



Catalog

# ABB component drives ACS150, 0.37 to 4 kW / 0.5 to 5 hp

Power and productivity  
for a better world™





# ABB component drives

## ABB component drives

ABB component drives are designed for machine building. These drives are components that are bought together with other components from a logistical distributor. The drives are stocked, and the number of options and variants is optimized for logistical distribution.

## Highlights

- User-friendly LCD control panel and integrated potentiometer
- Flexible mounting alternatives
- Integrated EMC filter
- Inbuilt brake chopper as standard
- FlashDrop tool

## Applications

- Fans
- Pumps
- Gate control
- Material handling
- Conveyors

| Feature  | Advantage  | Benefit   |
|--|--|---|
| User-friendly LCD control panel and integrated potentiometer | Clear alphanumeric display. Easy set-up and use.   | Time savings  |
| Flexible mounting alternatives                               | Screw or DIN rail mounting, sideways or side-by-side   | One drive type can be used in various designs, saving installation costs and time               |
| Integrated EMC filter  | High electromagnetic compatibility   | Low EMC emissions in selected environments  |
| Inbuilt brake chopper as standard                            | No need for an external brake chopper  | Space savings, reduced installation cost  |
| 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. |

# Technical specification



## Mains connection

|                                |   |
|--------------------------------|---|
| <b>Voltage and power range</b> | 1-phase, 200 to 240 V $\pm$ 10%<br>0.37 to 2.2 kW (0.5 to 3 hp)<br>3-phase, 200 to 240 V $\pm$ 10%<br>0.37 to 2.2 kW (0.5 to 3 hp)<br>3-phase, 380 to 480 V $\pm$ 10%<br>0.37 to 4 kW (0.5 to 5 hp) |
| <b>Frequency</b>               | 48 to 63 Hz   |
| <b>Power factor</b>            | 0.98  |

## Motor connection

|   |   |
|---|---|
| <b>Voltage</b>  | 3-phase, from 0 to $U_{supply}$   |
| <b>Frequency</b>  | 0 to 500 Hz   |
| <b>Continuous loading capability</b><br><small>(constant torque at a max. ambient temperature 40°C)</small> | Rated output current $I_{2N}$   |
| <b>Overload capability</b><br><small>(at a max. ambient temperature of 40°C)</small>                        | At heavy duty use $1.5 \times I_{2N}$ for 1 minute every 10 minutes<br>At start $1.8 \times I_{2N}$ for 2 s |
| <b>Switching frequency</b>  |   |
| Default   | 4 kHz   |
| Selectable  | 4 to 16 kHz with 4 kHz steps  |
| <b>Acceleration time</b>  | 0.1 to 1800 s   |
| <b>Deceleration time</b>  | 0.1 to 1800 s   |
| <b>Braking</b>  | Inbuilt brake chopper as standard   |

## Environmental limits

|                             |  |
|-----------------------------|--|
| <b>Ambient temperature</b>  | -10 to 40 °C (14 to 104 °F), no frost allowed, 50 °C (122 °F) with 10% derating  |
| <b>Altitude</b>             |  |
| 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) |
| <b>Relative humidity</b>    | Lower than 95% (without condensation)  |
| <b>Degree of protection</b> | IP20 / Optional NEMA 1 enclosure   |
| <b>Enclosure colour</b>     | NCS 1502-Y, RAL 9002, PMS 420 C  |
| <b>Contamination levels</b> | IEC 721-3-3  |
| Transportation              | No conductive dust allowed<br>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)  |

## Chokes

|                         |  |
|-------------------------|--|
| <b>AC input chokes</b>  | External option.<br>For reducing THD in partial loads and to comply with EN 61000-3-2. |
| <b>AC output chokes</b> | External option.<br>To achieve longer motor cables.                                    |

## Programmable control connections

|                               |   |
|-------------------------------|---|
| <b>One analog input</b>       |   |
| Voltage signal                | 0 (2) to 10 V, $R_{in} > 312 \text{ k}\Omega$   |
| Current signal                | 0 (4) to 20 mA, $R_{in} = 100 \Omega$   |
| Potentiometer reference value | 10 V $\pm$ 1% max. 10 mA, $R < 10 \text{ k}\Omega$                                    |
| Resolution                    | 0.1 %   |
| Accuracy                      | $\pm$ 2%  |
| <b>Auxiliary voltage</b>      | 24 V DC $\pm$ 10%, max. 200 mA  |
| <b>Five digital inputs</b>    | 12 to 24 V DC with internal or external supply, PNP and NPN, pulse train 0 to 10 kHz. |
| Input impedance               | 2.4 k $\Omega$  |
| <b>One relay output</b>       |   |
| 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   |

## 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

2<sup>nd</sup> environment filter, unrestricted distribution, C3 with 30 m (98 ft) cable, inbuilt as standard.

