

LOW VOLTAGE AC DRIVES

ABB machinery drives

ACS380, 0.25 to 22 kW/0.37 to 30 hp





**Reliable performance and ease of
integration for machine builders.
ACS380 machinery drives.**

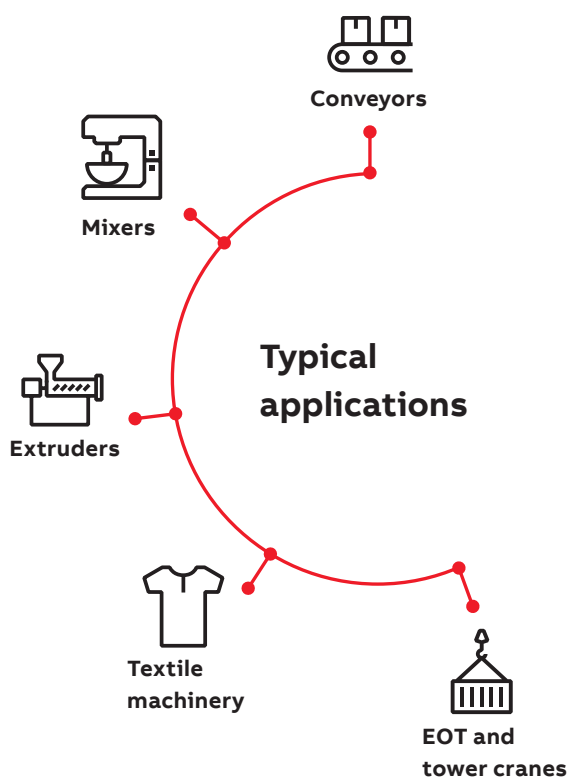
Table of contents

| | |
|--------------|--|
| 04–05 | The ACS380 machinery drives |
| 06–07 | Reliable performance and ease of integration for machine builders |
| 08 | Typical industries and applications |
| 09 | ACS380 drives software with versatile features |
| 10 | EU Ecodesign Regulation |
| 11 | Technical data |
| 12 | How to select a drive |
| 13 | Ordering information |
| 14 | Ratings, types and voltages |
| 16 | Dimensions |
| 17–19 | Construction variants |
| 20 | Control panel options and mounting kits |
| 21 | Door mounting and daisy chaining |
| 22 | Tools for configuration, monitoring and process tuning |
| 23 | Flexible connectivity to automation networks |
| 24–25 | Safety options |
| 26 | I/O option modules |
| 27 | Resistor braking |
| 28 | EMC – electromagnetic compatibility |
| 29 | Filters and chokes |
| 30–31 | Cooling, fuses and circuit breakers |
| 33 | ACS380 drives are compatible with the wide ABB product offering |
| 34 | Choose the right motor for your application |
| 35 | Synchronous reluctance motors |
| 36 | Drivetune mobile application for wireless access |
| 37 | ABB SmartGuide – ACS380 |
| 38–39 | Our service expertise, your advantage |
| 40–41 | ABB Drives Life Cycle Management |

The ACS380 machinery drives

Reliable performance and ease of integration

Thanks to its reliable performance and ease of integration, the ACS380 is an all-compatible machinery drive ideal for machine building. All-compatible ABB drives share the same architecture and user interface for ease of use.



Excellent motor control

The ACS380 machinery drive is a robust and compact drive ideal for machine building. It can control various motor types from 0.25 to 22 kW. Whether the requirement is high starting torque, accurate speed control, stable torque or dynamic response to sudden load variations, the ACS380 drive meets it with or without encoder feedback.

Ease of integration

The ACS380 drive has many advanced features built-in as standard. A selection of variants and options allow the drive to be optimized for various fieldbus communication, I/O and EMC requirements. With the integrated functional safety features, the ACS380 drive can also be part of the machine's safety system via PROFIsafe over PROFINET and safely stop the motor when required. All together, this saves a lot of time and money for machine builders using large numbers of drives per year.

Designed to last 10 years or more

The design lifetime expectancy of the ACS380 drive and its overall components exceeds 10 years in normal operating environments. In some cases, ACS380 drive can last 20 years or more. Design features including coated circuit boards, minimized airflow through the electronics, and up to 50 °C operating temperature without derating make the ACS380 a safe choice for customers expecting high reliability. This is further enhanced by a full load test that is carried out on every single drive during production.



Reliable performance and ease of integration for machine builders

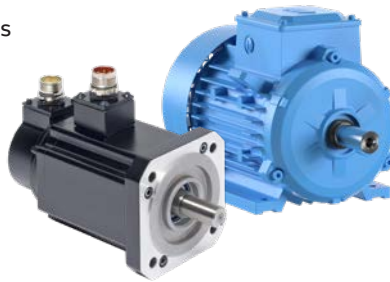
The ACS380 machinery drives are part of ABB's all-compatible drives portfolio. The drives give you consistent performance throughout their whole life cycle. They also offer a wider range of standard and optional features for optimal machine building.

A perfect match for a wide range of machines

ACS380 drives are available in two variants. The standard variant meets the most typical machinery requirements, whereas the configured variant can be optimized for more specific needs.

Excellent motor control

ACS380 drives support various motor types including induction, permanent magnet and synchronous reluctance motors. Motor control performance with 3-phase current measurement meets demanding load profile requirements. In addition, ACS380 controls induction or permanent magnet motors with or without speed feedback from an encoder.



Ease of integration

An extensive selection of fieldbus adapters enables connectivity with all major industrial automation networks. Communication of the ACS380 drive is automatically set at power up for easy access from a PLC to the drive. Additional analog and digital I/O, or speed feedback can be added with option modules when needed.



Built-in functional safety

Safe torque off (STO) is a standard feature in all ACS380 drives. STO or safe stop 1 (SS1-t) can also be controlled via PFOFIsafe with an optional communication module.





Ease of use

The ACS380 drive has an integrated control panel with a display and control keys. The control panel's icon-based menu helps in setting up the drive quickly and effectively. Also, external user panels are available for installation to a cabinet door or for operation via a Bluetooth connection.

All-compatible user interface

ACS380 is part of ABB all-compatible drives portfolio. Other products in this portfolio are ACS480, ACS580 and ACS880 drives. All these drives have the same, easy to use PC tools and similar intuitive multilingual user interface as well as parameter and function structure, making using and learning them fast and easy.



Drive based programmability

Adaptive programming allows customization of the drive software using sequential and function block programming. This is a standard feature of the ACS380 drive requiring no additional downloads or licenses. It may allow the reduction of system costs by replacing the need for a PLC.

Designed to last 10 years or more

The ACS380 drives have improved durability and reliability in harsh conditions, including coated circuit boards and minimized air flow through the electronics. The drives are designed for an ambient temperature of up to 50 °C without derating. Also, the foil coated control panel offers good protection against dust and moisture, and the galvanically isolated fieldbus gives noise immunity.

Typical industries and applications

ACS380 drives improve process performance, increase productivity, reduce external components, and ensure machine and personnel safety



01



02



03








04



05

- 01 Food and beverage
- 02 Material handling
- 03 Textile
- 04 Plastics
- 05 Lumber and wood

| Industry | Application | Customer benefits |
|---|---|---|
| Food and beverage  | Mixers, conveyors, mills, compressors, blowers, fans, pumps, dryers, ovens, extruders | <ul style="list-style-type: none"> • Precise speed control guarantees food production quality in different conditions • Robust design to maximize machine lifetime • Safe torque off (SIL 3/PL e) function ensures machine and personnel safety • Product flexibility to meet requirements of different food production machines |
| Material handling  | Conveyors, hoisting, cranes | <ul style="list-style-type: none"> • High starting torque for demanding operation and movements • Soft acceleration and deceleration with S-curve speed ramp, reducing the stress on the mechanical parts • Crane compatible mechanical brake control logic built in, including other crane application features • Integrated brake chopper enabling faster and accurate stop and reversing cycles • Safe torque off (SIL 3) function to prevent unexpected movements (POUS) |
| Textile  | Conveyors, drum washers, dyeing machines, spinning, pumps | <ul style="list-style-type: none"> • Precise and adjustable speed and torque control for highly accurate stretching management and better quality of the end product • Coated circuit boards, 50 °C ambient without derating and minimized air flow through electronics for reliable operation in harsh environments • Undervoltage control ensures uninterrupted production during power network disturbance |
| Plastics  | Extruders, molding machines, hoppers, polishers | <ul style="list-style-type: none"> • Accurate speed control to enable a steady extrusion process • Smooth speed profile to prevent plastic film web breakages • The scalable all-compatible platform allows easy process and component optimization with different drive types that share the same user interface and tools |
| Lumber and wood  | Conveyors, sorting lines, sanding, cutting | <ul style="list-style-type: none"> • High starting torque for demanding operation and movements • Soft acceleration and deceleration with S-curve speed ramp, reducing the stress on the mechanical parts • Mechanical brake control logic built in • Integrated brake chopper enabling faster and accurate stop and reversing cycles • Safe torque off (SIL 3) function to prevent unexpected movements |

ACS380 drives software with versatile features

Excellent motor control. Whether the requirement is high starting torque, accurate speed control, stable torque or dynamic response to sudden load variations, ACS380 meets it with or without encoder feedback.

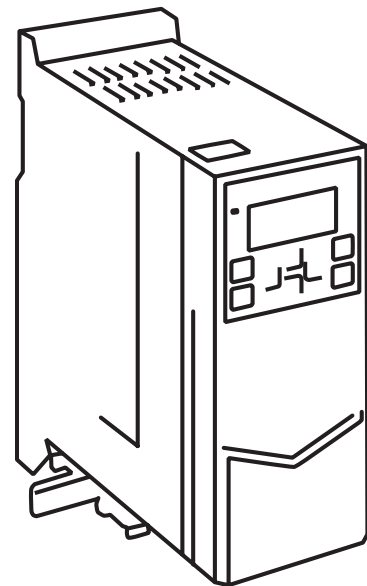
One drive for different motor types. ACS380 perfectly supports induction, permanent magnet and synchronous reluctance motors.

Easy integration to automation. Preconfigured fieldbus protocols enable connectivity with all major industrial automation networks with minimal effort and complexity.

Adaptive programming provides extra flexibility by offering easy alternative for simple programming needs. Download Drive Composer entry for free to start writing your application.

Built-in features for precise movements. Speed or torque reference can easily be adjusted for various needs. Movement range can be controlled with limit switches, and motor stopped in an optimal way with integrated braking chopper and mechanical brake control logic.

Load profile feature collects drive values, such as current and stores them in a log. This enables you to analyze and optimize the application with the help of historical data load.



EU Ecodesign Regulation

The EU has agreed upon a new, more demanding regulation (EU) 2019/1781, replacing regulation 640/2009. The new Ecodesign Regulation (EU) 2019/1781 sets the minimum efficiency levels not only for direct-on-line rated low voltage induction motors but now also for variable speed drives with a voltage up to 1000 V. The regulation will be implemented in two steps July 1, 2021 and July 1, 2023.

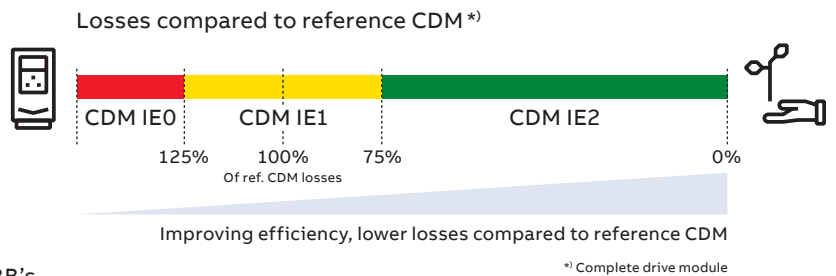


Variable speed drives

Step 1: July 1, 2021

IE2 efficiency level mandatory for AC drives

- Power range from 0.12 to 1000 kW.
- 3-phase drives with diode rectifier including ABB's micro, machinery, general purpose, industrial and industry-specific drives.
- Drive manufacturers must declare power losses in percentage of the rated apparent output power at 8 different operating points as well as standby losses. The international efficiency, IE level is given at nominal point. Drives fulfilling the requirements will be CE marked.
- All the covered ABB products fulfill the requirements.



Excluded from the regulation:

- All drives without CE marking
- Following low voltage AC drives: regenerative drives, low-harmonic drives (THD < 10%), multiple AC-output drives and single-phase drives.
- Drive cabinets with already conformity assessed modules
- Medium voltage drives, DC drives and traction drives

Markings on the ABB AC drives

Unique identifier QR code to Ecodesign information

IE class and % loss of rated apparent power 50 Hz, 400 V

IE2 (90;100) 2,3 %

Unique QR codes are located on the rating plate and/or the front side of the drive.

Step 2: July 1, 2023

No changes for drives from July 1, 2021

For more information, see Ecodesign tool: <https://ecodesign.drivesmotors.abb.com/>



Technical data

| Mains connection | |
|--|--|
| Voltage and power range | 1-phase, 200 to 240 V, +10%/-15% 0.25 to 3.0 kW (1/3 to 3 HP) 3-phase, 200 to 240 V, +10%/-15% 0.25 to 15 kW (1/3 to 20 HP) 3-phase, 380 to 480 V, +10%/-15% 0.37 to 22 kW (1/2 to 30 HP) |
| Frequency | 50/60 Hz ± 5% |
| Efficiency class (IEC 61800-9-2) | IE2 |
| Common DC connection | |
| DC voltage level | -1 and -2 types 270 to 324 V ±10% -4 types 513 to 648 V ±10% |
| Charging circuit | Internal charging circuit |
| Motor connection | |
| Voltage | 0 to U_N , 3-phase |
| Frequency | 0 to 599 Hz |
| Motor control | Scalar control Vector control |
| Switching frequency | 1 to 12 kHz, default 4 kHz |
| Dynamic braking | Flux braking (moderate or full) Resistor braking (optional) |
| Motor control performance | |
| Speed control performance, open loop | |
| Static accuracy | 20% of motor rated slip |
| Dynamic accuracy | 1% seconds with 100% torque step |
| Speed control performance, closed loop | |
| Static accuracy | 0.1% of motor rated speed |
| Dynamic accuracy | <1% seconds with 100% torque step |
| Torque control performance | |
| Torque step rise time | < 10 ms, rated torque step |
| Non-linearity | ±5% with rated torque |
| Braking power connection | |
| Brake chopper | Built-in brake chopper as standard |
| Brake resistor | External resistor connected to drive |
| Functional safety | |
| Built-in safety features | Safe torque off (STO) EN/IEC61800-5-2: IEC61508 ed2: SIL 3, IEC 61511: SIL 3, IEC 62061: SIL CL 3, EN ISO 13849-1: PL e/cat. 3 |

| Environmental limits | |
|---|--|
| Ambient temperature | |
| Transportation and storage | -40 to +70 °C (-40 to +158 °F) |
| Operation | -10 to +50 °C (14 to 122 °F), with derating up to 60 °C (except R0, which has max. temperature of 50 °C) |
| Cooling method | Air-cooled, dry clean air |
| Altitude | 0 to 4000 m, (0 to 13000 ft) for 400 V units (see allowed power systems in HW manual) 0 to 2000 m, (0 to 6600 ft) for 200 V units derating above 1000 m (3300 ft) |
| Relative humidity | 5 to 95%, no condensation allowed |
| Degree of protection | IP20 as standard Optional UL type 1 Kit |
| Contamination levels | No conductive dust allowed |
| Storage | IEC 60721-3-1, Class 1C2 (chemical gases) Class 1S2 (solid particles) |
| Transportation | IEC 60721-3-2, Class 2C2 (chemical gases) Class 2S2 (solid particles) |
| Operation | IEC 60721-3-3, Class 3C2 (chemical gases) Class 3S2 (solid particles) |
| Product compliance | |
| CE | |
| Low Voltage Directive 2014/35/EU 2, EN 61800-5-1: 2007 Machinery Directive 2006/42/EC, EN 61800-5-2: 2007 EMC Directive 2014/30/EU, EN 61800-3: 2004 + A1: 2012 UL, cUL certification – file E211945 TUV Certification for functional safety Quality assurance system ISO 9001 Ecodesign (EU) 2019/1781 Environmental system ISO 14001 Waste electrical and electronic equipment directive (WEEE) 2002/96/EC RoHS directive 2011/65/EU EAC, KC, RCM | |

How to select a drive

How you build up your ordering code

Start by identifying your supply voltage
This indicates what rating table to use;
see page 14.

