ABB general machinery drives

ACS350, 0.37 to 22 kW / 0.5 to 30 hp

Technical catalogue

Two ways to select your drive

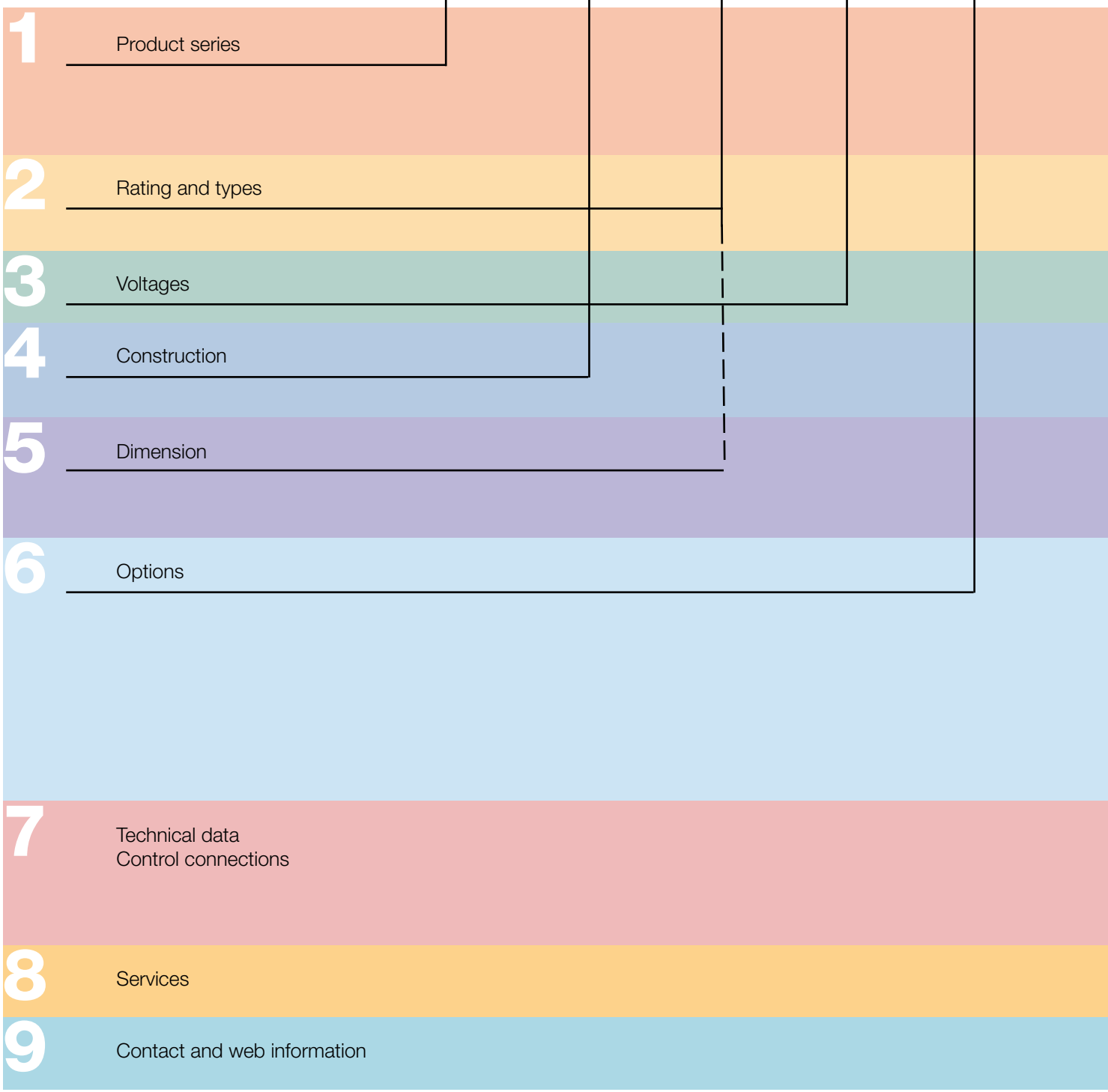
Choice 1: Simply contact your local ABB drives sales office (see page 15) and let them know what you want. Use page 3 as a reference section for more information.

OR

Choice 2: Build up your own ordering code using the simple 7-step approach below. Each step is accompanied by a reference to a page that is filled with useful information.

