output Current I _{2N}
02A4-2	R0	0.5	4.3	2.2	2.4
03A5-2	R0	0.75	6.1	3.5	3.5
04A7-2	R1	1	7.6	4.2	4.7
06A7-2	R1	1.5	12	6.1	6.7
07A5-2	R1	2	12	6.9	7.5
09A8-2	R2	3	14	9.2	9.8
17A6-2	R2	5	25	14	17.6
24A4-2	R3	7.5	41	21	24.4
31A0-2	R4	10	50	26	31
46A2-2	R4	15	69	41	46.2

Input Reactors for Three Phase 380-480V applications

Drive Part # ACS355-03U-	Frame size	HP ND	Drive Input Current @ 480V	Drive Input current @ 480V with 5% choke	Drive Output Current I _{2N}
01A2-4	R0	0.5	1.8	0.9	1.2
01A9-4	R0	0.75	3.0	1.5	1.9
02A4-4	R1	1	3.4	1.9	2.4
03A3-4	R1	1.5	5.0	2.6	3.3
04A1-4	R1	2	5.8	2.9	4.1
05A6-4	R1	3	8.0	4.0	5.6
08A8-4	R1	5	11	6.4	8.8
12A5-4	R3	7.5	16	9.5	12.5
15A6-4	R3	10	18	10	15.6
23A1-4	R3	15	26	15	23.1
31A0-4	R4	20	43	20	31
38A0-4	R4	25	51	26	38
44A0-4	R4	30	56	32	44

All KDR resistors in sizes that match with ACS355 drives include lugs, no separate lug kits are required

