



ABB drives

Product guide

Power and productivity
for a better world™



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Profile

ABB has designed an extensive portfolio of variable speed drives that are available through ABB's sales offices and technical partners around the world.

To meet the varying requirements of its customers, ABB offers a wide range of drives that meet the specific demands of pump, fan, conveyor and compressor applications as well as machinery and marine applications.

This product guide gives an overview of ABB's portfolio of AC and DC drives.

Benefits of using ABB drives

Being able to vary the speed and torque of an electric motor, and in turn the driven load by using an ABB drive, brings benefits including:

Substantial energy savings – Rather than have an electric motor running continuously at full speed, an adjustable speed drive allows the user to slow down or speed up the motor depending on the demand.

Optimal process control – An adjustable speed drive enables a process to achieve the right speed and torque while maintaining its accuracy. All of which can contribute to a more consistent quality and throughput of the end product.

Reduced need for maintenance – Being able to vary the speed and torque of an electric motor means there is less wear and tear on the motor and the driven machine. For example, the ability to bring a process up to speed slowly prevents the sudden shock loading that can damage a motor and the driven machine over time.

Efficient system upgrade – An adjustable speed drive allows the removal of valves, gears and belts. It also ensures network dimensioning based on a lower starting current.

ABB - global market and technology leader in AC and DC drives

ABB (www.abb.com) is a leader in power and automation technologies that enable utility and industry customers to improve their performance while lowering environmental impact. ABB is the world's largest drives manufacturer. The ABB Group of companies operates in around 100 countries and employs more than 124,000 people.

All ABB drives have the following common features:

Easy to select – A drive can be easily selected using the ABB drives selection table on pages 6 and 7. Selection can be as simple as choosing the current rating, voltage and power through to detailed dimensioning and the addition of various options.

Easy to purchase – ABB drives are available from ABB and selected ABB partners. Visit www.abb.us/drives to find your local sales contact.

Easy to install and commission – The drives are simple to install and commission. ABB has developed the most advanced control panels in the world. The panels feature plain-language instructions which can be accessed via very simple soft buttons. This combination, together with a series of Help menus, provides quick and effective access to all parameters needed to make the drive operational.

Easy to use – The drives are very easy to use. The advanced control panel allows instant adjustments to speed or other application parameters. PC tools extend the offering.

Electric motors consume about 65% of all electricity used throughout industry. Yet, less than 10% of those motors are fitted with an adjustable speed drive. Imagine the energy savings if more motors were controlled by an adjustable speed drive.



ABB drives

ABB low voltage AC drives

ABB's low voltage AC drives product range, from 0.25 to 7500 hp, is the widest available from any manufacturer. ABB drives are the global benchmark that signifies reliability, simplicity, flexibility and ingenuity throughout the entire life cycle of the drive.

Understanding how a process uses energy is essential in determining where additional energy savings can be made. To help, several ABB drives feature energy use calculators that provide energy consumption data. This information can be used to further analyze and tune a process for even greater energy savings.

The drives portfolio is supported by a selection of PC tools, fieldbus, and communication options.

ABB machinery drives

ABB offers machinery builders an AC drives portfolio featuring ABB component drives, ABB general machinery drives, and for high precision applications, ABB high performance machinery drives. Designed for use in very simple machines such as treadmills, to complex high speed flying shear machinery, the drives are designed for integration into machines.

ABB standard drives

The ABB standard drives portfolio controls applications such as pumps and fans, in diverse industries from building services, through to process industries, such as food & beverage. All the options needed for a particular application are built-in to the drive, reducing the need for external options or additional installation space.

ABB also provides a wide variety of packaged drive solutions for industrial applications. Pre-engineered packages make it easy to utilize ABB drives to meet specific requirements. In addition, industry, application, and customer-specific drive packages can be offered as solutions - tailored to the specific needs of the customers.

ABB industrial drives

The ABB industrial drive portfolio is designed for heavy industrial applications such as those found in pulp and paper, metals, mining, cement, power, chemical, oil and gas, water and wastewater, and food and beverage. ABB industrial drives are available as wall mounted drives, modules for cabinet assembly, or as complete cabinet-built drives.

Drives adapted and approved for use in the marine environment are also included within this portfolio.

ABB industrial drives have a wide selection of built-in options and are easily programmed to fit the needs of the application.

ABB DC drives

ABB's DC drive portfolio, from 10 to 3000 hp, provides the highest power-to-size ratio in the market. The drives are designed for most industries including metals, cement, mining, pulp and paper, printing, food and beverage, wire manufacturing, test rigs, ski lift and cranes. ABB DC drives are available as complete cabinets, modules for cabinet assembly, and as retrofit kits. With built-in field exciters and integrated PLC's, they are the best DC drives choice for all new and retrofit applications.

Additionally, the drives are used in non-motor applications such as DC chargers and electromagnetic applications.

The DC drives feature auto-tuning capabilities. Intuitive user software minimizes start-up time and improves daily operation. This helps increase process productivity and improve production quality.



ABB machinery drives

ACS55

Power range 0.25 to 0.5 hp (1-phase, 100 to 120 V)
 Power range 0.25 to 3 hp (1-phase, 200 to 240 V)

ACS150

Power range 0.5 to 3 hp (1-phase/3-phase, 200 to 240 V)
 Power range 0.5 to 5 hp (3-phase, 380 to 480 V)

ACS355

Power range 0.5 to 3 hp (1-phase, 200 to 240 V)
 Power range 0.5 to 15 hp (3-phase, 200 to 240 V)
 Power range 0.5 to 30 hp (3-phase, 380 to 480 V)

ACSM1

Power range 0.5 to 30 hp (3-phase, 200 to 240 V)
 Power range 1.0 to 200 hp (3-phase, 380 to 480 V)

ABB industrial drives

ACS800, drive modules

Power range 0.75 to 3800 hp (230 to 690 V)

ACS850

Power range 0.5 to 750 hp (230 to 500 V)

ACS800, single drives

Power range 0.7 to 7400 hp (230 to 690 V)

ACS800, multidrives

Power range 1.5 to 7400 hp (380 to 690 V)

ABB standard drives

ACS310

Power range 0.5 to 3 hp (1-phase, 200 to 240V)
 - Available November 2010.