Type code stucture:

ACS350 - 01E - 02A4 - 2 + J400



Contents

ABB general machinery drives, ACS350

ABB general machinery drives

ACS350 - 01E - 02A4 - 2 + J400

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
- FlashDrop tool for fast parameter setting

Feature	Advantage	Benefit
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.
Sequence programming	Application specific 8-state programming with comprehensive transition and triggering conditions.	Logic programming included as standard. Reduces the need for external PLC.
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. Assistant control panel with clear alphanumerical 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.
Fieldbuses	Enclosed plug-in fieldbus adapters. The most common fieldbusses are available.	High speed communication with compact and robust fieldbus design.
Cabinet compatibility	Screw, DIN-rail, sideways and side-by-side mounting. Unified height and depth.	Optimum installation layout and efficient cabinet space usage.
Inbuilt EMC filter	2nd environment filter complying with IEC 61800-3 as standard.	No extra space, parts, time or cost required.
Inbuilt 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.

Technical specification

ACS350 - 01E - 02A4 - 2 + J400

Mains connection

Voltage and power range	1-phase, 200 to 240 V ±10% 0.37 to 2.2 kW (0.5 to 3 hp) 3-phase, 200 to 240 V ±10% 0.37 to 11 kW (0.5 to 15 hp) 3-phase, 380 to 480 V ±10% 0.37 to 22 kW (0.5 to 30 hp)
Frequency	48 to 63 Hz
Power factor	0.98

Motor connection

Voltage	3-phase, from 0 to U_{SUPPLY}
Frequency	0 to 500 Hz
Continuous loading capability (constant torque at a max. ambient temperature of 40 °C)	Rated output current I_{2N}
Overload capacity (at a max. ambient temperature of 40 °C)	1.5 x I_{2N} for 1 minute every 10 minutes At start 1.8 x I_{2N} for 2 s
Switching frequency	
Default	4 kHz
Selectable	4 to 16 kHz with 4 kHz steps
Acceleration time	0.1 to 1800 s
Deceleration time	0.1 to 1800 s
Braking	Inbuilt 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	± 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 enclosure
Enclosure colour	NCS 1502-Y, RAL 9002, PMS 420 C
Contamination levels	IEC721-3-3 No conductive dust allowed
Transportation	Class 1C2 (chemical gases) Class 1S2 (solid particles)
Storage	Class 2C2 (chemical gases) Class 2S2 (solid particles)
Operation	Class 3C2 (chemical gases) Class 3S2 (solid particles)

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
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_{in} > 312 kΩ
Bipolar	-10 to 10 V, R_{in} > 312 kΩ
Current signal	
Unipolar	0 (4) to 20 mA, R_{in} = 100 Ω
Bipolar	-20 to 20 mA, R_{in} = 100 Ω
Potentiometer reference value	10 V ±1% max. 10 mA, R < 10 kΩ
Resolution	0.1%
Accuracy	±1%
One analog output	0 (4) to 20 mA, load < 500 Ω
Auxiliary voltage	24 V DC ±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 kΩ
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 EN61000-3-2.
AC output chokes	External option To achieve longer motor cables

Electromagnetic compatibility

ACS350 - 01E - 02A4 - 2 + J400

EMC according to EN61800-3

2nd environment, unrestricted distribution (C3),
Filter inbuilt as standard, maximum cable lenght 30 m

1st environment, restricted distribution (C2),
Filter as an option, cable lenghts depend on the frame size and switching frequency

EMC standards in general

EN 61800-3/A11 (2000), product standard	EN 61800-3 (2004), product standard	EN 55011, product family standard for industrial, scientific and medical (ISM) equipment
1st environment, unrestricted distribution	Category C1	Group 1 Class B
1st environment, restricted distribution	Category C2	Group 1 Class A
2nd environment, unrestricted distribution	Category C3	Group 2 Class A
2nd environment, restricted distribution	Category C4	Not applicable

Ratings, types, voltages and construction

ACS350 - 01E - 02A4 - 2 + J400

Type code

This is the unique reference number (shown above and in column 4, right) that clearly identifies your drive by power rating and frame size. Once you have selected the type code, the frame size (column 5) can be used to determine the drive dimensions, shown on the next page.

Voltages

ACS350 is available in two voltage ranges:
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

"01E" within the type code (shown above) varies depending on the drive phase and EMC filtering. Choose below the one you need.
01 = 1-phase
03 = 3-phase
E = EMC filter connected, 50 Hz frequency
U = EMC filter disconnected, 60 Hz frequency
(In case the filter is required it can easily be connected.)

