



ABB general machinery drives

ABB general machinery drives are designed for machine building. In serial type manufacturing the consumed time per unit is critical. The drives are designed to be the fastest drives in terms of installation, setting parameters and commissioning. The basic products have been made as user-friendly as possible, yet providing high intelligence. The drives offer diverse functionality to cater for the most demanding needs.

Applications

ABB general machinery drives are designed to meet the requirements of an extensive range of machinery applications. The drives are ideal for food and beverage, material handling, textile, printing, rubber and plastics, and woodworking applications.

Highlights

- Unified height and depth
- Convenient installation
- Optimized interfaces for users and machines
- Impressive software and compact hardware
- Sequence programming
- High ingress protection (UL Type 4X (IP66)) variant as an option
- FlashDrop tool for fast parameter setting

Feature	Advantage	Benefit
High ingress protection UL Type 4X (IP66) as an option	No need to design special enclosure for applications that demand a high ingress protection. No need for external cooling fan. Wall mounted.	Time and cost savings. No maintenance of external moving parts. Can be located close to the process and operator.
Sequence programming	Application specific 8-state programming with comprehensive transition and triggering conditions.	Logic programming included as standard. Reduces the need for external PLC.
Fieldbuses	Enclosed plug-in fieldbus adapters. The most common fieldbuses are available.	High speed communication with compact and robust fieldbus design.
Built-in EMC filter	EMC filter complying with IEC/EN 61800-3 as standard.	No extra space, parts, time or cost required.
Built-in brake chopper	100% braking capability.	Reduced cost, saved space and simple wiring.
Drive protection	Motor output and I/O protected against wiring faults. Protection against unstable supply networks. Coated boards included as standard.	Latest solutions to protect the drive and offer trouble free use and the highest quality.
Software	Excellent performance with exceptional flexibility. Software features include application macros, timed functions and fault history.	Quick and intuitive commissioning.
User interfaces	Panel cover for protection as standard. Advanced control panel with clear alphanumeric dynamic menus, real time clock and 14 languages. Basic panel with numerical display.	Cost efficient approach without control panels. Different control panels available according to functionality need.
FlashDrop tool	Faster and easier drive set up and commissioning for volume manufacturing and maintenance. The FlashDrop tool enables both downloading and uploading drive parameters.	Fast, safe and trouble-free parameter setting without the need to power-up the drive. Patented.
Cabinet compatibility	Screw, DIN-rail, sideways and side-by-side mounting. Unified height and depth.	Optimum installation layout and efficient cabinet space usage.

Technical specification



Input power connection	
Voltage and power range	1-phase, 200 to 240 V \pm 10% 0.5 to 3 hp (0.37 to 2.2 kW) 3-phase, 200 to 240 V \pm 10% 0.5 to 15 hp (0.37 to 11 kW) 3-phase, 380 to 480 V \pm 10% 0.5 to 30 hp (0.37 to 22 kW)
Frequency	48 to 63 Hz
Motor connection	
Voltage	3-phase, from 0 to U_{SUPPLY}
Frequency	0 to 500 Hz
Continuous loading capability	Rated output current I_{2N} (constant torque at a max. ambient temperature of 40 °C)
Overload capacity	1.5 x I_{2N} for 1 minute every 10 minutes (at a max. ambient temperature of 40 °C) At start 1.8 x I_{2N} for 2 s
Switching frequency	
Default	4 kHz
Selectable	4 to 16 kHz in 4 kHz steps
Acceleration time	0.1 to 1800 s
Deceleration time	0.1 to 1800 s
Braking	Built-in brake chopper as standard
Speed control	
Static accuracy	20% of motor nominal slip
Dynamic accuracy	< 1% s with 100% torque step
Torque control	
Torque step rise time	< 10ms with nominal torque
Non-linearity	\pm 5% with nominal torque
Environmental limits	
Ambient temperature	-10 to 40 °C (14 to 104 °F), no frost allowed 50 °C (122 °F) with 10% derating
Altitude	
Output current	Rated current available at 0 to 1000 m (0 to 3281 ft) reduced by 1% per 100 m (328 ft) over 1000 to 2000 m (3281 to 6562 ft)
Relative humidity	Lower than 95% (without condensation)
Degree of protection	IP20 / optional NEMA 1/ UL type 1 enclosure UL Type 4X (IP66) option up to 5Hp @ 240V & 10Hp @ 480V
Enclosure colour	NCS 1502-Y, RAL 9002, PMS 420 C
Contamination levels	IEC721-3-3 No conductive dust allowed Class 1C2 (chemical gases)
Storage.....	Class 1S2 (solid particles)
Transportation.....	Class 2C2 (chemical gases) Class 2S2 (solid particles)
Operation.....	Class 3C2 (chemical gases) Class 3S2 (solid particles)
Product compliance	
Low Voltage Directive 2006/95/EC Machinery Directive 2006/42/EC EMC Directive 2004/108/EC Quality assurance system ISO 9001 Environmental system ISO 14001 UL, cUL, CE, C-Tick and GOST R approvals RoHS compliant	