Power range 0.5 to 15 hp (3-phase, 200 to 240 V)
 Power range 0.5 to 30 hp (3-phase, 380 to 480 V)

ACS550-U1

Power range 1 to 100 hp (3-phase, 200 to 240 V)
 Power range 1 to 550 hp (3-phase, 380 to 480 V)

ACS550 packaged drives

Power range 1 to 550 hp (3-phase, 208 to 600V)

ABB DC drives

Power range 9 to 18000 kW, 6-pulse or 12-pulse systems

DCS800-S series, drive modules

230 to 1000 V AC, 20 to 5200 A

DCS800-A series, single drives, multidrives

230 to 1200 V AC, 20 to 20000 A

DCS800-EP, panel drives

230 to 460 V AC, 20 to 480 A

DCS800-R, rebuild and upgrade kits

ABB drive feature comparison



AC drives family	ABB machinery drives				ABB standard drives	
Type	ACS55	ACS150	ACS355	ACSM1	ACS310	ACS550
Voltage and power range	1-phase, 100 to 120 V: 0.25 to 0.5 hp (0.18 to 0.37 kW) 3-phase, 200 to 240 V: 0.25 to 3 hp (0.18 to 2.2 kW)	1-phase, 200 to 240 V: 0.5 to 3 hp (0.37 to 2.2 kW) 3-phase, 200 to 240 V: 0.5 to 3 hp (0.37 to 2.2 kW) 3-phase, 380 to 480 V: 0.5 to 5 hp (0.37 to 4 kW)	1-phase, 200 to 240 V: 0.5 to 3 hp (0.37 to 2.2 kW) 3-phase, 200 to 240 V: 0.5 to 15 hp (0.37 to 11 kW) 3-phase, 380 to 480 V: 0.5 to 30 hp (0.37 to 22 kW)	3-phase, 200 to 240 V 0.5 to 30 hp (0.37 to 22 kW) 3-phase, 380 to 480 V 1.0 to 200 hp (0.75 to 160 kW)	1-phase, 200 to 240 V: 0.5 to 3 hp (0.37 to 2.2 kW) 3-phase, 200 to 240 V: 0.5 to 15 hp, 0.37 to 11 kW 3-phase, 380 to 480 V: 0.5 to 30 hp, 0.37 to 22 kW	3-phase 200 to 240 V: 1 to 100 hp (0.75 to 75 kW) 3-phase, 380 to 480 V: 1.5 to 550 hp (1.1 to 355 kW) 3-phase, 500 to 600 V: 1.5 to 150 hp (1.1 to 110 kW)
Enclosure class	UL open/ IP20 (standard)	UL open/ IP20 (standard) UL type 1/ NEMA 1 (option)	UL Open/ IP20 UL type 1/ NEMA 1 (option) UL type 4X/ IP66/ NEMA 4x (product variant)	UL Open / IP20 (Standard)	UL open/ IP20 (standard) UL type 1/ NEMA 1 (option)	UL type 1/ NEMA 1 (standard) UL type 12/ NEMA 12 (option)
Motor control	Open loop speed control	Open loop speed control	Open / Closed loop speed and torque control, as well as permanent magnet motor control	Enhanced Direct Torque Control (DTC), Position and Synchronization, CAM, Winder, Elevator Lift, Flying Shear/Saw/Rotary Knife, Permanent Magnet motor control	Open loop speed control	Open / Closed loop speed and torque control
Supply options	N/A	N/A	N/A	6-pulse diode IEEE-519 Regen LCL Filter Very Low Harmonic Module / Regen Supply Module	N/A	6-pulse diode standard
Input and output connections Analog input (AI) Digital input (DI) Analog output (AO) Digital output (DO) Relay I/O (R I/O)	1 AI 3 DI 1 AO 1 DO 1 RO	1 AI 5 DI 1 AO 1 DO 1 RO	2 AI 5 DI 1 AO 1 DO 1 RO (+3 with option)	2 AI (+ 3 with option) 6 DI (+ 4 with option) 2 AO (+ 1 with option) 3 DO (+ 4 with option) 1 RO (+ 2 with option) 3 DI/O (+ 4 with option)	2 AI 5 DI 1 AO 1 DO 1 RO (+3 with option)	2 AI 6 DI 2 AO 3 RO
Fieldbuses	N/A	N/A	DeviceNet (option) PROFIBUS DP (option) CANopen (option) EtherNet/IP (option) Modbus TCP (option) Modbus-RTU RS-485 (option) Modbus-RTU RS-232 (standard)	DeviceNet (option) PROFIBUS DP (option) CANopen (option) EtherNet/IP (pending) Modbus TCP (pending) Modbus RTU (option) EtherCAT (pending) SERCOS II (pending) PROFINET IO (pending)	Modbus (standard)	DeviceNet (option) PROFIBUS DP (option) CANopen (option) ControlNet (option) EtherNet/IP (option) EtherCAT® (option) Modbus TCP (option) PROFINET IO (option) Modbus (standard)
Output ratings Output frequency Overload capacity Torque regulation Speed regulation	0 to 130 Hz 50% overload is allowed for 1 minute every 5 minutes	0 to 500 Hz 50% overload is allowed for 1 minute every 5 minutes	0 to 600 Hz 50% overload is allowed for 1 minute every 5 minutes	0 to 500 Hz Overload capacity - contact ABB	0 to 500 Hz Continuous output current at max ambient temperature of +50 °C, 10% overloadability for 1 minute every ten minutes.	0 to 500 Hz 1.5 x I _{2nd} (1 min / 10 min)
Safety options Emergency stop Safe torque-off	N/A	N/A	Safe torque-off	Safe torque-off (STO) - internal (SS1, SS2, SBC, SLS, SSM, SDI, SOS, SLR, SLI, SSR, SLA, SAR, SLT, STR, SMT, SMA - external)	N/A	N/A
Approvals	UL cUL CE C-Tick GOST R	UL cUL CE C-Tick GOST R	UL cUL CE C-Tick GOST R NSF – UL Type 4X (IP66)	UL, cUL, CE, CSA, C-Tick, GOST R CSA B44.1/ASME A17.5 Elevator	UL cUL CE C-Tick GOST R	UL cUL CE C-Tick GOST R Seismic
Drive tools	Drive Config kit	FlashDrop tool/DrivePM	DriveWindow Light (Ver. 2.8 or later) FlashDrop tool/DrivePM (Ver. 2 or later)	DriveStudio, DriveSPC, DriveSPC PRO, DriveSize, MC Size, DriveCAM	DriveWindow Light (Ver. 2.9 or later) FlashDrop tool/DrivePM (Ver. 2 or later)	DriveWindow Light FlashDrop tool/DrivePM DriveBrowser
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ABB industrial drives						
ACS850	ACS800, single drive modules	ACS800, single drives	ACS800, liquid-cooled, single drives	ACS800, multidrives	ACS800, liquid-cooled multidrives	DCS800
3-phase 230 to 480 V: 0.5 to 30 hp (230 V) 1.5 to 750 hp (480 V)	3-phase, 230 to 690 V: 1 to 600 hp (600 V), 1.1 to 560 kW	3-phase, 230 to 690 V: 0.75 to 3000 hp (600 V), 0.55 to 2800 kW	3-phase, 380 to 690 V: 75 to 6000 hp (600 V), 55 to 5600 kW	3-phase, 380 to 690 V: 1 to 6000 hp (600 V), 1.1 to 5600 kW	3-phase, 380 to 690 V: 1 to 6000 hp (600 V), 1.1 to 5600 kW	10 to 4000 hp (7.5 to 3000 kW) 240 to 500, 600, 700 to 800, 1000, 1200 V DC
IP20 (frame A – E) IP00 (frame G)	UL open/ IP20 R2 – R6 (with IP55 power section for flange mounting) UL open/ IP00 R7 – R8	UL type 1/ IP21, IP22 and IP42 UL type 12/ IP54	UL type 1/ IP42 UL type 12/ IP54	UL type 1/ IP21, IP22 and IP42 UL type 12/ IP54	UL type 1/ IP42 UL type 12/ IP54	IP00
ABB's direct torque control (DTC)						Closed loop speed with or without transducer
6-pulse diode	6-pulse diode	6-pulse diode 12-pulse diode Ultra low harmonic Regenerative	6-pulse diode 12-pulse diode Ultra low harmonic Regenerative	6-pulse diode 12-pulse diode Regenerative	6-pulse diode 12-pulse diode 18-pulse diode 24-pulse diode Regenerative	N/A
2 AI 6 DI 2 AO 2 DIO (inputs or outputs) 3 RO	3 AI (+2 with options) 7 DI (+6 DI without options) 2 AO (+2 with options) 3 DO (+2 with options)					4 AI 8 DI 3 AO 7 DO 1 RO
DeviceNet (option) PROFIBUS (option) CANopen (option) Modbus (option) EtherNet/IP (option) Modbus TCP (option) EtherCAT® (option)	DeviceNet (option) PROFIBUS DP (option) CANopen (option) ControlNet (option) EtherNet/IP (option) EtherCAT® (option) Modbus TCP (option) PROFINET IO (option) POWERLINK (option)					DeviceNet (option) PROFIBUS DP (option) CANopen (option) ControlNet (option) EtherNet/IP (option) Modbus TCP (option) Modbus RTU (option)
0 to 500 Hz 150% for 1 min/every 5 min Open: +/- 4% w/ nom torque Closed: +/- 3% w/ nom torque Open: 10% of motors slip Closed: 0.01% of nom speed	0 to 300 Hz 50% OL for 1 minute/every 5 minutes Open loop: +/- 4% with nominal torque Closed loop: +/- 1% with nominal torque Open loop: 10% of motor slip Closed loop: 0.01% of nominal speed					N/A 150% for 1 min/every 15 min +/- 0.1% .1% nom speed w/ tachometer .005% nom speed w/ encoder
Emergency stop Safe torque-off	Emergency stop Prevention of unexpected start-up					Emergency stop
UL cUL CSA (pending) C-Tick (pending) GOST R	UL cUL CSA C-Tick GOST R Marine					UL* cUL* CSA* C-Tick CE *600 V and below
DriveStudio DriveSPC Drive Size	DriveWindow DriveAP DriveWindow Light DriveBrowser					DriveWindow DriveWindow Light DriveSize
8	8					9

