

ABB motion control and drives
for machine builders, OEMs
and system integrators

Contents

ABB motion control and drives	3
Technology highlights	4-5
ABB micro drive - ACS55	6-7
ABB micro drive - ACS150	8-9
ABB general purpose drive for pumps and fans - ACS310	10-11
ABB machinery drive - ACS355	12-13
ABB drives accessories - ACS310 and ACS355 user interfaces	14
ABB machinery drive modules - ACS850	15-16
ABB synchronous reluctance motor and drive package (SynRM)	17
ABB motion control solutions	18
ABB motion control products	19
ABB motion control drives	
ACSM1	20-21
MicroFlex Analogue servo drive	22-23
MicroFlex e100 servo drive	24-25
MotiFlex e100 servo drive	26-27
MicroFlex e150 servo drive	28-29
ABB motion control products	30-32
Programmable logic controllers - AC500-eCo PLC	33
Programmable logic controllers - AC500 PLC	34-35
Programmable logic controllers - AC500-XC	36
Programmable logic controllers - AC500-S	37
PLC and controller	38
Human machine interface - CP600 HMI	39-40
Software tools	41-42
Other ABB offering for factory automation	43-44
AC drives and DC drives electronic products and relays	



ABB motion control and drives

Machine builders, original equipment manufacturers (OEMs) and system integrators can now specify variable-speed drives, motion control products, PLCs, HMIs and other related equipment and devices from ABB. All products within this catalogue can be seamlessly integrated to offer exceptional performance, efficiency and reliability.



Technology highlights

ABB industrial drive, ACS880

Available initially from 0.55 kW to 250 kW at 208 to 690 V, this drive range is designed to tackle any challenge in any motor-driven application across any industry.

The range is the first low voltage AC drive to use ABB's new common architecture that features the same control panel, harmonised parameters and functions, universal accessories and engineering tools. The architecture brings faster commissioning, minimal operator training and a familiarity across all ABB drives to be launched in the future.



AC500 PLC

AC500 is the PLC of choice when scalability, flexibility, performance, integration and communication are mandatory. Numerous I/O modules, carefully specified powerful CPUs and realtime communication couplers are key features of the PLC. The AC500 is one of the fastest PLCs on the market. This can be experienced when programming, running precise calculations, transferring data, serving the I/Os and presenting web server contents. New communications software blocks allow easy connectivity between the AC500 PLC and the ABB machinery drive. In addition, the PLC can perform complex motion control with ABB motion control products.



AC500-XC PLC

The XC range of PLCs are designed for extreme conditions (XC) and can operate over a temperature range of -40°C to +70°C. The new AC500-XC series is typically used for wind power plants, solar trackers, water and sewage treatment plants, construction machines, cranes, robot cells, tunnel safety technology and rail-bound automatic vehicles. Almost every module in the AC500 family is now available in the XC version. The dimensions, electrical specifications and software compatibility match the standard range.



Technology highlights

CP600 HMI

The CP600 series is ABB's latest HMI operator panel, allowing users better interaction with production plants and machines. It is highly flexible and is designed to complement advanced applications in complex systems or processes. The panel offers easy functionality and displays comprehensive operational information, allowing an operator to intervene manually at any time to stop or modify the production process.



MicroFlex™ e150

The MicroFlex e150 servo drive combines Ethernet technology, advanced multi-tasking programming and single-phase operation in a compact package.

The MicroFlex e150 can operate from 105 to 250 V AC single or three-phase and is available in multiple current / power ratings.

Ethernet and motor encoder feedback interfaces are fully integrated and optimised for demanding motion applications.

Safe torque-off is a standard feature, to meet the new European machinery directives.

The integrated Ethernet interface offers EtherCAT® for real-time control of multi-axis systems. In addition, EtherNet/IP™, Modbus TCP and RAW Ethernet are supported to enable control possibilities with other controllers such as PLC and Industrial PCs.



Synchronous reluctance motor and drive package

ABB's new, highly energy-efficient synchronous reluctance motor and drive package represents a breakthrough that combines best-in-class energy efficiency and customer value. The new innovative motor design has no rotor windings, unlike traditional synchronous designs. The rotor, therefore, suffers virtually no power losses and the rotor temperature remains lower than in conventional rotors, helping to achieve better power density and higher energy efficiency. The package includes a matched motor and drive with dedicated software. Optimised for variable-speed operation it offers smooth, efficient process control and optimal use of energy.



ABB micro drive

0.18 kW to 2.2 kW, ACS55

Motor control method - scalar

200/240 V, 1-phase supply, 3-phase output 0.18 kW - 2.2 kW

100/120 V, 1-phase supply, 3-phase output 0.18 kW - 0.37 kW

What is an ABB micro drive, ACS55?

The ABB micro drive is a component that is bought, together with other components, from a logistical distributor. The aim is for the ABB micro drive to be so small and simple that users of contactors and soft starters are encouraged to move to the benefits of variable-speed control. The ACS55 is a simple drive, programmed by switches. Extended programming is possible via a PC if required, as is programming without power.

Highlights

- Quick and easy installation - less than 5 minutes
- No programming - easy and descriptive interface
- Can be programmed via DriveConfig if needed to access extended functions (useful to OEMs)
- Compact size and narrow shape
- Ideal drive for DIN-rail mounting
- 110 V single phase – input gives 240 V, 3-phase output
- Two mounting orientations
- IP20 as standard
- No control panel required
- User interface via three rotary switches and a further eight on/off function DIP switches located on panel front
- Potentiometer option
- Integral EMC filter for 1st environment (EN61800-3), unrestricted distribution (C1)



For more details, please refer to Technical Catalogue 3AFE68899842

- Optional first environment filter for extended cable runs
- Optimised switching frequency for low noise (up to 16 kHz)
- Silent motor

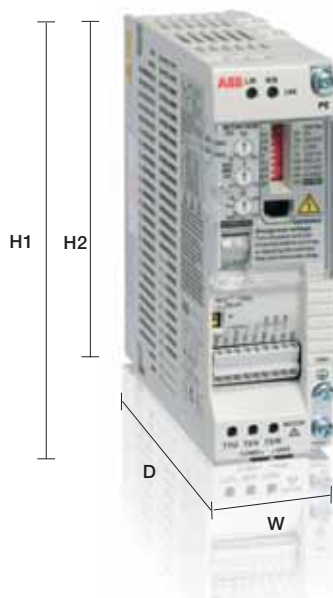
Feature	Advantage	Benefit
No programming if required	Inverter parameter settings with DIP switches and potentiometers. Extended programming is possible via DriveConfig if needed	Faster set-up Easier configuration Easy drive for new users
Compact size and narrow shape	Up to 0.37 kW, 45 mm width; 2.2 kW, 67.5 mm width	Less space required for installation
Removable mounting clip	Removable clip allows DIN-rail and wall-mounting from back and side of the unit	Flexible and easy mounting
DriveConfig kit	Fast and safe configuration of an unpowered drive	Simple programming for high volume OEMs - programming in the box, no mains power needed
EMC	First environment. C1 EMC filters as standard ('E' model)	Low EMC emissions
Automatic switching frequency	Increases switching frequency automatically, when drive temperature is decreased	Provides lowest possible noise without derating the drive
110-240 V AC, single phase supplies	Output always capable of full 240 V, 3-phase, regardless of supply voltage	Can easily replace single phase cap start motors
RoHS compliance	Compliance achieved in 2007	Environmentally friendly drives

ABB micro drive

ACS55 – Dimensions and options

Frame size	H1 mm	H2 mm	W mm	D mm	Weight Kg
A	170	146.5	45	128	0.65
B	170	146.5	67.5	128	0.70
C	194	171	70	159	1.1
D	226	203	70	159	1.1

H1 = Height with mounting clip
H2 = Height without mounting clip
W = Width
D = Depth



Options and interfaces

Potentiometer

Potentiometer with two switches: start/stop and forward/reverse direction. No external power source is needed for the potentiometer.



DriveConfig programming with no power

To increase the number of applications possible with the ACS55, the DriveConfig kit can be used to access an extended parameter set. It is still possible to programme in the usual way, if these extended features are not required. DriveConfig also allows programming in the box, with no need to apply power to the drive.



Suitable for use in a wide range of applications including pumps, fans, material handling systems, automatic gates, solar trackers, treadmills and whirlpool baths.



ABB micro drive

0.37 kW to 4 kW, ACS150

Motor control method - scalar

200/240 V, 1-phase supply, 0.37 kW - 2.2 kW

200/240 V, 3-phase supply, 0.37 kW - 2.2 kW

380/480 V, 3-phase supply, 0.37 kW - 4 kW

What is an ABB micro drive, ACS150?

The ABB micro drive is a component that is bought, together with other components, from a logistical distributor. ABB micro drives are designed to encourage users of contactors and soft starters to move to the benefits of variable-speed control. The ACS150 extends the capability of the ACS55 (see page 6), by adding an extended power range and programmability. The ACS150 can solve more difficult tasks like PID functionality. To retain the simplicity of an ABB micro drive, the ACS150 does not have a serial communications interface or extended options but does have a fixed keypad and speed control potentiometer.

Highlights

- PID controller built-in
- DC hold stop ensures stationary motor shaft
- IR compensation improves starting torque for heavy loads
- Parameter lock prevents tampering by unauthorised staff
- DIN rail or screw mounting as standard
- IP20 enclosure
- Drive branding available for volume users
- Fixed basic control panel
- Dedicated control potentiometer
- Two-year warranty
- Flashdrop - parameter programming whilst still in its box - excellent for OEMs



For more details, please refer to Technical Catalogue 3AFE68596114

- Protected against wiring errors: shows fault if power cable is inadvertently connected to motor terminals
- Automatic noise reduction
- Optional short or long parameter mode for standard or advanced users
- Unified height across the power range simplifies cabinet design

Feature	Advantage	Benefit
FlashDrop	Faster and easier drive set-up and commissioning for volume manufacturing - programming in the box	No need for high voltage safe programming areas Parameters can be hidden for clarity Programme the drive during machine production build-up
Fixed interface	Simple drive with comfortable and robust interface. Easy to navigate parameter structure	Integrated control panel with clear LCD display, backlight and buttons for editing and control
Fixed potentiometer	Intuitive speed setting	Integrated potentiometer. Settings shown on the control panel
Programmable functions	Useful control functions like PID, accelerating rates and start/stop modes included	Take control of the motor and reduce cost in the installation
Built-in EMC filter	No need for external filtering	2nd environment built-in filter. Complying with IEC 61800-3 as standard
Built-in brake chopper	Reduced cost, saved space and simple wiring	100 percent braking capability
Flexible installation	Optimum layout and efficient cabinet space usage	Screw, DIN-rail, sideways and side-by-side mounting Unified height and depth
Drive protection	Latest solutions to protect the drive and offer trouble-free use and the highest quality	The drive protects itself when power is connected to the motor terminals. I/O protected against short-circuit. Coated boards included as standard
Brand labelling	Drive logo, control panel logo, manuals and box can be printed with machine builders logo and name	Drives and packaging badged to your design
RoHS compliance	Compliance achieved in 2007	Environmentally friendly drives

ABB micro drive

ACS150 – Dimensions and options

Cabinet-mounted drives (UL open), wall mounted drives (NEMA 1)

Frame size	IP20 UL open						NEMA 1				
	H1	H2	H3	W	D	Weight	H4	H5	W	D	Weight
R0	169	202	239	70	142	1.1	257	280	70	142	1.5
R1	169	202	239	70	142	1.3	257	280	70	142	1.5
R2	169	202	239	105	142	1.5	257	282	105	142	1.5

H1 = Height without fastenings and clamping plate

H2 = Height with fastenings but without clamping plate

H3 = Height with fastenings and clamping plate

H4 = Height with fastenings and NEMA 1 connection box

H5 = Height with fastenings, NEMA 1 connection box and hood

W = Width

D = Depth



Options available

- Input and output chokes
- Brake chopper resistors (all drives in the ACS150 range have integral chopper)
- 1st. environment EMC filters - footprint style
- Low leakage EMC filters < 30mA leakage
- FlashDrop - programming without power
- NEMA 1 kit for tidier installations

ABB micro drives bring speed control benefits to a wide variety of applications including mixing, conveyors, heat pump systems and fans.

