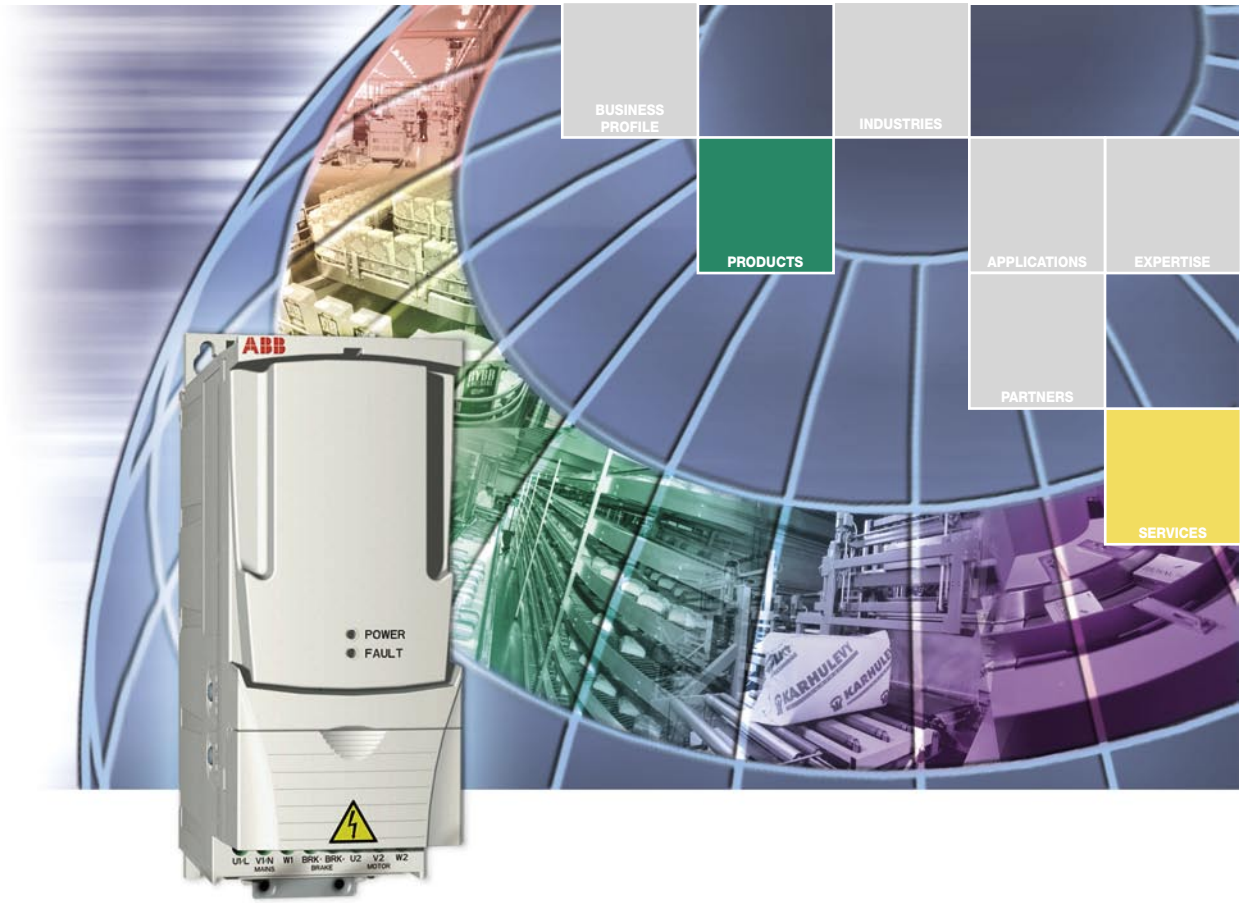
# ABB general machinery drives

## ACS350, 0.37 to 7.5 kW / 0.5 to 10 hp

## Technical catalogue



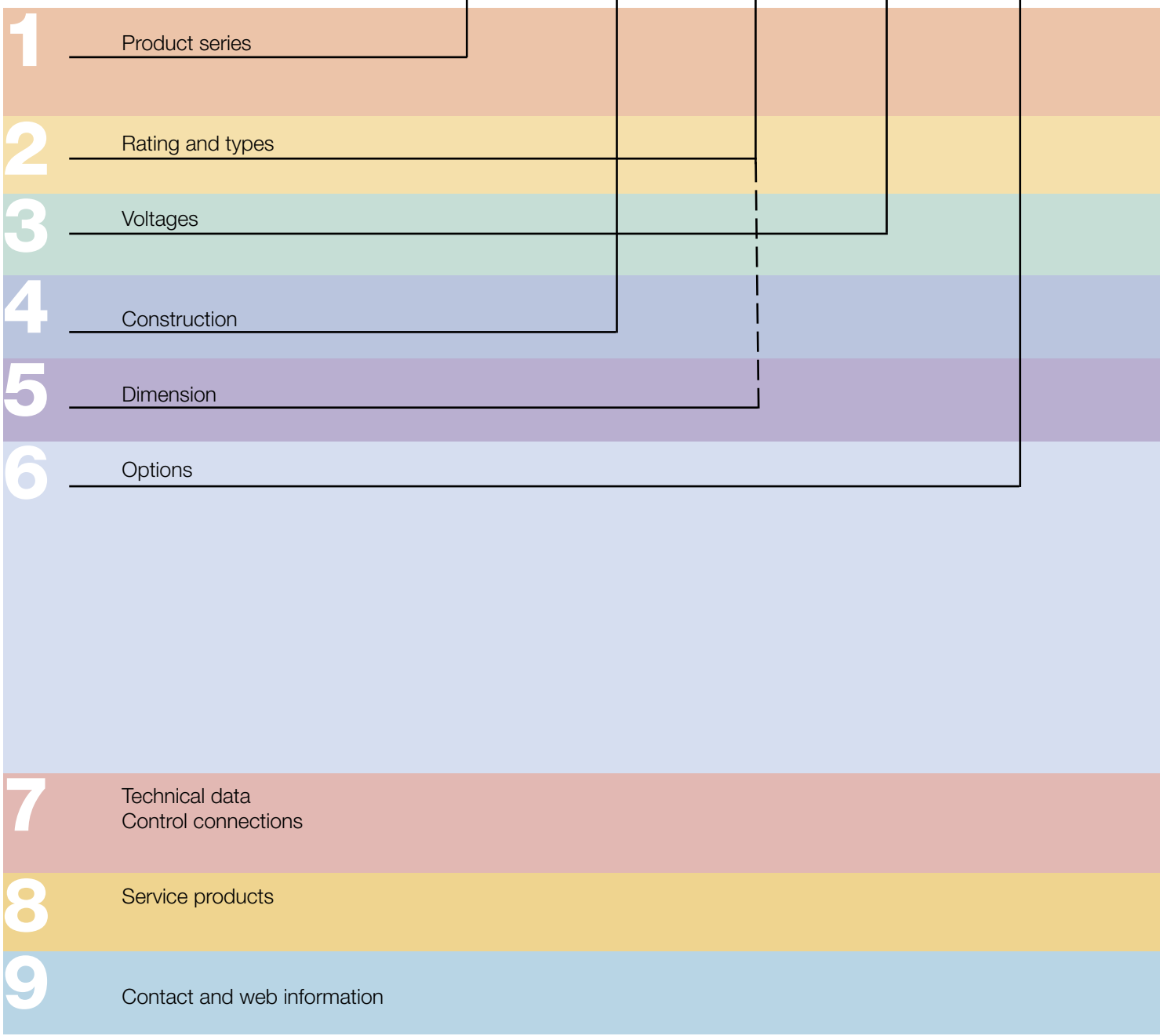
# Two ways to select your drive

**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 + B061



# Contents

## ABB general machinery drives, ACS350

# ABB general machinery drives

ACS350 - 01E - 02A4 - 2 + B061

## ABB general machinery drives

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

## Applications

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

## Highlights

- FlashDrop
- Sequence programming
- Impressive software and compact hardware
- Optimized interfaces for users and machines
- Unified height and depth
- Convenient installation