Select the ordering code for the ACS380
machinery drive by choosing either the
standard or the configured variant (page
13). Then choose the desired EMC level on
page 13. If the configured variant is
selected, choose the desired fieldbus
protocol (page 23) by selecting the correct
option code and add the option codes to
the drive's ordering code.

Ordering information

The type designation indicates the specifications and configuration of the drive.
The table shows the primary drive variants.
Sample type code 1: ACS380-04XX-00A4 (Standard variant, not possible to add options as placecode)
Sample type code 2: ACS380-04XX-02A6-4H4X3-L532 (Configured variant, possible to add options as placecode)

| | | | | | | |
|------------------------|----|----|----|----|----|----|
| Supply voltage | A | B | C | D | E | F |
| Product series | 1 | 2 | 3 | 4 | 5 | 6 |
| Types and construction | 00 | 01 | 02 | 03 | 04 | 05 |
| Rating | 06 | 07 | 08 | 09 | 10 | 11 |
| Voltage | 12 | 13 | 14 | 15 | 16 | 17 |
| Option code | 18 | 19 | 20 | 21 | 22 | 23 |

EMC codes

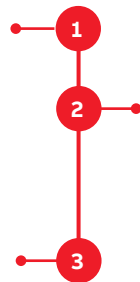
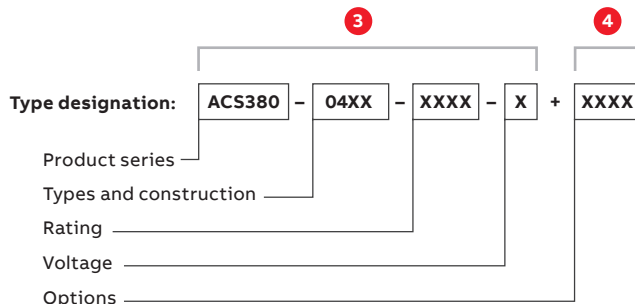
| Option | Code | Description |
|--------|------|---------------------------------------|
| A | 00 | EMC level 1 (EN 61800-6:2016 class A) |
| B | 01 | EMC level 2 (EN 61800-6:2016 class B) |
| C | 02 | EMC level 3 (EN 61800-6:2016 class C) |
| D | 03 | EMC level 4 (EN 61800-6:2016 class D) |
| E | 04 | EMC level 5 (EN 61800-6:2016 class E) |

Option codes for configured variant (ACS380-04XX) and BHP codes for name plate

| Option | Code | Type | Description |
|--------|------|-------------------------|-------------|
| F | 00 | Fieldbus adapter module | Profibus-DP |
| | 01 | Fieldbus adapter module | Modbus-TCP |
| | 02 | Fieldbus adapter module | Modbus-RTU |
| | 03 | Fieldbus adapter module | Profibus-DP |
| | 04 | Fieldbus adapter module | Modbus-TCP |
| | 05 | Fieldbus adapter module | Modbus-RTU |
| | 06 | Fieldbus adapter module | Profibus-DP |
| | 07 | Fieldbus adapter module | Modbus-TCP |
| | 08 | Fieldbus adapter module | Modbus-RTU |
| | 09 | Fieldbus adapter module | Profibus-DP |
| | 10 | Fieldbus adapter module | Modbus-TCP |
| | 11 | Fieldbus adapter module | Modbus-RTU |
| | 12 | Fieldbus adapter module | Profibus-DP |
| | 13 | Fieldbus adapter module | Modbus-TCP |
| | 14 | Fieldbus adapter module | Modbus-RTU |
| | 15 | Fieldbus adapter module | Profibus-DP |
| | 16 | Fieldbus adapter module | Modbus-TCP |
| | 17 | Fieldbus adapter module | Modbus-RTU |
| | 18 | Fieldbus adapter module | Profibus-DP |
| | 19 | Fieldbus adapter module | Modbus-TCP |
| | 20 | Fieldbus adapter module | Modbus-RTU |
| | 21 | Fieldbus adapter module | Profibus-DP |
| | 22 | Fieldbus adapter module | Modbus-TCP |
| | 23 | Fieldbus adapter module | Modbus-RTU |
| | 24 | Fieldbus adapter module | Profibus-DP |
| | 25 | Fieldbus adapter module | Modbus-TCP |
| | 26 | Fieldbus adapter module | Modbus-RTU |
| | 27 | Fieldbus adapter module | Profibus-DP |
| | 28 | Fieldbus adapter module | Modbus-TCP |
| | 29 | Fieldbus adapter module | Modbus-RTU |
| | 30 | Fieldbus adapter module | Profibus-DP |
| | 31 | Fieldbus adapter module | Modbus-TCP |
| | 32 | Fieldbus adapter module | Modbus-RTU |
| | 33 | Fieldbus adapter module | Profibus-DP |
| | 34 | Fieldbus adapter module | Modbus-TCP |
| | 35 | Fieldbus adapter module | Modbus-RTU |
| | 36 | Fieldbus adapter module | Profibus-DP |
| | 37 | Fieldbus adapter module | Modbus-TCP |
| | 38 | Fieldbus adapter module | Modbus-RTU |
| | 39 | Fieldbus adapter module | Profibus-DP |
| | 40 | Fieldbus adapter module | Modbus-TCP |
| | 41 | Fieldbus adapter module | Modbus-RTU |
| | 42 | Fieldbus adapter module | Profibus-DP |
| | 43 | Fieldbus adapter module | Modbus-TCP |
| | 44 | Fieldbus adapter module | Modbus-RTU |
| | 45 | Fieldbus adapter module | Profibus-DP |
| | 46 | Fieldbus adapter module | Modbus-TCP |
| | 47 | Fieldbus adapter module | Modbus-RTU |
| | 48 | Fieldbus adapter module | Profibus-DP |
| | 49 | Fieldbus adapter module | Modbus-TCP |
| | 50 | Fieldbus adapter module | Modbus-RTU |
| | 51 | Fieldbus adapter module | Profibus-DP |
| | 52 | Fieldbus adapter module | Modbus-TCP |
| | 53 | Fieldbus adapter module | Modbus-RTU |
| | 54 | Fieldbus adapter module | Profibus-DP |
| | 55 | Fieldbus adapter module | Modbus-TCP |
| | 56 | Fieldbus adapter module | Modbus-RTU |
| | 57 | Fieldbus adapter module | Profibus-DP |
| | 58 | Fieldbus adapter module | Modbus-TCP |
| | 59 | Fieldbus adapter module | Modbus-RTU |
| | 60 | Fieldbus adapter module | Profibus-DP |
| | 61 | Fieldbus adapter module | Modbus-TCP |
| | 62 | Fieldbus adapter module | Modbus-RTU |
| | 63 | Fieldbus adapter module | Profibus-DP |
| | 64 | Fieldbus adapter module | Modbus-TCP |
| | 65 | Fieldbus adapter module | Modbus-RTU |
| | 66 | Fieldbus adapter module | Profibus-DP |
| | 67 | Fieldbus adapter module | Modbus-TCP |
| | 68 | Fieldbus adapter module | Modbus-RTU |
| | 69 | Fieldbus adapter module | Profibus-DP |
| | 70 | Fieldbus adapter module | Modbus-TCP |
| | 71 | Fieldbus adapter module | Modbus-RTU |
| | 72 | Fieldbus adapter module | Profibus-DP |
| | 73 | Fieldbus adapter module | Modbus-TCP |
| | 74 | Fieldbus adapter module | Modbus-RTU |
| | 75 | Fieldbus adapter module | Profibus-DP |
| | 76 | Fieldbus adapter module | Modbus-TCP |
| | 77 | Fieldbus adapter module | Modbus-RTU |
| | 78 | Fieldbus adapter module | Profibus-DP |
| | 79 | Fieldbus adapter module | Modbus-TCP |
| | 80 | Fieldbus adapter module | Modbus-RTU |
| | 81 | Fieldbus adapter module | Profibus-DP |
| | 82 | Fieldbus adapter module | Modbus-TCP |
| | 83 | Fieldbus adapter module | Modbus-RTU |
| | 84 | Fieldbus adapter module | Profibus-DP |
| | 85 | Fieldbus adapter module | Modbus-TCP |
| | 86 | Fieldbus adapter module | Modbus-RTU |
| | 87 | Fieldbus adapter module | Profibus-DP |
| | 88 | Fieldbus adapter module | Modbus-TCP |
| | 89 | Fieldbus adapter module | Modbus-RTU |
| | 90 | Fieldbus adapter module | Profibus-DP |
| | 91 | Fieldbus adapter module | Modbus-TCP |
| | 92 | Fieldbus adapter module | Modbus-RTU |
| | 93 | Fieldbus adapter module | Profibus-DP |
| | 94 | Fieldbus adapter module | Modbus-TCP |
| | 95 | Fieldbus adapter module | Modbus-RTU |
| | 96 | Fieldbus adapter module | Profibus-DP |
| | 97 | Fieldbus adapter module | Modbus-TCP |
| | 98 | Fieldbus adapter module | Modbus-RTU |
| | 99 | Fieldbus adapter module | Profibus-DP |

Page 13

Choose other options (on page 26) and
add the option codes to the drive's order
code. Remember to use a "+" mark before
each option code.



Choose the motor power and
current rating from the ratings
table on page 14.

Ratings, types and voltages

Table with columns: Drive type, Power (kW), Motor current (A), Light-duty use, Heavy-duty use, Max. output current (A).

Section 1: 230V supply (50 to 60 Hz). The power ratings are valid at nominal voltage 230 V (50 to 60 Hz).

Section 2: 200 V supply (50 to 60 Hz). The power ratings are valid at nominal voltage 200 V (50 to 60 Hz).

Section 3: 180 V supply (50 to 60 Hz). The power ratings are valid at nominal voltage 180 V (50 to 60 Hz).

Section 4: 150 V supply (50 to 60 Hz). The power ratings are valid at nominal voltage 150 V (50 to 60 Hz).

Section 5: 110 V supply (50 to 60 Hz). The power ratings are valid at nominal voltage 110 V (50 to 60 Hz).

Section 6: 90 V supply (50 to 60 Hz). The power ratings are valid at nominal voltage 90 V (50 to 60 Hz).

Section 7: 480 V supply (50 to 60 Hz). The power ratings are valid at nominal voltage 480 V (50 to 60 Hz).

Section 8: 400 V supply (50 to 60 Hz). The power ratings are valid at nominal voltage 400 V (50 to 60 Hz).

Section 9: 380 V supply (50 to 60 Hz). The power ratings are valid at nominal voltage 380 V (50 to 60 Hz).

Section 10: 300 V supply (50 to 60 Hz). The power ratings are valid at nominal voltage 300 V (50 to 60 Hz).

Section 11: 230 V supply (60 Hz). The power ratings are valid at nominal voltage 230 V (60 Hz).

Section 12: 200 V supply (60 Hz). The power ratings are valid at nominal voltage 200 V (60 Hz).

Section 13: 180 V supply (60 Hz). The power ratings are valid at nominal voltage 180 V (60 Hz).

Section 14: 150 V supply (60 Hz). The power ratings are valid at nominal voltage 150 V (60 Hz).

Section 15: 110 V supply (60 Hz). The power ratings are valid at nominal voltage 110 V (60 Hz).

Section 16: 90 V supply (60 Hz). The power ratings are valid at nominal voltage 90 V (60 Hz).

Page 14

I/O option modules

Image of an ABB ACS380 drive with an I/O option module installed.

Text: ACS380 drives can be ordered with different I/O configurations. The standard input and output of the drive can be extended by using I/O option modules. A BHP-01 module extends the configured variant's I/O, whereas a BHP-02 module provides both additional I/O and Modbus. In case additional relay outputs are needed, they can be added with a BHP-03 module. A BHP-04 module introduces an external 24 V DC supply to the drive's control circuitry.

The ACS380 drive's open loop performance is sufficient for almost any application, even when accurate control is needed close to zero speed. However, if speed feedback is needed for even more accurate control or for active brake flow, a speed feedback module STAC-01 adds support for TTL and HTL pulse encoders.

| I/O option modules | Ordering code | Description | Module |
|--------------------|---------------|--|--------|
| BHP-01 | BA05000002142 | External relay output, 4 NO (24V opto) | BHP-01 |
| BHP-02 | BA05000002143 | I/O option (24V opto), CAN ext (24V opto) with Profibus | BHP-02 |
| BHP-03 | BA05000002144 | External 24 V DC (24V opto) | BHP-03 |
| BHP-04 | BA05000002145 | HTL/TTL module (interface + External 24 V DC (24V opto)) | BHP-04 |
| BHP-05 | BA05000002146 | I/O & Modbus extension (24V opto) | BHP-05 |

| Input | BHP-01 | BHP-02 | BHP-03 | BHP-04 | BHP-05 |
|-------------------|--------|--------|--------|--------|--------|
| Digital inputs | 4 | 4 | 4 | 4 | 4 |
| Analog inputs | 0 | 0 | 0 | 0 | 0 |
| Relay outputs | 4 | 4 | 4 | 4 | 4 |
| Digital outputs | 0 | 0 | 0 | 0 | 0 |
| Frequency outputs | 0 | 0 | 0 | 0 | 0 |
| Analog outputs | 0 | 0 | 0 | 0 | 0 |

Note: The number of inputs and outputs depends on the configuration. For example, BHP can be configured as digital input or output.

Page 26

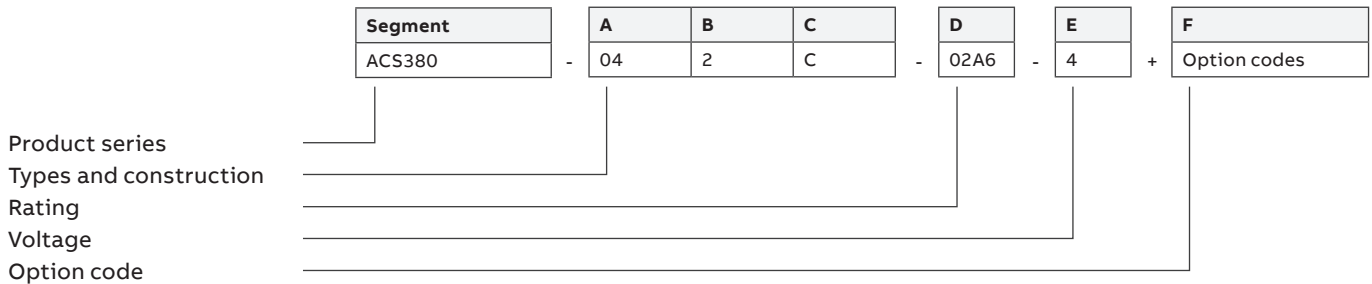
Ordering information

The type designation indicates the specifications and configuration of the drive.

The table shows the primary drive variants.

