Drives and motors packages

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Drives and motors packages Introduction

ABB is one of the only companies that makes both variable speed drives and low voltage AC motors. As such it is well equipped to offer customers a perfectly designed, tested and approved matched pair, for whatever the motor-driven application.

In addition, ABB has devised a selection of bespoke drives and motors packages aimed at specific industry applications.

ABB has also developed special firmware versions that support the hardware packages. Pre-developed firmware for winches, cranes (including anti-sway), winders, spinning machines and others exist already, reducing development time when designing a complex system.

Packages can extend beyond matching a motor and a drive. Other components, many of which are featured in this catalogue, also form part of the drive train – from bearings, couplings and gearboxes to programmable logic controllers (PLCs), switches and fusegear.





Drives and motors packages Standard motor and VSD package

From 1st January 2017, motors from 0.75 kW to 375 kW, must meet either the IE3 efficiency level (driven direct online) or the IE2 level if fitted with a variable speed drive (VSD), in order to comply with the European Minimum Energy Performance Standard (EU MEPS).

ABB offers a wide range of VSDs, all of which can be fitted to IE2 motors to deliver efficient, reliable and compliant motor control, satisfying regulations.

ABB offers packages for IE3 and IE4 induction motors. The motors are suitable for harsh environments, marine, crane and ATEX applications, as well as many others.

ABB machinery drive ACS355

- 0.37 kW to 22 kW

3

- FlashDrop parameter programming with drive still in its box
- Sequence programming designed for food and beverage and materials handling applications
- ACS880-M04 and ACS380 machinery drives also available



See details on page 35

ABB industrial drive ACS880

- Intuitive control panel and PC tool
- Direct torque control (DTC) for precise openand closed-loop control
- Built-in safety features for simplified configuration
- Communication with all major automation networks

- ABB general purpose drives ACS310
- 0.37 kW to 22 kW
- Pump and soft pump and fan control (PFC and SPFC)
- Pipe cleaning (anti-jam) and pipe fill functions



See details on page 39



See details on page 43

- Removable memory unit for easy drive commissioning and replacement
- Energy optimiser and energy efficiency information for monitoring and saving energy

See details on page 47

ABB drive for HVAC

- 0.75 kW to 250 kW

- Dedicated to HVAC

trouble-free use, easy

- Rapid start-up,

- Built-in BACnet

interfacing

ACH580

ACS580

- 0.55 kW to 500 kW
- Wide power range in wallmounted IP21 and IP55 variants
- Sensorless vector and scalar
- control



See details on page 56

Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

General performance motors combine convenience and easy handling seamlessly with ABB's engineering expertise, while providing standard variants and modifications. The motors can be tailored according to the specific needs of end-users and OEMs.

Highlights

- 0.06 kW to 355 kW
- One year warranty
- IE2 & IE3
- 2, 4 & 6 pole designs



Process performance motors are the flagship of ABB's standard low voltage motors. This range provides the most comprehensive, versatile set of motors for the process industries and heavy-duty applications which are dependent on continuous reliability, lowest possible environmental impact and life cycle costs.

Highlights

- 0.09 kW to 1,000 kW
- Three years warranty and an option to extend to five years
- IE2, IE3 & IE4
- All variant codes available for process industry applications



Drives and motors packages Synchronous reluctance motor-drive package

Get the best of both worlds. The efficiency advantages of permanent magnet technology together with the simplicity and service-friendliness of an induction motor platform. Each motor-drive package combines proven stator technology and innovative magnet-free rotor design motor, a best-in-class drive and advanced software to offer a complete, optimised solution.

The table below shows a quick selection for 1500 rpm motors (ABB can perform an optimised selection if required). Although all of SynRMs motors are 4-pole, the VSD handles the control for the differing speeds. SynRM are installed into a wide range of applications, from paper machines to crushers, offering improved control, maintainability and robustness.