## 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 |
|--|-------------------------------------|--|
| 1 <sup>st</sup> environment, unrestricted distribution | Category C1                         | Group 1 Class B  |
| 1 <sup>st</sup> environment, restricted distribution   | Category C2                         | Group 1 Class A  |
| 2 <sup>nd</sup> environment, unrestricted distribution | Category C3                         | Group 2 Class A  |
| 2 <sup>nd</sup> environment, restricted distribution   | Category C4                         | Not applicable   |



# Ratings, types, voltages and construction

## Type code

In column 4 on the right 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 (column 5) can be used to determine the drives dimensions, shown below.

## Voltages

ACS150 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 on the right.

## Construction

"01X" and "03X" within the type code 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.)

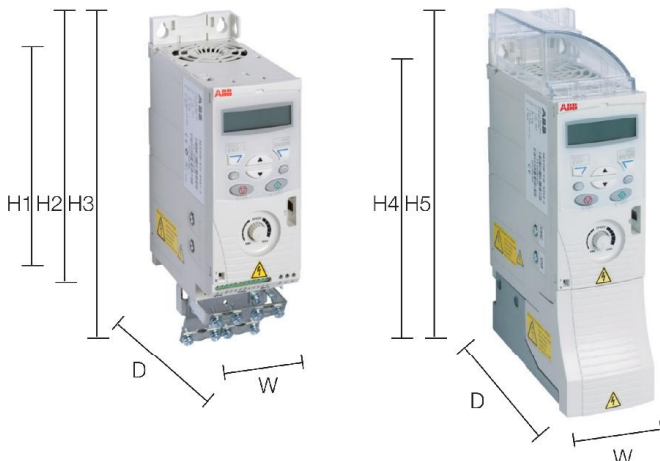
| Ratings   |             |               | Type code         | Frame size |
|---|-------------|---------------|-------------------|------------|
| $P_N$<br>kW                                     | $P_N$<br>hp | $I_{2N}$<br>A |                   |            |
| <b>1-phase supply voltage 200 - 240 V units</b> |             |               |                   |            |
| 0.37  | 0.5         | 2.4           | ACS150-01X-02A4-2 | R0         |
| 0.75  | 1           | 4.7           | ACS150-01X-04A7-2 | R1         |
| 1.1   | 1.5         | 6.7           | ACS150-01X-06A7-2 | R1         |
| 1.5   | 2           | 7.5           | ACS150-01X-07A5-2 | R2         |
| 2.2   | 3           | 9.8           | ACS150-01X-09A8-2 | R2         |
| <b>3-phase supply voltage 200 - 240 V units</b> |             |               |                   |            |
| 0.37  | 0.5         | 2.4           | ACS150-03X-02A4-2 | R0         |
| 0.55  | 0.75        | 3.5           | ACS150-03X-03A5-2 | R0         |
| 0.75  | 1           | 4.7           | ACS150-03X-04A7-2 | R1         |
| 1.1   | 1.5         | 6.7           | ACS150-03X-06A7-2 | R1         |
| 1.5   | 2           | 7.5           | ACS150-03X-07A5-2 | R1         |
| 2.2   | 3           | 9.8           | ACS150-03X-09A8-2 | R2         |
| <b>3-phase supply voltage 380 - 480 V units</b> |             |               |                   |            |
| 0.37  | 0.5         | 1.2           | ACS150-03X-01A2-4 | R0         |
| 0.55  | 0.75        | 1.9           | ACS150-03X-01A9-4 | R0         |
| 0.75  | 1           | 2.4           | ACS150-03X-02A4-4 | R1         |
| 1.1   | 1.5         | 3.3           | ACS150-03X-03A3-4 | R1         |
| 1.5   | 2           | 4.1           | ACS150-03X-04A1-4 | R1         |
| 2.2   | 3           | 5.6           | ACS150-03X-05A6-4 | R1         |
| 3   | 4           | 7.3           | ACS150-03X-07A3-4 | R1         |
| 4   | 5           | 8.8           | ACS150-03X-08A8-4 | R1         |

X within the type code stands for E or U.

