LOW VOLTAGE AC DRIVES

ABB coldplate machinery drives

ACS280, 0.37 to 5.5 kW (0.5 to 7.5 hp)

Space-saving, dependable machine control, for unique environments. ACS280 coldplate machinery drives.

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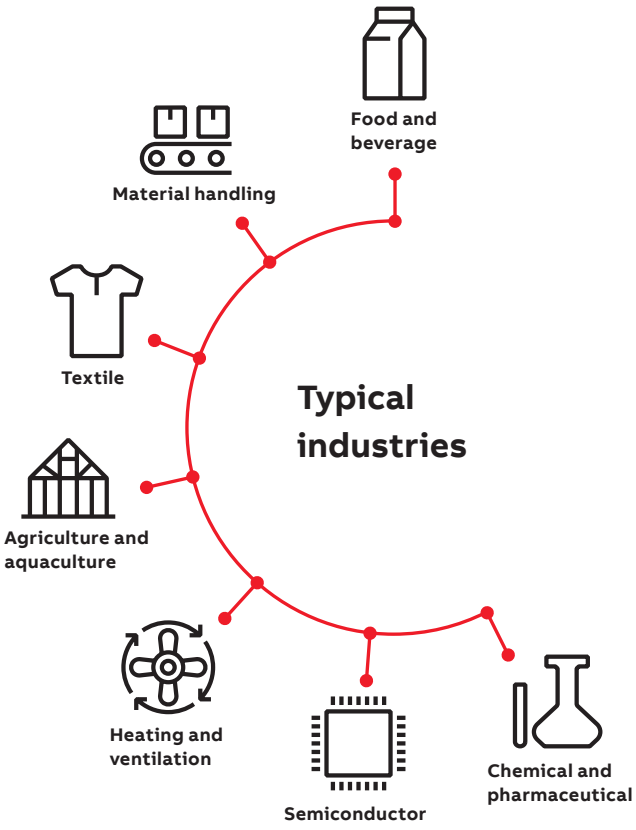
ACS280 coldplate machinery drives

Space-saving, dependable machine control for unique environments

The ACS280 coldplate drive, an all-compatible ABB machinery drive, is built for harsh environments, where its compact design and fit-for-purpose characteristics mean it can be fit in small spaces, saving machine builders space and money.

Fit-for-purpose
ACS280 drives offer versatile installation options due to their compact size. They can be directly mounted onto a motor, integrated into an enclosure, or used as flange-mounted drives in any orientation. These drives support various cooling methods, including passive, air (fan), and even liquid cooling. The integrated Safe Torque Off (STO) function ensures safety compliance, optimizing both cabinet space and cost.



Reliable and solid performance
The ACS280 drive's coldplate form-factor eliminates the need for fans and air ducts, enabling installation in high-protection enclosures like IP66 for a longer lifespan in harsh environments. Coated circuit boards meeting C3 standards ensure reliability in corrosive conditions.
The ACS280 also operates at full capacity in temperatures up to 50 °C without derating. Tested to IEC 60068-2 standards, it is optimized for shock and vibration resistance, making it ideal for mobile and railway applications, ensuring dependable performance in demanding conditions.

Easy to install, commissioning and learn
ACS280 drives offer consistent functionality, user interface, and tools across the entire ABB all-compatible portfolio. With built-in Modbus RTU and CANopen, connecting to a PLC or other control system is straightforward. Adaptive programming allows for customization to meet specific customer needs, while convenient spring terminals make installation quick and easy.

Ensure high efficiency and keep low motor noise
The ACS280 drive maximizes efficiency with its advanced cooling and control algorithms, supporting various high-efficiency motors, such as induction, permanent magnet, and permanent magnet-assisted synchronous reluctance motors. It enables effortless motor optimization through automatic flux optimization and 3-phase modulation, improving efficiency and reducing noise.


UDC-
UDC+
ABB
ACS280
EXT. FAN
24V
DC
USER TOOL
WARNING:
Risk of Electric Shock.
AVERTISSEMENT:
CCA
PWR
STO
T1/
U
T2/
V
T3/
W

Space-saving, dependable machine control for unique environments

Designed to withstand challenging conditions, ACS280 maintains reliable operation in demanding settings. From high temperatures to dusty or wet environments, their robust construction minimises downtime and extends equipment life.

Drive-based programmability
Adaptive and sequence programming allows the customization of the drive software using sequence and function block programming. This means system costs can be reduced by replacing the need for a PLC for logic execution. This is a standard feature in the ACS280 drive, requiring no additional downloads or licenses.

Built-in EMC filter
High-frequency noise can directly affect sensitive electronic equipment and high-speed communication fieldbuses. The ACS280 drive is equipped with a built-in EMC filter to reduce high-frequency emissions. The built-in EMC filter allows the drive to be used in industrial or domestic environments without the need to buy and install additional external filters.

Simple and flexible installation
The ACS280 has a small and compact size with a special flat design, allowing for a highly flexible installation in various machines. It can be installed at any direction and side-by-side, providing versatility in mounting options.

Supports high protective design
The unique coldplate form-factor, without the requirement for a main fan and air ducts, allows the ACS280 to be installed in enclosed spaces with cooling element, achieving fit-for-purpose protection levels, such as IP66.

All-compatible user interface
The ACS280 is part of the ABB all-compatible drives portfolio like ACS180, ACS380, ACS480, ACS580 and ACS880 drives. All these drives have the same easy to use PC tools and a similar intuitive multilingual user interface and parameter structure making using and learning them fast and easy.

Excellent motor control performance
The ACS280 drive delivers exceptional motor control performance, catering to a variety of high-efficient motors, including induction, permanent magnet, and permanent magnet-assisted synchronous reluctance motors. Notably, it offers support for both scalar control and sensorless vector control modes, ensuring versatile and precise control over motor operations.

Designed for maximum reliability
The ACS280 features standard coated circuit boards, reliable earth fault protection, and a design suitable for operation in environments up to 50 °C. It is optimized for shock and vibration resistance, tested to IEC 60068-2 standards, making it suitable for mobile and railway applications. These attributes ensure the ACS280 is the preferred choice for customers seeking high reliability. ABB further enhances this assurance by conducting full-load tests on every drive prior to shipment.

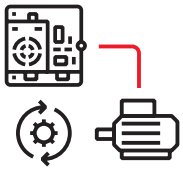
Communication
The standard ModbusRTU and CANopen interfaces facilitate seamless connection with industrial automation fieldbuses, making it easy to connect to PLCs.

Remote connectivity
Utilizing the Bluetooth control panel allows for remote access to the inverter, facilitating monitoring and adjustment at convenience.

Safe Torque Off
Certified Safe Torque Off (SIL 3, PL e) is a standard built-in feature in ACS280 drives.

Flexible in any application

The flexibility of ACS280 makes it ideal for diverse applications, providing unparalleled adaptability and performance. By choosing ACS280, you ensure top-tier performance and reliability across your varied applications, making them indispensable to machine builders.

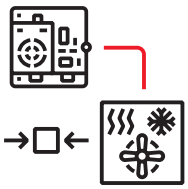


Integrated motor drive

The ACS280 coldplate drive can be used in integrated motor drive applications, where the motor's terminal box is designed to serve as both the drive enclosure and cooling element. This solution is widely applicable in industries such as water management, HVAC, and agriculture, particularly for fan, pump, and conveyor applications.