Motor kW	High Output SynRM 1500rpm	ACH580	ACS580	ACQ580	ACS880
1.1	M3AL 90 LA 4	ACH580-01-03A3-4	ACS580-01-03A3-4	ACQ580-01-03A3-4	ACS880-01-03A3-3
1.5	M3AL 90 LB 4	ACH580-01-04A0-4	ACS580-01-04A0-4	ACQ580-01-04A0-4	ACS880-01-04A0-3
2.2	M3AL 90 LD	ACH580-01-07A2-4	ACS580-01-07A2-4	ACQ580-01-07A2-4	ACS880-01-07A2-3
3	M3AL 100 LB 4	ACH580-01-07A2-4	ACS580-01-07A2-4	ACQ580-01-07A2-4	ACS880-01-07A2-3
4	M3AL 100 LD	ACH580-01-12A6-4	ACS580-01-12A6-4	ACQ580-01-12A6-4	ACS880-01-12A6-3
Motor kW	IE4 SynRM 1500rpm	ACH580	ACS580	ACQ580	ACS880
5.5	M3AL 132 SMA 4	ACH580-01-12A6-4	ACS580-01-12A6-4	ACQ580-01-12A6-4	ACS880-01-12A6-3
7.5	M3AL 132 SMB 4	ACH580-01-017A-4	ACS580-01-017A-4	ACQ580-01-017A-4	ACS880-01-017A-3
11	M3AL 132 SMC 4	ACH580-01-025A-4	ACS580-01-025A-4	ACQ580-01-025A-4	ACS880-01-025A-3
11	M3BL 160 MLA 4	ACH580-01-025A-4	ACS580-01-025A-3	ACQ580-01-025A-4	ACS880-01-025A-3
15	M3BL 160 MLB 4	ACH580-01-038A-4	ACS580-01-038A-3	ACQ580-01-038A-4	ACS880-01-035A-3
18.5	M3BL 180 MLA 4	ACH580-01-045A-4	ACS580-01-045A-3	ACQ580-01-045A-4	ACS880-01-043A-3
22	M3BL 200 MLF 4	ACH580-01-062A-4	ACS580-01-061A-3	ACQ580-01-062A-4	ACS880-01-050A-3
30	M3BL 200 MLA 4	ACH580-01-073A-4	ACS580-01-073A-4	ACQ580-01-073A-4	ACS880-01-069A-3
37	M3BL 250 SMF 4	ACH580-01-088A-4	ACS580-01-088A-4	ACQ580-01-088A-4	ACS880-01-085A-3
45	M3BL 250 SMG 4	ACH580-01-106A-4	ACS580-01-106A-4	ACQ580-01-106A-4	ACS880-01-103A-3
55	M3BL 250 SMA 4	ACH580-01-145A-4	ACS580-01-145A-3	ACQ580-01-145A-4	ACS880-01-123A-3
75	M3BL 280 SMA 4	ACH580-01-206A-4	ACS580-01-206A-3	ACQ580-01-206A-4	ACS880-01-173A-3
90	M3BL 280 SMB 4	ACH580-01-206A-4	ACS580-01-206A-3	ACQ580-01-206A-4	ACS880-01-202A-3
110	M3BL 280 SMC 4	ACH580-01-246A-4	ACS580-01-246A-3	ACQ580-01-246A-4	ACS880-01-245A-3
110	M3BL 315 SMA 4	ACH580-01-246A-4	ACS580-01-246A-3	ACQ580-01-246A-4	ACS880-01-245A-3
132	M3BL 315 SMB 4	ACH580-01-293A-4	ACS580-01-293A-3	ACQ580-01-293A-4	ACS880-01-290A-3
160	M3BL 315 SMC 4	ACH580-01-363A-4	ACS580-01-363A-3	ACQ580-01-363A-4	ACS880-01-343A-3
200	M3BL 315 MLA 4	ACH580-01-430A-4	ACS580-01-430A-3	ACQ580-01-430A-4	ACS880-01-427A-3
250	M3BL 315 LKA 4	n/a	ACS580-04-585A-3	n/a	ACS880-04-585A-3
315	M3BL 315 LKC 4	n/a	ACS580-04-650A-3	n/a	ACS880-04-650A-3

ACH580

- 0.75 kW to 250 kW
- Dedicated to HVAC
- Rapid start-up, trouble-free use, easy interfacing
- Built-in BACnet



See details on page 47

ACS580

- 0.55 kW to 500 kW
- Wide power range in wall-mounted IP21 and IP55 variants
- Sensorless vector and scalar control



- 0.55 kW to 250 kW
- Dedicated drive for water and wastewater applications

See details on page 43



See details on page 51

ACS880



- 0.55 kW to 3200 kW

– Direct torque control

(DTC) for precise

loop control

- Built-in safety features

open- and closed-

See details on page 56

3

IE4 SynRM

The IE4 design offers super premium efficiency motors in a chassis that is identical to standard IEC induction motor frame sizes and fixings, offering a direct replacement package with a better efficiency. The variable speed drive (VSD) + IE4 SynRM motor package has a better efficiency than a VSD + IE4 induction motor package.