ABB low voltage AC drives

ABB machinery drives

ABB component drives

ABB component drives are designed to be incorporated into a wide variety of simple machines such as automatic gates, exercise machines, whirlpools and pizza ovens. These drives are widely available and easy to purchase through the ABB distribution network.

There are two series in the ABB component drive family: ACS55 and ACS150.

The ACS55 is the simplest drive, programmed by switches. Extended programming is provided by the DriveConfig kit PC tool. DriveConfig kit enables drive programming without a power connection to the drive. The drive works with single phase power and is suitable for domestic environments as standard.



Series ACS55

- Power range 0.25 to 0.5 hp (1-phase 100 to 120 V)
- Power range 0.25 to 3 hp (1-phase 200 to 240 V)
- IP20 enclosure (UL open)
- For basic machinery applications
- Scalar control
- Suitable for domestic networks as standard
- Parameter setting by switches or by PC software
- Built-in EMC filter for 1st environment
- Options
 - DriveConfig kit PC tool, potentiometer

For further information, see catalog "ACS55 Technical catalog", code: ACS55-PHTC01U-EN

The ACS150 extends the capability of the ACS55 by adding an extended power range and programmability. The ACS150 includes more advanced functions such as PID control and built-in brake chopper. To retain the simplicity of an ABB component drive, the ACS150 has a fixed keypad and speed control potentiometer. The drive is available for both single and three phase supply.



Series ACS150

- Power range 0.5 to 3 hp (1-phase/ 3-phase 200 to 240 V)
- Power range 0.5 to 5 hp (3-phase 380 to 480 V)
- IP20 enclosure, optional NEMA 1 kit
- For basic machinery applications
- Scalar control
- Integrated user interface and potentiometer
- Built-in brake chopper
- Built-in EMC filter for 2nd environment
- Options
 - FlashDrop tool for unpowered drive configuration in 2 seconds

For further information, see catalog "ACS150 Technical catalog", code: ACS150-PHTC01U-EN

ABB low voltage AC drives

ABB machinery drives

ABB general machinery drives

The ABB general machinery drives are designed to be the fastest drives to install, parameter-set and commission. They are highly compact and cost effective. Equipped with cutting-edge intelligence and safety capability, the drives are designed specifically to meet the production and performance needs of machine builders, system integrators, and panel builders, as well as the requirements of end users in a broad range of applications.



