



Low voltage AC drives

# ABB machinery drives

## ACS355

0.5 to 30 hp/0.37 to 22 kW

### Catalog

Power and productivity  
for a better world™



# 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
- IP66 product variant for harsh environments and solar pump drive variant available

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# Little big drives without limiting your business

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.

### Remote monitoring

With a built-in web server and stand-alone datalogger, available remote monitoring options enables worldwide and secure access to drives.



# 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.



It is very easy to select the right drive.

**1 Start with identifying your supply voltage.**  
This tells you what rating table to use. See page 8.

**4 Choose your options** (on pages 20 to 29) and add the option codes to drive's ordering code. Remember to use a "+" mark before each option code.

Page 8

Page 8

Pages 22 to 36



Product series

## Types and construction

Rating

Voltage

Options

# Ratings and types

ACS355 - 03E - 02A4 - 2 + N830

## Type designation

This is the unique reference number (shown above and 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 10.

## 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 shown above.

## 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 (shown above) varies depending on the drive phase and EMC filtering. Choose below the one you need.

01 = 1-phase

03 = 3-phase

E = EMC filter connected, 50 Hz frequency

U = EMC filter disconnected, 60 Hz frequency

(In case the filter is required it can easily be connected)

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

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.

# Technical data

ACS355

-

0XX

-

0XAX

-

X

+

XXXX

## Mains connection

|                         |                                 |
|-------------------------|---------------------------------|
| Voltage and power range | 1-phase, 200 to 240 V $\pm$ 10% |
|                         | 0.37 to 2.2 kW (0.5 to 3 hp)    |
|                         | 3-phase, 200 to 240 V $\pm$ 10% |
|                         | 0.37 to 11 kW (0.5 to 15 hp)    |
|                         | 3-phase, 380 to 480 V $\pm$ 10% |

|           |             |
|-----------|-------------|
| Frequency | 48 to 63 Hz |
|-----------|-------------|

## Common DC connection

|                         |                                                    |
|-------------------------|----------------------------------------------------|
| Voltage and power range | 230 V drives, 325 V $\pm$ 15%                      |
|                         | 400/480 V drives, 540 $\pm$ 15% (common DC manual) |
|                         | $P_{\max} = P_n$ of the drive                      |

## Motor connection

|                                                                                           |                                                                                           |
|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Voltage                                                                                   | 3-phase, from 0 to $U_{\text{SUPPLY}}$                                                    |
| Frequency                                                                                 | 0 to 599 Hz                                                                               |
| Continuous loading capability<br>(constant torque at a max. ambient temperature of 40 °C) | Rated output current $I_{2N}$                                                             |
| Overload capacity<br>(at a max. ambient temperature of 40 °C)                             | 1.5 $\times I_{2N}$ for 1 minute every 10 minutes<br>At start 1.8 $\times I_{2N}$ for 2 s |
| Switching frequency<br>Selectable                                                         | Default 4 kHz<br>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<br>Static accuracy<br>Dynamic accuracy                                      | 20% of motor nominal slip<br>< 1% s with 100% torque step                                 |
| Torque control<br>Torque step rise time<br>Non-linearity                                  | < 10 ms with nominal torque<br>$\pm$ 5% with nominal torque                               |

## Environmental limits

|                      |                                                                                                                                                                                                                                                                                                                      |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ambient temperature  | -10 to 40 °C (14 to 104 °F), no frost allowed<br>50 °C (122 °F) with 10% derating                                                                                                                                                                                                                                    |
| Altitude             | Rated current available at 0 to 1000 m.<br>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<br>IP66/IP67/UL Type 4X as an option up to 7.5 kW, IP69K available for IP66/IP67 variant with compatible cable glands                                                                                                                                                       |
| Enclosure colour     | NCS 1502-Y, RAL 9002, PMS 420 C                                                                                                                                                                                                                                                                                      |
| Contamination levels | IEC721-3-3<br>No conductive dust allowed<br>Class 1C2 (chemical gases)<br>Class 1S2 (solid particles)                                                                                                                                                                                                                |
| Transportation       | Class 2C2 (chemical gases)<br>Class 2S2 (solid particles)                                                                                                                                                                                                                                                            |
| Storage              | Class 3C2 (chemical gases)<br>Class 3S2 (solid particles)                                                                                                                                                                                                                                                            |
| Operation            |                                                                                                                                                                                                                                                                                                                      |

## Product compliance

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

## Programmable control connections

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

|                                              |                                                                                           |
|----------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>Fieldbuses</b>                            | Plug-in type                                                                              |
| Refresh rate                                 | < 10 ms (between drive and fieldbus module)                                               |
| <b>DeviceNet™</b>                            | 5-pin screw type connector, up to 500 kbit/s baud rate                                    |
| <b>PROFIBUS DP</b>                           | 9-pin D-connector, up to 12 Mbit/s baud rate                                              |
| <b>PowerLink</b>                             | 2 pcs RJ-45 connector, 100 Mbit/s baud rate                                               |
| <b>ControlNet™</b>                           | 2 pcs 8P8C modular jacks                                                                  |
| <b>CANopen®</b>                              | 9-pin D-connector, up to 1 Mbit/s                                                         |
| <b>Modbus RTU</b>                            | 4-pin screw type connector, up to 115 kbit/s baud rate                                    |
| <b>EtherNet/IP™, Modbus TCP, PROFINET IO</b> | 1 RJ45 connector (FENA-01 and -11) or 2 RJ45 connectors (FENA-21). 10/100Mbit/s baud rate |
| <b>LonWorks®</b>                             | 3-pin screw type connector, up to 78 kbit/s baud rate                                     |
| <b>EtherCAT®</b>                             | 2 pcs RJ-45 connectors, 100 Mbit/s baud rate                                              |

## Chokes

|                         |                                                                                          |
|-------------------------|------------------------------------------------------------------------------------------|
| <b>AC input chokes</b>  | External option. For reducing THD in partial loads and to comply with EN/IEC 61000-3-12. |
| <b>AC output chokes</b> | External option. To achieve 2x longer motor cables                                       |

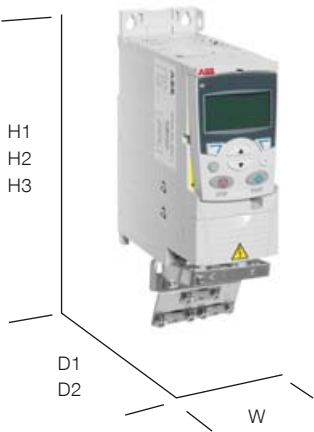
# Dimensions and weights

ACS355 - 0XX - 0XAX - X + XXXX

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

| Frame size | IP20/UL Open |          |          |         |          |          |              |
|------------|--------------|----------|----------|---------|----------|----------|--------------|
|            | H1<br>in     | H2<br>in | H3<br>in | W<br>in | D1<br>in | D2<br>in | Weight<br>lb |
| 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 |          |         |          |          |              |
|------------|------------------|----------|---------|----------|----------|--------------|
|            | H4<br>in         | H5<br>in | W<br>in | D1<br>in | D2<br>in | Weight<br>lb |
| 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/UL Type 4X)

| Frame size | IP66/IP67/UL Type 4X |         |         |              |
|------------|----------------------|---------|---------|--------------|
|            | H<br>in              | W<br>in | D<br>in | Weight<br>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 <sup>1)</sup> | m <sup>3</sup> /h | ft <sup>3</sup> /min |
| 1-phase AC supply, 200 to 240 V |            |                  |                      |                   |                      |
| ACS355-01X-02A4-2               | R0         | 48               | 163                  | — <sup>2)</sup>   | — <sup>2)</sup>      |
| ACS355-01X-04A7-2               | R1         | 72               | 247                  | 24                | 14                   |
| ACS355-01X-06A7-2               | R1         | 97               | 333                  | 24                | 14                   |
| ACS355-01X-07A5-2               | R2         | 101              | 343                  | 21                | 12                   |
| ACS355-01X-09A8-2               | R2         | 124              | 422                  | 21                | 12                   |
| 3-phase AC supply, 200 to 240 V |            |                  |                      |                   |                      |
| ACS355-03X-02A4-2               | R0         | 42               | 142                  | — <sup>2)</sup>   | — <sup>2)</sup>      |
| ACS355-03X-03A5-2               | R0         | 54               | 183                  | — <sup>2)</sup>   | — <sup>2)</sup>      |
| ACS355-03X-04A7-2               | R1         | 64               | 220                  | 24                | 14                   |
| ACS355-03X-06A7-2               | R1         | 86               | 295                  | 24                | 14                   |
| ACS355-03X-07A5-2               | R1         | 88               | 302                  | 21                | 12                   |
| ACS355-03X-09A8-2               | R2         | 111              | 377                  | 21                | 12                   |
| ACS355-03X-17A6-2               | R2         | 180              | 613                  | 52                | 31                   |
| ACS355-03X-24A4-2               | R3         | 285              | 975                  | 71                | 42                   |
| ACS355-03X-31A0-2               | R4         | 328              | 1119                 | 96                | 57                   |
| ACS355-03X-46A2-2               | R4         | 488              | 1666                 | 96                | 57                   |
| 3-phase AC supply, 380 to 480 V |            |                  |                      |                   |                      |
| ACS355-03X-01A2-4               | R0         | 35               | 121                  | — <sup>2)</sup>   | — <sup>2)</sup>      |
| ACS355-03X-01A9-4               | R0         | 40               | 138                  | — <sup>2)</sup>   | — <sup>2)</sup>      |
| ACS355-03X-02A4-4               | R1         | 50               | 170                  | 13                | 8                    |
| ACS355-03X-03A3-4               | R1         | 60               | 204                  | 13                | 8                    |
| ACS355-03X-04A1-4               | R1         | 69               | 235                  | 13                | 8                    |
| ACS355-03X-05A6-4               | R1         | 90               | 306                  | 19                | 11                   |
| ACS355-03X-08A8-4               | R1         | 127              | 433                  | 24                | 14                   |
| ACS355-03X-12A5-4               | R3         | 161              | 551                  | 52                | 31                   |
| ACS355-03X-15A6-4               | R3         | 204              | 697                  | 52                | 31                   |
| ACS355-03X-23A1-4               | R3         | 301              | 1029                 | 71                | 42                   |
| ACS355-03X-31A0-4               | R4         | 408              | 1393                 | 96                | 57                   |
| ACS355-03X-38A0-4               | R4         | 498              | 1700                 | 96                | 57                   |
| ACS355-03X-44A0-4               | R4         | 588              | 2007                 | 96                | 57                   |