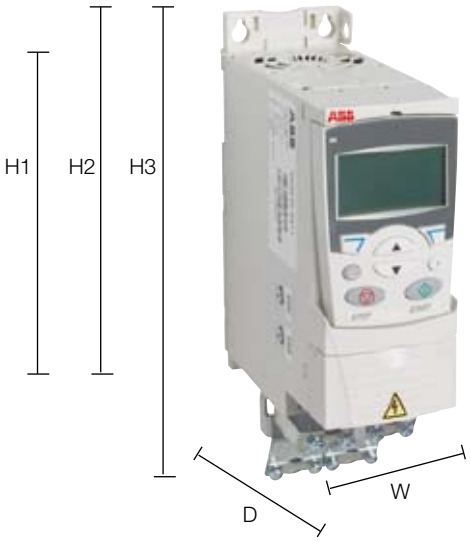
Ratings			Type code	Frame size
P_N kW	P_N hp	I_{2N} A		
1-phase supply voltage 200 - 240 V units				
0.37	0.5	2.4	ACS350-01X-02A4-2	R0
0.75	1.0	4.7	ACS350-01X-04A7-2	R1
1.1	1.5	6.7	ACS350-01X-06A7-2	R1
1.5	2.0	7.5	ACS350-01X-07A5-2	R2
2.2	3.0	9.8	ACS350-01X-09A8-2	R2
3-phase supply voltage 200 - 240 V units				
0.37	0.5	2.4	ACS350-03X-02A4-2	R0
0.55	0.75	3.5	ACS350-03X-03A5-2	R0
0.75	1.0	4.7	ACS350-03X-04A7-2	R1
1.1	1.5	6.7	ACS350-03X-06A7-2	R1
1.5	2.0	7.5	ACS350-03X-07A5-2	R1
2.2	3.0	9.8	ACS350-03X-09A8-2	R2
3.0	4.0	13.3	ACS350-03X-13A3-2	R2
4.0	5.0	17.6	ACS350-03X-17A6-2	R2
5.5	7.5	24.4	ACS350-03X-24A4-2	R3
7.5	10.0	31.0	ACS350-03X-31A0-2	R4
11.0	15.0	46.2	ACS350-03X-46A2-2	R4
3-phase supply voltage 380 - 480 V units				
0.37	0.5	1.2	ACS350-03X-01A2-4	R0
0.55	0.75	1.9	ACS350-03X-01A9-4	R0
0.75	1.0	2.4	ACS350-03X-02A4-4	R1
1.1	1.5	3.3	ACS350-03X-03A3-4	R1
1.5	2.0	4.1	ACS350-03X-04A1-4	R1
2.2	3.0	5.6	ACS350-03X-05A6-4	R1
3.0	4.0	7.3	ACS350-03X-07A3-4	R1
4.0	5.0	8.8	ACS350-03X-08A8-4	R1
5.5	7.5	12.5	ACS350-03X-12A5-4	R3
7.5	10.0	15.6	ACS350-03X-15A6-4	R3
11.0	15.0	23.1	ACS350-03X-23A1-4	R3
15.0	20.0	31.0	ACS350-03X-31A0-4	R4
18.5	25.0	38.0	ACS350-03X-38A0-4	R4
22.0	30.0	44.0	ACS350-03X-44A0-4	R4

X within the type code stands for E or U.

Dimensions

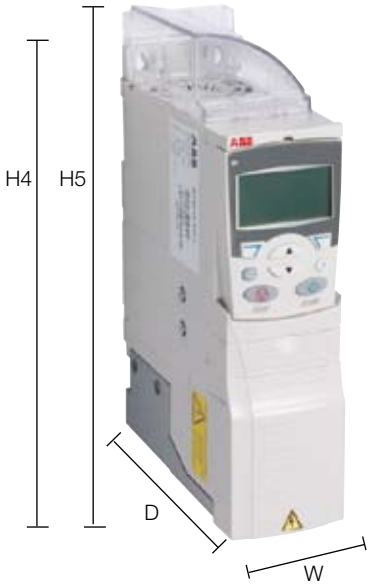
ACS350 - 01E - 02A4 - 2 + J400

Cabinet-mounted drives (IP20 UL open)



Frame size	IP20 UL open						NEMA 1				
	H1 mm	H2 mm	H3 mm	W mm	D mm	Weight kg	H4 mm	H5 mm	W mm	D mm	Weight kg
R0	169	202	239	70	161	1.2	257	280	70	169	1.6
R1	169	202	239	70	161	1.2	257	280	70	169	1.6
R2	169	202	239	105	165	1.5	257	282	105	169	1.9
R3	169	202	236	169	169	2.5	260	299	169	177	3.1
R4	181	202	244	260	169	4.4	270	320	260	177	5.0

Wall-mounted drives (NEMA 1)



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

Options

ACS350 - 01E - 02A4 - 2 + J400

How to select options

The options shown in the table are available within the ACS350 range. Each has an associated 4-figure option code, which is shown in the first column. It is this code that replaces J400 in the type code above. You can order as many options as required, simply by extending the code as necessary.