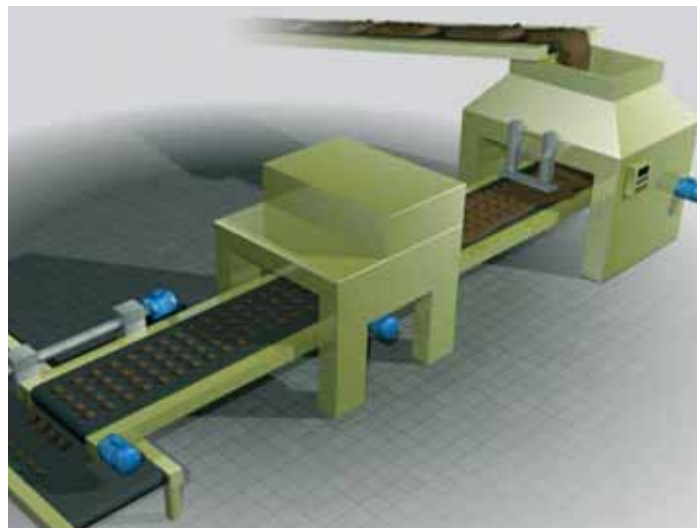


ABB general purpose drive for pumps and fans

0.37 kW to 22 kW, ACS310

Motor control method – Scalar (quadratic/squared torque only)

200/240 V, 3-phase supply, 0.37 kW - 11 kW

380/480 V, 3-phase supply, 0.37 kW - 22 kW

What is an ABB general purpose drive for fans and pumps?

ABB general purpose drives include a dedicated fan and pump controller designed for squared-torque applications such as pumps, booster pumps and centrifugal fans.

The drive design includes a powerful set of features which benefit pump and fan applications including built-in PID controllers and PFC (pump and fan control). The drives also have pre-programmed protection functions such as pipe cleaning (anti-jam) and duty standby functionality.

These features, combined with pre-programmed application macros, an intuitive user interface and several assistant screens, speed up the installation, parameter setting and commissioning of the drive.



For more details, please refer to Technical Catalogue 3AUA0000051082

Highlights

- Pump and fan features such as pump and fan control (PFC) and soft pump and fan control (SPFC) for multi-pump and soft fill control
- Pipe cleaning (anti-jam) and pipe fill functions
- Multiple PID set points, allowing for automatic duty/assist/standby schemes to be implemented
- Energy efficiency counters, real-time clock
- Energy optimiser – optimises the motor control for the application
- Load analyser for optimised dimensioning of the drive, motor and process
- Embedded Modbus RS-485 fieldbus interface
- FlashDrop tool for fast parameter setting, without mains power

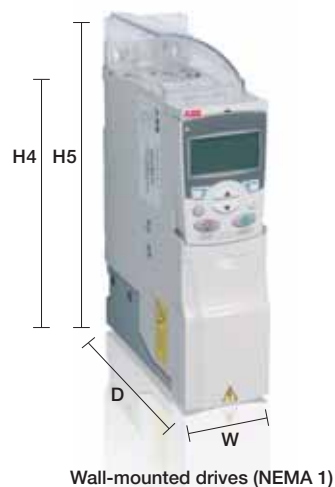
Feature	Advantage	Benefit
Pump and fan control (PFC) feature to control pumps and fans in parallel	One drive controls several pumps or fans and eliminates the need for an external programmable logic controller Interlock function enables one motor to be disengaged from the mains supply while others continue operating in parallel	Saves cost of additional drives and external PLC Longer life for pump or fan system while reducing maintenance time and costs. Maintenance can be carried out safely without stopping the process
Soft pump and fan control feature (SPFC)	Reduces unwanted pressure peaks in pumps and pipelines when an auxiliary motor is started	Reduces maintenance costs Longer life for pump or fan system
Pump protection functions	Pre-programmed features like: Pipe cleaning (anti-jamming), inlet/outlet pressure supervision and detection of under- or over-load for preventive maintenance	Reduces maintenance costs Smoother processes: improved and optimised system Longer life for pump and fan system, reduced maintenance costs
Energy monitoring and optimising features	Drive monitors the saved energy compared to equivalent DOL operation Drive controls the motor voltage dependant on the load	Energy savings presented in local currency and CO ₂ Consumed energy optimised across the speed and load range
Full output current at 50°C ambient	Drive can be operated in ambient temperatures up to 50°C without de-rating the output current	Optimised drive dimensioning for wide temperature range
Unified height and depth	Optimum installation layout, as all drive frames are the same height – only the width changes	Space savings. Easier to layout the cabinet back panel
Best-in-class user interfaces	Assistant and Basic keypads with intuitive operation. Short and long menus, Assistants and wizards for ease of use	Users are supported as they program the drive. Can tailor the open menu views to suite customer needs
FlashDrop	Faster and easier drive set up and commissioning for volume manufacturing	Fast, safe and trouble-free method to set up and commission without powering up the drive - patented
RoHS compliance	Compliance achieved in 2007	Environmentally friendly drives

ABB general purpose drive for pumps and fans

ACS310 – Dimensions and options

	IP20 UL Open						NEMA 1/UL Type 1				
Frame size	H1 mm	H2 mm	H3 mm	W mm	D mm	Weight Kg	H4 mm	H5 mm	W mm	D mm	Weight kg
R0	169	202	239	70	161	1.1	257	280	70	169	1.5
R1	169	202	239	70	161	1.3	257	280	70	169	1.7
R2	169	202	239	105	165	1.5	257	282	105	169	1.69
R3	169	202	236	169	169	2.9	260	299	169	177	3.5
R4	181	202	244	260	169	4.4	270	320	260	177	5.0

H1 = Height without fastenings and clamping plate
H2 = Height with fastenings but without clamping plate
H3 = Height with fastenings and clamping plate
H4 = Height with fastenings and NEMA 1 connection box
H5 = Height with fastenings, NEMA 1 connection box and hood
W = Width
D = Depth



Options available

- Input and output chokes
- ACS310 has no braking options
- 1st environment EMC filters - footprint style
- Low leakage EMC filters < 30mA leakage
- FlashDrop
- An extensive range of user interfaces is available - refer to page 14
- NEMA kit for tidier installation

Ideal for meeting the variable-torque loads demanded by centrifugal fans and pumps including booster pump systems, irrigation, level control and wood drying kilns.

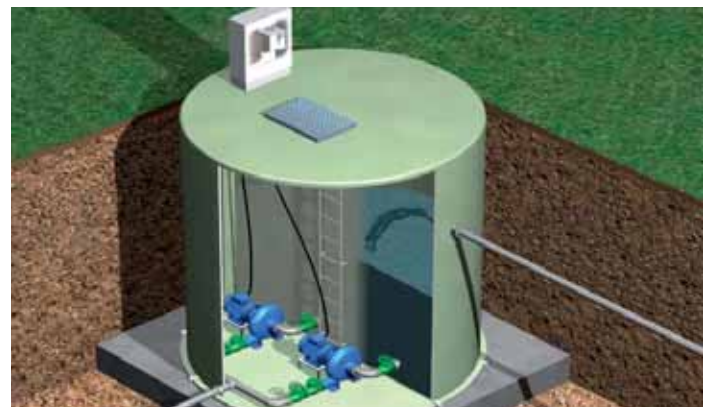
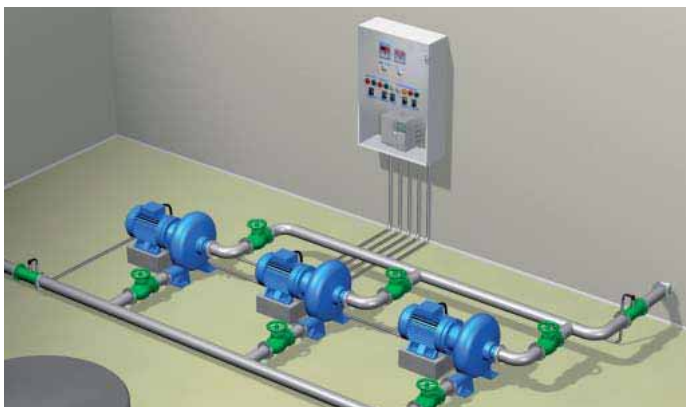


ABB machinery drive

0.37 kW to 22 kW, ACS355

Motor control method - scalar, vector (open and closed loop)

200/240 V, 1-phase supply, 0.37 kW - 2.2 kW

200/240 V, 3-phase supply, 0.37 kW - 11 kW

380/480 V, 3-phase supply, 0.37 kW - 22 kW

What is an ABB machinery drive?

ABB machinery drives are designed for the machine building sector. In serial type manufacturing the consumed time per unit is critical. The drive is designed to be optimal in terms of installation, setting parameters, available machinery features and commissioning. The basic product has been made as user-friendly as possible, yet providing high intelligence. The drive offers diverse functionality to cater for the most demanding needs. The drive is also equipped with a safe torque-off interface to SIL3/PL e.

Highlights

- FlashDrop - parameter programming with drive still in its box - excellent for OEMs
- Sequence programming designed for food and beverage and materials handling applications - Eight-steps included
- Impressive software and compact hardware
- Unified height and depth across the power range simplifies cabinet design
- Optimised interfaces for users and machines (can select Basic or Assistant control panel)
- Protected against wiring errors: shows fault if power cable is inadvertently connected to motor terminals
- Automatic noise reduction
- Drive branding available for volume users



For more details, please refer to Technical Catalogue 3AFE68596106

Feature	Advantage	Benefit
FlashDrop*	Faster and easier drive set up and commissioning for volume manufacturing	Fast, safe and trouble-free method to set up and commission without powering up the drive - patented
Safe torque-off	Built-in compliance to new Machinery Directive	SIL3/PL e certified dual channel input - TÜV approved
Sequence programming	Application specific 8-state programming with comprehensive triggering conditions	Logic programming included as standard Reduces the need for external PLC
Common DC link	Connection to existing DC power sources	Easy integration into high performance machines
User interfaces	Wide range, including assistant panel - see options	Cost efficient approach - according to requirements of OEM
Fieldbus	Extensive range of industrial fieldbus option modules available	Connectability to all of the most popular fieldbuses in use
24 V 'live keypad' operation	Connect 24 V to the drive via the MPOW option	Keep fieldbus, control card and I/O healthy while able to remove the main supply - safer maintenance
Built-in EMC filter	2nd environment filter complying with IEC 61800-3 as standard	No extra space, parts, time or cost required
Built-in brake chopper	100 percent braking capability	Reduces cost, saves space and simplifies wiring
Drive protection	Latest solutions to protect the drive and offer trouble-free use and the highest quality	The drive protects itself when power is connected to the motor terminals. I/O protected against short-circuit Coated boards included as standard
IP66/69k enclosure option	Makes drive suitable for hose down applications	Meets food hygiene standards in a wall-mounted enclosure
Brand labelling	Drive logo, control panel logo, manuals and box can be printed with machine builders logo and name	Drives and packaging badged to your design
RoHS compliance	Compliance achieved in 2007	Environmentally friendly drives

* For details of FlashDrop, see user interfaces in ABB drive section (page 14)

ABB machinery drive

ACS355 – Dimensions and options

Frame size	IP20 UL Open							NEMA 1/UL Type 1							IP66/67/UL Type 4x						
	H1	H2	H3	W	D1	D2	Weight	H4	H5	W	D1	D2	Weight	H	W	D1	Weight	H	W	D1	Weight
R0	169	202	239	70	161	187	1.2	257	280	70	169	187	1.6	-	-	-	-	-	-	-	-
R1	169	202	239	70	161	187	1.2	257	280	70	169	187	1.6	305	195	281	7.7	-	-	-	-
R2	169	202	239	105	165	191	1.5	257	282	105	169	191	1.9	-	-	-	-	-	-	-	-
R3	169	202	236	169	169	195	2.5	260	299	169	177	195	3.1	436	246	277	13	-	-	-	-
R4	181	202	244	260	169	195	4.4	270	320	260	177	195	5.0	-	-	-	-	-	-	-	-

H = Height

H1= Height without fastenings and clamping plate

H2 = Height with fastenings but without clamping plate

H3 = Height with fastenings and clamping plate

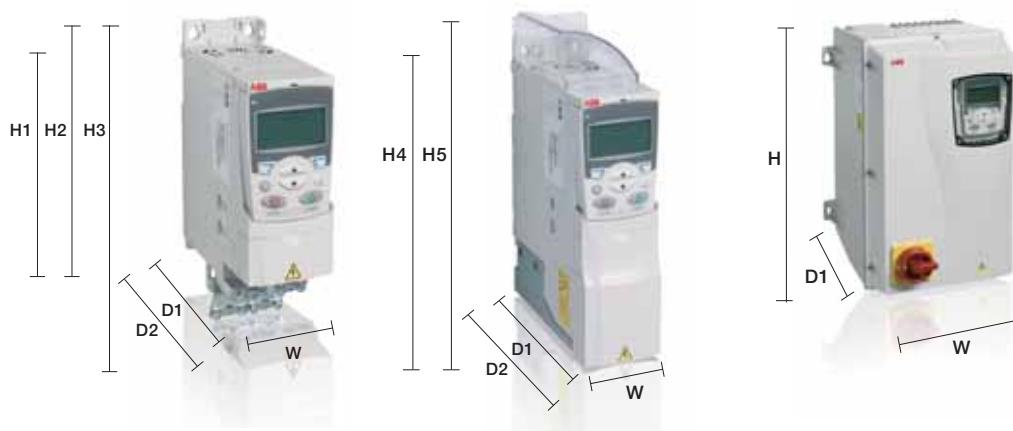
H4 = Height with fastenings and NEMA 1 connection box

H5 = Height with fastenings, NEMA 1 connection box and hood

W = Width

D1 = Standard depth

D2 = Depth with MREL or MTAC option



Options available

- Input and output chokes
- Brake chopper resistors (all drives in the ACS355 range have integral chopper)
- 1st. environment EMC filters - footprint style
- Low leakage EMC filters < 30mA leakage
- FlashDrop
- Fieldbus modules
- An extensive range of user interfaces is available - refer to page 14
- IP66/69 designed to the relevant hygiene specs for food and beverage
- NEMA kit for tidier installation

Suitable for a wide range of applications including mixing, conveyors, decanters and packaging machines in industries from food & beverage, textiles, printing, rubber & plastics.