X within the type designation stands for E or U.

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

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

## Free space requirements

| Enclosure type  | Space above<br>in | Space below<br>in | Space on left/right<br>in |
|-----------------|-------------------|-------------------|---------------------------|
| All frame sizes | 3.0               | 3.0               | 0.0                       |
| IP66 enclosure  | 3.0               | 3.0               | 0.8                       |

# Circuit protection

## Circuit protection

Standard fuses and manual motor protectors can be used with ACS355 drive. See table below for selecting the correct fuse for correct drive type.



Selection table

| Type designation                              | Frame size | IEC fuses           |                         | UL fuses |                         | Manual motor protector             |                          |
|-----------------------------------------------|------------|---------------------|-------------------------|----------|-------------------------|------------------------------------|--------------------------|
|                                               |            | [A]                 | Fuse type <sup>1)</sup> | [A]      | Fuse type <sup>1)</sup> | MMP type code <sup>3) 4)</sup>     | Trip current setting [A] |
| 1-phase AC supply, 200 to 240 V               |            |                     |                         |          |                         |                                    |                          |
| ACS355-01X-02A4-2                             | R0         | 10                  | gG                      | 10       | UL class T              | MS132-6.3 & S1-M3-25 <sup>5)</sup> | 6.1                      |
| ACS355-01X-04A7-2                             | R1         | 16                  | gG                      | 20       | UL class T              | MS451-16E                          | 11.0                     |
| ACS355-01X-06A7-2                             | R1         | 16/20 <sup>2)</sup> | gG                      | 25       | UL class T              | MS451-20E                          | 16.0                     |
| ACS355-01X-07A5-2                             | R2         | 20/25 <sup>2)</sup> | gG                      | 30       | UL class T              | MS451-20E                          | 17.0                     |
| ACS355-01X-09A8-2                             | R2         | 25/35 <sup>2)</sup> | gG                      | 35       | UL class T              | MS451-25E                          | 21.0                     |
| 3-phase AC supply, 200 to 240 V               |            |                     |                         |          |                         |                                    |                          |
| ACS355-03X-02A4-2                             | R0         | 10                  | gG                      | 10       | UL class T              | MS132-6.3 & S1-M3-25 <sup>5)</sup> | 4.3                      |
| ACS355-03X-03A5-2                             | R0         | 10                  | gG                      | 10       | UL class T              | MS132-6.3 & S1-M3-25 <sup>5)</sup> | 6.1                      |
| ACS355-03X-04A7-2                             | R1         | 10                  | gG                      | 15       | UL class T              | MS132-10 & S1-M3-25 <sup>5)</sup>  | 7.6                      |
| ACS355-03X-06A7-2                             | R1         | 16                  | gG                      | 15       | UL class T              | MS451-16E                          | 12.0                     |
| ACS355-03X-07A5-2                             | R1         | 16                  | gG                      | 15       | UL class T              | MS451-16E                          | 12.0                     |
| ACS355-03X-09A8-2                             | R2         | 16                  | gG                      | 20       | UL class T              | MS451-16E                          | 14.0                     |
| ACS355-03X-13A3-2                             | R2         | 25                  | gG                      | 30       | UL class T              | MS451-25E                          | 22.0                     |
| ACS355-03X-17A6-2                             | R2         | 25                  | gG                      | 35       | UL class T              | MS451-32E                          | 25.0                     |
| ACS355-03X-24A4-2                             | R3         | 63                  | gG                      | 60       | UL class T              | MS451-45E                          | 41.0                     |
| ACS355-03X-31A0-2                             | R4         | 80                  | gG                      | 80       | UL class T              | MS495-63E                          | 50.0                     |
| ACS355-03X-46A2-2                             | R4         | 100                 | gG                      | 100      | UL class T              | MS495-75E                          | 69.0                     |
| 3-phase AC supply, 380 to 415 V <sup>6)</sup> |            |                     |                         |          |                         |                                    |                          |
| ACS355-03X-01A2-4                             | R0         | 10                  | gG                      | 10       | UL class T              | MS132-2.5 & S1-M3-25 <sup>5)</sup> | 2.2                      |
| ACS355-03X-01A9-4                             | R0         | 10                  | gG                      | 10       | UL class T              | MS132-4.0 & S1-M3-25 <sup>5)</sup> | 3.6                      |
| ACS355-03X-02A4-4                             | R1         | 10                  | gG                      | 10       | UL class T              | MS132-6.3 & S1-M3-25 <sup>5)</sup> | 4.1                      |
| ACS355-03X-03A3-4                             | R1         | 10                  | gG                      | 10       | UL class T              | MS132-6.3 & S1-M3-25 <sup>5)</sup> | 6.0                      |
| ACS355-03X-04A1-4                             | R1         | 16                  | gG                      | 15       | UL class T              | MS132-10 & S1-M3-25 <sup>5)</sup>  | 6.9                      |
| ACS355-03X-05A6-4                             | R1         | 16                  | gG                      | 15       | UL class T              | MS132-10 & S1-M3-25 <sup>5)</sup>  | 9.6                      |
| ACS355-03X-07A3-4                             | R1         | 16                  | gG                      | 20       | UL class T              | MS451-16E                          | 12.0                     |
| ACS355-03X-08A8-4                             | R1         | 20                  | gG                      | 25       | UL class T              | MS451-16E                          | 14.0                     |
| ACS355-03X-12A5-4                             | R3         | 25                  | gG                      | 30       | UL class T              | MS451-20E                          | 19.0                     |
| ACS355-03X-15A6-4                             | R3         | 35                  | gG                      | 35       | UL class T              | MS451-25E                          | 22.0                     |
| ACS355-03X-23A1-4                             | R3         | 50                  | gG                      | 50       | UL class T              | MS451-32E                          | 31.0                     |
| ACS355-03X-31A0-4                             | R4         | 80                  | gG                      | 80       | UL class T              | MS495-63E                          | 52.0                     |
| ACS355-03X-38A0-4                             | R4         | 100                 | gG                      | 100      | UL class T              | MS495-63E                          | 61.0                     |
| ACS355-03X-44A0-4                             | R4         | 100                 | gG                      | 100      | UL class T              | MS495-75E                          | 67.0                     |
| 3-phase AC supply, 440 to 480 V <sup>6)</sup> |            |                     |                         |          |                         |                                    |                          |
| ACS355-03X-01A2-4                             | R0         | 10                  | gG                      | 10       | UL class T              | MS132-2.5 & S1-M3-25 <sup>5)</sup> | 1.8                      |
| ACS355-03X-01A9-4                             | R0         | 10                  | gG                      | 10       | UL class T              | MS132-4.0 & S1-M3-25 <sup>5)</sup> | 3.0                      |
| ACS355-03X-02A4-4                             | R1         | 10                  | gG                      | 10       | UL class T              | MS132-4.0 & S1-M3-25 <sup>5)</sup> | 3.4                      |
| ACS355-03X-03A3-4                             | R1         | 10                  | gG                      | 10       | UL class T              | MS132-6.3 & S1-M3-25 <sup>5)</sup> | 5.0                      |
| ACS355-03X-04A1-4                             | R1         | 16                  | gG                      | 15       | UL class T              | MS132-6.3 & S1-M3-25 <sup>5)</sup> | 5.8                      |
| ACS355-03X-05A6-4                             | R1         | 16                  | gG                      | 15       | UL class T              | MS132-10 & S1-M3-25 <sup>5)</sup>  | 8.0                      |
| ACS355-03X-07A3-4                             | R1         | 16                  | gG                      | 20       | UL class T              | MS132-10 & S1-M3-25 <sup>5)</sup>  | 9.7                      |
| ACS355-03X-08A8-4                             | R1         | 20                  | gG                      | 25       | UL class T              | MS451-16E                          | 11.0                     |
| ACS355-03X-12A5-4                             | R3         | 25                  | gG                      | 30       | UL class T              | MS451-20E                          | 16.0                     |
| ACS355-03X-15A6-4                             | R3         | 35                  | gG                      | 35       | UL class T              | MS451-20E                          | 18.0                     |
| ACS355-03X-23A1-4                             | R3         | 50                  | gG                      | 50       | UL class T              | MS451-32E                          | 26.0                     |
| ACS355-03X-31A0-4                             | R4         | 80                  | gG                      | 80       | UL class T              | MS451-45E                          | 43.0                     |
| ACS355-03X-38A0-4                             | R4         | 100                 | gG                      | 100      | UL class T              | MS495-63E                          | 51.0                     |
| ACS355-03X-44A0-4                             | R4         | 100                 | gG                      | 100      | UL class T              | MS495-63E                          | 56.0                     |

X within the type designation stands for E or U.