Sample type code 1: ACS380-042S-02A6-4 (Standard variant, not possible to add options as pluscode)

Sample type code 2: ACS380-042C-02A6-4+K475+ L535 (Configured variant, possible to add options as pluscode)



| Basic codes | | |
|-------------|----------------|--|
| Segment | Option | Description |
| A | Construction | 04 = Module, IP20 |
| B | EMC filter | 0 = C3 (3-phase 400 V) or C4 (1-phase 230 V, 3-phase 230 V) 2 = C2 (3-phase 400 V, 1-phase 230 V) |
| C | Connectivity | S = Standard variant (I/O and Modbus), C = Configured variant, N = Base variant |
| D | Current rating | For example, 02A6 refers to a nominal output current of 2.6 A |
| E | Voltage rating | 1 = 1-phase 230 V, 2 = 3-phase 230 V, 4 = 3-phase 400 V |

| Option codes for configured variant (ACS380-04xC) and MRP codes for loose items | | | | | | | |
|---|---------------------------|-------------|-----------------|------------------|--|---------|--|
| Segment | Option | Option code | MRP code | Type designation | Description | | |
| F | Fieldbus adapter module | +K451 | 68469341 | FDNA-01 | DeviceNet™ | | |
| | | +K454 | 68469325 | FPBA-01 | Profibus-DP | | |
| | | +K457 | 68469376 | FCAN-01 | CANopen® | | |
| | | +K462 | 3AUA0000094512 | FCNA-01 | ControlNet™ | | |
| | | +K469 | 3AUA0000072069 | FECA-01 | EtherCAT® | | |
| | | +K470 | 3AUA0000072120 | FEPL-02 | Ethernet POWERLINK | | |
| | | +K490 | 3AXD50000192786 | FEIP-21 | EtherNet/IP™ | | |
| | | +K491 | 3AXD50000049964 | FMBT-21 | Modbus/TCP | | |
| | | +K492 | 3AXD50000192779 | FPNO-21 | PROFINET IO | | |
| | | +K495 | 3AXD5000033816 | BCAN-11 | CANopen® (screw terminals) | | |
| | | I/O | | +L511 | 3AXD50000022162 | BREL-01 | External relay option (4 x relay) (side option) |
| | | | | +L515 | 3AXD50000191635 | BIO-01 | I/O option module (front option, can be used together with fieldbus) |
| | | | | +L534 | 3AXD50000022164 | BAPO-01 | External 24 V DC (side option) |
| | | | | +L535 | 3AXD50000022163 | BTAC-02 | HTL/TTL encoder interface + External 24 V DC (side option) |
| +L538 | 3AXD50000021262 | | | BMIO-01 | I/O & Modbus option module (front option) | | |
| Safety functions module | | +Q986 | 3AXD50000112821 | FSPS-21 | PROFIsafe with PROFINET IO | | |
| Services | | +P992 | | | Pre-assembled options (front and side options) | | |
| The product package includes a quick installation and start-up guide in several languages. The option code determines the language variants of the hardware and firmware manuals. | Printed manual languages: | +R700 | | | English | | |
| | | +R701 | | | German | | |
| | | +R702 | | | Italian | | |
| | | +R703 | | | Dutch | | |
| | | +R704 | | | Danish | | |
| | | +R705 | | | Swedish | | |
| | | +R706 | | | Finnish | | |
| | | +R707 | | | French | | |
| | | +R708 | | | Spanish | | |
| | | +R709 | | | Portuguese (Portugal) | | |
| | | +R711 | | | Russian | | |
| +R712 | | | Chinese | | | | |
| +R714 | | | Turkish | | | | |
| +R713 | | | Polish | | | | |

Ratings, types and voltages

1-phase, $U_N = 230$ V (range 200 to 240 V). The power ratings are valid at nominal voltage 230 V (0.25 to 3.0 kW).

| Drive type | Frame size | Nominal ratings | | Light-duty use | | Heavy-duty use | | Max. output current I_{MAX} (A) |
|--------------------|------------|-----------------|------------|----------------|---------------|----------------|---------------|--------------------------------------|
| | | I_N (A) | P_N (kW) | I_{Ld} (A) | P_{Ld} (kW) | I_{Hd} (A) | P_{Hd} (kW) | |
| ACS380-04xx-02A4-1 | R0 | 2.4 | 0.37 | 2.3 | 0.37 | 1.8 | 0.25 | 3.2 |
| ACS380-04xx-03A7-1 | R0 | 3.7 | 0.55 | 3.5 | 0.55 | 2.4 | 0.37 | 4.3 |
| ACS380-04xx-04A8-1 | R1 | 4.8 | 0.75 | 4.6 | 0.75 | 3.7 | 0.55 | 6.7 |
| ACS380-04xx-06A9-1 | R1 | 6.9 | 1.1 | 6.6 | 1.1 | 4.8 | 0.75 | 8.6 |
| ACS380-04xx-07A8-1 | R1 | 7.8 | 1.5 | 7.4 | 1.5 | 6.9 | 1.1 | 12.4 |
| ACS380-04xx-09A8-1 | R2 | 9.8 | 2.2 | 9.3 | 2.2 | 7.8 | 1.5 | 14.0 |
| ACS380-04xx-12A2-1 | R2 | 12.2 | 3.0 | 11.6 | 3.0 | 9.8 | 2.2 | 17.6 |

3-phase, $U_N = 230$ V (range 200 to 240 V). The power ratings are valid at nominal voltage 230 V (0.25 to 15 kW).

| Drive type | Frame size | Nominal ratings | | Light-duty use | | Heavy-duty use | | Max. output current I_{MAX} (A) |
|--------------------|------------|-----------------|------------|----------------|---------------|----------------|---------------|--------------------------------------|
| | | I_N (A) | P_N (kW) | I_{Ld} (A) | P_{Ld} (kW) | I_{Hd} (A) | P_{Hd} (kW) | |
| ACS380-04xx-02A4-2 | R1 | 2.4 | 0.37 | 2.3 | 0.37 | 1.8 | 0.25 | 3.2 |
| ACS380-04xx-03A7-2 | R1 | 3.7 | 0.55 | 3.5 | 0.55 | 2.4 | 0.37 | 4.3 |
| ACS380-04xx-04A8-2 | R1 | 4.8 | 0.75 | 4.6 | 0.75 | 3.7 | 0.55 | 6.7 |
| ACS380-04xx-06A9-2 | R1 | 6.9 | 1.1 | 6.6 | 1.1 | 4.8 | 0.75 | 8.6 |
| ACS380-04xx-07A8-2 | R1 | 7.8 | 1.5 | 7.5 | 1.5 | 6.9 | 1.1 | 12.4 |
| ACS380-04xx-09A8-2 | R1 | 9.8 | 2.2 | 9.3 | 2.2 | 7.8 | 1.5 | 14.0 |
| ACS380-04xx-12A2-2 | R2 | 12.2 | 3.0 | 11.6 | 3.0 | 9.8 | 2.2 | 17.6 |
| ACS380-04xx-17A5-2 | R3 | 17.5 | 4.0 | 16.7 | 4.0 | 12.2 | 3.0 | 22.0 |
| ACS380-04xx-25A0-2 | R3 | 25.0 | 5.5 | 24.2 | 5.5 | 17.5 | 4.0 | 31.5 |
| ACS380-04xx-032A-2 | R4 | 32.0 | 7.5 | 30.8 | 7.5 | 25.0 | 5.5 | 45.0 |
| ACS380-04xx-048A-2 | R4 | 48.0 | 11.0 | 46.2 | 11.0 | 32.0 | 7.5 | 57.6 |
| ACS380-04xx-055A-2 | R4 | 55.0 | 15.0 | 52.8 | 15.0 | 48.0 | 11.0 | 86.4 |

3-phase, $U_N = 400$ V (range 380 to 480 V). The power ratings are valid at nominal voltage 400 V (0.37 to 22 kW).

| Drive type | Frame size | Nominal ratings | | Light-duty use | | Heavy-duty use | | Max. output current I_{MAX} (A) |
|--------------------|------------|-----------------|------------|----------------|---------------|----------------|---------------|--------------------------------------|
| | | I_N (A) | P_N (kW) | I_{Ld} (A) | P_{Ld} (kW) | I_{Hd} (A) | P_{Hd} (kW) | |
| ACS380-04xx-01A8-4 | R0 | 1.8 | 0.55 | 1.7 | 0.55 | 1.2 | 0.37 | 2.2 |
| ACS380-04xx-02A6-4 | R1 | 2.6 | 0.75 | 2.5 | 0.75 | 1.8 | 0.55 | 3.2 |
| ACS380-04xx-03A3-4 | R1 | 3.3 | 1.1 | 3.1 | 1.1 | 2.6 | 0.75 | 4.7 |
| ACS380-04xx-04A0-4 | R1 | 4.0 | 1.5 | 3.8 | 1.5 | 3.3 | 1.1 | 5.9 |
| ACS380-04xx-05A6-4 | R1 | 5.6 | 2.2 | 5.3 | 2.2 | 4.0 | 1.5 | 7.2 |
| ACS380-04xx-07A2-4 | R1 | 7.2 | 3.0 | 6.8 | 3.0 | 5.6 | 2.2 | 10.1 |
| ACS380-04xx-09A4-4 | R1 | 9.4 | 4.0 | 8.9 | 4.0 | 7.2 | 3.0 | 13.0 |
| ACS380-04xx-12A6-4 | R2 | 12.6 | 5.5 | 12.0 | 5.5 | 9.4 | 4.0 | 16.9 |
| ACS380-04xx-17A0-4 | R3 | 17.0 | 7.5 | 16.2 | 7.5 | 12.6 | 5.5 | 22.7 |
| ACS380-04xx-25A0-4 | R3 | 25.0 | 11.0 | 23.8 | 11.0 | 17.0 | 7.5 | 30.6 |
| ACS380-04xx-032A-4 | R4 | 32.0 | 15.0 | 30.5 | 15.0 | 25.0 | 11.0 | 45.0 |
| ACS380-04xx-038A-4 | R4 | 38.0 | 18.5 | 36.0 | 18.5 | 32.0 | 15.0 | 57.6 |
| ACS380-04xx-045A-4 | R4 | 45.0 | 22.0 | 42.8 | 22.0 | 38.0 | 18.5 | 68.4 |
| ACS380-04xx-050A-4 | R4 | 50.0 | 22.0 | 48.0 | 22.0 | 45.0 | 22.0 | 81.0 |

Nominal ratings

| | |
|-------|---|
| I_N | Nominal output current available continuously without overloadability at 50 °C. |
| P_N | Typical motor power in no-overload use. |

Maximum output current

| | |
|-----------|---|
| I_{max} | Maximum output current. Available for 2 seconds at start, then as long as allowed by drive temperature. |
|-----------|---|

Heavy-duty use

| | |
|----------|---|
| I_{Hd} | Output current allowing 150% I_{Hd} for 1 minute every 10 minutes at 50 °C. |
| P_{Hd} | Typical motor power in heavy-duty use. |

Light-duty use

| | |
|----------|---|
| I_{Ld} | Output current allowing 110% I_{Ld} for 1 minute every 10 minutes at 50 °C. |
| P_{Ld} | Typical motor power in light-overload use. |

The ratings apply at 50 °C ambient temperatures.

For derating at higher altitudes, temperatures or switching frequencies, see the user's HW manual, document code: 3AXD5000029274.



Dimensions

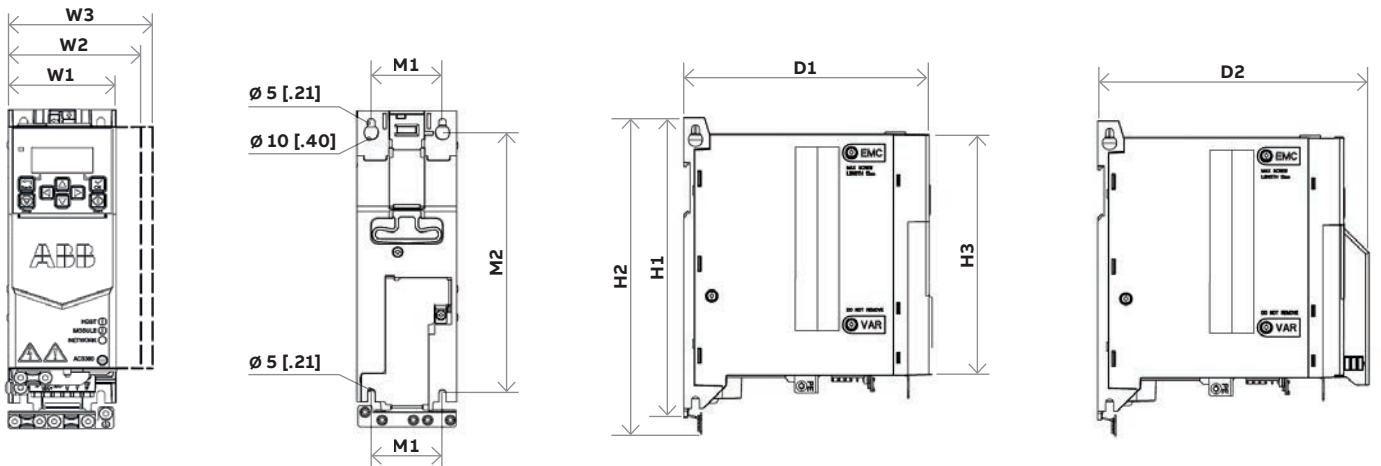
Dimensions and weights (IP20 / UL open type)

| Frame size | H1 (mm) | H2 (mm) | H3 (mm) | W1 (mm) | W2 (mm) | W3 (mm) | D1 (mm) | D2 (mm) | M1 (mm) | M2 (mm) | Weight (kg) |
|------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------------|
| R0 | 205 | 223 | 170 | 70 | 86 | 94 | 176 | 191 | 50 | 191 | 1.4 |
| R1 | 205 | 223 | 170 | 70 | 86 | 94 | 176 | 191 | 50 | 191 | 1.4 |
| R2 | 205 | 223 | 170 | 95 | 111 | 119 | 176 | 191 | 75 | 191 | 2.0 |
| R3 | 205 | 223 | 170 | 170 | 186 | 194 | 176 | 191 | 148 | 191 | 3.3 |
| R4 | 205 | 240 | 170 | 260 | 276 | 284 | 181 | 196 | 234 | 191 | 5.3 |

H1 = Mounting surface height (back)
H2 = Height, total
H3 = Enclosure height (front)
W1 = Width without side option
W2 = Width with side option BAPO-01
W3 = Width with side optios BTAC-02, BREL-01

D1 = Depth
D2 = Depth with deeper cover *)
M1 = Mounting hole distance 1
M2 = Mounting hole distance 2

*) Deeper cover (with BIO-01 or FSPS-21) will increase normal depth (D1) by 15 mm

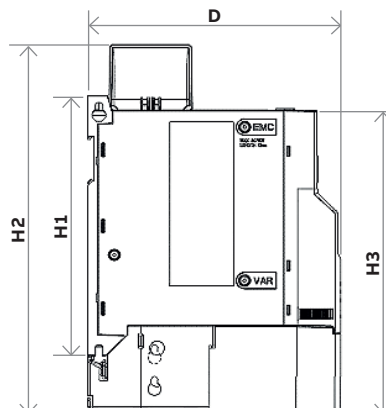


Dimensions and weights (drive with UL type 1 kit)

| Frame size | H1 (mm) | H2 (mm) | H3 (mm) | W1 (mm) | W2 (mm) | W3 (mm) | D (mm) | M1 (mm) | M2 (mm) | Weight (kg) |
|------------|---------|---------|---------|---------|---------|---------|--------|---------|---------|-------------|
| R0 | 205 | 285 | 247 | 70 | 86 | 94 | 191 | 50 | 191 | 1.8 |
| R1 | 205 | 293 | 247 | 70 | 86 | 94 | 191 | 50 | 191 | 1.8 |
| R2 | 205 | 293 | 247 | 95 | 111 | 119 | 191 | 75 | 191 | 2.5 |
| R3 | 205 | 329 | 261 | 170 | 186 | 194 | 191 | 148 | 191 | 4.0 |
| R4 | 205 | 391 | 312 | 260 | 276 | 284 | 196 | 234 | 191 | 6.5 |

H1 = Mounting surface height (back)
H2 = Height with UL Type 1 kit, total
H3 = Height with UL type 1 kit, enclosure (front)
W1 = Width without side option
W2 = Width with side option BAPO-01
W3 = Width with side optios BTAC-02, BREL-01

D = Depth
M1 = Mounting hole distance 1
M2 = Mounting hole distance 2



Construction variants

The ACS380 machinery drive comes in several variants ensuring seamless integration into machines and connecting perfectly to automation systems.