| Features | Benefits | Notes |
|---|---|---|
| **FlashDrop** | Faster and easier drive set up and commissioning for volume manufacturing. | New fast, safe and trouble free method available without electricity.<br>Patented. |
| **Sequence programming** | Logic programming included as standard.<br>Reduces the need for external PLC. | Application specific 8-state programming with comprehensive triggering conditions. |
| **Software** | High technology and performance with exceptional flexibility. | Sensorless vector control with set of innovative features. |
| **User interfaces** | Cost efficient approach without control panels.<br>Different control panels available according to functionality need. | Panel cover for protection as standard.<br>Assistant control panel with clear alphanumerical dynamic menus, real time clock and 14 languages.<br>Basic panel with numerical display. |
| **Cabinet compatibility** | Optimum installation layout and efficient cabinet space usage. | Screw, DIN-rail, sideways and side-by-side mounting.<br>Unified height and depth. |
| **Fieldbuses** | High speed communication with compact and robust fieldbus design. | Enclosed plug-in type of fieldbus adapter. |
| **Inbuilt EMC filter** | No extra space, parts, time or cost required. | 2nd environment filter complying with IEC 61800-3 as standard. |
| **Drive protection** | Latest solutions to protect the drive and offer trouble free use and the highest quality. | Motor output and IO protected against miswiring.<br>Coated boards included as standard.<br>Protection against unstable supply networks. |

# Technical specification

ACS350 - 01E - 02A4 - 2 + B061

## Mains connection

| | |
|---|---|
| **Voltage and power range** | 1-phase, 200 to 240 V ±10%<br>0.37 to 2.2 kW (0.5 to 3 hp)<br>3-phase, 200 to 240 V ±10%<br>0.37 to 4 kW (0.5 to 5 hp)<br>3-phase, 380 to 480 V ±10%<br>0.37 to 7.5 kW (0.5 to 10 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) | At heavy duty use 1.5 x $I_{2N}$ for 1 minute every 10 minutes<br>At start 1.8 x $I_{2N}$ for 2 s |
| **Switching frequency** | |
| Default | 4 kHz |
| Selectable | 4 to 12 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 |

## Environmental limits

| | |
|---|---|
| **Ambient temperature** | -10 to 40°C (14 to 104°F), no frost allowed<br>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) |
| **Protection class** | IP 20 / optional NEMA 1 enclosure |
| **Enclosure colour** | NCS 1502-Y, RAL 9002, PMS 420 C |
| **Contamination levels** | IEC721-3-3<br>No conductive dust allowed |
| Transportation | Class 1C2 (chemical gases)<br>Class 1S2 (solid particles) |
| Storage | Class 2C2 (chemical gases)<br>Class 2S2 (solid particles) |
| Operation | Class 3C2 (chemical gases)<br>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

## EMC (according to EN61800-3)

2nd environment filter, unrestricted distribution with 30 m (98 ft) cable, inbuilt type as standard.

## 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 |
| Accuracy | 0.2% |

## Serial communication

| | |
|---|---|
| **Fieldbuses** | Plug-in type |
| Refresh rate | < 10 ms (between drive and fieldbus module) |
| PROFIBUS DP | 9-pin D-connector<br>Baud rate up to 12 Mbit/s<br>PROFIBUS DP and PROFIBUS DPV1<br>Network side based on "PROFIdrive" profile. |
| DeviceNet | 5-pin screw type connector<br>Baud rate up to 500 kbit/s<br>Network side based on ODVA "AC/DC drive" profile. |
| CANopen | 9-pin D-connector<br>Baud rate up to 1 Mbit/s<br>Network side based on CiA DS402 profile. |
| Modbus | 4-pin screw type connector<br>Baud rate up to 115 kbit/s |

## Chokes

| | |
|---|---|
| **AC input chokes** | External option<br>For reducing THD in partial loads and to comply with EN61000-3-2. |
| **AC output chokes** | External option<br>To achieve longer motor cables |

# Ratings, types, voltages and construction

ACS350 - 01E - 02A4 - 2 + B061

## Type code

This is the unique reference number (shown above and in column 4, right) that clearly indentifies 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

The 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.)