<sup>1)</sup> According to IEC-60269 standard.

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

<sup>3)</sup> All manual motor protectors listed are Type E self-protected up to 65 kA.

<sup>4)</sup> Manual motor protectors may require adjusting the trip limit from the factory setting at or above the drive input Amps to avoid nuisance tripping. If the manual motor protector is set to the maximum current trip level and nuisance tripping is occurring, then select the next size MMP. (MS132-10 is the highest size in MS132 frame size to meet Type E at 65 kA; the next size up is the MS451-16E).

<sup>5)</sup> S1-M3-25 line side feeder terminal is needed with manual motor protector to meet Type E self protection class according to UL and cUL requirements.

<sup>6)</sup> 480Y/277V only.

# Control connections



## Application macros

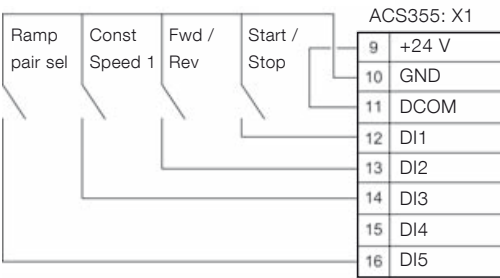
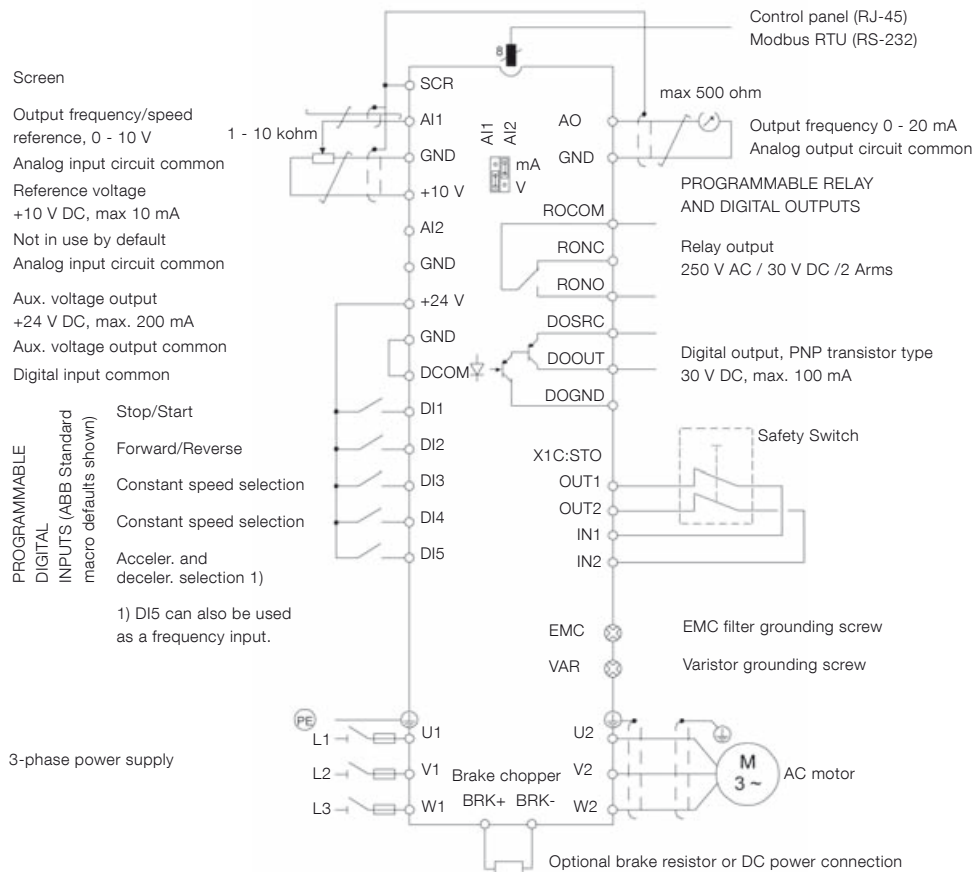
Application macros are preprogrammed parameter sets. While starting up the drive, the user typically selects one of the macros that is best suited for the application. The diagram below gives an overview of ACS355 control connections and shows the default I/O connections for the ABB standard macro.

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

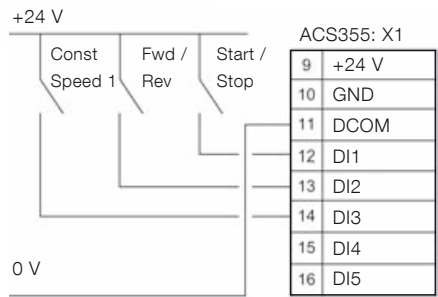
ABB machinery drives have eight application macros:

- ABB standard macro
- Torque 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.



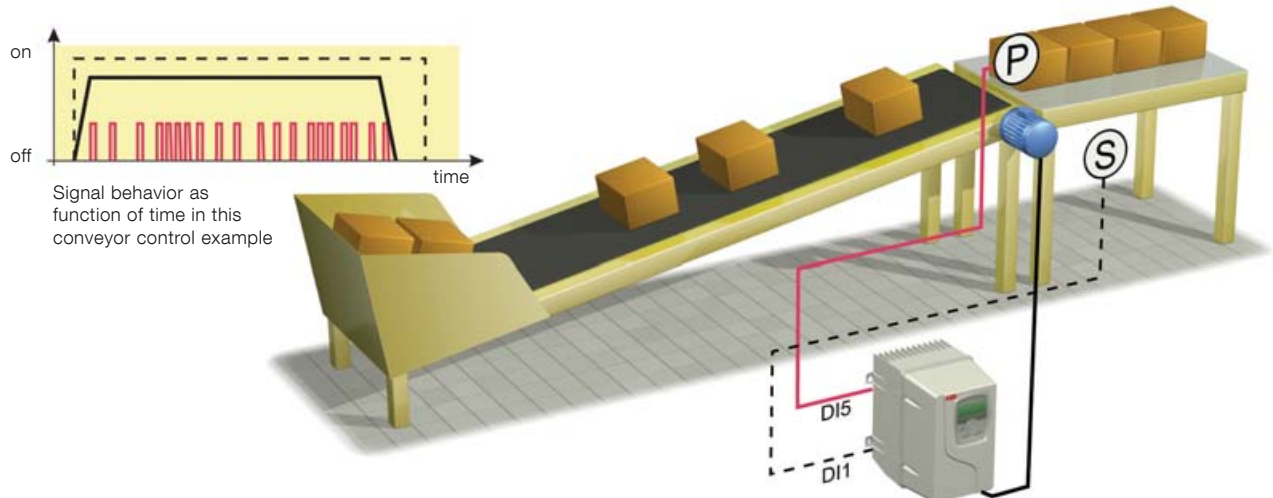
Sinking DI configuration (NPN connected).



Sourcing DI configuration (PNP connected) with external power supply.

# Control program example

ACS355 - 0XX - 0XAX - X + XXXX



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.

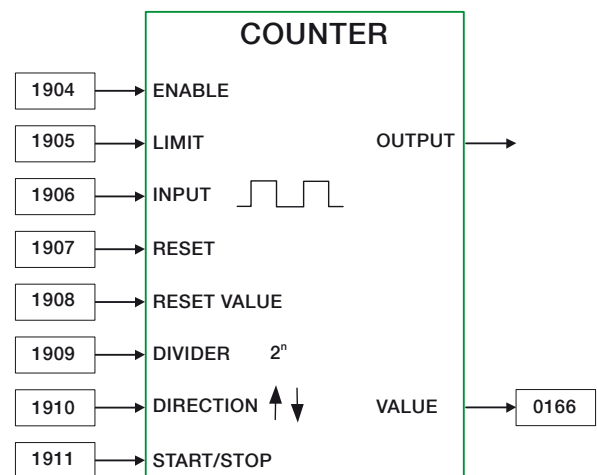
### Start/Stop functions

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.