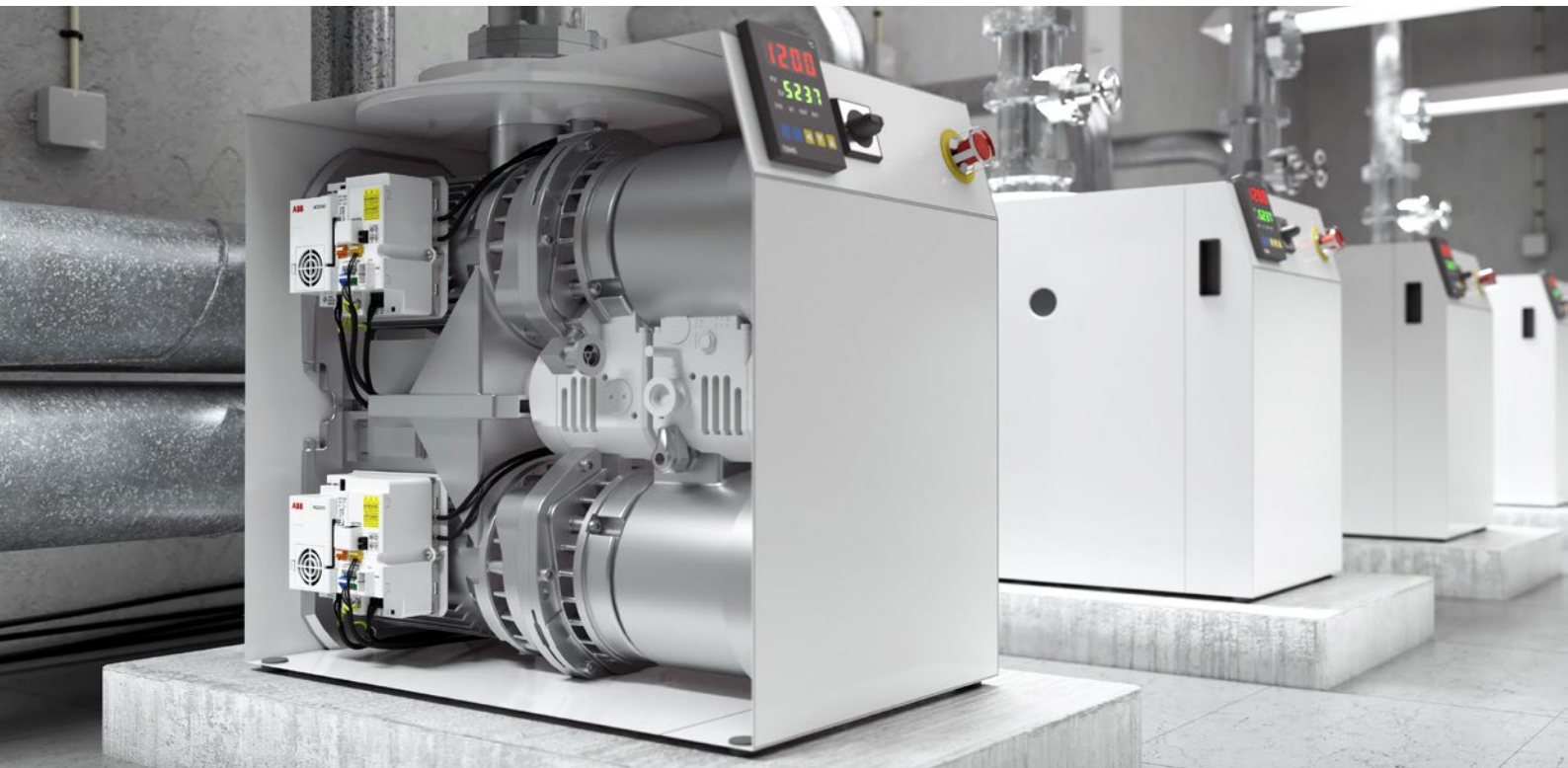
Installed in high-protection enclosures

The majority of the drive's heat losses are transferred outside the high-protection enclosure through the flat metal coldplate. For the remaining heat, the ACS280 has a built-in circulation fan, which helps reduce the size of the high-protection enclosures. As a result, it can be installed in sealed enclosures with high protection levels, suitable for dusty, humid, or corrosive environments, while maintaining stable performance. This assists users in overcoming application challenges in extreme conditions and is applicable in various industries.



Integrated into various types of machinery

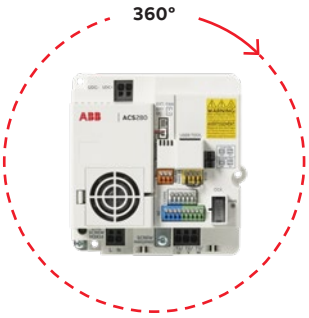
The ACS280 is compact and versatile, seamlessly integrating into machinery with stringent space requirements. It interfaces effortlessly with existing cooling systems in various types of equipment, such as heat pumps, vacuum pumps, and textile machinery. Whether mounted directly to the machine structure, on a heat sink with large fins, or on a liquid cooling plate, its adaptability makes it suitable for industries like semiconductors, photovoltaics, and lithium batteries.

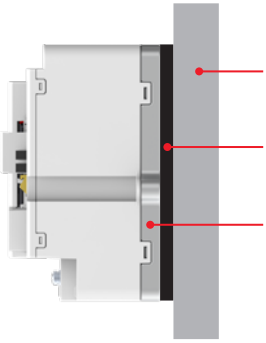


Maximize space and efficiency

With their small physical footprint, ACS280 drives are easy to install in tight spaces, optimising your equipment layout without sacrificing performance. Enjoy the benefits of reduced installation costs, improved space utilisation and enhanced operational efficiency, making them perfect for applications requiring a streamlined solution.

Installation in any direction
Thanks to its unique coldplate structure, the ACS280 drive offers flexible installation in almost any direction on a suitable thermally conductive surface. After installation, thermal testing should be conducted to ensure the drive operates within design limits.





Flexible cooling methods
ACS280 drive's innovative design provides a range of different cooling possibilities, from passive heat sink with large fins to liquid-cooled plates, ensuring optimal performance across diverse applications. Available methods include various refrigerants and high thermal conductivity materials.

—
Fanless natural convection cooling

—
Liquid cooling

—
Air cooling

Compact and tough control for extreme envinronmets
The ACS280 drive features a robust design and unique coldplate form-factor, allowing it to be installed inside IP66-rated enclosures. This ensures reliable performance in high temperatures, dust, and moisture while minimizing downtime.

ACS280 drives software with versatile features

One drive to control different types of motor. The ACS280 supports induction, permanent magnet and permanent magnet assisted synchronous reluctance motors.

Excellent motor control performance. Thanks to its sensorless vector control, the ACS280 supports precise torque control even without encoder feedback. Furthermore, in more demanding applications, the ACS280 also offers rich functions, such as flystart, torque boost, DC injection, and slip compensation, to outstanding performance for various operating modes.

"Mini PLC" included in the drive. By using intuitive and visualized Adaptive Programming, which offers numerous logical or mathematical function blocks, the user can build their own logic to scale up and customize the drive to your application's requirements. The PC tool Drive Composer Entry, which is used to edit the Adaptive Programming, is also free.

Energy optimization function can automatically adjust the motor flux to its most efficient level: this helps reduce motor current and thus reduce power consumption and noise.

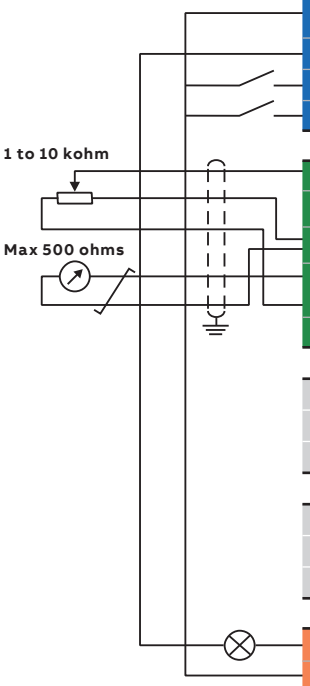
Many protective and process limit functions for protecting your machine through long-term running. The ACS280 not only offers various functions to protect the motor, such as overload, overheat, overcurrent, overvoltage, phase loss or phase-ground protections, but also has functions to protect the machine, such as limit of speed, torque or time.