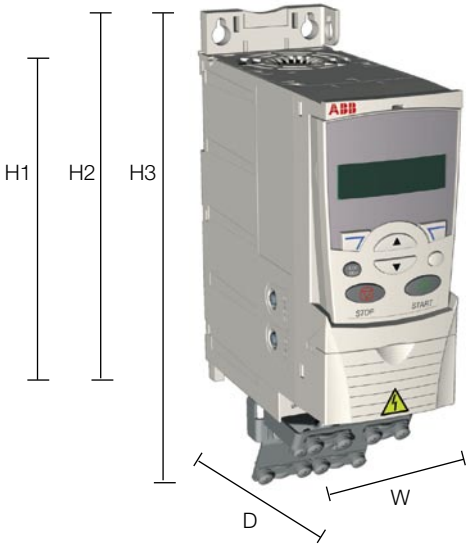
| Ratings | | | Type code | Frame size |
|---|---|---|---|---|
| $P_N$ kW | $P_N$ hp | $I_{2N}$ A | | |
| **1-phase supply voltage 200 - 240 V units** | | | | |
| 0.37 | 0.5 | 2.4 | ACS350-01X-02A4-2 | R0 |
| 0.75 | 1 | 4.7 | ACS350-01X-04A7-2 | R1 |
| 1.1 | 1.5 | 6.7 | ACS350-01X-06A7-2 | R1 |
| 1.5 | 2 | 7.5 | ACS350-01X-07A5-2 | R2 |
| 2.2 | 3 | 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 | 4.7 | ACS350-03X-04A7-2 | R1 |
| 1.1 | 1.5 | 6.7 | ASC350-03X-06A7-2 | R1 |
| 1.5 | 2 | 7.5 | ACS350-03X-07A5-2 | R1 |
| 2.2 | 3 | 9.8 | ACS350-03X-09A8-2 | R2 |
| 3 | 4 | 13.3 | ACS350-03X-13A3-2 | R2 |
| 4 | 5 | 17.6 | ACS350-03X-17A6-2 | R2 |
| **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 | 2.4 | ACS350-03X-02A4-4 | R0 |
| 1.1 | 1.5 | 3.3 | ACS350-03X-03A3-4 | R1 |
| 1.5 | 2 | 4.1 | ACS350-03X-04A1-4 | R1 |
| 2.2 | 3 | 5.6 | ACS350-03X-05A6-4 | R1 |
| 3 | 4 | 7.3 | ACS350-03X-07A3-4 | R1 |
| 4 | 5 | 8.8 | ACS350-03X-08A8-4 | R1 |
| 5.5 | 7.5 | 12.5 | ACS350-03X-12A5-4 | R3 |
| 7.5 | 10 | 15.6 | ACS350-03X-15A6-4 | R3 |

X within the type code stands for E or U.

# Dimensions

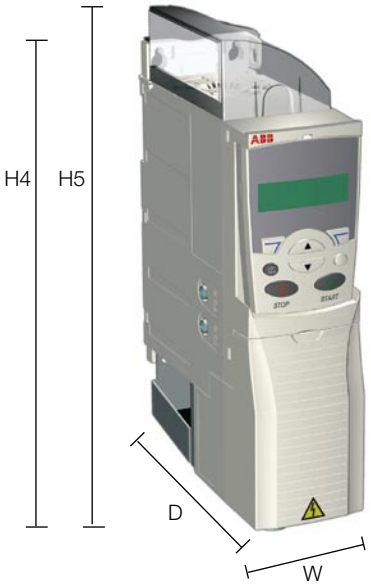
ACS350 - 01E - 02A4 - 2 + B061

## Cabinet-mounted drives (IP 20 UL open)




| Frame size | IP 20 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 | 162 | 1.1 | 257 | 280 | 70 | 169 | 1.5 |
| R1 | 169 | 202 | 239 | 70 | 162 | 1.3 | 257 | 282 | 70 | 169 | 1.7 |
| R2 | 169 | 202 | 239 | 105 | 162 | 1.5 | 257 | 282 | 105 | 169 | 1.9 |
| R3 | 169 | 202 | 236 | 169 | 169 | 2.5 | 260 | 299 | 169 | 177 | 3.1 |

## 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 connection box
H5 = Height with fastenings, connection box and hood
W = Width
D = Depth

# Options

ACS350 - 01E - 02A4 - 2 + B061

## 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 B061 in the type code above. You can order as many options as required, simply by extending the code as necessary.