## Dimensions

### Cabinet-mounted drives (UL open)

### Wall-mounted drives (NEMA 1)



| Frame size | IP20 UL open |          |          |         |         |              | NEMA 1   |          |         |         |              |
|------------|--------------|----------|----------|---------|---------|--------------|----------|----------|---------|---------|--------------|
|            | H1<br>mm     | H2<br>mm | H3<br>mm | W<br>mm | D<br>mm | Weight<br>kg | H4<br>mm | H5<br>mm | W<br>mm | D<br>mm | Weight<br>kg |
| R0         | 169          | 202      | 239      | 70      | 142     | 1.1          | 257      | 280      | 70      | 142     | 1.5          |
| R1         | 169          | 202      | 239      | 70      | 142     | 1.3          | 257      | 280      | 70      | 142     | 1.7          |
| R2         | 169          | 202      | 239      | 105     | 142     | 1.5          | 257      | 282      | 105     | 142     | 1.9          |

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

## 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 pdf-format on the previous CD-rom
- Cable for connection between the PC and FlashDrop
- Battery charger



## Brake resistors

The brake resistor is selected using the respective table. For more information about the selection of brake resistors, see the ACS150 User's Manual.

ACS150 is delivered with an integrated brake chopper as standard. No additional space or installation time is needed.

### Selection table

| Type code                                       | Frame size | $R_{min}$ ohm | $R_{max}$ ohm | $P_{RRmax}$ kW | hp   |
|---|------------|---------------|---------------|----------------|------|
| <b>1-phase supply voltage 200 - 240 V units</b> |            |               |               |                |      |
| ACS150-01X-02A4-2                               | R0         | 70            | 390           | 0.37           | 0.5  |
| ACS150-01X-04A7-2                               | R1         | 40            | 200           | 0.75           | 1    |
| ACS150-01X-06A7-2                               | R1         | 40            | 130           | 1.1            | 1.5  |
| ACS150-01X-07A5-2                               | R2         | 30            | 100           | 1.5            | 2    |
| ACS150-01X-09A8-2                               | R2         | 30            | 70            | 2.2            | 3    |
| <b>3-phase supply voltage 200 - 240 V units</b> |            |               |               |                |      |
| ACS150-03X-02A4-2                               | R0         | 70            | 390           | 0.37           | 0.5  |
| ACS150-03X-03A5-2                               | R0         | 70            | 260           | 0.55           | 0.75 |
| ACS150-03X-04A7-2                               | R1         | 40            | 200           | 0.75           | 1    |
| ACS150-03X-06A7-2                               | R1         | 40            | 130           | 1.1            | 1.5  |
| ACS150-03X-07A5-2                               | R1         | 30            | 100           | 1.5            | 2    |
| ACS150-03X-09A8-2                               | R2         | 30            | 70            | 2.2            | 3    |
| <b>3-phase supply voltage 380 - 480 V units</b> |            |               |               |                |      |
| ACS150-03X-01A2-4                               | R0         | 200           | 1180          | 0.37           | 0.5  |
| ACS150-03X-01A9-4                               | R0         | 175           | 800           | 0.55           | 0.75 |
| ACS150-03X-02A4-4                               | R1         | 165           | 590           | 0.75           | 1    |
| ACS150-03X-03A3-4                               | R1         | 150           | 400           | 1.1            | 1.5  |
| ACS150-03X-04A1-4                               | R1         | 130           | 300           | 1.5            | 2    |
| ACS150-03X-05A6-4                               | R1         | 100           | 200           | 2.2            | 3    |
| ACS150-03X-07A3-4                               | R1         | 70            | 150           | 3              | 4    |
| ACS150-03X-08A8-4                               | R1         | 70            | 110           | 4              | 5    |

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.