- Aluminium frame 132
 - 5.5 kW to 15 kW
- Cast iron frame 160 to 315
- 7.5 kW to 315 kW
- 40 percent lower losses compared to induction designs
- No magnets
- Cool running rotor
- Improved bearing system reliability
- Easy to service
- Simple to retrofit on induction motor applications due to identical physical size

High Output (HO) SynRM

High Output (HO) design takes advantage of the 40 percent fewer losses, allowing ABB to offer SynRM in a motor frame that can be two frames smaller than a conventional induction motor, while providing more power in a smaller package. SynRM weighs less than the equivalent induction motor, so applications where space and weight are premium are ideal for the HO design.

- Aluminium frame 90 to 132
- 1.1 kW to 37 kW
- Cast iron frame 160 to 315
- 17 kW to 350 kW
- Achieve the same output with a motor that's up to two frame sizes smaller
- Enables smaller, lighter and more cost-efficient machine designs
- Ideal for applications where space and weight factors are critical

Drives and motors packages ATEX compliant

An ATEX approved AC motor and drive combination gives safe, economical power combined with effective control. By choosing an ATEX compliant motor-drive package, end-users can be confident that it is optimised for their application, complies to ATEX 2014/34/EU and is commercially beneficial, giving more available power for your money.

ABB industrial drive, ACS880

- ATEX approved STO, no need for contactor
- ATEX certified PTC relay fits inside
- FPTC-02 ATEX certified option module



- Direct torque control (DTC) proven motor control platform
- All major types of drive topology covered -6-pulse, 12-pulse, 4-quadrant, low harmonic, air-cooled and watercooled
- Built-in safety module



See details on page 56

ABB general purpose drive, ACS550

- 0.37 kW to 355 kW
- Assistant control panel providing intuitive use of
- the drive
 Patented
 swinging choke
 for superior
 harmonic
 reduction
- Sensorless vector and scalar control



*ACS580

- 0.55 kW to 500 kW
- Superior keypad
- IP21, IP55
- Patented swinging choke
- Sensorless vector
- STO as standard
- CPTC ATEX certified option modules



*Check with ABB regarding ATEX availability.

See details on page 43



ABB machinery drive, ACS355

- IP20 as standard (UL type 1 as option)
- IP66/69 variants
- Advanced functionality with sequence programming
- Configuration of unpowered drive in two seconds
- Compact installation
- STO as standard



See details on page 35

ABB hazardous area low voltage motors

- Flameproof motors, frame size 80 to 450
- 0.18 kW to 710 kW
- Non-sparking motors, frame size 71 to 450
- 0.09 kW to 1,000 kW
- Loadability curves optimised for ABB drives



ABB Ex tD/DIP motors

- Ex tD/DIP motors, frame size
 71 to 450
- 0.09 kW to 1,000 kW
- IP55 or IP65 for nonconductive dust
- IP65 for conductive dust
- Loadability curves optimised for ABB drives



Drives and motors packages ATEX compliant

The route to EC Declaration of Conformity for ABB low voltage AC drives and motors (ATEX 2014/34/EU)

Important note: This flowchart only applies to standard ABB motors

Type testing means thermistor relays are not mandatory but to allow protection against stall conditions they are recommended for a safe installation. Use ATEX approved thermistor measurement. ACS880/ACS580 do not require a contactor as the ATEX approved STO can be used to disconnect. ACS880/ACS580 do not require an external PTC relay, as an internal option can be used.

3





Drives and motors packages Deck winch

ABB offers motors and drives for anchoring and mooring winches, RoRo gate ramp winches and tugboat winches. A deck winch motor-drive package consists of an ABB low voltage marine motor with mechanical disc brakes and an ABB industrial drive, ACS880. Both are designed to stand up to the operations and installations found on many sea-going vessels. SynRMs have now been successfully used on many winch systems.

ABB's marine certified motors and drives fulfil marine and offshore requirements and the design and operation comply with regulations from all major classification societies. ABB's electrical drive solutions improve reliability and offer advantages over hydraulic systems. They enable more precise rope control and reduce operating noise. No hydraulics means no hydraulic fluid concerns, fewer parts, reduced installation space and lower maintenance needs.