## Selection table

| | | |
|---|---|---|
| **Protection class** | | |
| B061 | NEMA 1 | |
| **Control panel** | | |
| 0J400 | 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 | FDAN-01 |
| K454 | PROFIBUS DP | FPBA-01 |
| K457 | CANopen | FCAN-01 |
| K458 | ModBus RTU | FMBA-01 |

# Options
## Interfaces

ACS350 - 01E - 02A4 - 2 + B061

## 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.

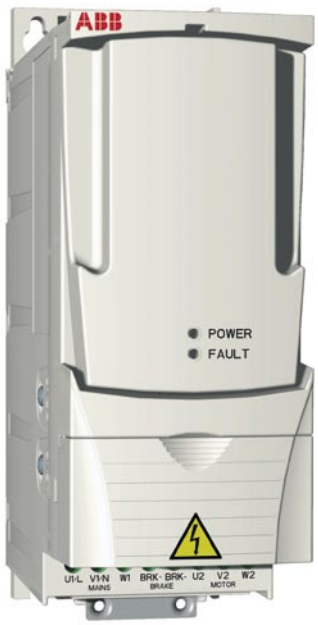
**Basic control panel**
The basic control panel features a single line numeric display. The panel can be used to control the drive, set the parameter values or copy them from one drive to another.

**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.

**FlashDrop**
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.



Panel cover
(included as standard)

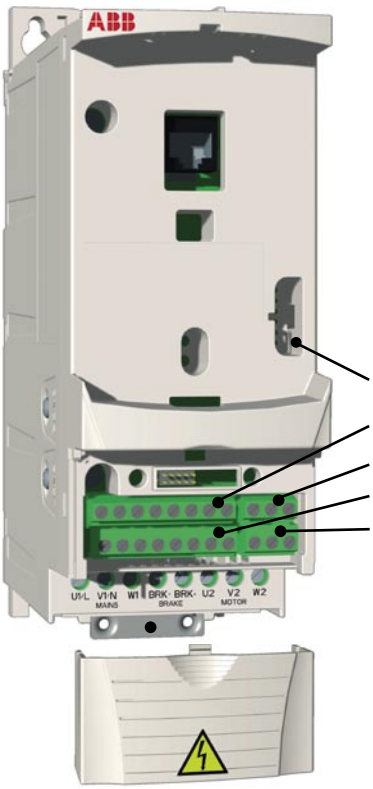
Basic control panel


Potentiometer

Assistant control panel

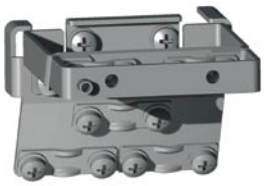
# Options
## Interfaces

ACS350 - 01E - 02A4 - 2 + B061


FlashDrop connection
Analog I/O
Relay output
Digital inputs
Digital output

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.

The ACS350 supports the following fieldbus options:
DeviceNet
PROFIBUS DP
CANopen
Modbus RTU

## Protection and installation

**NEMA 1 kit**
The NEMA 1 kit includes a connection box for finger protection 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 with 360° grounding. The clamping plates with the clamps are included in the drive package as standard.