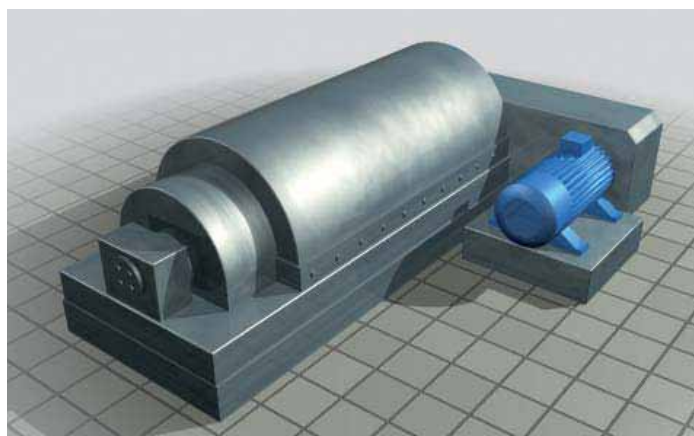


ABB drives accessories

ACS310 and ACS355 – User interfaces

Assistant control panel

The assistant control panel features a multilingual alphanumeric display for easy drive programming. The control panel has various assistants and a built-in help function to guide the user. It includes a real-time clock, which can be used during fault logging and in controlling the drive, such as start/stop. The control panel can be used for copying parameters for backup or for downloading to another drive. A large graphical display and soft keys make it extremely easy to navigate.



Basic control panel

The basic control panel features a single line numeric display. The panel can be used to control the drive, set the parameter values or copy them from one drive to another, or view changes.



Panel cover

The panel cover protects the drive when no control panel is used. The ABB machinery drive is delivered with a panel cover as standard. In addition, there are two alternative control panels available as options, see above.



NEMA 1 kit

The NEMA 1 kit is a convenient cover which is added to the drive and enables easy wall-mounting. It includes a connection box for finger protection, conduit tube installation and a hood for protection against dirt and dust.



Panel mounting kit, IP54 and IP66

The panel mounting kits enable mounting of control panels onto cabinet doors. These kits include a 3 m extension cable, a gasket, mounting screws and a mounting template - two versions are now available, IP54 and IP66. The IP66 has an additional keypad membrane cover.



Relay extension module (ACS355 only)

Add an additional three relays to the ACS355 to allow greater use of the drives program. Fits behind the keypad.



Potentiometer (ACS355 only)

Potentiometer with two switches: start/stop and forward/reverse direction. No external power source is needed for the potentiometer. Fits to the drive.



FlashDrop

Programme the drive whilst still in the box, with no power. Perfect for OEMs and machine builders. FlashDrop is a powerful palm-sized tool for fast and easy parameter selecting and setting. It gives the possibility to hide selected parameters to protect the machine. The tool stores 20 parameter sets, which can be moved between a PC and a drive. Safe programming during machine building production.



Fieldbus interfaces (ACS355 only)

Extensive range of plug-in fieldbus interfaces, allowing connection to Profibus, DeviceNet, CanOpen, Modbus RTU and Ethernet and others



24V “live keypad” options (ACS355 only)

There are two ways of powering the fieldbus modules, so that they operate when the main power is removed.



FEPA - maintains power to the fieldbus module only

MPOW - Powers the fieldbus module, the control card, the drive I/O and the drive keypad, generating the functionality commonly known as ‘live keypad’ operation.



DriveWindow Light PC tool

DriveWindow Light is a parameterisation and commissioning tool used to set-up and commission the drive. Monitoring and diagnostic facilities are included, as well as a local control panel. Wizards are included to guide the user through the most commonly performed tasks.

ABB machinery drive modules

0.37 kW to 560 kW, ACS850

Supply voltage:

380/500 V, 3-phase supply +10/-15%, 0.37 kW - 560 kW

200/240 V, 3-phase supply +/-10%, 0.37 kW - 560 kW



What is the ABB machinery drive?

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 (DTC) 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.

Highlights

- Compact size, ideal for cabinets
- IP20 as standard
- Easy access to power terminals in cabinet installations
- Direct torque control (DTC) 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



For further information see Technical Catalogue 3AUA0000041481

Feature	Advantage	Benefit
Compact size, side-by-side mounting	Smallest frame size is only 93 mm (4 in) wide. More drives can be placed in the same cabinet.	Optimum installation layout and efficient cabinet space usage. Space and cost savings.
Modular design	Many standard features and a wide range of options allow different system configurations.	Fits many application needs. Offers flexibility in system design.
Safe torque-off	Built-in compliance to new Machinery Directive	SIL3/PL e certified dual channel input - TÜV approved
Intuitive human-machine interface	Large alphanumeric display showing different assistants and macros.	Faster and more accurate drive configuration. Optimal drive settings as assistants offer interactive help.
Drive programming and configuration	Can replace relays and small PLCs with function block programming.	Lower investment cost. Higher flexibility in system design.
Memory unit for easy drive management	Complete drive configuration and settings are stored in a separate memory unit. Power or control unit can be replaced without parameter setting.	Drive functionality can be easily configured, modified or updated with the memory unit. Offers quick and easy after-sales service.
Robust main circuit design	Enhanced reliability. Coated boards and long lifetime components. Cooling supervision (depending on frame size).	Less process interruptions. Lower maintenance costs.
Extensive protection	Advanced thermal protection of the drive semiconductors and motor.	Higher process uptime. Early warning of any production interruptions.
Maintenance assistant	Indicates preventive maintenance needs of drive, motor or machine.	Helps with maintenance schedules and cost control of maintenance.
Diagnostic assistant	Helps in locating failures or reasons for performance changes and suggests remedies.	Reduced process downtime.
Energy saving calculator	Monitors used and saved energy, displayed in kWh, currency (€ or \$) or volume of CO ₂ emission.	Easy to check the return on investment.

ABB machinery drive modules

ACS850 – Dimensions and options

Frame size	Height ¹⁾		Depth ^{2) 3)}		Width		Weight	
	mm	in	mm	in	mm	in	kg	lb
A	364	14.3	197	7.8	93	3.7	3	7
B	380	15.0	274	10.8	101	4.0	5	11
C	567	22.3	276	10.9	166	6.5	16	35
D	567	22.3	276	10.9	221	8.7	23	51
E0	602	23.7	354	13.9	276	10.9	35	77
E	700	27.6	443	17.4	312	12.3	67	147
G ⁴⁾	1564	61.6	568	22.4	562	22.1	205	441
G1 ^{*4)}	1462 (1560) ⁵⁾	57.6 (61.4) ⁵⁾	505 (515) ⁵⁾	19.9 (20.3) ⁵⁾	305 (329) ⁵⁾	12 (13) ⁵⁾	161 (191) ⁵⁾	355 (421) ⁵⁾
G2 ⁴⁾	1662 (1710) ⁵⁾	65.4 (67.3) ⁵⁾	505 (515) ⁵⁾	19.9 (20.3) ⁵⁾	305 (329) ⁵⁾	12 (13) ⁵⁾	199 (229) ⁵⁾	439 (505) ⁵⁾

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⁾ G frames include separately mounted control section, 325 mm (12.8 in) H x 114 mm (4.5 in) D x 94 mm (3.7 in) W, 1.3 kg (3 lb) (except for frame G1 and G2 with integrated control unit).

⁵⁾ With +H381 optional cabling panel



Options available

- Control and communication modules
- Control panel
- G1 and G2 frames - larger frames on wheeled modules - easy install
- 1st and 2nd environment EMC filters
- Choice of mains chokes and braking options
- Crane control programming option
- SynRM (synchronous reluctance) motor control

Suitable for meeting the production and performance needs of a broad range of applications including cranes, extruders, winches, conveyors, winders, pumps, fans and mixers.



Synchronous reluctance motor and drive package (SynRM)

What is a SynRM, synchronous reluctance motor?

ABB offers two high-performance variable-speed motor and drive packages for industrial applications such as fans and pumps. Both packages are based on perfectly controlled synchronous motor technology without permanent magnet materials, combined with the ACS850 (previous page). The packages are optimised for quadratic torque loads.

- The IE4 super premium efficiency package is designed to meet increasing demands of green energy use in general industrial applications.
- The high output SynRM motor and drive package offers machine builders a highly powerful, yet compact solution that improves machine performance and enables more cost efficient machine designs. Equivalent motors can be two frame sizes smaller.

SynRM super premium efficiency class IE4

160 to 315 cast iron frame, 11 kW to 200 kW combined with ABB machinery drive.

This package, consisting of a super premium efficiency synchronous motor and matched frequency converter, is designed for maximum efficiency.

Highlights

- Energy saver – IE4 efficiency
- Swappable with induction motors – same size and output
- Reliable – cooler bearings and windings
- Service friendly – no permanent magnets
- Optimised for VSD operation
- Advanced ABB open loop control software (no feedback device needed)
- Global ABB support



High output SynRM motor

90 to 132 aluminium frame, 1 kW to 55 kW combined with ABB machinery drive.

160 to 315 cast iron frame, up to 315 kW combined with ACS850 machinery drive.

This package, a high-performance synchronous motor and matched frequency converter, is designed for maximum performance.

Highlights

- Up to two frame sizes smaller compared to induction motors
- Competitive product offering compared to traditional or other new technologies
- Minimum IE2 efficiency
- Optimised for VSD operation up to 6000 rpm
- Simplicity – no permanent magnets
- Extended bearing service intervals
- Advanced ABB open loop control software
- Global ABB support

Standard for LV motor efficiency classes

Motors covered by standard include:

- Single-speed, three-phase, 50 and 60 Hz
- 2, 4 or 6-pole
- Rated output from 0.75 kW to 375 kW
- Rated voltage U_N up to 1000 V
- Duty type S1 (continuous duty) or S3 (intermittent periodic duty) with a rated cyclic duration factor of 80 percent or higher
- Capable of operating direct-on-line 50 and 60 Hz

Super premium efficiency IE4 Super premium efficiency

Premium efficiency IE3 Premium

High efficiency IE2 Comparable to Eff1

Standard efficiency IE1 Comparable to Eff2

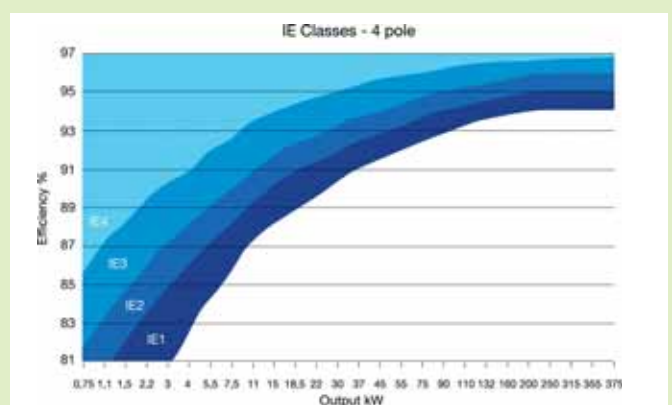


ABB motion control solutions

ABB offers solutions to a variety of machine control applications in many industries. Our capability includes intelligent programmable drives, plug-in controller options for drives, real-time Ethernet controllers, PLC systems and standard analogue and stepper-based control products



EtherCAT solutions using AC500

ABB's extensive AC500 PLC product line provides industry standard PLCopen motion functions within the IEC61131-3 programming environment and a broad line of expansion options such as distributed I/O and fieldbus networks. When combined with the ACSM1 high power motion drives, the new MicroFlex e150 or the ACS355 standard drives, the PLC offers machine control based on real-time EtherCAT technology.



Ethernet POWERLINK solutions

The NextMove e100 machine controller, MotiFlex e100 and MicroFlex e100 motion drives are optimised as a family to solve complex motion for up to 16 axes of interpolated motion utilising Ethernet POWERLINK. e100 products feature integrated Ethernet, CAN manager for I/O expansion and are programmable in MINT, a high level language for motion applications.