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

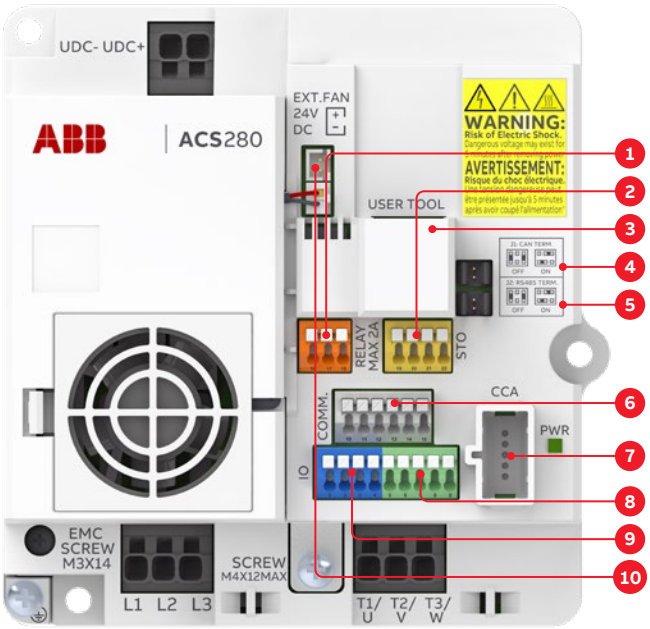
Standard interface for ACS280 coldplate drive

ACS280 coldplate drives offer a wide range of standard interfaces, including I/O interfaces, communication interfaces, relay outputs, STO, user tool interfaces, and external 24V DC power supplies, proving various flexible control methods. The standard version include:

- 2 DI + 2 AI/DI + 1 AO/DO + 1 RO + STO
- Built-in ModbusRTU and CANopen



1. Relay output
2. Safe Torque Off (STO)
3. User tool interface
4. CAN termination jumper
5. EIA-485 termination jumper
6. EIA-485 Modbus RTU CANopen interface
7. Cold Configuration CCA-01 interface
8. Analog intput and output
9. Digital input
10. 24V output for the external cooling fan



Default I/O connections

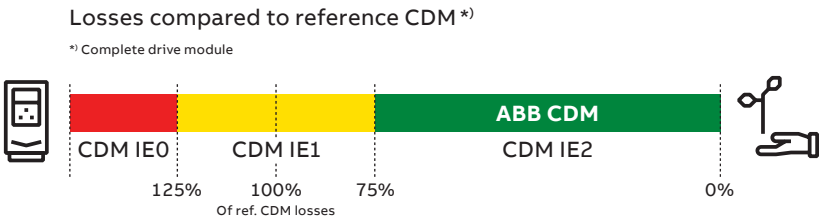
Terminals		Descriptions
		Digital inputs and outputs
3	24 V	Aux. voltage output +24 V DC, max 100 mA
4	DGND	Aux. voltage output common
1	DI1	Digital input 1: Stop (0)/Start (1)
2	DI2	Digital input 2: Forward (0)/Reverse (1)
		Analog inputs and outputs
5	AI1/DI3	Analog Input 1: Speed reference (0...10 V)
6	AI2/DI4	Unused
9	AGND	Analog input circuit common terminal
8	AO1/DO1	Analog Output: Output frequency (0...10 V)
7	10 V	Given voltage +10 V DC
		CANopen protocol
10	CAN-H	Built-in CANopen
11	CAN-L	
12	GND	
		EIA-485 Modbus RTU
13	A-	Built-in Modbus RTU (EIA-485)
14	A+	
15	GND	
		Relay Output
16	NC	No fault [Fault (-1)]
17	COM	
18	NO	
		Safety Torque Off (STO)
19	S+	Safety Torque Off function. Factory connection. The inverter can only start when both circuits are closed.
20	SGND	
21	S 1	
22	S 2	
		PC/PANEL connection
PC/PANEL (RJ45)		Use standard Category 5 or better network cable. Alternatitively, you can directly connect to a PC usign BCBL-01 (USB-RJ45 connector cable). Note: This interface is not an Ethernet port. Do not connect to an Ethernet network.

ABB AC drives comply with the EU Ecodesign requirements

The Ecodesign regulation (EU) 2019/1781 is the legislative framework, that sets minimum energy efficiency requirements for low voltage induction motors and variable speed drives. AC drives and power drive systems are classified according to their power losses. From July 2021, the minimum requirement for non-regenerative AC drives in EU is IE2.

ABB's AC drives (micro and machinery, general purpose, industrial and industry-specific drives) comply with the strictest requirements of the standard for energy efficiency and are classified as IE2.

Energy efficiency classes for a Complete Drive Module (CDM)



Markings on the ABB LV 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.

ABB EcoDesign web-based tool

- Calculates absolute and relative losses and efficiency data at standard and user-defined operating points according to EU regulation 2019/1781 for complete drive module (CDM), LV motors with VSD supply, and power drive system (PDS)
- Losses and efficiency data at operating points in graphical and table format
- Printable efficiency report with possibility to customize title and additional details
- Report can be converted to PDF or CSV format and shared via email

The regulation was implemented in two steps:

Step 1: July 1, 2021

- Power range: from 0.12 to 1000 kW
- 3-phase LV AC drives with diode rectifier
- 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 IE level is given at the nominal point. Drives fulfilling the requirements will be CE marked.

Out of scope of 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.
- Medium voltage drives, DC drives and traction drives
- Drive cabinets with already conformity assessed modules

Step 2: July 1, 2023

No changes for AC drives

For more information, see: ecodesign.drivesmotors.abb.com

ABB Ability™ Mobile Connect for drives

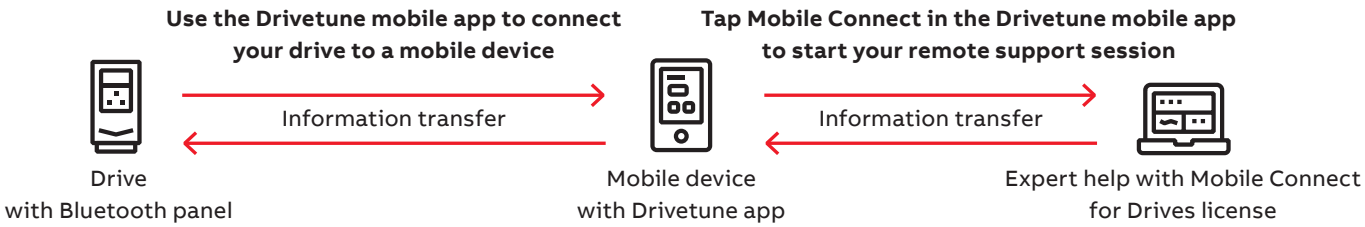
Easy access to remote support
ABB Ability™ Mobile Connect for drives is a platform for remote drive support consisting of the Mobile Connect web portal and the Drivetune mobile app.

The platform allows ABB service partners to provide remote commissioning and troubleshooting support for personnel on-site without any complex connectivity infrastructure. Chats, sharing images and backups, viewing parameters online and sending support packages are all possible, making your technical support process quick and efficient.

All that is needed is the Bluetooth control panel and a mobile device.

The platform is available for ABB partners and OEMs under a renewable subscription-based agreement.

