ABB DRIVE PRODUCTS

Powering machine innovations

Servo drive and motor packages

One drive, one motor, many possibilities.

Every detail and feature is reimagined with users in mind, to deliver one of the most flexible and dynamic servo drive-motor packages available. The package helps address the most demanding needs of system integrators, OEMs and machine builders. It provides unprecedented levels of productivity and performance improvements to the smart factory of today and tomorrow.

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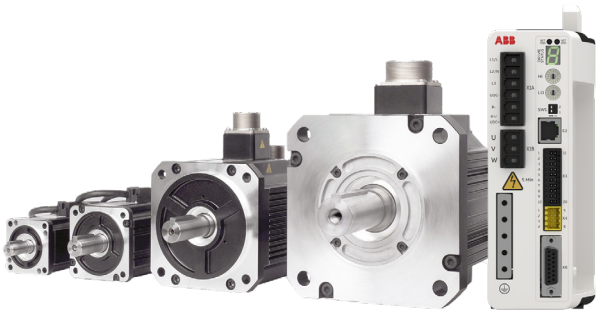
ABB highly dynamic packages



MicroFlex e190 and 220 V eSM motor package

- The package's AC operating voltage is 1-phase/3-phase 200...240 V. The DC operating voltage is 270...340 V.
- The MicroFlex e190 servo drive and 220 V eSM servo motor provide a compact and highly dynamic motion control package with matched and tested components from a single supplier.
- The package is suited to single axis intelligent applications as well as centralized motion control systems which use a controller supporting EtherCAT, POWERLINK, PROFINET IO, EtherNet/IP, and Modbus TCP/IP.
- Low inertia system, higher acceleration, shorter operating cycle.

MotiFlex e180 and 400 V eSM motor package

- The package's AC operating voltage is 3-phase 200...480 V. The DC operating voltage is 270...650 V.
- The MotiFlex e180 servo drive and 400 V eSM servo motor provide a versatile motion control package with matched and tested components from a single supplier.
- The package is suited to single axis intelligent applications as well as centralized motion control systems which use a controller supporting EtherCAT, POWERLINK, PROFINET IO, EtherNet/IP, and Modbus TCP/IP.
- High inertia system, higher torque accuracy and extremely low speed fluctuation, ensuring better product quality.

Highlights of the servo drive and motor packages

Low cost

- The package provides a lower cost of ownership through the efficient installation, commissioning, operation and maintenance. ABB's global service and support network provide high quality after sales service.
- A free license is provided for the Mint programmable drive. The memory unit authorized by the Mint Workbench is a factory standard option.

Easy to use

- The configuration, tuning and motion programming can be simplified by the commissioning tool when you use the optional motion programming function.
- Integrates two realtime Ethernet interfaces and one TCP/IP interface for commissioning and other protocols.
- Solder-free connector is easy to assemble.
- The memory unit makes it convenient to copy the firmware from the Mint Workbench to drive.
- Commissioning tool makes the configuration and machine tuning more simply.

Excellent servo performance

- The Package can operate with PTI control, analog control, or one of the selectable built-in Ethernet protocols. The drive can also act as a simple motion controller to realize easy positioning tasks and receive the feedback signal from the master (line shaft) encoder. The drive performs the Human Computer Interaction by communicating with the HMI.
- Various industry standard encoder supported to meet different application needs.
- Powerful and intelligent commissioning tool with advanced motion programming - Mint language
- Minimizes EMC-related start-up and reliability issues by providing effective and easy-to-use earth bar for EMC bonding and cable shield connection

Reliable operation

- The drive integrates the Safe Torque Off (STO) function as standard.
- The degree of protection of the motor is IP67 except for the shaft opening and connectors.
- Equipped with a high quality motor shaft.

Matched performance and typical application

MicroFlex e190 and 220 V eSM motor package

MicroFlex e190	
Voltage	1-phase or 3-phase 200...240 V AC ± 10% 270...340 V DC ± 10%
Communications	EtherCAT POWERLINK PROFINET IO EtherNet/IP Modbus TCP/IP
Degree of Protection	IP20 (cabinet installation)
Accessories	See page 28, 29
eSM Motor (220 V)	
Shaft length	25 mm, 30 mm, 35 mm, 40 mm, 58 mm
Rated torque/Peak torque	0.32...9.55 N·m/0.95...28.65 N·m
Rated speed/Max. speed	2000...3000 rpm/2800...6000 rpm
Motor Inertia	Without brake 0.04...12.14 kg·cm² With brake 0.23...12.84 kg·cm²
Various Encoder supported	T1 = Absolute, Single-turn (SmartInc), 17 bits per revolution T2 = Absolute, Multi-turn (SmartAbs), 17 bits per revolution/16 bits multi-turn
Degree of Protection	IP67 rated except for the shaft opening and connectors
Motor cables	See page 30, 31
Advantages	
Highly dynamic: Low inertia package, higher acceleration, shorter operating cycle **High speed:** Maximum speed could be 6000rpm, improve system's productivity **Small size:** Can be used in portable equipment, and meet critical installation requirements	

MotiFlex e180 and 400 V eSM motor package

MotiFlex e180	
Voltage	3-phase 200...480 V AC ± 10% 270...650 V DC ± 10%
Communications	EtherCAT POWERLINK PROFINET IO EtherNet/IP Modbus TCP/IP
Degree of Protection	IP20 (cabinet installation)
Accessories	See page 28, 29
eSM Motor (400 V)	
Shaft length	58 mm, 74 mm, 108 mm
Rated torque/Peak torque	4.8...48 N·m/14.3...119 N·m
Rated speed/Max. speed	1500...3000 rpm/3200...3500 rpm
Motor Inertia	Without brake 6.26...129.8 kg·cm² With brake 6.96...132.4 kg·cm²
Various Encoder supported	T1 = Absolute, Single-turn (SmartInc), 17 bits per revolution T2 = Absolute, Multi-turn (SmartAbs), 17 bits per revolution/16 bits multi-turn
Degree of Protection	IP67 rated except for the shaft opening and connectors
Motor cables	See page 30, 31
Advantages	
Stable operation: Higher torque accuracy and extremely low speed fluctuations ensure better product quality **Torque output:** Rated torque reaches 48 N·m **Broad range of applications:** Big power range and large range of inertias, can be used for wide range of applications	

Typical industries and applications		220 V Package - MicroFlex e190 and eSM motor (220 V)	400 V Package - MotiFlex e180 and eSM motor (400 V)
	Food and beverage	Labelling, HFFS, VFFS	VFFS Cartoners
	Metal cutting/forming	CNC laser/plasma/MMC/Lathe	CNC tube bending Drilling Metal cutting/forming
	Rubber and plastic	Plastic bag making	Plastic bag making End of line extrusion processes
	Other	Water-jet, glue-laying, pick&place, woodworking	Textiles Wood working

MicroFlex e190 and MotiFlex e180 servo drives
Technology highlights

MicroFlex e190 and MotiFlex e180 drives deliver versatile motion control performance, capability and dependability to power machine innovations. Flexible connectivity with Ethernet and motor feedback technologies is highly integrated and optimized for demanding motion applications. With the Mint Workbench commissioning tool you can quickly and easily customize the drive to the exact control requirements of your machine.

Dual encoder

Dual encoder input for position and commutation. Provides line shaft following or dual loop control to eliminate mechanical errors.

I/O-digital and analog

I/O can be used for configurable drive functions, such as enable/disable limit switches, home sensors or provide the inputs/outputs for typical machine functions (e.g. buttons) within the Mint programming.

Two high speed registration inputs

Precise registration of print marks or product position achieved with 2 x 24 V fast isolated inputs which can be used to latch feedback device position in hardware and trigger software events locally in Mint.

HMI connection via multiple Ethernet protocols

PROFINET IO, Modbus TCP/IP and EtherNet/IP provide support for HMI, PLC or upstream communication network.

Dynamic overload

3 times overload current of the rated current maximizes available torque for dynamic acceleration to 300%. The 300% peak torque delivers a faster dynamic response.

Wide range of feedback interfaces

Drive feedback options support different serial encoders (SSI, 1V pk-pk SinCos, BiSS-B, EnDat2.1/2.2, SmartAbs, Hiperface), resolver and incremental encoders. Besides DSL encoders are supported on e180 (46 A and below) to provide the single cable solution.

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Memory unit

The compact memory unit stores drive's settings, parameters and application programs. With it you can prepare drive settings off-site, manage functionality levels or copy parameters from one drive to another.

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Safety

Safe Torque Off (STO) SIL3 PLe is a standard feature. STO prevents torque from being applied at the motor shaft for machine safety applications. It eliminates the need of removing AC power supply in most applications, and minimizes the downtime and maximizes the machine utilization.

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Flexible Ethernet connectivity

Integrated Ethernet interfaces realize the connectivity with EtherCAT, PROFINET IO and POWERLINK protocols via E1 and E2 ports (simply select the required protocol by switches on the drive). In addition, EtherNet/IP, Modbus TCP/IP and socket communication are supported via the E3 port.

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Comply with the Ecodesign Regulation (EU)

The energy efficiency complies with the Ecodesign Regulation (EU) 2019/1781. Our drives play a active role in containing worldwide energy consumption and in reducing CO_2 emissions.

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Advanced motion programming

The intelligent drive offers Mint programming - a high level multitask language which is tailored for motion applications. This powerful but simple programming language is accessed by the Mint Workbench software which provides the control of the communication, logic, motion and HMI interactions.

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Rotary and linear motors

Provides precision control of rotary servo motors and linear servo motors. Universal encoder interface can be simply configured by the software to support a wide range of feedback types.

eSM motors
Technology highlights

eSM servo motors for dynamic precision motion

Thanks to its high torque density, the eSM servo motor is perfect for highly dynamic, precision motion. You can choose a single-turn or multi-turn high resolution absolute encoder to match the application requirements.
The power range of the eSM motor is 100 W to 7.5 kW, in five nominal flange sizes from 40 mm to 180 mm.

The motors are available with an optional brake and have a degree of protection of IP67 except the shaft opening and connectors. The motors with frame sizes of 40, 60 and 80 are equipped with cable outlet type connectors which are convenient for connecting. The motors with frame sizes of 130 and 220 are equipped with socket type connectors which are safe and reliable.

Compact and rugged brushless motors

Available in five flange sizes, 40 mm, 60 mm, 80 mm, 130 mm and 180 mm, with high torque density and quick dynamic response.

High reliability and efficiency combined

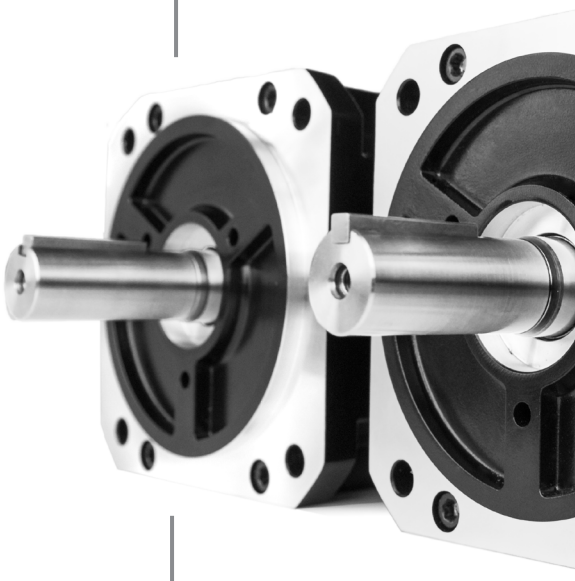
The servo motors have a high reliable, low-maintenance, and energy efficient design. Combined with the servo drives, the overall system reliability and efficiency are greatly improved.

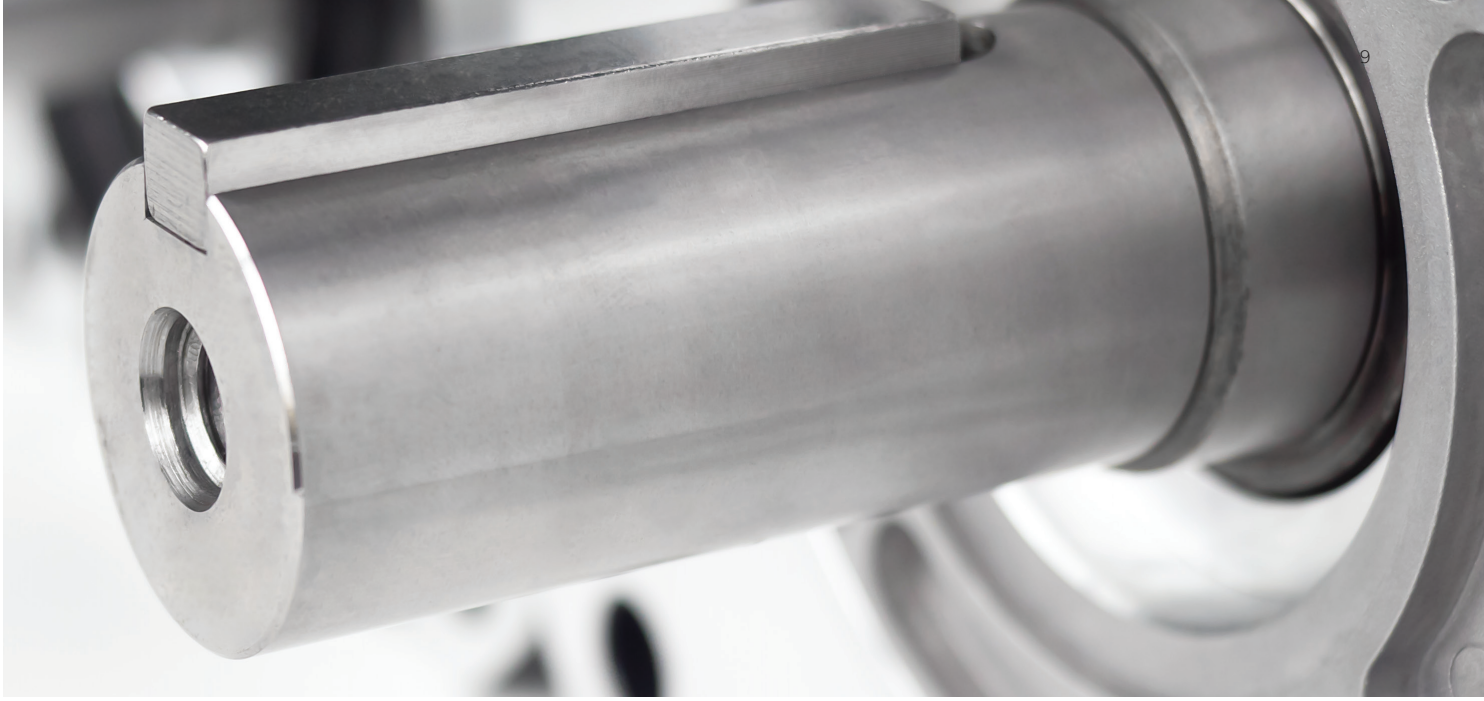
Practical installation options

The pre-assmbled cable sets fitted for all feedback types, with or without drive interface connector, provide a flexible choice of drive connection to make installation simple.

Options and configuration

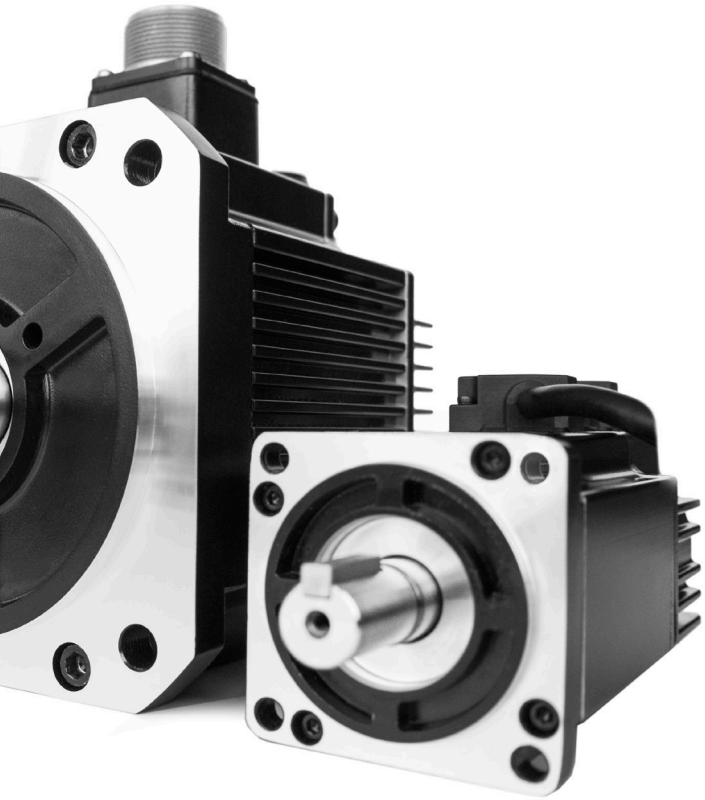
An optional 24 V holding brake is available on ESM06, ESM08, ESM13 and ESM18 motors.





International standards

eSM motors have cUL/UL, CE approvals.



Absolute precision and performance

To meet the demands of higher productivity and product quality, eSM motor digital feedback provides precise position information resulting in tighter control and lower settling times in dynamic movement. An absolute multi-turn option can eliminate homing cycles, reducing machine set-up time.

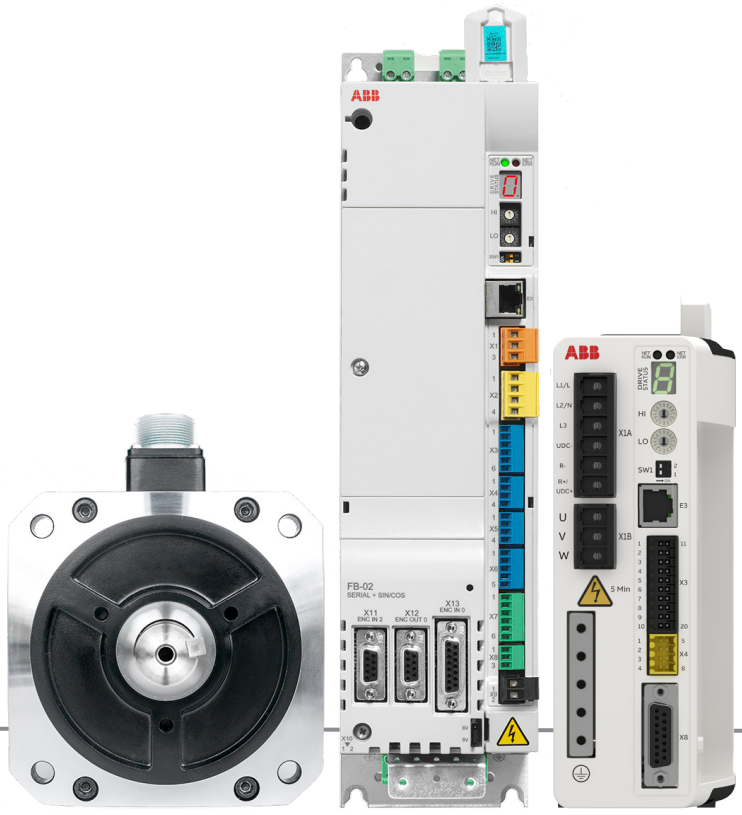
Dynamic performance

The wide ranges of the rated power from 100 W to 7.5 kW and continuous torque from 0.32 N·m to 48 N·m provide flexible choice for you.

Capable of yesterdays, todays and tomorrows control methodologies

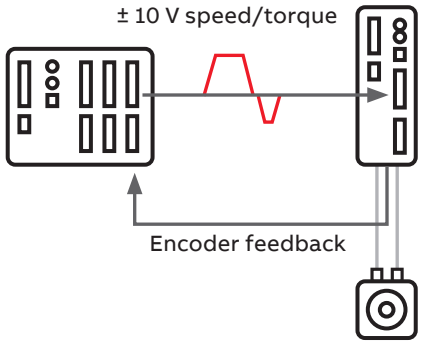
MicroFlex e190 and MotiFlex e180 both provide expanded solutions that adapt to many different control modes. Operating with the PTI control, analog control, or one of the selectable built-in Ethernet protocols the e190 and e180 are a versatile choice for solving different levels of machine control.

The e180 and e190 can also act as a simple motion controller to realize easy positioning tasks and receive the feedback signal from the master (line shaft) encoder. The drive performs the Human Computer Interaction by communicating with the HMI, thus forming a complete control system.