Reactors

Low impedance

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

Drive Part #	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
ACS355-01U-														
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	KDRAA3L2	48.8	4.44x4.25x2.64	3	KDRAA3L2E01	48.8	12.25x12.5x6.75	14	KDRAA3L2E3R1	48.8	11.5x10x12	18
06A7-2	1.5	16	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	17	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 #	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
ACS355-03U-														
02A4-2	0.5	4.3	KDRMA8L1	30.6	3.63x4.45x1.78	4	KDRMA8L1E01	30.6	12.25x12.5x6.75	12	KDRMA8L1E3R1	30.6	11.5x10x12	17
03A5-2	0.75	6.1	KDRAA3L2	44.5	4.44x4.25x2.64	3	KDRAA3L2E01	44.5	12.25x12.5x6.75	14	KDRAA3L2E3R1	44.5	11.5x10x12	18
04A7-2	1	7.6	KDRAA4L2	62.9	4.44x4.25x2.64	4	KDRAA4L2E01	62.9	12.25x12.5x6.75	14	KDRAA4L2E3R1	62.9	11.5x10x12	19
06A7-2	1.5	12	KDRAA4L2	62.9	4.44x4.25x2.64	4	KDRAA4L2E01	62.9	12.25x12.5x6.75	14	KDRAA4L2E3R1	62.9	11.5x10x12	19
07A5-2	2	12	KDRMA27L1	27	3.63 x 4.45 x 1.78	2	KDRMA27L1E01	27	12.25x12.5x6.75	12	KDRMA27L1E3R1	27	11.5x10x12	16
09A8-2	3	14	KDRAA28L2	42	4.44 x 2.63 x 3.75	4	KDRAA28L2E01	42	12.25x12.5x6.75	14	KDRAA28L2E3R1	42	11.5x10x12	18
17A6-2	5	25	KDRB22L	38	5.00 x 6.00 x 4.00	8	KDRB22LE01	38	12.25x12.5x6.75	18.5	KDRB22LE3R	38	11.5x10x12	23
24A4-2	7.5	41	KDRB23L	48	5.00 x 6.00 x 4.00	8	KDRB23LE01	48	12.25x12.5x6.75	18.5	KDRB23LE3R	48	11.5x10x12	23
31A0-2	10	50	KDRD25L	64	5.75x7.2x4.25	12	KDRD25LE01	64	12.25x12.5x6.75	22.5	KDRD25LE3R	64	11.5x10x12	27
46A2-2	15	69	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 #	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
ACS355-03U-														
01A2-4	0.5	1.8	KDRMA3L1	9.7	3.63x4.45x1.78	2	KDRMA3L1E01	9.7	12.25x12.5x6.75	12	KDRMA3L1E3R1	9.7	11.5x10x12	17
01A9-4	0.75	3.0	KDRMA4L1	12.2	3.63x4.45x1.78	2	KDRMA4L1E01	12.2	12.25x12.5x6.75	12	KDRMA4L1E3R1	12.2	11.5x10x12	17
02A4-4	1	3.4	KDRMA5L1	25.2	3.63x4.45x1.78	2	KDRMA5L1E01	25.2	12.25x12.5x6.75	12	KDRMA5L1E3R1	25.2	11.5x10x12	17
03A3-4	1.5	5.0	KDRMA6L1	26.4	3.63x4.45x1.78	2	KDRMA6L1E01	26.4	12.25x12.5x6.75	12	KDRMA6L1E3R1	26.4	11.5x10x12	17
04A1-4	2	5.8	KDRMA7L1	23.5	3.63x4.45x1.78	2	KDRMA7L1E01	23.5	12.25x12.5x6.75	12	KDRMA7L1E3R1	23.5	11.5x10x12	17
05A6-4	3	8.0	KDRMA8L1	30.6	3.63x4.45x1.78	2	KDRMA8L1E01	30.6	12.25x12.5x6.75	12	KDRMA8L1E3R1	30.6	11.5x10x12	17
08A8-4	5	11	KDRAA3L2	48.8	4.44x4.25x2.64	3	KDRAA3L2E01	48.8	12.25x12.5x6.75	14	KDRAA3L2E3R1	48.8	11.5x10x12	18
12A5-4	7.5	16	KDRAA4L2	62.9	4.55x4.25x2.64	4	KDRAA4L2E01	62.9	12.25x12.5x6.75	14	KDRAA4L2E3R1	62.9	11.5x10x12	18
15A6-4	10	18	KDRAA5L2	77	4.44 x 2.63 x 3.75	4	KDRAA5L2E01	77	12.25x12.5x6.75	14	KDRAA5L2E3R1	77	11.5x10x12	19
23A1-4	15	26	KDRB2L	65	5.00 x 6.00 x 4.00	8	KDRB2LE01	65	12.25x12.5x6.75	18.5	KDRB2LE3R	65	11.5x10x12	23
31A0-4	20	43	KDRB1L	79	5.00x6.00x4.00	8	KDRB1LE01	79	12.25x12.5x6.75	18.5	KDRB1LE3R	79	11.5x10x12	23
38A0-4	25	51	KDRD1L	96	5.75 x 7.20 x 4.25	10	KDRD1LE01	96	12.25x12.5x6.75	20.5	KDRD1LE3R	96	11.5x10x12	25
44A0-4	30	56	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 ACS355 drives include lugs, no separate lug kits are required

Reactors

High impedance

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

Drive Part #	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	12.3x12.5x6.75	14	KDRMA8L1E3R1	30.6	11.5x10x12	19
04A7-2	1	11	KDRAA3L2	44.5	4.44x4.25x2.64	4	KDRAA3L2E01	44.5	12.3x12.5x6.75	14	KDRAA3L2E3R1	44.5	11.5x10x12	19
06A7-2	1.5	16	KDRAA28H2	43.1	4.00x4.18x3.75	4	KDRAA28H2E01	43.1	12.3x12.5x6.75	14.5	KDRAA28H2E3R1	43.1	11.5x10x12	19
07A5-2	2	17	KDRB25H	53.1	5.00 x 6.00 x 4.00	8	KDRB25HE01	53.1	12.3x12.5x6.75	18.5	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	12.3x12.5x6.75	18.5	KDRB26HE3R	66.5	11.5x10x12	23