ABB Ability™ Mobile Connect for drives support portal



Drivetune mobile app for managing drives via an intuitive interface

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**

Download Drivetune mobile app

ANDROID APP ON Google play

Available on the App Store

Technical data

Mains connection	
Voltage and power range	1-phase, 208 to 240 V, +10%/-15% 0.37 to 3 kW (0.5 to 3.0 HP) 3-phase, 208 to 240 V, +10%/-15% 0.37 to 4 kW (0.5 to 5.0 HP) 3-phase, 380 to 480 V, +10%/-15% 0.75 to 5.5 kW (1.0 to 7.5 HP)
Supply network type	TN, TT, IT support 460 V corner-grounded delta network
Frequency	from 47 to 63 Hz
Power factor	$\cos\varphi = 0.98$
Efficiency (at nominal power)	98%
Efficiency class (IEC 61800-9-2)	IE2
Motor connection	
Voltage	0 to U_N, 3-phase
Frequency	0 to 598 Hz
Motor control	Scalar control Sensorless vector control
Switching frequency	1.5 to 12 kHz, default 4 kHz
Motor control performance	
Speed control performance, open loop	
Static accuracy	20% of motor rated slip
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	R1: No, R2: Yes (integrated)
DC connection	Yes
Control and connectivity	
Analog input	2 mA or V configure by parameter AI1 can be used as DI3, AI2 can be used as DI4
Analog output	1 V mode only AO1 can be used as DO1 (transistor output) Maximum 60 mA in transistor output mode
Digital input	2 PNP
Relay output	1 NO+NC, 230 V, 2 A
Communication	1 x RJ45 for external control panel/PC tool Terminals for EIA-485 Modbus RTU Terminals for CANopen
Functional safety	
Built-in safety features	Safe Torque Off (STO) acc. to EN/IEC61800-5-2: IEC61508 ed2: SIL 3, IEC 61511: SIL 3, IEC 62061: SIL CL 3, EN ISO 13849-1: PL e

Environmental limits	
Ambient temperature	
Operation	-10 to +50 °C
Transportation and storage	-40 to +70 °C
Cooling method	According to users design
Altitude	0 to 2,000 m (see allowed power systems in HW manual) derating above 1,000 m
Vibration level	Sinusoidal (IEC 60068-2-6:2007): Frequency range: 5... 1000 Hz: Amplitude: 5... 11.5 Hz: ±7.5 mm 11.5... 1000 Hz: 4 g Sweep rate: 1 oct/min Three directions, 10 double sweeps per direction Random (IEC 60068-2-64:2008): 5...199 Hz: 0.03 g^2/Hz 200... 399 Hz: 0.02 g^2/Hz 400... 1000 Hz: 0.005 g^2/Hz Total spectral acceleration 3.72 grms Three directions, 1 hour per direction Shock/Impact (IEC 60068-2-27:2008): Basic pulse shape: Half-sine 30g / 6 ms 6 shocks in 6 directions (±X/±Y/±Z)
Relative humidity	5 to 95%, no condensation allowed
Degree of protection	IP00 as standard
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 C3 (chemical gases) Class 3S2 (solid particles)

Product compliance
CE Low Voltage Directive 2014/35/EU, 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 RoHS directive 2011/65/EU and delegated directive (EU) 2015/863 Ecodesign (EU) 2019/1781 China RoHS II GB/T 26572 KC cRUus Certification TÜV Nord (safety functions) UKCA ISO 9001:2015 Quality Management System ISO 14001:2015 Environmental Management System ISO 45001:2018 Occupational Health and Safety Management System ISO 50001:2018 Energy Management System Waste Electrical and Electronic Equipment Directive (WEEE) 2012/19/EU

EMC according to EN 61800-3:2004 + A1:2012	
ACS280-04S-xxxx-1	Class C2 as standard
ACS280-04S-xxxx-2	Class C3 as standard
ACS280-042-xxxx-4	Class C3 as standard

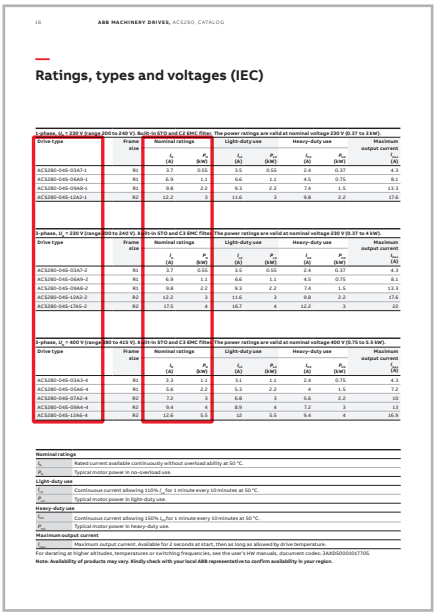
How to select a drive

How you build up your ordering code

Start by identifying your supply voltage. This indicates what rating table you should use. See pages 16 and 17.

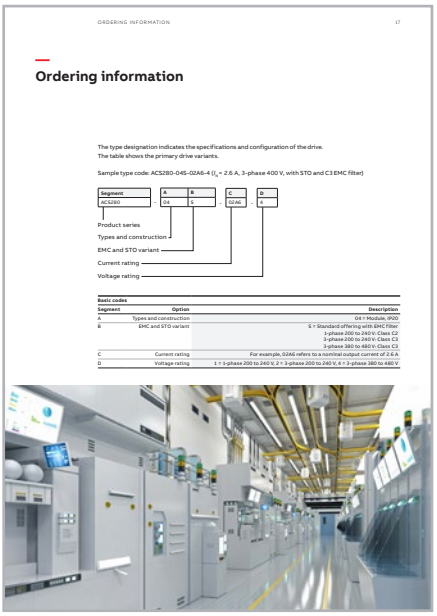
Choose the motor power and current rating from the ratings table on pages 18 and 19.

Select the ordering code for the ACS280 machinery drive.



Ratings, types and voltages (IEC)

Pages 18 and 19



Ordering information

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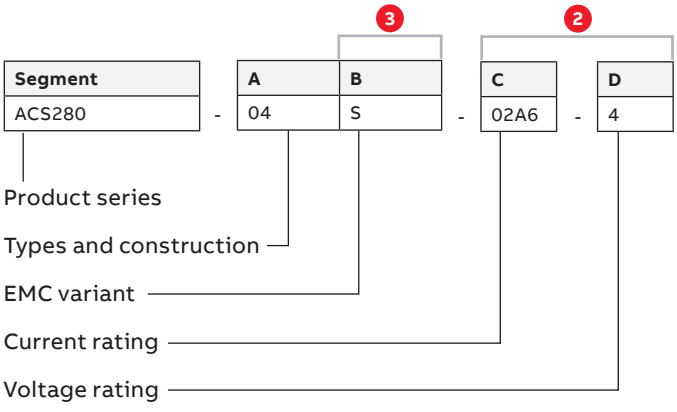


Ordering information

The type designation indicates the specifications and configuration of the drive.
The table shows the primary drive variants.

Sample type code: ACS280-04S-02A6-4 (I_N = 2.6 A, 3-phase 400 V, with STO and C3 EMC filter)

Segment		A	B		C		D
ACS280	-	04	S	-	02A6	-	4

Product series
Types and construction
EMC variant
Current rating
Voltage rating

Basic codes		
Segment	**Option**	**Description**
A	Types and construction	04 = Module, IP00
B	EMC variant	S = Standard offering with EMC filter 1-phase 200 to 240 V: Class C2 3-phase 200 to 240 V: Class C3 3-phase 380 to 480 V: Class C3
C	Current rating	For example, 02A6 refers to a nominal output current of 2.6 A
D	Voltage rating	1 = 1-phase 208 to 240 V, 2 = 3-phase 208 to 240 V, 4 = 3-phase 380 to 480 V

Ratings, types and voltages (IEC)

1-phase, U_N = 230 V (range 208 to 240 V). Built-in STO and C2 EMC filter. The power ratings are valid at nominal voltage 230 V (0.37 to 3 kW).