Series ACS355

- Power range 0.5 to 3 hp (1-phase 200 to 240 V), 0.5 to 15 hp (3-phase 200 to 240 V)
- Power range 0.5 to 30 hp (3-phase 380 to 480 V)
- IP20 enclosure, optional NEMA 1 kit
- IP66, IP67 or IP69K as optional variant up to 10 hp
- Controls permanent magnet and induction motors
- Sensorless vector control
- Advanced functionality with sequence programming
- Built-in brake chopper and EMC filter for 2nd environment
- Integrated safe torque-off (STO) as standard
- Options
 - Basic and assistant control panels
 - Potentiometer, plug-in fieldbus adapters, encoder interface, and relay output extension module
 - FlashDrop tool for unpowered drive configuration in 2 seconds

For further information, see catalog "ACS550 Technical catalog", code: ACS550-PHTC01U-EN

ABB high performance machinery drives

ABB high performance machinery drives provide excellent speed, torque and motion control for demanding machines. They control induction, synchronous and asynchronous servo and high torque motors with various feedback devices. The drive's small size gives options to install it within existing designs, without modifications to the machine. A variety of programming tools means that the drive can be configured for virtually any application. With a detachable memory unit the drive can be configured as near to its point of commissioning as is practical. The drive offers different options for master communication as it supports PROFIBUS DP, Modbus RTU, CANopen, DeviceNet, Modbus/TCP, EtherNet/IP, PROFINET IO, EtherCAT and SERCOS II.



Series ACSM1

- Power range 1 to 200 hp (3-phase 380 to 480 V), 0.5 to 30 hp (3-phase 200 to 240V)
- IP20 enclosure for cabinet installation (UL open)
- Suitable for single drive and multidrive configurations
- For a wide range of demanding applications
- Speed, torque and motion control
- Controls synchronous and induction motors
- Integrated safe torque-off (STO) as standard
- Removable memory unit for easy drive parameter management
- Options
 - CAM, Winder, Elevator, Flying Shear control programs
 - Keypad Control Panel and door mounting kit
 - Encoder/Resolver feedback, communication with master, and I/O extension
 - Mains Chokes, Filters, Braking resistors
 - Mounting and Cooling Options include: Air Cooled, Cold Plate, Flange, Liquid Cooled, Side-by-Side, Horizontal, DIN Rail
 - IEEE 519 Regen LCL filter module / Regen supply module
 - IEC 61131 Function block programming
 - DriveStudio/SPC/SPC PRO Software

For further information, see catalog "ABB high performance machinery drives, ACSM1, 0.75 to 160 kW", code: 3AFE68675073 EN

"ABB high performance machinery drives for lifts, ACSM1, 0.75 to 110 kW", code: 3AUA0000075727 EN

ABB low voltage AC drives

ABB standard drives

ABB standard drives

ABB standard drives are designed to control a wide range of applications such as pumps, fans, conveyors and mixers, as well as for process control in industries including material handling, food and beverage, chemical, rubber and plastics, textile and printing. The drives are designed for easy selection, installation, commissioning and operation. The drives include a wide variety of built-in features which help reduce installation space and cabling. These drives are widely available and easy to purchase through the ABB distribution network.

There are two series in the ABB standard drive family: ACS310 and ACS550

The ACS310 is designed for pump and fan applications, such as booster pumps and process ventilation, having a wide range



Series ACS310

- Power range 0.5 to 30 hp (3-phase 200 to 240 V, 380 to 480 V)
- Power range 0.5 to 3.0 hp (1-phase 200 to 240 V) - Available Q4 2010
- IP20 enclosure, optional NEMA 1 kit
- Built-in pump and fan features such as multi-pump control, pipe clean and fill functions, and pump protection
- Embedded Modbus EIA-485
- Options
 - Basic and assistant control panels
 - Relay output extension module
 - FlashDrop tool for unpowered drive configuration in 2 seconds

For further information, see catalog "ACS310 Technical catalog", code: ACS310-PHTC01U-EN

of built-in functionality. Features such as pump and fan control (PFC), PID control with booster functionality and pump protection functions help optimize pump or fan flow, cut maintenance costs and save energy. Drive's compact dimensions and unified height and depth facilitate cabinet installations.

The ACS550 extends the capability of ACS310 with a wide power range and is targeted for a broad range of industries and variable and constant torque applications; from pumps and fans to conveyors and mixers. Built-in features including EMC filter for 1st environment, vector control and swinging choke enhance drive performance and help reduce needed installation space.



Series ACS550-U1

- Power range 1 to 550 hp (3-phase 208 to 240 V, 380 to 480 V)
- Wall-mounted drives, IP21 as standard (UL type 1), IP54 as option (UL type 12 in frame sizes R1-R6)
- Vector control
- Built-in EMC filter and Modbus fieldbus interface
- Swinging choke for superior harmonic reduction
- Options
 - Advanced control panel
 - Plug-in fieldbus adapters, panel mounting kits, relay output extension module
 - Brake units and choppers
 - FlashDrop tool for unpowered drive configuration in 2 seconds

For further information, see catalog "ACS550 Technical catalog", code: ACS550-PHTC01U-EN

ABB low voltage AC drives ABB standard drives



Series ACS550 packaged drives

- Power range 1 to 550 hp (3-phase 208 to 600 V)
- Disconnect and input protection
- Drive with circuit breaker disconnect
- Drive with disconnect switch and drive fuses
- Bypass
- Drive with bypass and circuit breaker disconnect
- Environmental enclosures
- NEMA 1, 12, 3R and 115V control

For further information, see catalog "ACS550 Technical catalog", code: ACS550-PHTC01U-EN

ABB low voltage AC drives

ABB industrial drives

ABB industrial drives

ABB industrial drives are highly flexible AC drives that can be customized to meet the precise needs of industrial applications. The drives cover a wide range of powers and voltages, including voltages up to 690 V. ABB industrial drives can be built-in a number of differing formats: wall-mounted, free standing, cabinet, industrial kits, multidrives or liquid-cooled.



ABB single drives

ABB single drives are complete AC drives, which can be installed without any additional cabinet or enclosure. A single drive configuration contains a rectifier, optional EMC filter, reactor, DC link choke and an inverter in one single AC drive unit. Single drives are available as wall-mounted, free-standing and cabinet-built constructions. The degree of protection is at least IP21, and higher protection classes are available as an option. The key features of these drives are programmability and configurability during both ordering and commissioning, which makes adaptation to different applications easy.