## Protection class NEMA 1

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



# Technical data

## Cooling

ACS150 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

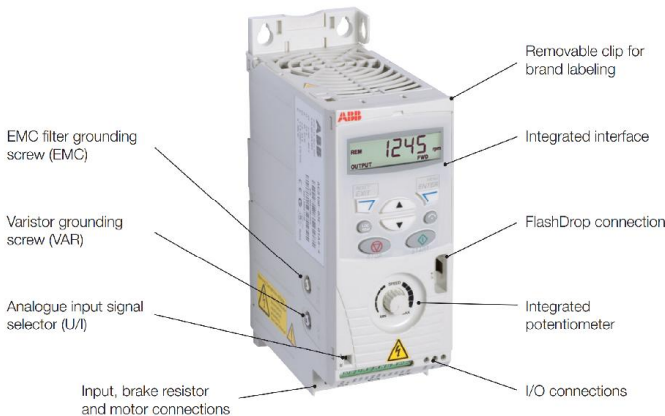
| Type code                                       | Frame size | Heat dissipation |        | Air flow          |                      |
|---|------------|------------------|--------|-------------------|----------------------|
|   |            | w                | BTU/Hr | m <sup>3</sup> /h | ft <sup>3</sup> /min |
| <b>1-phase supply voltage 200 - 240 V units</b> |            |                  |        |                   |                      |
| ACS150-01X-02A4-2                               | R0         | 25               | 85     | -*)               | -*)                  |
| ACS150-01X-04A7-2                               | R1         | 46               | 157    | 24                | 14                   |
| ACS150-01X-06A7-2                               | R1         | 71               | 242    | 24                | 14                   |
| ACS150-01X-07A5-2                               | R2         | 73               | 249    | 21                | 12                   |
| ACS150-01X-09A8-2                               | R2         | 96               | 328    | 21                | 12                   |
| <b>3-phase supply voltage 200 - 240 V units</b> |            |                  |        |                   |                      |
| ACS150-03X-02A4-2                               | R0         | 19               | 65     | -*)               | -*)                  |
| ACS150-03X-03A5-2                               | R0         | 31               | 106    | -*)               | -*)                  |
| ACS150-03X-04A7-2                               | R1         | 38               | 130    | 24                | 14                   |
| ACS150-03X-06A7-2                               | R1         | 60               | 205    | 24                | 14                   |
| ACS150-03X-07A5-2                               | R1         | 62               | 212    | 21                | 12                   |
| ACS150-03X-09A8-2                               | R2         | 83               | 283    | 21                | 12                   |
| <b>3-phase supply voltage 380 - 480 V units</b> |            |                  |        |                   |                      |
| ACS150-03X-01A2-4                               | R0         | 11               | 38     | -*)               | -*)                  |
| ACS150-03X-01A9-4                               | R0         | 16               | 55     | -*)               | -*)                  |
| ACS150-03X-02A4-4                               | R1         | 21               | 72     | 13                | 8                    |
| ACS150-03X-03A3-4                               | R1         | 31               | 106    | 13                | 8                    |
| ACS150-03X-04A1-4                               | R1         | 40               | 137    | 13                | 8                    |
| ACS150-03X-05A6-4                               | R1         | 61               | 208    | 19                | 11                   |
| ACS150-03X-07A3-4                               | R1         | 74               | 253    | 24                | 14                   |
| ACS150-03X-08A8-4                               | R1         | 94               | 321    | 24                | 14                   |

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                      |

## Interface and control connections



## Fuses

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

### Selection table

| Type code                                       | Frame size | IEC Fuses |             | UL Fuses |             |
|---|------------|-----------|-------------|----------|-------------|
|   |            | A         | Fuse type*) | A        | Fuse type*) |
| <b>1-phase supply voltage 200 - 240 V units</b> |            |           |             |          |             |
| ACS150-01X-02A4-2                               | R0         | 10        | gG          | 10       | UL class T  |
| ACS150-01X-04A7-2                               | R1         | 16        | gG          | 20       | UL class T  |
| ACS150-01X-06A7-2                               | R1         | 20        | gG          | 25       | UL class T  |
| ACS150-01X-07A5-2                               | R2         | 25        | gG          | 30       | UL class T  |
| ACS150-01X-09A8-2                               | R2         | 35        | gG          | 35       | UL class T  |
| <b>3-phase supply voltage 200 - 240 V units</b> |            |           |             |          |             |
| ACS150-03X-02A4-2                               | R0         | 10        | gG          | 10       | UL class T  |
| ACS150-03X-03A5-2                               | R0         | 10        | gG          | 10       | UL class T  |
| ACS150-03X-04A7-2                               | R1         | 10        | gG          | 15       | UL class T  |
| ACS150-03X-06A7-2                               | R1         | 16        | gG          | 15       | UL class T  |
| ACS150-03X-07A5-2                               | R1         | 16        | gG          | 15       | UL class T  |
| ACS150-03X-09A8-2                               | R2         | 16        | gG          | 20       | UL class T  |
| <b>3-phase supply voltage 380 - 480 V units</b> |            |           |             |          |             |
| ACS150-03X-01A2-4                               | R0         | 10        | gG          | 10       | UL class T  |
| ACS150-03X-01A9-4                               | R0         | 10        | gG          | 10       | UL class T  |
| ACS150-03X-02A4-4                               | R1         | 10        | gG          | 10       | UL class T  |
| ACS150-03X-03A3-4                               | R1         | 10        | gG          | 10       | UL class T  |
| ACS150-03X-04A1-4                               | R1         | 16        | gG          | 15       | UL class T  |
| ACS150-03X-05A6-4                               | R1         | 16        | gG          | 15       | UL class T  |
| ACS150-03X-07A3-4                               | R1         | 16        | gG          | 20       | UL class T  |
| ACS150-03X-08A8-4                               | R1         | 20        | gG          | 25       | UL class T  |

X within the type code stands for E or U.  
\*) According to IEC-60269 standard.