Selection table

Protection class		
- *)	NEMA 1 (R0, R1, R2)	MUL1-R1
- *)	NEMA 1 (R3)	MUL1-R3
- *)	NEMA 1 (R4)	MUL1-R4
Control panel		
J400	Assistant control panel	ACS-CP-A
J404	Basic control panel	ACS-CP-C
- *)	Panel mounting kit	ACS/H-CP-EXT
Potentiometer		
J402	Potentiometer	MPOT-01
Fieldbus		
K451	DeviceNet	FDNA-01
K454	PROFIBUS DP	FPBA-01
K457	CANopen	FCAN-01
K458	ModBus RTU	FMBA-01
K466	Ethernet	FENA-01
External options		
- *)	FlashDrop tool	MFDT-01
- *)	DriveWindow Light 2	DriveWindow Light 2

*) Ordering with a separate MRP code number.

Options
Interfaces

ACS350 - 01E - 02A4 - 2 + J400

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 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.

Assistant control panel
The assistant control panel features a multilingual alphanumeric display for easy drive programming. The control panel has various assistants and an inbuilt 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.

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 kit
The panel mounting kit enables mounting of control panels on cabinet doors. This kit includes a 3 m extension cable, a gasket, mounting screws and a mounting template.

Panel cover
(included as standard)

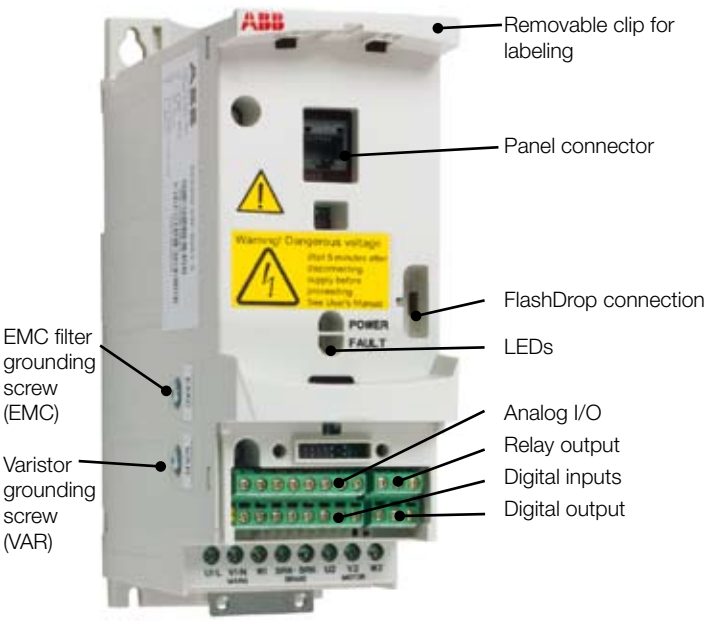
Basic control panel


Potentiometer

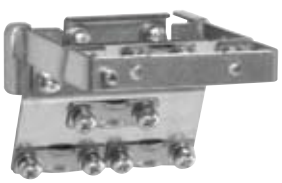
Assistant control panel

Options
Interfaces

ACS350 - 01E - 02A4 - 2 + J400



Terminal cover
(included as standard)



Clamping plates
(included as standard)

Machine interfaces

The plug-in fieldbus modules bring connectivity to major automation systems. A single twisted pair avoids large amounts of conventional cabling, thereby reducing costs and increasing system reliabilty.

ACS350 supports the following fieldbus options:

- PROFIBUS DP
- CANopen
- DeviceNet
- Modbus RTU
- Ethernet

Protection and installation

NEMA 1 kit
The NEMA 1 kit includes a connection box for finger protection, conduit tube installation, and a hood for protection against dirt and dust.

Terminal cover
The terminal cover is for protection of the I/O connections.

Clamping plates
The clamping plates are used for protection against electrical disturbances. The clamping plates with the clamps are included in the drive package as standard.

Options
External

A separate order line and type code is required for any of these external options.

FlashDrop tool

FlashDrop is a powerful palm sized tool for fast and easy parameter selecting and setting. It gives the possibility to hide selected parameters to protect the machine. Only the parameters needed in the application are shown. The tool can copy parameters between two drives or between a PC and a drive. All the above can be done without a power connection to the drive – in fact, it is not even necessary to unpack the drive.

DrivePM

DrivePM (Drive parameter manager) is a tool to create, edit and copy parameter sets for FlashDrop. For each parameter/group the user has a possibility to hide it, which means that the drive user does not see the parameter/group at all.

DrivePM requirements

- Windows 2000/XP
- Free serial port from a PC

FlashDrop package includes

- FlashDrop tool
- DrivePM software on a CD-rom
- User's manual in English and in pdf-format on the CD-rom
- Cable OPCA-02 for connection between the PC and FlashDrop tool
- Battery charger

Brake resistors

The brake resistor is selected using the table below. For more information about the selection of brake resistors, see the ACS350 User's Manual.

ACS350 is delivered with an integrated brake chopper as standard. Therefore no additional space or installation time is needed.