Series ACS800-U1

- Power range 1 to 200 hp (230 to 690 V)
- 6-pulse wall-mounted drives, IP21 as standard (UL type 1), IP55 as option (UL type 12)
- Built-in harmonic filtering choke
- High performance and overload capacity for all applications
 - Reliable and full-featured drive
 - Start-up assistant
- Built-in options
 - I/O extension modules
 - Fieldbus adapter modules
 - Pulse encoder and fiber optic link module
 - EMC filter, braking chopper
- Marine type approved design

For further information, see catalog “ACS800 Technical catalog (Single drives)”, code: ACS800-PHTC01U-EN

Series ACS800-U11, regenerative drives

- Power range 7.5 to 125 hp (230 to 690 V)
- Regenerative wall-mounted drives, IP21 as standard (UL type 1)
- Built-in active rectifier and LCL filter for distortionless regenerative operation
- Advanced regenerative drive in one package
 - Complete full-performance drive
 - Built-in application know-how in software solutions
 - Start-up assistant
- Built-in options
 - I/O extension modules
 - Fieldbus adapter modules
 - Pulse encoder and fiber optic link module
 - EMC filter

For further information, see catalog “ACS800 Technical catalog (Single drives)”, code: ACS800-PHTC01U-EN

ABB low voltage AC drives

ABB industrial drives



Series ACS800-U31, ultra low harmonic drives

- Power range 7.5 to 125 hp (230 to 690 V)
- Wall-mounted ultra low harmonic drives, IP21 as standard (UL type 1)
- Complete drive package
- Total current distortion less than 5%
- Power factor as unity
- Premium technology - double DTC
- Easy start-up
 - Plug and play
 - Start-up assistance
- Built-in options according to ACS800 series

For further information, see catalog "ACS800 Technical catalog (Single drives)", code: ACS800-PHTC01U-EN

Series ACS800-U2

- Power range 125 to 600 hp (230 to 690 V)
- 6-pulse free standing drives, IP21 as standard (UL type 1)
- Ultra compact drive
 - Everything inside
 - Two mounting directions
 - Narrow design
- Enclosure extension (option)
 - For options such as contactor and motor thermal protection
 - Fuse switch as standard

For further information, see catalog "ACS800 Technical catalog (Single drives)", code: ACS800-PHTC01U-EN

ABB low voltage AC drives

ABB industrial drives

ABB single drives

ABB cabinet-built single drives are drives that are mounted into a cabinet and the complete assembly is sold and delivered as one package. Often the cabinet will include additional accessories such as contactors, earth fault protection units, etc. These components are included when the term cabinet drive is used. Cabinet drives are typically made-to-order products.



Cabinet-built drives

Series ACS800-U7/07

- Power range 60 to 3000 hp (380 to 690 V)
- IP21 as standard, IP22, IP42 (UL type 1), IP54 and IP54R as option (UL type 12)
- 6/12-pulse cabinet-built drives
- Rugged drive for demanding applications
 - Reliable and easy-to-use
 - Wide range of powers and voltages
 - Compact and modular design
- Customized solutions
 - Pre-configured or order-based solutions by application engineering
 - Industry-specific hardware and software solutions

For further information, see catalog "ACS800 Technical catalog (Single drives)", code: ACS800-PHTC01U-EN

Series ACS800-07LC, liquid-cooled single drives

- Power range 350 to 6000 hp (380 to 690 V)
- Totally enclosed cabinet, IP42 as standard, IP54 as option
- Liquid-cooled cabinet-built drives for harsh conditions
 - Compact size
 - Totally enclosed cabinet
 - 98% of heat dissipation through coolant, no additional air conditioning needed
- Customized solutions
 - Pre-configured or order-based solutions by application engineering
 - Industry and marine specific hardware and software solutions
 - Marine type approved design
 - Also regenerative ACS800-17LC and ultra low harmonic ACS800-37LC variants available

For further information, see catalog "ACS800 Technical catalog (Single drives)", code: ACS800-PHTC01U-EN

ABB low voltage AC drives

ABB industrial drives



Series ACS800-17, regenerative drives

- Power range 60 to 2600 hp (380 to 690 V)
- IP21 as standard, IP22, IP42 (UL type 1), IP54 and IP54R as option (UL type 12)
- Advanced regenerative drive in one package
 - Complete full-performance drive
 - Premium technology - double DTC
 - Easy start-up
- Customized solutions
 - Pre-configured or order-based solutions by application engineering
 - Industry and marine specific hardware and software solutions
 - Marine type approved design

For further information, see catalog "ACS800 Technical catalog (Single drives)", code: ACS800-PHTC01U-EN



Series ACS800-37, ultra low harmonic drives

- Power range 60 to 2800 hp (380 to 690 V)
- IP21 as standard, IP22, IP42 (UL type 1), IP54 and IP54R as option (UL type 12)
- Cabinet-built ultra low harmonic drives
- Ultra-compact
- Minimal network distortion
- Power factor as unity
- Premium technology - double DTC
- Easy start-up
 - Plug and play
 - Start-up assistant
- Customized solutions
 - Pre-configured and order-based solutions by application engineering
 - Marine type approved design

For further information, see catalog "ACS800 Technical catalog (Single drives)", code: ACS800-PHTC01U-EN

ABB low voltage AC drives

ABB industrial drives

ABB multidrives

ABB multidrives are built from ABB industrial drive modules connected to a common DC bus. This enables a single power entry and common braking resources for several drives.

This construction simplifies the total installation and results in many benefits: savings in cabling, reduced installation and maintenance costs, reduced line currents, and more.



Series ACS800, air-cooled multidrives

- Power range 1.5 to 7500 hp (380 to 690 V)
- IP21 as standard, IP22, IP42 (UL type 1), and IP54 as option (UL type 12)
- Common DC busbar
- Single power line connection
- Shared energy and motor-to-motor braking without braking chopper or regenerative supply unit
- Reduced line current
- Common braking resourced to several drives
- Does not require use of separate MCC
- Savings in cabling, installation and maintenance costs

An ABB multidrive is made up of several different units. These sections are called multidrive units and the most important ones are:

- Inverter units, ACS800-107
- Regenerative IGBT supply units, ACS800-207
- Diode supply units, 6- and 12-pulse ACS800-307 and -507
- Regenerative thyristor supply units, 6- and 12-pulse ACS800-407 and -807
- Braking unit, ACS800-607
- Control units as option

Series ACS800, liquid-cooled multidrives

- Power range 1.5 to 7500 hp (380 to 690 V)
- Totally enclosed cabinet, IP42 (UL Type 1) as standard, IP54 (UL Type 12) as option
- Common DC busbar
- Totally enclosed cabinet
- For harsh environments
- Silent operation
- Compact size
- Customized solutions
 - Industry and marine specific hardware and software solutions
 - Marine type approved design