# Control program example

ACS355 - 0XX - 0XAX - X + XXXX

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

ACS355 - 0XX - 0XAX - X + N826



## 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                      |

# Control program variants

ACS355 - 0XX - 0XAX - X + N830



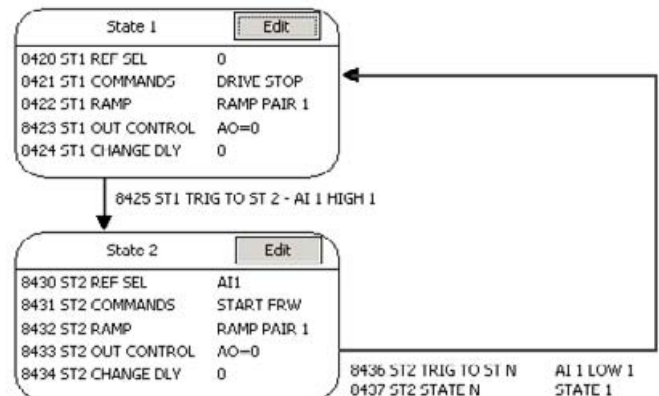
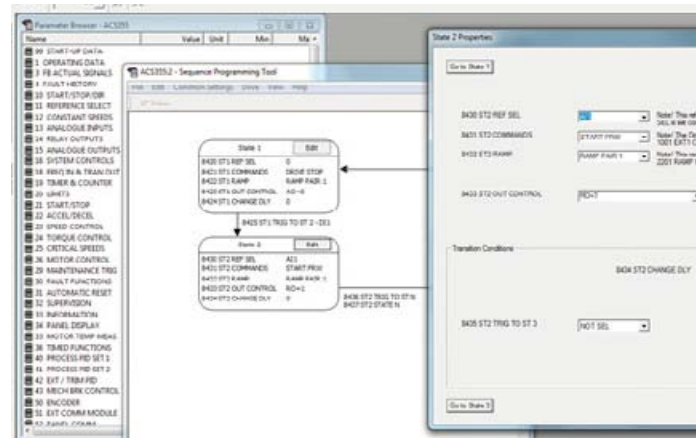
## Enhanced sequence programming +N830

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.



# Product variants

ACS355 - 0XX - 0XAX - X + B063

## 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                                                                                                                                                                                                                               |                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <b>Voltage and power range</b>                                                                                                                                                                                                                                              | 3-phase, 200 to 240 V $\pm$ 10%<br>0.37 to 4 kW (0.5 to 5 hp)<br>3-phase, 380 to 480 V $\pm$ 10%<br>0.37 to 7.5 kW (0.5 to 10 hp) |
| <b>Common DC</b>                                                                                                                                                                                                                                                            | Cannot be used with high degree protection class                                                                                  |
| Environmental limits, high protection class drive                                                                                                                                                                                                                           |                                                                                                                                   |
| <b>Ambient temperature</b>                                                                                                                                                                                                                                                  | -10 to 40 °C (14 to 104 °F), no frost allowed                                                                                     |
| <b>Degree of protection</b>                                                                                                                                                                                                                                                 | IP66/IP67/UL Type 4X, indoor use only<br>IP69K with compatible cable glands                                                       |
| Product compliance, high protection class drive                                                                                                                                                                                                                             |                                                                                                                                   |
| Low Voltage Directive 2006/95/EC<br>Machinery Directive 2006/42/EC<br>EMC Directive 2004/108/EC<br>Quality assurance system ISO 9001<br>Environmental system ISO 14001<br>UL, cUL, CE, C-Tick and GOST R approvals<br>RoHS compliant<br>NSF Certified<br>DIN40050-9 (IP69K) |                                                                                                                                   |

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

# Product variants

ACS355 - 0XX - 0XAX - X + B827

## 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<br>IP20 | Typical losses W*) | MPPT voltage range |     | DC voltage range |          |
|----------------------------------------------------|-------------|---------------|-------------------|--------------------|--------------------|--------------------|-----|------------------|----------|
| $P_N$<br>hp                                        | $P_N$<br>kW | $I_{2N}$<br>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      |
| 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      |
| 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.

# Control program variants

ACS355 - 0XX - 0XAX - X + N828



## 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.

# Options

ACS355 - 0XX - 0XAX - X + XXXX

## 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 above. 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                                 | J400           | Assistant control panel                      | ACS-CP-A          | □            | ●               |
| (choose one option only)                      | 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<br>(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           | Ethernet 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<br>(choose one option only) | L502           | Speed encoder module                         | MTAC-01           | □            | -               |
|                                               | L511           | Relay output module                          | MREL-01           | □            | -               |
|                                               | G406           | Auxiliary power extension module             | MPOW-01           | □            | -               |
| Remote monitoring                             | *)             | Remote monitoring adapter                    | SREA-01           | □            | □               |
|                                               | 3AUA0000094517 | Remote monitoring adapter                    | NETA-21           | □            | □               |
| 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                               | MFDT-01           | □            | □               |
|                                               | *)             | DriveWindow Light                            | DriveWindow Light | □            | □               |
|                                               | P924 **)       | PLC and AC drive starter kit                 |                   | □            | □               |
| External options                              | *)             | Input chokes                                 |                   | □            | □ <sup>1)</sup> |
|                                               | *)             | EMC filters                                  |                   | □            | □ <sup>1)</sup> |
|                                               | *)             | Braking resistors                            |                   | □            | □ <sup>1)</sup> |
|                                               | *)             | Output chokes                                |                   | □            | □ <sup>1)</sup> |
|                                               | 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.

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

# Options Interface

ACS355 - 0XX - 0XAX - X + XXXX

## 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.



Panel cover (included as standard)



Basic control panel



Assistant control panel



Potentiometer



Panel holder mounting kit OPMP-01

# Options Interface

ACS355 - 0XX - 0XAX - X + XXXX



## 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™
- EtherNet PowerLink
- 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

ACS355 - 0XX - 0XAX - X + XXXX

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](http://www.abb.com/automationbuilder) for 30 days test license.

