

ABB machinery drives ACS850 0.5 to 700 hp/0.37 to 560 kW

ABB machinery drives are designed to meet the production and performance needs of machine builders, system integrators, panel builders and end users in a broad range of applications. The compact design of the ACS850 low voltage AC drive makes it ideal for cabinet installation. Direct torque control provides highly accurate motor torque and speed control without any encoder feedback. Depending on the challenges of the application, the drive can be programmed in a variety of ways. The drive's integrated safety function helps to enhance the safe operation of the application.



G1 and G2 modules in the picture are equipped with option + H381

Highlights of the ACS850

- Compact size, ideal for cabinets
- Easy access to power terminals in cabinet installations
- DTC (direct torque control) as standard for highly accurate motor torque and speed control
- Wide range of options including fieldbuses and PC tools
- Safe torque off (STO) as standard
- Maintenance and diagnostic assistants
- Removable memory unit

Diverse options provide flexibility

ACS850 drives feature many options, including various speed feedback devices and different fieldbus adapters. Extensive set of standard inputs and outputs provide easy integration into most applications.

Safety as standard

The drive's safety functions comply with European Union Machinery Directive 2006/42/EC. Functional safety is provided by integrated safe torque off (STO), which removes the torque from the motor shaft. Other safety functions such as safe brake control (SBC) and safely limited speed (SLS) are available when combined with external safety components.

Applications

ACS850 drives are suitable for:

- Cranes
- Extruders
- Conveyors
- Winders
- Pumps
- Fans
- Mixers

The drives provide configuration flexibility from simple parameter linking to creating custom function block programs. A crane control program, developed by ABB is also available.

ABB machinery drives

ACS850

Cost efficient cabinet assembly

The ACS850 drive is designed for fast, cost effective installation and integration into cabinets. With the smallest module only 93 mm wide, side-by-side cabinet mounting is straightforward, leading to cabinets with shorter run lengths.

Reduced maintenance

Many features are implemented to enhance the reliability and durability of ACS850 drives:

- Maintenance assistant for preventive maintenance of the drive or its components
- Diagnostic assistant to help locate the cause of any disturbance to the drive and suggest remedies
- Coated boards, within the drive, for increased protection

A removable memory unit stores the complete drive settings, including all user settings and motor data. If the drive needs to be replaced or updated, it can be done quickly without any special tools or knowledge.

Ease of commissioning

ACS850 drives feature several macros which have preset, application-specific parameter settings, enabling fast commissioning. Complementing the preset macros, the drive has an intelligent and intuitive startup assistant with a built-in help function to make parameter setting easy. In addition, there are several advanced functions such as short and long parameter menus, inputs and outputs mapping and changed parameters list. All these features are accessed via the easy-to-use control panel or PC tool.

Precise and reliable control

The performance and functionality of ACS850 drives are based on the motor control platform, direct torque control (DTC). DTC features:

- Dynamic torque and accurate speed control even without feedback
- Support for AC induction and permanent magnet motors as standard
- Good performance using enhanced motor identification at standstill
- Firmware option for ABB synchronous reluctance motors



Examples of various options for the ACS850 including panels, control and communication modules.

Services and support

An extensive global service infrastructure and a strong partner network support the ACS850 drive. Advanced PC tools are available for dimensioning, programming, commissioning and maintenance of the drives. The drives are complemented by extensive documentation and support material.

Energy saving features

ACS850 drives feature an energy optimizer which maximizes the total efficiency of the drive. The built-in kWh calculator records the amount of energy consumed and saved. The drive cooling fans are also monitored and controlled for even greater energy savings.

Mains connection	
Supply voltage	3-phase 380 to 500 V AC +10/-15% 3-phase 200 to 240 V AC ±10%
Frequency	50 to 60 Hz ±5%
DC connection	
DC voltage level	485 to 675 V DC ±10% (-5 types) 270 to 324 V DC ±10% (-2 types)
Charging circuit	Internal in frames A to D External in frames E0 to G2
Motor connection	
Motor types	AC induction motors, permanent magnet motors and synchronous reluctance motors
Output frequency	0 to 500 Hz
Motor control	Direct torque control (DTC) or scalar control
Brake power connection	
Brake chopper	Standard in frames A to D, built-in option in the other frame sizes
Brake resistor	External resistor connected to drive
Operating conditions	
Degree of protection	IP20 according to EN 60529 (G frames IP00); Open type according to UL 508.
EMC	Categories C2 and C3 with optional filter (according to EN 61800-3)
Compliance	Frames A to D: CE, GOST R, UL, cUL, CSA, C-Tick Frames E0 to G: CE, GOST R; pending: UL, cUL, CSA, C-Tick
Standard control interface	
Control voltage supply	Internal or 24 V DC external
PC-tools/control panel	Connection as standard
Memory unit	Standard
Drive to drive link/ embedded Modbus	Galvanic RS-485 as standard
Digital inputs and outputs	6 × DI, 2 × DI/O, 3 × RO
Analog inputs and outputs	2 × AI, 2 × AO
Safe torque off (STO) (EN 61800-5-2)	IEC 61508: SIL 3 IEC 61511: SIL 3 IEC 62061: SILCL 3 EN ISO 13849-1: PL e Certified by TÜV
Option slots	Three slots for analog and digital inputs and outputs, feedback and communication plug-in option modules
Control and communication option modules	
Analog and digital extension modules	
FIO-01	4×DI/O, 2×RO
FIO-11	3×AI (mA/V), 1×AO (mA), 2×DI/O
FIO-21	1×AI (mA/V), 1×AO (mA), 1×DI, 2×RO
Feedback interface modules	
FEN-01	2 inputs (TTL incremental encoder), 1 output
FEN-11	2 inputs (SinCos absolute, TTL incremental encoder), 1 output
FEN-21	2 inputs (resolver, TTL incremental encoder), 1 output
FEN-31	1 input (HTL incremental encoder), 1 output
Fieldbus adapter modules	
FPBA-01	PROFIBUS DP
FCAN-01	CANopen®
FDNA-01	DeviceNet™
FENA-11	EtherNet/IP™, Modbus TCP, PROFINET IO
FSCA-01	Modbus RTU
FECA-01	EtherCAT®
FLO-01	LonWorks®
Remote monitoring module	
SREA-01	Ethernet adapter