Drive type	Frame size	Nominal ratings		Light-duty use		Heavy-duty use		Maximum output current
		I_N (A)	P_N (kW)	I_{Ld} (A)	P_{Ld} (kW)	I_{Hd} (A)	P_{Hd} (kW)	I_{max} (A)
ACS280-04S-03A7-1	R1	3.7	0.55	3.5	0.55	2.4	0.37	4.3
ACS280-04S-06A9-1	R1	6.9	1.1	6.6	1.1	4.5	0.75	8.1
ACS280-04S-09A8-1	R1	9.8	2.2	9.3	2.2	7.4	1.5	13.3
ACS280-04S-12A2-1	R2	12.2	3	11.6	3	9.8	2.2	17.6

3-phase, U_N = 230 V (range 208 to 240 V). Built-in STO and C3 EMC filter. The power ratings are valid at nominal voltage 230 V (0.37 to 4 kW).

Drive type	Frame size	Nominal ratings		Light-duty use		Heavy-duty use		Maximum output current
		I_N (A)	P_N (kW)	I_{Ld} (A)	P_{Ld} (kW)	I_{Hd} (A)	P_{Hd} (kW)	I_{max} (A)
ACS280-04S-03A7-2	R1	3.7	0.55	3.5	0.55	2.4	0.37	4.3
ACS280-04S-06A9-2	R1	6.9	1.1	6.6	1.1	4.5	0.75	8.1
ACS280-04S-09A8-2	R1	9.8	2.2	9.3	2.2	7.4	1.5	13.3
ACS280-04S-12A2-2	R2	12.2	3	11.6	3	9.8	2.2	17.6
ACS280-04S-17A5-2	R2	17.5	4	16.7	4	12.2	3	22

3-phase, U_N = 400 V (range 380 to 415 V). Built-in STO and C3 EMC filter. The power ratings are valid at nominal voltage 400 V (0.75 to 5.5 kW).

Drive type	Frame size	Nominal ratings		Light-duty use		Heavy-duty use		Maximum output current
		I_N (A)	P_N (kW)	I_{Ld} (A)	P_{Ld} (kW)	I_{Hd} (A)	P_{Hd} (kW)	I_{max} (A)
ACS280-04S-03A3-4	R1	3.3	1.1	3.1	1.1	2.4	0.75	4.3
ACS280-04S-05A6-4	R1	5.6	2.2	5.3	2.2	4	1.5	7.2
ACS280-04S-07A2-4	R2	7.2	3	6.8	3	5.6	2.2	10
ACS280-04S-09A4-4	R2	9.4	4	8.9	4	7.2	3	13
ACS280-04S-12A6-4	R2	12.6	5.5	12	5.5	9.4	4	16.9

Nominal ratings	
I_N	Rated current available continuously without overload ability at 50 °C.
P_N	Typical motor power in no-overload use.
Light-duty use	
I_{Ld}	Continuous current allowing 110% I_{Ld} for 1 minute every 10 minutes at 50 °C.
P_{Ld}	Typical motor power in light-duty use.
Heavy-duty use	
I_{Hd}	Continuous current allowing 150% I_{Hd} for 1 minute every 10 minutes at 50 °C.
P_{Hd}	Typical motor power in heavy-duty use.
Maximum output current	
I_{max}	Maximum output current. Available for 2 seconds at start, then as long as allowed by drive temperature.

For derating at higher altitudes, temperatures or switching frequencies, see the user's HW manuals, document codes: 3AXD50001017705.

Note: Availability of products may vary. Kindly check with your local ABB representative to confirm availability in your region.

Ratings, types and voltages (UL)

1-phase, U_N = 230 V (range 208 to 240 V). Built-in STO and C2 EMC filter.

Drive type	Frame size	Light-duty use		Heavy-duty use		Maximum output current
		I_{Ld} (A)	P_{Ld} (hp)	I_{Hd} (A)	P_{Hd} (hp)	I_{max} (A)
ACS280-04S-03A7-1	R1	3.5	0.75	2.4	0.5	4.3
ACS280-04S-06A9-1	R1	6.6	1.5	4.5	1	8.1
ACS280-04S-09A8-1	R1	9.3	3	7.4	2	13.3
ACS280-04S-12A2-1	R2	11.6	3	9.8	3	17.6

3-phase, U_N = 230 V (range 208 to 240 V). Built-in STO and C3 EMC filter.

Drive type	Frame size	Light-duty use		Heavy-duty use		Maximum output current
		I_{Ld} (A)	P_{Ld} (hp)	I_{Hd} (A)	P_{Hd} (hp)	I_{max} (A)
ACS280-04S-03A7-2	R1	3.5	0.75	2.4	0.5	4.3
ACS280-04S-06A9-2	R1	6.6	1.5	4.5	1	8.1
ACS280-04S-09A8-2	R1	9.3	2	7.4	2	13.3
ACS280-04S-12A2-2	R2	11.6	3	9.8	3	17.6
ACS280-04S-17A5-2	R2	16.7	5	12.2	4	22

3-phase, U_N = 460 V (range 440 to 460 V). Built-in STO and C3 EMC filter.

Drive type	Frame size	Light-duty use		Heavy-duty use		Maximum output current
		I_{Ld} (A)	P_{Ld} (hp)	I_{Hd} (A)	P_{Hd} (hp)	I_{max} (A)
ACS280-04S-03A3-4	R1	3	1.5	2.1	1	4.3
ACS280-04S-05A6-4	R1	4.7	3	3.4	2	7.2
ACS280-04S-07A2-4	R2	6	3	4.8	3	10.1
ACS280-04S-09A4-4	R2	7.6	5	6.3	3	13
ACS280-04S-12A6-4	R2	11	7.5	7.6	5	16.9

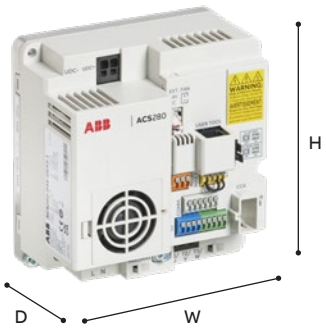
Nominal ratings	
I_N	Rated current available continuously without overload ability at 50 °C.
P_N	Typical motor power in no-overload use.
Light-duty use	
I_{Ld}	Continuous current allowing 110% I_{Ld} for 1 minute every 10 minutes at 50 °C.
P_{Ld}	Typical motor power in light-duty use.
Heavy-duty use	
I_{Hd}	Continuous current allowing 150% I_{Hd} for 1 minute every 10 minutes at 50 °C.
P_{Hd}	Typical motor power in heavy-duty use.
Maximum output current	
I_{max}	Maximum output current. Available for 2 seconds at start, then as long as allowed by drive temperature.