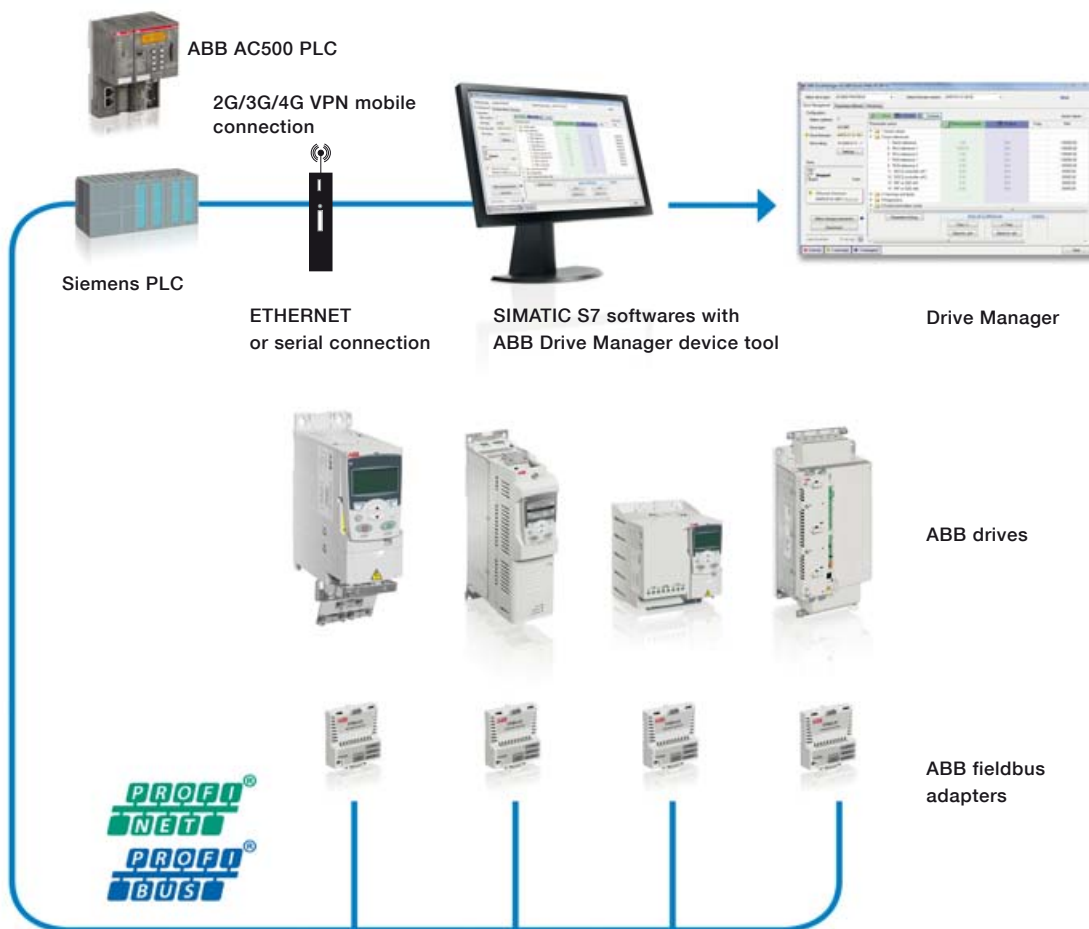
### Drive Manager

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

# Options

## Software tools

### 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.

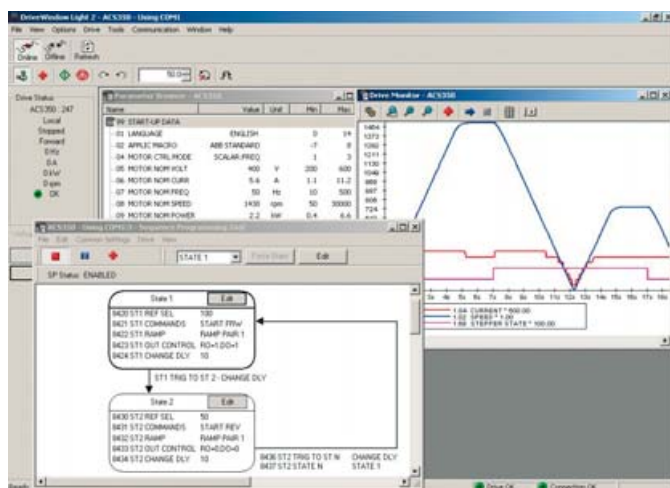
### Sequence programming tool

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

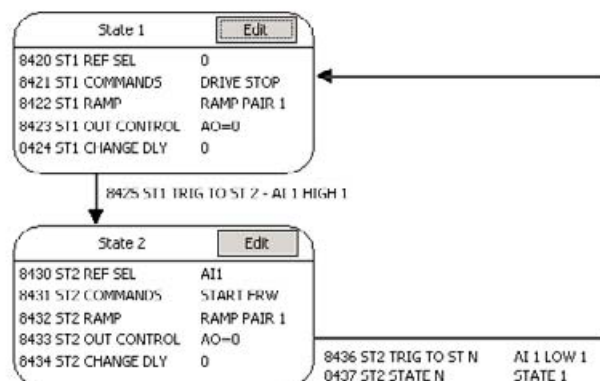
In this example, analog input AI1 will start the motor at a fixed speed. This function is useful when the drive is operated using only a potentiometer. The motor speed is proportional to the analog input when analog input level is higher than the fixed level. In this case separate start and stop commands 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

### Brake resistors

ACS355 is delivered with an integrated brake chopper as standard. Therefore no additional space or installation time is needed. The brake resistor is selected using the table below. For more information about the selection of brake resistors, see the ACS355 user's manual.



# Options External

## 230 V 1 phase supply, type CR resistors

| ACS355-01U- | hp  | Duty cycle = 3 sec on/27 sec off |      |       | Duty cycle = 10 sec on/50 sec 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   |

| ACS355-01U- | hp  | Duty cycle = 30 sec on/180 sec off |      |       | Duty cycle = 60 sec on/180 sec 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   |                                    |      |       |

## 230 V 1 phase supply, standard enclosed resistor packages

| ACS355-01U- | hp  | Duty cycle = 3 sec on/27 sec off |      |       | Duty cycle = 10 sec on/50 sec 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   |

| ACS355-01U- | hp  | Duty cycle = 30 sec on/180 sec off |      |       | Duty cycle = 60 sec on/180 sec 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   |

## 230 V 3 phase supply, type CR resistors

| ACS355-03U- | hp   | Duty cycle = 3 sec on/27 sec off |      |       | Duty cycle = 10 sec on/50 sec 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   |

| ACS355-03U- | hp   | Duty cycle = 30 sec on/180 sec off |      |       | Duty cycle = 60 sec on/180 sec 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-11                       | 100  | 150   |
| 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-24                       | 50   | 300   | P14494-CR-32                       | 50   | 400   |
| 09A8-2      | 3    | P14494-CR-32                       | 50   | 400   |                                    |      |       |

# Options External

| 230 V 3 phase supply, standard enclosed resistor packages |      |                                  |      |       |                                   |      |       |
|-----------------------------------------------------------|------|----------------------------------|------|-------|-----------------------------------|------|-------|
| ACS355-03U-                                               | hp   | Duty cycle = 3 sec on/27 sec off |      |       | Duty cycle = 10 sec on/50 sec 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   |
| 03A5-2                                                    | 0.75 | 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   |
| 17A6-2                                                    | 5    | P14494-31                        | 35   | 300   | P14494-32                         | 35   | 820   |
| 24A4-2                                                    | 7.5  | P14494-39                        | 21   | 400   | P14494-40                         | 21   | 750   |
| 31A0-2                                                    | 10   | P14494-46                        | 15   | 750   | P14494-47                         | 15   | 1150  |
| 46A2-2                                                    | 15   | P14494-56                        | 10   | 750   | P14494-57                         | 10   | 1250  |

| ACS355-03U- | hp   | Duty cycle =30 sec on/180 sec off |      |       | Duty cycle = 60 sec on/180 sec 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   |
| 03A5-2      | 0.75 | 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   |
| 17A6-2      | 5    | P14494-32                         | 35   | 820   | P14494-33                          | 35   | 1200  |
| 24A4-2      | 7.5  | P14494-41                         | 21   | 1050  | P14494-42                          | 21   | 1500  |
| 31A0-2      | 10   | P14494-48                         | 15   | 1550  | P14494-49                          | 15   | 2160  |
| 46A2-2      | 15   | P14494-58                         | 10   | 1800  | P14494-59                          | 10   | 3600  |

| 480 V 3 phase supply, type CR resistors |      |                                  |      |       |                                   |      |       |
|-----------------------------------------|------|----------------------------------|------|-------|-----------------------------------|------|-------|
| ACS355-03U-                             | hp   | Duty cycle = 3 sec on/27 sec off |      |       | Duty cycle = 10 sec on/50 sec 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-01                      | 500  | 100   |
| 02A4-4                                  | 1    | P14494-CR-02                     | 200  | 100   | P14494-CR-02                      | 200  | 100   |
| 03A3-4                                  | 1.5  | P14494-CR-02                     | 200  | 100   | P14494-CR-09                      | 200  | 150   |
| 04A1-4                                  | 2    | P14494-CR-03                     | 150  | 100   | P14494-CR-15                      | 150  | 200   |
| 05A6-4                                  | 3    | P14494-CR-11                     | 100  | 150   | P14494-CR-22                      | 100  | 300   |
| 08A8-4                                  | 5    | P14494-CR-22                     | 100  | 300   | P14494-CR-30                      | 100  | 400   |
| 12A5-4                                  | 8    | P14494-CR-32                     | 50   | 400   |                                   |      |       |

| ACS355-03U- | hp   | Duty cycle = 30 sec on/180 sec off |      |       | Duty cycle = 60 sec on/180 sec 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   |                                    |      |       |

# Options External

## 480 V 3 phase supply, standard enclosed resistor packages

| ACS355-03U- | hp   | Duty cycle = 3 sec on/27 sec off |      |       | Duty cycle = 10 sec on/50 sec off |      |       |
|-------------|------|----------------------------------|------|-------|-----------------------------------|------|-------|
|             |      | Resistor part No. 1              | Ohms | Watts | Resistor part No.                 | Ohms | Watts |
| 01A2-4      | 0.50 | P14494-10                        | 350  | 200   | P14494-10                         | 350  | 200   |
| 01A9-4      | 0.75 | P14494-11                        | 250  | 300   | P14494-11                         | 250  | 300   |
| 02A4-4      | 1    | P14494-11                        | 250  | 300   | P14494-11                         | 250  | 300   |
| 03A3-4      | 1.5  | P14494-13                        | 200  | 300   | P14494-13                         | 200  | 300   |
| 04A1-4      | 2    | P14494-15                        | 150  | 300   | P14494-15                         | 150  | 300   |
| 05A6-4      | 3    | P14494-15                        | 150  | 300   | P14494-15                         | 150  | 300   |
| 08A8-4      | 5    | P14494-19                        | 75   | 300   | P14494-20                         | 75   | 600   |
| 12A5-4      | 7.5  | P14494-25                        | 45   | 800   | P14494-25                         | 45   | 800   |
| 15A6-4      | 10   | P14494-25                        | 45   | 800   | P14494-26                         | 45   | 1260  |
| 23A1-4      | 15   | P14494-32                        | 35   | 820   | P14494-33                         | 35   | 1200  |
| 31A0-4      | 20   | P14494-41                        | 21   | 1050  | P14494-43                         | 21   | 2000  |
| 38A0-4      | 25   | P14494-47                        | 15   | 1150  | P14494-49                         | 15   | 2160  |
| 44A0-4      | 30   | P14494-48                        | 15   | 1550  | P14494-50                         | 15   | 2450  |

| ACS355-03U- | hp   | Duty cycle = 30 sec on/180 sec off |      |       | Duty cycle = 60 sec on/180 sec off |      |       |
|-------------|------|------------------------------------|------|-------|------------------------------------|------|-------|
|             |      | Resistor part No. 1                | Ohms | Watts | Resistor part No. 1                | Ohms | Watts |
| 01A2-4      | 0.5  | P14494-10                          | 350  | 200   | P14494-10                          | 350  | 200   |
| 01A9-4      | 0.75 | P14494-11                          | 250  | 300   | P14494-11                          | 250  | 300   |
| 02A4-4      | 1    | P14494-11                          | 250  | 300   | P14494-11                          | 250  | 300   |
| 03A3-4      | 1.5  | P14494-13                          | 200  | 300   | P14494-13                          | 200  | 300   |
| 04A1-4      | 2    | P14494-15                          | 150  | 300   | P14494-16                          | 150  | 600   |
| 05A6-4      | 3    | P14494-16                          | 150  | 600   | P14494-16                          | 150  | 600   |
| 08A8-4      | 5    | P14494-20                          | 75   | 600   | P14494-21                          | 75   | 1000  |
| 12A5-4      | 7.5  | P14494-26                          | 45   | 1260  | P14494-27                          | 45   | 1920  |
| 15A6-4      | 10   | P14494-26                          | 45   | 1260  | P14494-27                          | 45   | 1920  |
| 23A1-4      | 15   | P14494-38                          | 35   | 1865  | P14494-36                          | 35   | 3600  |
| 31A0-4      | 20   | P14494-44                          | 21   | 2600  | P14494-45                          | 21   | 4400  |
| 38A0-4      | 25   | P14494-53                          | 15   | 3600  | P14494-54                          | 15   | 5000  |
| 44A0-4      | 30   | P14494-53                          | 15   | 3600  | P14494-55                          | 15   | 6000  |

All resistors are for stopping duty only.