Selection table

Type code	Frame size	R_{min} ohm	R_{max} ohm	P_{BRmax} kW	hp
1-phase supply voltage 200 - 240 V units					
ACS350-01X-02A4-2	R0	70	390	0.37	0.5
ACS350-01X-04A7-2	R1	40	200	0.75	1
ACS350-01X-06A7-2	R1	40	130	1.1	1.5
ACS350-01X-07A5-2	R2	30	100	1.5	2
ACS350-01X-09A8-2	R2	30	70	2.2	3
3-phase supply voltage 200 - 240 V units					
ACS350-03X-02A4-2	R0	70	390	0.37	0.5
ACS350-03X-03A5-2	R0	70	260	0.55	0.75
ACS350-03X-04A7-2	R1	40	200	0.75	1
ACS350-03X-06A7-2	R1	40	130	1.1	1.5
ACS350-03X-07A5-2	R1	30	100	1.5	2
ACS350-03X-09A8-2	R2	30	70	2.2	3
ACS350-03X-13A3-2	R2	30	50	3	4
ACS350-03X-17A6-2	R2	30	40	4	5
ACS350-03X-24A4-2	R3	18	25	5.5	7.5
ACS350-03X-31A0-2	R4	7	19	7.5	10
ACS350-03X-46A2-2	R4	7	13	11	15
3-phase supply voltage 380 - 480 V units					
ACS350-03X-01A2-4	R0	200	1180	0.37	0.5
ACS350-03X-01A9-4	R0	175	800	0.55	0.75
ACS350-03X-02A4-4	R1	165	590	0.75	1
ACS350-03X-03A3-4	R1	150	400	1.1	1.5
ACS350-03X-04A1-4	R1	130	300	1.5	2
ACS350-03X-05A6-4	R1	100	200	2.2	3
ACS350-03X-07A3-4	R1	70	150	3	4
ACS350-03X-08A8-4	R1	70	110	4	5
ACS350-03X-12A5-4	R3	40	80	5.5	7.5
ACS350-03X-15A6-4	R3	40	60	7.5	10
ACS350-03X-23A1-4	R3	30	40	11	15
ACS350-03X-31A0-4	R4	16	29	15	20
ACS350-03X-38A0-4	R4	13	23	18.5	25
ACS350-03X-44A0-4	R4	13	19	22	30

X within the type code stands for E or U.

Input and output chokes

For input and output chokes, please contact your nearest ABB drives channel partner or local ABB office.

Options
Software tools

A separate order line and type code is required for any of these software tool options.

DriveWindow Light 2

DriveWindow Light 2 is an easy-to-use start-up and maintenance tool for ACS350 drives. It can be used in an offline mode, which enables parameter setting at the office even before going to the actual site. The parameter browser enables viewing, editing and saving of parameters. The parameter comparison feature makes it possible to compare parameter values between the drive and the file. With the parameter subset you can create your own parameter sets. Controlling of the drive is naturally one of the features in DriveWindow Light. With this software tool, you can monitor up to four signals simultaneously. This can be done in both graphical and numerical format. Any signal can be set to stop the monitoring from a predefined level.

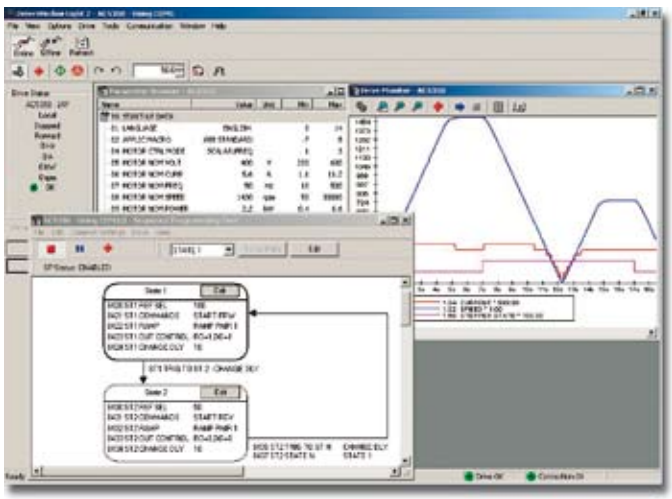
Sequence programming tool
For ACS350, DriveWindow Light 2 offers sequence programming, which is a tool for setting up the sequence programming parameters. The tool draws the program graphically on the PC screen showing used states, active state, transition conditions, possible transition delay as well as used reference and ramp.

Sequence programming enables application specific programming. This new and easy way to preset sequences reduces the need for an external programmable logic control (PLC). In simple applications an external PLC can be left out.

Start-up wizards
Start-up wizards make the setting of parameters easy. Simply launch the wizard, select an appropriate assistant e.g. for setting analog outputs, and all parameters related to this function are shown together with help pictures.