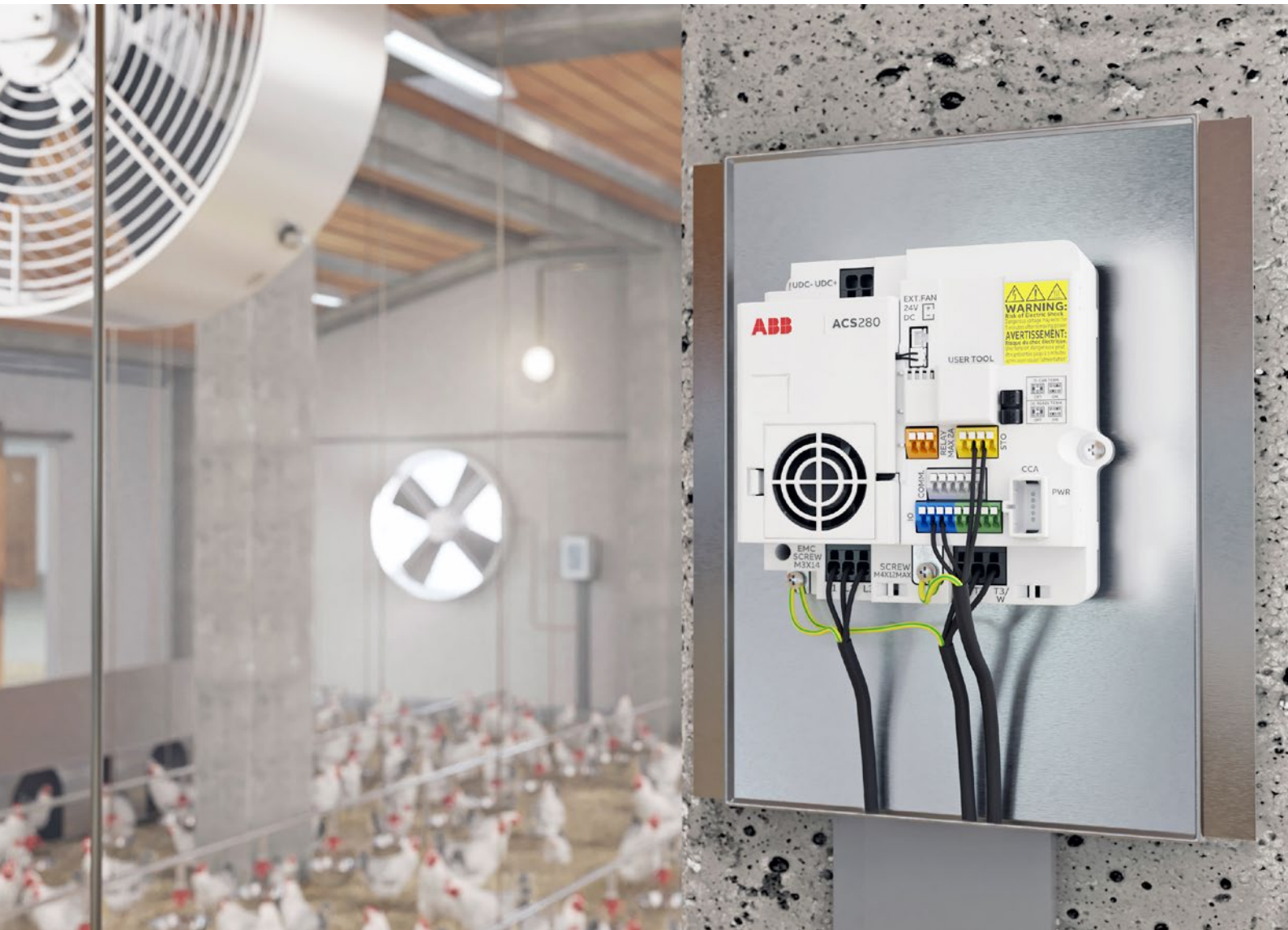
For derating at higher altitudes, temperatures or switching frequencies, see the user's HW manuals, document codes: 3AXD50001017705.

Note: Availability of products may vary. Kindly check with your local ABB representative to confirm availability in your region.

Dimensions

ACS280 IP00								
Frame size	Height		Width		Depth		Weight	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(kg)	(lb)
R1	145	5.71	135	5.31	90	3.35	0.95	2.09
R2	196	7.71	141	5.55	90	3.54	1.33	2.94





Drive commissioning and adaptable use with your control panel

External control panels are available for installation on a cabinet door or for operation via a Bluetooth connection.

Assistant control panel, ACS-AP-I *)
The optional Assistant control has a graphical multilingual display. There is no need to know any drive parameters, because 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 commission and monitor the drive remotely, for example.

Basic control panel, ACS-BP-S
If there is a need to install a basic panel in 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.

*) Also compatible with the following ABB all-compatible drives: ACS180, ACS380, ACS480, ACS580, and ACS880 drives.

Control panel options

Ordering code	Description	Control panel
3AUA0000088311	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

Commissioning, programming and customization tools

Your engineering efficiency is boosted with our commissioning and programming tools, giving you the optimal solution to perform virtualization, planning, commissioning and maintenance.

Drive Composer
The Drive Composer PC tool offers fast and harmonized setup, commissioning and monitoring for all-compatible drives. The free version of the tool provides startup and maintenance capabilities and gathers all drive information, such as parameter loggers, faults, backups and lists, 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.

Drive Composer	Entry level (free)	Pro level
	Basic functionality	All entry-level features
	Multi-language UI	Networked drives
	Parameter setting	Control diagrams
	Backup-restore	Data logger(s)
	Adaptive programming	Graphical safety setup
	Simple monitoring	Advanced monitoring
	Single-point connection	Multiple-point connection
	Connection via USB	Connection via USB/Ethernet
	–	Control diagrams
	–	Datalogger
	–	Graphical safety setup

Link/MRP codes	Description	Type designation
new.abb.com/drives/software-tools/drive-composer	Link to download free Drive Composer entry	–
9AKK105408A3415	Drive Composer entry PC tool (document)	–
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

Adaptive programming

Drive Composer could be used to set up Adaptive programming. Adaptive programming is embedded inside the drive, is especially handy when there is a need to distribute some of the machine's control logic to the drive. The drive also offers sequence programming capabilities. Adaptive programming makes it possible to enhance the existing application control program to precisely fit users' application needs.

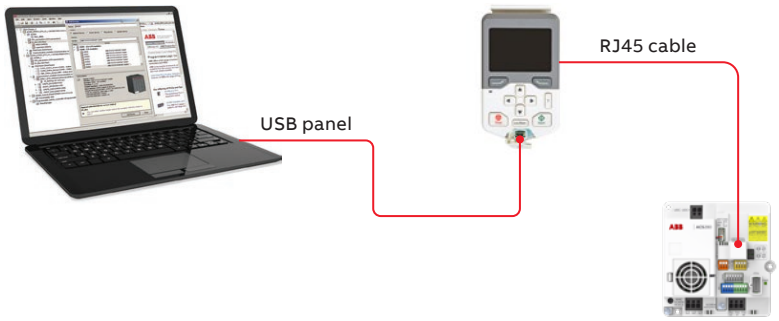
Key features of Adaptive programming

Graphical UI. Uses a graphical environment to configure control logic with function blocks like logic gates, mathematical operations, timers, and comparators. These can be linked to create custom solutions.
Easy to use. No complex coding needed; users can visually connect blocks by click-n-drag, making it accessible for non-programmers.
Easy to deploy. The Adaptive programming is stored together with parameter backups and can be easily copied between multiple drives via control panels without PC tools.
IP protection. The Adaptive programming can be hidden and protected from copying or editing.
Free of charge. Adaptive programming is embedded in every drive and can be edit by using the free Drive Composer Entry tool.

Connecting PC to the USB port on the panel

1. Use the USB cable to connect the PC to the panel via USB port.
2. Ensure that the USB drivers are installed on your computer if required.
3. Once connected, the computer should detect the control panel as a USB device.
4. Use any software or tools compatible with the control panel to operate or configure the drive.

Connecting the PC, drive and control panel



Safe configuration for unpowered drives

The CCA-01 cold configuration adapter provides a serial communication interface for unpowered ACS280 drives. With the adapter, safety isolation of both serial communication and control board power supply is possible. The power supply is taken from a PC USB port.

Cold configurator

Users can download the firmware and parameters to drives without powering ACS280 drive.

MRP code	Description	Type designation
3AXD50000019865	Cold configurator adapter, packed kit	CCA-01

BCBL-01 cable

The BCBL-01 cable enables direct connection between a PC and the ACS280 drive's RJ-45 port at the front, eliminating the need for the assistant control panel.

BCBL-01

Connects PC and RJ-45 panel port.