# Options

## External

Type CR technical data

| 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-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-09 | 200  | 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-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-18 | 50   | 200   | CR200     | 6W x 3D x 1.5H        | 1           |
| 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-24 | 50   | 300   | CR300     | 9W x 3D x 1.5H        | 3           |
| P14494-CR-26 | 40   | 300   | CR300     | 9W x 3D x 1.5H        | 3           |
| 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-32 | 50   | 400   | CR400     | 12W x 3D x 1.5H       | 4           |
| P14494-CR-34 | 40   | 400   | CR400     | 12W x 3D x 1.5H       | 4           |

Standard enclosed resistor packages 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           |
| P14494-13   | 200  | 300   | GCE1      | 12W x 5D x 5H         | 7           |
| P14494-15   | 150  | 300   | GCE1      | 12W x 5D x 5H         | 7           |
| P14494-16   | 150  | 600   | GCE2      | 12W x 7D x 5H         | 10          |
| 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          |
| P14494-24   | 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          |
| P14494-31   | 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          |
| P14494-36   | 35   | 3600  | GCE9      | 26.5W x 10D x 5H      | 28          |
| 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          |
| P14494-53   | 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          |

# Options External

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

## Input chokes

Input choke smooths the wave shape of mains current and reduces total harmonic distortion (THD). In addition, the input choke provides improved protection against mains voltage transients.

## Input current ratings

with and without AC line reactors

| Type designation<br>ACS355-                        | Input without reactor | Input with 5% reactor | Drive output | KLR 5% Open, non | KLR 5% NEMA 1, non | KLR 5% UL Open | KLR 5% UL Type 1 | KLR 5% UL Type 3R | Losses |
|----------------------------------------------------|-----------------------|-----------------------|--------------|------------------|--------------------|----------------|------------------|-------------------|--------|
|                                                    | Input A               | Input A               | Output A     | $P_N$            | $P_N$              | $P_N$          | $P_N$            | $P_N$             | Watts  |
| <b>Single phase drive – 200-240 V applications</b> |                       |                       |              |                  |                    |                |                  |                   |        |
| 01U-02A4-2                                         | 6.1                   | 4.5                   | 2.4          | KDRA25H          | KDRA25HC1          | KDRULA25H      | KDRULA25HE01     | KDRULA25HE3R      | 14     |
| 01U-04A7-2                                         | 11                    | 8.1                   | 4.7          | KDRA27H          | KDRA27HC1          | KDRULA27H      | KDRULA27HE01     | KDRULA27HE3R      | 23.6   |
| 01U-06A7-2                                         | 16                    | 11                    | 6.7          | KDRA28H          | KDRA28HC1          | KDRULA28H      | KDRULA28HE01     | KDRULA28HE3R      | 30.6   |
| 01U-07A5-2                                         | 17                    | 12                    | 7.5          | KDRD22H          | KDRD22HC2          | KDRULD22H      | KDRULD22HE01     | KDRULD22HE3R      | 30.5   |
| 01U-09A8-2                                         | 21                    | 15                    | 9.8          | KDRD22H          | KDRD22HC2          | KDRULD22H      | KDRULD22HE01     | KDRULD22HE3R      | 43.1   |
| <b>Three phase drive – 200-240 V applications</b>  |                       |                       |              |                  |                    |                |                  |                   |        |
| 03U-02A4-2                                         | 4.3                   | 2.2                   | 2.4          | KDRA25H          | KDRA25HC1          | KDRULA25H      | KDRULA25HE01     | KDRULA25HE3R      | 23.6   |
| 03U-03A5-2                                         | 6.1                   | 3.5                   | 3.5          | KDRA27H          | KDRA27HC1          | KDRULA27H      | KDRULA27HE01     | KDRULA27HE3R      | 30.6   |
| 03U-04A7-2                                         | 7.6                   | 4.2                   | 4.7          | KDRA26H          | KDRA26HC1          | KDRULA26H      | KDRULA26HE01     | KDRULA26HE3R      | 30.5   |
| 03U-06A7-2                                         | 12                    | 6.1                   | 6.7          | KDRB25H          | KDRB25HC1          | KDRULB25H      | KDRULB25HE01     | KDRULB25HE3R      | 53.1   |
| 03U-07A5-2                                         | 12                    | 6.9                   | 7.5          | KDRB25H          | KDRB25HC1          | KDRULB25H      | KDRULB25HE01     | KDRULB25HE3R      | 53.1   |
| 03U-09A8-2                                         | 14                    | 9.2                   | 9.8          | KDRB26H          | KDRB26HC1          | KDRULB26H      | KDRULB26HE01     | KDRULB26HE3R      | 66.5   |
| 03U-13A3-2                                         | 22                    | 13                    | 13.3         | KDRB26H          | KDRB26HC1          | KDRULB26H      | KDRULB26HE01     | KDRULB26HE3R      | 66.5   |
| 03U-17A6-2                                         | 24.8                  | 14                    | 17.6         | KDRD21H          | KDRD21HC2          | KDRULD21H      | KDRULD21HE01     | KDRULD21HE3R      | 91.8   |
| 03U-24A4-2                                         | 41                    | 21                    | 24.4         | KDRD22H          | KDRD22HC2          | KDRULD22H      | KDRULD22HE01     | KDRULD22HE3R      | 107.8  |
| 03U-31A0-2                                         | 50                    | 26                    | 31           | KDRC22H          | KDRC22HC2          | KDRULC22H      | KDRULC22HE01     | KDRULC22HE3R      | 113.1  |
| 03U-46A2-2                                         | 69                    | 41                    | 46.2         | KDRF25H          | KDRF25HC4          | KDRULF25H      | KDRULF25HE01     | KDRULF25HE3R      | 179.2  |
| <b>Three phase drive – 380-480 V applications</b>  |                       |                       |              |                  |                    |                |                  |                   |        |
| 03U-01A2-4                                         | 1.8                   | 0.9                   | 1.2          | KDRA8H           | KDRA8HC1           | KDRULA8H       | KDRULA8HE01      | KDRULA8HE3R       | 12     |
| 03U-01A9-4                                         | 3.0                   | 1.5                   | 1.9          | KDRA9H           | KDRA9HC1           | KDRULA9H       | KDRULA9HE01      | KDRULA9HE3R       | 23     |
| 03U-02A4-4                                         | 3.4                   | 1.9                   | 2.4          | KDRA1H           | KDRA1HC1           | KDRULA1H       | KDRULA1HE01      | KDRULA1HE3R       | 33     |
| 03U-03A3-4                                         | 5.0                   | 2.6                   | 3.3          | KDRA2H           | KDRA2HC1           | KDRULA2H       | KDRULA2HE01      | KDRULA2HE3R       | 38     |
| 03U-04A1-4                                         | 5.8                   | 2.9                   | 4.1          | KDRA2H           | KDRA2HC1           | KDRULA2H       | KDRULA2HE01      | KDRULA2HE3R       | 38     |
| 03U-05A6-4                                         | 8.0                   | 4.0                   | 5.6          | KDRA4H           | KDRA4HC1           | KDRULA4H       | KDRULA4HE01      | KDRULA4HE3R       | 77     |
| 03U-07A3-4                                         | 9.7                   | 5.1                   | 7.3          | KDRA4H           | KDRA4HC1           | KDRULA4H       | KDRULA4HE01      | KDRULA4HE3R       | 77     |
| 03U-08A8-4                                         | 11                    | 6.4                   | 8.8          | KDRA5H           | KDRA5HC1           | KDRULA5H       | KDRULA5HE01      | KDRULA5HE3R       | 111    |
| 03U-12A5-4                                         | 16                    | 9.5                   | 12.5         | KDRB2H           | KDRB2HC1           | KDRULB2H       | KDRULB2HE01      | KDRULB2HE3R       | 133    |
| 03U-15A6-4                                         | 18                    | 10                    | 15.6         | KDRB2H           | KDRB2HC1           | KDRULB2H       | KDRULB2HE01      | KDRULB2HE3R       | 133    |
| 03U-23A1-4                                         | 26                    | 15                    | 23.1         | KDRE2H           | KDRE2HC2           | KDRULE2H       | KDRULE2HE01      | KDRULE2HE3R       | 141    |
| 03U-31A0-4                                         | 43                    | 20                    | 31           | KDRF4H           | KDRF4HC3           | KDRULF4H       | KDRULF4HE01      | KDRULF4HE3R       | 169    |
| 03U-38A0-4                                         | 51                    | 26                    | 38           | KDRF4H           | KDRF4HC3           | KDRULF4H       | KDRULF4HE01      | KDRULF4HE3R       | 169    |
| 03U-44A0-4                                         | 56                    | 32                    | 44           | KDRF1H           | KDRF1HC3           | KDRULF1H       | KDRULF1HE01      | KDRULF1HE3R       | 191    |