Input Reactors for Three Phase 200-240V applications

Drive Part #	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	4.3	KDRMA6L1	26.4	3.63x4.45x1.78	2	KDRMA6L1E01	26.4	12.3x12.5x6.75	13	KDRMA6L1E3R1	26.4	11.5x10x12	17
03A5-2	0.75	6.1	KDRMA8L1	30.6	3.63x4.45x1.78	4	KDRMA8L1E01	30.6	12.3x12.5x6.75	14	KDRMA8L1E3R1	30.6	11.5x10x12	19
04A7-2	1	7.6	KDRAA6L2	39.2	4.44x4.25x2.64	3	KDRAA6L2E01	39.2	12.3x12.5x6.75	13	KDRAA6L2E3R1	39.2	11.5x10x12	18
06A7-2	1.5	12	KDRAA3L2	44.5	4.44x4.25x2.64	3	KDRAA3L2E01	44.5	12.3x12.5x6.75	13	KDRAA3L2E3R1	44.5	11.5x10x12	18
07A5-2	2	12	KDRMA26H1	29	3.63x4.45x1.78	2	KDRMA26H1E01	29	12.3x12.5x6.75	12	KDRMA26H1E3R1	29	11.5x10x12	17
09A8-2	3	14	KDRAA28H2	43.1	4.44x4.25x2.64	3	KDRAA28H2E01	43.1	12.25x12.5x6.75	13	KDRAA28H2E3R1	43.1	11.5x10x12	18
17A6-2	5	25	KDRB25H	53.1	5.00 x 6.00 x 4.00	8	KDRB25HE01	53.1	12.25x12.5x6.75	18.5	KDRB25HE3R	53.1	11.5x10x12	23
24A4-2	7.5	41	KDRB26H	66.5	5.00 x 6.00 x 4.00	8	KDRB26HE01	66.5	12.3x12.5x6.75	18.5	KDRB26HE3R	66.5	11.5x10x12	23
31A0-2	10	50	KDRD21H	91.8	5.75 x 7.20 x 4.25	12	KDRD21HE01	91.8	12.3x12.5x6.75	18.5	KDRD21HE3R	91.8	11.5x10x12	23
46A2-2	15	69	KDRD22H	107.8	5.75 x 7.20 x 4.25	12	KDRD22HE01	107.8	12.3x12.5x6.75	22.5	KDRD22HE3R	107.8	11.5x10x12	30

Input Reactors for Three Phase 380-480V applications

Drive Part #	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
01A2-4	0.5	1.8	KDRMA3H1	14.3	3.63x4.45x1.78	2	KDRMA3H1E01	14.3	12.3x12.5x6.75	13	KDRMA3H1E3R1	14.3	11.5x10x12	17
01A9-4	0.75	3.0	KDRMA4H1	19.3	3.63x4.45x1.78	2	KDRMA4H1E01	19.3	12.3x12.5x6.75	13	KDRMA4H1E3R1	19.3	11.5x10x12	17
02A4-4	1	3.4	KDRMA5H1	26.7	3.63x4.45x1.78	2	KDRMA5H1E01	26.7	12.3x12.5x6.75	13	KDRMA5H1E3R1	26.7	11.5x10x12	17
03A3-4	1.5	5.0	KDRMA6H1	30	3.63x4.45x1.78	2	KDRMA6H1E01	30	12.3x12.5x6.75	13	KDRMA6H1E3R1	30	11.5x10x12	17
04A1-4	2	5.8	KDRAA1H2	45	4.44x4.25x2.64	3	KDRAA1H2E01	45	12.3x12.5x6.75	14	KDRAA1H2E3R1	45	11.5x10x12	18
05A6-4	3	8.0	KDRAA2H2	41.8	4.44x4.25x2.64	3	KDRAA2H2E01	41.8	12.3x12.5x6.75	14	KDRAA2H2E3R1	41.8	11.5x10x12	18
08A8-4	5	11	KDRAA3H2	66	4.44x4.25x2.64	3	KDRAA3H2E01	66	12.3x12.5x6.75	14	KDRAA3H2E3R1	66	11.5x10x12	18
12A5-4	7.5	16	KDRAA4H2	70	4.44x4.25x2.64	5	KDRAA4H2E01	70	12.3x12.5x6.75	15	KDRAA4H2E3R1	70	11.5x10x12	19
15A6-4	10	18	KDRAA5H2	98	4.44x4.25x2.64	5	KDRAA5H2E01	98	12.3x12.5x6.75	15	KDRAA5H2E3R1	98	11.5x10x12	19
23A1-4	15	26	KDRB2H	133	5.00 x 6.00 x 4.00	7	KDRB2HE01	133	12.3x12.5x6.75	17.5	KDRB2HE3R	133	11.5x10x12	22
31A0-4	20	43	KDRC3H	108	5.75 x 7.20 x 5.00	15	KDRC3HE01	108	12.3x12.5x6.75	26	KDRC3HE3R	108	11.5x10x12	22
38A0-4	25	51	KDRC1H	112	5.75 x 7.20 x 5.00	15	KDRC1HE01	112	12.3x12.5x6.75	26	KDRC1HE3R	112	11.5x10x12	22
44A0-4	30	56	KDRE2H	141	5.75 x 7.20 x 5.00	16	KDRE2HE01	141	12.3x12.5x6.75	27	KDRE2HE3R	141	11.5x10x12	30