Standard variant (ACS380-04xS)

Meets the most typical machinery requirements.

A standard variant (ACS380-04xS) includes BMIO-01 module in the delivery to support Modbus RTU and a wide range of digital and analog I/O. In addition, this construction variant has one side option slot. Options are available as loose items via mrp ordering codes.

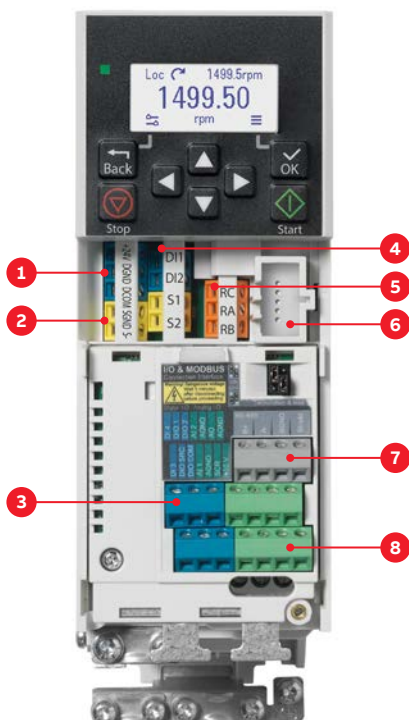
The standard variant includes:

- 4 DI + 2 DI/DO + 2 AI + 1 AO + 1 RO + STO
- Embedded Modbus RTU

Default I/O connections of standard variant (ACS380-04xS)

| Terminals | Descriptions |
|--|--|
| Aux. voltage output and digital connections | |
| +24 V | Aux. voltage output +24 V DC, max. 250 mA |
| DGND | Aux. voltage output common |
| DCOM | Digital input common for all |
| DI 1 | Digital input 1: Stop (0)/Start (1) |
| DI 2 | Digital input 2: Forward (0)/Reverse (1) |
| DI 3 | Digital input 3: Speed selection |
| DI 4 | Digital input 4: Speed selection |
| DIO 1 | Digital input function: Ramp set 1 (0)/Ramp set 2 (1) |
| DIO 2 | Digital output function: Ready to run (0)/Not ready (1) |
| DIO SRC | Signal cable shield (screen) |
| DIO COM | Digital input common for all |
| Reference voltage and analog I/O | |
| AI 1 | Output frequency/Speed reference (0...10 V) |
| AGND | Analog input circuit common |
| AI 2 | Not configured |
| AGND | Analog input circuit common |
| AO | Output frequency (0...20 mA) |
| AGND | Analog output circuit common |
| SCR | Signal cable shield (screen) |
| +10 V | Reference voltage |
| Safe torque off (STO) | |
| S+ | Safe torque-off function. Connected at the factory. The drive starts only when both circuits are closed. Refer to the Safe torque off function in the hardware manual. |
| SGND | |
| S 1 | |
| S 2 | |
| Relay output | |
| RC | No fault [Fault (-1)] |
| RA | |
| RB | |
| EIA-485 Modbus RTU | |
| B+ | Embedded Modbus RTU (EIA-485) |
| A- | |
| BGND | |
| Shield | |
| Termination | |

Default I/O connections of the standard variant



1. Auxiliary voltage outputs
2. Safe torque off connections
3. Digital inputs and outputs
4. Digital inputs
5. Relay output connection
6. Cold configuration connection for CCA-01
7. EIA-485 Modbus RTU
8. Analog inputs and outputs

Construction variants

Configured variant (ACS380-04xC)

Simplified ordering by one single ordering code and possibility for preinstalled options.

A configured variant (ACS380-04xC) can be configured with different options covering digital and analog I/O, fieldbus communication, speed feedback and external 24 V DC supply.

The configured variant includes:

- 2 DI + 1 RO + STO + one preconfigured fieldbus

Options ordered with the pluscode. (See pluscodes, page 13):

- **Fieldbus options**
PROFIBUS, PROFINET/PROFIsafe, EtherNet/IP™, Modbus TCP/IP, EtherCAT®, POWERLINK, DeviceNet™, CanOpen®
- **One of following side options**
 - HTL/TTL encoder & ext. 24 V DC supply (BTAC-02)
 - 4 x relay output module (BREL-01)
 - External 24 V DC supply (BAPO-01)
- **One front I/O option**
can be used together with fieldbus
3 DI + 1 DO + 1 AI + 1 AO (BIO-01)

Default connections of configured variant (ACS380-04xC)

| Terminals | Descriptions |
|--|--|
| Aux. voltage output and digital connections | |
| +24 V | Aux. voltage output +24 V DC, max. 250 mA |
| DGND | Aux. voltage output common |
| DCOM | Digital input common for all |
| DI 1 | Digital input 1: Stop (0)/Start (1) |
| DI 2 | Digital input 2: Forward (0)/Reverse (1) |
| Safe torque off (STO) | |
| S+ | Safe torque off function. Connected at the factory. The drive starts only when both circuits are closed. Refer to the Safe torque off function in the hardware manual. |
| SGND | |
| S 1 | |
| S 2 | |
| Relay output | |
| RC | Fault (-1) |
| RA | 250 V AC/30 V DC |
| RB | 2 A |
| Option module connections | |
| See table on page 17 for available fieldbus connection options and table on page 22 for I/O options. | |

ACS380 configured variant (ACS380-04xC)



Base variant (ACS380-04xN)

Offers maximum flexibility with minimum stock items for varying machine building needs.

Base variant can be ordered with any of the connectivity or I/O option as loose item.

Options:

Fieldbus options

PROFIBUS, PROFINET/PROFIsafe, EtherNet/IP™, Modbus TCP/IP, EtherCAT®, POWERLINK, DeviceNet™, CanOpen®

One of following side options

- HTL/TTL encoder & ext. 24 V DC supply (BTAC-02)
- 4 x relay output module (BREL-01)
- External 24 V DC supply (BAPO-01)

One front I/O option

can be used together with fieldbus
3 DI + 1 DO + 1 AI + 1 AO (BIO-01)

Default connections of base variant (ACS380-04xN)

| Terminals | Descriptions |
|--|--|
| Aux. voltage output and digital connections | |
| +24 V | Aux. voltage output +24 V DC, max. 250 mA |
| DGND | Aux. voltage output common |
| DCOM | Digital input common for all |
| DI 1 | Digital input 1: Stop (0)/Start (1) |
| DI 2 | Digital input 2: Forward (0)/Reverse (1) |
| Safe torque off (STO) | |
| S+ | Safe torque off function. Connected at the factory. The drive starts only when both circuits are closed. Refer to the Safe torque off function in the hardware manual. |
| SGND | |
| S 1 | |
| S 2 | |
| Relay output | |
| RC | Fault (-1) |
| RA | 250 V AC/30 V DC |
| RB | 2 A |
| Option module connections | |
| See table on page 17 for available fieldbus connection options and table on page 22 for I/O options. | |

ACS380 base variant (ACS380-04xN)



Control panel options and mounting kits

The ACS380 drive has an integrated control panel with a display and control keys. Also, external control panels are available for installation to a cabinet door or for operation via Bluetooth connection.



Integrated control panel

Almost anyone can set up and commission the machinery drive using the available control panels. The ACS380 comes with the integrated icon-based control panel as standard. You do not need to know any drive parameters as the control panel helps you to set up the essential settings quickly and get the drive into action. In addition, ACS380 supports the assistant control panel (AP-I, AP-S or AP-W).



Assistant control panel, ACS-AP-I *)

The optional Assistant control has a graphical, multilingual display. There is no need to know any drive parameters, as the control panel helps you set up the essential settings quickly and get the drive into action without hassle. The panel can be used with any products in the ABB all-compatible product portfolio.



Bluetooth control panel, ACS-AP-W *)

The optional Bluetooth panel enables connection with the Drivetune mobile app. The app is available for free from Google Play and the Apple App Store. Together with the Drivetune app and the Bluetooth panel, users can, for example, commission and monitor the drive remotely.



Basic control panel, ACS-BP-S

If there is a need to install a basic panel into the cabinet door, the ACS-BP-S is the right choice. The icon-based control panel supports users with basic operation, settings and fault tracking when nothing extra is needed.



Control panel mounting platform, DPMP-01

This mounting platform is for flush mountings. The panel mounting platform does not include the control panel.



Control panel mounting platform, DPMP-02

This mounting platform is for surface mounting. The panel mounting platform does not include the control panel.



Control panel mounting platform, DPMP-04

Enables control panel outdoor mounting thanks to IP66 protection class, UV resistance and IK07 impact protection rating.

Control panel options

| Ordering code | Description | Control panel |
|-----------------|--|---------------|
| 3AUA0000088311 | Industrial assistant control panel *) | ACS-AP-I |
| 3AUA0000064884 | Assistant control panel | ACS-AP-S |
| 3AXD0000025965 | Assistant control panel with bluetooth interface *) | ACS-AP-W |
| 3AXD50000028828 | Basic control panel | ACS-BP-S |
| 3AUA0000108878 | Control panel mounting platform (flush mounted) | DPMP-01 |
| 3AXD50000009374 | Control panel mounting platform (surface mounted) | DPMP-02 |
| 3AXD50000217717 | Control panel mounting platform (outdoor installation) | DPMP-04 |

*) Also compatible with the following ABB all-compatible drives: ACS480, ACS580 and ACS880.

Door mounting and daisy chaining

Improve safety and leverage the full potential of the ACS380 control panel options with a door mounting kit and panel bus adapter.



Door mounting fosters easy operation and safety. It enables you to operate the drive without opening the cabinet door, saving time and keeping all the electronics behind the closed door. Up to 32 drives can be connected to one control panel

for even easier and quicker operation. When daisy chaining the drives, you need only one assistant control panel. The rest of the drives can be equipped with panel bus adapters and the last drive with termination plug.

Cabinet door

Control panel mounting platform

The mounting platform for the drive's control panel.

Assistant control panel

The assistant control panel can be selected with ACS380 drives. Also a Bluetooth control panel can be used.

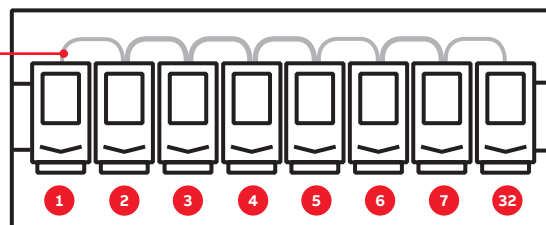


Cabinet, outside

RJ-45 cable for daisy chaining drives

With BSPL-01 Panel bus adapter and panel bus termination plug.

Panel bus adapter is required for each drive and termination plug only for the last drive.



Cabinet, inside

Tools for configuration, monitoring and process tuning

ACS380 has various tools to simplify the commissioning, operation and monitoring of the drive.



Easy configuration for unpowered drives

With the CCA-01 tool, it is possible to configure drive parameters and even download new software from PC to the unpowered ACS380. The power is supplied by a PC USB port.



Connection with cable

Using the BCBL-01 cable, the PC can be connected directly to the RJ-45 panel port on the ACS380 drive.



Drive Composer

The Drive Composer PC tool offers fast and harmonized setup, commissioning and monitoring. Drive Composer entry (a free version of the tool) provides startup and maintenance capabilities and gathers all drive information, such as parameter loggers, faults, and backups into a support diagnostics file.

Drive Composer pro provides additional features such as custom parameter windows, graphical control diagrams of the drive's configuration, and improved monitoring and diagnostics.



Connection to assistant panel

When using the Assistant control panel, the Drive composer tool is connected to the drive using the mini USB connection on the panel.

| Ordering code | Description | Type designation |
|-----------------|--|------------------|
| 3AXD50000032449 | PC cable, USB to RJ45 | BCBL-01 |
| 3AXD50000019865 | Cold configurator adapter, packed kit | CCA-01 |
| 3AUA0000108087 | Drive Composer pro PC tool (single user license) | DCPT-01 |
| 3AUA0000145150 | Drive Composer pro PC tool (10 users license) | DCPT-01 |
| 3AUA0000145151 | Drive Composer pro PC tool (20 users license) | DCPT-01 |
| 3AXD50000131976 | Panel bus adapter | BSPL-01 |
| 3AXD50000128624 | Panel bus termination plug | BPLG-01 |

Free Drive Composer entry available at <https://new.abb.com/drives/software-tools/drive-composer>

Flexible connectivity to automation networks

Fieldbus communication reduces wiring costs compared with traditional hard-wired input/output connections.

The ACS380 configured variant is compatible with a wide range of fieldbus protocols. Fieldbus adapter modules are automatically configured during first power up, thus reducing commissioning time and allowing drive commissioning from the PLC. The ACS380 standard variant comes with built-in Modbus RTU protocol.

Support tools for integration with automation

Support for the fieldbuses is not always enough to get the full functionality and to make integration easy. For this reason, ABB also offers tools for seamless integration to automation systems of various manufacturers.



Universal communication with ABB fieldbus adapters

The machinery drives support the following fieldbus protocols:

| Option code | Ordering code | Fieldbus protocol | Adapter module |
|-------------|-----------------|----------------------------|----------------|
| +K451 | 68469341 | DeviceNet™ | FDNA-01 |
| +K454 | 68469325 | PROFIBUS DP, DPV0/DPV1 | FPBA-01 |
| +K457 | 68469376 | CANopen® | FCAN-01 |
| +K462 | 3AUA0000094512 | ControlNet™ | FCNA-01 |
| +K469 | 3AUA0000072069 | EtherCAT® | FECA-01 |
| +K470 | 3AUA0000072120 | Ethernet POWERLINK | FEPL-02 |
| +K490 | 3AXD50000192786 | Ethernet/IP™ | FEIP-21 |
| +K491 | 3AXD50000049964 | Modbus/TCP | FMBT-21 |
| +K492 | 3AXD50000192779 | PROFINET IO | FPNO-21 |
| +K495 | 3AXD50000033816 | CANopen® (screw terminals) | BCAN-11 |

Safety options

Integrated safety

Integrated safety reduces the need for external safety components, simplifying configuration and reducing installation space. The safety functionality is a built-in feature of the ACS380, with safe torque off (STO) as standard. ACS380 can also be part of PROFIsafe over PROFINET network, where safety PLC is controlling the STO or safe stop 1, time controlled, SS1-t functionality. This connectivity and functionality can be done by using the FSPS-21 option module.

The drives' functional safety is designed in accordance with EN/IEC 61800-5-2 and complies with the requirements of the European Union Machinery Directive (2006/42/EC). The safety functions are certified by TÜV Nord and comply with the highest safety performance level (SIL 3/PL e) for machinery safety. It is possible to install the safety modules also afterwards to the drive.