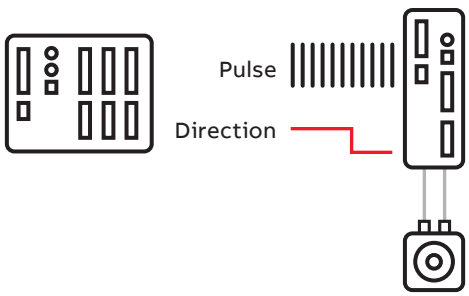
Analog control

- ±10 V torque or speed setpoint
- Encoder frequency dividing output



Pulse Train Input (PTI) control

- Pulse and Direction interface
- 5 V differential (via 2nd encoder)
- 24 V single end (via fast inputs DI1 and DI2)



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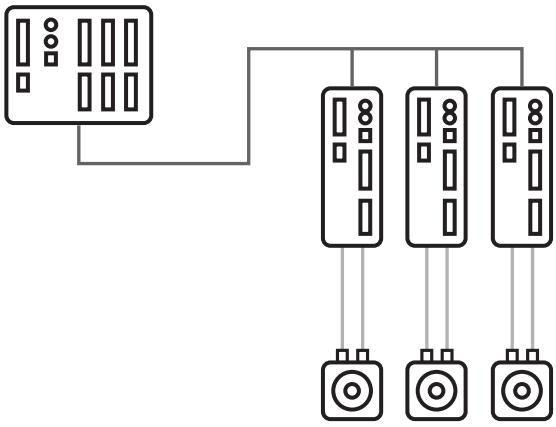
Ethernet control

- EtherCAT
- POWERLINK
- PROFINET IO
- EtherNet/IP
- Modbus TCP/IP



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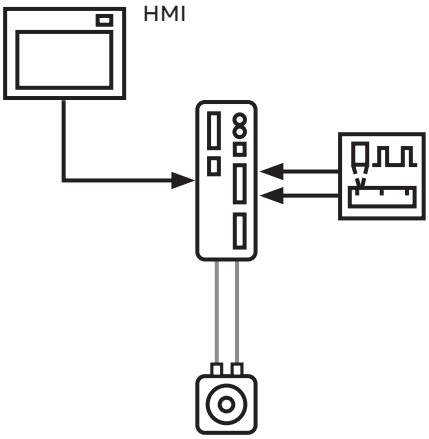
Programmable motion drive

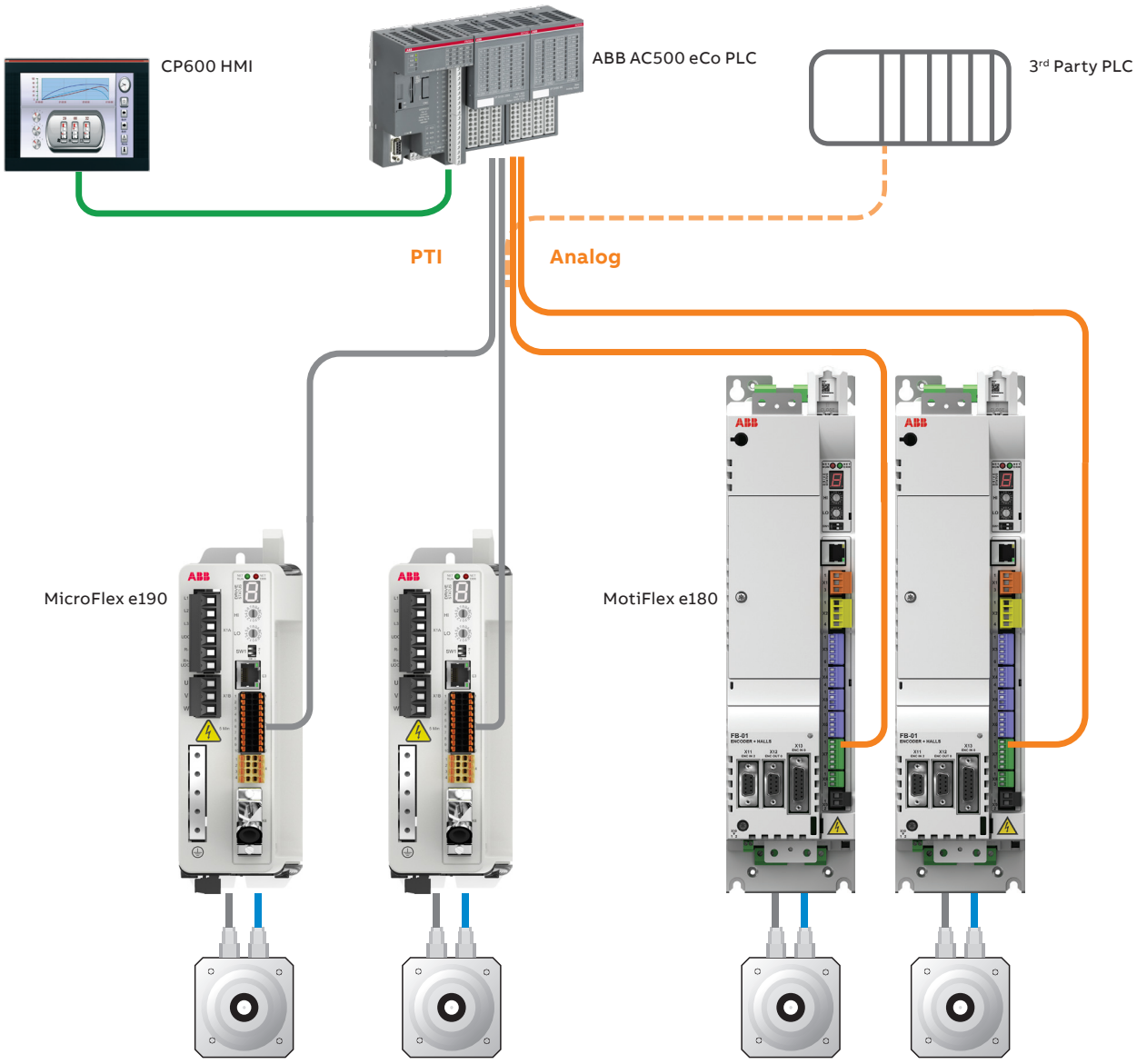
The memory unit authorized by the Mint Workbench unlocks powerful programmable control features. This helps solve simple motion tasks or create a self-controlled solution for the flying shear or labelling control with HMI and registration.



Capable control methodologies
PTI and Analog control methods

MicroFlex e190 and MotiFlex e180 can operate in the PTI control mode or analog control mode. They have the following advantages:

- Configuration and control are simple
- Responses are fast
- Lower cost



Capable control methodologies
Generic Drive Interface

Users of a range of PLCs can now take advantage of our free pre-written motion function libraries that provides control of ABB motion drives via a range of protocols including; AB RSLogix5000 Family (EtherNet/IP), Siemens S7 using TIA14 or later (PROFINET IO), ABB AC500 (EtherCAT/PROFINET), B&R PLC (POWERLINK/Modbus TCP/IP) or any CoDeSys compatible controller.
The libraries can easily be imported directly into your project and combined with the Generic Drive Interface (GDI) mint program in the drive, to directly control and monitor motion axes.

Save time with prewritten functions

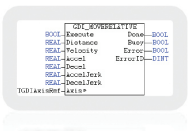
The libraries comprise a set of prewritten motion functions and data mappings, which directly handle all process data interaction logic, providing commands for most common motion tasks. The function library can easily be imported into your project, reducing code development time and risk in implementing motion control.

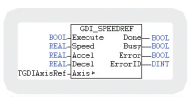
Customizable for your application

The function library makes use of our Generic Drive Interface (GDI), a flexible drive profile for Ethernet based drive control. The GDI can be used without modification, but if you have special requirements to implement at low level for a specific axis task, then the source code is available and can be modified to add your own custom application functions directly in any drive using Mint.

Benefits of pre-written libraries and a flexible drive control profile

Prewritten drive control interface, ready to use
Prewritten library of motion control function blocks
Highly flexible/configurable behavior and functions
Extensible - simplify or extend features by customising the provided Mint application
Note: prewritten libraries are also available for ABB AC500 with Modbus TCP/IP





Standard control features

The standard features supported in the GDI are listed below. These can be reduced to a subset or enhanced by adding or customising the functions in the Mint application.
The sample programs included with the application note provide a mechanism for an ABB PLC to:

- Issue a home command
- Issue a relative/absolute move
- Issue an incremental relative move (and optionally stop a programmed distance past a “fast-latch” position)
- Issue an incremental absolute move (and ptionally stop a programmed distance past a “fast-latch” position). Effectively a ready-made solution for indexing conveyor applications
- Jog the axis
- Set the axis position
- Issue a speed reference
- Issue a torque reference
- Enable/disable the axis
- Enable/disable hardware limits
- Reset axis errors
- Perform a controlled stop or crash stop on the axis
- Gear the axis to a secondary encoder input
- Set speed, acceleration times, deceleration times and jerk times for all motion
- Control modulo or non-modulo axes
- Standard monitoring functions

At the same time the PLC is able to monitor status information from the drive including:

- Enabled state
- Idle state
- Motor brake state
- Forward limit state
- Fault state
- Indication of missing fast latch interrupt
- Phase search status
- Measured position
- Axis mode of operationReady to be enabled state
- In Position state
- Homed state
- Reverse limit state
- Stop input state
- Error code
- Measured velocity
- Following error
- RMS current

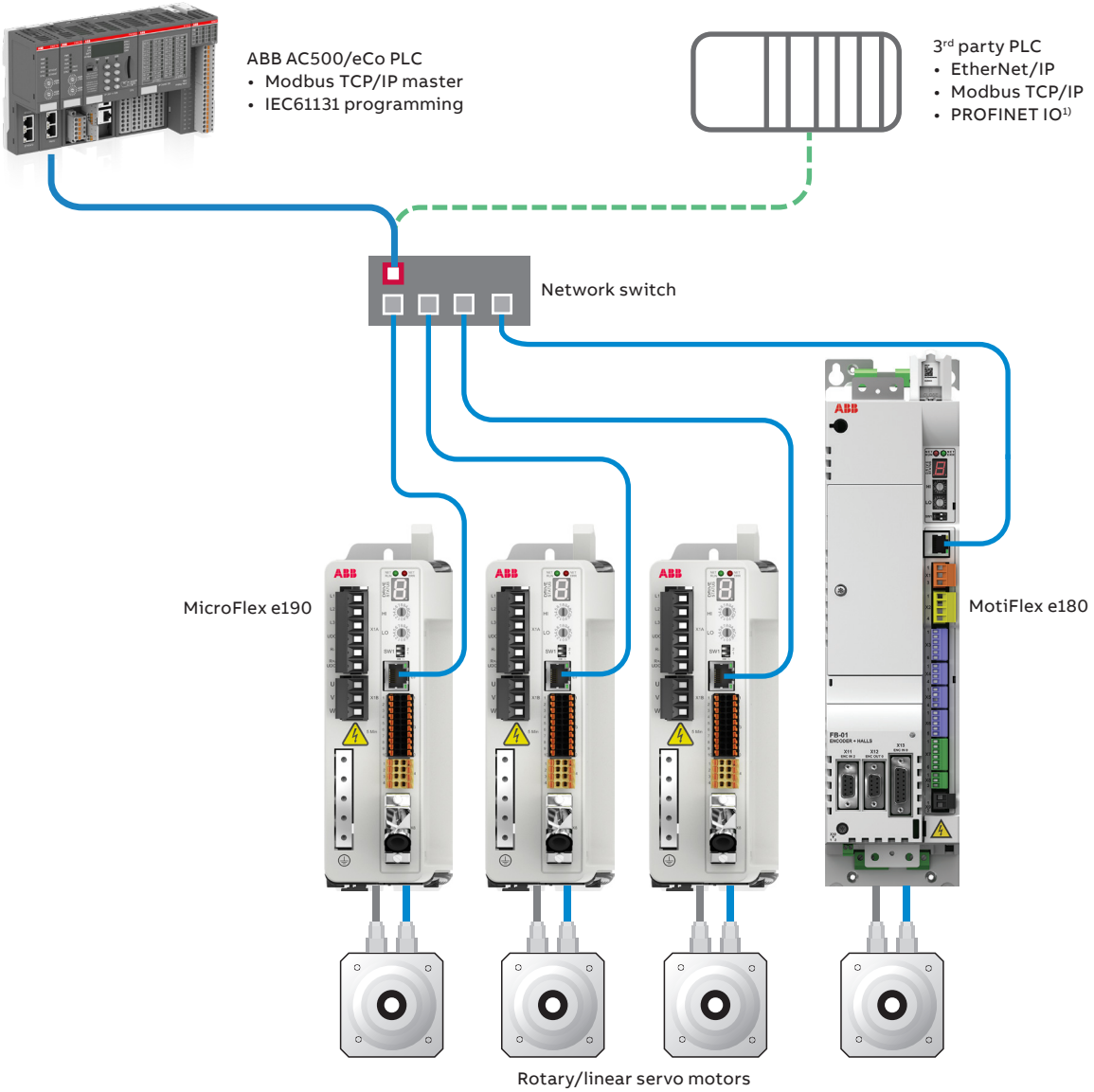
Capable control methodologies
Standard Ethernet protocols

Ethernet simple multi-axis motion solutions

- RJ45 interface E3 suppot the max. speed of 100 Mbps
  - Generic Drive Interface (GDI)
  - Predefined PLC drive control interface
  - Customization possible though Mint to optimize the solution
  - Prewritten PLC function libraries for AC500 and other PLCs
- Simple wizard drive-based configuration and predefined PLC drive data
  - Up and running in shorter time
  - Making distributed control easy
  - Application note AN00204 available at the website of ABB servo products

EtherNet/IP drive control for distributed axes

- RJ45 interface E3 suppot the max. speed of 100 Mbps
- Drives perform the homing and motion functions (home sensor connects to the drive)
- Generic Drive Interface (GDI) can be used or customized
- Function libraries available for RSLogix, Siemens TIA portal, Automation Builder, Generic CoDeSys master, and Automation Studio for easy control of MicroFlex e190 and MotiFlex e180



1) MotiFlex e180/MicroFlex e190 supports the PROFINET IO protocol via the ports E1 and E2.

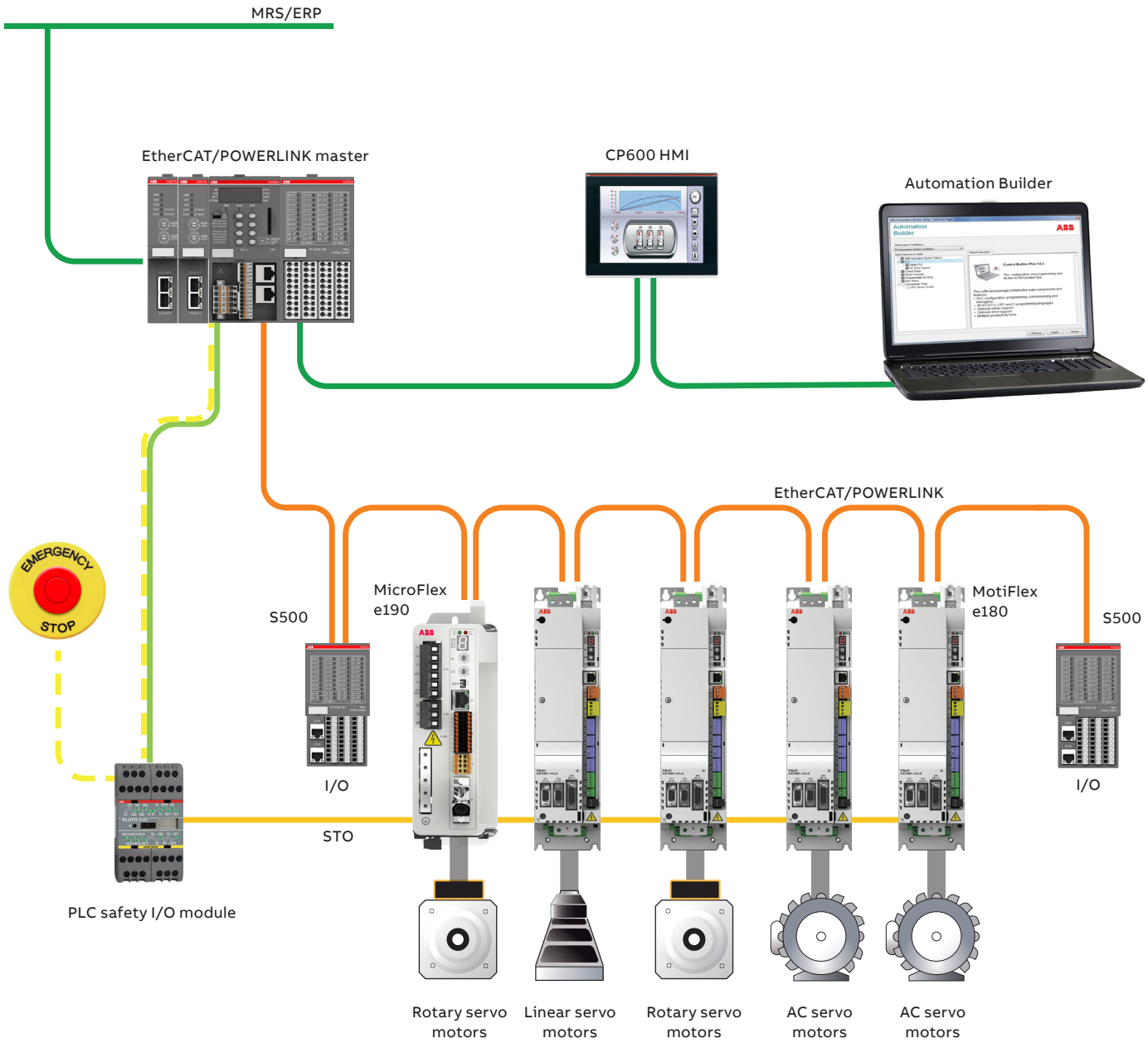
Capable control methodologies
Realtime Ethernet protocols

Multi-axis coordinated motion via the realtime Ethernet

MicroFlex e190 and MotiFlex e180 support the Ethernet protocols EtherCAT and POWERLINK via the ports E1 and E2. The drives can work together with the masters which support the above protocols, for example, the ABB's AC500 PLC and B&R X20 PLC, to realize the realtime motion control.

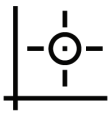
The realtime Ethernet ports have the following features:

- The RJ45 interfaces E1 and E2 suppot the max. speed of 100 Mbps, and integrate the switch function
- Support DS402 profile (IEC 61800-7) (CSP, CSV, CST, Homing), which can control the drive to realize the position control, velocity control, homing, and touch probe function via the standard motion control commands



Capable control methodologies
Intelligent drive solutions - Mint

MicroFlex e190/MotiFlex e180 Mint - advanced motion control functions



Homing (referencing/datuming)

Provides a method of finding a start or reference position for an axis. This can also be avoided altogether when using motors with absolute encoders.

Input Latch/touch probe handling

Fast inputs provide position LATCH functionality that can automatically trigger software EVENTS to perform calculations, and positional corrections at high speed.

JOG (in position or velocity control)

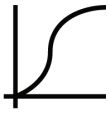
Provides a method of Jogging of an axis while maintaining position control.

INCR/A target change on the fly

Final position of an axis can be adjusted 'on the fly' to compensate for some measurement or trigger, for example, cut to length of printed material, accurate product positioning, press feeder applications, etc.

Splines and PVT profiles

Spline and PVT (Position-Velocity-Torque) motion use a series of data points and interpolation to provide smooth path control. (single axis only).



Jerk control (S ramp)

Jerk limitation controls the rate of change of acceleration during motion, to provide a smooth control reducing shock and vibration on the load. This results in 'softer' motion and improves mechanical life of the system.

Electronic gearing with simulated clutch

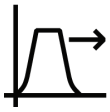
Replace mechanical linkages with software gearing that can be dynamically controlled at the touch of a button. Change ratio, advance or retard an axis, simulate mechanical clutch engage/disengage

Flying shear segments (FLY)

FLY segments provide a means to create simple or complex motion which is 'geared' to a second axis (master encoder) position.

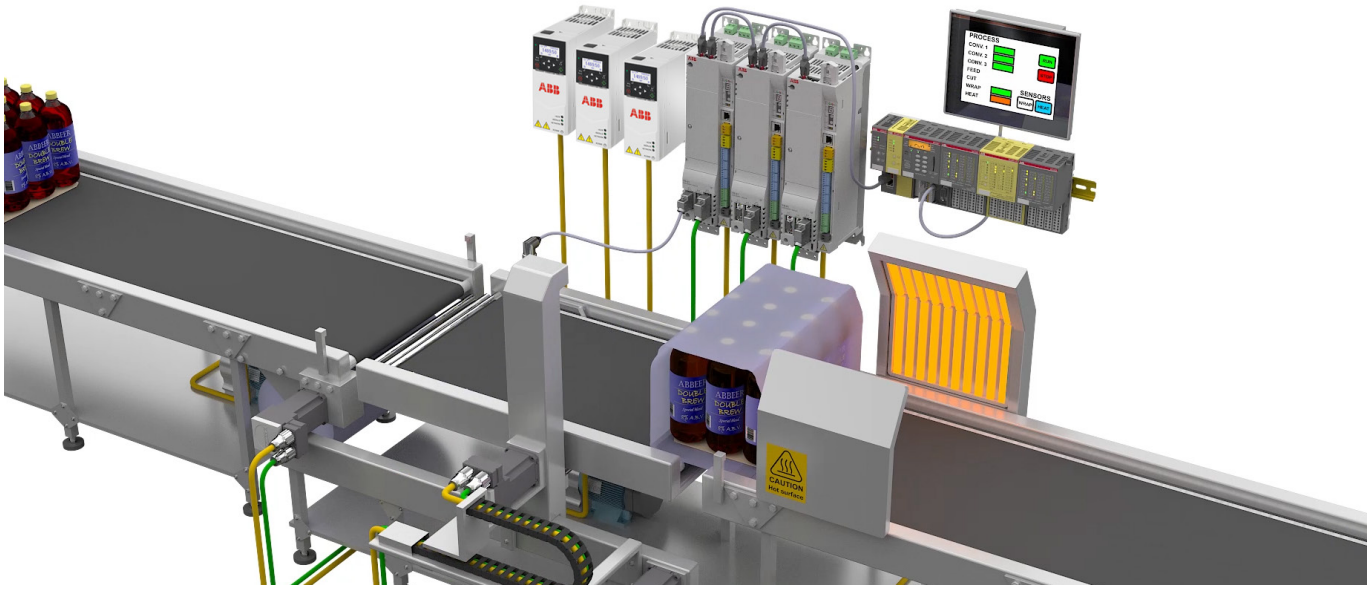
Electronic CAMs

Software CAMs eliminate mechanical wear or 'bounce' issues associated with mechanical systems. CAM data can be changed for different 'recipes' or dynamically varied during operation.