Intelligent drives solutions

MicroFlex e100 and MotiFlex e100 are programmable in MINT Lite and provide solutions to simple motion tasks such as indexing or flexible solutions to distributed control from PLCs where the behaviour of each axis can be tailored.

MicroFlex e150 supports multi-tasking MINT programming with support for software CAMs, flying shears and registration control, offering a single device solution to applications such as cut-to-length and labelling.

A plug-in MINT motion controller option for MotiFlex e100 provides five axes of coordinated motion, eliminating the need for an external controller thereby saving panel space and reducing cabling.



ABB motion control products











			Multiaxis real-time Ethernet			Single axis motion	Simple motion	
			EtherCAT Solutions	POWERLINK Solutions	Multi axis intelligent drives	Intelligent Drives	Analogue and Stepper Solutions	Features
Controllers		AC500	Scalable EtherCAT Master					<ul style="list-style-type: none">– Scalable CPU family– Distributed I/O and expansion options– IEC61131-3 programming– PLCOpen motion functions
		MINT Module		4 axes	4 x e100 1 x analogue			<ul style="list-style-type: none">– Plug-in controller for MotiFlex e100– 4 axes on POWERLINK + 1 x analogue– CANopen
		NextMove e100		16 axes			3 x analogue 4 x stepper	<ul style="list-style-type: none">– Multi axis machine controller– Real-time Ethernet POWERLINK– MINT programmable– CANopen RS232/RS485
		NextMove ESB-2					8 axes 4 x analogue 4 x stepper	<ul style="list-style-type: none">– 4 analogue axes + 4 stepper axes– Master encoder input– CANopen, RS232 or RS485
Drives		MicroFlex					+/-10 V or Step & Dir'	<ul style="list-style-type: none">– Analogue or step & direction (5V 1MHz)– Resolver or encoder feedback– Emulated encoder output
		MicroFlex 100		Integrated Ethernet	As an axis with MINT module	MINT Lite		<ul style="list-style-type: none">– +/- 10 V or step & direction (24V 1MHz)– Resolver or encoder feedback– Emulated encoder output– AC servo motor control
		MicroFlex e150	Integrated Ethernet			Advanced MINT		<ul style="list-style-type: none">– EtherCAT, Ethernet/IP, Modbus TCP/IP– Universal encoder interface– STO SIL 3 PL e
		MotiFlex e100		Integrated Ethernet	MINT module 4 +1 axes	MINT Lite	+/-10V	<ul style="list-style-type: none">– Ethernet POWERLINK, Modbus TCP/IP– Universal encoder interface– Feedback, fieldbus and I/O options– Plug-in 5 axes controller option
		ACSM1	Fieldbus option			SPC	+/-10V	<ul style="list-style-type: none">– SPC motion function blocks– Broad power range/line regen option– Feedback, fieldbus and I/O options– STO SIL 3 PL e
		ACS355	Fieldbus option				+/-10V	<ul style="list-style-type: none">– Flexible inverter drives for auxiliary axes– Feedback, fieldbus and I/O options– STO SIL 3 PL e

ABB motion control drive

0.75 kW to 355 kW, ACSM1

Motor control method - Enhanced DTC

380/480 V 3-phase supply, 0.75 kW - 110 kW



What is an ABB motion control drive?

ABB motion control drives provide high performance torque, speed and motion control for demanding machines. The following is an overview. For more information please contact ABB.

Highlights

- One drive for all motor types
- Memory unit for easy drive management and re-commissioning
- Wide range of feedback interfaces
- Solution programming to extend drive functions, DriveStudio (IEC61131 compatible)
- Safe torque-off (SIL3 rated), TÜV approved

Common DC link and regenerative capability

The ABB motion control drive can be supplied with an active rectifier. This allows common DC link schemes to be designed. Other drives can be supplied by this common DC link, including the ABB machinery drive. Full regenerative capability is possible with the rectifier and renewable energy applications become possible.

Lift/elevator control

Specific lift/elevator application control programme available, tailored for the lift industry

Speed and torque control

- Open and closed loop DTC
- For synchronous and asynchronous motors

Motion control

In addition to speed and torque control, ABB motion control drive also offers:

- Point-to-point positioning with extensible positioning profile sets



For more details, please refer to Technical Catalogue 3AFE68675073

- Synchronisation (encoder feedback or drive-to-drive link)
- Register control based on fast probe inputs
- Multiple homing methods
- Pre-written motion blocks for ABB PLCs

DTC (direct torque control)

ABB's highly accurate motor control platform, has gained extensive acceptance from ABB industrial drive customers for over a decade. DTC fulfils demanding machine builders' requirements.



Motors

ABB can supply suitable motors and cable sets to complete the machinery drive offering.

Feature	Advantage	Benefit
Various control arrangements	Speed and torque control variant as well as motion control variant. High bandwidth for torque, speed and position control	Suitable for wide range of standard and demanding applications
Asynchronous and synchronous motor compatibility	Various motor types from asynchronous motors (standard induction motors, servo) to synchronous motors (servo, high torque), can be controlled in open or closed loop mode	Saves capital costs through purchase of one drive type to control various motor types
System offering from one supplier	ABB has a wide offering for products and expertise in motion control applications with PLCs, servo motors and other low voltage products.	Reduces supplier selection, design, installation and commissioning time
Wide range of feedback interfaces	Speed and position feedback needs of virtually all applications can be readily accommodated. Each feedback interface option has two inputs and one output	Use one drive type for variety of applications, saving time and cost in finding alternative suppliers and purchasing a variety of different drives
Safe torque-off	Built-in compliance to new Machinery Directive	SIL3/PL e certified dual channel input - TÜV approved

ABB motion control drive

Frame size	Height ¹⁾ mm	Width mm	Depth ²⁾ mm	Weight kg
R0	169	202	239	70
R1	169	202	239	70
R2	169	202	239	105
R3	169	202	236	169
R4	181	202	244	260

Notes

All dimensions and weights are without options.

1) Height is the maximum measure without clamping plates.

2) Depth will increase by 23 mm with options. Additionally, 50 mm should be reserved for feedback cabling if FEN-xx options are used.

3) Depth or weight is for ACSM1 with the cold plate variant

H = Height

W = Width

D1 = Standard depth



Options available

- Regenerative supply to feed ACSM1 drive modules with full braking power capacity
- Optionally drives can be powered from 230 V AC UPS or a 48 to 96 V back-up battery supply
- Mains filters to meet EMC requirements
- Mains chokes to limit total harmonic distortion (THD)
- Braking resistors for various braking power needs
- Possibility for different common DC configurations
- Extensive range of servo motors and cable sets



ABB motion control drive

MicroFlex Analogue

Motor control, AC vector and scalar modes

110/230 V 1-phase and 3-phase supply

What is a MicroFlex Analogue servo drive?

The ABB MicroFlex Analogue is a compact servo drive, available in single – or three-phase 105 to 250 V AC or 3-phase 230 V AC operation in current ratings of 3, 6 and 9A.

The motor feedback is software programmable, accepting encoder, SSI (Synchronous Serial Interface) or Halls only. Resolver feedback is available as a factory fit option.

Motors can be tuned using the intuitive software tools, MINT Workbench, which provides full auto-tuning capabilities and wizard based configuration. Extended capabilities include programmable notch filters to reduce or remove resonance in a machine.

Where can it be used?

The ABB MicroFlex Analogue provides high performance servo control for both rotary and linear brushless motors with its powerful DSP (digital signal processor) core.

Highlights

- Brushless servo drive
- Control of rotary and linear servo motors
- Single or 3-phase 105-250 V AC
- 3, 6 or 9 A continuous with 2x overload for 0.5 seconds.
- Panel-mounting enclosure
- Software selectable encoder, SSI (Synchronous Serial Interface) or Hall only feedback
- Optional resolver feedback
- Simulated encoder output
- Auto-tuning wizard and software oscilloscope facilities via MINT Workbench
- Notch filters to eliminate mechanical resonance
- Analogue or pulse and direction command reference
- LED status for error notification
- RS232 serial channel for configuration (RS485 optional)
- ActiveX libraries supplied free of charge



Feature	Advantage	Benefit
External 24V logic supply	Supports control electronics even when the main power is off	Maintains drive status and simulated encoder output to an external controller to reduce the need to re-datum after main AC power is removed
Built-in brake chopper	On-board braking capability	More dynamic movements possible
Resolver or encoder options	Ability to interface with all industry standard feedback devices	No need to alter present preferred feedback device on site
RS232 and serial - communications	RS232 for configuration and customer PC	Improved application interfaces (supported by free ActiveX components)

ABB motion control drive

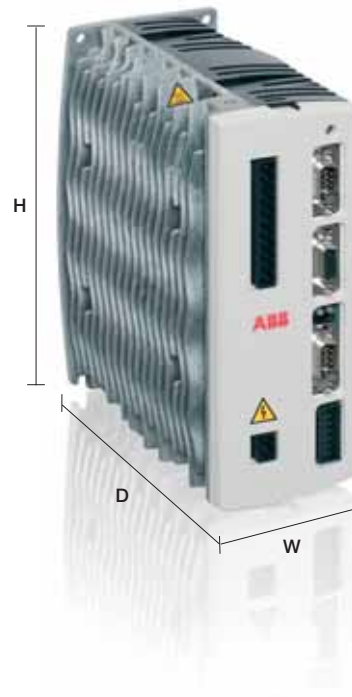
MicroFlex Analogue

Motor control, AC vector and scalar modes

110/230 V 1-phase and 3-phase supply

Frame size	H mm	W mm	D mm	Weight Kg
IP20	180	80	157	1.5

The drive comes in one frame size, IP20 and 3, 6 and 9 A rms with 200 percent for 3 s.



Options available

The drive comes complete, including all of the items it requires to operate.

The following options are available to allow system integration:

- Brake resistors
 - RG56 44 W regen resistor for use with 3 A MicroFlex
 - RG39 100 W regen resistor for use with 6 A and 9 A MicroFlex
- RS485 serial port
- RS232 programming cables
- Footprint EMC filters
- Force vent fan kits



ABB motion control drive

MicroFlex e100

Motor control, AC vector and scalar modes

Ethernet POWERLINK solution

105/250 V 1-phase and 3-phase supply

What is a MicroFlex e100 servo drive?

The ABB MicroFlex e100 is a compact servo drive, available in single-phase from 105 to 250 V AC or 3-phase 230 V AC operation in current ratings of 3, 6 and 9 A. It provides high performance servo control for rotary and linear brushless motors.

The MicroFlex e100 integrates the advanced capabilities of real-time Ethernet POWERLINK to provide superior performance, network integration and cost savings. The drive is compatible with the ABB NextMove e100 motion controller to provide a fully integrated solution using real-time Ethernet.

Where can it be used?

The ABB MicroFlex e100 drives can be used as a stand alone single-axis machine controller, fully programmable in MINT and with Ethernet connectivity combined with on-board I/O and a serial port for a simple HMI interface. A cost competitive solution to simple single axis applications requiring cut to length, infeed control, or point-to-point positioning.

The ABB MicroFlex e100 can be integrated with the NextMove e100 motion controller which integrates management of a real-time Ethernet network of drives for multi-axis motion control solutions.

Highlights

- Brushless servo drive with onboard Ethernet POWERLINK for real-time control
- Integrated Ethernet 2 port hub allows simple daisy chaining connection
- CAN in automation (CiA) DS402 positioning drive profile
- CANopen port with network manager function for low cost I/O expansion
- Control of rotary and linear servo motors



- Direct-on-line single-phase 105-250 V AC or 3-phase 230 V AC
- 3, 6 or 9 A continuous with 2x overload for 3 seconds.
- Universal encoder interface supporting: incremental encoder, BiSS, synchronous serial interface (SSI), EnDat v2.1/v2.2 and 1V Sin/Cos encoders
- Panel-mounting enclosure
- 4 digital inputs. Opto-isolated 24V. Two inputs can be programmed to capture axis position within one micro-second
- 2 digital outputs. Opto-isolated 24V PNP. 50 mA per channel
- Auto-tuning wizard and software oscilloscope facilities via MINT Workbench for Windows
- Notch filters to eliminate mechanical resonance
- LED status indicators for error and communications notification
- USB port for configuration
- ActiveX libraries supplied free of charge

Feature	Advantage	Benefit
Ethernet POWERLINK	Real-time control single Ethernet cable – no need for additional Fieldbus. High speed real time communications	Reduced hardware requirements, less cabling, reduced system design requirements and cheaper cabling solutions
MINT Lite motion control	Simple motion programming	Powerful MINT multi-tasking software. Motion capability including linear motion, indexing, registration and more
External 24 V logic supply	Support the control electronics even when the main power is off	Maintain present positional information in a power outage. Allows immediate restart without the need to datum
Built-in brake chopper	On-board braking capability	More dynamic movements possible
Motor feedback - universal encoder	Ability to interface with all industry standard feedback devices	No need to alter present preferred feedback device on site
USB and serial communications	USB for configuration and customer PC	Improved application interfaces (supported by free ActiveX components). RS485 serial comms for PLC, HMI or other device communications
CANopen Port	Simple expansion port for additional I/O etc.	CANopen network manager allows the drive to expand the system I/O via the drive

ABB motion control drive

MicroFlex e100

Motor control, AC vector and scalar modes

Ethernet POWERLINK solution

105/250 V 1-phase and 3-phase supply

Frame size	H mm	W mm	D mm	Weight Kg
IP20	180	80	157	1.5

The drive comes in one frame size, IP20 and 3, 6 and 9 A rms with 200 percent for 3 s.