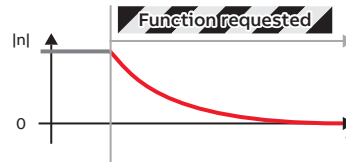
PROFIsafe safety functions module FSPS-21

The FSPS-21 module has integrated PROFIsafe, safety functions and PROFINET IO connection. The ready-made safety functions make safety configuration in the drive unnecessary. The module supports STO and SS1-t safety functions. It is used together with a safety PLC that supports PROFIsafe over PROFINET communication.

For more information see FSPS-21 PROFIsafe safety functions module web page at new.abb.com/drives/functional-safety



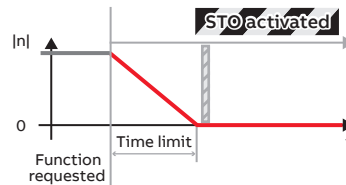
Safe torque off (STO)



STO is the basic foundation of drive-based functional safety, as it brings a drive safely to no-torque state making the motor coast to stop. Integrated STO-function simplifies the safety circuit as external components are not needed to safely stop the application.

- **STO** is a standard safety function in all ABB drives.
- Typically used for prevention of an unexpected startup
- (EN ISO 14118) of machinery or for an emergency stop, fulfilling stop category 0 (EN 13850 / IEC 60204-1).

Safe stop 1, time controlled (SS1-t)



Safe stop 1 stops the motor safely with a controlled ramp stop and stop time monitoring. SS1-t initiates the ramp stop from the drive and activates STO when speed reaches zero. If the drive is not decelerating to zero speed within the time limit, the STO function is activated. SS1-t is typically used in applications where motion must be stopped quickly and safely before switching to a no-torque state.

- **SS1-t** stops the motor safely, using a controlled ramp stop and then activates the STO function.
- **SS1-t** can be used to implement an Emergency stop, fulfilling stop category 1 (EN/IEC 60204-1).



PROFIsafe safety functions module FSPS-21

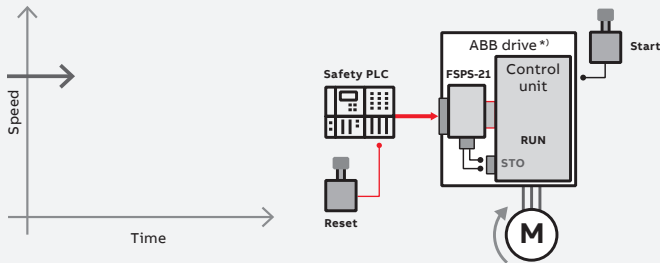
| Option code | Ordering code | Module |
|-------------|-----------------|---------|
| +Q986 | 3AXD50000112821 | FSPS-21 |

Note: This module isn't compatible with other fieldbus option modules for ACS380 and ACS580 drives

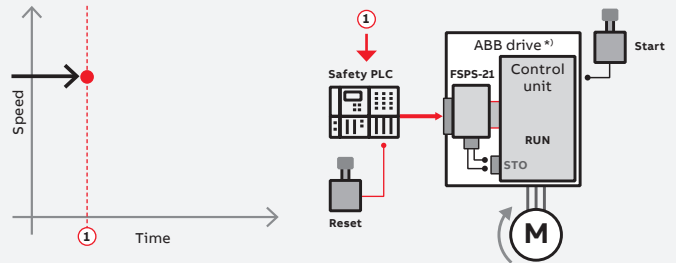
Example: SS1-t

Safety function module FSPS-21, functionality cycle

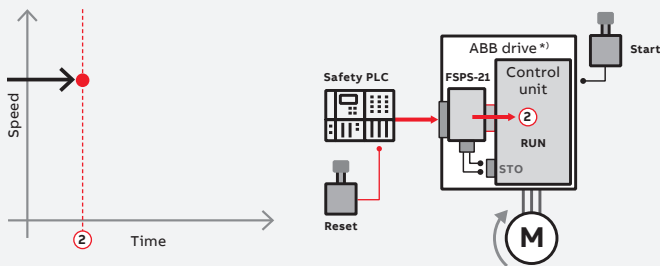
0. Drive running



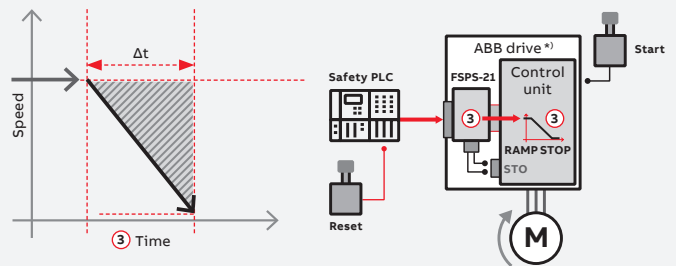
1. Safety PLC – safety function request to the FSPS-21



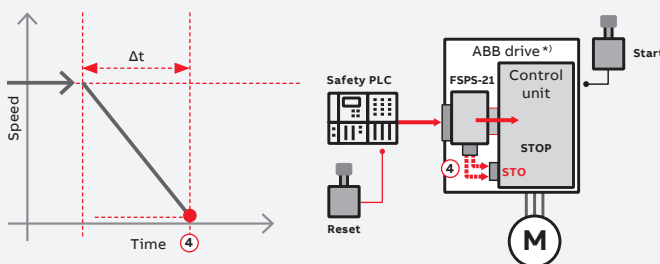
2. SS1-t, safety functions request / start of monitoring



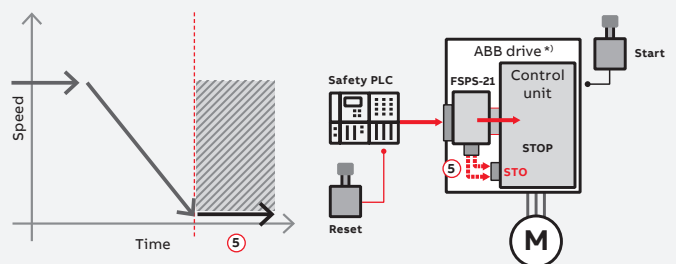
3. Transition and time monitoring of the SS1-t



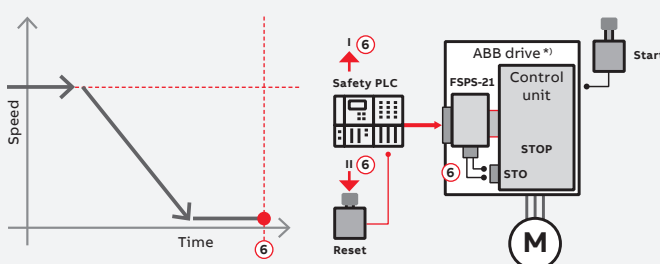
4. Zero speed or SS1-t time limit reached / STO is opened



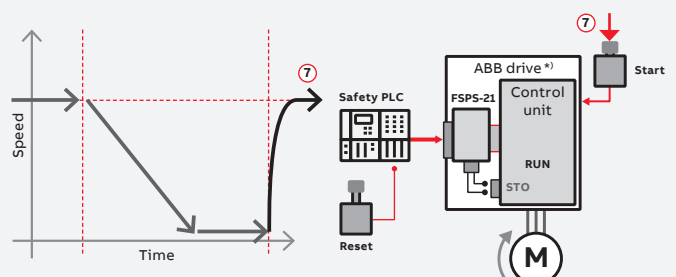
5. Safe state / STO is open



6. Safety function request removed / reset / STO is closed



7. Start – return to normal operation



^{*)} The ABB drive can be ACS380, ACS580 or ACS880

I/O option modules



ACS380 drives can be ordered with different I/O configurations. The standard input and output of the drive can be extended by using I/O option modules. A BIO-01 module extends the configured variant's I/O, whereas a BMIO-01 module provides both additional I/O and Modbus. In case additional relay outputs are needed, they can be added with a BREL-01 module. A BAPO-01 module introduces an external 24 V DC supply to the drive's control circuits.

The ACS380 drive's open loop performance is sufficient for almost any application, even when accurate control is needed close to zero speed. However, if speed feedback is needed for even more accurate control or for active loads like hoists, a speed feedback module BTAC-02 adds support for TTL and HTL pulse encoders.

I/O option modules

| Option code | Ordering code | Description | Module |
|-------------|-----------------|--|---------|
| +L511 | 3AXD5000022162 | External relay option, 4 x RO (side option) | BREL-01 |
| +L515 | 3AXD50000191635 | I/O option (front option). Can be used together with fieldbus. | BIO-01 |
| +L534 | 3AXD5000022164 | External 24 V DC (side option) | BAPO-01 |
| +L535 | 3AXD5000022163 | HTL/TTL encoder interface + External 24 V DC (side option) | BTAC-02 |
| +L538 | 3AXD5000021262 | I/O & Modbus extension (front option) | BMIO-01 |

| I/O | Base unit (ACS380-04xx) | BMIO-01 (ACS380-04xS) | BIO-01 | BREL-01 |
|-------------------|----------------------------|-----------------------------|----------------------|---------------------------|
| Inputs | | | | |
| Digital inputs | 2 (DI1, DI2) | 4 (DI3, DI4, DIO1, DIO2) | 3 (DI3, DI4, DI5) | - |
| Frequency inputs | - | 2 (DI3, DI4) | 2 (DI4, DI5) | - |
| Counter inputs | - | 1 (DI3) | 1 (DI4) | - |
| Analog inputs | - | 2 (AI1, AI2) | 1 (AI1) | - |
| Outputs | | | | |
| Relay outputs | 1 (RO1) | - | - | 4 (RO4, RO5, RO6, RO7) |
| Digital outputs | - | 2 (DIO1, DIO2) | 1 (DIO1) | - |
| Frequency outputs | - | 2 (DIO1, DIO2) | 1 (DIO1) | - |
| Analog outputs | - | 1 (AO1) | 1 (AO1) | - |

Note: The number of inputs and outputs depends on the configuration. For example, DIO can be configured as digital input or output.

Resistor braking

Brake chopper

The brake chopper is built in as standard for the ACS380. It not only controls braking, but also supervises system status and detects failures such as brake resistor and resistor cable short-circuits, chopper short-circuit, and calculated resistor over-temperature. See the tables for internal brake chopper specifications for each drive type.

Brake resistor

The brake resistors are separately available for the ACS380. Resistors other than the standard option resistors may be used, provided that the specified resistance value is higher than the minimum resistance and that heat dissipation capacity of the resistor is sufficient for the drive application (see hardware manual). No separate fuses in the brake circuit are required if the conditions for the mains cable, for example, are protected with fuses and no mains cable/fuse overrating occurs.

| Drive type | Frame size | Internal brake chopper | | | | Example brake resistor | |
|----------------------|------------|------------------------|--------------------|----------------------|---------------------|---|--|
| | | R_{min} (ohm) | R_{max} (ohm) | P_{BRcont} (kW) | P_{BRmax} (kW) | Danotherm type | |
| 1-phase 230 V | | | | | | | |
| ACS380-04xx-02A4-1 | R0 | 32.5 | 468 | 0.25 | 0.38 | CBH 360 C T 406 210R, CAR 200 D T 406 210R | |
| ACS380-04xx-03A7-1 | R0 | 32.5 | 316 | 0.37 | 0.56 | | |
| ACS380-04xx-04A8-1 | R1 | 32.5 | 213 | 0.55 | 0.83 | CBR-V 330 D T 406 78R UL | |
| ACS380-04xx-06A9-1 | R1 | 32.5 | 145 | 0.75 | 1.10 | | |
| ACS380-04xx-07A8-1 | R1 | 32.5 | 96.5 | 1.10 | 1.70 | CBR-V 560 D HT 406 39R UL | |
| ACS380-04xx-09A8-1 | R2 | 32.5 | 69.9 | 1.50 | 2.30 | | |
| ACS380-04xx-12A2-1 | R2 | 19.5 | 47.1 | 2.20 | 3.30 | | |
| 3-phase 230 V | | | | | | | |
| ACS380-04xx-02A4-2 | R1 | 39 | 474 | 0.25 | 0.38 | CBH 360 C T 406 210R, CAR 200 D T 406 210R | |
| ACS380-04xx-03A7-2 | R1 | 39 | 319 | 0.37 | 0.56 | | |
| ACS380-04xx-04A8-2 | R1 | 39 | 217 | 0.55 | 0.83 | CBR-V 330 D T 406 78R UL | |
| ACS380-04xx-06A9-2 | R1 | 39 | 145 | 0.75 | 1.13 | | |
| ACS380-04xx-07A8-2 | R1 | 39 | 105 | 1.10 | 1.65 | CBR-V 560 D HT 406 39R UL | |
| ACS380-04xx-09A8-2 | R1 | 20 | 71 | 1.50 | 2.25 | | |
| ACS380-04xx-12A2-2 | R2 | 20 | 52 | 2.20 | 3.30 | | |
| ACS380-04xx-17A5-2 | R3 | 16 | 38 | 3.00 | 4.50 | CBT-H 560 D HT 406 19R | |
| ACS380-04xx-25A0-2 | R3 | 16 | 28 | 4.00 | 6.00 | | |
| ACS380-04xx-032A-2 | R4 | 3 | 20 | 5.50 | 8.25 | CBT-V 760 G H T 282 8R | |
| ACS380-04xx-048A-2 | R4 | 3 | 14 | 7.50 | 11.25 | | |
| ACS380-04xx-055A-2 | R4 | 3 | 10 | 11.00 | 16.50 | | |
| 3-phase 400 V | | | | | | | |
| ACS380-04xx-01A8-4 | R0 | 99 | 933 | 0.37 | 0.56 | CBH 360 C T 406 210R, CAR 200 D T 406 210R | |
| ACS380-04xx-02A6-4 | R1 | 99 | 628 | 0.55 | 0.83 | | |
| ACS380-04xx-03A3-4 | R1 | 99 | 428 | 0.75 | 1.13 | CBR-V 330 D T 406 78R UL | |
| ACS380-04xx-04A0-4 | R1 | 99 | 285 | 1.10 | 1.65 | | |
| ACS380-04xx-05A6-4 | R1 | 99 | 206 | 1.50 | 2.25 | CBR-V 560 D HT 406 39R UL | |
| ACS380-04xx-07A2-4 | R1 | 53 | 139 | 2.20 | 3.30 | | |
| ACS380-04xx-09A4-4 | R1 | 53 | 102 | 3.00 | 4.50 | | |
| ACS380-04xx-12A6-4 | R2 | 32 | 76 | 4.00 | 6.00 | CBR-V 330 D T 406 78R UL | |
| ACS380-04xx-17A0-4 | R3 | 32 | 54 | 5.50 | 8.25 | | |
| ACS380-04xx-25A0-4 | R3 | 23 | 39 | 7.50 | 11.25 | CBR-V 560 D HT 406 39R UL | |
| ACS380-04xx-032A-4 | R4 | 6 | 29 | 11.00 | 17.00 | | |
| ACS380-04xx-038A-4 | R4 | 6 | 24 | 15.00 | 23.00 | | |
| ACS380-04xx-045A-4 | R4 | 6 | 20 | 18.50 | 28.00 | CBT-H 560 D HT 406 19R | |
| ACS380-04xx-050A-4 | R4 | 6 | 20 | 22.00 | 33.00 | | |

R_{min} = The minimum permitted resistance value of the brake resistor

R_{max} = The maximum resistance value of the brake resistor that can provide P_{BRcont}

P_{BRcont} = The continuous braking capacity of the drive

P_{BRmax} = The maximum braking capacity of the drive, when the length of the braking pulse is at most 1 minute for each 10 minutes ($P_{BRcont} \times 1.5$). The maximum braking capacity must be more than the desired braking power.