Incremental/absolute moves

Simple point to point motion.

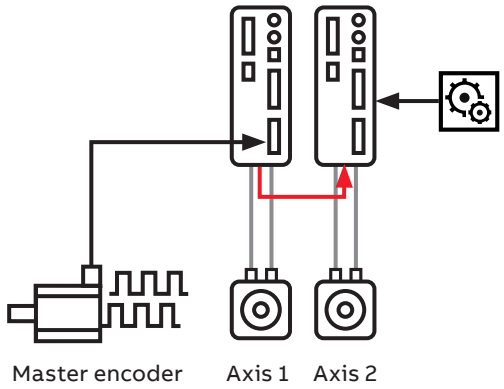


Application versatility
Dual encoder solutions

Master follower configuration

For simple multi-axis systems, the analog encoder output of one drive can be connected to the encoder input of the next drive, which helps to form a following movement system including one or more axes while without a motion controller.

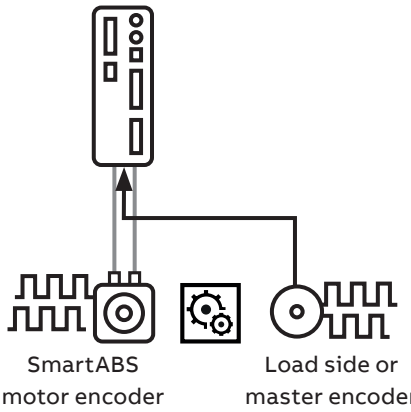
2-axis system



- For the motor using SSI feedback, the output of the master encoder is input to the encoder interface of the axis 1
- The simulated encoder output of axis 1 is input to the encoder interface of the axis 2

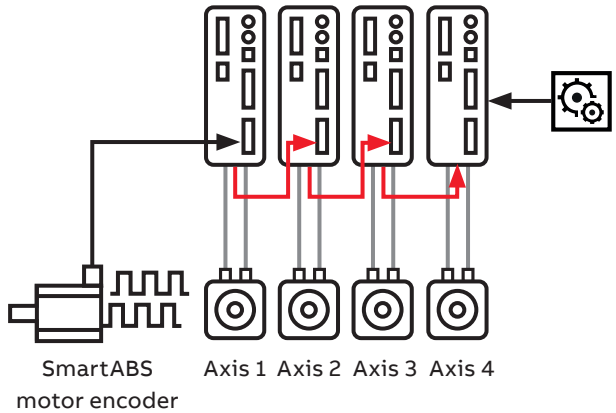
Dual encoder operation

In precision applications such as CNC milling or grinding, errors introduced by mechanical transmission can be compensated by load side encoders. MicroFlex e190 and MotiFlex e180 support dual encoder inputs for this purpose.



- Motor feedback serial e.g. SmartAbs or SSI
- Load side encoder/master ABZ encoder
- Eliminates errors introduced by the mechanical transmission
- Improves precision of the control and process

Multi-axis system



- The output of the master encoder is input to the encoder interface on axis 1
- The simulated encoder output of each axis is input to the encoder interface of the next axis within the axis chain

Easy commissioning tool for ABB servo products
Mint WorkBench

Mint Workbench is a commissioning tool for ABB's motion controllers and servo drives. It provids a simple way to configure drives, and program in the smart drives and and multi axis motion controllers.

Easy drive commissioning

Drive commissioning is simplified by the smart navigation panels. You can connect more than one drives to the commissioning tool at the same time. It also provides the auto tuning function which makes the system tuning easy.

Intelligent support with one click

If you are using one of our electronic products that requires the use of Mint Workbench, the SupportMe function will gather important information about your device configuration and environment. This information helps our engineers in assisting you with your inquiry and going straight to the point.

Smart program editor

Mint Worknench offers a smart program editor for the motion program development with its code hinting function. The context sensitive help provides you clear instructions of each command word and gives you tips for using it without the need of the user manual. The Program navigator makes it a breeze to navigate the source code, no matter how complicated it is.

Advanced motion programming language with Mint

Designed on the basis of Basic language, the Mint motion programming language is a feature-rich motion programming language, with English like keywords and high level functionality, comparable to Structured Text (ST).

Software features

- The smart navigation panels simplify 'expert' tasks such as drive configuration and network configuration
- The program editor provides code hinting and debugging functions
- Command line interface to interrogate the controller even when the program is running
- Watch window to monitor common motion variables, I/O, communications and more
- 6-channel software oscilloscope
- SupportMe function with automatic email generation for rapid technical support
- Updates of firmware within the Mint Workbench
- Easy management of firmware and project files

How to get Mint Workbench

Download easily from the website of ABB servo products for free.

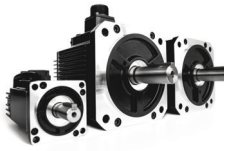
How to select a servo system

ABB servo products selection procedures

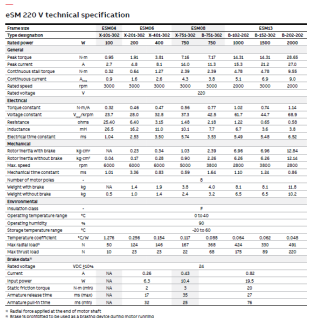
STEP 1: Servo motor selection

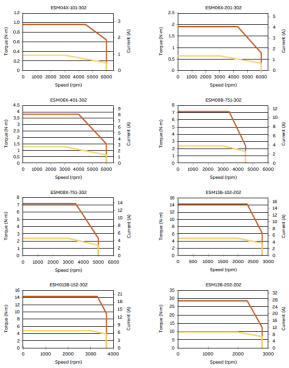
Calculate and confirm below technical data:

- Torque
- Speed
- Inertia
- Encoder
- Brake



Select your motor order code based on the information on page 30 page 37.





E S M X X X - X X X - X X X - X X X X X 0 0

Code	Frame size
04	40 mm
06	60 mm
08	80 mm
13	130 mm
18	180 mm

Code	Inertia type
X	Low Inertia
B	Medium Inertia
E	High Inertia

Code	Frame size
101	0.1 kW
201	0.2 kW
401	0.4 kW
751	0.75 kW
102	1.0 kW
152	1.5 kW
202	2.0 kW
292	2.9 kW
302	3.0 kW
442	4.4 kW
502	5.0 kW
552	5.5 kW
752	7.5 kW

Code	Rated speed
15	1500 rpm
20	2000 rpm
30	3000 rpm

Code	Rated voltage
2	220 V AC ± 10%
4	400 V AC ± 10%

Code	Cooling
0	Self-cooling, without thermistor connection

Code	Shaft type
A	Shaft end fitted key way and key, without shaft seal
B	Shaft end fitted keyway and key, with shaft seal

Code	Encoder type
0	• 18-pin plastic connector (ESM04/06/08) • Aviation socket (ESM13/18)
1	9-pin plastic connector (ESM04/06/08)

Code	Brake
N	No brake
B	With brake (brake option not available on 100 W motor)

Code	Feedback
T1	Absolute, Single-turn (SmartInc), 17 bits per revolution
T2	Absolute, Multi-turn (SmartAbs), 17 bits per revolution/16 bits multi-turn

STEP 2: Servo drive selection

- Current
- Input voltage
- Overload mode

Select your drive order code based on the information on page 20, page 21, page 25, page 29.

Motor type and rating			Drive type and rating		Package rating				
Motor type	Cout current (A)	Peak current (A)	Drive type	Mode [1]	Rated Amps (A)	Peak Amps (A)	Cont Torque (N.m)	Peak Torque (N.m)	Rated power (kW)
ESM04X-101-302-xxx0A00	0.9	2.7	MFE190-04UD-03A0-2	200%	3.0	6.0	0.3	1.0	0.1
ESM06X-201-302-xxx0A00	1.6	4.8	MFE190-04UD-03A0-2	300%	3.0	7.5	0.6	1.9	0.2
ESM06X-401-302-xxx0A00	2.6	8.1	MFE190-04UD-03A0-2	200%	3.0	6.0	1.3	2.8	0.4
			MFE190-04UD-06A0-2	200%	6.0	12.0	1.3	3.8	0.4
ESM08X-751-302-xxx0A00	4.3	14.0	MFE190-04UD-06A0-2	300%	5.3	15.8	2.4	7.2	0.75
ESM08B-751-302-xxx0A00	3.8	11.3	MFE190-04UD-06A0-2	200%	6.0	12.0	2.4	7.2	0.75
ESM13B-102-202-xxx0A00	5.1	15.3	MFE190-04UD-06A0-2	200%	6.0	12.0	4.8	12.0	1.0
			MFE190-04UD-09A0-2	200%	9.0	18.0	4.8	14.3	1.0
ESM13B-152-302-xxx0A00	6.9	21.2	MFE190-04UD-06A0-2	200%	6.0	12.0	4.4	8.9	1.4
			MFE190-04UD-09A0-2	300%	7.5	22.5	4.8	14.3	1.5
ESM13B-202-202-xxx0A00	9.0	27.0	MFE190-04UD-09A0-2	200%	9.0	18.0	9.6	20.5	2.0
			MFE190-04UD-09A0-2	300%	7.5	22.5	8.6	25.7	1.8

M F E 1 9 0 - 0 4 U D - X X A X - 2

Code	Type designation
MFE190	Product series MicroFlex e190

Code	Construction
04	Construction/frame size
U	Universal encoder, slave/CN
D	Dual port PROFINET, programmable

Code	Rated current
03A0	3 A
06A0	6 A
09A0	9 A

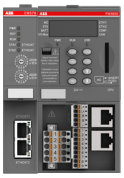
Code	Voltage rating
2	200…240 V AC ± 10% 270…340 V DC ± 10%

STEP 3: Options and accessories selection

Select drive and motor's options and accessories from page 38, page 40.

STEP 4: Controller selection

- B&R X20
- ABB AC500
- 3rd party product



200 V package combination

MicroFlex e190 and eSM servo motor (220 V) - Matched performance drive and motor package

Motor type and rating			Drive type and rating				Package rating		
Motor type	Cout current (A)	Peak current (A)	Drive type	Mode [1]	Rated Amps (A)	Peak Amps (A)	Cont Torque (N.m)	Peak Torque (N.m)	Rated power (kW)
ESM04X-101-302-xxx0A00	0.9	2.7	MFE190-04UD-03A0-2	200%	3.0	6.0	0.3	1.0	0.1
ESM06X-201-302-xxx0A00	1.6	4.8	MFE190-04UD-03A0-2	300%	3.0	7.5	0.6	1.9	0.2
ESM06X-401-302-xxx0A00	2.6	8.1	MFE190-04UD-03A0-2	200%	3.0	6.0	1.3	2.8	0.4
			MFE190-04UD-06A0-2	200%	6.0	12.0	1.3	3.8	0.4
ESM08X-751-302-xxx0A00	4.3	14.0	MFE190-04UD-06A0-2	300%	5.3	15.8	2.4	7.2	0.75
ESM08B-751-302-xxx0A00	3.8	11.3	MFE190-04UD-06A0-2	200%	6.0	12.0	2.4	7.2	0.75
ESM13B-102-202-xxx0A00	5.1	15.3	MFE190-04UD-06A0-2	200%	6.0	12.0	4.8	12.0	1.0
			MFE190-04UD-09A0-2	200%	9.0	18.0	4.8	14.3	1.0
ESM13B-152-302-xxx0A00	6.9	21.2	MFE190-04UD-06A0-2	200%	6.0	12.0	4.4	8.9	1.4
			MFE190-04UD-09A0-2	300%	7.5	22.5	4.8	14.3	1.5
ESM13B-202-202-xxx0A00	9.0	27.0	MFE190-04UD-09A0-2	200%	9.0	18.0	9.6	20.5	2.0
			MFE190-04UD-09A0-2	300%	7.5	22.5	8.6	25.7	1.8

[1] The e190 drive offers a 200% and 300% rating mode, which offers a higher peak torque at a slightly reduced rms rating. Highlighted rows provide a full peak and continuous torque of the motor. If the full peak torque is not required by the application, a lower rating drive can be selected in some cases for a more cost effective solution.

400 V package combination

MotiFlex e180 and eSM motor (400 V) - Matched performance drives and motor packages

Motor type and rating			Drive type and rating				Package rating		
Motor type	Cont current (A)	Peak current (A)	Drive type	Mode[1]	Rated Amps (A)	Peak Amps (A)	Cont torque (N·m)	Peak torque (N·m)	Rated power (kW)
ESM13B-152-304-xxx0A00	3.0	9.0	MFE180-04AN-03A0-4	200%	3.0	6.0	4.8	9.5	1.5
			MFE180-04AN-03A0-4	300%	2.0	6.0	3.2	9.5	1.5
			MFE180-04AN-05A0-4	200%	4.0	8.0	4.8	12.7	1.5
			MFE180-04AN-05A0-4	300%	2.7	8.1	4.3	13	1.5
			MFE180-04AN-07A0-4	200%	4.7	9.4	4.8	14.3	1.5
			MFE180-04AN-07A0-4	300%	3.2	9.6	4.8	14.3	1.5
ESM13B-302-304-xxx0A00	6.0	18.0	MFE180-04AN-07A0-4	200%	4.7	9.4	7.5	15.0	3.0
			MFE180-04AN-07A0-4	300%	3.2	9.6	5.1	15.2	3.0
			MFE180-04AN-016A-4	200%	9.0	18.0	9.6	28.7	3.0
			MFE180-04AN-016A-4	300%	7.0	21.0	9.6	28.7	3.0
ESM13B-502-304-xxx0A00	8.7	25.8	MFE180-04AN-016A-4	200%	9.0	18.0	16.1	33.7	5.0
			MFE180-04AN-016A-4	300%	7.0	21.0	13.1	39.3	5.0
			MFE180-04AN-024A-4	200%	13.5	27.0	16.1	48.2	5.0
			MFE180-04AN-024A-4	300%	10.0	30.0	16.1	48.2	5.0
ESM18E-292-154-xxx0A00	11.4	27.7	MFE180-04AN-016A-4	200%	9.0	18.0	14.7	29.4	2.9
			MFE180-04AN-016A-4	300%	7.0	21.0	11.4	34.2	2.9
			MFE180-04AN-024A-4	200%	13.5	27.0	18.6	44.0	2.9
			MFE180-04AN-024A-4	300%	10.0	30.0	16.3	45.1	2.9
			MFE180-04AN-031A-4	200%	21.0	42.0	18.6	45.1	2.9
			MFE180-04AN-031A-4	300%	16.0	48.0	18.6	45.1	2.9
ESM18E-442-154-xxx0A00	17.6	44.1	MFE180-04AN-024A-4	200%	13.0	27.0	20.9	44.0	4.4
			MFE180-04AN-024A-4	300%	10.0	30.0	16.1	48.3	4.4
			MFE180-04AN-031A-4	200%	21.0	42.0	28.0	67.6	4.4
			MFE180-04AN-031A-4	300%	16.0	48.0	25.8	71.1	4.4
			MFE180-04AN-046A-4	200%	28.0	56.0	28.4	71.1	4.4
			MFE180-04AN-046A-4	300%	20.0	60.0	28.4	71.1	4.4
ESM18E-552-154-xxx0A00	20.5	51.3	MFE180-04AN-024A-4	200%	13.0	27.0	35.0	40.4	5.5
			MFE180-04AN-024A-4	300%	10.0	30.0	17.1	51.3	5.5
			MFE180-04AN-031A-4	200%	21.0	42.0	35.0	71.8	5.5
			MFE180-04AN-031A-4	300%	16.0	48.0	27.4	82.1	5.5
			MFE180-04AN-046A-4	200%	28.0	56.0	35.0	87.6	5.5
			MFE180-04AN-046A-4	300%	20.0	60.0	34.2	87.6	5.5
			MFE180-04AN-060A-4	200%	35.0	70.0	35.0	87.6	5.5
			MFE180-04AN-060A-4	300%	25.0	75.0	35.0	87.6	5.5
ESM18E-752-1Z54-xxx0A00	27.4	68.0	MFE180-04AN-031A-4	200%	21.0	42.0	36.8	73.5	7.5
			MFE180-04AN-031A-4	300%	16.0	48.0	28.0	84.0	7.5
			MFE180-04AN-046A-4	200%	28.0	56.0	48.0	98.0	7.5
			MFE180-04AN-046A-4	300%	20.0	60.0	35.0	105.0	7.5
			MFE180-04AN-060A-4	200%	35.0	70.0	48.0	119.0	7.5
			MFE180-04AN-060A-4	300%	25.0	75.0	43.8	119.0	7.5

[1] The e180 drive offers a 200% and 300% rating mode, which offers a higher peak torques at a slightly reduced rms rating. Highlighted rows will provide full peak and continuous torque of the motor. If full peak torque is not required by the application, a lower rating drive can be selected in some cases for a more cost effective solution.

MicroFlex e190 overview

MicroFlex e190 technical specifications

Type designation	Current at PWM switching frequency 8 kHz (A)					
	Low speed output[1] (< 2 Hz)		200% 3 s		300% 3 s	
	$I2_n$	$I2_{max}$	$I2_n$	$I2_{max}$	$I2_n$	$I2_{max}$
MFE190-04UD-03A0-2	3.00	4.50	3.00	6.00	2.50	7.50
MFE190-04UD-06A0-2	6.00	9.00	6.00	12.00	5.25	15.75
MFE190-04UD-090A-2	9.00	13.50	9.00	18.00	7.50	22.50

Ratings	
MicroFlex e190 has two different overload modes for user selection: 200%, 300%	
$I2_n$	Rated output current in selected overload mode. The rms current when continuous working should be lower than this.
$I2_{max}$	Max output current (last 3 s) in one duty cycle under the selected overload mode.
[1] The maximum overload current between 0 Hz and 2 Hz is 150% of rated current	

Technical specifications	
Voltage/Frequency	1-phase 200 to 240 V AC ± 10% 3-phase 200 to 240 V AC ± 10% 270...340 V DC ± 10% 50/60 Hz ± 5%
Efficiency	> 95%
PWM switching frequency/control	8 kHz/Space Vector Modulation
Motor types	Asynchronous motors (standard induction, servo), synchronous motors (servo, high torque), linear servo motors
Braking resistor (external)	0.25 kW nominal/2.7 kW peak 10% duty: 57 Ω nominal (min 39 Ω, max 100 Ω)
Product compliance	
Approvals	CE, cUL/UL, RoHS, UKCA, TüV functional safety
EMC	EN61800-3 C2 emissions with external filter (30 m motor cable limit)
Environmental limits	
Operating temperature	0 ~ 55 °C no derating
Altitude	0...2000 m (6560 ft) above sea level Note: when above 1000 m (3280 ft), with derating of 1%/100 m
Degree of Protection	IP20 (cabinet installation)
Safety	
Safe torque-off (STO)	Two-channel STO function comply with the IEC 61800-5-2, SIL3 PLe as standard
I/O (Standard)	
4 × digital inputs	Opto-isolated 24 V 2 inputs can be programmed as fast position latch inputs 1 µs (feedback device dependent) or pulse direction inputs (max 2 MHz)
3 × digital outputs	Opto-isolated 24 V 100 mA per channel Configurable/programmable function
1 × ±10 V analog input 1 × ±10 V analog output	12 bit . Analog speed/torque control with emulated encoder output

Technical specifications	
I/O (Expansion option)	
I/O and serial port expansion option	OPT-SIO-1 provides an additional 6 DIs, 4 DOs, 1 AI and a serial port (2-wire RS485 or 4-wire RS422). User installed via the expansion interface of the e190. Note when installed it increases the drive width by approximately 2 mm
Communications	
EtherCAT (E2=In, E1=Out)	2 RJ45 interfaces for daisy chain connection LED indication built into RJ45 sockets Drive profile: DS402/IEC61800-7-1
POWERLINK (E2, E1)	2 RJ45 interfaces for daisy chain connection LED indication built into RJ45 sockets Drive profile: DS402/IEC61800-7-1
PROFINET IO (E2, E1)	2 RJ45 interfaces for daisy chain connection Communication with the PROFINET masters Drive operation can be customized with a Mint program
EtherNet/IP (E3 port only)	Drive operation can be customized with a Mint program Note: CIP™ sync not supported
Modbus TCP/IP (E3 port only)	Communication with PLCs/Industrial PCs/IO/HMIs. Drive operation can be customized with a Mint program
E3 Ethernet configuration port	Mint PC support tool Mint WorkBench
7-segment status display	For error and communications notification to quickly identify problems and minimize downtime
NET RUN&NET ERR LEDs	Indicate EtherCAT status of operation in accordance with EtherCAT Technology Group (ETG) guidelines
Motor feedback	
Universal digital feedback	Incremental encoder + Halls, SSI (Synchronous Serial Interface), EnDat 2.1/2.2, 1V pk-pk SinCos, BiSS-B, SmartAbs, SmartInc, Hiperface (8 V)
Dual encoder input	For line shaft following or dual loop control (position/velocity and commutation) to eliminate mechanical errors
Ethernet and motor encoder feedback interfaces	Highly integrated with minimal latency, optimized for demanding motion applications
Encoder splitter	Provides the motor encoder and the 2nd encoder input interface via the option OPT-MF-200
Resolver	Support by option OPT-MF-201 adapter