Technical data, dimensions and weights

Feature/frame size	A	B	C	D	E0	E	G1	G2
Current and power								
Nominal current	3 to 8 A	10.5 to 18 A	25 to 50 A	61 to 94 A	103 to 144 A	166 to 290 A	387 to 650 A	710 to 875 A
Maximum current	4.4 to 10.5 A	13.5 to 21 A	33 to 66 A	78 to 124 A	138 to 170 A	202 to 348 A	470 to 730 A	850 to 1100 A
Typical motor power in kW (230 V)	0.37 to 1.5 kW	2.2 to 4 kW	5.5 to 11 kW	15 to 22 kW	-	-	-	-
(400 V)	1.1 to 3 kW	4 to 7.5 kW	11 to 22 kW	30 to 45 kW	55 to 75 kW	90 to 160 kW	200 to 355 kW	400 to 500 kW
(500 V)	1.5 to 4 kW	5.5 to 11 kW	15 to 30 kW	37 to 55 kW	55 to 90 kW	110 to 200 kW	250 to 400 kW	500 to 560 kW
Typical motor power in hp (230 V)	0.5 to 2 hp	3 to 5 hp	7.5 to 15 hp	20 to 30 hp	-	-	-	-
(480 V)	1.5 to 5 hp	5 to 10 hp	15 to 30 hp	40 to 60 hp	75 to 100 hp	125 to 200 hp	300 to 550 hp	600 to 700 hp
Brake chopper	●	●	●	●	□	□	□	□
Brake resistor	■	■	■	■	■	■	■	■
Input choke	■	■	●	●	●	●	●	●
EMC filter/C2	■	■	■	■	□	□	-	-
EMC filter/C3	■	■	□	□	□	□	●	●
Mounting and cooling								
Air cooling	●	●	●	●	●	●	●	●
Side-by-side mounting	●	●	●	●	●	●	●	●
DIN rail mounting	●	●	-	-	-	-	-	-
Removable power connectors	●	●	-	-	-	-	-	-
Removable control connectors	●	●	●	●	●	●	●	●

● = standard □ = option, built-in ■ = option, external - = not available

Dimensions

Frame size	Height ¹⁾		Depth ^{2) 3)}		Width		Weight	
	in	mm	in	mm	in	mm	lb	kg
A	14.3	364	7.8	197	3.7	93	7	3
B	15.0	380	10.8	274	4.0	101	11	5
C	22.3	567	10.9	276	6.5	166	35	16
D	22.3	567	10.9	276	8.7	221	51	23
E0	23.7	602	13.9	354	10.9	276	77	35
E	27.6	700	17.4	443	12.3	312	147	67
G1	57.6 (61.4) ⁴⁾	1462 (1560) ⁴⁾	19.9 (20.3) ⁴⁾	505 (515) ⁴⁾	12 (13) ⁴⁾	305 (329) ⁴⁾	355 (421) ⁴⁾	161 (191) ⁴⁾
G2	65.4 (67.3) ⁴⁾	1662 (1710) ⁴⁾	19.9 (20.3) ⁴⁾	505 (515) ⁴⁾	12 (13) ⁴⁾	305 (329) ⁴⁾	439 (505) ⁴⁾	199 (229) ⁴⁾

Notes

All dimensions and weights are without additional options.

¹⁾ Height is the maximum measure without clamping plates.

²⁾ An additional 50 mm (2 in) should be reserved for feedback cabling if FEN-01, -11 or -21 options are used (except for frame G1 and G2 with integrated control unit).

³⁾ Assistant control panel adds 23 mm (0.9 in) to the depth (except for frame G1 and G2 with integrated control unit).

⁴⁾ With +H381 optional cabling panel.

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

www.abb.com/drives

www.abb.com/drivespartners

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Specifications subject to change without notice.