Options available

The drive comes complete, including all of the items it requires to operate.

The following options are available to allow system integration:

- Brake resistors
 - RG56 44 W regen resistor for use with 3 A MicroFlex
 - RG39 100 W regen resistor for use with 6 A and 9 A MicroFlex
- CANopen I/O extension
- Ethernet cables
- Footprint EMC filters
- Force vent fan kits

ABB motion control drive

MotiFlex e100

Motor control, AC vector and scalar modes

Ethernet POWERLINK solution

180/528 V 3-phase supply

What is a MotiFlex e100 servo drive?

The ABB MotiFlex e100 is part of the e100 real-time Ethernet POWERLINK solution from ABB. System architecture is simplified by a single, highly configurable drive and motion control platform.

The drive is designed to control a wide range of motion applications from simple point-to-point motion to more complex applications. POWERLINK offers real-time control of many axes and Modbus TCP and Ethernet RAW offer a wide variety of control possibilities with PLCs, industrial PCs and other controllers.

Where can it be used?

The ABB MotiFlex e100 can be used as a single axis machine controller, fully programmable in MINT and with Ethernet connectivity, on board I/O and serial port for a simple HMI interface. Suitable for applications requiring cut-to-length, infeed control or indexing.

For more complex motion a plug-in controller for MotiFlex provides coordinated motion of up to four e100 drives and one analogue axis.



Highlights

- Integrated hub for simple ‘daisy chain’ of Ethernet between drives and controller
- TCP/IP Ethernet operation for less demanding applications
- Rotary or linear brushless servo motors with 200 percent and 300 percent overloads for dynamic control
- Closed loop AC vector motor control with 150 percent / 60 s overload mode
- V/Hz operation (open loop control)
- Universal encoder interface supporting: incremental encoder, synchronous serial interface (SSI), EnDat v2.1/ v2.2, 1V Sin/Cos and BiSS encoders. Optional resolver interface and secondary encoder interface for dual loop control via option cards

Feature	Advantage	Benefit
Ethernet POWERLINK	Real-time control single Ethernet cable – no need for additional Fieldbus. High-speed real-time communications	Reduced hardware requirements, less cabling, reduced system design requirements and cheaper cabling solutions
MINT Lite motion control	Simple motion programming	Powerful MINT multi-tasking software. Motion capability including linear motion, indexing, tuning, registration and more
External 24 V logic supply	Support control electronics even when the mains power is off	Maintain present positional information in a power outage. Allows immediate restart without the need to datum
Built-in brake chopper	On-board braking capability	More dynamic movements possible
Motor feedback - universal encoder	Ability to interface with all industry standard feedback devices	No need to alter present preferred feedback device on site
USB and serial - communications	USB for configuration and customer PC	Improved application interfaces (supported by free ActiveX components). RS485 serial comms for PLC, HMI or other device communications
CANopen Port	Simple expansion port for additional I/O etc.	CANopen network manager allows the drive to expand the system I/O via the drive
Two expansion slots	Plug in options available	Allow onboard expansion of analogue and digital I/O Also allows the drive to have a MINT controller plugged in
Plug in MINT Motion controller	On-board motion controller	Cost effective motion controller for medium sized projects. The MINT module can be used to control the host drive and up four other drives (five axis in total)
DC bus connection	Connect an existing DC bus system directly to the drive	Easy integration into high performance machines, allow regeneration onto the DC bus network, reducing losses to the overall system

ABB motion control drive

MotiFlex

Motor control, AC vector and scalar modes

Ethernet POWERLINK solution

180/528 V 3-phase supply

Frame size	H mm	W mm	D mm	Weight Kg
A	350	79	260	1.9 to 5.8
B	350	129	260	6.5
C	362	212	260	12.45

The drive comes in three frame sizes, IP20 and is rated, from 1.5 to 65 A rms with variable overloads

Size A : 1.5, 3.0, 6.0, 10.5, and 16 A rms

Size B : 21.5, and 26 A

Size C : 34.5 and 65 A

Options available

- Analogue I/O +/-10V 16-bit. 4 In, 4 Out
- Digital I/O 12-24V operation. 6 digital inputs and 4 digital outputs
- Encoder, resolver, scalable encoder modules
- Encoder management brackets
- Dual axis programmable MINT Machine Module
- Multi-axis programmable MINT Machine Module
- Fieldbus gateway carrier card, which allows interface to many industry standard fieldbus interface modules, including:
 - DeviceNet
 - Profibus DP
 - Modbus RTU
 - Ethernet/IP
 - Modbus TCP
 - Profinet I/O
- DC busbar kits
- Line reactors

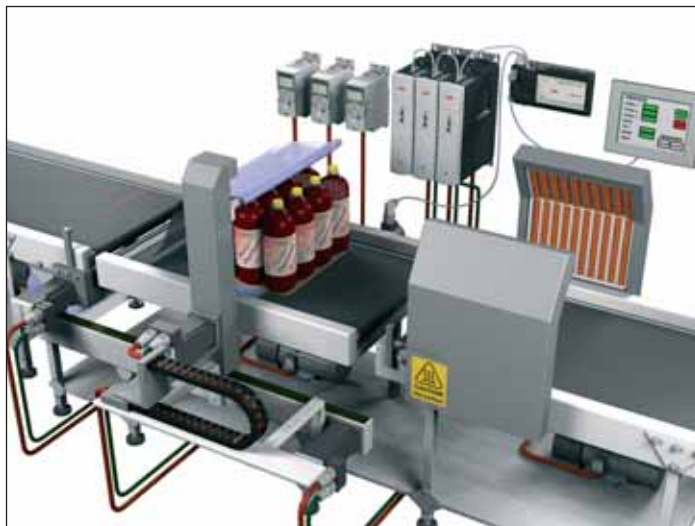


ABB motion control drive

MicroFlex e150

Motor control, AC vector and scalar modes

Ethernet POWERLINK solution

105/250 V 1-phase and 3-phase supply

What is a MicroFlex e150 servo drive?

The ABB MicroFlex e150 servo drive combines Ethernet technology, advanced multi-tasking programming and single-phase operation in a compact package.

Ethernet and motor encoder feedback interfaces are fully integrated and optimised for demanding motion applications.

Safe torque-off is a standard feature, to meet the new European machinery directives.

ABB MicroFlex e150 is ideally suited to integration with the AC500 PLC line with EtherCAT or Modbus TCP control.

Where can it be used?

The integrated Ethernet interface offers EtherCAT for real-time control of multi-axis systems. In addition, EtherNet/IP™, Modbus TCP and RAW Ethernet are supported to enable control possibilities with other controllers such as PLC and industrial PCs.

The intelligent drive offers MINT programming as standard. MINT is a high-level multi-tasking language, tailored for motion applications. This powerful but simple programming language within MINT WorkBench provides control of communications, logic, motion and HMI interactions to solve a variety of applications such as labellers and flying shears.

Highlights

- Embedded Ethernet including EtherCAT, Modbus/TCP and Ethernet/IP
- EtherCAT conformance certified by ETG



- Advanced MINT programming as standard
- Safe torque-off (STO) as standard - to IEC 61800-5-2, SIL3 PL e
- 2 / 4 wire RS485 with optional termination and Modbus RTU support
- MINT Workbench provides configuration via USB or Ethernet TCP/IP
- AC servo drive 3, 6 or 9 A with 200 percent overload
- Single or three-phase 105 - 250 V AC operation (maximum limits)

Feature	Advantage	Benefit
Safe-torque off (STO)	Built in machine safety features to SIL3 PL e.	Able to integrate into safety systems without extra equipment
Ethernet POWERLINK	Real-time control single Ethernet cable – no need for additional Fieldbus. High-speed real-time communications	Reduced hardware requirements, less cabling, reduced system design requirements and cheaper cabling solutions
MINT motion control	Advanced motion programming	Powerful MINT multi-tasking software. Motion capability including linear motion, indexing, tuning, registration and more
External 24 V logic supply	Support control electronics even when mains power is off	Maintain present positional information in a power outage. Allows immediate restart without the need to datum
Built-in brake chopper	On-board braking capability	More dynamic movements possible
Motor feedback - universal encoder	Ability to interface with all industry standard feedback devices	No need to alter present preferred feedback device on site
USB and serial - communications	USB for configuration and customer PC	Improved application interfaces (supported by free ActiveX components). RS485 serial comms for PLC, HMI or other device communications
CANopen port	Simple expansion port for additional I/O etc.	CANopen network manager allows the drive to expand the system I/O via the drive

ABB motion control drive

MicroFlex e150

Motor control, AC vector and scalar modes

Ethernet POWERLINK solution

105/250 V 1-phase and 3-phase supply

Frame size	H mm	W mm	D mm	Weight Kg
IP20	180	80	157	1.5

The drive comes in one frame size, IP20 in construction and comes in three ratings, 1, 3, 6 and 9 A rms with 200 percent for 3 s.

Options available

The drive comes complete, including all of the items it requires to operate.

The following options are available to allow system integration:

- Expansion I/O and simulated encoder outputs
- Forced cooling options
- Brake resistors
 - RG56 44 W regen resistor for use with 3 A MicroFlex
 - RG39 100 W regen resistor for use with 6 A and 9 A MicroFlex
- CANopen I/O extension
- Ethernet cables
- Footprint EMC filters

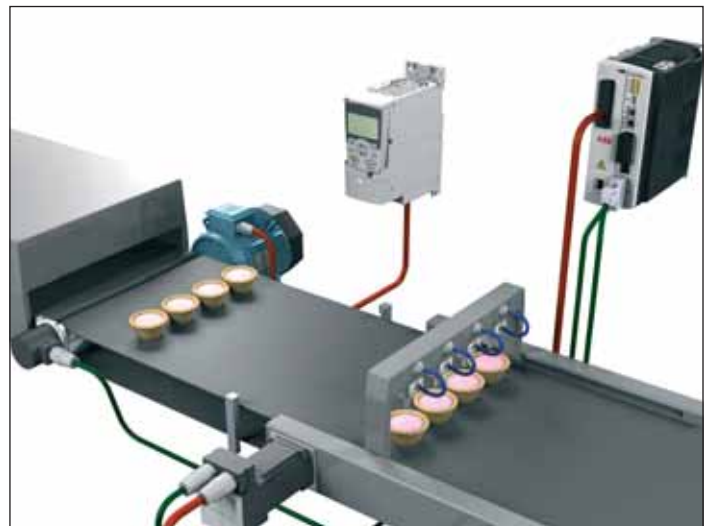
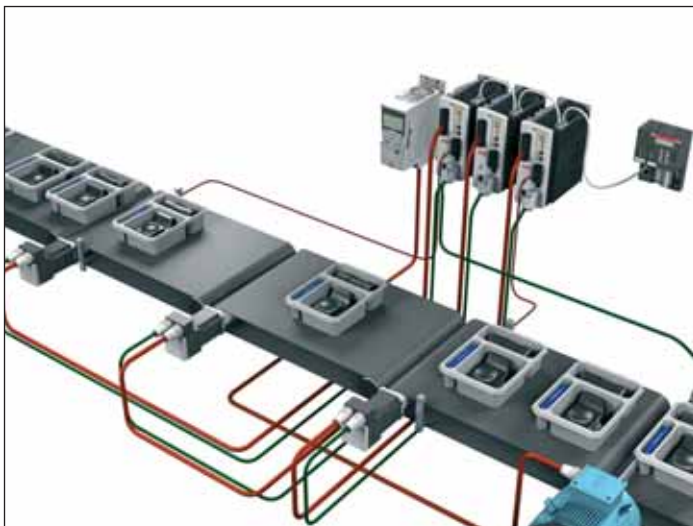


ABB motion control products

NextMove e100 real-time Ethernet motion controller
NextMove ESB-2 high performance motion controller
MINT Machine Module

ABB motion controllers

ABB offers a range of motion control modules. The NextMove ESB-2 motion controller is an analogue controller; the NextMove e100 predominantly interfaces using Ethernet POWERLINK. The MINT Machine Module plugs into the top of a MotiFlex e100 drive and offers a local five-axes motion controller. The motion controllers are suitable for a range of different applications. Motion controllers are available in PCI format, as standalone units with USB, CANopen, serial and Ethernet interfaces and as intelligent programmable drives for use in single or multi-axis systems.