All KDR resistors in sizes that match with ACS355 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 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 60Hz.



dv/dt output filters

Single Phase 200-240V applications

Drive Part # ACSx5x-01U-	HP ND	Drive Output Current I _{2N}	V1K UL Open				V1K UL Type 1 Enclosure				V1k UL Type 3R Enclosure				List Price
			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	\$839
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	\$859
06A7-2	1.5	6.7	V1K8A00	90	9.00x5.50x7.25	8	V1K8A01	90	9.00x5.50x10.00	11	V1K8A03	90	11.45x10.00x12.00	25	\$878
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	\$878
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	\$917

Three Phase 200-240V applications

Drive Part # ACSx5x-03U-	HP ND	Drive Output Current I _{2N}	V1KULOpen				V1KULType1Enclosure				V1kULType3REnclosure				List Price
			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	\$839
03A5-2	0.75	3.5	V1K4A00	75	9.00x5.50x7.25	8	V1K4A01	75	9.00x5.50x10.00	11	V1K4A03	75	11.45x10.00x12.00	25	\$844
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	\$859
06A7-2	1.5	6.7	V1K8A00	90	9.00x5.50x7.25	8	V1K8A01	90	9.00x5.50x10.00	11	V1K8A03	90	11.45x10.00x12.00	25	\$878
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	\$878
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	\$917
13A3-2	3	13.3	V1K16A00	95	9.00x5.50x8.25	12	V1K16A01	95	9.00x5.50x10.00	15	V1K16A03	15	11.45x10.00x12.00	29	\$935
17A6-2	5	17.6	V1K18A00	110	9.00x5.50x8.25	12	V1K18A01	110	9.00x5.50x10.00	15	V1K18A03	110	11.45x10.00x12.00	25	\$974
24A4-2	7.5	24.4	V1K25A00	110	9.00x5.50x8.25	12	V1K25A01	110	9.00x5.50x10.00	15	V1K25A03	110	11.45x10.00x12.00	29	\$1,037
31A0-2	10	31	V1K35A00	130	12.00x8.00x9.00	17	V1K35A01	130	12.00x8.00x11.50	23	V1K35A03	130	19.18x15.62x19.50	56	\$1,113
46A2-2	15	46.2	V1K55A00	145	12.00x8.00x9.00	23	V1K55A01	145	12.00x8.00x11.50	23	V1K55A03	145	19.18x15.62x19.50	56	\$1,253