MRP code	Description	Type designation
3AXD50000032449	PC cable, USB to RJ45	BCBL-01

EMC – electromagnetic compatibility

ACS280-04S coldplate drives are equipped with a built-in filter (C2 for 1-phase and C3 for 3-phase) to reduce high-frequency emissions.

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 that include 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
1st environment, unrestricted distribution	Category C1	Group 1, Class B	Not applicable	Applicable
1st environment, restricted distribution	Category C2	Group 1, Class A	Applicable	Not applicable
2nd environment, unrestricted distribution	Category C3	Group 2, Class A	Not applicable	Not applicable
2nd environment, restricted distribution	Category C4	Not applicable	Not applicable	Not applicable

EMC compliance and maximum motor cable length

Voltage	Drive type	Frame size	EMC category (EN 61800-3), max. cable length with internal filter		
			C1	C2	C3
1-phase 230 V	ACS280-04S-xxxx-1	R1	–	5 m	–
		R2			
3-phase 230 V	ACS280-04S-xxxx-2	R1	–	–	10 m
		R2			
3-phase 400 V	ACS280-04S-xxxx-4	R1	–	–	10 m
		R2			

Cooling and fuses

Cooling
The heat generated by the control board of the ACS280 inverter is cooled by internal fans and needs to dissipate through the enclosure surface. The heat generated by the mainboard section is disspated through the coldplate.

Fuses
Standard fuses can be used with the ACS280. For input fuses, see the table below. Manual motor protectors can also be used. See hardware manual for details.

Drive losses and recommended input protection fuses

1-phase U_N = range 208 to 240 V

Drive type	Frame size	Typical power loss [1]			Max. noise level [*] (dBA)	IEC fuses		IEC fuses		UL fuses	
		Main loss [2] (W)	Control parts [3] (W)	Sum of losses (W)		(A)	Fuse type	(A)	Fuse type	(A)	Fuse type
ACS280-04S-03A7-1	R1	25	12	32	51	16	gG	32	gR	10	UL class T
ACS280-04S-06A9-1	R1	44	17	61	51	20	gG	50	gR	20	UL class T
ACS280-04S-09A8-1	R1	62	25	87	51	40	gG	50	gR	35	UL class T
ACS280-04S-12A2-1	R2	89	36	125	51	40	gG	63	gR	35	UL class T

Drive losses and recommended input protection fuses

3-phase U_N = range 208 to 240 V

Drive type	Frame size	Typical power loss [1]			Max. noise level [*] (dBA)	IEC fuses		IEC fuses		UL fuses	
		Main loss [2] (W)	Control parts [3] (W)	Sum of losses (W)		(A)	Fuse type	(A)	Fuse type	(A)	Fuse type
ACS280-04S-03A7-2	R1	24	10	34	51	8	gG	32	gR	10	UL class T
ACS280-04S-06A9-2	R1	43	14	57	51	16	gG	50	gR	15	UL class T
ACS280-04S-09A8-2	R1	61	19	80	51	25	gG	50	gR	20	UL class T
ACS280-04S-12A2-2	R2	87	27	114	51	32	gG	50	gR	30	UL class T
ACS280-04S-17A5-2	R2	142	48	190	51	32	gG	63	gR	35	UL class T

Drive losses and recommended input protection fuses

1-phase U_N = range 380 to 480 V

Drive type	Frame size	Typical power loss [1]			Max. noise level [*] (dBA)	IEC fuses		IEC fuses		UL fuses	
		Main loss [2] (W)	Control parts [3] (W)	Sum of losses (W)		(A)	Fuse type	(A)	Fuse type	(A)	Fuse type
ACS280-04S-03A3-4	R1	19	19	38	51	10	gG	20	gR	10	UL class T
ACS280-04S-05A6-4	R1	39	19	58	51	16	gG	25	gR	20	UL class T
ACS280-04S-07A2-4	R2	51	20	71	51	20	gG	32	gR	20	UL class T
ACS280-04S-09A4-4	R2	73	26	99	51	25	gG	32	gR	25	UL class T
ACS280-04S-12A6-4	R2	111	40	151	51	32	gG	50	gR	30	UL class T

[*] Drive noise without an enclosure

[1] Typical drive losses when it operates at 90% of the motor nominal frequency and 100% of the drive nominal.

[2] The main loss refers to the heat generated by IGBT and the rectifier bridge when the drive is running under rated full load conditions, which needs to be discharged through the cold plate.

[3] The control part loss refers to the loss caused by the main capacitor, internal power supply and control devices of the drive under the rated full load condition and the full load of the control loop, which is discharged into the air around the drive by the internal stirring fan.

Circuit breakers

The miniature circuit breakers listed below are tested and approved for use with ACS280 drives.
Other circuit breakers can also be used with the drive if they provide the same electrical characteristics.

IEC

Circuit breakers

Drive type	Frame size	ABB miniature circuit breaker Type	kA*)
1-phase U_N = 230 V (range 200 to 240 V)			
ACS280-04S-03A7-1	R1	S 201P-B10NA	5
ACS280-04S-06A9-1	R1	S 201P-B20NA	5
ACS280-04S-09A8-1	R1	S 201P-B32NA	5
ACS280-04S-12A2-1	R2	S 201P-B40NA	5
3-phase U_N = 230 V (range 200 to 240 V)			
ACS280-04S-03A7-2	R1	S 203P-Z 8 NA	5
ACS280-04S-06A9-2	R1	S 203P-Z 16 NA	5
ACS280-04S-09A8-2	R1	S 203P-Z 20 NA	5
ACS280-04S-12A2-2	R2	S 203P-Z 32 NA	5
ACS280-04S-17A5-2	R2	S 203P-Z 32 NA	5
3-phase U_N = 400 V (range 380 to 480 V)			
ACS280-04S-03A3-4	R1	S 203P-B6	5
ACS280-04S-05A6-4	R1	S 203P-B10	5
ACS280-04S-07A2-4	R2	S 203P-B16	5
ACS280-04S-09A4-4	R2	S 203P-B16	5
ACS280-04S-12A6-4	R2	S 203P-B25	5

*) Maximum allowed rated conditional short-circuit current (IEC 61800-5-1) of the electrical power network to use with this type of miniature circuit breaker.

UL

Circuit breakers

Drive type	Frame size	Breaker type (UL) 1)	Minimum enclosure volume 2) 3)	
			dm³	in³
1-phase U_N = 208...240 V				
ACS280-04S-03A7-1	R1	SU202M-C10	15	890
ACS280-04S-06A9-1	R1	SU202M-C20	15.3	890
ACS280-04S-09A8-1	R1	SU202M-C32	15	890
ACS280-04S-12A2-1	R2	SU202M-C32	16	970
3-phase U_N = 208...240 V				
ACS280-04S-03A7-2	R1	SU203M-C10	15	890
ACS280-04S-06A9-2	R1	SU203M-C16	15	890
ACS280-04S-09A8-2	R1	SU203M-C25	15	890
ACS280-04S-12A2-2	R2	SU203M-C32	16	970
ACS280-04S-17A5-2	R2	SU203M-C32	16	970
3-phase U_N = 440...480 V				
ACS280-04S-03A3-4	R1	SU203M-C10	15	890
ACS280-04S-05A6-4	R1	SU203M-C10	15	890
ACS280-04S-07A2-4	R2	SU203M-C16	15	890
ACS280-04S-09A4-4	R2	SU203M-C20	15	890
ACS280-04S-12A6-4	R2	SU203M-C25	16	970

1) Ratings in the tables are maximum for the given circuit breaker frame size. Breakers of the same frame size and interrupting rating with lower current ratings are also allowed.
2) Drives that have an Minimum Enclosure Volume listed must be mounted in an enclosure ≥ Minimum Enclosure Volume specified in this table.
3) When multiple drives that have an Enclosure Minimum Volume specified are installed in the same enclosure, minimum volume of the enclosure is determined by largest Enclosure Minimum Volume ofthe drives to be placed in the enclosure, plus the volume(s) of each additional drive.