The NextMove ESB-2 high performance motion controller

NextMove ESB-2 is a compact panel mount motion controller for the control of up to 8 axes - 4 servo, 4 open loop stepper. NextMove ESB-2, coupled with MINT motion programming, offers a high speed and flexible motion controller. On board I/O can be used to control many parts of the machine. This can be further expanded with ABB's range of CAN I/O modules operating over the CAN bus, or alternatively, CANopen devices conforming to the standard DS401 I/O profile.

NextMove e100 high performance motion controller

The NextMove e100 builds on the proven NextMove controller family of products, integrating the management of real-time Ethernet using the industry standard protocol Ethernet POWERLINK. Drives, I/O devices, sensors, absolute encoders can all be added to the POWERLINK network and controlled from the MINT programming language. This greatly simplifies system design and installation, and simultaneously expands the capabilities of the NextMove e100 as a machine control platform.

MINT Machine Module

The MINT machine module transforms MotiFlex e100 drives into powerful intelligent drive systems. It assumes complete control of the drive on-board I/O, communications and networking features, allowing the design of five-axis control in a compact local module.

Highlights – NextMove ESB-2

- Panel mount configuration with two-part connectors and D-type connector for encoder connections
- 1 MB SRAM for user programs and data
- 1 MB FLASH for firmware and user program storage
- 32 kB FRAM for non-volatile parameter storage
- Product variants available for 3 or 4-axes of servo control and 4-axes of stepper control. MicroFlex can be used in step



ESB-2 Motion controller



NextMove e100



Mint Machine Module

- and direction mode for additional 'open loop' servo axis
- 20 PNP/NPN opto-isolated digital inputs
Programmable for hardware limits, home input, stop input and error input. Four of the inputs can be programmed for high speed capture of position with one microsecond
- 12 PNP opto-isolated digital outputs
- 24 V/150 mA relay output to signal system error conditions
- 2 x 12-bit analogue inputs
- 12-bit analogue output for 3-axes variant
- Two auxiliary encoder interfaces for position following or position verification with 3-axes servo variant. One additional auxiliary encoder interface for 4-axes servo variant
- USB programming interface
- RS232 (115,200 baud) and (optional RS485)

ABB motion control products

NextMove e100 real-time Ethernet motion controller

NextMove ESB-2 high performance motion controller

MINT Machine Module

- CAN interface for I/O expansion and HMI interfaces. Can be used to provide full peer-to-peer networking capabilities with other MINT based controllers
- Multi-tasking programming capability with MINT-MT. Number of tasks limited only by available memory
- Comprehensive move types including: linear, circular and helical interpolation; software cams; flying shears; splines; synchronization with positional offsets and virtual axes
- ActiveX libraries supplied free of charge
- Compatible with MINT NC and HPGL
- RoHS compliant

Highlights – NextMove e100

- Ethernet POWERLINK for real-time control of up to 16 axes of interpolated motion
- Control of additional Ethernet POWERLINK devices, including drives, I/O and encoders
- Compatible with MicroFlex e100 - providing a complete motion control solution
- Integrated Ethernet hub for ease of wiring - simple daisy chain units together
- Panel mount configuration with two part connectors
- 32-bit 120MHz Digital Signal Processor
- 1MB SRAM for user programmes and data
- 1MB FLASH for firmware and user programme storage
- 32kB FRAM for non-volatile parameter storage
- Onboard control for 3 axes of servo (+/-10V interface) & 4 axes of stepper (pulse and direction)
- 20 uncommitted PNP/NPN opto-isolated digital inputs
Programmable for hardware limits, home input, stop input and error input. 4 of the inputs can be programmed for high speed capture of position within 1 microsecond
- 12 uncommitted PNP opto-isolated digital outputs
Programmable for drive enable and high speed position compare output.
- 4 V/150 mA relay output to signal system error conditions

- 2 x 12-bit uncommitted analogue inputs
- Uncommitted 12-bit analogue output
- RS232 & RS485 (User selectable. 115,200 Baud) and USB programming interfaces
USB drivers compatible with Windows 2000/XP
- CAN interface for I/O expansion and HMI interfaces. Can be used to provide full peer-to-peer networking capabilities with other MINT based controllers
- Multitasking programming capability with MINT. Number of tasks limited only by available memory
- Comprehensive move types including: linear, circular and helical interpolation; software cams; flying shears; splines; synchronisation with positional offsets and virtual axes
- ActiveX libraries supplied free of charge
- Compatible with MintNC and HPGL

Highlights – Mint Machine Module

- Plug-in intelligent drive module for machine control
- Powerful MINT® multitasking programming
- CANopen manager for system expansion
- Non-volatile RAM for user data storage and Flash program storage
- Control of one auxiliary closed loop analogue axis
- Compact solution, requiring less panel space and wiring
- Elimination of external controller or PLC saving cost and reducing complexity
- Real-time Ethernet technology
- CAN interface for I/O expansion and HMI interfaces. Can be used to provide full peer-to-peer networking capabilities with other MINT based controllers
- Multitasking programming capability with MINT.
- Comprehensive move types including: linear, circular and helical interpolation; software cams; flying shears; splines; synchronisation with positional offsets and virtual axes
- ActiveX libraries supplied free of charge
- Compatible with MINT-NC and HPGL

ABB motion control products

NextMove e100 real-time Ethernet motion controller

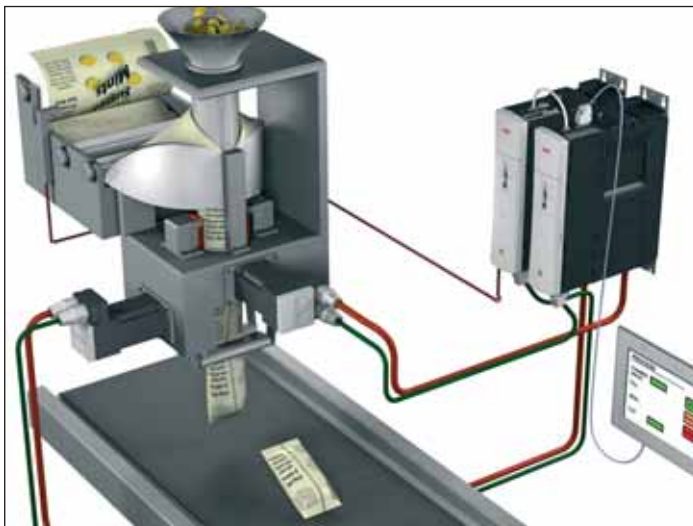
NextMove ESB-2 high performance motion controller

Mint Machine Module

Main features

	NextMove ESB-2	NextMove e100	MINT Machine Module
Physical Format	Panel Mount		Plug-in controller for MotiFlex e100
Number of axis	7	16	4 x Ethernet + 1 x analogue
Servo axis	3 or 4	3	5
Stepper axis	4	4	-
Battery backup	No	No	No
Non-volatile memory	32 kB FRAM	32 kB FRAM	32 kB FRAM
RS232 ports	1	Yes (5)	none
RS485 ports	optional	Yes (5)	xxx
USB ports	1	1	1 (via drive)
CAN ports	1	1	1 (via drive)
Digital inputs	20	20	4
Opto-isolated	PNP/NPN	PNP/NPN	PNP/NPN
High speed position inputs	4 (1)	4 (1)	2
Digital outputs	12	12	4
Opto-isolated	PNP	PNP	PNP
High speed position compare outputs	4 (3)	4 (3)	0
Analogue outputs	4	4	1
Analogue inputs	2	2	0
Relay outputs	1	1	0
Master encoder inputs	1 or 2 (4)	0-3 (6)	1
RoHS compliant	Yes		Yes

- (1) Shared with the digital inputs. First four inputs can be used for position latching to within 1µs
- (2) One fast latch to within 1µs. 3 to within 1ms.
- (3) Uses first four digital outputs for fast position compare.
- (4) Two available with three-axis servo unit. One available with four-axes servo unit.
- (5) RS232/485 switch selectable
- (6) NextMove e100 has 3 encoder inputs for analogue axes which can be used as master encoders



Programmable logic controllers (PLCs)

AC500-eCo PLC

What is an AC500-eCo PLC?

The AC500-eCo from ABB is a range of scalable PLCs offering unrivalled cost effectiveness for modern industrial automation applications where small-scale PLC solutions often represent the ideal solution. These extremely compact, entry-level PLCs offer the most flexible and economical configuration available, low cost and straightforward servicing and all of the requirements of a modern control system for small applications – without compromising on power and support.

Highlights

- 128 kB user memory makes programme optimisation obsolete
- Programme processing time 0.1 µs/ instruction provides the performance your application needs
- RS485 communication with additional Ethernet port
- CoDeSys programming environment across the entire AC500 range
- All analogue inputs on CPU PM564 can be configured as digital inputs to allow for individual customer solutions
- AC500-eCo comes with an easily integrated network configuration based on CoDeSys - ultimately saving time and money
- An integrated serial interface parameterised as a Modbus master/slave or CS31 master provides an easy means of exchanging data. A second serial interface and SD card holder can optionally be attached
- IEC 61131-3 compliant programming software as standard



Feature	Advantage	Benefit
128 kB memory capacity	Programmers can create a plethora of functions and function blocks, variables and data from the running programme	Flexible programming
Fieldbus	Extensive range of industrial fieldbus option modules available	Connects to Modbus RS485, ASCII and upgrade to Ethernet TCP/IP
CoDeSys programming	Masks created within the programming system can be utilised in all operational forms without having to be modified	Allow the user to eliminate many costly PLC's in their architectures
Extensive support of communication protocols	CS31, Modbus RTU, RCOM, Ethernet and Internet	Can be connected to a wide range of machinery
ABB PS501Control Builder Plus	Single smart engineering tool to help make programming simple	Makes installation and commissioning much faster
Convenient diagnostic and debugging	Smart online diagnostic and debugging for simple online use, multiple watch lists offering superior overview	Issues can be recognised quickly helping to maintain performance levels
CPU flexibility	Upgrading CPU modules lets operators increase the processing performance while other PLC parts remain untouched	Future proofing installation as performance can be enhanced at a later stage

Programmable logic controllers (PLCs)

AC500 PLC

What is an AC500 PLC?

The AC500 PLC range offers latest generation levels of performance and scalability. It also supports most industry standard communications variants making it an ideal solution for multi-protocol or multi-domain fieldbus environments. The PLC is a very flexible range which offers different levels of CPU performance in a simple product portfolio without the need to supply several disparate platforms to support the same range of applications. This also means that upgrades to meet increasing system performance demands are extremely simple and low cost. The PS501 Control Builder programming software provides a standard programming package for the whole platform.

Highlights

- Scalable control
- Wide choice of communication and fieldbus couplers
- User-selectable coupler types for simultaneous operation
- Fast replacement thanks to plug-in modules
- A single software package for the entire range
- Seamless integration of control system and field devices
- Attractive price-performance ratio

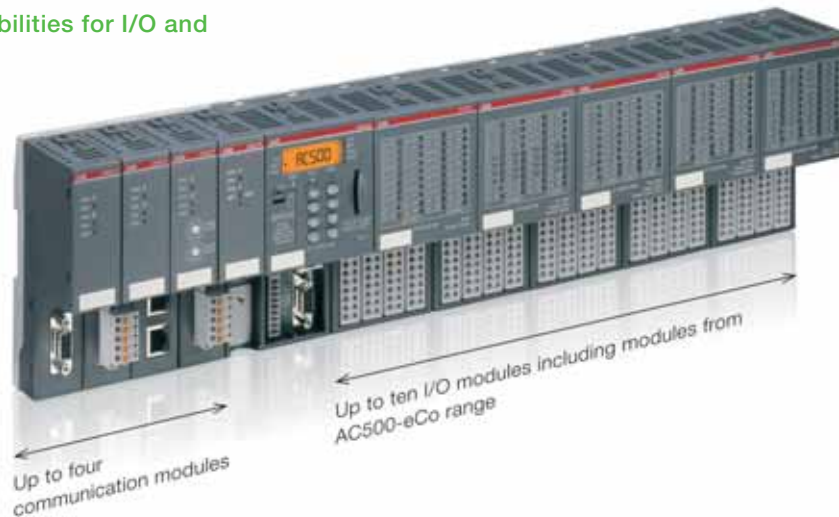


Feature	Advantage	Benefit
Huge memory capacity	Programmers can create a plethora of functions and function blocks, variables and data from the running programme	Improved flexibility and performance
Fieldbus	Extensive range of industrial fieldbus option modules available	Connectability to all of the most popular fieldbuses in use
Web server for remote control	Global access and easy maintenance of the system	User can get information about the system at any given time
Extensive support of communication protocols	PROFINET, PROFIBUS DP, CANopen, DeviceNet, CS31, Modbus RTU, RCOM, Ethernet and Internet, EtherCat	Can be connected to a wide range of machinery
ABB PS501Control Builder Plus	Single smart engineering tool to help make programming simple	Makes installation and commissioning much faster
Convenient diagnostic and debugging	Smart online diagnostic and debugging for simple online use, multiple watch lists offering superior overview	Issues can be recognised quickly helping to maintain performance levels
CPU flexibility	Upgrading CPU modules lets operators increase the processing performance while other PLC parts remain untouched	Future proofing installation as performance can be enhanced at a later stage

Programmable logic controllers (PLCs)

AC500 PLC

Local extension capabilities for I/O and communication



AC500 CPU: High-level functionality and industry leading performance with extensive range of communication modules and industrial interfaces

1. Terminal base:

- Easy snap-on of CPU and optional communication module
- CPU performance upgrade is convenient and fast
- Pre-wiring of CPU connections

2. Communication module:

- Up to four modules in numerous combinations to communicate with nearly everything

3. FieldBusPlug connector:

- Slaves for Profibus DP, CANopen, DeviceNet

4. Onboard Ethernet (optional)

- Programming via PC
- SMTP e-mail, FTP file transfer, HTTP web server, SNTP time synchronisation, DHCP IP address assignment, socket programming for project-specific protocols, IEC60870-5-104 for substation automation, PING request and reply, DNS

5. COM2 (Sub-D9, RS232/RS485)

- Programming via PC
- ASCII protocol
- Modbus-RTU (master or slave)

6. COM1 (spring terminal, RS232/RS485)

- Programming via PC
- CS31 bus (master)
- ASCII protocol
- Modbus-RTU (master or slave)



Programmable logic controllers (PLCs)

AC500-XC

What is an AC500-XC PLC?