Three Phase 380-480V applications

Drive Part # ACSx5x-03U-	HP ND	Drive Output Current I _{2N}	V1K UL Open				V1K UL Type 1 Enclosure				V1k UL Type 3R Enclosure				List Price
			Part Number	Watts	Dimensions (HxWxD)	Weight	Part Number	Watts	Dimensions (HxWxD)	Weight	Part Number	Watts	Dimensions (HxWxD)	Weight	
01A2-4	0.5	1.2	V1K2A00	75	9.00x5.50x7.25	8	V1K2A01	75	9.00x5.50x10.00	11	V1K2A03	11	11.45x10.00x12.00	25	\$833
01A9-4	0.75	1.9	V1K2A00	75	9.00x5.50x7.25	8	V1K2A01	75	9.00x5.50x10.00	11	V1K2A03	11	11.45x10.00x12.00	25	\$833
02A4-4	1	2.4	V1K3A00	75	9.00x5.50x7.25	8	V1K3A01	75	9.00x5.50x10.00	11	V1K3A03	11	11.45x10.00x12.00	25	\$839
03A3-4	1.5	3.3	V1K4A00	75	9.00x5.50x7.25	8	V1K4A01	75	9.00x5.50x10.00	11	V1K4A03	75	11.45x10.00x12.00	25	\$844
04A1-4	2	4.1	V1K6A00	80	9.00x5.50x7.25	8	V1K6A01	80	9.00x5.50x10.00	11	V1K6A03	11	11.45x10.00x12.00	25	\$859
05A6-4	3	5.6	V1K6A00	80	9.00x5.50x7.25	8	V1K6A01	80	9.00x5.50x10.00	11	V1K6A03	11	11.45x10.00x12.00	25	\$859
07A3-4	3	7.3	V1K8A00	90	9.00x5.50x7.25	8	V1K8A01	90	9.00x5.50x10.00	11	V1K8A03	90	11.45x10.00x12.00	25	\$878
08A8-4	5	8.8	V1K12A00	95	9.00x5.50x7.25	8	V1K12A01	95	9.00x5.50x10.00	11	V1K12A03	95	11.45x10.00x12.00	25	\$917
12A5-4	7.5	12.5	V1K16A00	95	9.00x5.50x8.25	12	V1K16A01	95	9.00x5.50x10.00	15	V1K16A03	15	11.45x10.00x12.00	29	\$935
15A6-4	10	15.6	V1K16A00	95	9.00x5.50x8.25	12	V1K16A01	95	9.00x5.50x10.00	15	V1K16A03	15	11.45x10.00x12.00	29	\$935
23A1-4	15	23.1	V1K25A00	110	9.00x5.50x8.25	12	V1K25A01	110	9.00x5.50x10.00	15	V1K25A03	110	11.45x10.00x12.00	29	\$1,037
31A0-4	20	31	V1K35A00	130	12.00x8.00x9.00	17	V1K35A01	130	12.00x8.00x11.50	23	V1K35A03	130	19.18x15.62x19.50	56	\$1,113
38A0-4	25	38	V1K45A00	135	12.00x8.00x9.00	17	V1K45A01	135	12.00x8.00x11.50	23	V1K45A03	23	19.18x15.62x19.50	56	\$1,149
44A0-4	30	44	V1K45A00	135	12.00x8.00x9.00	17	V1K45A01	135	12.00x8.00x11.50	23	V1K45A03	23	19.18x15.62x19.50	56	\$1,149

ABB automation products

AC500

ABB's powerful flagship PLC provides a wide range of performance levels and scalability within a single simple concept, where most competitors require multiple product ranges to deliver similar functionality.



AC500-S

A PLC-based modular automation solution that makes it easier than ever to mix and match standard and safety I/O modules to expertly meet your safety requirements in all functional safety applications.

An "extreme conditions" version is also available.



Programmability

Automation Builder integrates the engineering and maintenance of PLCs, drives, motion, HMI and robotics. It complies with the IEC 61131-3 standard, offering all five IEC programming languages for PLC and drive configuration. Automation Builder supports a number of languages and comes with new libraries, FTP functions, SMTP, STP, smart diagnostics and debugging capabilities.



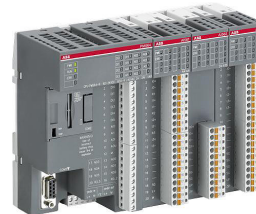
AC motors

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 seamlessly combine convenience and easy handling with ABB's engineering expertise. Process performance motors provide the most comprehensive, versatile set of motors for process industries and heavy-duty applications.