# Options External

## Output Filters

Output choke decreases du/dt on the drive output and filters current spikes caused by voltage spikes. Output filter also increases the maximum motor cable length.

| Type designation | hp | Output current | V1K UL Open | V1K UL Type 1 | V1K UL Type 3R | Loss  |
|------------------|----|----------------|-------------|---------------|----------------|-------|
|                  |    |                | $P_N$       | $P_N$         | $P_N$          | Watts |

### ACS355-01U-

|        |     |     |          |          |          |    |
|--------|-----|-----|----------|----------|----------|----|
| 02A4-2 | 0,5 | 2,4 | V1K3A00  | V1K3A01  | V1K3A03  | 75 |
| 04A7-2 | 1   | 4,7 | V1K6A00  | V1K6A01  | V1K6A03  | 80 |
| 06A7-2 | 1,5 | 6,7 | V1K6A00  | V1K6A01  | V1K6A03  | 80 |
| 07A5-2 | 2   | 7,5 | V1K8A00  | V1K8A01  | V1K8A03  | 90 |
| 09A8-2 | 3   | 9,8 | V1K12A00 | V1K12A01 | V1K12A03 | 95 |

### ACS355-03U-

|        |      |      |          |          |          |     |
|--------|------|------|----------|----------|----------|-----|
| 02A4-2 | 0,5  | 2,4  | V1K3A00  | V1K3A01  | V1K3A03  | 75  |
| 03A5-2 | 0,75 | 3,5  | V1K4A00  | V1K4A01  | V1K4A03  | 75  |
| 04A7-2 | 1    | 4,7  | V1K6A00  | V1K6A01  | V1K6A03  | 80  |
| 06A7-2 | 1,5  | 6,7  | V1K6A00  | V1K6A01  | V1K6A03  | 80  |
| 07A5-2 | 2    | 7,5  | V1K8A00  | V1K8A01  | V1K8A03  | 90  |
| 09A8-2 | 3    | 9,8  | V1K12A00 | V1K12A01 | V1K12A03 | 95  |
| 13A3-2 | 3    | 13,3 | V1K12A00 | V1K12A01 | V1K12A03 | 95  |
| 17A6-2 | 5    | 17,6 | V1K16A00 | V1K16A01 | V1K16A03 | 95  |
| 24A4-2 | 7,5  | 24,4 | V1K25A00 | V1K25A01 | V1K25A03 | 110 |
| 31A0-2 | 10   | 31   | V1K35A00 | V1K35A01 | V1K35A03 | 130 |
| 46A2-2 | 15   | 46,2 | V1K45A00 | V1K45A01 | V1K45A03 | 135 |

| Type designation | hp | Output current | V1K UL Open | V1K UL Type 1 | V1K UL Type 3R | Loss  |
|------------------|----|----------------|-------------|---------------|----------------|-------|
|                  |    |                | $P_N$       | $P_N$         | $P_N$          | Watts |

### ACS355-01U-

|        |      |      |          |          |          |     |
|--------|------|------|----------|----------|----------|-----|
| 01A2-4 | 0,5  | 1,2  |          |          |          |     |
| 01A9-4 | 0,75 | 1,9  | V1K2A00  | V1K2A01  | V1K2A03  | 75  |
| 02A4-4 | 1    | 2,4  | V1K3A00  | V1K3A01  | V1K3A03  | 75  |
| 03A3-4 | 1,5  | 3,3  | V1K3A00  | V1K3A01  | V1K3A03  | 75  |
| 04A1-4 | 2    | 4,1  | V1K4A00  | V1K4A01  | V1K4A03  | 75  |
| 05A6-4 | 3    | 5,6  | V1K6A00  | V1K6A01  | V1K6A03  | 80  |
| 07A3-4 | 3    | 7,3  | V1K6A00  | V1K6A01  | V1K6A03  | 80  |
| 08A8-4 | 5    | 8,8  | V1K8A00  | V1K8A01  | V1K8A03  | 90  |
| 12A5-4 | 7,5  | 12,5 | V1K12A00 | V1K12A01 | V1K12A03 | 95  |
| 15A6-4 | 10   | 15,6 | V1K16A00 | V1K16A01 | V1K16A03 | 95  |
| 23A1-4 | 15   | 23,1 | V1K21A00 | V1K21A01 | V1K21A03 | 110 |
| 31A0-4 | 20   | 31   | V1K27A00 | V1K27A01 | V1K27A03 | 110 |
| 38A0-4 | 25   | 38   | V1K35A00 | V1K35A01 | V1K35A03 | 130 |
| 44A0-4 | 30   | 44   | V1K45A00 | V1K45A01 | V1K45A03 | 135 |

# 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<br>designation<br><br>ACS355- | Frame<br>size | Filter<br>type       | Cable length <sup>1)</sup><br>with external EMC<br>filter |           |           | Cable length <sup>1)</sup><br>without external<br>EMC filter |           |
|------------------------------------|---------------|----------------------|-----------------------------------------------------------|-----------|-----------|--------------------------------------------------------------|-----------|
|                                    |               |                      | C1<br>[m]                                                 | C2<br>[m] | C3<br>[m] | C3<br>[m]                                                    | C4<br>[m] |
|                                    |               |                      |                                                           |           |           |                                                              |           |
| 1-phase AC supply, 200 to 240 V    |               |                      |                                                           |           |           |                                                              |           |
| 01X-02A4-2                         | R0            | RFI-11               | 10                                                        | 30        | -         | 30                                                           | 30        |
| 01X-04A7-2                         | R1            | RFI-12               | 10                                                        | 30        | 50        | 30                                                           | 50        |
| 01X-06A7-2                         | R1            | RFI-12               | 10                                                        | 30        | 50        | 30                                                           | 50        |
| 01X-07A5-2                         | R2            | RFI-13               | 10                                                        | 30        | 50        | 30                                                           | 50        |
| 01X-09A8-2                         | R2            | RFI-13               | 10                                                        | 30        | 50        | 30                                                           | 50        |
| 3-phase AC supply, 200 to 240 V    |               |                      |                                                           |           |           |                                                              |           |
| 03X-02A4-2                         | R0            | RFI-32 <sup>2)</sup> | 10                                                        | 30        | -         | 30                                                           | 30        |
| 03X-03A5-2                         | R0            | RFI-32 <sup>2)</sup> | 10                                                        | 30        | -         | 30                                                           | 30        |
| 03X-04A7-2                         | R1            | RFI-32 <sup>2)</sup> | 10                                                        | 30        | 50        | 30                                                           | 50        |
| 03X-06A7-2                         | R1            | RFI-32 <sup>2)</sup> | 10                                                        | 30        | 50        | 30                                                           | 50        |
| 03X-07A5-2                         | R1            | RFI-32 <sup>2)</sup> | 10                                                        | 30        | 50        | 30                                                           | 50        |
| 03X-09A8-2                         | R2            | RFI-32 <sup>2)</sup> | 10                                                        | 30        | 50        | 30                                                           | 50        |
| 03X-13A3-2                         | R2            | RFI-33               | 10                                                        | 30        | 50        | 30                                                           | 50        |
| 03X-17A6-2                         | R2            | RFI-33               | 10                                                        | 30        | 50        | 30                                                           | 50        |
| 03X-24A4-2                         | R3            | RFI-34               | 10                                                        | 30        | 50        | 30                                                           | 50        |
| 03X-31A0-2                         | R4            | RFI-34               | 10                                                        | 30        | 50        | 30                                                           | 50        |
| 03X-46A2-2                         | R4            | RFI-34               | 10                                                        | 30        | 50        | 30                                                           | 50        |
| 3-phase AC supply, 380 to 480 V    |               |                      |                                                           |           |           |                                                              |           |
| 03X-01A2-4                         | R0            | RFI-32 <sup>2)</sup> | 30                                                        | 30        | -         | 30                                                           | 30        |
| 03X-01A9-4                         | R0            | RFI-32 <sup>2)</sup> | 30                                                        | 30        | -         | 30                                                           | 30        |
| 03X-02A4-4                         | R1            | RFI-32 <sup>2)</sup> | 50                                                        | 50        | 50        | 30                                                           | 50        |
| 03X-03A3-4                         | R1            | RFI-32 <sup>2)</sup> | 50                                                        | 50        | 50        | 30                                                           | 50        |
| 03X-04A1-4                         | R1            | RFI-32 <sup>2)</sup> | 50                                                        | 50        | 50        | 30                                                           | 50        |
| 03X-05A6-4                         | R1            | RFI-32 <sup>2)</sup> | 50                                                        | 50        | 50        | 30                                                           | 50        |
| 03X-07A3-4                         | R1            | RFI-32 <sup>2)</sup> | 50                                                        | 50        | 50        | 30                                                           | 50        |
| 03X-08A8-4                         | R1            | RFI-32 <sup>2)</sup> | 50                                                        | 50        | 50        | 30                                                           | 50        |
| 03X-12A5-4                         | R3            | RFI-33               | 40                                                        | 40        | 40        | 30                                                           | 50        |
| 03X-15A6-4                         | R3            | RFI-33               | 40                                                        | 40        | 40        | 30                                                           | 50        |
| 03X-23A1-4                         | R3            | RFI-33               | 40                                                        | 40        | 40        | 30                                                           | 50        |
| 03X-31A0-4                         | R4            | RFI-34               | -                                                         | 30        | -         | 30                                                           | 50        |
| 03X-38A0-4                         | R4            | RFI-34               | -                                                         | 30        | -         | 30                                                           | 50        |
| 03X-44A0-4                         | R4            | RFI-34               | -                                                         | 30        | -         | 30                                                           | 50        |