# Options
## Software tools

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

## DrivePM

DrivePM (Drive parameter manager) is a tool to create, edit and copy parameter sets for FlashDrop. The parameter sets can consist of all parameters (incl. motor parameters and ID run results) or only a set of the user parameters. 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

## 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

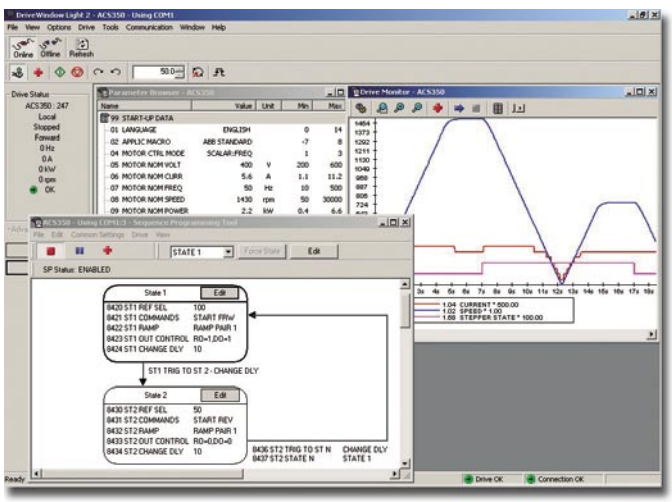
Start-up wizards make the setting of parameters easy. Simply launch the wizard, select an appropriate assistant e.g. for setting analog outputs, and all parameters related to this function are shown together with help pictures.

### 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



# Options
## External

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

## Brake choppers

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

## 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.

### 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 |
| ASC350-03X-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 |
| **3-phase supply voltage 380 - 480 V units** | | | | | |
| ACS350-03X-01A2-4 | R0 | 310 | 1180 | 0.37 | 0.5 |
| ACS350-03X-01A9-4 | R0 | 230 | 800 | 0.55 | 0.75 |
| ACS350-03X-02A4-4 | R0 | 210 | 500 | 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 |

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.

# Technical data

## Cooling

The ACS350 is fitted with cooling fans as standard. The cooling air must be free from corrosive materials 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 | 25 | 85 | -*) | -*) |
| ACS350-01X-04A7-2 | R1 | 46 | 157 | 24 | 14 |
| ACS350-01X-06A7-2 | R1 | 71 | 242 | 24 | 14 |
| ACS350-01X-07A5-2 | R2 | 73 | 249 | 21 | 12 |
| ACS350-01X-09A8-2 | R2 | 96 | 328 | 21 | 12 |
| **3-phase supply voltage 200 - 240 V units** | | | | | |
| ACS350-03X-02A4-2 | R0 | 19 | 65 | -*) | -*) |
| ACS350-03X-03A5-2 | R0 | 31 | 106 | -*) | -*) |
| ACS350-03X-04A7-2 | R1 | 38 | 130 | 24 | 14 |
| ASC350-03X-06A7-2 | R1 | 60 | 205 | 24 | 14 |
| ACS350-03X-07A5-2 | R1 | 62 | 212 | 21 | 12 |
| ACS350-03X-09A8-2 | R2 | 83 | 283 | 21 | 12 |
| ACS350-03X-13A3-2 | R2 | 112 | 383 | 52 | 31 |
| ACS350-03X-17A6-2 | R2 | 152 | 519 | 52 | 31 |
| **3-phase supply voltage 380 - 480 V units** | | | | | |
| ACS350-03X-01A2-4 | R0 | 11 | 38 | -*) | -*) |
| ACS350-03X-01A9-4 | R0 | 16 | 55 | -*) | -*) |
| ACS350-03X-02A4-4 | R0 | 21 | 72 | -*) | -*) |
| ACS350-03X-03A3-4 | R1 | 31 | 106 | 13 | 8 |
| ACS350-03X-04A1-4 | R1 | 40 | 137 | 13 | 8 |
| ACS350-03X-05A6-4 | R1 | 61 | 208 | 19 | 11 |
| ACS350-03X-07A3-4 | R1 | 74 | 253 | 24 | 14 |
| ACS350-03X-08A8-4 | R1 | 94 | 321 | 24 | 14 |
| ACS350-03X-12A5-4 | R3 | 130 | 444 | 52 | 31 |
| ACS350-03X-15A6-4 | R3 | 173 | 591 | 52 | 31 |