MicroFlex e190 connection

Simple mounting
- 2 key-holes

PE connection for AC supply

AC power 1-phase or 3-phase
- 200...240 V AC 50/60 Hz

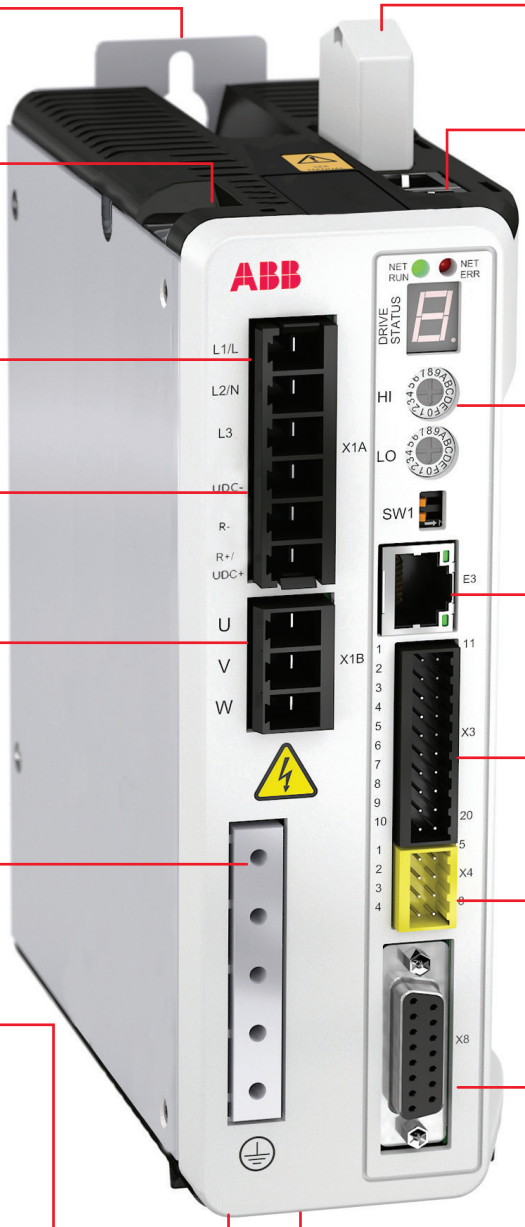
DC bus connection and braking resistor connection
- 270...340 V DC

Separate motor power
- Easy to wire
- Easy to isolate the motor during startup/service

EMC/PE plate
- Shield bonding
- Motor PE

24 V control supply
- Maintain communications and position after the AC power is removed

Simulated encoder output/2nd incremental encoder input
- Electronic gearing (line-shaft) or dual-loop feedback operation



Memory unit
- For backing up the configuration information, firmware, and motion programming

Ethernet ports E1 and E2
2 Ethernet ports with LED indicators for:
- EtherCAT
- POWERLINK
- PROFINET IO

Status/Node ID
- 2 LED network status/error indicators
- 7-segment status display
- 2 hex switches for node ID/protocol setting

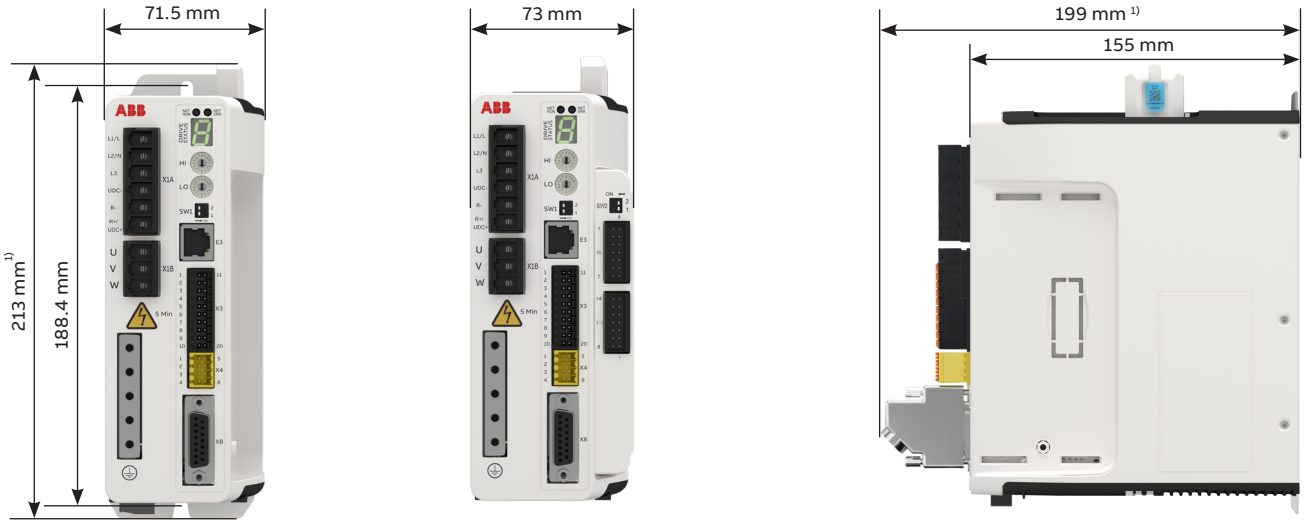
Ethernet port E3
- Port for drive commissioning
- Modbus TCP/IP (server/client)
- EtherNet/IP

Digital and analog I/O
- 4 DIs, 3 DOs, 1 AI, 1 AO
- Including 2 latch inputs for position registration <1 µs latency
- Expandable via OPT-SIO-1 to a total of 10 DIs, 7 DOs, 2 AIs, 1 AO + serial port 2-wire RS485 or 4-wire RS422

STO PLe SIL 3
- Daisy chain and pulse tolerance
- Allows removal of STO leaving main I/O in-place for system testing

Universal encoder interface
- Incremental (ABZ) + Halls
- 1V pk-pk SinCos, SSI, BiSS-B, EnDat 2.1/2.2
- Smart Inc/Smart Abs and Hiperface
- 5 V/8 V selectable encoder supply
- Resolver support via adapter OPT-MF-201

MicroFlex e190 dimensions



1) Approximate dimensions. Allow extra space for feedback and other control cables.

MicroFlex e190 supported accessories and installation methods

Accessories	
Braking chopper	•
Braking resistor	*
AC choke	*
DC choke	-
Mains filter (EMC)/C3	*
Installation features	
Air cooling (fan)	•
Removable connectors Control/Power	•/•
Side by side mounting	•
DIN rail mounting	-
Horizontal mounting	-

- • Standard
- * External option
- - Not available

For the ordering information about the accessories, see page 18.

MicroFlex e190 ordering information

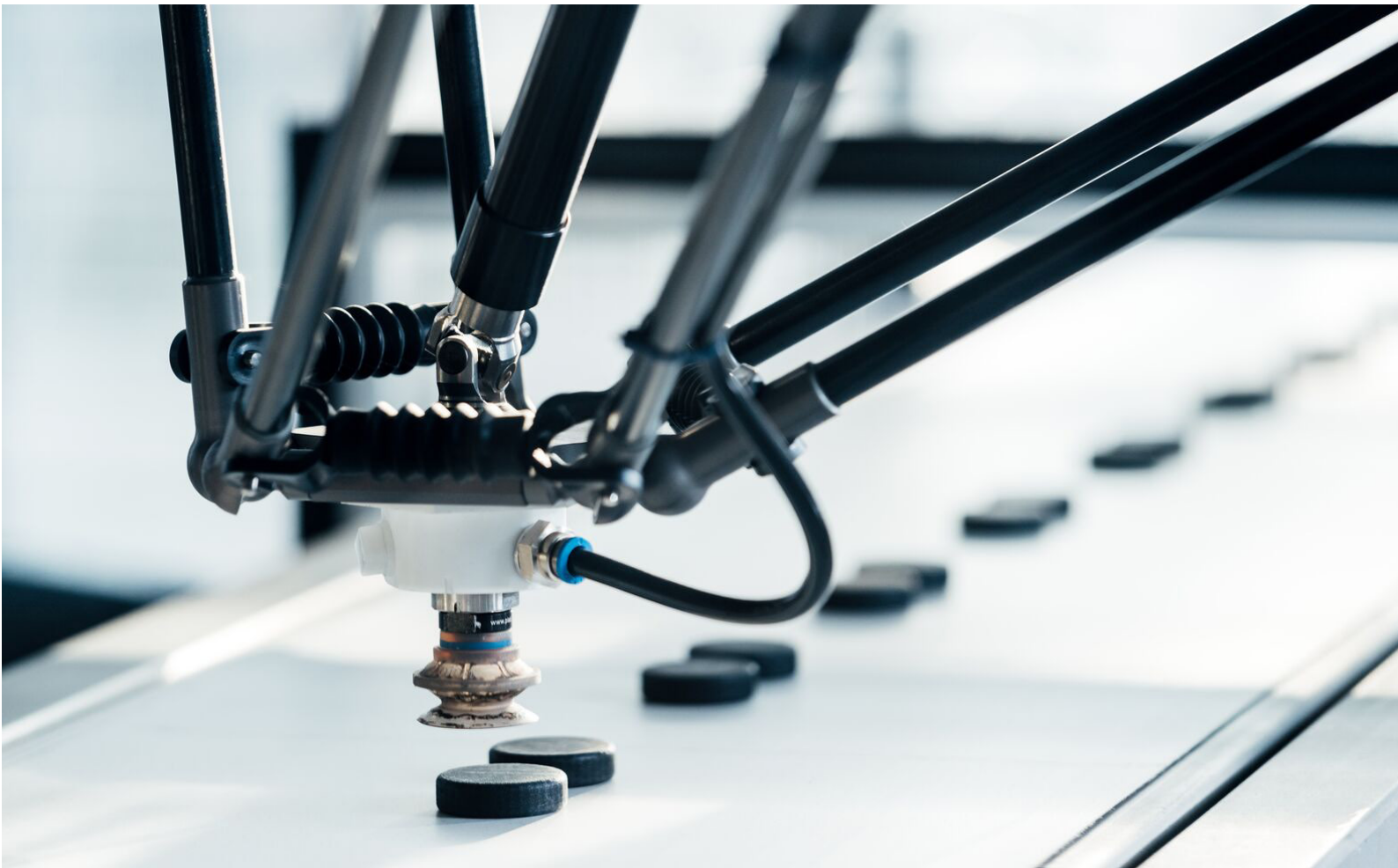
MFE190-04UD-XXAX-2

Code	Type designation
MFE190	Product series MicroFlex e190

Code	Construction
04	Construction/frame size
U	Universal encoder, slave/CN
D	Dual port PROFINET, programmable

Code	Rated current
03A0	3 A
06A0	6 A
09A0	9 A

Code	Voltage rating
2	200...240 V AC ± 10% 270...340 V DC ± 10%



MotiFlex e180 overview

MotiFlex e180 technical specifications

Type designation	Frame size	Current at PWM switching frequency 4/8 kHz (A)			
		200% 3 s		300% 3 s	
		$I2_n$	$I2_{max}$	$I2_n$	$I2_{max}$
MFE180-04AN-03A0-4	A	3.00	6.00	2.00	6.00
MFE180-04AN-05A0-4	A	4.00	8.00	2.70	8.10
MFE180-04AN-07A0-4	A	4.70	9.40	3.20	9.60
MFE180-04AN-016A-4	B	9.00	18.00	7.00	21.00
MFE180-04AN-024A-4	C	13.50	27.00	10.00	30.00
MFE180-04AN-031A-4	C	21.00	42.00	16.00	48.00
MFE180-04AN-046A-4	C	28.00	56.00	20.00	60.00
MFE180-04AN-060A-4	D	35.00	70.00	25.00	75.00
MFE180-04AN-090A-4	D	55.00	110.00	40.00	120.00

Ratings	
MotiFlex e180 has two different overload modes as user selection: 200%, 300%	
$I2_N$	Rated output current in selected overload mode. The rms current when continuous working should be lower than this.
$I2_{max}$	Max output current (last 3 s) in one duty cycle under the selected overload mode.

Technical specifications	
Supply connection	
AC Supply	3-phase 200 to 480 V AC ± 10% 270...650 V DC ± 10% 50/60 Hz ± 5%
Motor connection	
Voltage	3-phase output voltage
Frequency	0 to ± 500 Hz
Motor control	Vector
Motor types	Asynchronous motors (standard induction, servo), synchronous motors (servo, high torque), linear servo motors
Switching frequency/control	4 to 8 kHz/Space Vector Modulation
Braking power connection	
Braking chopper	As standard in all types
Braking resistor	External resistor connected to drive
Product compliance	
Approvals	CE, UKCA, cUL/UL
EMC	Category C3 with optional filter (according to EN 61800-3)
Functional safety	Safe torque off (STO according EN 61800-5-2) EN 61508 ed2: SIL 3 EN 62061: SIL CL 3 EN ISO 13849-1: PL e

Technical specifications	
Environmental limits	
Ambient temperature	
Transport Storage Operation	-40 to +70°C (-40 to +158°F) -40 to +70°C (-40 to +158°F) 0 to +55°C (32 to 131°F), no frost allowed. Note: When above 40°C (104°F), with derating of 2%/1°C
Cooling method	Air-cooled, dry clean air
Altitude	0 to 2000 m (6560 ft) above sea level Note: When above 1000 m (3280 ft), with derating of 1%/100 m (328 ft)
Relative humidity	Max. 95%, no condensation allowed
Degree of protection	IP20 acc. to EN 60529; Open Type acc. to UL 508C
Contamination levels	No conductive dust allowed
Vibration	Sinusoidal vibration (EN 60068-2-6:2008): 2 to 9 Hz: 3.0 mm (0.12") 9 to 200 Hz: 1 g
Shock	Half sine pulse (IEC 60068-2-27:2008): 10 g for 11 ms

MotiFlex e180 connection

AC power 1-phase or 3-phase
- 200...480 V AC 50/60 Hz

DC supply connection and Braking resistor connection
- 270...650 V DC

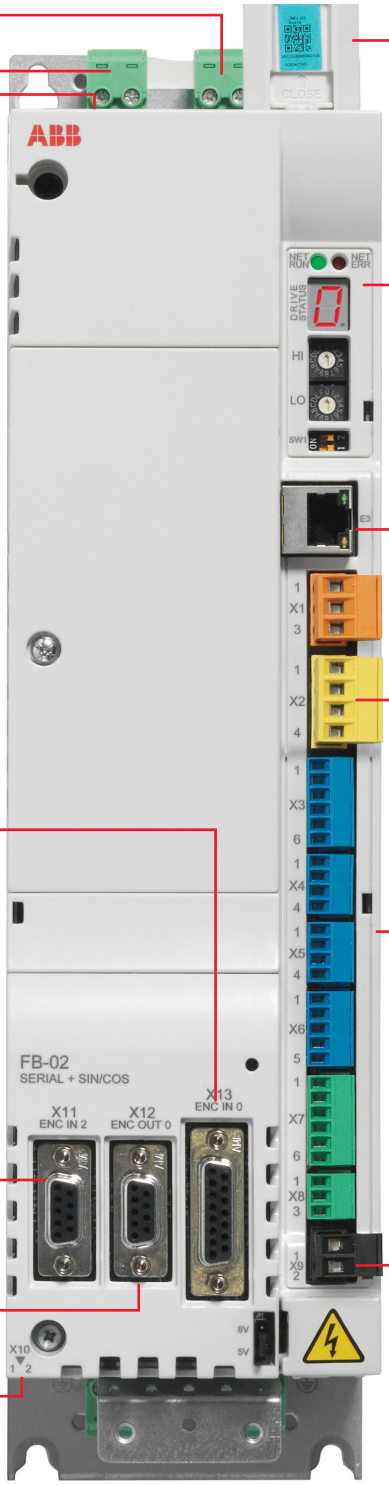
Ethernet ports E1 and E2
2 Ethernet ports with LED indicators for:
- EtherCAT
- POWERLINK
- PROFINET IO

Feedback options
- Serial Encoder + SinCos (1V pk-pk), EnDat 2.1/2.2, SSI, BiSS-B, SmartAbs, SmartInc,Hiperface
- Incremental + Halls
- Resolver
- DSL

Incremental encoder input
- Dual loop or line shaft functions

Simulated encoder output

Motor thermal PTC
(isolated)



Memory unit
- For backing up the configuration information, firmware, and motion programming

Status/Node ID
- 2 LED network status/error indicators
- 7-segment status display
- 2 hex switches for node ID/protocol setting
- 2 × DIP switches comms functions

Ethernet port E3
- Modbus TCP/IP
- EtherNet/IP
- PROFINET IO *

* Can be selected by the DIP switches

2 channel STO SIL 3 PL e

Digital and analog I/O
- 2 fast latch inputs (1 micro sec)
- 8 DIs (inc fast latch input)
- 4 DOs
- 2 AIs (12 bit, ±10 V)
- 1 AOs (12 bit, ±10 V)
- 1 Relay out (240 V 2.0 A)

24 V control supply
- The connection is not recommended for field application. It is used for ABB technical support only

MotiFlex e180 dimensions

Frame	Height (H)	Width (W)	Depth (D)	Weight
	mm	mm	mm	kg
A	364	90	144	3
B	380	100	221	5
C	467	165	223	10
D	467	220	223	17

Note: Height is the maximum measure without clamping plates
In depth, an additional 50 mm should be reserved for feedback cabling

MotiFlex e180 supported accessories and installation methods

Frame size	A	B	C	D
Accessories				
Braking chopper	•	•	•	•
Braking resistor	*	*	*	*
AC choke	*	*	*	*
DC choke	-	-	*	*
Mains filter (EMC)/C3	*	*	*	*
Installation features				
Air cooling (fan)	•	•	•	•
Removable connectors Control/Power	•/•	•/•	•/-	•/-
Side by side mounting	•	•	•	•
DIN rail mounting	•	•	-	-
Horizontal mounting	•	•	•	•

- • Standard
- * External option
- - Not available

For the ordering information about the accessories, see page 22.

MotiFlex e180 ordering information

MFE180-04AN-XXXX-4+LXXX+N8020

Code	Type designation
MFE180	Product series MotiFlex e180

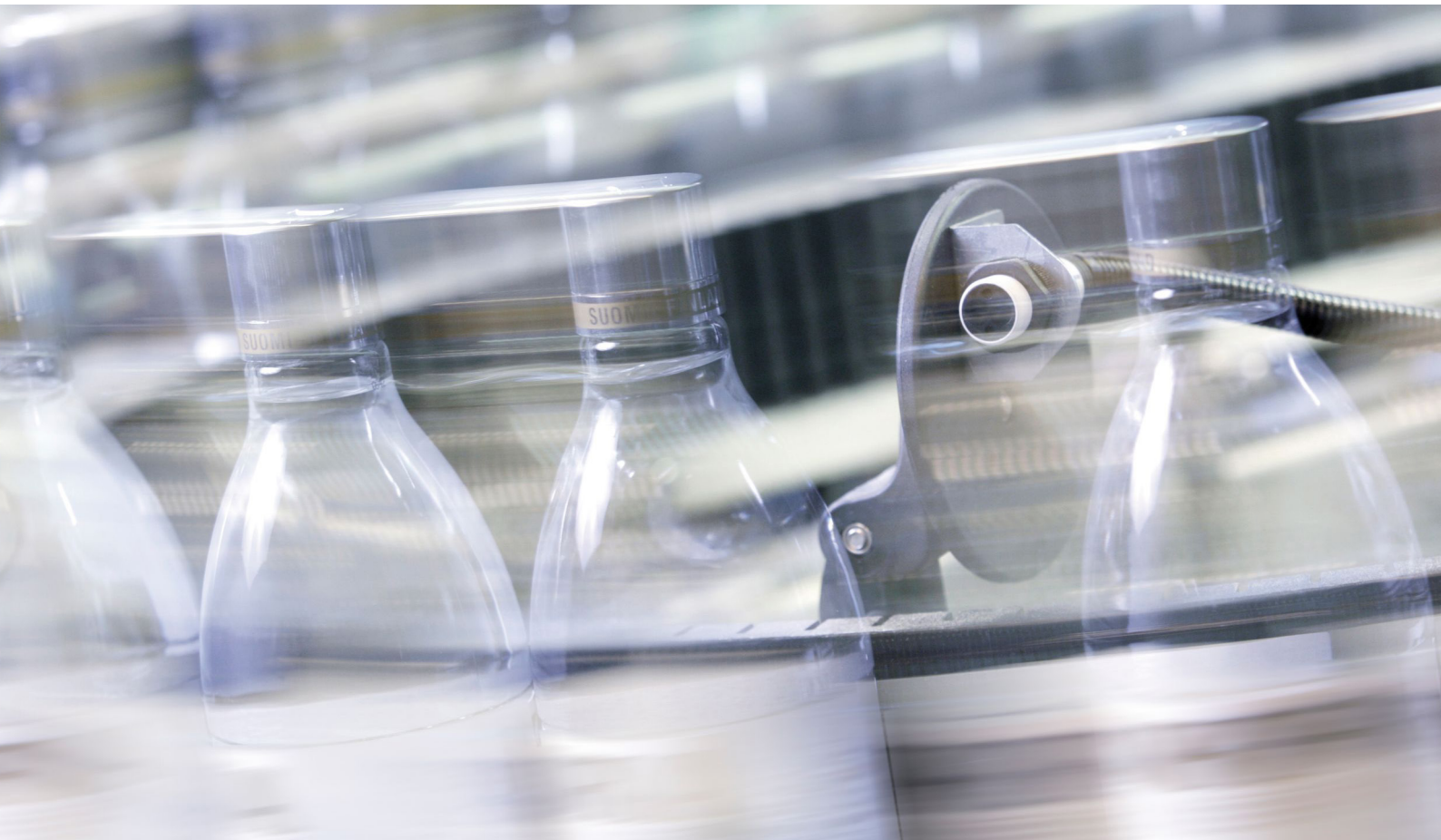
Code	Construction
04AN	Air-cooled module

Code	Rated current
03A0	3 A
05A0	5 A
07A0	7 A
016A	16 A
024A	24 A
031A	31 A
046A	46 A
060A	60 A
090A	90 A