<sup>1)</sup> Internal EMC filter must be connected with the EMC screw in the drive.  
When the filter is not connected the C4 maximum cable lengths are allowed to be used.

<sup>2)</sup> RFI-30 also available as footprint filter for frame size R0 and R1 with similar characteristics.

## Low leakage current filters

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

| Type designation<br>ACS355-                           | Frame size | Filter type | Cable length <sup>1)</sup><br>with LRFI filter |
|-------------------------------------------------------|------------|-------------|------------------------------------------------|
|                                                       |            |             | C2<br>[m]                                      |
| Low leakage current filters, 3-phase AC supply, 400 V |            |             |                                                |
| 03X-01A2-4                                            | R0         | LRFI-31     | 10                                             |
| 03X-01A9-4                                            | R0         | LRFI-31     | 10                                             |
| 03X-02A4-4                                            | R1         | LRFI-31     | 10                                             |
| 03X-03A3-4                                            | R1         | LRFI-31     | 10                                             |
| 03X-04A1-4                                            | R1         | LRFI-31     | 10                                             |
| 03X-05A6-4                                            | R1         | LRFI-31     | 10                                             |
| 03X-07A3-4                                            | R1         | LRFI-32     | 10                                             |
| 03X-08A8-4                                            | R1         | LRFI-32     | 10                                             |

<sup>1)</sup> Internal EMC filter must be disconnected by removing the EMC screw from the drive. RFI-11, RFI-12 and RFI-13 are also low leakage current filters.

## EMC standards in general

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

# Compact PLC and AC drive starter kit

ACS355

-

01E

-

02A4

-

2

+

P924

ABB's programmable logic controller (PLC) and AC drive starter kit offer an out-of-box motor control in minutes.

The compact, yet powerful kit, targets small-scale machines and systems requiring PLC control and up to seven drives.

## Easy ordering and fast startup

Providing PLC, AC drive and accessories as a package simplifies ordering and provides quick deliveries. The ordering code for the starter kit is ACS355-01E-02A4-2+P924.

## The starter kit for evaluation and customization (application programming) includes:

- PLC AC500-eCo PM554-T (8 DI / 8 DO-Transistor)
- ACS355-01E-02A4-2 (single phase 230 V AC, with power of 0.37 kW) drive with ACS-CP-A assistant control panel and FMBA-01 Modbus fieldbus adapter
- MC502 SD card containing the AC500 function block library for drives with complete functional objects for easy and secure programming
- Several accessories such as MC503 SD card adapter, TA562-RS serial interface, TA571-SIM 6 switches simulator, TK503 communication cable between the PLC and the drive for programming

- Full version of PS501 Control Builder programming environment with all functionalities. Excludes sheet license to receive free software updates.
- A step-by-step guide for setting up the intuitive set

Ready-made reorder packages for ACS355 enables expansion of starter kit to a multiple drives system. AC500 product family offers several controllers for system scaling.

## Benefits of the kit

- Control of a motor in minutes
- Easy ordering of PLC, AC drive and accessories as a kit from ABB's central stock
- Entry-level kit for learning the Control Builder programming environment based on IEC 61161-3 programming standard
- Pre-engineered communication libraries for all ABB LV AC drives
- Ready-made HMI visualization
- Cost-efficient system expansion, since the same application program can be used for the entire AC500 PLC platform



# ABB automation products

## Motion controllers

ABB offers a wide range of motion control products to suit many different applications. Motion controllers are available in PCI format, as stand-alone units with USB, CANopen®, serial and Ethernet interfaces and as intelligent programmable drives for use in single or multiaxis systems.



## Servo drives

ABB offers a range of servo drives to cover many different applications. Its drives range from simple analog, fieldbus controlled drives, indexing drives, fully programmable motion drives and real-time Ethernet solutions based on the open standard Ethernet PowerLink and EtherCAT®. ABB motion drives control rotary and linear AC servo motors, and are available from 1 A single phase through to 65 A three phase.



## Machinery drives

ABB offers machinery builders AC drives from component drives up to high performance machinery drives. Global support and service guarantees lifelong satisfaction. ABB machinery drives provide speed control of diverse applications from spa bath motors to treadmill motors, as well as high precision applications such as positioning and synchronization systems.



## 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 tailor-made 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.



## Servo motors

ABB's BSM series servo motors offer a wide choice of high or low inertia models with winding options, feedback devices and gearheads to match. All ABB servo motors are designed for durability and ability to handle harsh environments.



## AC motors

ABB's low voltage AC motors are designed to save energy, reduce operating costs and enable demanding motor applications to perform reliably and without unscheduled downtime. General performance motors combine convenience and easy handling seamlessly with ABB's engineering expertise. Process performance motors provide the most comprehensive, versatile set of motors for the process industries and heavy-duty applications.



## Jokab safety products

ABB Jokab Safety offers an extensive range of innovative products and solutions for machine safety systems. It is represented in standardization organisations for machine safety and works daily with the practical application of safety requirements in combination with production requirements. ABB Jokab Safety delivers everything from a single safety solution to complete safety systems for single machines or entire production lines.



# ABB automation products

## AC500

ABB's powerful flagship PLC offering a wide range of performance levels and scalability within a single simple concept where most competitors require multiple product ranges to deliver similar functionality. Web server integrated and IEC 60870-5-104 remote control protocol for all Ethernet versions.



## AC500-eCo

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



## AC500-S

A PLC based modular automation solution that makes it easier than before to mix and match standard and safety I/O modules to meet your safety requirements in all functional safety applications. "Extreme conditions" version is also offered.



## 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 against dirt, water, gases and dust.



## Robotics

ABB's robotic automation offers cell automation by integrating AC500 PLCs in IRC5 robot controllers. More productivity with robots is achieved by wireless interfaces for sensors and actuators on robot tools. Wireless from ABB is an innovative, proven solution well-suited for robots, presses, rotary tables and gantries.



## Programming software

Automation Builder integrates the engineering and maintenance for PLC, drives, motion products, HMI and robotics. It complies with the IEC 61131-3 standard offering all five IEC programming languages for PLC and drive configuration. In addition, it includes continuous function chart, C, extensive function block libraries and powerful embedded simulation/visualization features. Automation Builder supports a number of languages (English, German, French, Chinese, Spanish) and comes with new libraries, FTP functions, SMTP, SNTP, smart diagnostics and debugging capabilities.



## I/O modules

Centralised I/O expansion of the AC500 line and decentralised modular I/O supporting CS31, CANopen®, PROFIBUS DP, PROFINET and EtherCAT®.



# Life cycle services

## Your choice, your future

**Your future takes the course of the service you choose for your drives.**

**Whatever your choice, 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:**

- How do I want to maintain my drives?
- What would my optimal service options be?

### **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](http://www.abb.com/drivereg) for extended warranty options and other benefits.



## Service offerings for your business

**Your needs in service usually depend on your operation, priorities, and life cycle phase of your equipment. Here are the most typical service needs with some of our service product options that satisfy them:**

### **Is performance most critical to your operation?**

Get optimal performance out of your machinery and systems.

#### **Supporting services include:**

- Training
- Inspections and Diagnostics
- Hardware and Control Upgrades
- Retrofits
- Workshop Repair

### **Need to extend your assets' lifetime?**

Maximize your drive's lifetime with our services.

#### **Supporting services include:**

- Life Cycle Assessment
- Hardware and Control Upgrades
- Retrofits
- Replacement, Disposal and Recycling

### **Is uptime your priority?**

Keep your drives running with precisely planned and executed maintenance.

#### **Supporting services include:**

- Life Cycle Assessment
- Installation and Commissioning
- Spare Parts
- Preventive Maintenance
- Reconditioning

### **Is rapid response a key consideration?**

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

#### **Supporting services include:**

- Technical Support
- Drive Exchange
- On-site repairs
- Remote Support





## Notes

## Notes



# Contact us

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

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

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