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 | 80 | 80 | 0 |

## Fuses

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

### Selection table

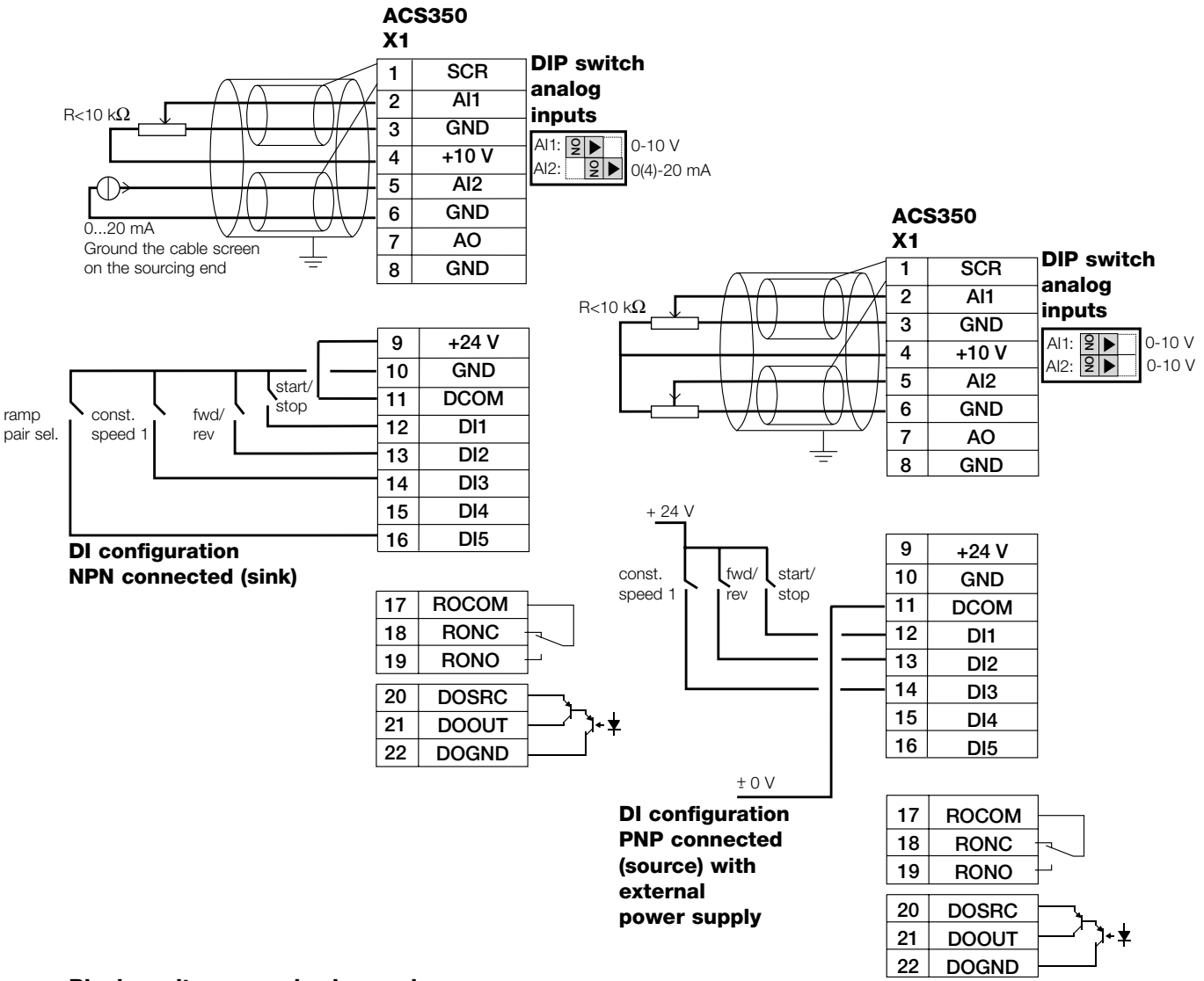
| Type code | Frame size | IEC Fuses | | UL Fuses | |
|---|---|---|---|---|---|
| | | A | Fuse type*) | A | Fuse type*) |
| **1-phase supply voltage 200 - 240 V units** | | | | | |
| ACS350-01X-02A4-2 | R0 | 10 | gG | 10 | UL class T |
| ACS350-01X-04A7-2 | R1 | 16 | gG | 20 | UL class T |
| ACS350-01X-06A7-2 | 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 |
| ASC350-03X-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 |
| **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 | R0 | 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 | 30 | gG | 35 | UL class T |

X within the type code stands for E or U.