Programmable control connections	
Two analog inputs	
Voltage signal	
Unipolar	0 (2) to 10 V, $R_{\text{in}} > 312 \text{ k}\Omega$
Bipolar	-10 to 10 V, $R_{\text{in}} > 312 \text{ k}\Omega$
Current signal	
Unipolar	0 (4) to 20 mA, $R_{\text{in}} = 100 \Omega$
Bipolar	-20 to 20 mA, $R_{\text{in}} = 100 \Omega$
Potentiometer reference value	10 V \pm 1% max. 10 mA, $R < 10 \text{ k}\Omega$
Resolution	0.1%
Accuracy	\pm 1%
One analog output	0 (4) to 20 mA, load < 500 Ω
Auxiliary voltage	24 V DC \pm 10%, max. 200 mA
Five digital inputs	12 to 24 V DC with internal or external supply, PNP and NPN, pulse train 0 to 16 kHz
Input impedance	2.4 k Ω
One relay output	
Type	NO + NC
Maximum switching voltage	250 V AC/30 V DC
Maximum switching current	0.5 A/30 V DC; 5 A/230 V AC
Maximum continuous current	2 A rms
One digital output	
Type	Transistor output
Maximum switching voltage	30 V DC
Maximum switching current	100 mA/30 V DC, short circuit protected
Frequency	10 Hz to 16 kHz
Resolution	1 Hz, 0.2%
Accuracy	
Serial communication	
Fieldbuses	Plug-in type
Refresh rate	< 10 ms (between drive and fieldbus module)
PROFIBUS DP	9-pin D-connector Baud rate up to 12 Mbit/s PROFIBUS DP and PROFIBUS DPV1 Network side based on "PROFIdrive" profile.
DeviceNet	5-pin screw type connector Baud rate up to 500 kbit/s Network side based on ODVA "AC/DC drive" profile.
CANopen	9-pin D-connector Baud rate up to 1 Mbit/s Network side based on CiA DS402 profile.
Modbus	4-pin screw type connector Baud rate up to 115 kbit/s
Ethernet	RJ-45 connector 10 Mbit/s or 100 Mbit/s Modbus/TCP and EtherNet/IP Network side based on ODVA "AC/DC drive" profile (EtherNet/IP)
Chokes	
AC input chokes	External option For reducing THD in partial loads and to comply with EN/IEC 61000-3-12.
AC output chokes	External option To achieve longer motor cables



High protection class drive

A range of ABB general machinery drives with a UL Type 4X (IP66) protection class is designed to excel in the harshest and most demanding of conditions.

Designed for the food and beverage, textile, ceramics, pulp and paper and water and waste water industries, the drives are suitable for screws, mixers, pumps, fans and conveyers especially where the machine is exposed to dust, moisture and cleaning chemicals. The heat sink's cooling fins are completely open from top to bottom, which allows easy washing to ensure no dirt adheres to the surfaces. A user control panel housed within a plastic window is designed to resist moist and dusty atmospheres. Furthermore, the cooling fan is located inside the drive, thereby eliminating the need for an external cooling fan and the subsequent maintenance of external moving parts.

The drive is designed for fast installation, parameter setting and commissioning and is based on ABB general machinery drives, possessing the same software features and hardware connections. The drive features the Advanced control panel as standard. The wall mounted drive can be located close to the process and the operator.