Highlights
- Sequence programming tool for ACS350
- Editing, saving and downloading parameters
- Graphical and numerical signal monitoring
- Drive control
- Start-up wizards

DriveWindow Light requirements
- Windows NT/2000/XP
- Free serial port from a PC
- Free control panel connector



Technical data

Cooling

ACS350 is fitted with cooling fans as standard. The cooling air must be free from corrosive substances and must not be above the maximum ambient temperature of 40 °C (50 °C with derating). For more specific limits see the Technical specification - Environmental limits in this catalogue.

Cooling air flow

Type code	Frame size	Heat dissipation		Air flow	
		w	BTU/Hr	m^3/h	ft^3/min
1-phase supply voltage 200 - 240 V units					
ACS350-01X-02A4-2	R0	48	163	-*)	-*)
ACS350-01X-04A7-2	R1	72	247	24	14
ACS350-01X-06A7-2	R1	97	333	24	14
ACS350-01X-07A5-2	R2	101	343	21	12
ACS350-01X-09A8-2	R2	124	422	21	12
3-phase supply voltage 200 - 240 V units					
ACS350-03X-02A4-2	R0	42	142	-*)	-*)
ACS350-03X-03A5-2	R0	54	183	-*)	-*)
ACS350-03X-04A7-2	R1	64	220	24	14
ACS350-03X-06A7-2	R1	86	295	24	14
ACS350-03X-07A5-2	R1	88	302	21	12
ACS350-03X-09A8-2	R2	111	377	21	12
ACS350-03X-13A3-2	R2	140	476	52	31
ACS350-03X-17A6-2	R2	180	613	52	31
ACS350-03X-24A4-2	R3	285	975	71	42
ACS350-03X-31A0-2	R4	328	1119	96	57
ACS350-03X-46A2-2	R4	488	1666	96	57
3-phase supply voltage 380 - 480 V units					
ACS350-03X-01A2-4	R0	35	121	-*)	-*)
ACS350-03X-01A9-4	R0	40	138	-*)	-*)
ACS350-03X-02A4-4	R1	50	170	13	8
ACS350-03X-03A3-4	R1	60	204	13	8
ACS350-03X-04A1-4	R1	69	235	13	8
ACS350-03X-05A6-4	R1	90	306	19	11
ACS350-03X-07A3-4	R1	107	364	24	14
ACS350-03X-08A8-4	R1	127	433	24	14
ACS350-03X-12A5-4	R3	161	551	52	31
ACS350-03X-15A6-4	R3	204	697	52	31
ACS350-03X-23A1-4	R3	301	1029	71	42
ACS350-03X-31A0-4	R4	408	1393	96	57
ACS350-03X-38A1-4	R4	498	1700	96	57
ACS350-03X-44A1-4	R4	588	2007	96	57

X within the type code stands for E or U.

*) Frame size R0 with free convection cooling.

Free space requirements

Enclosure type	Space above mm	Space below mm	Space on left/right mm
All frame sizes	75	75	0

Fuses

Standard fuses can be used with ABB general machinery drives. For input fuse connections see table below.