AC500 is ABB's highly scalable PLC, offering many different I/O, all major fieldbus interfaces and a wide range of powerful CPU modules. The AC500-XC is designed for indoor or outdoor extreme conditions (XC) and is capable of withstanding harsh environments during operations and storage. Suitable markets include marine, wastewater, solar, high-altitude, cold and high-humidity areas. Built-in internet technology allows remote maintenance and remote programming.

Highlights

- Extended operating temperature
 - operating temperature -30°C up to +70°C (two couplers, regular mounting, display readable above 0°C)
 - reliable system start at -40°C
- Extended immunity to vibration
 - 4 g root mean square random vibration up to 500Hz
 - 2 g sinusoidal vibration up to 500Hz, including SD-Card
- Extended immunity to hazardous gases and salt mist
 - G3 as often requested by water treatment
 - 3C2 immunity for chemical gases
 - Salt mist EN 60068-2-52 / EN 60068-2-11
 - Hazardous gases from the standard IEC60721-3.3 3C2 mean for example:
 - H2S - SO2/S
 - Cl2 - NOX
- Use at high-altitudes
 - Operating altitude up to 4.000m above sea level
- Extended EMC requirements
 - EN 61000-4-5 Surge immunity test
 - EN 61000-4-4 Transient / burst immunity test



Feature	Advantage	Benefit
No expensive housing	PLC works in simple cabinet designs	Lower cost
Expensive extras removed	Sealings at cable entrance and doors not required. PLC free from oil, wear and tear HVAC panel not required Cabinets free from EMC shielding springs	Avoids brittle sealings Lower environmental impact Lower energy and maintenance costs Reduced EMC protection
Mechanical and electrical specs	Same as for AC500 series	Re-use cabinet layouts and wiring harnesses Training requirements lower
Compatible functionality	Same as for AC500 series	Less training as configuration, programming and commissioning are identical

Programmable logic controllers (PLCs)

AC500-S

What is an AC500-S PLC?

AC500-S is the new safety PLC that fulfills the highest safety requirements and standards. The PLC is TÜV certified up to SIL3 (IEC62061) and PL e (ISO13849). Separate safety and non-safety application programming provides flexibility and scalability for customised solutions by using the complete AC500 CPU range.

ABB's new AC500-S safety PLC sets new standards in the field of safety engineering by bringing a powerful set of functions for trigonometric operations, including COS, SIN, TAN, ASIN, ACOS and LOG. The PLC is suited for tasks such as the creation of safe motion control systems for cranes, hoists and a vast array of automated machinery.

Highlights

- SIL3 (IEC 62061, IEC 61508) and PL e (ISO 13849) certified
- Safety I/O modules are certified up to SIL3 (IEC 62061, IEC 61508) and PL e (ISO 13849)
- Standardised architecture makes adding safety functionality to existing application easy - simply plug AC500-S modules onto the busbar alongside other AC500 components
- Features same easy-to-learn programming environment – based on CoDeSys – for safety and non-safety application programming
- Suitable for creating safe motion control systems for cranes, hoists and a vast array of automated machinery



Feature	Advantage	Benefit
Easy to install	Pluggable in standard AC500 terminal bases without any wiring or installation effort.	Fast and low cost installation.
Easy to commission	Various diagnostics messages.	Reduces commissioning time and costs.
Easy to program	Configuration and programming via one Ethernet interface. Direct data mapping between safety and non-safety CPUs.	Allows quick and easy access to the CoDeSys programming environment. Simplifies data exchange and programming efforts which saves engineering time and costs.
Easy to maintain	Download of firmware and/or user program via SD card.	No need for an additional programming tool - reduces maintenance time and costs.
Easy to protect	User program protection.	Saves intellectual property and investments.

PLC and controller

Scalable AC500 PLC and Pluto safety controller

Automation with AC500

Easy to learn

Providing all the advantages you would expect from a modern automation system, the AC500 family delivers an impressive set of powerful programming features. In addition, the use of a common CoDeSys-based programming system for the entire AC500 family, makes it easy to learn and configure.

Easy to program

The IEC 61131-3 compliant programming software makes the automation system easy to programme. Based on the AC500 concept, all existing AC500 libraries are compatible and immediately available for use within the complete AC500 CPU range.

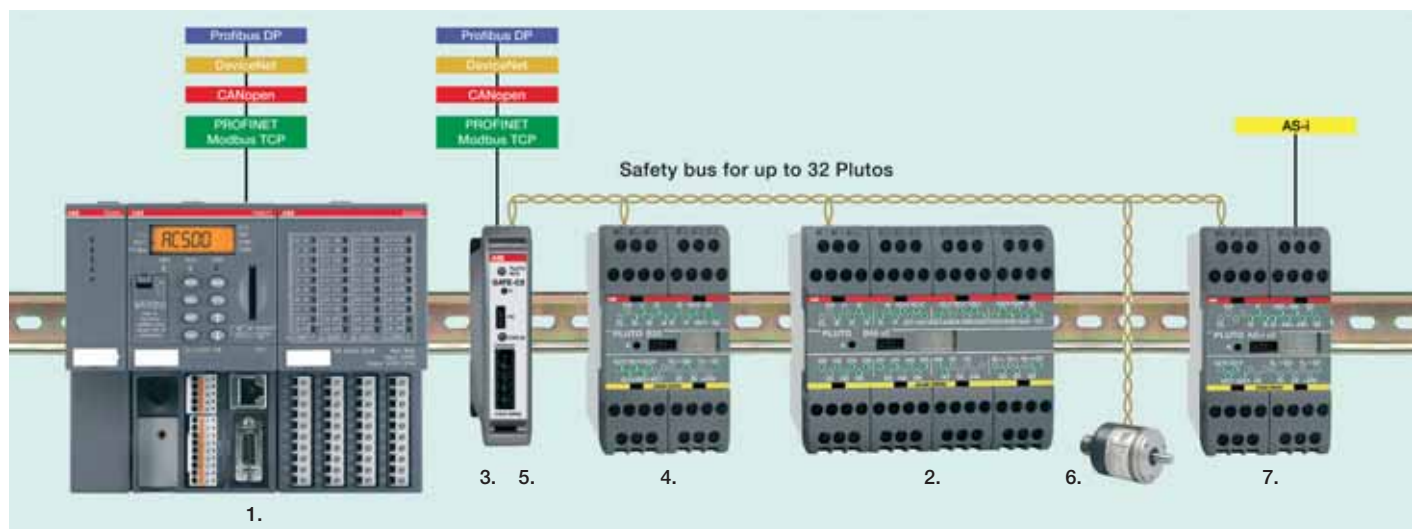
Easy to commission

ABB's advanced simulation mode allows programmes to be debugged without the need for PLC hardware, thereby reducing on-site testing requirements. ABB's user-configurable I/O system provides the flexibility to make decisions and modifications right up to the last minute. Likewise, a graphical diagnosis environment speeds up commissioning to keep you on schedule.

Pluto Manager

Pluto is programmed in ladder-diagram format or using Boolean algebra with time units, flags, registers, sequence programming and function blocks that are certified. The Pluto Manager programming software can be downloaded from ABB's website free of charge. The safety programme can be loaded into all Pluto units in a project via one of them and the bus. For free software see www.abb.de/stotz-kontakt

1. The scalable AC500 PLC can be configured and expanded flexibly according to your requirements. Decentralised structures and simple integration into existing systems are made possible by various standard fieldbuses and Ethernet interfaces. These multifaceted communication options allow easy exchange of data between the AC500 PLC and the Pluto safety controller.
2. The Pluto safety controller is a system for dynamic and static safety circuits in which the inputs and other information can be distributed by means of a bus.
3. Gateways are used for the bilateral data transfer between Pluto and higher level controls.
4. It is possible to communicate with operator desks and other equipment via the USB/RS232 programming interface.
5. If the protocol converter is configured in bridge mode, the following are possible:
 - Optimisation of the bus length
 - Use of different bus speeds at each end
 - Filtration of data at one end to reduce the bus load at the other end
6. Absolute encoders (single-turn or multi-turn) can be connected directly to the safety bus. Thanks to the existing, certified function blocks, various safety applications can be implemented easily and conveniently.
7. Pluto AS-i is a Pluto version with an AS-i bus connection option. The controller can be used as a master, monitor or slave. Digital and analogue signals can be processed using Pluto AS-i. Safe outputs enable PI. e to be achieved in accordance with ISO 13849-1.



Human machine interface

CP600 HMI

What is a CP600 series HMI?

The CP600 series is now available in a broader range from the entry level (4.3") to the high-end panel (15"). It is highly flexible and is specifically designed for advanced applications in complex systems or processes. Using premium graphic panels created with either the PB610 engineering software or the web browser panels via the PLC web server, the CP600 series gives better information representation to ease human-machine interaction.

The engineering software is based on XML technology, enabling you to create easy intuitive graphics. Visual objects created with the Scalable Vector Graphics (SVG) are totally independent of the operating system, providing high customisation flexibility and easy integration with your automation system, as well as the easy creation of dynamic objects with configurable properties, the ability to interconnect objects, transformation or easy resizing.

Highlights

- Wide screen formats, complex operating screens can be clearly displayed and divided into sections for application control and application monitoring
- USB interface on side, for projects downloaded without connecting a computer
- Easy commissioning: all Ethernet settings of the panel are made while configuring; simply insert the system card into another device to transfer data from one device to another.
- Marine approval to use your panels in many sectors and regions : (DNV), C-tick
- Approvals : RoHS, (cUL),



Additional features of the CP600 Series:

- Data acquisition and trend presentation
- 64k colours
- User memory RAM 128 MB flash disk and 256 MB DDR
- Recipe data storage
- Multi-language applications
- Powerful macro editor using Java script based on standard
- ECMA-262 execute widgets and pages events to get more capabilities
- Alarms and historical alarm list
- Eight level password protection
- Report printing to serial printer
- Vector graphic capabilities including the support of multiple layers and object transparency
- Data display in numerical, text, bargraph, analogue gauges and graphic image formats. Dynamic object properties supported
- RSS feeds, rotating menu, scheduler.