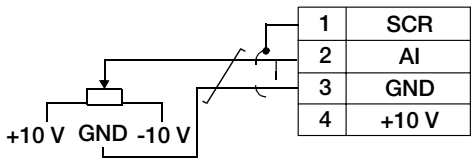
*) According to IEC-60269 standard.

# Control connections

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




**Bipolar voltage can also be used as in the following diagram:**



# Service products

## 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 round-the-clock 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

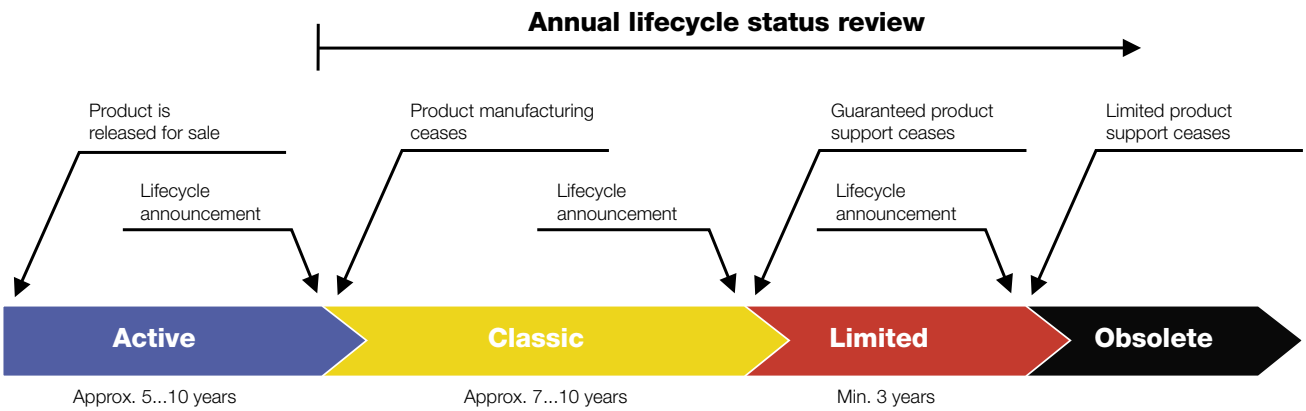
ABB offers dedicated training on ACS350 drives for your service and operating personnel for acquiring the required skills to use ABB drives correctly and safely and to run the application in the most effective way.

### 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/motors&drives and www.abb.com/abbuniversity.

### Lifecycle phases and related services




**Drives service offerings matched to different lifecycle phases:**

**Active**
Selection & Dimensioning
Installation & Commissioning
Training & Learning
Support & Remote Services
Spare parts & Repair
Maintenance & Field Services
Optimization

**Classic**
Support & Remote Services
Spare parts & Repair
Maintenance & Field Services
Training & Learning
Migration & Retrofits
Optimization

**Limited**
Support & Remote Services
Spare parts & Repair
Maintenance & Field Services
Migration & Retrofits
Replacement & Recycling

**Obsolete**
Sale of spare parts is limited to available inventory. Availability of repair services is contingent on components.

Many ABB products have been and will be supported for over 20 years.

# Contact and web information

ABB's worldwide presence is built on strong local companies working together with the local distributor and channel partner network across borders to achieve a uniform level of services for all our customers. By combining the experience and know-how gained in local and global markets, we ensure that our customers in all industries can gain the full benefit from our products.

For further details about all our variable speed drive products and services please contact your nearest ABB drives channel partner or visit the ABB website www.abb.com/motors&drives.

For orders, quotations, etc. please contact your local ABB drives channel partner, ABB office, or visit the website www.abb.com/drivespartners.

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