Example brake resistor → Check the allowed braking cycle from the resistor data sheet.

Please see the ACS380 hardware manual for the selection guidelines.

EMC – electromagnetic compatibility

The ACS380 machinery drives are equipped with a built-in filter to reduce high-frequency emissions. Low EMC filters (C3 for 400 V and C4 for 230 V) are denoted by type code ACS380-040X and high EMC filters (C2 for all voltages) by type code ACS380-042X. C1 can be achieved with an external EMC filter.

EMC standards

The EMC product standard (EN 61800-3) covers the specific EMC requirements stated for drives (tested with motor and cable) within the EU. EMC standards such as EN 55011 or EN 61000-6-3/4 are applicable to industrial and domestic equipment and systems including components inside the drive. Drive units complying with the requirements of EN 61800-3 are compliant with comparable categories

in EN 55011 and EN 61000-6-3/4, but not necessarily vice versa. EN 55011 and EN 61000-6-3/4 do not specify cable length or require a motor to be connected as a load. The emission limits are comparable to EMC standards according to the table below.

Domestic environments versus public low voltage networks

The first environment includes domestic premises. It also includes establishments directly connected without an intermediate transformer to a low voltage power supply network that supplies buildings used for domestic purposes. The second environment includes all establishments directly connected to public low voltage power supply networks.

| Comparison of EMC standards | | | | |
|--|-----------------------------|--|---|---|
| EMC according to EN 61800-3 product standard | EN 61800-3 product standard | EN 55011, product family standard for industrial, scientific and medical (ISM) equipment | EN 61000-6-4, generic emission standard for industrial environments | EN 61000-6-3, generic emission standard for residential, commercial and light-industrial environments |
| 1 st environment, unrestricted distribution | Category C1 | Group 1, Class B | Not applicable | Applicable |
| 1 st environment, restricted distribution | Category C2 | Group 1, Class A | Applicable | Not applicable |
| 2 nd environment, unrestricted distribution | Category C3 | Group 2, Class A | Not applicable | Not applicable |
| 2 nd environment, restricted distribution | Category C4 | Not applicable | Not applicable | Not applicable |

| EMC compliance and maximum motor cable length | | | | |
|---|------------|--|-------------|-------------|
| Voltage (Product variant) | Frame size | EMC category (EN 61800-3), max. motor cable length | | |
| | | C1 | C2 | C3 |
| With internal / external filter | | | | |
| 1-phase 230 V (ACS380-04xx-xxxx-1) | R0 | | | |
| | R1 | - / 10 m | 10 m / 10 m | 10 m / 10 m |
| | R2 | - / - | 10 m / - | 10 m / - |
| 3-phase 230 V (ACS380-04xx-xxxx-2) | R1 | | | |
| | R2 | - / - | - / 20 m | - / 20 m |
| | R3 | | | |
| 3-phase 400 V (ACS380-04xx-xxxx-4) | R4 | | | |
| | R0 | - / 30 m | 10 m / 30 m | 30 m / 30 m |
| | R1 | | | 30 m / 40 m |
| | R2 | - / 40 m | 10 m / 40 m | 20 m / 40 m |
| | R3 | | | 30 m / 40 m |
| | R4 | - / 30 m | 10 m / 30 m | 30 m / 30 m |

• Internal filter: C2 with ACS380-042x-xxxx-x, C3 with ACS380-040x-xxxx-4

• External filter: Please see page 29 Filters and chokes for the suitable external filter type

Filters and chokes

It is advisable to use a mains choke if the short-circuit capacity of the network at the drive terminals is higher than specified in the table.

| Frame size /voltage rating | R0, R1, R2 | R3, R4 |
|----------------------------|------------|---------|
| 1-phase 230 V | >5.0 kA | >7.5 kA |
| 3-phase 230 V | >5.0 kA | >7.5 kA |
| 3-phase 380...480 V | >5.0 kA | >10 kA |

1-phase $U_N = 230$ V (range 200 to 240 V)

| Drive type | Frame size | C1 filter ABB type / Schaffner type | Mains choke Max. ambient temp. 40 °C | du/dt filter Max. ambient temp. 40 °C |
|--------------------|------------|--|---|--|
| ACS380-04xx-02A4-1 | R0 | RFI-11 / FN21754-6.1-07 | CHK-A1 | ACS-CHK-B3 |
| ACS380-04xx-03A7-1 | R0 | RFI12 / FN21754-16.1-07 | CHK-B1 | ACS-CHK-B3 |
| ACS380-04xx-04A8-1 | R1 | RFI12 / FN21754-16.1-07 | CHK-B1 | ACS-CHK-B3 |
| ACS380-04xx-06A9-1 | R1 | RFI12 / FN21754-16.1-07 | CHK-C1 | ACS-CHK-C3 |
| ACS380-04xx-07A8-1 | R1 | RFI12 / FN21754-16.1-07 | CHK-C1 | ACS-CHK-C3 |
| ACS380-04xx-09A8-1 | R2 | – | CHK-D1 | ACS-CHK-C3 |
| ACS380-04xx-12A2-1 | R2 | – | CHK-D1 | ACS-CHK-C3 |

3-phase $U_N = 230$ V (range 200 to 240 V)

| Drive type | Frame size | C1 filter ABB type / Schaffner type | Mains choke Max. ambient temp. 40 °C | du/dt filter Max. ambient temp. 40 °C |
|--------------------|------------|--|---|--|
| ACS380-04xx-02A4-2 | R1 | RFI 32 / FN 3258-16-44 | CHK-01 | – |
| ACS380-04xx-03A7-2 | R1 | RFI 32 / FN 3258-16-44 | CHK-02 | – |
| ACS380-04xx-04A8-2 | R1 | RFI 32 / FN 3258-16-44 | CHK-03 | – |
| ACS380-04xx-06A9-2 | R1 | RFI 32 / FN 3258-16-44 | CHK-03 | – |
| ACS380-04xx-07A8-2 | R1 | RFI 32 / FN 3258-16-44 | CHK-03 | – |
| ACS380-04xx-09A8-2 | R1 | RFI 32 / FN 3258-16-44 | CHK-04 | – |
| ACS380-04xx-12A2-2 | R2 | RFI-33 / FN 3258-30-33 | CHK-04 | – |
| ACS380-04xx-17A5-2 | R3 | RFI-33 / FN 3258-30-33 | CHK-04 | – |
| ACS380-04xx-25A0-2 | R3 | RFI-33 / FN 3258-30-33 | CHK-06 | – |
| ACS380-04xx-032A-2 | R4 | RFI-34 / FN3258-100-35 | CHK-06 | – |
| ACS380-04xx-048A-2 | R4 | RFI-34 / FN3258-100-35 | CHK-07 | – |
| ACS380-04xx-055A-2 | R4 | RFI-34 / FN3258-100-35 | CHK-07 | – |

3-phase $U_N = 400$ V (range 380 to 480 V)

| Drive type | Frame size | C1 filter ABB type / Schaffner type | Mains choke Max. ambient temp. 40 °C | du/dt filter Max. ambient temp. 40 °C |
|--------------------|------------|--|---|--|
| ACS380-04xx-01A8-4 | R0 | RFI 32 / FN 3258-16-44 | CHK-01 | ACS-CHK-B3 |
| ACS380-04xx-02A6-4 | R1 | RFI 32 / FN 3258-16-44 | CHK-01 | ACS-CHK-B3 |
| ACS380-04xx-03A3-4 | R1 | RFI 32 / FN 3258-16-44 | CHK-01 | ACS-CHK-B3 |
| ACS380-04xx-04A0-4 | R1 | RFI 32 / FN 3258-16-44 | CHK-02 | ACS-CHK-C3 |
| ACS380-04xx-05A6-4 | R1 | RFI 32 / FN 3258-16-44 | CHK-02 | ACS-CHK-C3 |
| ACS380-04xx-07A2-4 | R1 | RFI 32 / FN 3258-16-44 | CHK-02 | NOCH0016-6x |
| ACS380-04xx-09A4-4 | R1 | RFI 32 / FN 3258-16-44 | CHK-03 | NOCH0016-6x |
| ACS380-04xx-12A6-4 | R2 | RFI-33 / FN 3258-30-33 | CHK-03 | NOCH0016-6x |
| ACS380-04xx-17A0-4 | R3 | RFI-33 / FN 3258-30-33 | CHK-04 | NOCH0030-6x |
| ACS380-04xx-25A0-4 | R3 | RFI-34 / FN3258-100-35 | CHK-04 | NOCH0030-6x |
| ACS380-04xx-032A-4 | R4 | RFI-34 / FN3258-100-35 | CHK-05 | NOCH0030-6x |
| ACS380-04xx-038A-4 | R4 | RFI-34 / FN3258-100-35 | CHK-06 | NOCH0070-6x |
| ACS380-04xx-045A-4 | R4 | RFI-34 / FN3258-100-35 | CHK-06 | NOCH0070-6x |
| ACS380-04xx-050A-4 | R4 | RFI-34 / FN3258-100-35 | CHK-07 | NOCH0070-6x |

Cooling, fuses and circuit breakers

Cooling

ACS380 drives are fitted with variable-speed cooling air fans. The cooling air must be free from corrosive materials and must not exceed the maximum ambient temperature of 50 °C (60 °C with derating).*)

Fuse and circuit breakers

Standard fuses and circuit breakers can be used with the ACS380 drives. For input fuse or circuit breaker specifications, see the table below. Manual motor protectors can also be used. See ACS380 hardware manual for details.

Cooling air flow and recommended input protection fuses

1-phase $U_N = 230\text{ V}$ (range 200 to 240 V)

| Drive type | Frame size | Typical power loss ¹⁾ | | Air flow (m ³ /h) | Noise | | IEC fuses | | IEC fuses | | UL fuses | |
|--------------------|------------|----------------------------------|--------|---------------------------------|-------|-------|-----------|-----------|-----------|-----------|----------|------------|
| | | (W) | BTU/Hr | | CFM | (dBA) | (A) | Fuse type | (A) | Fuse type | (A) | Fuse type |
| ACS380-04xx-02A4-1 | R0 | 33 | 113 | -*) | - | - | 10 | gG | 32 | gR | 10 | UL class T |
| ACS380-04xx-03A7-1 | R0 | 49 | 167 | -*) | - | - | 10 | gG | 32 | gR | 10 | UL class T |
| ACS380-04xx-04A8-1 | R1 | 67 | 229 | 57 | 33 | 63 | 16 | gG | 40 | gR | 20 | UL class T |
| ACS380-04xx-06A9-1 | R1 | 93 | 317 | 57 | 33 | 63 | 20 | gG | 50 | gR | 20 | UL class T |
| ACS380-04xx-07A8-1 | R1 | 106 | 362 | 57 | 33 | 63 | 25 | gG | 63 | gR | 25 | UL class T |
| ACS380-04xx-09A8-1 | R2 | 92 | 314 | 63 | 37 | 59 | 32 | gG | 63 | gR | 25 | UL class T |
| ACS380-04xx-12A2-1 | R2 | 115 | 392 | 63 | 37 | 59 | 35 | gG | 63 | gR | 35 | UL class T |

3-phase, $U_N = 230\text{ V}$ (range 200 to 240 V)

| | | | | | | | | | | | | |
|--------------------|----|-----|------|-----|----|----|-----|----|-----|----|-----|------------|
| ACS380-04xx-02A4-2 | R1 | 39 | 133 | 57 | 33 | 63 | 6 | gG | 25 | gR | 6 | UL class T |
| ACS380-04xx-03A7-2 | R1 | 57 | 194 | 57 | 33 | 63 | 10 | gG | 32 | gR | 10 | UL class T |
| ACS380-04xx-04A8-2 | R1 | 72 | 246 | 57 | 33 | 63 | 10 | gG | 32 | gR | 10 | UL class T |
| ACS380-04xx-06A9-2 | R1 | 111 | 379 | 57 | 33 | 63 | 16 | gG | 40 | gR | 20 | UL class T |
| ACS380-04xx-07A8-2 | R1 | 105 | 358 | 57 | 33 | 63 | 16 | gG | 40 | gR | 20 | UL class T |
| ACS380-04xx-09A8-2 | R1 | 140 | 478 | 57 | 33 | 63 | 16 | gG | 40 | gR | 20 | UL class T |
| ACS380-04xx-12A2-2 | R2 | 149 | 508 | 63 | 37 | 59 | 25 | gG | 50 | gR | 25 | UL class T |
| ACS380-04xx-17A5-2 | R3 | 265 | 904 | 128 | 75 | 66 | 32 | gG | 63 | gR | 35 | UL class T |
| ACS380-04xx-25A0-2 | R3 | 398 | 1358 | 128 | 75 | 66 | 50 | gG | 80 | gR | 40 | UL class T |
| ACS380-04xx-032A-2 | R4 | 350 | 1194 | 150 | 88 | 69 | 63 | gG | 100 | gR | 60 | UL class T |
| ACS380-04xx-048A-2 | R4 | 561 | 1914 | 150 | 88 | 69 | 100 | gG | 160 | gR | 100 | UL class T |
| ACS380-04xx-055A-2 | R4 | 676 | 2307 | 150 | 88 | 69 | 100 | gG | 160 | gR | 100 | UL class T |

3-phase $U_N = 400\text{ V}$ (range 380 to 480 V)

| | | | | | | | | | | | | |
|--------------------|----|-----|------|-----|----|----|-----|----|-----|----|-----|------------|
| ACS380-04xx-01A8-4 | R0 | 28 | 96 | - | - | - | 4 | gG | 25 | gR | 6 | UL class T |
| ACS380-04xx-02A6-4 | R1 | 44 | 150 | 57 | 33 | 63 | 6 | gG | 25 | gR | 6 | UL class T |
| ACS380-04xx-03A3-4 | R1 | 55 | 188 | 57 | 33 | 63 | 6 | gG | 25 | gR | 6 | UL class T |
| ACS380-04xx-04A0-4 | R1 | 62 | 212 | 57 | 33 | 63 | 10 | gG | 32 | gR | 10 | UL class T |
| ACS380-04xx-05A6-4 | R1 | 91 | 311 | 57 | 33 | 63 | 10 | gG | 32 | gR | 10 | UL class T |
| ACS380-04xx-07A2-4 | R1 | 100 | 341 | 57 | 33 | 63 | 16 | gG | 40 | gR | 20 | UL class T |
| ACS380-04xx-09A4-4 | R1 | 140 | 478 | 57 | 33 | 63 | 16 | gG | 40 | gR | 20 | UL class T |
| ACS380-04xx-12A6-4 | R2 | 165 | 563 | 63 | 37 | 59 | 25 | gG | 50 | gR | 25 | UL class T |
| ACS380-04xx-17A0-4 | R3 | 259 | 884 | 128 | 75 | 66 | 32 | gG | 63 | gR | 35 | UL class T |
| ACS380-04xx-25A0-4 | R3 | 390 | 1331 | 128 | 75 | 66 | 50 | gG | 80 | gR | 40 | UL class T |
| ACS380-04xx-032A-4 | R4 | 396 | 1351 | 150 | 88 | 69 | 63 | gG | 100 | gR | 60 | UL class T |
| ACS380-04xx-038A-4 | R4 | 497 | 1696 | 150 | 88 | 69 | 80 | gG | 125 | gR | 80 | UL class T |
| ACS380-04xx-045A-4 | R4 | 582 | 1986 | 150 | 88 | 69 | 100 | gG | 160 | gR | 100 | UL class T |
| ACS380-04xx-050A-4 | R4 | 672 | 2293 | 150 | 88 | 69 | 100 | gG | 160 | gR | 100 | UL class T |

¹⁾ Typical drive losses when it operates at 90% of the motor nominal frequency and 100% of the drive nominal output current.