Liquid-cooled multidrive units:

- Inverter units, ACS800-107LC
- Regenerative IGBT supply units, ACS800-207LC
- Diode supply units, 6-pulse ACS800-307LC, 12-pulse ACS800-507LC, 18-pulse ACS800-1107LC and 24-pulse ACS800-1207LC
- Liquid-cooling unit, ACS800-1007LC
- Braking unit, ACS800-607LC

For further information, see the catalog "ABB industrial drives, ACS800, multidrives, 1.5 to 7500 hp", code: 3AFE68248531 EN

ABB low voltage AC drives

ABB industrial drives

ABB single drive modules

ABB single drive modules are designed for fast, cost effective installation and integration into a customer's own cabinet. Modules enable OEMs, system integrators and panel builders to build their own drive while benefitting from ABB drives technology such as DTC system motor control, adaptive programming and a wide range of built-in and external options. ABB provides detailed cabinet installation instructions and other support material to help customers build their own solutions.

The ACS850 units are complete single drive modules that are optimized for this purpose, using minimal cabinet space while ensuring cabinet assembly is as easy as possible. They offer a wide range of built-in options such as different I/O and communications and a wide selection of external accessories. The flexibility and programmability of the modules makes them an ideal choice for many applications in different areas of industry.



Series ACS800-U4 and ACS800-04LC

- Air-cooled power range 0.75 to 2500 kW (230 to 690 V)
- Liquid-cooled power range 260 to 2800 hp (380 to 690 V)
- IP00, IP20
- Optimized design for cabinet assembly
- Compact and modular design allowing wide range of variants
- Easy cabling
- EMC compliant modules available
- Wide range of built-in options
- Marine type approved design

For further information, see catalog "ABB industrial drives, ACS800, drive modules, 0.55 to 2900 kW", code: 3AFE68404592 EN

For further information about the ACS800 marine type approved design, see catalog "ABB drives for marine applications, ACS800-01/-04/-07LC, -17LC, -37LC, 0.55 to 5600 kW", code: 3AFE68326753 EN



Series ACS850

- Power range 0.5 to 750 hp (230 to 500 V)
- IP20 as standard
- Designed for fast, cost effective cabinet installation and integration
- Compact size and side-by-side mounting
- Built-in input chokes above 10 hp for harmonic filtering
- Built-in braking chopper up to 60 hp as standard
- Customization with wide range of options and extensive standard inputs and outputs
- Features for enhanced reliability and durability
- Integrated safe torque-off (STO) as standard
- Removable memory unit for easy drive management

For further information, see catalog "ACS850 Technical catalog (Single drives)", code: ACS850-PHTC01U-EN

ABB low voltage AC drives

ABB industrial drives

ABB multidrive modules

ABB multidrive modules are designed to be installed into cabinets that feature a common DC bus, by OEMs and system integrators. They are available as inverter modules, supply modules and braking choppers and resistors and cover a wide range of applications.

These modules contain all the drive technology and different types of supply units that convert the AC supply from the mains into a DC supply for the inverter modules. ABB provides full engineering support for designing cabinets.



Inverter units ACS800-104 and ACS800-104LC

- Air-cooled power range 2 to 2200 hp (380 to 690 V)
- Liquid-cooled power range 2 to 2800 hp (380 to 690 V)

Diode supply units ACS800-304 (6-pulse), ACS800-704 (6-/12-pulse), ACS800-304LC and ACS800-704LC

- Air-cooled power range 240 to 4700 hp (380 to 690 V)
- Liquid-cooled power range 490 to 6300 hp (380 to 690 V)

IGBT supply units ACS800-204 + LCL filters and ACS800-204LC

- Air-cooled range is from 3 to 2200 hp
- Liquid-cooled power range 270 to 9400 hp (380 to 690 V)
- Provides regenerative capacity plus additional filtering of harmonics in the supply

For further information, see catalog “ABB industrial drives, ACS800, drive modules, 0.75 to 2800 hp”, code: 3AFE68404592 EN

ABB DC drives

ABB offers thyristor-based digital DC drives for a wide variety of applications and in many configurations, including modules, panel drives, and complete drive solutions in cabinets. Both regenerative and non-regenerative drives are available. We also offer rebuild and upgrade kits specifically for retrofits to update the controls on existing DC drives. Power range is from 20 Amp (10 hp) to 5200 Amp (3000 hp) with packaged solutions up to 20,000 Amps.



DC drive converter modules

DCS800-EP panel drive series

- 10 to 300 hp (230/460 V AC)
- Space efficient, multi-level panel
- Pre-wired, pre-tested solution for smooth start-ups
- Greatly simplifies the procurement process
- UL Listed with 65 kA SCCR

For further information, see catalog "DCS800 Technical catalog", code: DCS800-PHTC01U-EN



DCS800-S series

- Compact design, highest power-to-size ratio in its class
- Simple operation
- Integrated field exciter
- Fast installation and commissioning via start-up assistants and macros
- Numerous optional features to adapt the drive to various applications
- Freely programmable by means of integrated IEC 61131-PLC
- 20 to 5200 A DCR
- 0 to 1160 V DC
- 230 to 1000 V AC
- IP00

For further information, see catalog "DCS800 Technical catalog", code: DCS800-PHTC01U-EN

ABB DC drives



Cabinet-built DC drives

DCS800-A - complete drive solutions

- Individually adaptable to customer requirements
- High power solutions in 6- and 12-pulse up to 20000 A, 1500 V
- Individually factory load tested
- Detailed documentation
- 20 to 20000 A DC
- 0 to 1500 V DC
- 230 to 1200 V AC
- IP21, IP54

For further information, see catalog "DCS800 Technical catalog", code: DCS800-PHTC01U-EN



DCS800-R series - rebuilt kit

- Proven long-life components are re-used, such as power stacks, (main) contactors, cabinets and cabling/ busbars, cooling systems
- Features a wide range of high speed serial modules to interface to factory automation systems
- Increased production and quality
- Very cost-effective solution
- Open rebuild kits for nearly all existing DC drives
- Tailor-made solutions for classic or obsolete products

For further information, see catalog "DCS800 Technical catalog", code: DCS800-PHTC01U-EN

Connectivity and software products

ABB's connectivity products enable communication between drives and automation systems as well as enable remote monitoring capabilities. Software tools are used throughout the drive's life cycle from start-up, daily operation, to drive programming and tuning.