Feature	Advantage	Benefit
XML technology	Simple to create graphic displays	Users can display information however they want, making it simple for them to interpret what is going on.
Low development cost	Users can import pages by using the 'drag and drop' symbol from the library, reducing development and maintenance costs	More productivity
CoDeSys	Produce native machine code for a large number of common processors and adhere to international industrial standard IEC61131-3	Native machine code is inherently faster and more reliable than interpreted solutions
Common interface, PS501 Control Builder Plus	Designed for efficient PLC programming according to all languages of IEC 61131-3 and Continuous Function Chart	Simple integration with a wide range of PLCs
Intuitive user guidance	Users can set up the HMI by simply following the easy to follow user guidance	Fast commissioning

Human machine interface

CP600 HMI

Dimensions and weights



	CP620 CP620-WEB	CP630 CP630-WEB	CP635 CP635-WEB	CP650 CP650-WEB	CP660 CP660-WEB	CP675 CP675-WEB
Size (inches)	4.3"	5.7"	7"	10.4"	12.1"	15"
Weight (per piece kg)	0.950	1.150	1.100	2.100	2.900	3.800
Protection class front	IP66					
Resolution	480 x 272	320 X 240	800 x 480	800 x 600	800 x 600	1024 x 768
Dimensions (L x H x D) (mm)	149 x 109 x 56	187 x 147 x 51	187 x 147 x 51	287 x 232 x 46	337 x 267 x 46	392 x 307 x 50
Cut out (mm)	136 x 96	176 x 136	176 x 136	276 x 221	326 x 256	381 x 296
CP600	Windows CE 6.0 with runtime licence for PB610 Panel Builder 600					
CP600-WEB	Windows CE 6.0 with microbrowser for AC500 WebServer					
Backlight	LED	LED	LED	LED	CCFL	CCFL
Upright installation*	Yes	Yes	Yes	No	No	No
Interfaces						
Ethernet ports number, type	2 - 100 Mbit (with integrated Switch function)			1 - 10/100 Mbit		
USB ports number, type	1 - host interface, version 2.0	2 - host interface, version 2.0	2 - host interface, version 2.0	1 - host interface, version 2.0		
Serial ports number, type	1 - RS-232, RS-485, RS-422, software confi gurable			2 - RS-232, RS-485, RS-422, software confi gurable		
Additional ports number, type	1 - Expansion slot for optional modules	2 - Expansion slot for optional modules	2 - Expansion slot for optional modules	1 - aux port		
Card slot number, type	1 - SD card slot			–		
User memory	128MB FlaDsk					
RAM	256 MB DDR					

* in preparation



Software tools

ABB offers several software tools to facilitate and enhance the use of ABB drives. Especially when straightforward routines cannot be applied, these tools provide a user-friendly and easy-to-use approach for the selection, commissioning and use of AC drives.

DriveStudio (ACSM1 and ACS850)

A user-friendly PC environment for simple drive commissioning tasks as well as more demanding drive tuning and programming tasks. DriveStudio is used with the ABB machinery drive and includes:

Start-up and maintenance tools

DriveWindow

A Windows application used for commissioning and maintenance. Functions include local control, monitoring, parameter edits, fault logging, trending, back-up and restore

- Shows actual status of the connected drive
- Edit and show the drive parameters
- Save and load drive parameters
- Back-up and restore drive parameters
- Offline configuration of drive parameters
- Read fault loggers and diagnostic data

Used with ABB industrial drives equipped with high-speed fibre optic communication, or remotely via the Internet.

DriveWindow Light

Available for ABB standard drives and ABB machinery drives, has the same functions as DriveWindow but is designed for point-to-point communication, via control panel port.



Commissioning and tuning

- Drive overview screen for fast parameter and function block navigation
- Parameter setting and signal monitoring
- Data logger and on-line signal monitoring for tuning
- Back-up and restore tool for drive parameter cloning and support

Solution programme composer

- Simple, easy-to-understand function block interface to drive firmware functions for signal monitoring and parameter setting
- Function block programming with standard function block library
- Professional programming environment: hierarchy levels, custom circuits, user parameters, copy protection etc.

DriveConfig

Dedicated programming tool for the ABB micro drive, ACS55. Allows access to the extended parameter set of ACS55 and allows un-powered programming.



Drive PM flashdrop

Drive PM (program manager) is a dedicated PC tool for use with Flashdrop. It allows parameter sets to be named and managed. Parameters and groups can be hidden for customised views for OEM users. Parameter sets can be uploaded and downloaded between PC and Flashdrop handset.

To download software tools, go to:
www.abb.com > drives > drive PC tools.

Software tools

Control Builder Plus

The PS501 Control Builder Plus enables configuration of all standard intelligent automation devices for machine builders. This covers the vital areas of programming, parameterisation, debugging and diagnostics, and network and fieldbus configuration. Parameterisation is made simple by the ability to access your networked devices from your laptop or PC connected to any node on the network. The PS501 Control Builder Plus offers huge savings in terms of time and effort compared to conventional systems, particularly for applications where a distributed arrangement of drives has been integrated into a complex control and visualisation system.

Features include:

- Combination of all of the tools you require for configuring, programming, debugging and maintaining your PLCs, drives and control panels
- Easy and fast programming
- Parameterisation including many ABB drives diagnostics setup automatically for online monitoring of inputs and outputs
- Debugging and diagnostics with multiple, comprehensive watch list
- Recipe management provide rapid factory adaptation to changed market requirements
- Internet, network and fieldbus configuration within one comfortable tool
- ABB PROFINET drives, Ethernet-PLCs and Ethernet-panels can be simply hooked up to single Ethernet
- ABB PROFIBUS or PROFINET drives connected to AC500 are all accessible by engineering tool
- Huge savings in terms of time for drives in distributed arrangement
- One single engineering tool for the entire ABB range, from AC500-eCo through the complete AC500 family.

MINT Workbench

MINT® WorkBench is a Windows-based front end which is used as a commissioning and setup tool, allowing you to tune a motor in minutes.

MINT WorkBench offers an easy to use Windows development front end for MINT programming, with its colour highlighting of keywords and context sensitive help. The Program Navigator makes it easy to navigate and organize the source code, no matter how complicated. MINT® WorkBench is suitable for ABB's range of motion control products, including; Motiflex, MicroFlex, e100 MINT, NextMove e100 and NextMove ESB-2.

Features include:

- Full screen editor with colour syntax highlighting of MINT keywords
- Command line interface to interrogate the controller even when the programme is running
- Spy window to monitor common motion variables and I/O
- Software oscilloscope - digital capture of six channels.
- Watch window for monitoring variables and tasks
- SupportMe function with automatic email generation for rapid technical support
- Web updates of firmware within the MINT WorkBench
- Easy management of firmware files
- Commissioning wizard for step-by-step setup of drive, motor and control parameters.
- Network wizard for step-by-step setup of Ethernet POWERLINK networks.

Other ABB offering for factory automation

AC drives and DC drives, electronic products and relays

Drive technology extends the motor speed range from zero to high above the rated speed, increasing the productivity of the driven process. With lower output demand, the drive reduces the machine speed and saves energy. ABB drives are available directly from ABB or through the ABB drives distribution network. www.abb.com/drives

AC drives

ABB offers a wide range of AC drives designed for various applications and industries such as the food & beverage, converting, wire drawing, mixer, extruders, test rigs, ski lifts, metals, cement, mining, pulp & paper and printing.

ABB AC drives are available as complete drives and as modules to meet the requirements of the end-users, OEMs and system integrators.

DC drives

ABB DC drives continue to be an attractive alternative for machine suppliers. The modern DC converters are easy to operate, compact and low in maintenance. DC drives can be used in most industrial applications as well as for the modernisation of old plants. ABB offers the complete portfolio of three-phase DC drives - from 9 kW up to 18 MW.

Power supplies, CP range

Modern power supply units are a vital component in most areas of energy management and automation technology. As your global partner in this area, ABB pays close attention to corresponding requirements. Innovation is the key to the substantial enlargement of its power supply product range. ABB offers four different product lines for single and three-phase supplies, output voltages 5/12/24, and 48 V DC in plastic and metal enclosure, as well as various accessories.

For more information, refer to the following brochure:
"Primary switch mode power supplies CP range"
document number: 2CDC114038B0205
www.abb.com/lowvoltage



Other ABB offering for factory automation

AC drives and DC drives, electronic products and relays

Interface relays and optocouplers, CR range and R600

Interface relays and optocouplers are widely used in various industrial applications. As an interface, they link the controller, e.g. PLC (programmable logic controller), PC or fieldbus systems to the sensor/actuator level. Here, they have various functions: switching AC or DC loads with different resistive, inductive and capacitive parts, switching voltages from a few mV up to 250 V, switching currents from a few mA up to 16 A, amplification of weak control signals, electrical isolation of control and load circuits and signal multiplying.



For more information, refer to the following brochure:
“Electronic Products and Relays - Selection Table Interface Relays CR-Range and R600 Range” document number: 2CDC110070C0201 www.abb.com/lowvoltage

Signal converters, CC range and ILPH

The ABB serial data converters allow communication to be established between units with different communication standards. In order to assure process continuity, existing systems must be updated consistently or connected to new devices. Serial data enables communication to be established if the communication standard of the existing system and the connected device vary. As well as converting signals, analogue signal converters and serial data converters can amplify, filter or separate signals.



For more information, refer to the following brochure:
“Electronic Products and Relays - Selection Table Signal Converters CC-Range” document number: 2CDC110069C0201 www.abb.com/lowvoltage

Useful engineering information

Useful servo drive calculations

Correctly rating a servo motor and drive application often involves mechanical calculations. Overleaf are typical examples of some of the commonly occurring formula that are often encountered. These are provided for general guidance only and any results may need to be modified to take into account specific application details such as mechanical losses, inclined angles and duty cycles etc.

Time to accelerate a rotating mass

$M(\text{acc})$ = Accelerate torque, Nm
 $J(\text{tot})$ = Total inertia, kgm^2
 $J(\text{mot})$ = Motor inertia, kgm^2
 $J(\text{load})$ = Load Inertia, kgm^2
 Z = Gearbox ratio (speed reducing)
 $t(\text{acc})$ = Acceleration time, sec
 α = Angular acceleration, $\text{rad}.\text{sec}^{-2}$
= Angular speed, $\text{rad}.\text{sec}^{-1}$
 n = Angular speed, rpm

$$M(\text{acc}) = J(\text{tot}) \times \alpha \text{ or } \alpha = M(\text{acc})/J(\text{tot})$$

$$\alpha = \omega/t(\text{acc}) \text{ or } t(\text{acc}) = \omega/\alpha$$

$$\omega = (n/60) \times 2\pi$$

$$J(\text{tot}) = J(\text{mot}) + (J(\text{load})/Z^2)$$

Example

$J(\text{load})$ = 0.05 kgm^2
 $J(\text{mot})$ = 5.0 kgcm^2 (= 0.00050 kgm^2)
 Z = 30:1
 n = 1500 rpm
 $M(\text{acc})$ = 15 Nm

$$J(\text{tot}) = 0.00050 + (0.5/30^2)$$

$$J(\text{tot}) = 0.00106 \text{ kgm}^2$$

$$\alpha = M(\text{acc})/J(\text{tot})$$

$$\alpha = 15/0.00106$$

$$\alpha = 14,150 \text{ rad}.\text{sec}^{-2}$$

$$\omega = (1500/60) \times 2\pi$$

$$\omega = 157 \text{ rad}.\text{sec}^{-1}$$

$$t(\text{acc}) = \omega/\alpha$$

$$t(\text{acc}) = 157/14,150$$

$$t(\text{acc}) = 0.0111 \text{ sec (11.1mS)}$$

Useful inertia formula

Servo drives are often employed in highly dynamic applications where rapid and accurate positioning is required. To obtain the ultimate performance in any system, the reflected load inertia (taking into account any gearbox or pulley ratios) should equal the motor inertia. This is often not possible, but ratio mismatches of typically 5:1 are not normally significant. The greater this mismatch between reflected load inertia and motor inertia, the lower will be the dynamic performance of the system.

Solid cylinder rotating about axis XX

$$J = (mR^2)/2$$

Hollow cylinder rotating about axis XX

$$J = m(R^2 + r^2)/2$$

Equivalent inertia of slide mass on a ballscrew

$$J = m(s/2\pi)^2$$

Effect of gear ratio on reflected inertia

$$J = J(\text{load})/Z^2$$

Torque required to produce a force on a leadscrew

M = Required torque, Nm

F = Linear force, N

Z = Gearbox ratio (speed reducing)

($Z = 1$ for direct drive)

s = Ballscrew pitch, m

η = Efficiency

$$M = Fs/2\pi R\eta$$

Example

$$F = 10,000 \text{ N}$$

$$s = 10 \text{ mm (0.01m)}$$

$$Z = 2:1$$

$$\eta = 0.9$$

$$\begin{aligned} \text{Required motor torque } M &= (10,000 \times 0.01)/ \\ &\quad (2\pi \times 2 \times 0.9) \\ &= 8.85 \text{ Nm} \end{aligned}$$

NB: The required force is often provided in kg's or kgf. This implies the force exerted on the mass by gravity (g) and must be multiplied by 9.81 to obtain the force in N (newtons); eg A "force" of 100 kg is 981 N.

Notes

Contact us

ABB Limited

Daresbury Park

Daresbury

Warrington

Cheshire

WA4 4BT

Tel: +44 (0) 1925 741 111

Fax: +44 (0) 1925 741 212

www.abb.co.uk/energy

Notes:

We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein.

Any reproduction, disclosure to third parties or utilization of its contents – in whole or in parts – is forbidden without prior written consent of ABB.

Copyright© 2012 ABB

All rights reserved

Printed in UK (12.2012)