The miniature circuit breakers listed below are tested and approved for use with the ACS380 drives.
Other circuit breakers can also be used with the drive if they provide the same electrical characteristics.

| Circuit breakers | | | | |
|---|------------|-------------------------------|--------------------|---|
| 1-phase $U_N = 230\text{ V}$ (range 200 to 240 V) | | | | |
| Drive type | Frame size | ABB miniature circuit breaker | | |
| | | Type | (kA) ¹⁾ | |
| ACS380-04xx-02A4-1 | R0 | S 201P-B 10 NA | | 5 |
| ACS380-04xx-03A7-1 | R0 | S 201P-B 10 NA | | 5 |
| ACS380-04xx-04A8-1 | R1 | S 201P-B 16 NA | | 5 |
| ACS380-04xx-06A9-1 | R1 | S 201P-B 20 NA | | 5 |
| ACS380-04xx-07A8-1 | R1 | S 201P-B 25 NA | | 5 |
| ACS380-04xx-09A8-1 | R2 | S 201P-B 25 NA | | 5 |
| ACS380-04xx-12A2-1 | R2 | S 201P-B 32 NA | | 5 |
| 3-phase, $U_N = 230\text{ V}$ (range 200 to 240 V) | | | | |
| ACS380-04xx-02A4-2 | R1 | S 203P-Z 6 NA | | 5 |
| ACS380-04xx-03A7-2 | R1 | S 203P-Z 8 NA | | 5 |
| ACS380-04xx-04A8-2 | R1 | S 203P-Z 10 NA | | 5 |
| ACS380-04xx-06A9-2 | R1 | S 203P-Z 16 NA | | 5 |
| ACS380-04xx-07A8-2 | R1 | S 203P-Z 16 NA | | 5 |
| ACS380-04xx-09A8-2 | R1 | S 203P-Z 25 NA | | 5 |
| ACS380-04xx-12A2-2 | R2 | S 203P-Z 25 NA | | 5 |
| ACS380-04xx-17A5-2 | R3 | S 203P-Z 32 NA | | 5 |
| ACS380-04xx-25A0-2 | R3 | S 203P-Z 50 NA | | 5 |
| ACS380-04xx-032A-2 | R4 | S 203P-Z 63 NA | | 5 |
| ACS380-04xx-048A-2 | R4 | - | | - |
| ACS380-04xx-055A-2 | R4 | - | | - |
| 3-phase $U_N = 380...480\text{ V}$ (380, 400, 415, 440, 460, 480 V) | | | | |
| ACS380-04xx-01A8-4 | R0 | S 203P-B 4 | | 5 |
| ACS380-04xx-02A6-4 | R1 | S 203P-B 6 | | 5 |
| ACS380-04xx-03A3-4 | R1 | S 203P-B 6 | | 5 |
| ACS380-04xx-04A0-4 | R1 | S 203P-B 8 | | 5 |
| ACS380-04xx-05A6-4 | R1 | S 203P-B 10 | | 5 |
| ACS380-04xx-07A2-4 | R1 | S 203P-B 16 | | 5 |
| ACS380-04xx-09A4-4 | R1 | S 203P-B 16 | | 5 |
| ACS380-04xx-12A6-4 | R2 | S 203P-B 25 | | 5 |
| ACS380-04xx-17A0-4 | R3 | S 203P-B 32 | | 5 |
| ACS380-04xx-25A0-4 | R3 | S 203P-B 50 | | 5 |
| ACS380-04xx-032A-4 | R4 | S 203P-B 63 | | 5 |
| ACS380-04xx-038A-4 | R4 | S 803S-B 80 | | 5 |
| ACS380-04xx-045A-4 | R4 | S 803-B 100 | | 5 |
| ACS380-04xx-050A-4 | R4 | S 803-B 100 | | 5 |

¹⁾ Maximum permitted rated conditional short-circuit current (IEC 61800-5-1) of the electrical power network.



ACS380 drives are compatible with the wide ABB product offering



Programmable Logic Controllers, PLCs

The AC500, AC500-eCo, AC500-S and AC500-XC scalable PLC ranges provide solutions for small, medium and high-end applications. Our AC500 PLC platform offers different performance levels and is the ideal choice for high availability, extreme environments, condition monitoring, motion control or safety solutions.



All-compatible drives portfolio

The all-compatible drives share the same architecture: software platform, tools, user interfaces and options. There is an optimal drive from the smallest water pump to the biggest cement kiln, and everything in between.



AC motors

ABB's low voltage AC motors are designed to save energy, reduce operating costs and minimize unscheduled downtime. General performance motors ensure convenience, while process performance motors provide a broad set of motors for the process industries and heavy-duty applications.



Automation Builder Engineering suite

ABB Automation Builder is the software for machine builders and system integrators wanting to automate their machines and systems in a unified and efficient way. Automation Builder connects the engineering tools for PLC, safety, control panels, SCADA, drives, motion and robots.



Control panels

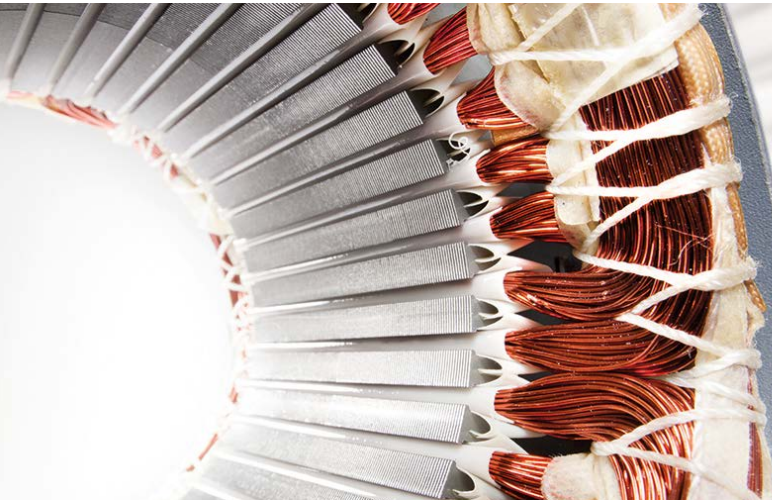
CP600-eCo, CP600 and CP600-Pro control panels offer a wide range of features and functionalities for maximum operability. ABB control panels are distinguished by their robustness and high usability, providing all the relevant information from production plants and machines at a single touch.



ABB Jokab Safety

ABB Jokab Safety is helping machine builders to create production-friendly and safe work environments for operators. We deliver machine safety solutions for single machines or entire production lines. Our long experience of helping customers making solutions for demanding environments has made us experts in combining production demands with safety demands for production-friendly solutions.

Choose the right motor for your application



Choose the best motor for your application. A natural match for induction motors, ABB machinery drives can also control high-efficiency motors such as permanent magnet or synchronous reluctance motors for greater efficiency.

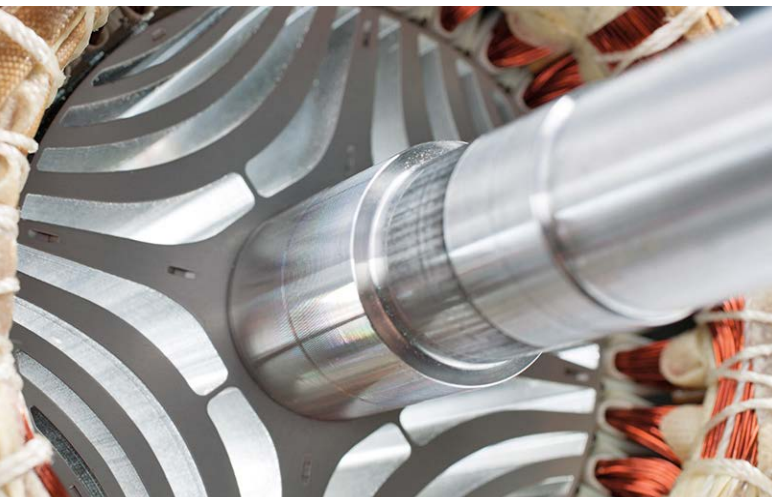
Induction motors, the industry workhorse

Pair the ACS380 with an induction motor (IM) for simple and reliable operation in many applications and in a wide range of environments. Further simplifying setup, the machinery drives can be integrated with virtually any type of IM by entering the nameplate motor data only.



Permanent magnet motors for smooth operation

Permanent magnet technology is used for improved motor characteristics in terms of energy efficiency and compactness. This technology is particularly well-suited for low speed control applications, as they eliminate the need to use gear boxes. Even without speed or rotor position sensors, the ACS380 drives control most types of permanent magnet motors.



IE5 SynRM for optimized energy efficiency

Combining ABB's machinery drive control technology with our synchronous reluctance motors will give you a motor and a drive package that ensures high energy efficiency, reduces motor temperatures, and provides a significant reduction in motor noise. The key is in the efficiency-optimized rotor design of our SynRM motors.

Synchronous reluctance motors

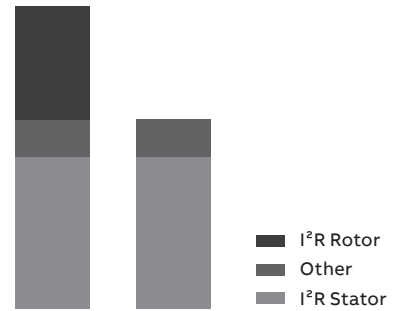
Ultimate efficiency and reliability to optimize your cost of ownership



Traditional induction motor



IE5 SynRM motor



Losses IM vs SynRM

Innovation inside

The idea is simple. Take a conventional, proven stator technology and an innovative rotor design. Then combine them with an ABB machinery drive loaded with software with versatile features. Finally, optimize the whole package for applications such as compressors, conveyors, pumps, extruders, fans and many other variable and constant torque applications.

Magnet-free design

Synchronous reluctance technology combines the performance of a permanent magnet motor with the simplicity and service-friendliness of an induction motor. The new rotor has neither magnets nor windings, and suffers virtually no power losses. And because there are no magnetic forces in the rotor, maintenance is as straightforward as with induction motors.

Superior reliability to minimize the cost of not running

International Efficiency class IE5 synchronous reluctance motors (SynRM) have very low winding temperatures, which increases the reliability and lifetime of the winding. More importantly, a cool synchronous reluctance rotor means significantly lower bearing temperatures – an important factor because bearing failures cause about 70 percent of unplanned motor outages.

Perfect for retrofits

The SynRM package is a perfect solution for motor retrofits. The IE5 SynRM is the same size as an IE3 induction motor, eliminating the need for mechanical modifications. The increased efficiency will, on the other hand, reduce the payback time of the investment.

Full motor control, down to zero speed

Many processes require accurate speed control. SynRM always runs at reference speed with practically no error, without an encoder. Even the best slip compensation systems in an induction motor inverter will never match the precision of SynRM. Sometimes your application may require you to run your motor at slow speeds. If you are using SynRM and your drive cannot provide the necessary torque, it may trip. ABB drives provide full control and torque down to zero speed, even without speed sensors.

For all applications

This is important if you are planning on using the motor with applications other than quadratic torque applications like pumps and fans. Our drives provide full SynRM motor control for constant torque applications such as extruders, conveyors and wire drawing machines.

| SynRM technology | Benefit |
|--|--|
| Higher efficiency IE5 | Lowest energy consumption |
| No rare earth metals | Environmental sustainability |
| Magnet-free rotor | Easy service |
| Lower winding and bearing temperatures | Longer life time, extended service intervals |
| Better controllability | Accurate speed and torque control |
| Lower noise level | Better working and living environment |
| Same size with IE3 | Perfect for retrofits |



Drivetune mobile application for wireless access

User-friendly experience with Bluetooth connectivity.

Drivetune mobile app is a powerful tool for performing basic drive startup and troubleshooting tasks. It is possible to connect with drives and access data available in the Internet at the same time. The wireless Bluetooth

connectivity means that users won't need to enter hazardous or difficult-to-reach work areas to access information necessary to help them commission and tune the drive.



Startup, commission and tune your drive and application with full parameter access

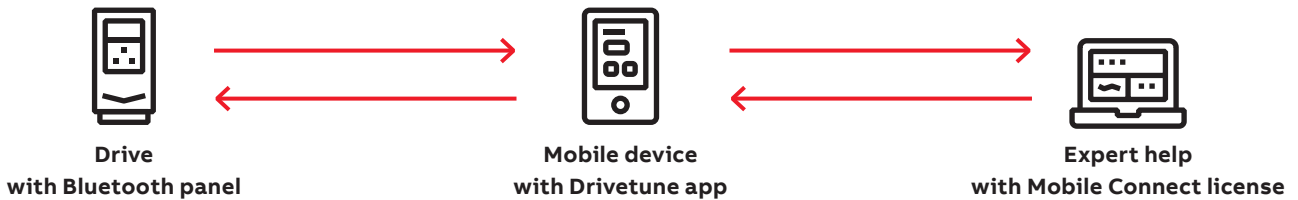
Optimize performance via drive troubleshooting features

Create and share backups and support packages

Keep track of drives installed base

ABB Ability™ Mobile Connect for drives is a module in the Drivetune app. It gives you the access to the technical support for fast problem solving. Mobile Connect makes all the necessary data instantly available to the expert, providing support.

Remote and rapid access to ABB's drive experts can save you and your team considerable time, money and headaches. Check Mobile Connect availability in your country.



Download Drivetune



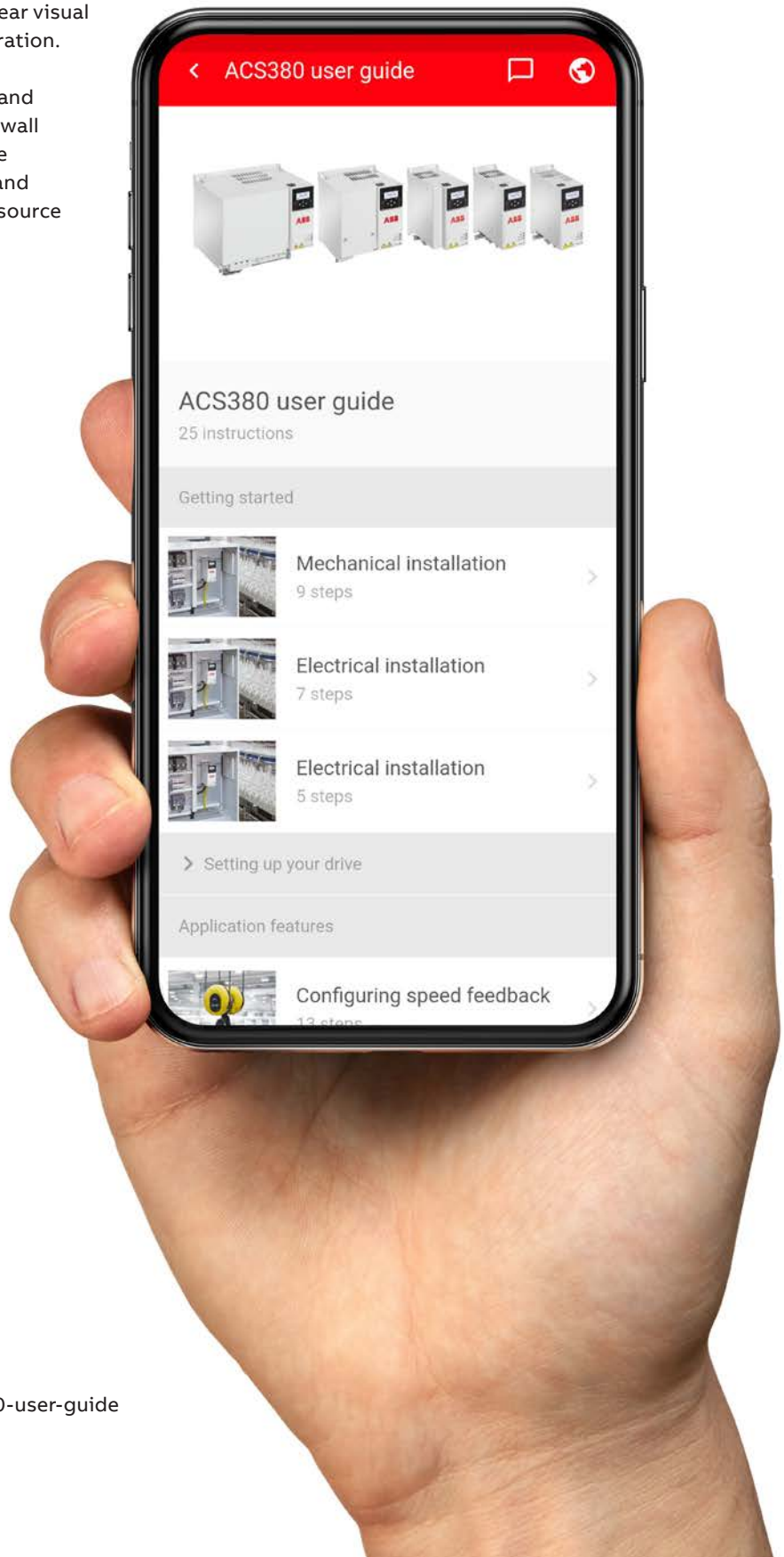
Drivetune for commissioning and managing drives

ABB SmartGuide – ACS380

Being one of the handiest ways to get short and clear visual instructions on drive installation, startup and operation.