Code	Voltage rating
4	200...480 V AC ± 10% 270...650 V DC ± 10%

Code	Feedback options
L517	FB-01: Incremental encoder + Halls
L518	FB-02: Serial Encoder + SinCos (1V pk-pk)
L516	FB-03: Resolver
L530	FB-04: DSL (stegmann 2 wire solution)

Code	Mint licence
N8020	Mint single axis (included as standard)



eSM servo motor overview

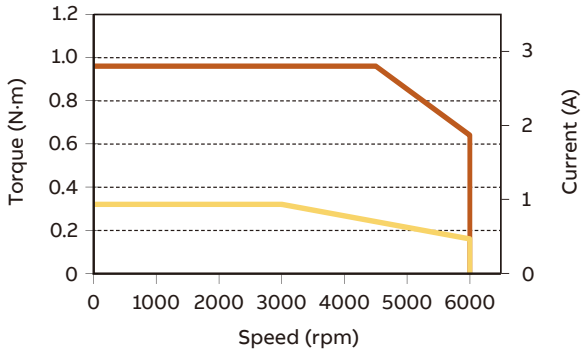
eSM 220 V technical specifications

Frame size		ESM04	ESM06		ESM08		ESM13		
Type designation		**X-101-302**	**X-201-302**	**X-401-302**	**X-751-302**	**B-751-302**	**B-102-202**	**B-152-302**	**B-202-202**
Rated power	**kW**	**0.1**	**0.2**	**0.4**	**0.75**	**0.75**	**1.0**	**1.5**	**2.0**
General									
Peak torque	N·m	0.95	1.91	3.81	7.16	7.17	14.31	14.31	28.65
Peak current	A	2.7	4.8	8.1	14.0	11.3	15.3	21.2	27.0
Continuous stall torque	N·m	0.32	0.64	1.27	2.39	2.39	4.78	4.78	9.55
Continuous current	A_{rms}	0.9	1.6	2.6	4.3	3.8	5.1	6.9	9.0
Rated speed	rpm	3000	3000	3000	3000	3000	2000	3000	2000
Rated voltage	V	220							
Electrical									
Torque constant	N·m/A	0.32	0.46	0.47	0.56	0.77	1.02	0.74	1.14
Voltage constant	V_{rms}/krpm	23.7	28.0	32.8	37.3	42.5	61.7	44.7	68.9
Resistance	ohms	25.40	6.40	3.15	1.48	2.18	1.22	0.65	0.58
Inductance	mH	26.5	16.2	11.0	10.1	7.7	6.7	3.6	3.8
Electrical time constant	ms	1.04	2.53	3.50	5.74	3.53	5.49	5.48	6.52
Mechanical									
Rotor inertia with brake	kg·cm²	NA	0.23	0.34	1.03	2.39	6.96	6.96	12.84
Rotor inertia without brake	kg·cm²	0.04	0.17	0.28	0.90	2.26	6.26	6.26	12.14
Max. speed	rpm	6000	6000	6000	5000	3800	2800	3800	2800
Mechanical time constant	ms	1.01	3.36	0.83	0.59	1.64	1.10	1.24	0.86
Number of motor poles	-	8							
Weight with brake	kg	NA	1.4	1.9	3.8	4.0	8.1	8.1	11.8
Weight without brake	kg	0.5	1.0	1.4	2.4	3.2	6.5	6.5	10.2
Environmental									
Insulation class	-	F							
Operating temperature	°C	0 to 40: no derating							
Operating humidity	%	< 90							
Operating altitude	m	0 to 1000: no derating							
Storage temperature	°C	-20 to 60							
Temperature coefficient	°C/W	1.276	0.256	0.154	0.117	0.088	0.064	0.062	0.048
Power derating coefficient	-	Altitude/Temp. | 40 °C | 45 °C | 50 °C | 55 °C <1000 m | 1.00 | 0.95 | 0.89 | 0.84 1500 m | 0.95 | 0.90 | 0.85 | 0.79 2000 m | 0.90 | 0.85 | 0.80 | 0.75							
Max radial load[1]	N	50	124	146	167	368	424	330	491
Max axial load	N	10	23	23	22	68	175	89	220
Brake data[2]									
Rated voltage	VDC ±10%	24							
Current	A	NA	0.26		0.43		0.82		
Input power	W	NA	6.3		10.4		19.5		
Static friction torque	N·m (min)	NA	2		3		20		
Armature release time	ms (max)	NA	17		35		27		
Armature pull-in time	ms (min)	NA	32		25		76		

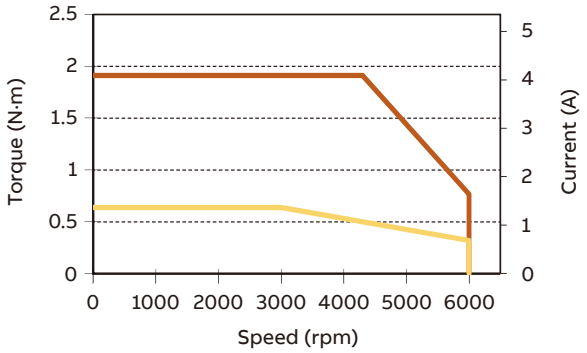
[1] Radial force applied at the end of motor shaft
[2] Brake is prohibited to be used as a braking device during motor running

eSM 220 V motor torque curves

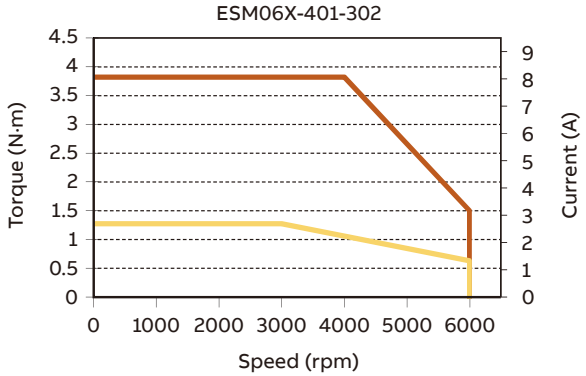
ESM04X-101-302



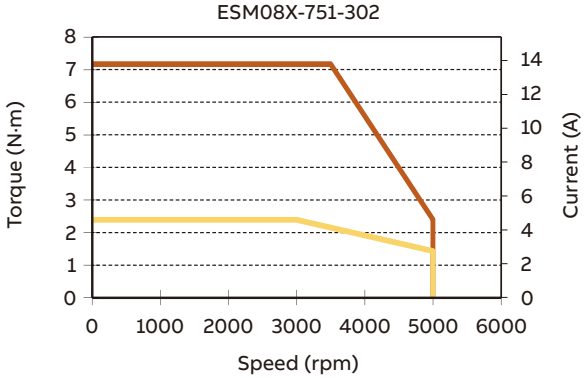
ESM06X-201-302



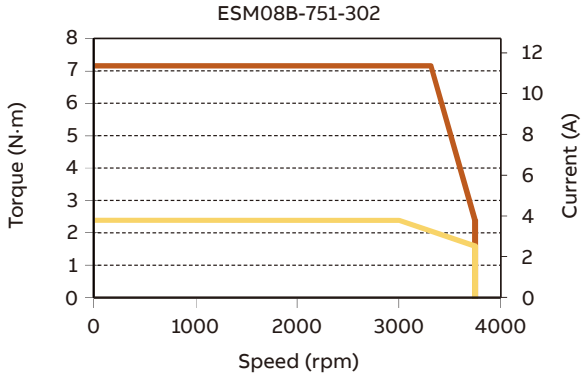
ESM06X-401-302



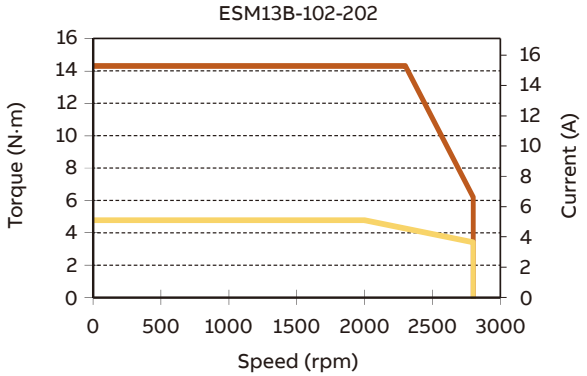
ESM08X-751-302



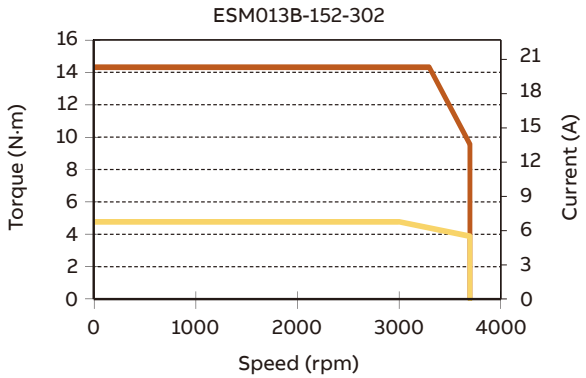
ESM08B-751-302



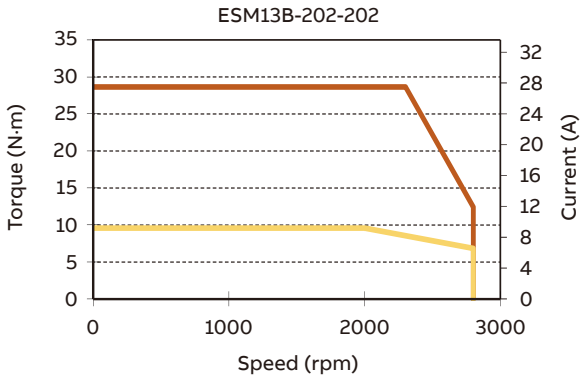
ESM13B-102-202



ESM013B-152-302



ESM13B-202-202



Peak torque - speed curve

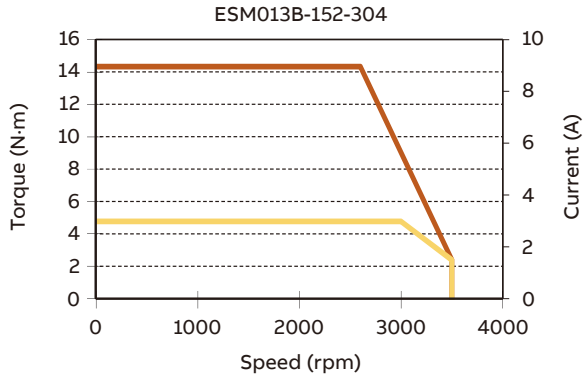
Coutinuous torque-speed curve

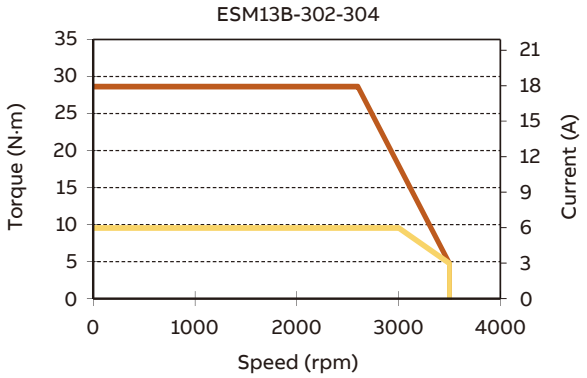
eSM 400 V technical specifications

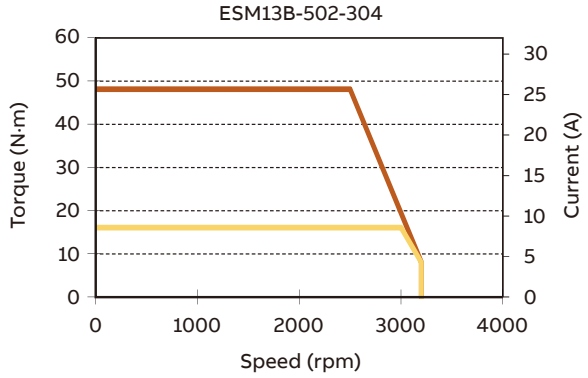
Frame size		ESM13			ESM18			
Type designation		**B-152-304**	**B-302-304**	**B-502-304**	**E-292-154**	**E-442-154**	**E-552-154**	**E-752-154**
Rated power	**kW**	**1.5**	**3.0**	**5.0**	**2.9**	**4.4**	**5.5**	**7.5**
General								
Peak torque	N·m	14.3	28.7	48.2	45.1	71.1	87.6	119
Peak current	A	9.0	18.0	25.8	27.7	44.1	51.3	68.0
Continuous stall torque	N·m	4.8	9.6	16.1	18.6	28.0	35.0	48.0
Continuous current	A_{rms}	3.0	6.0	8.6	11.4	17.6	20.5	27.4
Rated speed	rpm	3000	3000	3000	1500	1500	1500	1500
Rated voltage	V				400			
Electrical								
Torque constant	N·m/A	1.59	1.59	1.87	1.63	1.61	1.71	1.75
Voltage constant	V_{rms}/krpm	106.7	107.4	122.1	107.5	107.2	113.5	116.5
Resistance	ohms	3.8	1.6	1.1	0.5	0.3	0.2	0.2
Inductance	mH	20.1	9.1	7.5	11.2	7.4	6.2	4.2
Electrical time constant	ms	6.27	6.56	6.13	22.12	23.63	26.3	27.18
Mechanical								
Rotor inertia with brake	kg·cm²	6.96	12.84	18.62	48	67.8	92.4	132.4
Rotor inertia without brake	kg·cm²	6.26	12.14	17.9	45.6	65.4	89.98	129.8
Max. speed	rpm	3500	3500	3200	3500	3500	3500	3200
Mechanical time constant	ms	0.86	0.85	0.99	1.2	1.1	1.0	0.9
Number of motor poles	-				8			
Weight with brake	kg	8.1	11.77	15.1	22.5	28.0	35.0	45.7
Weight without brake	kg	6.5	10.6	13.87	18	23.5	30.5	41.2
Environmental								
Insulation class	-				F			
Operating temperature	°C				0 to 40: no derating			
Operating humidity	%				< 90			
Operating altitude	m				0 to 1000: no derating			
Storage temperature	°C				-20 to 60			
Temperature coefficient	°C/W	0.060	0.038	0.022	0.024	0.022	0.017	0.014
Power derating coefficient	-	Altitude/Temp.	40 °C	45 °C	50 °C	55 °C		
		<1000 m	1.00	0.95	0.89	0.84		
		1500 m	0.95	0.90	0.85	0.79		
		2000 m	0.90	0.85	0.80	0.75		
Max radial load[1]	N	330	470	449	999	1112	1072	1216
Max axial load	N	89	89	67	221	221	221	221
Brake data[2]								
Rated voltage	V DC ±10%				24			
Current	A		0.82		1.29		0.79	
Input power	W		19.5		31		19	
Static friction torque	N·m (min)		20		35		50	
Armature release time	ms (max)		27		30		100	
Armature pull-in time	ms (min)		76		120		220	

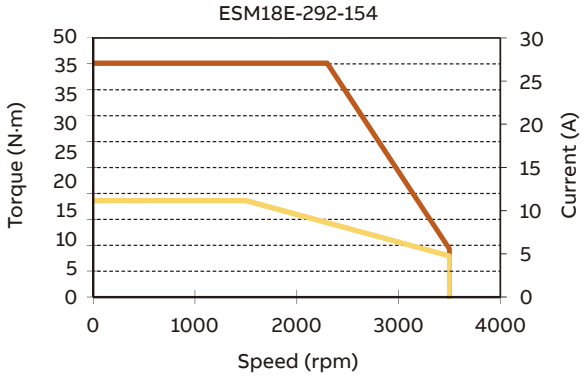
[1] Radial force applied at the end of motor shaft
[2] Brake is prohibited to be used as a braking device during motor running

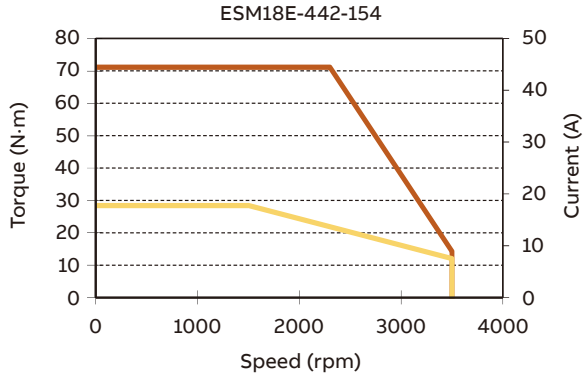
eSM 400 V motor torque curves

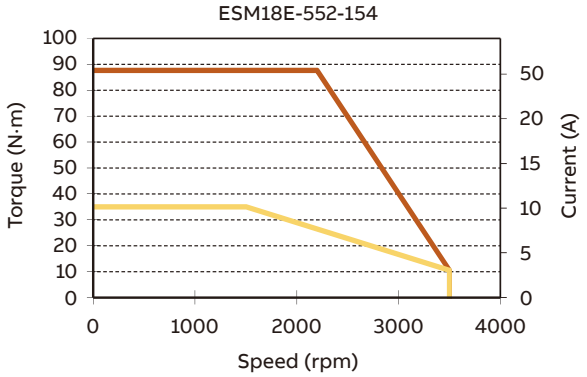


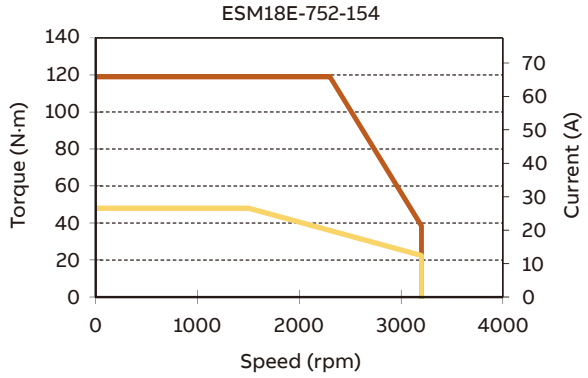


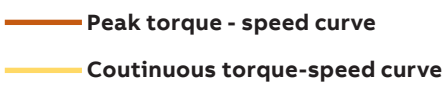






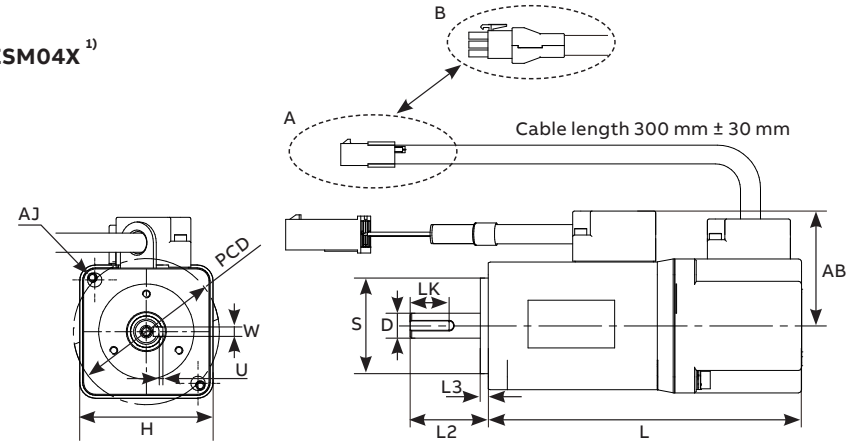




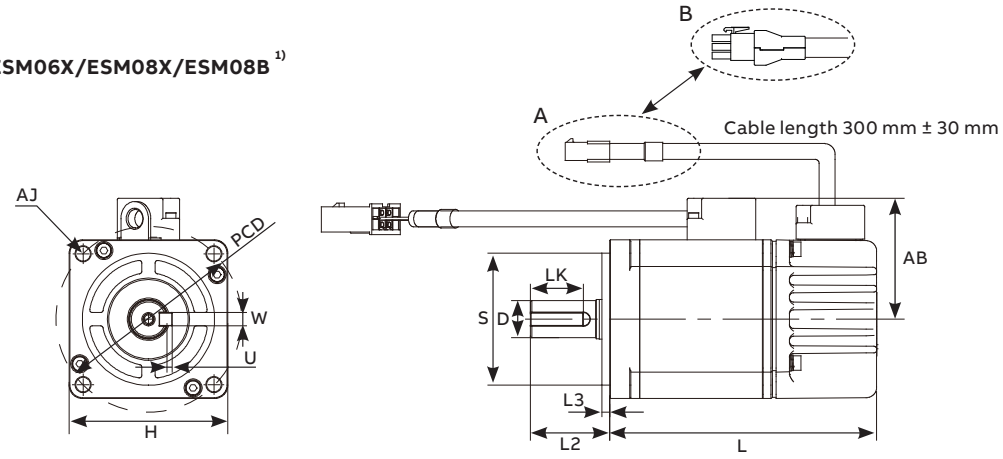


eSM motor drawings

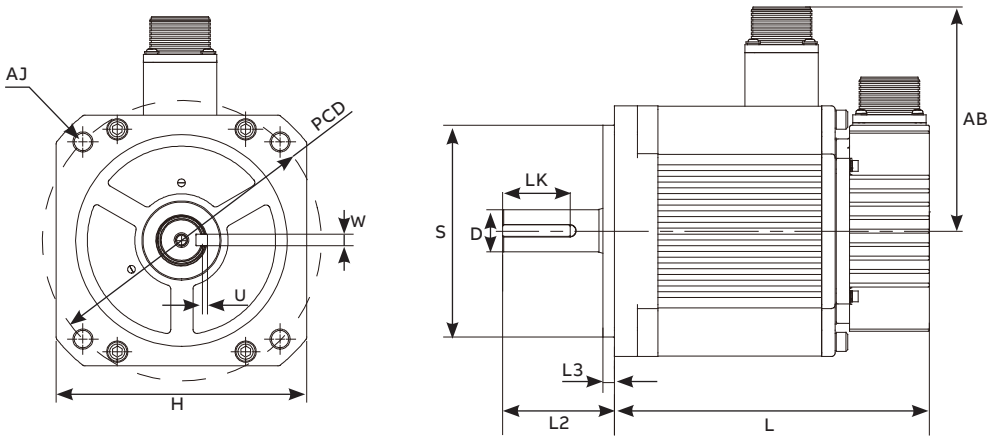
ESM04X [1)]