Input power connection

Voltage and power range	3-phase, 200 to 240 V \pm 10% 0.5 to 5 hp (0.37 to 4 kW) 3-phase, 380 to 480 V \pm 10% 0.5 to 10 hp (0.37 to 7.5 kW)
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Environmental limits

Ambient temperature	-10 to 40 °C (14 to 104 °F), no frost allowed
Degree of protection	UL Type 4X (IP66), indoor use only

Product compliance

Low Voltage Directive 73/23/EEC with supplements
Machinery Directive 98/37/EC
EMC Directive 89/336/EEC with supplements
Quality assurance system ISO 9001
Environmental system ISO 14001
CE and C-Tick approvals
UL, cUL and GOST R
RoHS compliant
NSF certified



Ratings, Types, Voltages & Construction



Type code

This is the unique reference number that clearly identifies your drive by power rating and frame size. Once you have selected the type code, the frame size can be used to determine the drive dimensions, shown on the next page

Voltages

2 = 200 - 240 V

4 = 380 - 480 V

Insert either "2" or "4", depending on your chosen voltage, into the type code shown above.

Construction

"01U" or "03U" within the type code indicates the number of input phases for the power and EMC filtering.

01 = 1-phase (200-240V only)

03 = 3-phase (200-240V & 380-480V)

U = EMC filter disconnected, 60 Hz frequency
(In case the filter is required it can easily be connected.)

+B063 = UL Type 4X (IP66) enclosure

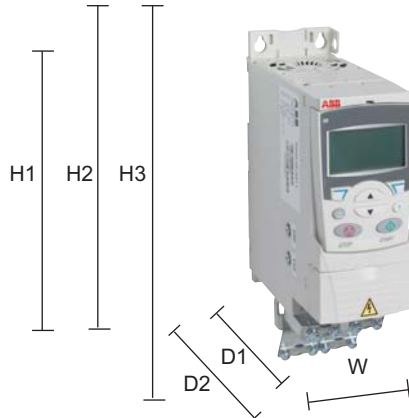
Ratings			Type code	Frame size
P_N [Hp]	P_N [kW]	I_{2N} [A]		
1-phase supply voltage 200 - 240 V units				
0.5	0.37	2.4	ACS350-01U-02A4-2	R0
1	0.75	4.7	ACS350-01U-04A7-2	R1
1.5	1.1	6.7	ACS350-01U-06A7-2	R1
2	1.5	7.5	ACS350-01U-07A5-2	R2
3	2.2	9.8	ACS350-01U-09A8-2	R2
3-phase supply voltage 200 - 240 V units				
0.5	0.37	2.4	ACS350-03U-02A4-2	R0
0.75	0.55	3.5	ACS350-03U-03A5-2	R0
1	0.75	4.7	ACS350-03U-04A7-2	R1
1.5	1.1	6.7	ACS350-03U-06A7-2	R1
2	1.5	7.5	ACS350-03U-07A5-2	R1
3	2.2	9.8	ACS350-03U-09A8-2	R2
5	4.0	17.6	ACS350-03U-17A6-2	R2
7.5	5.5	24.4	ACS350-03U-24A4-2	R3
10	7.5	31.0	ACS350-03U-31A0-2	R4
15	11.0	46.2	ACS350-03U-46A2-2	R4
3-phase supply voltage 380 - 480 V units				
0.5	0.37	1.2	ACS350-03U-01A2-4	R0
0.75	0.55	1.9	ACS350-03U-01A9-4	R0
1	0.75	2.4	ACS350-03U-02A4-4	R1
1.5	1.1	3.3	ACS350-03U-03A3-4	R1
2	1.5	4.1	ACS350-03U-04A1-4	R1
3	2.2	5.6	ACS350-03U-05A6-4	R1
5	4.0	8.8	ACS350-03U-08A8-4	R1
7.5	5.5	12.5	ACS350-03U-12A5-4	R3
10	7.5	15.6	ACS350-03U-15A6-4	R3
15	11.0	23.1	ACS350-03U-23A1-4	R3
20	15.0	31.0	ACS350-03U-31A0-4	R4
25	18.5	38.0	ACS350-03U-38A0-4	R4
30	22.0	44.0	ACS350-03U-44A0-4	R4