AC500-eCo

Meets the cost-effectiveness demands of the small PLC market, while offering total inter-operability with the core AC500 range. Web server, FTP server and Modbus TCP for all Ethernet versions. A Pulse Train output module is available for multi-axis positioning.



AC500-XC

"Extreme conditions" modules with extended operating temperature, immunity to vibration and hazardous gases, for use at high altitudes, in humid conditions, etc. It replaces expensive cabinets with its built-in protection.

**Control panels**

Our control panels offer a wide range of touchscreen graphical displays, from 3.5" up to 15". They are provided with user-friendly configuration software that enables customized HMI solutions. Rich sets of graphical symbols and the relevant drivers for ABB automation products are provided. Control panels for visualization of AC500 web server applications are available.

**All-compatible drives portfolio**

The all-compatible drives share the same architecture: software platform, tools, user interface and options. Yet, there is an optimal drive from the smallest water pump to the biggest cement kiln, and everything in the between. When you have learned to use one drive, it is easy use any of the other drives in the portfolio.

**Jokab Safety products**

ABB Jokab Safety offers an extensive range of innovative products and solutions for machine safety systems. It is represented in standardization organizations for machine safety and works daily with the practical application of safety requirements in combination with production requirements.



Services to match your needs

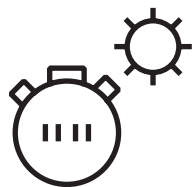
Your service needs depend on your operation, life cycle of your equipment and business priorities. We have identified our customers' four most common needs and defined service options to satisfy them. What is your choice to keep your drives at peak performance?

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



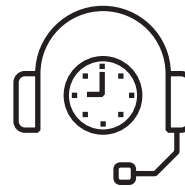
Operational efficiency

Is rapid response a key consideration?

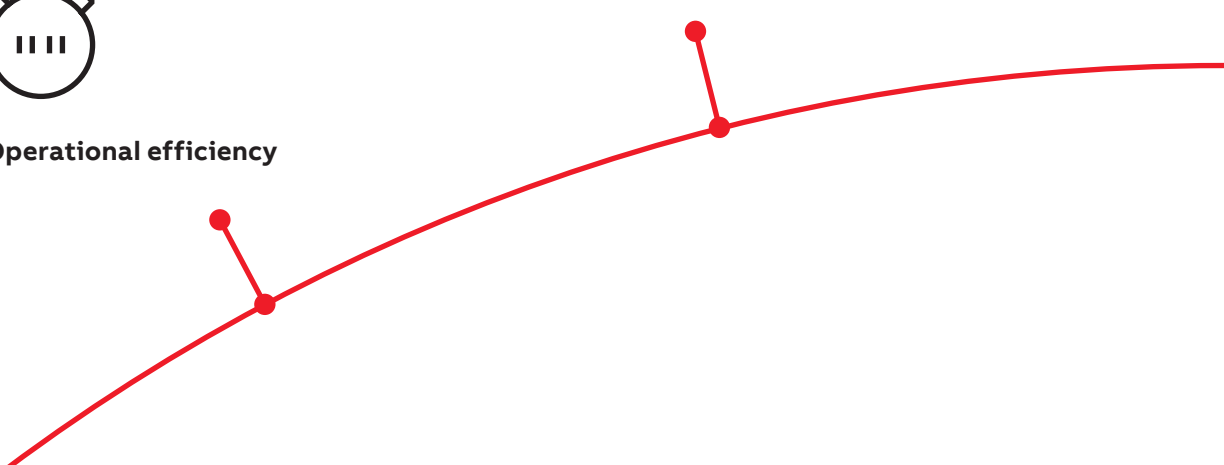
If your drives require immediate action, our global network is at your service.

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?

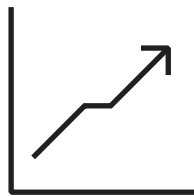
From here, you have our guidance and full support along the course you take, throughout the entire lifetime of your drives.

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

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.

We can help you more by knowing where you are!

Register your drive at www.abb.com/drivereg for extended warranty options and other benefits.