Mobile friendly digital user guides provide simple and animated step-by-step instructions to assist with wall mounting of drives, electrical installation and drive programming. The content is frequently updated and further developed, making it your comprehensive source of instructions and help.

Scan the QR code and test it yourself!



<https://drives-abb.swipeguide.com/guide/acs380-user-guide>
<https://drives-abb.swipeguide.com/>

Our service expertise, your advantage

ABB Motion Services helps customers around the globe by maximizing uptime, extending product life cycle, and enhancing the performance and energy efficiency of electrical motion solutions. We enable innovation and success through digitalization by securely connecting and monitoring your motors and drives, increasing reliability and improving efficiency.

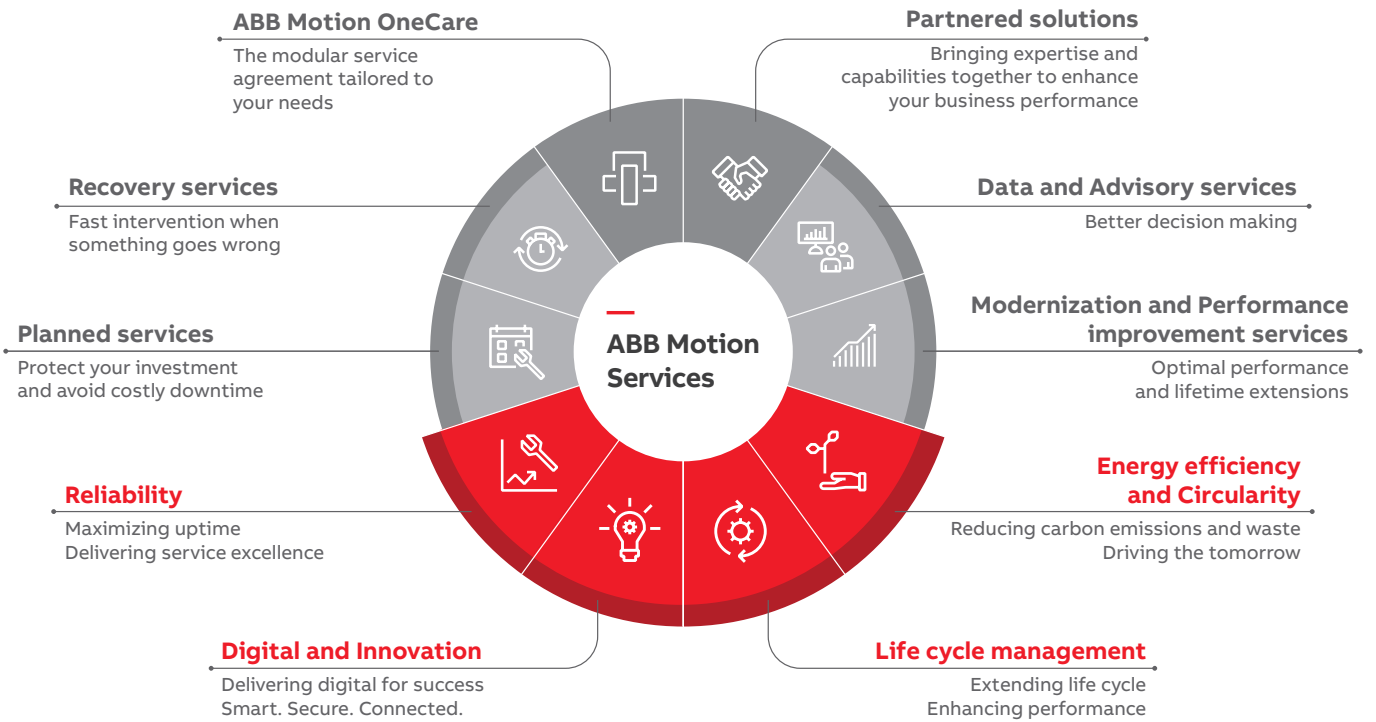
Even before you consider buying a drive or motor, ABB's experts are on hand to provide technical solutions ranging from advisory to modernization and performance improvement services, giving you peace of mind and transparency into your cost of ownership throughout the asset's economical lifetime.

When you've decided on the right product, ABB and its global network of Value Providers can help with installation and commissioning. They are also on hand to support you

throughout the operations and maintenance phases of the products life cycle, providing planned services programs customized to your operations.

With a service offering tailored to your needs, service experts can maximize the uptime and extend the life cycle of your powertrain, while optimizing its performance and maximizing your energy efficiency gains across the entire lifetime of your applications. Service helps keep your applications turning profitably, safely, and reliably.





OUR EXPERTISE
YOUR ADVANTAGE

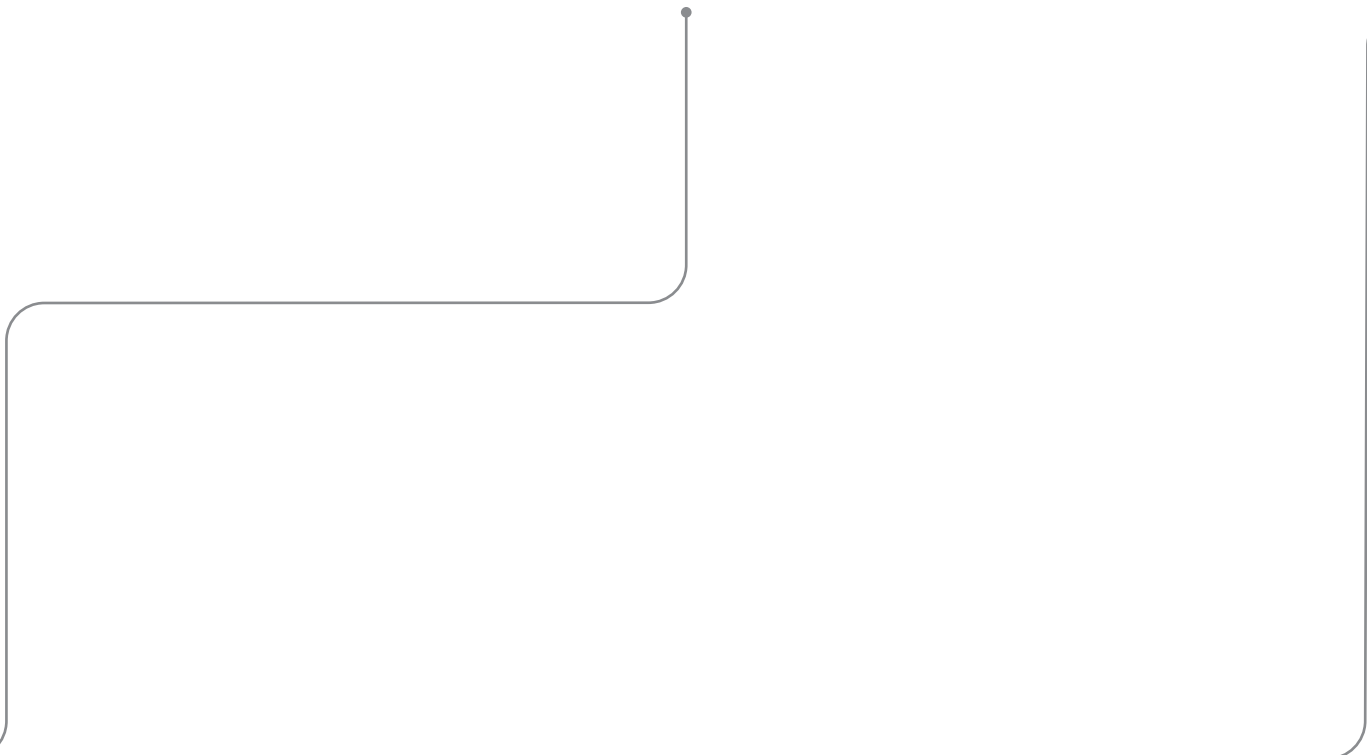


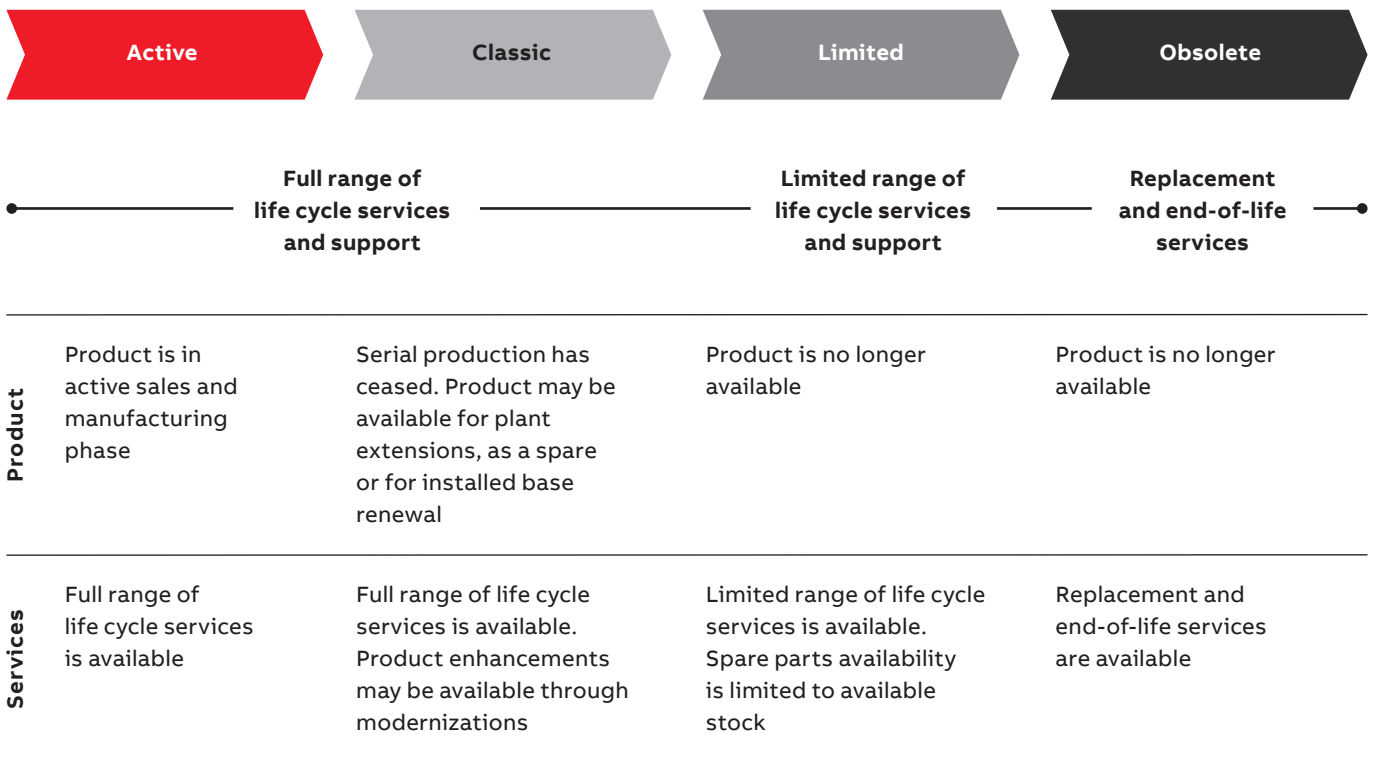
ABB Drives Life Cycle Management

A life time of peak performance

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

We notify you every step of the way. Your benefit is clear information about your drives' status and precise services available. It helps you plan service actions ahead of time and make sure that continuous support is always available.

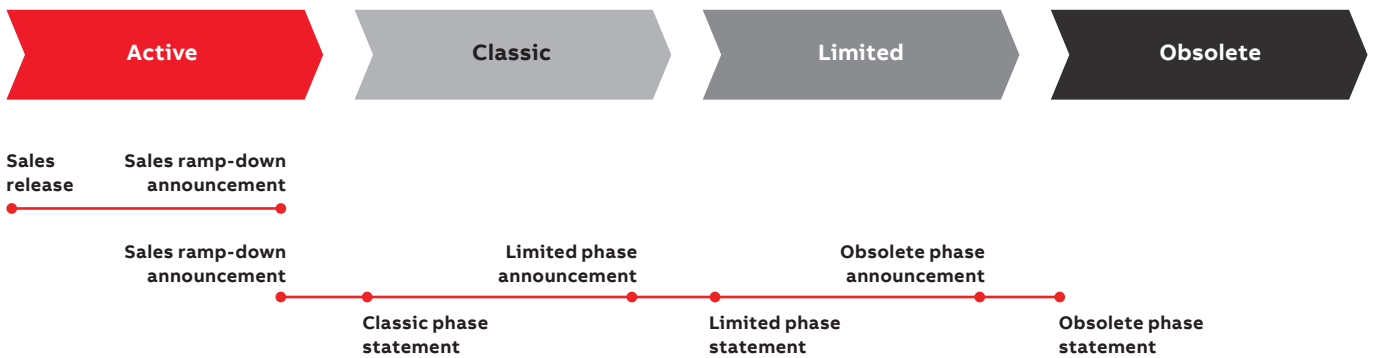
Now it's easy for you to see the exact service and maintenance available for your drives.



Keeping you informed throughout the life cycle

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

Your benefit is clear information about your drives' status and precise services available. It helps you plan the preferred service actions ahead of time and make sure that continuous support is always available.



Sales release

Details about product portfolio and release schedule.

Sales ramp down announcement

Last time buy and last deliveries dates, informed well in advance.

Life cycle phase change announcement

Early information about the upcoming life cycle phase change and affects on the service availability. Informed well in advance, minimum six months prior to the change.

Life cycle phase statement

Information about the current life cycle status, product and services availability and recommended actions. Plan for the next life cycle phase transition.



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

new.abb.com/drives
new.abb.com/drives/drivespartners
new.abb.com/motors-generators

Learn more
from ACS380 website



Online manuals
for the ACS380 drives