ESM06X/ESM08X/ESM08B [1)]

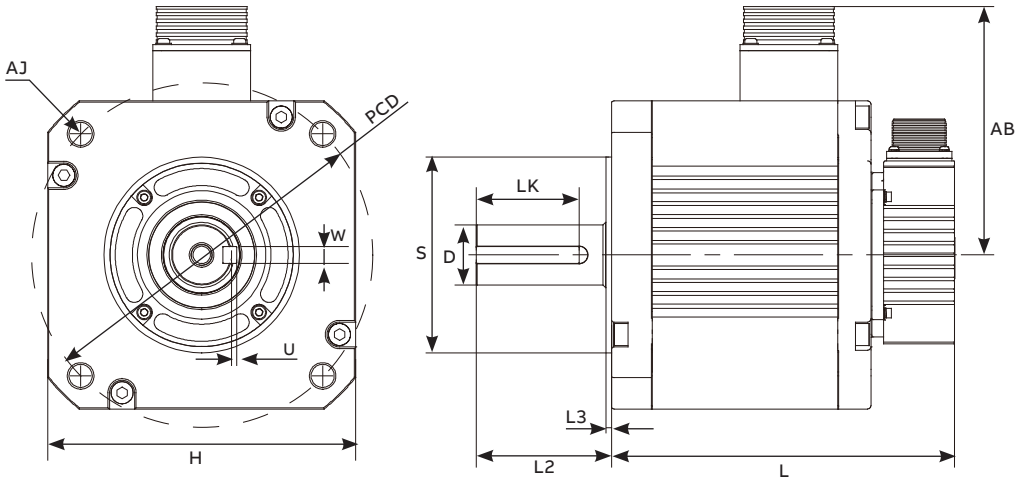


ESM13B/ESM13E

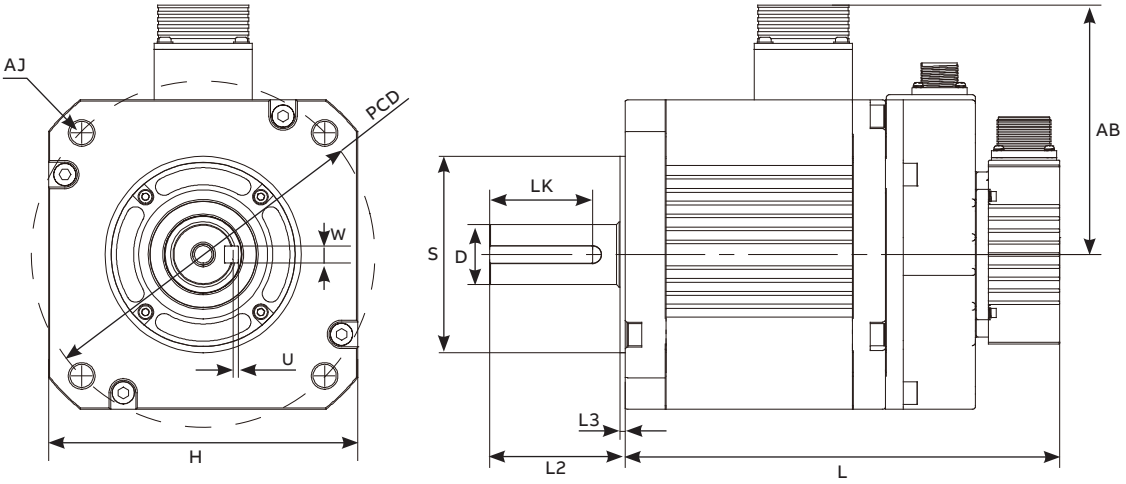


Note: The ESM04, ESM06 and ESM08 motors have two kinds of encoder connectors: 18-pin plastic connector (A) and 9-pin plastic connector (B). Please check the ordering number carefully when purchasing.

ESM18E, without brake



ESM18E, with brake



eSM motor dimensions

Unit: mm

	Motor length L		Shaft		Key			Frame		Spigot		Mounting holes	
Type designation	W/O brake	W/ brake	L2	D	LK	U	W	H	AB	L3	S	AJ	PCD
ESM04X-101-302	98.2	NA	25	$8^{0}_{-0.013}$	12.5	$1.2^{0}_{-0.1}$	$3^{0}_{-0.025}$	40	36	2.5	$30^{0}_{-0.02}$	4.5	46
ESM06X-201-302	101	139.5	30	$14^{0}_{-0.013}$	20	$2^{0}_{-0.2}$	$5^{0}_{-0.03}$	60	46	3	$50^{0}_{-0.02}$	5.5	70
ESM06X-401-302	123	161.5	30	$14^{0}_{-0.013}$	20	$2^{0}_{-0.2}$	$5^{0}_{-0.03}$	60	46	3	$50^{0}_{-0.02}$	5.5	70
ESM08X-751-302	122.2	160.5	40	$19^{0}_{-0.013}$	28	$2.5^{0}_{-0.2}$	$6^{0}_{-0.03}$	80	56	3	$70^{0}_{-0.03}$	6.5	90
ESM08B-751-302	147.5	182.5	35	$16^{0}_{-0.011}$	20	$2^{0}_{-0.2}$	$5^{0}_{-0.03}$	86	59	3	$80^{0}_{-0.03}$	6.5	100

	Motor length L		Shaft		Key			Frame		Spigot		Mounting holes	
Type designation	W/O brake	W/ brake	L2	D	LK	U	W	H	AB	L3	S	AJ	PCD
ESM13B-102-202	164.8	219.3	58	$22^{0}_{-0.013}$	35	$2.5^{0}_{-0.2}$	$6^{0}_{-0.03}$	130	118.4	6	$110^{0}_{-0.03}$	9	145
ESM13B-152-302	164.8	219.3	58	$22^{0}_{-0.013}$	35	$2.5^{0}_{-0.2}$	$6^{0}_{-0.03}$	130	118.4	6	$110^{0}_{-0.03}$	9	145
ESM13B-202-202	214.8	269.3	58	$22^{0}_{-0.013}$	35	$2.5^{0}_{-0.2}$	$6^{0}_{-0.03}$	130	118.4	6	$110^{0}_{-0.03}$	9	145
ESM13B-152-304	164.8	219.3	58	$22^{0}_{-0.013}$	35	$2.5^{0}_{-0.2}$	$6^{0}_{-0.03}$	130	118.4	6	$110^{0}_{-0.03}$	9	145
ESM13B-302-304	214.8	269.3	58	$22^{0}_{-0.013}$	35	$2.5^{0}_{-0.2}$	$6^{0}_{-0.03}$	130	118.4	6	$110^{0}_{-0.03}$	9	145
ESM13B-502-304	264.8	319.3	58	$28^{0}_{-0.013}$	35	$3^{0}_{-0.2}$	$8^{0}_{-0.03}$	130	118.4	6	$110^{0}_{-0.03}$	9	145

	Motor length L		Shaft		Key			Frame		Spigot		Mounting holes	
Type designation	W/O brake	W/ brake	L2	D	LK	U	W	H	AB	L3	S	AJ	PCD
ESM18E-292-154	201.4	253.6	79	$35^{0}_{-0.013}$	60	$3^{0}_{-0.3}$	$10^{0}_{-0.036}$	180	148.2	3.2	$114.3^{0}_{-0.022}$	13.5	200
ESM18E-442-154	233.4	285.6	79	$35^{0}_{-0.013}$	60	$3^{0}_{-0.3}$	$10^{0}_{-0.036}$	180	148.2	3.2	$114.3^{0}_{-0.022}$	13.5	200
ESM18E-552-154	269.4	321.6	113	$42^{0}_{-0.013}$	90	$3^{0}_{-0.3}$	$12^{0}_{-0.036}$	180	148.2	3.2	$114.3^{0}_{-0.022}$	13.5	200
ESM18E-752-154	343.4	395.6	113	$42^{0}_{-0.013}$	90	$3^{0}_{-0.3}$	$12^{0}_{-0.036}$	180	148.2	3.2	$114.3^{0}_{-0.022}$	13.5	200

Colors of the flying lead cable (For 18-pin plastic encoder connector and power connector, ESM04、ESM06 and ESM08 motors)

Smart Inc (T1)

Pin	Function	Color
3	Data +	Blue
4	Data -	Purple
7	GND	Black
10	Vcc	White
18	Shield	Shield

SmartAbs (T2)

Pin	Function	Color
3	Data +	Blue
4	Data -	Blue/black
7	GND	Black
8	Bat -	Brown/black
9	Bat +	Brown
10	Vcc	Red
18	Shield	Shield

Power connector

Pin	Function	Color
1	U	Red
2	V	White
3	W	Black
4	GND	Yellow/Green
5	Shield	Shield
6	Brake 24V	Yellow
7	Brake 0V	Blue

eSM motor ordering information

E S M X X X - X X X - X X X - X X X X X 0 0

Code	Frame size
04	40 mm
06	60 mm
08	80 mm
13	130 mm
18	180 mm

Code	Inertia type
X	Low inertia
B	Medium inertia
E	High inertia

Code	Frame size
101	0.1 kW
201	0.2 kW
401	0.4 kW
751	0.75 kW
102	1.0 kW
152	1.5 kW
202	2.0 kW
292	2.9 kW
302	3.0 kW
442	4.4 kW
502	5.0 kW
552	5.5 kW
752	7.5 kW

Code	Rated speed
15	1500 rpm
20	2000 rpm
30	3000 rpm

Code	Rated voltage
2	220 V AC ± 10%
4	400 V AC ± 10%

Code	Feedback
T1	Absolute, Single-turn (SmartInc), 17 bits per revolution
T2	Absolute, Multi-turn (SmartAbs), 17 bits per revolution/16 bits multi-turn

Code	Brake
N	No brake
B	With brake (brake option not available on 100 W motor)

Code	Encoder type
0	• 18-pin plastic connector (ESM04/06/08) • Aviation socket (ESM13/18)
1	9-pin plastic connector (ESM04/06/08)

Code	Shaft type
A	Shaft end fitted key way and key, without shaft seal
B	Shaft end fitted keyway and key, with shaft seal

Code	Cooling
0	Self-cooling, without thermistor connection

Accessories for MicroFlex e190 and MotiFlex e180

MicroFlex e190 accessories

Code	Description
OPT-SIO-1	I/O and serial port expansion option
OPT-MF-201	Resolver adapter - in-line adapter in the D-shell housing
OPT-MF-200	Encoder splitter - simplified the wiring for dual encoder connection

EMC filters

Code	Description		Rated Amps	Leakage current @40 °C	Weight kg (lbs)	Comppatible with MFE190-04UD-		
						03A0-2	06A0-2	09A0-2
OFI-01	Foot-mount filter with pre-drilled drive mounting holes and shielded AC input cable, suitable for all ratings. Saves space and install time	1-phase 230 V AC	20	12	0.72 (0.59)	•	•	•
OFI-02	Compact filter with low leakage current		8	0.7	0.33 (0.73)	•		
OFI-03	Compact filter		7	33	0.5 (1.1)	•		
JFI-02	Compact filter	3-phase 230 V AC	16	33	0.8 (1.76)		•	•

All filters meet EN 61800-3, category C2 with motor cables <50 m

MotiFlex e180 accessories

Code	Description
FB-01	Encoder Adaptor, for Incremental + Halls (+L517)
FB-02	Encoder Adaptor, for Serial Encoder + SinCos (1V pk-pk) (+L518)
FB-03	Encoder Adaptor, for Resolver (+L516)
FB-04	Encoder Adaptor, for DSL (Stegmann 2 wire solution) (+L530)

Mains chokes

Each individual case should be checked to ascertain whether a mains choke needs to be installed. Mains chokes are typically used to:

- Reduce harmonics in the mains current
- Achieve a reduction in the rms mains current
- Reduce mains disturbance and low frequency interference
- Increase the allowed DC bus continuous power

AC chokes	
CHK-01	AC Choke/MFE180 size: 03A0-4
CHK-02	AC Choke/MFE180 size: 05A0-4, 07A0-4
CHK-04	AC Choke/MFE180 size: 016A-4
CHK-05	AC Choke/MFE180 size: 024A-4, 031A-4
CHK-06	AC Choke/MFE180 size: 046A-4
CHK-07	AC Choke/MFE180 size: 060A-4
CHK-08	AC Choke/MFE180 size: 090A-4

EMC filters

Code	
JFI-02	EMC filter/MFE180 size: 03A0-4, 05A0-4, 07A0-4
JFI-03	EMC filter/MFE180 size: 016A-4
JFI-05	EMC filter/MFE180 size: 024A-4, 031A-4, 046A-4
JFI-07	EMC filter/MFE180 size: 060A-4, 090A-4

General accessories for MicroFlex e190 and MotiFlex e180

Braking resisror

JBR series	
JBR-01	Braking resistor, IP20 (145 W/120 ohm)
JBR-03	Braking resistor, IP20 (185 W/80 ohm)
JBR-04	Braking resistor, IP20 (360 W/40 ohm)
JBR-05	Braking resistor, IP20 (570 W/20 ohm)
JBR-06	Braking resistor, IP20 (790 W/13 ohm)

eSM motor cable

Motor power and feedback cables are available in lengths from 5 m to 30 m to complete the drive and motor package, and can be configured from the code structure below:

C B L X X X - X X X - X X X X

Code	Cable length
050	5 m
100	10 m
150	15 m
300	30 m

Code	Motor compatibility
EPP	ESM04, ESM06, ESM08 power&brake cable
EPM	ESM13, ESM18 power&brake cable
EFP	ESM04, ESM06, ESM08 feedback cable
EFM	ESM13, ESM18 feedback cable

Code	Designation with power cable (cable rating)
06	6 Amp motor power cable (ESM04, ESM06, ESM08)
12	12 Amp motor power cable (ESM13B)
20	20 Amp motor power cable (ESM18E-292, ESM18E-442)
35	35 Amp motor power cable (ESM18E-552, ESM18E-752)
2	Feedback cable with 15 way D type fitted

Code	Motor compatibility
F2	Single-turn (SmartInc), 18-pin plastic connector or aviation plug on the motor side
S2	Single-turn (SmartInc), 9-pin plastic connector on the motor side
T2	Absolute, multi-turn (SmartAbs), including battery case, 18-pin plastic connector or aviation plug on the motor side
M2	Absolute, multi-turn (SmartAbs), including battery case, 9-pin plastic connector on the motor side
P	Power only (ESM18 only)
B	Brake only (ESM18 only)
PB	Power and brake

—

CBLxxx-EPP-PB06

Power and brake cable for ESM04, ESM06 and ESM08

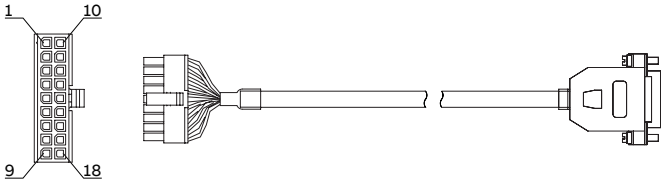
Motor	Color	Function
1	Red	U
2	White	V
3	Black	W
4	Green	Ground
5	Shield	Shield
6	Yellow	Brake 24V
7	Blue	Brake 0V

—

CBLxxx-EFP-F22 [1)]

Encoder signal cable for ESM04, ESM06 and ESM08, 17 bit single-turn absolute encoder

Motor	Color	Function	Drive
3	Blue	SD+	1
4	Blue/Black	SD-	9
7	Black	0 V	13
10	Red	5 V	12
18	Shield	Shield	Shell



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CBLxxx-EFP-S22 [2)]

Encoder signal cable for ESM04, ESM06 and ESM08, 17 bit single-turn absolute encoder

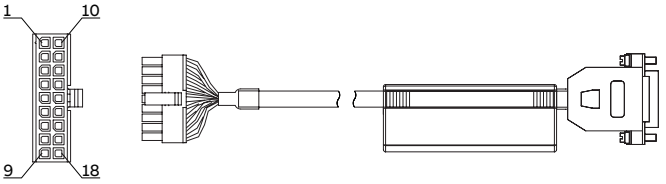
Motor	Color	Function	Drive
5	Blue	SD+	1
6	Green	SD-	9
2	Black	0 V	13
1	White	5 V	12
9	Shield	Shield	Shell

—

CBLxxx-EFP-T22 [1)]

Encoder signal cable for ESM04, ESM06 and ESM08,17 bit multi-turn absolute encoder [3]

Motor	Color	Function	Drive
3	Blue	SD+	1
4	Green	SD-	9
7	Black	0 V	13
8	Red	VB-	-
9	Brown	VB+	-
10	White	5 V	12
18	Shield	Shield	Shell



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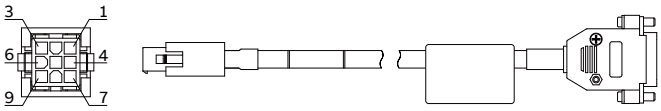
CBLxxx-EFP-M22 [2)]

Encoder signal cable for ESM04, ESM06 and ESM08,17 bit multi-turn absolute encoder [3)]

Motor	Color	Function	Drive
5	Blue	SD+	1
6	Green	SD-	9
2	Black	0 V	13
4	Red	VB-	-
3	Brown	VB+	-
1	White	5 V	12
9	Shield	Shield	Shell



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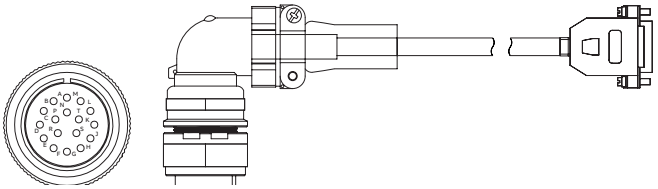
CBLxxx-EFM-F22

Encoder signal cable for ESM13 and ESM18, 17 bit single-turn absolute encoder

Motor	Color	Function	Drive
C	Blue	SD+	1
D	Blue/Black	SD-	9
G	Black	0 V	13
K	Red	5 V	12
T	Shield	Shield	Shell



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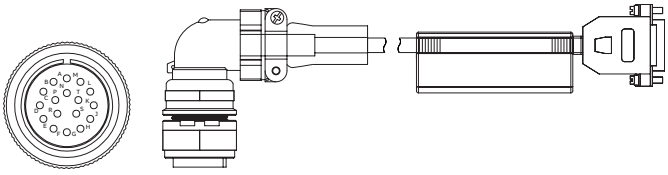
CBLxxx-EFM-T22

Encoder signal cable for ESM13 and ESM18, 17 bit multi-turn absolute encoder [1]

Motor	Color	Function	Drive
C	Blue	SD+	1
D	Green	SD-	9
G	Black	0V	13
H	Red	VB-	-
J	Brown	VB+	-
K	White	5V	12
T	Shield	Shield	Shell



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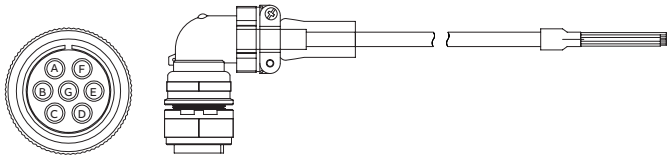
CBLxxx-EPM-PB12
Power and brake cable for ESM13B

Motor	Color	Function
B	Red	U
G	White	V
E	Black	W
A	Blue	Brake 0V
F	Yellow	Brake 24V
C	Green	FG



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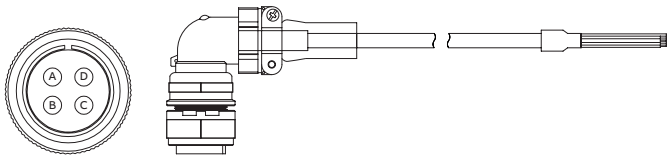
CBLxxx-EPM-P20
Power cable for ESM18E-292 and ESM18E-442
CBLxxx-EPM-P35
Power cable ESM18E-552 and ESM18E-752

Motor	Color	Function
A	Red	U
B	White	V
C	Black	W
D	Green	FG



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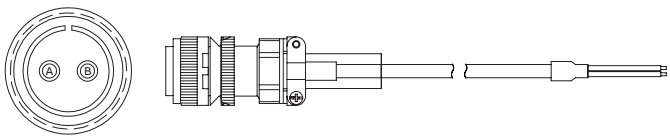
CBLxxx-EPM-B02
Brake cable for ESM18

Motor	Color	Function
A	Red	Brake 24V
B	Black	Brake 0V



[1] For motors with a 18-pin plastic encoder connector.
[2] For motors with a 9-pin plastic encoder connector.
[3] Absolute feedback battery data-please use a 3.6 V Lithium Thionyl Chloride AA non-rechargeable battery, available from electrical suppliers.

The standard motor power and feedback cables for ESM04, ESM06 and ESM08 motors comply with EN55011 Class A Group 1 (Industrial) standard. To enable compliance with EN55011 Class B Group 1 (Domestic) EMC standards the plastic connectors should be replaced by metallic circular connectors providing complete screening with suitable screen terminations in both the plug and socket of an in-line connector.

HDS servo motors
Choices of the high precision requirement

For the applications with a high precision requirement, you can choose the HDS series servo motors. By combining with the MotiFlex e180 or MicroFlex e190, they form a system which provides control on speed, torque and position with high precision and quality. Finally, the system can improve the efficiency and stability of the equipment and ensure higher reliability of the complete system.