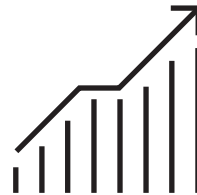
Option code	Description
+P904	Extension of warranty to 24 months from commissioning or 30 months from delivery
+P909	Extension of warranty to 36 months from commissioning or 42 months from delivery

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



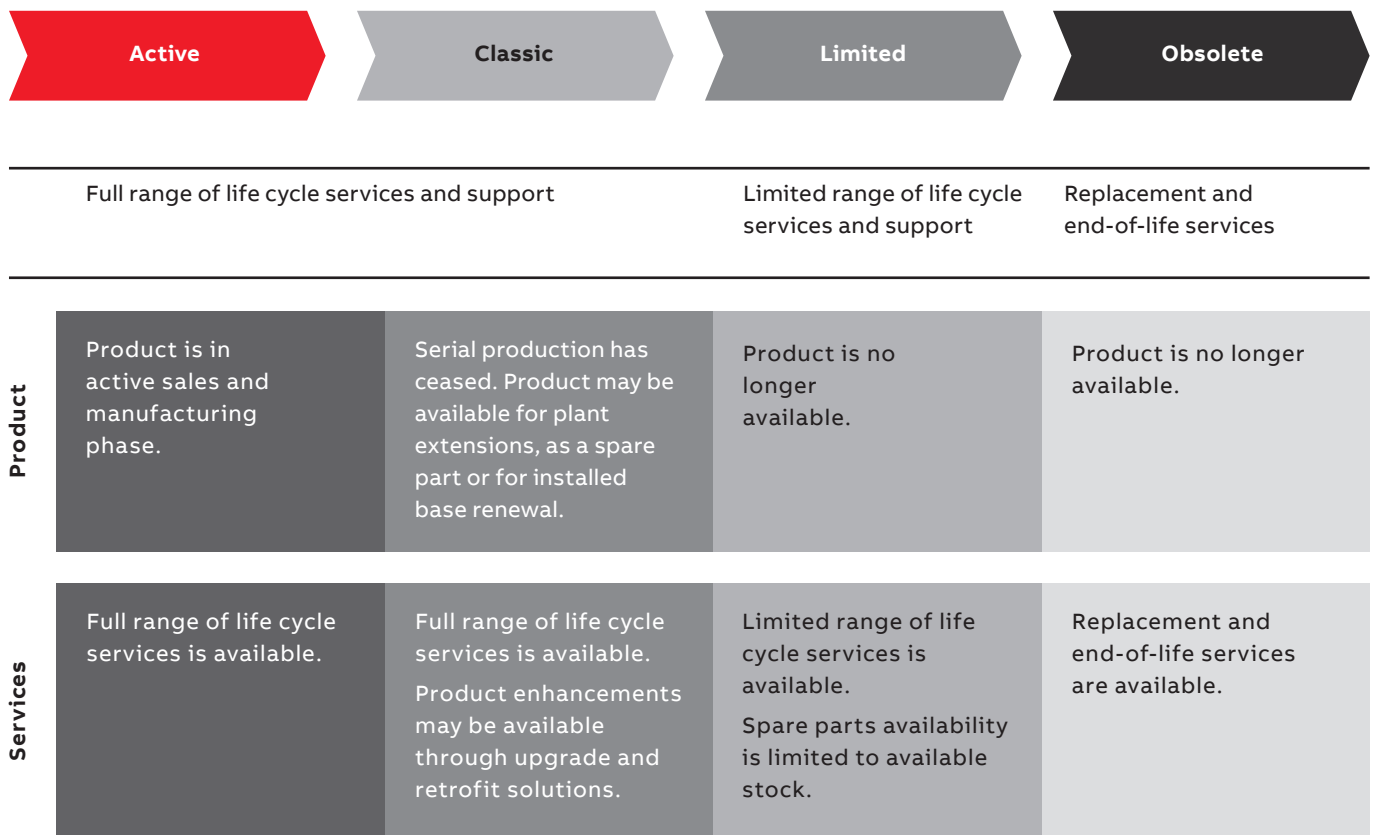
Performance improvement

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:



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.



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

www.abb.com/drives