Ratings			Type code	Frame size
P_N [Hp]	P_N [kW]	I_{2N} [A]		
3-phase supply voltage 200 - 240 V units				
0.5	0.37	2.4	ACS350-03U-02A4-2+B063	R1
0.75	0.55	3.5	ACS350-03U-03A5-2+B063	R1
1	0.75	4.7	ACS350-03U-04A7-2+B063	R1
1.5	1.1	6.7	ACS350-03U-06A7-2+B063	R1
2	1.5	7.5	ACS350-03U-07A5-2+B063	R1
3	2.2	9.8	ACS350-03U-09A8-2+B063	R3
5	4.0	17.6	ACS350-03U-17A6-2+B063	R3
3-phase supply voltage 380 - 480 V units				
0.5	0.37	1.2	ACS350-03U-01A2-4+B063	R1
0.75	0.55	1.9	ACS350-03U-01A9-4+B063	R1
1	0.75	2.4	ACS350-03U-02A4-4+B063	R1
1.5	1.1	3.3	ACS350-03U-03A3-4+B063	R1
2	1.5	4.1	ACS350-03U-04A1-4+B063	R1
3	2.2	5.6	ACS350-03U-05A6-4+B063	R1
5	4.0	8.8	ACS350-03U-08A8-4+B063	R1
7.5	5.5	12.5	ACS350-03U-12A5-4+B063	R3
10	7.5	15.6	ACS350-03U-15A6-4+B063	R3

Dimensions

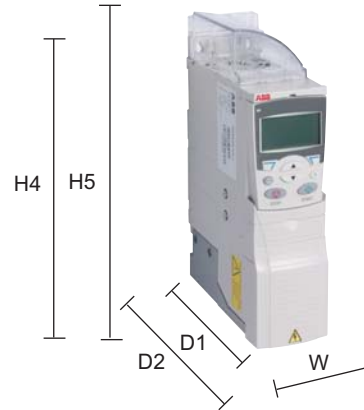


Cabinet-mounted drives (IP20 UL open)



Frame size	IP20 Cabinet /UL open						Weight lbs (kg)
	H1 in (mm)	H2 in (mm)	H3 in (mm)	W in (mm)	D1 in (mm)	D2 in (mm)	
R0	6.65 (169)	7.95 (202)	9.41 (239)	2.76 (70)	6.34 (161)	7.36 (187)	2.65 (1.2)
R1	6.65 (169)	7.95 (202)	9.41 (239)	2.76 (70)	6.34 (161)	7.36 (187)	2.65 (1.2)
R2	6.65 (169)	7.95 (202)	9.41 (239)	4.13 (105)	6.50 (165)	7.52 (191)	3.31 (1.5)
R3	6.65 (169)	7.95 (202)	9.29 (236)	6.65 (169)	6.65 (169)	7.68 (195)	5.51 (2.5)
R4	7.13 (181)	7.95 (202)	9.61 (244)	10.24 (260)	6.65 (169)	7.68 (195)	9.70 (4.4)

Wall-mounted drives (NEMA 1/UL type 1)



Frame size	NEMA 1 / UL Type 1					
	H4 in (mm)	H5 in (mm)	W in (mm)	D1 in (mm)	D2 in (mm)	Weight lbs (kg)
R0	10.12 (257)	11.03 (280)	2.76 (70)	6.65 (169)	7.36 (187)	3.53 (1.6)
R1	10.12 (257)	11.03 (280)	2.76 (70)	6.65 (169)	7.36 (187)	3.53 (1.6)
R2	10.12 (257)	11.10 (282)	4.13 (105)	6.65 (169)	7.52 (191)	4.16 (1.9)
R3	10.24 (260)	11.77 (299)	6.65 (169)	6.97 (177)	7.68 (195)	6.83 (3.1)
R4	10.63 (270)	12.60 (320)	10.24 (260)	6.97 (177)	7.68 (195)	11.02 (5.0)

Wall-mounted drives UL Type 4X (IP66)

Frame size	UL Type 4X (IP66)			
	H in (mm)	W in (mm)	D1 in (mm)	Weight lbs (kg)
R1	12.01 (305)	7.68 (195)	11.06 (281)	16.98 (7.7)
R3	17.17 (436)	9.69 (246)	10.91 (277)	28.66 (13)



H = Height
H1 = Height without fastenings and clamping plate
H2 = Height with fastenings but without clamping plate
H3 = Height with fastenings and clamping plate
H4 = Height with fastenings and NEMA 1 connection box

H5 = Height with fastenings, NEMA 1 connection box & hood
W = Width
D1 = Standard depth
D2 = Depth with MREL or MTAC option



Plus codes

The options shown in the table below are available with the ACS350. The factory configured option is a unique Plus Code. The Plus Code is added to the end of a basic drive option code using a "+" code. Ordering the Field Kit Code provides a field installation kit shipped separately from the drive shipping package.