Motor type	AC permanent magnet synchronous servo motor
Cooling method	Totally enclosed, non-ventilated; Fan-cooled; Water-cooled [1]
Magnet material	Ultra-high intrinsic coercive field rare earth
Insulation class	F
Mounting	IMB5; IMB35 optional
Thermal protection [2]	3 × PTC 155
Exterior paint	Epoxy
Color	Motor body: black End-cover: white, with ABB logo
Feedback device	Resolver Incremental/absolute encoder
Ingress protection (IP)	IP54 without oil seal IP65 with oil seal
Certification	UL, CE
Energy efficiency index	According to the energy efficiency standard GB30253, motors with the rated power 4 kW and above have the energy label of grade 1, and motors with the rated power below 4 kW have the enery label of grade 2 [3]

Features

- High torque density and power density: reduced volume and weight
- Low cogging torque and torque ripple: excellent performance at low speed and system control
- Outstanding overload performance: 3 times peak torque, 4 times mechanical overload capacity
- Wide speed characteristic, optional high speed characteristic [4]
- Fast dynamic response, accurate rotor balance
- Epoxy resin potting technology on complete stator: compact size and better heat dissipation
- Precise flange and shaft machining: low noise and vibration
- Various feedback options, including Hiperface DSL - single cable absolute encoder solution

[1] For more details on water cooling options, please contact ABB.
[2] Standard models of 60 and 80 flanges do not have the heat protection option. If customization is required, please contact ABB.
[3] Energy efficiency index is not applicable for servo motors with the rated power below 550 W and servo motors with brakes.
[4] The maximum speed in the technical specifications tables is based on standard conditions. If it is required to exceed the maximum speed in the technical specifications tables, please contact ABB.

For more information about the HDS servo motors, refer to catalog 9AKK107304.

Ordering information

Code	Flange size
60	60 mm
80	80 mm
6A	60 mm, plastic connector
8A	80 mm, plastic connector
65	65 mm
100	100 mm
130	130 mm
180	180 mm
240	240 mm

Code	Motor type
W	Water cooled
F	Fan cooled
C	High inertia
-	Low inertia

Code	Rated torque
08	≤8 Nm

Code	Rated power [1]
02	200 W

Code	Input voltage
A	3-phase 230 VAC
B	3-phase 400 VAC

Code	Feedback
R	Resolver
E	Incremental encoder, w/commutation, 2500 ppr
S	Absolute encoder, single-turn, Smart Abs, 17 bit
M	Absolute encoder, multi-turn, Smart Abs, 17 + 16 bit
S2	Absolute encoder, single-turn, Smart Abs, 23 bit
M2	Absolute encoder, multi-turn, Smart Abs, 23 + 16 bit
G	Absolute encoder, single-turn, single-cable, Hiperface DSL
D	Absolute encoder, multi-turn, single-cable, Hiperface DSL
D3	Absolute encoder, single-turn, Hiperface SKS36, 128 sine/cosine periods per revolution
D4	Absolute encoder, multi-turn, Hiperface SKM36, 128 sine/cosine periods per revolution, 4096 revolutions measurable

Code	Shaft end
K	Keyway (half key balance)
N	No keyway

Code	Brake
B	With barke
N	Without brake

Code	Oil seal
S	With oil seal
N	Without oil seal

[1] The code stands for the first two digits of the rated power (kW). For example, for the motor whose rated power is lower than 10 kW (HSD60/80/65/100/130/180), 04 stands for 0.4 kW, 17 stands for 1.7 kW; for the motor whose rated power is greater than or equals to 10 kW (HSD240), 11 stands for 11 kW, 15 stands for 15 kW.

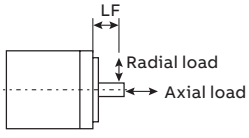
Technical data

Frame size		HDS60/HDS6A		HDS65			HDS80/HDS8A	
Type designation		**-0102A**	**-0104A**	**-0102A**	**-0104A**	**-0206A**	**-0309A**	**C-0309A**
Rated power	**kW**	**0.2**	**0.4**	**0.19**	**0.38**	**0.57**	**0.85**	**0.85**
General								
Rated voltage	V				230			
Rated torque	N·m	0.637	1.27	0.6	1.2	1.8	2.7	2.7
Peak torque	N·m	2.23	4.46	1.8	3.6	5.4	9.4	9.4
Continuous stall torque	N·m	0.7	1.4	0.7	1.4	2.1	3.2	3.2
Rated current	A_{rms}	1.3	2.6	1.6	3.3	4.7	5.5	5.5
Peak current	A	5.1	10.5	5.8	12.0	17.6	20.5	20.5
Continuous stall current	A	1.5	2.8	1.9	3.9	5.5	6.4	6.4
Rated speed	rpm	3000	3000	3000	3000	3000	3000	3000
Maximum speed [1]	rpm	6000	6000	5000	5000	5000	6000	6000
Electrical								
Torque constant [2]	N·m/A	0.554	0.554	0.41	0.41	0.44	0.554	0.554
Voltage constant	V_{rms}/krpm	33.5	33.5	25.0	25.0	26.4	33.5	33.5
Resistance	ohms	12.9	5.1	5.27	2.07	1.45	1.42	1.42
Inductance	mH	30.9	14.6	17.3	8.64	6.4	3.94	3.94
Electrical time constant	ms	2.39	3.96	3.3	4.2	4.4	3.66	3.66
Mechanical								
Rotor inertia with brake	kg·cm²	0.205	0.347	0.19	0.30	0.41	1.597	2.364
Rotor inertia without brake	kg·cm²	0.198	0.34	0.16	0.27	0.38	1.56	2.28
Mechanical time constant	ms	0.4	0.3	0.4	0.3	0.3	0.4	1.0
Number of motor poles	-				10			
Weight with brake	kg	1.7	1.9	1.74	2.31	2.88	3.2	3.4
Weight without bake	kg	1.4	1.6	1.41	1.98	2.55	2.5	2.7
Thermal time constant	min	6	9	8	12	17	16	16
Environmental								
Insulation class	-				F			
Operating temperature	℃				-20...40			
Operating humidity	%				40...80 (no condensation)			
Storage temperature	℃				-40...50			
Max radial load (@LF [3])	N	235 (@25 mm)		250 (@20 mm)			420 (@30 mm)	
Max axial load (@LF [3])	N	60 (@25 mm)		75 (@20 mm)			150 (@30 mm)	
Brake								
Rated voltage	VDC ± 10%				24			
Current	A	0.316	0.316	0.47	0.47	0.47	0.48	0.48
Input power	W	7.6	7.6	11.4	11.4	11.4	11.5	11.5
Static friction torque	N·m (min)	1.5	1.5	2.0	2.0	2.0	3.2	3.2
Armature release time	ms (max)	40	40	10	10	10	40	40
Armature pull-in time	ms (max)	60	60	58	58	58	60	60
Rotational inertia	kg·cm²	0.0065	0.0065	0.03	0.03	0.03	0.0368	0.0368
Weight	kg	0.32	0.32	0.33	0.33	0.33	0.51	0.51

[1] The max speed in applications shall be co-decided by the input voltage and the output frequency range and the output frequency range of the drive, feedback encoder type, etc. For higher speed applications, please contact ABB.
[2] The torque constant decreases in a non-linear manner as the torque increases, the Kt values are considered valid until approximately 2 times continuous stall torque.

Frame size		HDS100						HDS130	
Type designation		**-0308A**	**C-0308A**	**-0413A**	**C-0413A**	**-0619A**	**C-0619A**	**-0620A**	**C-0620A**
Rated power	**kW**	**0.75**	**0.75**	**1.3**	**1.3**	**1.9**	**1.9**	**2.0**	**2.0**
General									
Rated voltage	V	230							
Rated torque	N·m	2.5	2.5	4.0	4.0	6.0	6.0	6.4	6.4
Peak torque	N·m	7.5	7.5	12.0	12.0	18.0	18.0	19.1	19.1
Continuous stall torque	N·m	3.4	3.4	5.0	5.0	7.5	7.5	7.2	7.2
Rated current	A_{rms}	4.3	4.3	6.9	6.9	10.5	10.5	10.9	10.9
Peak current	A	15.5	15.5	25.7	25.7	39.5	39.5	36.0	36.0
Continuous stall current	A	5.8	5.8	8.6	8.6	12.6	12.6	11.5	11.5
Rated speed	rpm	3000	3000	3000	3000	3000	3000	3000	3000
Maximum speed [1]	rpm	4000	4000	4000	4000	4000	4000	5000	5000
Electrical									
Torque constant [2]	N·m/A	0.68	0.68	0.68	0.68	0.69	0.69	0.685	0.685
Voltage constant	V_{rms}/krpm	41.3	41.3	41.3	41.3	41.8	41.8	41.4	41.4
Resistance	ohms	1.1	1.1	1.1	1.1	0.65	0.65	0.5	0.5
Inductance	mH	7.54	7.54	7.54	7.54	5.15	5.15	4.8	4.8
Electrical time constant	ms	6.9	6.9	6.9	6.9	7.9	7.9	9.6	9.6
Mechanical									
Rotor inertia with brake	kg·cm²	1.43	2.8	1.43	2.8	1.97	3.47	5.94	12.68
Rotor inertia without brake	kg·cm²	1.31	2.68	1.31	2.68	1.85	3.35	4.06	10.8
Mechanical time constant	ms	0.3	0.6	0.3	0.6	0.2	0.4	0.5	1.2
Number of motor poles	-	10							
Weight with brake	kg	5.47	5.76	5.47	5.76	6.27	6.56	8.6	9.45
Weight without bake	kg	4.71	5.0	4.71	5.0	5.51	5.8	6.65	7.5
Thermal time constant	min	28	28	28	28	23	23	32.5	32.5
Environmental									
Insulation class	-	F							
Operating temperature	℃	-20...10							
Operating humidity	%	40...80 (no condensation)							
Storage temperature	℃	-40...50							
Max radial load (@LF [3])	N	550 (@30 mm)						500 (@40 mm)	
Max axial load (@LF [3])	N	150 (@30 mm)						200 (@40 mm)	
Brake									
Rated voltage	VDC ± 10%								
Current	A	0.71	0.71	0.71	0.71	0.71	0.71	0.96	0.96
Input power	W	17	17	17	17	17	17	23	23
Static friction torque	N·m (min)	6	6	6	6	6	6	18	18
Armature release time	ms (max)	40	40	40	40	40	40	60	60
Armature pull-in time	ms (max)	80	80	80	80	80	80	120	120
Rotational inertia	kg·cm²	0.12	0.12	0.12	0.12	0.12	0.12	1.88	1.88
Weight	kg	0.89	0.89	0.89	0.89	0.89	0.89	1.78	1.78

[3] The allowed loads of the shaft end are shown as follows. Please notice that, the radial load and axial load of the shaft end when the motor is operating cannot exceed the values indicated in the table.



Technical data

Frame size		HDS130						HDS180		
Type designation		**-0817B**	**C-0817B**	**-1226B**	**C-1226B**	**-1829B**	**C-1829B**	**-2540B**	**C-2540B**	**-3555B**
Rated power	**kW**	**1.7**	**1.7**	**2.6**	**2.6**	**2.9**	**2.9**	**4.0**	**4.0**	**5.5**
General										
Rated voltage	V					400				
Rated torque	N·m	8	8	12	12	18	18	25	25	35
Peak torque	N·m	24	24	36	36	54	54	75	75	105
Continuous stall torque	N·m	10	10	15	15	20	20	29	29	41
Rated current	A_{rms}	7.7	7.7	9.5	9.5	14.8	14.8	15.7	15.7	22.3
Peak current	A	29.5	29.5	30.6	30.6	51.0	51.0	48.8	48.8	68.5
Continuous stall current	A	9.0	9.0	11.7	11.7	16.1	16.1	18.0	18.0	25.7
Rated speed	rpm	2000	2000	2000	2000	1500	1500	1500	1500	1500
Maximum speed [1]	rpm	4000	4000	4000	4000	4000	4000	3500	3500	3500
Electrical										
Torque constant [2]	N·m/A	1.22	1.22	1.41	1.41	1.40	1.40	1.75	1.75	1.74
Voltage constant	V_{rms}/krpm	73.5	73.5	85.4	85.4	84.7	84.7	105.9	105.9	105.1
Resistance	ohms	1.6	1.6	0.78	0.78	0.58	0.58	0.36	0.36	0.19
Inductance	mH	12.3	12.3	8.3	8.3	6.13	6.13	5.9	5.9	3.9
Electrical time constant	ms	7.7	7.7	10.6	10.6	10.5	10.5	16.5	16.5	20.2
Mechanical										
Rotor inertia with brake	kg·cm²	5.94	12.68	9.34	16.7	11.62	19.58	51.7	153.7	70.6
Rotor inertia without brake	kg·cm²	4.06	10.8	7.46	14.82	9.74	17.7	44.6	146.6	63.5
Mechanical time constant	ms	0.4	1.0	0.3	0.5	0.3	0.5	0.5	1.5	0.4
Number of motor poles	-	10	10	10	10	10	10	10	10	10
Weight with brake	kg	8.6	9.45	10.4	11.65	12.2	13.25	23.4	28.8	28.1
Weight without bake	kg	6.65	7.5	8.75	9.7	10.25	11.3	19.7	25.1	24.4
Thermal time constant	min	49	49	64	64	54	54	45	45	58
Environmental										
Insulation class	-					F				
Operating temperature	℃					-20...40				
Operating humidity	%					40...80 (no condensation)				
Storage temperature	℃					-40...50				
Max radial load (@LF [3])	N		600 (@40 mm)			700 (@40 mm)		1900 (@65 mm)		
Max axial load (@LF [3])	N		270 (@40 mm)			350 (@40 mm)		600 (@65 mm)		
Brake										
Rated voltage	VDC ± 10%					24				
Current	A	0.96	0.96	0.96	0.96	0.96	0.96	1.06	1.06	1.06
Input power	W	23	23	23	23	23	23	25.3	25.3	25.3
Static friction torque	N·m (min)	18	18	18	18	18	18	55	55	55
Armature release time	ms (max)	60	60	60	60	60	60	22	22	22
Armature pull-in time	ms (max)	120	120	120	120	120	120	127	127	127
Rotational inertia	kg·cm²	1.88	1.88	1.88	1.88	1.88	1.88	7.1	7.1	7.1
Weight	kg	1.78	1.78	1.78	1.78	1.78	1.78	3.7	3.7	3.7

Frame size					HDS240			
Type designation		**C-3555B**	**-4876B**	**C-4876B**	**-5011B**	**-7215B**	**F-6715B**	**F-9320B**
Rated power	**kW**	**5.5**	**7.6**	**7.6**	**11.0**	**15.0**	**15.0**	**20.0**
General								
Rated voltage	V				400			
Rated torque	N·m	35	48	48	50	72	67	93
Peak torque	N·m	105	150	150	150	216	201	279
Continuous stall torque	N·m	41	53	53	65	92	90	122
Rated current	A_{rms}	22.3	30.8	30.8	23.5	29.5	30.5	39.0
Peak current	A	68.5	99.7	99.7	93	117	120	150
Continuous stall current	A	25.7	33	33	31	39	40	50
Rated speed	rpm	1500	1500	1500	2200	2000	2200	2000
Maximum speed [1]	rpm	3500	3500	3500	3000	2700	3000	2700
Electrical								
Torque constant [2]	N·m/A	1.74	1.75	1.75	2.2	2.4	2.2	2.4
Voltage constant	V_{rms}/krpm	105.1	105.9	105.9	135	150	135	150
Resistance	ohms	0.19	0.13	0.13	0.15	0.13	0.15	0.13
Inductance	mH	3.9	2.9	2.9	3.7	3.2	3.7	3.2
Electrical time constant	ms	20.2	22.2	22.2	32	29	32	29
Mechanical								
Rotor inertia with brake	kg·cm²	176.2	89.2	198.4	155.6	190.6	155.6	190.6
Rotor inertia without brake	kg·cm²	169.1	82.1	191.3	107	142	107	142
Mechanical time constant	ms	1.0	0.3	0.7	5.4	5.9	5.4	5.9
Number of motor poles	-	10	10	10	6	6	6	6
Weight with brake	kg	33.9	32.6	38.8	66	81.5	71	86.5
Weight without bake	kg	30.2	28.9	35.1	57.5	73	62.5	78
Thermal time constant	min	58	56	56	27	32	37	40
Environmental								
Insulation class	-				F			
Operating temperature	°C				-20...40			
Operating humidity	%				40...80 (no condensation)			
Storage temperature	°C				-40...50			
Max radial load (@LF [3])	N		1900 (@65 mm)		2810 (@60 mm)		2730 (@80 mm)	
Max axial load (@LF [3])	N		600 (@65 mm)		530 (@60 mm)		530 (@80 mm)	
Brake								
Rated voltage	VDC ± 10%							
Current	A	1.06	1.06	1.06	1.80	1.80	1.80	1.80
Input power	W	25.3	25.3	25.3	42.7	42.7	42.7	42.7
Static friction torque	N·m (min)	55	55	55	143	143	143	143
Armature release time	ms (max)	22	22	22	60	60	60	60
Armature pull-in time	ms (max)	127	127	127	450	450	450	450
Rotational inertia	kg·cm²	7.1	7.1	7.1	48.6	48.6	48.6	48.6
Weight	kg	3.7	3.7	3.7	8.5	8.5	8.5	8.5

HY explosion-proof servo motors
Satisfies the applicaions on special occasions

HY series - ABB's high-performance explosion-proof servo motor series - is derived from the same advanced product platform since ABB established the HDS servo motor family. This series adopts increased-safety ec level and enclosure protection type tc level explosion-proof design for applications requiring explosion-proof certification to ensure safe operation of the product in Zone 2/Zone 22 explosion-proof areas. The explosion-proof certification is II 3 G Ex ec IIC T4 Gc and II 3 D Ex tc IIIC T130°C Dc IP65.

Features

- High reliability and long service life
- High density of power and torque
- Ultra-high intrinsic coercivity rare earth permanent magnet materials
- Superior overload capability, triple peak torque
- Low cogging torque and torque ripple, excellent low speed and system control performance
- Epoxy potting process, compact structure and excellent heat dissipation
- High dynamic response, precise dynamic balance
- Precision flange and shaft machining, lower noise and vibration

Applications

- Printing industry
- Painting equipment
- Paint robots
- Cleaning equipment
- Food & beverage
- Pharmaceutical equipment
- Petrochemical and natural gas facilities

More information about the HY explosion-proof servo motors, please refer to the catalog 9AKK107304.

Explosion-proof markings

Explosion-proof zones and markings of HY series motors

Atmosphere type	Certification system	Zone	Marking
Explosive gas atmosphere	ATEX	Zone 2	II 3 G Ex ec IIC T4 Gc
Explosive dust atmosphere		Zone 22	II 3 D Ex tc IIIC T130℃ Dc IP65

Explosive gas atmosphere, ATEX Zone 2, II 3 G Ex ec IIC T4 Gc

HY series motors meet the explosion-proof requirement of: ATEX Zone 2 explosive gas atmosphere, increased safety type, ground with gas type C, T4 thermal level, general protection level

Explosion-proof zone

Zone 0	Places where an explosive gas atmosphere occurs continuously or exists for a prolonged period of time
Zone 1	Places where an explosive gas atmosphere is likely to occur during normal operations
Zone 2	Places where an explosive gas atmosphere is unlikely to occur during normal operations, and even if it occurs, it is only occasional and only exists for a short period of time

Explosion-proof marking of HY motors
II 3 G Ex ec IIC T4 Gc

II	3	G	Ex	ec	II	C	T4	Gc
I Mine	M1 Very high protection level	Explosive gases	Explosion-proof	db Flameproof type ec Increased safety type	I Mine	Methane, coal dust	Max. surface temp. allowed Tx or Txxx℃ Tx as below: T1: 450℃ T2: 300℃ T3: 200℃ T4: 135℃ T5: 100℃ T6: 85℃	Ma very high protection level
	M2 High protection level							Mb High protection level
II Ground	1 Very high protection level				II Ground	A Propane		Ga very high protection level
	2 High protection level					B Ethylene		Gb high protection level
	3 General protection level					C Hydrogen, acetylene		Gc General protection level

Explosive dust atmosphere, ATEX Zone 22, II 3 D Ex tc IIIC T130°C Dc IP65

HY series motors meet the explosion-proof requirement of: ATEX Zone 22 explosive dust atmosphere, enclosure protection type, ground with C type conductive dust, maximum surface temperature allowed 130°C, general protection level, IP65

Explosion-proof zone

Zone 20	Places where an explosive dust atmosphere occurs continuously or exists for a prolonged period of time
Zone 21	Places where an explosive dust atmosphere is likely to occur during normal operations
Zone 22	Places where an explosive dust atmosphere is unlikely to occur during normal operations, and even if it occurs, it is only occasional and only exists for a short time

Explosion-proof marking of HY motors
II 3 D Ex tc IIIC T130℃ Dc

II	3	D	Ex	tc	III	C	T130℃	Dc
II Ground	1 Very high protection level	Explosive dust	Explosion-ptoof	tc Enclosure protection type	III Ground	A Conductive flying's	Max. surface temp. allowed Tx or Txxx℃ Tx as below: T1: 450℃ T2: 300℃ T3: 200℃ T4: 135℃ T5: 100℃ T6: 85℃ T130℃	Da very high protection level
	2 High protection level					B Nonconductive dust		Db High protection level
	3 General protection level					C Conductive dust		Dc General protection level

Ordering information

Code	Ex Zones
Y	Zone 2/Zone 22

Code	Cooling type
A	Totally enclosed, non-ventilated

Code	Flange size
65	65 mm
10	100 mm
13	130 mm
18	180 mm

Code	Rated power[1)]
17	1.7 kW

Code	Rated speed
15	1500 rpm
20	2000 rpm
25	2500 rpm
30	3000 rpm

Code	Design version
0	Standard

Code	Accessories
2	Angled connector, smooth shaft, oil seal
3	Angled connector, key shaft, oil seal

Code	Brake
B	Brake as standard
N	Without brake

Code	Feedback type
R0	Resolver

Code	Input voltage
A	3-phase 230 VAC
B	3-phase 400 VAC

[1)] The code stands for the first two digits of the rated power. For the available rated power information, refer to the technical data table.