Selection table

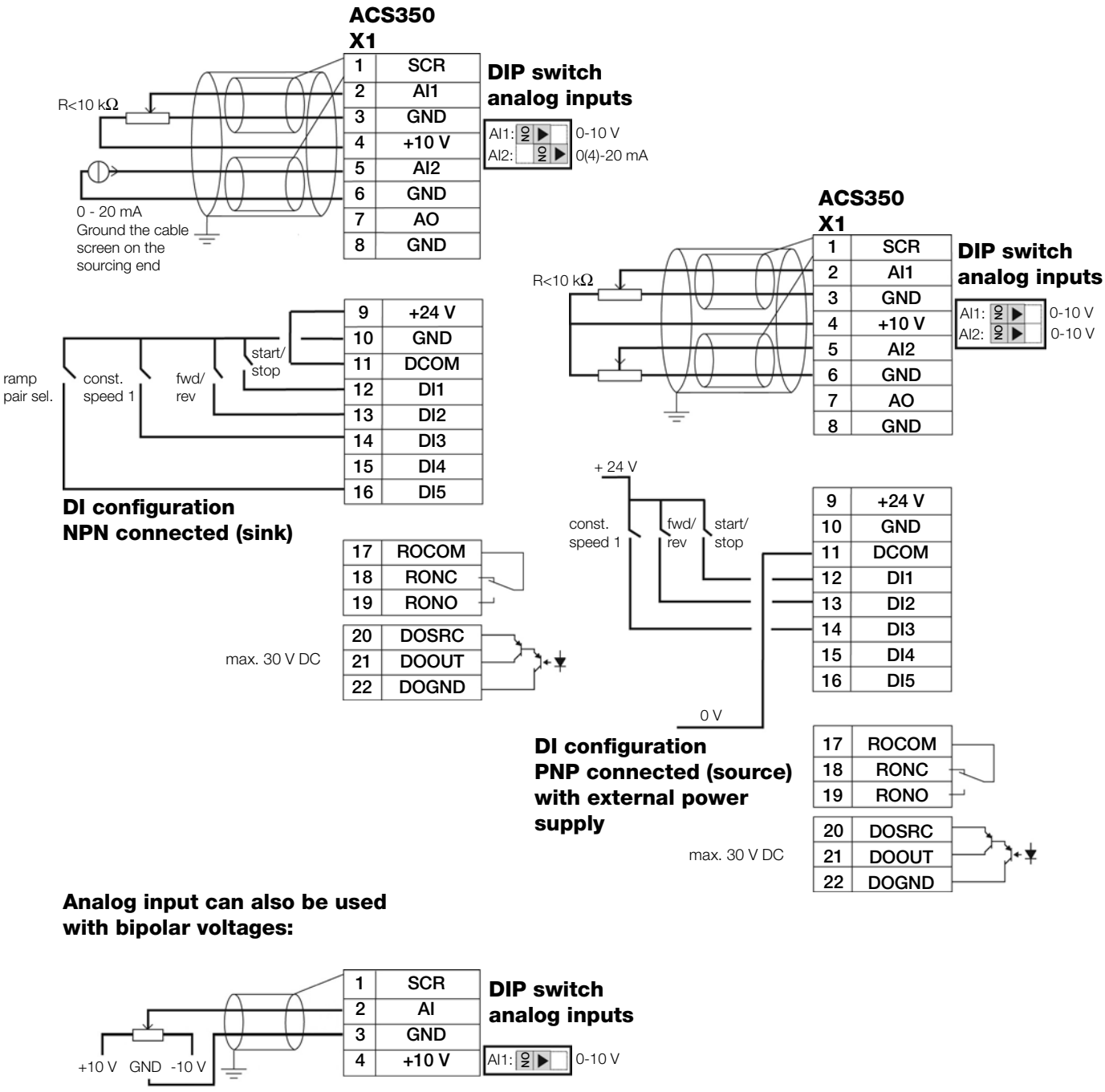
Type code	Frame size	IEC Fuses		UL Fuses	
		A	Fuse type*)	A	Fuse type*)
1-phase supply voltage 200 - 240 V units					
ACS350-01X-02A4-2	R0	10	gG	10	UL class T
ACS350-01X-04A7-2	R1	16	gG	20	UL class T
ACS350-01X-06A7-2	R1	20	gG	25	UL class T
ACS350-01X-07A5-2	R2	25	gG	30	UL class T
ACS350-01X-09A8-2	R2	35	gG	35	UL class T
3-phase supply voltage 200 - 240 V units					
ACS350-03X-02A4-2	R0	10	gG	10	UL class T
ACS350-03X-03A5-2	R0	10	gG	10	UL class T
ACS350-03X-04A7-2	R1	10	gG	15	UL class T
ACS350-03X-06A7-2	R1	16	gG	15	UL class T
ACS350-03X-07A5-2	R1	16	gG	15	UL class T
ACS350-03X-09A8-2	R2	16	gG	20	UL class T
ACS350-03X-13A3-2	R2	25	gG	30	UL class T
ACS350-03X-17A6-2	R2	25	gG	35	UL class T
ACS350-03X-24A4-2	R3	63	gG	60	UL class T
ACS350-03X-31A0-2	R4	80	gG	80	UL class T
ACS350-03X-46A2-2	R4	100	gG	100	UL class T
3-phase supply voltage 380 - 480 V units					
ACS350-03X-01A2-4	R0	10	gG	10	UL class T
ACS350-03X-01A9-4	R0	10	gG	10	UL class T
ACS350-03X-02A4-4	R1	10	gG	10	UL class T
ACS350-03X-03A3-4	R1	10	gG	10	UL class T
ACS350-03X-04A1-4	R1	16	gG	15	UL class T
ACS350-03X-05A6-4	R1	16	gG	15	UL class T
ACS350-03X-07A3-4	R1	16	gG	20	UL class T
ACS350-03X-08A8-4	R1	20	gG	25	UL class T
ACS350-03X-12A5-4	R3	25	gG	30	UL class T
ACS350-03X-15A6-4	R3	35	gG	35	UL class T
ACS350-03X-23A1-4	R3	50	gG	50	UL class T
ACS350-03X-31A0-4	R4	80	gG	80	UL class T
ACS350-03X-38A1-4	R4	100	gG	100	UL class T
ACS350-03X-44A1-4	R4	100	gG	100	UL class T

X within the type code stands for E or U.

*) According to IEC-60269 standard.

Control connections

These connections are shown as examples only. Please refer to the ACS350 User's Manual for more detailed information.