For example, and ACS350-03U-01A2-4+J400 would be a base drive with an Advanced Control Panel included in the drives shipping package. Option descriptions are provided in the subsequent pages.

Options	Ordering code "+ code"	Description	Field Kit Code	Availability	
				IP20 drive	UL Type 4X (IP66) drive
Protection class	-	NEMA 1/UL type 1 (R0, R1, R2)	MUL1-R1	■	-
	-	NEMA 1/UL type 1 (R3)	MUL1-R3	■	-
	-	NEMA 1/UL type 1 (R4)	MUL1-R4	■	-
	+B063	UL type 4X (IP66) enclosure		-	■
Control panel (choose one option only)	+J400	Advanced control panel	ACS-CP-A	□	●
	+J404	Basic control panel	ACS-CP-B	□	-
Panel mounting kit	-	Panel mounting kit	ACS/H-CP-EXT	□	-
	-	Panel holder mounting kit	OPMP-01	□	-
Potentiometer	+J402	Potentiometer	MPOT-01	□	-
Fieldbus (choose one option only)	+K451	DeviceNet	FDNA-01	□	□
	+K454	PROFIBUS DP	FPBA-01	□	□
	+K457	CANopen	FCAN-01	□	□
	+K458	Modbus RTU	FMBA-01	□	□
	+K466	Ethernet IP / Modbus TCP / IP	FENA-01	□	□
	-	RS-485/Modbus	FRSA-00	□	□
Fieldbus power module	-	Auxiliary power module for fieldbus	FEPA-01	□ ¹⁾	□
Extension modules (choose one option only)	-	Speed encoder module	MTAC-01	□	-
	-	Relay output module	MREL-01	□	-
Remote monitoring	-	Ethernet adapter	SREA-01	□	□
Connection options	+H376	Cable gland kit		-	□
	+F278	Input switch kit		-	□
Pressure compensation valve	+C169	Pressure compensation valve		-	□
Tools	-	FlashDrop tool	MFD-01	□	□
	-	DriveWindow Light 2.X	DriveWindow Light 2.X	□	□

- = standard
- = product variant
- = option, external
- = not available

¹⁾ Option not available with NEMA 1/UL type 1

²⁾ Options only with IP2x

Product Options

Interfaces



User interfaces

Panel Cover

The purpose of the panel cover is to protect the drive's connection surfaces. The ACS350 drive is delivered with a panel cover as standard. In addition there are two alternative control panels available as options; Basic & Advanced.

Basic Control Panel

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

Advanced Control Panel

The Advanced control panel features a multilingual alphanumeric display for easy drive programming. The control panel has various assistants and an built-in help function to guide the user. It includes a real time clock, which can be used during fault logging and in controlling the drive, such as start/stop. The control panel can be used for copying parameters for back up or for downloading to another drive. A large graphical display and soft keys make it extremely easy to navigate. The drive with UL Type 4X (IP66) enclosure has the assistant control panel as standard.

Potentiometer

Potentiometer MPOT-01 with two switches: start/stop and forward/reverse. Polarity is selected with DIP switches. No external power source is needed for the potentiometer.

Panel Mounting Kits

To attach the control panel to the outside of a larger enclosure, two panel mounting kits are available. A simple and cost-efficient installation is possible with the ACS/H-CP-EXT kit, while the OPMP-01 kit provides a more user-friendly solution, including a panel platform that enables the panel to be removed in the same way as a drive-mounted panel. The panel mounting kits include all hardware required, including 3 m extension cables and installation instructions.



Blank Panel Cover
(included as standard)



Basic Control Panel



Potentiometer



Advanced Control Panel



Panel Holder Mounting Kit
OPMP-01



MREL-01 Module