Resistor braking

Brake chopper
The brake chopper is standard for the ACS280 R2. It not only controls braking, but also supervises system status and calculated resistor over-temperature. See the tables for internal brake chopper specifications for each drive type. The ACS280 frame R1 does not have a built-in braking chopper, but it can be connected to an external braking unit via DC terminals.

Brake resistor
The brake resistors are separately available for the ACS280. Resistors other than the standard option resistors may be used, provided that the specified resistance value is within the specified limits and that the 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			
		R_{min} (ohm)	R_{max} (ohm)	P_{BRcont} (kW)	P_{BRmax} (kW)
1-phase 230 V					
ACS280-04S-12A2-1	R2	20	47	2.2	3.3
3-phase 230 V					
ACS280-04S-12A2-2	R2	20	47	2.2	3.3
ACS280-04S-17A5-2	R2	16	38	2.2	3.3
3-phase 400 V					
ACS280-04S-07A2-4	R2	53	139	2.2	3
ACS280-04S-09A4-4	R2	53	102	2.2	4.5
ACS280-04S-1260-4	R2	32	76	4	6

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} × 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 ACS280 hardware manual for the selection guidelines.

ACS280 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. Yet, 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.

Safety products
ABB safety products are 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.

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 easy usability, providing all the relevant information from production plants and machines at a single touch.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Our service expertise, your advantage

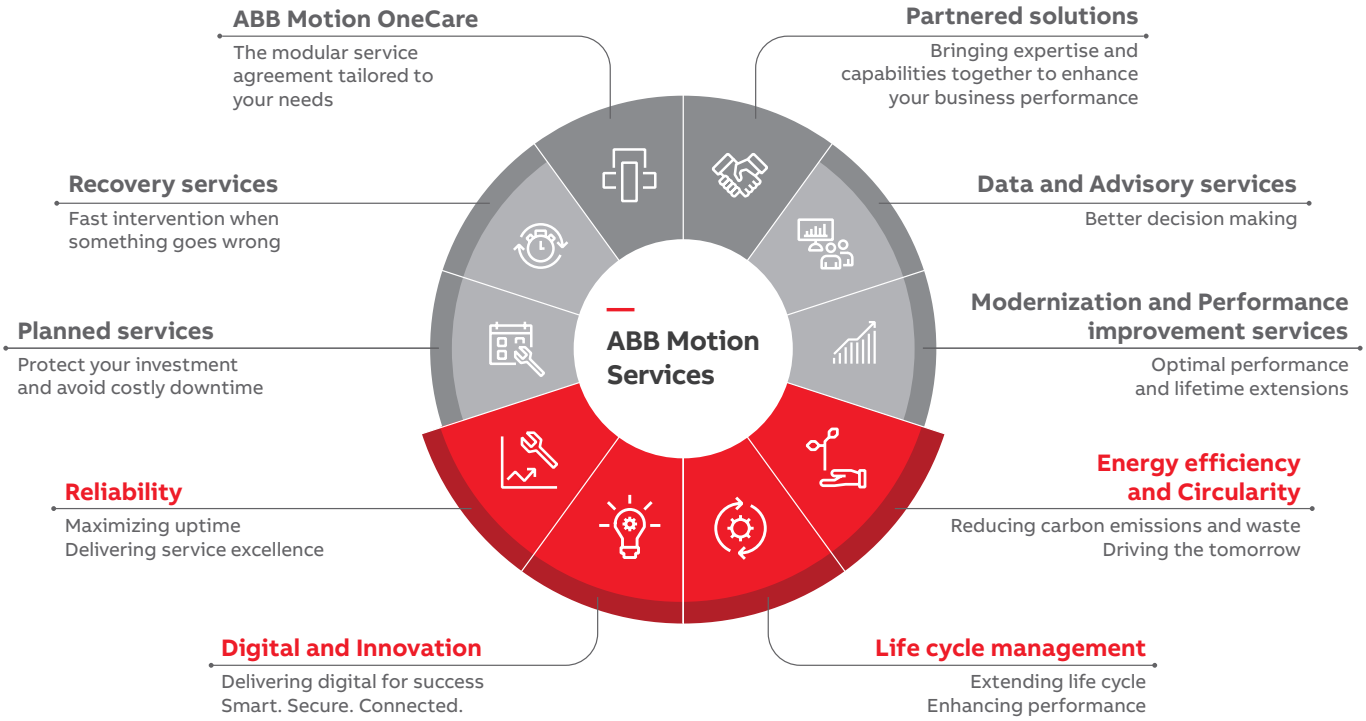
ABB Motion Services helps customers around the globe by maximizing uptime, extending product life cycle, and enhancing the performance and energy efficiency of electrical motion solutions. We enable innovation and success through digitalization by securely connecting and monitoring our customers' motors and drives, increasing operational uptime, and improving efficiency. We make the difference for our customers and partners every day by keeping their operations running profitably, safely and reliably.

With a service offering tailored to your needs, ABB Motion Services maximizes the uptime and extends the life cycle of your electrical motion solutions, while optimizing their performance and maximizing your energy efficiency gains throughout the entire lifetime of your applications. We help to keep your applications turning profitably, safely and reliably.

Digitalization enables new smart and secured ways to prevent unexpected downtime while optimizing the operation and maintenance of your assets. We securely connect and monitor your motors, drives or your entire powertrain via our easy-to-use cloud service solutions. Connecting your applications also gives you access to our in-depth service domain expertise.

We quickly respond to your service needs. Together with our partners, local field service experts, and service workshop networks, we provide and install original spare parts to help resolve any issues and minimize the impact of unexpected disruptions.

Our tailored to your needs service offerings and digital solutions will enable you to unlock new possibilities. Not only are we your premier supplier of motion equipment, we are your trusted partner and advisor offering support throughout the entire life cycle of your assets. We ensure your operations run profitably, safely and reliably and continue to drive real world results, now and in the future. Our service teams work with you, delivering the expertise needed to keep your world turning while saving energy every day.



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.

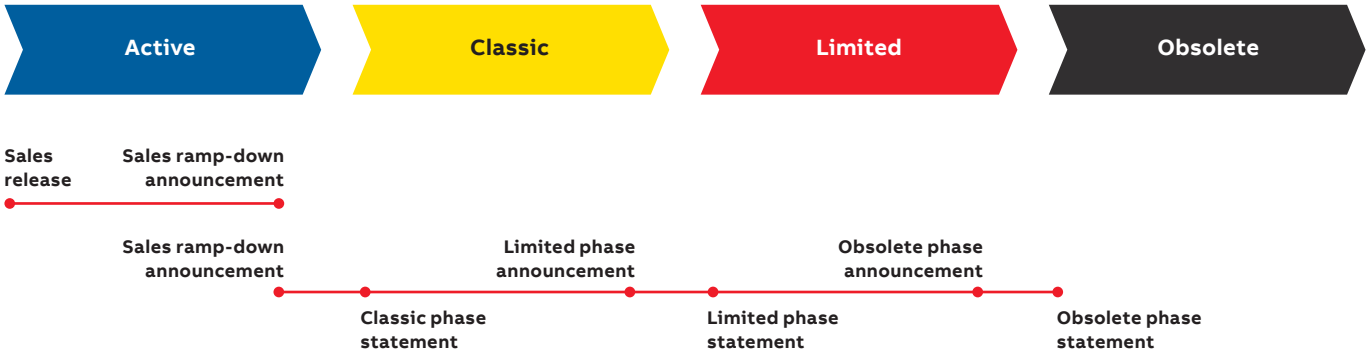
Now it's easy for you to see the exact service and maintenance available for your drives.

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

Keeping you informed 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.

Additional information
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