There are many advantages for using connectivity products in industrial applications including:

- Reduced site wiring
- Reduced start-up time
- Remote access to drive status and parameter configuration
- Improved quality, productivity, flexibility and scalability



Fieldbuses

ABB drives are connected to automation systems using embedded protocols and fieldbus adapters. All of the major fieldbus protocols are supported allowing flexibility and compatibility with the automation system:

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



Remote monitoring

Remote monitoring allows access to a drive via the local internet through a standard web browser. This enables application and drive diagnostics, monitoring, configuration and even drive control when needed. Remote monitoring tools can be configured to automatically send alarm notifications via SMS messages or email. This capability is very useful when drives are installed in remote or difficult to access locations.

PC tools

ABB drives are supported by a selection of PC tools used for drive selection, commissioning, programming, daily operation and maintenance, monitoring, and process tuning. The PC tools support the drive throughout the drive's life cycle.

Engineering tool

- DriveSize, Motion Control Size

Startup and maintenance tools

- DriveWindow
- DriveWindowLight
- DriveStudio

Programming tools

- DriveSPC (Solution Program Composer)
- DriveSPC PRO
- DriveAP
- DriveCam

Operation tools

- DriveBrowser
- DriveAnalyzer
- DriveOPC

Expertise



ABB has amassed a wealth of expertise on all aspects of drive systems applied to many different applications across most industries. Its dedicated experts talk your language and can offer the quickest route to a profitable solution, without forgetting personnel safety and environmental responsibility.

Leading technology in design and production

For over 100 years, ABB has invested a proportion of its profits in research and development, working closely with the world's leading universities and institutions. The result is numerous technology patents that have benefited the most advanced range of adjustable speed drives in the market. ABB's reputation is enhanced through association with world leading standards authorities and legislative bodies which has contributed to the safety of ABB's products.

Cooperating with its sub-suppliers, ABB can exploit the latest component technology when designing drive products. The result is improved quality at component and complete drive level.

ABB's drive manufacturing facilities use the latest techniques and advanced software. Precision robots combined with fully automated material flow and testing routines guarantee high quality products and short throughput times. Identical manufacturing facilities are located in Finland, Switzerland, the USA, China and India.

Complete technical advice from selection to installation and use

ABB constantly monitors all legislation, regulations, directives and standards, not only ensuring that its products comply but by offering sound advice to customers.

For example, ATEX, the European regulation for equipment used in potentially explosive atmospheres, became mandatory in July 2003. ABB was one of the first companies to gain blanket ATEX certification for its ABB industrial drives and flameproof and non-sparking motors. ABB, therefore, can provide combined ATEX-approved drives and motors packages that do not need further testing on site.

ABB's expertise extends across a plant's entire electrical installations from correct selection, dimensioning and installation through to operation and maintenance of drives, motors, transformers, relays, switches, contactors through to transducers and meters.

Severe plant disruptions caused by harmonic disturbances in electrical equipment can be overcome using ABB harmonic filters. ABB can assess the user's vulnerability to harmonic problems and the need for filters. In water and wastewater treatment plants, reducing inductive reactive power consumption can be achieved using ABB's compensation equipment.

In many applications there is a need to interface the drives with external systems. ABB has the expertise in all high performance communication protocols.

Expertise

Thorough process know-how for improved competitiveness

ABB has a thorough knowledge of all applications from pumps, fans and compressors through to conveyors and mixers. ABB has a formidable team of dedicated industry specialists whose focus is on their chosen industry but who share the knowledge from other sectors to their benefit.

In the 1970s, ABB developed the very first high-power AC drive. In subsequent decades ABB has led a technology revolution, driven by the needs of its customers. ABB is recognized as the world's leading application engineering organization, offering advice throughout process control and focussing on increasing production capacity, improving end product quality, reducing waste and reducing maintenance costs.

Sustainable development for people and the environment

The ISO 14001, international environmental management standard, has been implemented by ABB.

Life cycle assessment (LCA) is applied continually to all product development. All certificates and declarations relating to environmental issues can be found at www.abb.com/drives.

Health and personnel safety is a fundamental part of ABB's commitment to sustainability. ABB cares deeply about how its operations and products affect its employees, customers, contractors and neighbors.

ABB's ultimate aim is to prevent all accidents, injuries and occupational illness through the active participation of its customers, contractors and employees.

Smaller carbon footprint through improved energy efficiency

One of the biggest benefits of controlling the speed of an electric motor according to demand is the energy saving opportunity over other control methods that are used in combination with motors running at fixed speed. For example, in pump and fan applications, using AC drives can cut energy bills typically from 20 to 50 percent, although higher savings are possible.

ABB offers energy appraisals, coupled with a series of energy saving tools. An energy appraisal identifies key applications that can benefit from AC drives and proves the saving through "before" and "after" measurements. ABB AC drives achieve a payback usually within months, based on energy savings alone.

Energy efficient ABB motors and drives can help to minimize life cycle cost (LCC) of pumps, fans and other driven machines and the entire mechanical installation. Optimal speed control by an AC drive not only saves energy, but also reduces the application's maintenance needs.

Services



All industries face a common goal: to maximize their production output at the lowest possible cost, while maintaining the highest quality end products. One of ABB's key objectives is to maximize the uptime of its customers' processes by ensuring optimum lifetime of all ABB products in a predictable, safe and low cost manner.

The services offered for ABB drives span the entire value chain, from the moment a customer makes the first inquiry through to disposal and recycling of the drive. Throughout the value chain, ABB provides training and learning, technical support and contracts. All of this is supported by one of the most extensive global drive sales and service networks.

Maximizing return on investment

At the heart of ABB's services is its drive life cycle management model (see below). All services available for ABB drives are planned according to this model. For customers it is easy to see which services are available at which phase.

Drive specific maintenance schedules are also based on this four-phase model. Thus, a customer knows precisely the timing of the part replacements plus all other maintenance related actions. The model also helps the customer when deciding about upgrades, retrofits and replacements.

Professional management of the drive's life cycle maximizes the return on any investment in ABB drives.