Analog input can also be used with bipolar voltages:

Services

All the support you need

The ABB drive product lifecycle management model provides proactive service offerings for maximizing drive availability and performance. This four-phase model provides not only optimum support to you but also a smooth transition to a new drive when the service life of your current drive ends. It also provides ABB with a well-structured means of managing different drive generations. With complete lifecycle support, you will always be aware of the support plans for your valuable assets.

Globally local

ABB has the largest drive service team of all drive suppliers with field service engineers located throughout the world. In addition, the ABB drives channel partners - the technical partner network with outlets in many countries – provide you with support and service. All ABB's and its channel partners' drive specialists have been trained, audited and certified to exacting standards allowing each to provide fast and professional support where and when you need it.

Training services

ABB offers dedicated training on ACS350 drives for your service and operating personnel for acquiring the required skills to use ABB drives correctly and safely.

Selection table

Service product code	Service type	Description
G350E	ACS350 fundamentals	Internet course
G350	ACS350 operation & programming	Hands-on course

More details and specific information about our support, service and training offerings is available in product specific brochures, from local ABB representatives and on the ABB internet pages www.abb.com/drives and www.abb.com/abbuniversity.

ABB drive lifecycle management model

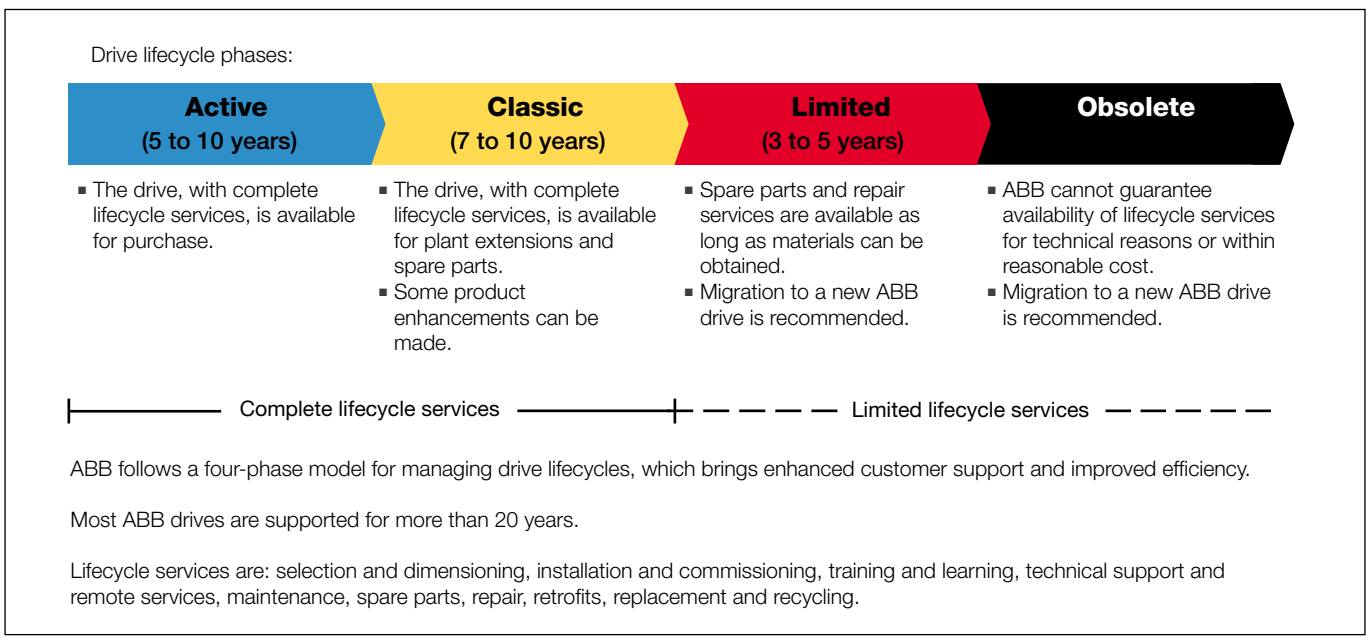


ABB follows a four-phase model for managing drive lifecycles, which brings enhanced customer support and improved efficiency.

Most ABB drives are supported for more than 20 years.

Lifecycle services are: selection and dimensioning, installation and commissioning, training and learning, technical support and remote services, maintenance, spare parts, repair, retrofits, replacement and recycling.

Contact and web information

www.abb.com/drives

ABB's worldwide presence is built on strong local companies working together with the channel partner network. By combining the experience and know-how gained in local and global markets, ABB ensures that its customers in all industries gain the full benefit from its products.

For further details about all ABB low voltage AC drives and services, please contact your nearest ABB office or ABB drives channel partner or visit the websites www.abb.com/drives and www.abb.com/drivespartners.

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