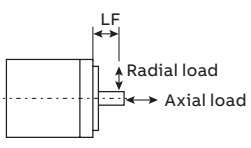
Technical data

Frame size		HYA65	HYA10		HYA13		HYA18		
Type designation		**5030A**	**1030A**	**1730A**	**1620B**	**2820B**	**5020B**	**6520B**	**8020B**
Rated power	kW	0.5	1.0	1.7	1.6	2.8	5.0	6.5	8.0
General									
Rated voltage	V		230				400		
Rated torque	N·m	1.6	3.2	5.3	7.5	13.4	24	31	38.5
Peak torque	N·m	4.5	9.6	16.5	22.5	45	75	105	135
Continuous stall torque	N·m	1.8	4	7	7.8	17	29	41	50
Rated current	A_{rms}	4.3	5.6	9.1	7	10.8	15.3	20.2	24.2
Peak current	A	14.7	20	36.2	27.8	42.4	48.8	68.5	95
Continuous stall current	A	4.4	6.7	11.4	7.1	12.7	18	25.7	30
Rated speed	rpm	3000	3000	3000	2000	2000	2000	2000	2000
Maximum speed [1]	rpm	5000	4000	4000	4000	4000	3500	3500	3500
Electrical									
Torque constant [2]	N·m/A	0.44	0.68	0.69	1.22	1.4	1.75	1.74	1.75
Voltage constant	V_{rms}/krpm	26.4	41.3	41.8	73.5	84.7	105.9	105.1	105.9
Resistance	ohms	1.45	1.1	0.65	1.6	0.58	0.36	0.19	0.13
Inductance	mH	6.4	7.54	5.15	12.3	6.13	5.9	3.9	2.9
Electrical time constant	ms	4.4	6.9	7.9	7.7	10.5	16.5	20.2	22.2
Mechanical									
Rotor inertia with brake	kg·cm²	0.41	1.44	1.98	5.06	10.74	51.7	70.6	89.2
Rotor inertia without brake	kg·cm²	0.38	1.31	1.85	4.06	9.74	44.6	63.5	82.1
Mechanical time constant	ms	0.3	0.3	0.2	0.4	0.3	0.5	0.4	0.3
Number of motor poles	-		10				10		
Weight with brake	kg	2.88	5.47	6.27	8.60	12.2	23.4	28.1	32.6
Weight without bake	kg	2.55	4.71	5.51	6.65	10.25	19.7	24.4	28.9
Thermal time constant	min	17	28	23	49	54	45	58	56
Environmental									
Insulation class	-				F				
Operating temperature	℃				-20...40				
Operating humidity	%				5...95 (no condensation)				
Storage temperature	℃				-40...50				
Max radial load (@LF [3])	N	420 (@30 mm)	550 (@30 mm)		600 (@40 mm)	700 (@40 mm)	1900 (@65 mm)		
Max axial load (@LF [3])	N	150 (@30 mm)	150 (@30 mm)		270 (@40 mm)	350 (@40 mm)	600 (@65 mm)		
Brake									
Rated voltage	VDC ± 10%				24				
Current	A	0.47	0.58	0.58	0.87	0.87	1.06	1.06	1.06
Input power	W	11.4	14	14	20.8	20.8	25.3	25.3	25.3
Static friction torque	N·m (min)	2.0	4.5	4.5	18	18	55	55	55
Armature release time	ms (max)	10	20	20	40	40	22	22	22
Armature pull-in time	ms (max)	58	80	80	145	145	127	127	127
Rotational inertia	kg·cm²	0.03	0.13	0.13	1.00	1.00	7.10	7.10	7.10
Weight	ms (min)	0.33	0.76	0.76	1.95	1.95	3.70	3.70	3.70

[1] The max speed in applications shall be co-decided by the input voltage and the output frequency range and the output frequency range of the drive, feedback encoder type, etc. For higher speed applications, please contact ABB.

[2] The torque constant decreases in a non-linear manner as the torque increases, the Kt values are considered valid until approximately 2 times continuous stall torque.

[3] The allowed loads of the shaft end are shown as follows. Please notice that, the radial load and axial load of the shaft end when the motor is operating cannot exceed the values indicated in the table.



More motion control solutions

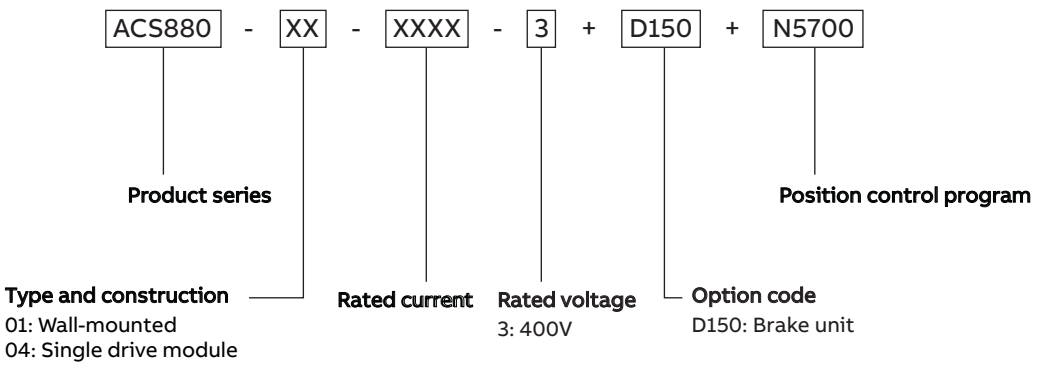
ACS880 (+N5700) - choice of the high power position control application

For the position control applications required a high power range, you can choose the ACS880 drives which are configured with the positon control program (+N5700). Its wide power range and various drive variants make the ACS880 position control ideal for any axis. Motion functions are based on PLCopen motion control blocks and can be easily configured by parameters. Programming flexibility and connectivity to all motors and PLCs ensure optimized solutions for production machinery and material handling applications.

ACS880 position control program (+N5700)	
Motor and feedback	
Motors	Asynchronous, permanent magnet (servo and high torque), synchronous reluctance motors
Feedback devices	HTL, TTL, sin/cos, EnDat, Hiperface, SSI, resolvers
Position control function	
Homing	Different modes with home switch, and index pulse
Absolute/relative positioning	Linear/rotary/modulo
Profiled positioning	Target position, velocity, acceleration/deceleration, jerk 8 predefined sets via DI/fieldbus Target change on the fly
Position synchronizing/electrical shaft	Reference via master encoder, drive-to-drive link, or virtual master
Fast position latching	With 2 position registers for homing, position correction
Jogging	Adjusting an axis while maintaining smooth position control
Control performance	
Position control loop	500 µs
Drive-to-drive link	500 µs
Speed control loop	500 µs
Torque control loop	125 µs

ACS880 position control program (+N5700)	
Programmability	
IEC61131 programming	Ladder, IL, CFC, FBD, ST, SFC
Motion control library	PLCopen motion function blocks and additional ABB specific blocks
Adaptive programming	20 blocks for flexible adjustments
Programming tools	Drive application builder for IEC programming Drive composer for adaptive programming
ACS880 drive product family	
Power and voltage range	0.55 to 5600 kW, 3-phase, 230 to 690 V
Enclosure	IP00 to IP55
Configurations	Single and multidrive (common DC)
Mounting	Wall-mounting up to IP55, stand-alone cabinet-built, modules for cabinet mounting, flange (push through) mounting
Functional safety	
Supported functions	Safe torque off (STO), Safe stop 1 (SS1), Safe stop emergency (SSE), Safe brake control (SBC), Safely limited speed (SLS) with/without encoder, Safe maximum speed (SMS), Prevention of unexpectedstartup (POUS), Safe direction (SDI), Safe speed monitoring (SSM), Safe temperature monitoring (SMT)
Safety data	PL e, SIL 3
Safety communication	PROFIsafe over PROFINET IO

Ordering information of the ACS880 for position control



For more information about the ACS880, refer to catalog 3AUA0000098111 and 3AUA0000115038.

Technical data of the ACS880 for position control

Drive type	Frame size	Brake unit	Nominal ratings			Low overload		High overload		Noise level (dB (A))	Heat dissipation (W)	Air flow (m^3/h)
			I_N(A)	I_{MAX}(A)	P_N(KW)	I_{Ld}(A)	P_{Ld}(kW)	I_{Hd}(A)	P_{Hd}(kW)			
ACS880-01-02A4-3+N5700	R1	Built-in	2.4	3.1	0.75	2.3	0.75	1.8	0.55	46	30	44
ACS880-01-03A3-3+N5700	R1	Built-in	3.3	E4.1	1.1	3.1	1.1	2.4	0.75	46	40	44
ACS880-01-04A0-3+N5700	R1	Built-in	4.0	5.6	1.5	3.8	1.5	3.3	1.1	46	52	44
ACS880-01-05A6-3+N5700	R1	Built-in	5.6	6.8	2.2	5.3	2.2	4.0	1.5	46	73	44
ACS880-01-07A2-3+N5700	R1	Built-in	8.0	9.5	3.0	7.6	3.0	5.6	2.2	46	94	44
ACS880-01-09A4-3+N5700	R1	Built-in	10	12.2	4.0	9.5	4.0	8.0	3.0	46	122	44
ACS880-01-12A6-3+N5700	R1	Built-in	12.9	16	5.5	12	5.5	10	4.0	46	172	44
ACS880-01-017A-3+N5700	R2	Built-in	17	21	7.5	16	7.5	12.6	5.5	51	232	88
ACS880-01-025A-3+N5700	R2	Built-in	25	29	11	24	11	17	7.5	51	337	88
ACS880-01-032A-3+N5700	R3	Built-in	32	42	15	30	15	25	11	57	457	134
ACS880-01-038A-3+N5700	R3	Built-in	38	54	18.5	36	18.5	32	15	57	562	134
ACS880-01-045A-3+N5700	R4	Built-in	45	64	22	43	22	38	18.5	62	667	134
ACS880-01-061A-3+N5700	R4	Built-in	61	76	30	58	30	45	22	62	907	280
ACS880-01-072A-3+N5700[1]	R5	Optional	72	104	37	68	37	61	30	62	1117	280
ACS880-01-087A-3+N5700[1]	R5	Optional	87	122	45	83	45	72	37	62	1120	280
ACS880-01-105A-3+N5700[1]	R6	Optional	105	148	55	100	55	87	45	67	1295	435
ACS880-01-145A-3+N5700[1]	R6	Optional	145	178	75	138	75	105	55	67	1440	435
ACS880-01-169A-3+N5700[1]	R7	Optional	169	247	90	161	90	145	75	67	1940	450
ACS880-01-206A-3+N5700[1]	R7	Optional	206	287	110	196	110	169	90	67	2310	450
ACS880-01-246A-3+N5700[1]	R8	Optional	246	350	132	234	132	206	110	65	3300	550
ACS880-01-293A-3+N5700[1]	R8[2]	Optional	293	418	160	278	160	246[5]	132	65	3900	550
ACS880-01-363A-3+N5700[1]	R9[3]	Optional	363	498	200	345	200	293	160	68	4800	1150
ACS880-01-430A-3+N5700[1]	R9[4]	Optional	430	545	250	400	200	363[6]	200	68	6000	1150
ACS880-04-505A-3+N5700[1]	R10	Optional	505	560	250	485	250	361	200	72	5602	1200
ACS880-04-585A-3+N5700[1]	R10	Optional	585	730	315	575	315	429	250	72	6409	1200
ACS880-04-650A-3+N5700[1]	R10	Optional	650	730	355	634	355	477	250	72	8122	1200
ACS880-04-725A-3+N5700[1]	R11	Optional	725	1020	400	715	400	566	315	72	8764	1200
ACS880-04-820A-3+N5700[1]	R11	Optional	820	1020	450	810	450	625	355	72	9862	1200
ACS880-04-880A-3+N5700[1]	R11	Optional	880	1100	500	865	500	725[7]	400	71	10578	1420

Note	
I_N	Rated current available continuously without overloadability at 40 °C.
P_N	Typical motor power in no-overload use.
I_{MAX}	Maximum output current. Available for 10 seconds at start, then as long as allowed by drive temperature. Low overload.
I_{Ld}	Continuous current allowing 110% I_{Ld} for 1 minute every 5 minutes at 40 °C.
P_{Ld}	Typical motor power in low overload use.
I_{Hd}	Continuous current allowing 150% I_{Hd} for 1 minute every 5 minutes at 40 °C.
P_{Hd}	Typical motor power in high overload use.

The ratings apply at 40 °C ambient temperature. At higher temperatures (up to 55 °C) the derating is 1%/1 °C.

[1] For the drives with the frame size from R5 to R11, you can choose to assemble an optional brake unit. Add the option code "+D150" when you order the drives and then the brake unit is assembled at delivery.

[2] For drives with enclosure class IP55 the ratings apply at 40 °C ambient temperature. At higher temperature the derating is from 40 to 45 °C 1%/1 °C and 45 to 55 °C 2.5%/1 °C.

[3] For drives with enclosure class IP55 the ratings apply at 40 °C ambient temperature. At higher temperatures the derating is from 40 to 45 °C. 1%/1 °C and 45 to 50 °C 2.5%/1 °C and 50 to 55 °C 5%/1 °C.

[4] For drives with enclosure class IP55 the maximum ambient temperature is 35 °C

[5] =130% overload

[6] =125% overload

[7] Continuous rms output current allowing 40% overload for 1 minute every 5 minutes

Servo drives and eSM motors are compatible with the wide ABB product offering

AC500

ABB's powerful flagship PLC offering a wide range of performance levels and scalability within a single simple concept where most competitors require multiple product ranges to deliver similar functionality. Web server integrated and IEC 60870-5-104 remote control protocol for all Ethernet versions.

CP600

The control panels offer a wide range of touchscreen graphical displays from 3.5" up to 15". They are provided with user-friendly configuration software that enables tailor made customized HMI solutions. Rich sets of graphical symbols and the relevant drivers for ABB automation products are provided. Control panels for visualization of AC500 web server applications are available.

Automation Builder

Automation Builder integrates the engineering and maintenance for PLC, drives, motion, HMI and robotics. It complies with the IEC 61131-3 standard offering all five IEC programming languages for PLC and drive configuration. In addition, it includes continuous function chart, C, extensive function block libraries and powerful embedded simulation/ visualization features. Automation Builder supports a number of languages (English, German, French, Chinese, Spanish) and comes with new libraries, FTP functions, SMTP, SNTP, smart diagnostics and debugging capabilities.

HDS motors

HDS Series AC brushless servo motors have a 10-pole design that provides high torque and reduced cogging for superior performance. HDS Series AC brushless servo motors achieve accurate positioning, high speeds and efficiency in a reliable package.

HY motors

HY series servo motor is designed for safe operation in where explosion-proof certification is required such as the Zone 2/Zone 22 explosion-proof areas. Together with the Motiflex e180 and MicroFlex e190, they consititute a robust servo system.

B&R X20

There are many different plug-in I/O systems. With the introduction of the X20 system, B&R set a new standard for the automation industry under the guidance of the "perfect automation" concept. With global application experience, long-term cooperation with customers, and the pursuit of simplicity, economy, and safety, the X20 system has become a universal solution for all automation tasks of machinery and system manufacturers.

ACS880

ABB’s all-compatible drives are designed to provide customers across industries and applications with unprecedented levels of compatibility and flexibility. Our ACS880 drive modules are optimized for panel building. They are customized to meet the particular needs of specific industries, such as oil and gas, mining, metals, chemicals, cement, power plants, material handling, pulp and paper, sawmills, marine,water and wastewater, food and beverage, and automotive. They can control a wide range of applications, including cranes, extruders, winches, winders, conveyors, mixers,compressors, centrifuges, test benches, elevators, extruders, pumps and fans.

ACS380

The ACS380 machinery drive is part of ABB’s all-compatible drives portfolio. The preconfigured ACS380 machinery drive comes in several variants ensuring seamless integration into machines and connecting perfectly to automation system. Drive usability is enhanced with the built-in icon based user interface and other optional control panels. Adaptive programming offers an easy alternative for simple programming needs. The drive is suitable for industries such as food and beverage, material handling and textile. Typical applications include mixers, conveyors, cranes and other constant-torque applications.

AC motors

ABB’s low voltage AC motors are designed to save energy, reduce operating costs and enable demanding motor applications to perform reliably and without unscheduled downtime. General performance motors combine convenience and easy handling seamlessly with ABB’s engineering expertise. Process performance motors provide the most comprehensive, versatile set of motors for the process industries and heavy-duty applications.

ACS180

The ACS180 machinery drive is part of ABB’s all compatible drives portfolio. This cost-effective and compact drive is optimized for machine builders requiring ease of use and reliable machine performance. Typical applications including Fans and water pumps, Logistics, Material mixers, Automatic doors.

Robotics

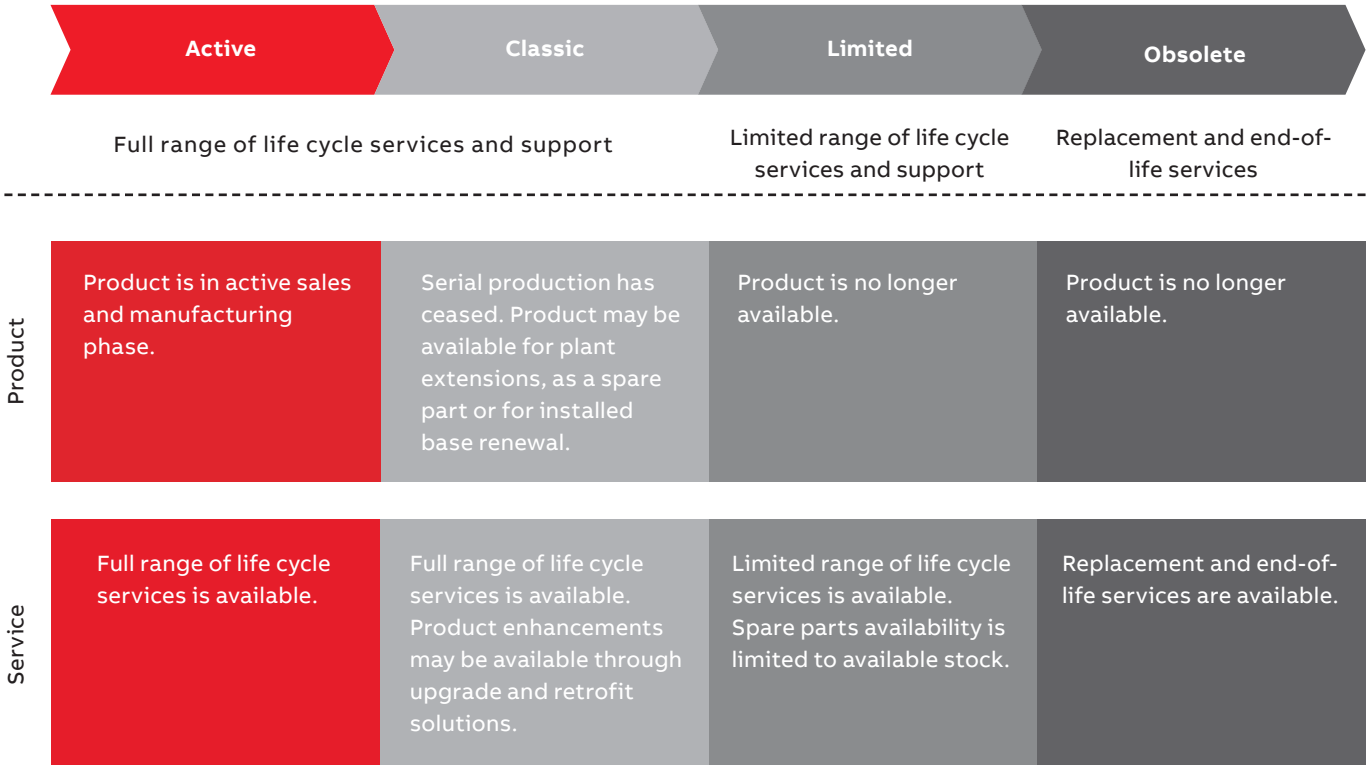
ABB’s robotic automation offers cell automation by integrating AC500 PLCs in IRC5 robot controllers. More productivity with robots is achieved by wireless interfaces for sensors and actuators on robot tools. Wireless from ABB is an innovative, proven solution well-suited for robots, presses, rotary tables and gantries.

A lifetime of peak performance

You're in control of every life cycle phase of your servo products. At the heart of servo product services is a four-phase product life cycle management model.
This model defines the services recommended and available throughout drives lifespan.

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

ABB servo products life cycle phases



Keeping you informed

We notify you every status of the product using the life cycle status announcements and statements. It helps you know the status and availble services of your products.

You can plan the preferred services ahead of time and make sure that continuous support is always available.

Step 1

Life Cycle Status Announcement

Provides early information about the upcoming life cycle phase change and how it affects the availability of services.

Step 2

Life Cycle Status Statement

Provides information about the drive's current life cycle status, availability of product and services, life cycle plan and recommended actions.

Notes

Additional information
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 AG does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

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