Control stand integration

- Connect up to three control stands and one wireless radio controller to a single drive
- Connect via drive I/O, PLC or fieldbus communications

- ABB industrial drive, ACS880
- Built-in winch control program
- The combination of direct torque control (DTC) and winch control program eliminate the need for motor shaft encoders and load cell sensors in the winch gearbox
- Ensures smooth winch start-up, eliminating the motor start-up voltage and current peaks on the ship's electrical network
- SynRM control as standard
- Dynamic braking with integrated brake chopper and external braking resistor
- Stepless speed and torque operation reduces winch noise
- Direct bulkhead installation or in cabinets (marine certified)



Low voltage marine motors with mechanical disc brakes

- Exact nominal data on rating plate helps optimise motor operation especially when motor encoder is not used
- Specially designed low wear shaft seals
- SynRM available

- Corrosion resistance improved with zinc primer painting
- IP56 open deck protection class
- Optional heating element and temperature supervision
- Ex motors available

A V C

Drives and motors packages Cranes and hoists

ABB has been generating crane-specific software for over 20 years such that today virtually any crane type can be controlled. The SynRM brings more accurate control, with 0.01 percent speed accuracy in open-loop. It has 40 percent fewer losses compared to induction motors, while the high output version can be two frames smaller. The crane software operates with the ABB industrial drive, ACS880, which provides premium motor control, including torque at zero speed, through the use of direct torque control (DTC).



Highlights

- Sensorless anti-sway control
- Mechanical brake control
- Master-follower operations, ideal for long travel operations
- Synchro control, synchronises the operation of main hooks
- Direct torque control (DTC) ABB's signature motor control algorithm
- Safe torque off (STO) as standard
- Built-in additional drive based programmable safety to SIL 3 / PL e
- Safety PLCs incorporating ProfiSafe, to allow direct communications to the built-in safety module
- Control via I/O of fieldbuses
- Custom crane solutions via a PLC library for larger crane systems

To see the accuracy of the ABB crane systems – take the challenge at: http://new.abb.com/drives/acs880-challenge#/





Built-in functional safety

Drives and motors packages Aggregates

3

ABB has a long history of controlling machinery in the aggregates industry, including powering the world's largest mobile mineral crusher, which operates in an open cast mine in Australia. Several different drives can be used to optimise every part of an aggregates plant. The ABB industrial drive, ASC880, for instance, has an extensive power range and topologies to suite every kind of application. Featuring the world renowned direct torque control (DTC) motor control platform, the robust and reliable ACS880 handles high torque loads and transients. The ABB general purpose drive can be used for less demanding machines, fans and pumps. The ABB machinery drive is ideal where precision is needed, for example, to pack or palletise materials. ABB's drive technology is complimented by a range of motors which boast the best in robust design and performance, especially suited to the aggregates industry. ABB can also integrate the entire operation with its PLC and HMI range, incorporating control with the TÜV certified safety systems built into the drives.



ABB drives highlights

- Wide range of powers to suite specific aggregate applications
- Liquid-cooled designs to minimise ingress of dust
- IP55 variants where required, or flange mounting for easy heat and dust management
- Supreme motor control, especially good at high torque loads
- All-compatible user interfaces, so all drive families operate the same with the same tools
- Designed to work optimally with ABB motors
- SynRM control as standard
- PLC's and HMI range to integrate controls and safety across the operation



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Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

ABB motors highlights

- Reinforced insulation
- Standard and enhanced dust seals
- Bearing monitoring
- Enhanced IP classes
- Improved paint systems



Drives and motors packages Cooling tower direct drive-motor

The ABB motor-drive package for cooling towers comprises an ABB permanent magnet motor with an ABB industrial drive, ACS880. Together, the package delivers precise fan control without the need for a gearbox, even under low load or speed conditions often experienced in cooling tower applications. ABB's RPM AC permanent magnet motor has a high power and torque density ratio which is needed to achieve the sustained low speed required for cooling tower operation. It is designed to retrofit into existing gearbox footprints within the cooling tower to allow swap-out in less than six hours.



- No gearbox

- No mechanical losses
- No lubrication issues and costs

ABB industrial drive, ACS880 and RPM AC permanent magnet motor

- Designed to drop directly into existing gearbox mounting patterns
- Retrofit can be accomplished in under six hours
- Eliminates gearbox, lowers vibration and system noise
- Permanent magnet control greatly increases operating efficiencies even under lightly loaded conditions, typical in fan applications at low speeds
- Temperature rise in the motor is considerably lower
- A power dense package increases motor life compared to a conventional induction motor system
- Special weather sealing ensures maximum life expectancy