ABB drive life cycle management model

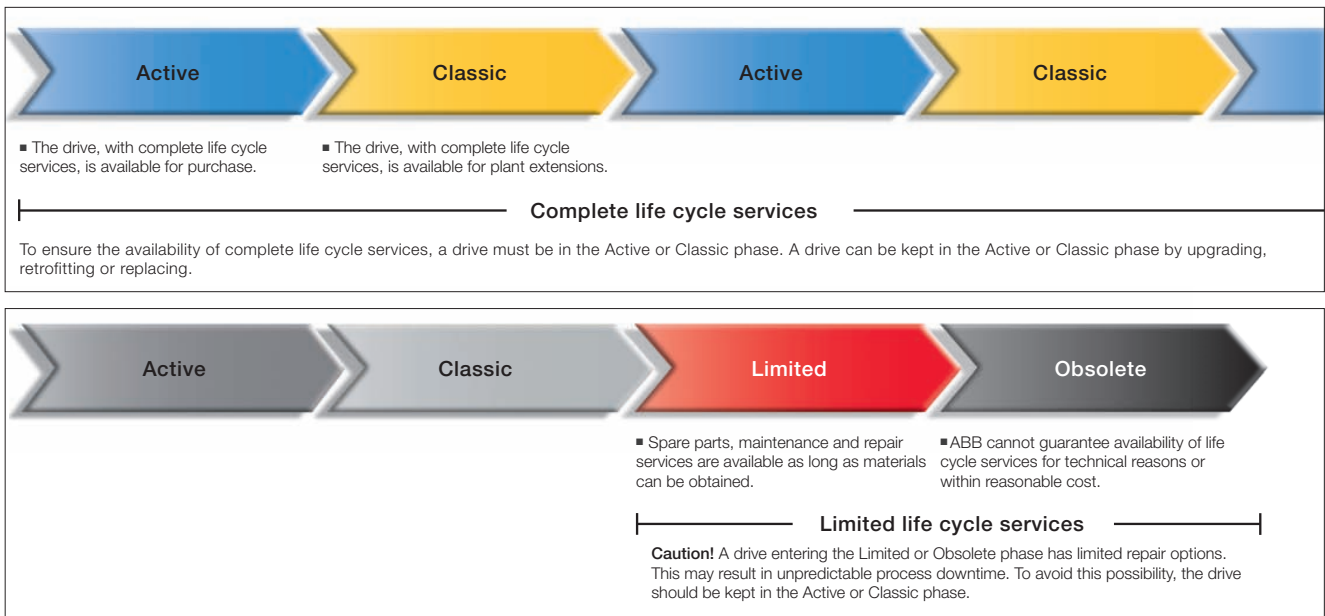


ABB follows a four-phase model for managing drive life cycles, which brings enhanced customer support and improved efficiency.

Examples of life cycle services are: selection and dimensioning, installation and commissioning, preventive and corrective maintenance, remote services, spare part services, training and learning, technical support, upgrade and retrofit, replacement and recycling.

Drive selection guide flowchart

Step	Process	Action
1	Identify the Application	Continue to step 2
2	Gather the load data; system inertia, required accel & decel rates, min and max speed, overload requirements, etc.	Continue to step 3
3	Gather the motor data: rated torque, HP/kW, Volts, insulation class, speed, etc. Whether an existing motor or a new motor is being used, the motor information is critical to choosing a drive.	Continue to step 4
4	Does the motor meet or exceed the application requirements? The data gathered in Step 3 must meet or exceed the data from Step 2. This assures that the motor can produce the torque, speed and power required to do the application	If yes, continue to step 5 If no, replace the existing motor with a new motor and return to step 3
5	Choose a drive. Match the data gathered in Steps 1-3 against the chart of drive features on pages 4-5. Select a drive that meets the motor requirements and has all the software features needed to do the application.	Continue to step 6.
6	Is the drive offered in the correct HP/kW/Amp rating? The drive you choose must be able to supply the necessary current to the motor to produce the torque required. This includes normal and overload conditions	If yes, continue to step 7 If no, go to step 5.
7	Is the drive offered in the correct enclosure and environmental ratings? The drive you choose must be available in an enclosure style that will withstand the application's environment. It also must produce the required current at the application's altitude and ambient temperature	If yes, continue to step 8 If no, go to step 5
8	Does this drive have the features needed to meet the application's demands? The drive you choose must have a feature set that matches the application. It also must have sufficient hardware (I/O, feedback, communications, etc.) to perform the application.	If yes, continue to step 9 If no, go to step 5.
9	Does this drive have the motor control performance to meet the application demands? The drive you choose must be able to produce the needed torque at the necessary speeds. It must also be able to control speed and torque depending on the application requirements.	If yes, continue. If no, go to step 5.

Congratulations!

The ABB drive you have chosen has the features and performance needed to have a successful application. As the leading supplier of adjustable speed drives, ABB can help in nearly any drive application.

ABB drives technical guides

ABB has produced a series of technical guides that explain in great detail different aspects of using ABB low voltage drives. The listing below shows the available technical guides and the topics they cover.

Technical guides:

1. **Direct torque control (DTC)** explains what DTC is; why and how it has evolved; the basic theory behind its success; and the features and benefits of this motor control platform.
Code: 3AFE58056685 EN

2. **EU Council Directives and adjustable speed electrical power drive systems** gives a straightforward explanation of how the various EU Council Directives relate to power drive systems.
Code: 3AFE61253980 EN

3. **EMC compliant installation and configuration for a power drive system** helps personnel using AC drives in their designs or installations to better understand the requirements of the EMC directive.
Code: 3AFE61348280 EN

4. **Guide to variable speed drives** describes basics of different variable speed drives (VSD) and how they are used in industrial processes.
Code: 3AFE61389211 EN

5. **Bearing currents in modern AC drive systems** explains how to avoid damages.
Code: 3AFE64230247 EN

6. **Guide to harmonics with AC drives** describes harmonic distortion, its sources and effect, and also distortion calculation and evaluation with special attention to the methods for reducing harmonics with AC drives.
Code: 3AFE64292714 EN

7. **Dimensioning of a drive system.** Correct dimensioning is the most effective way to control capital expenditure. Biggest savings can be achieved by avoiding very basic mistakes. Guide provides top tips for those involved with dimensioning drives.
Code: 3AFE64362569 EN

8. **Electrical braking** describes the practical solutions available in reducing stored energy and transferring it back into electrical energy.
Code: 3AFE64362534 EN



9. **Guide to motion control drives** gives an overview of high performance drives and motion control.
Code: 3AFE68695201 EN

10. **Functional safety** introduces the Machinery Directive and the standards that must be taken into account when designing a machine, in order to ensure operational safety. Code: 3AUA0000048753 EN

Contact us

www.abb.us/drives

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