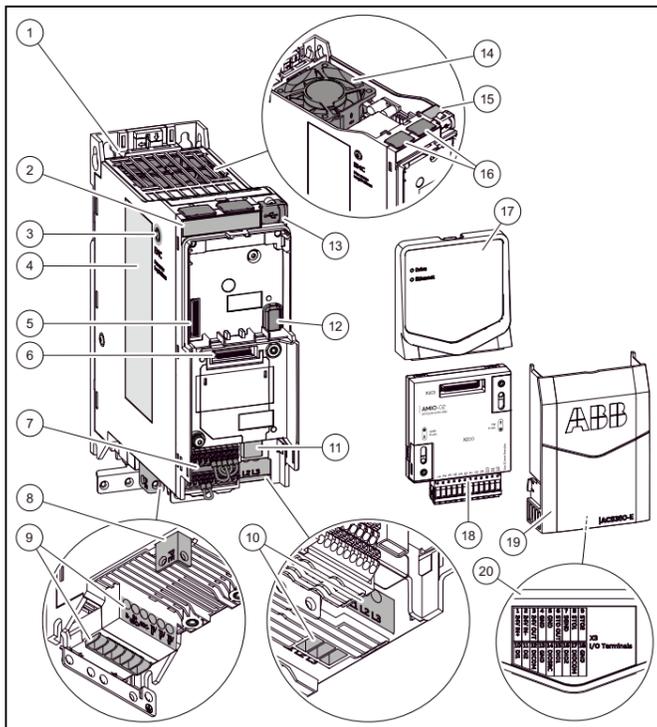


# ACS380-E drives

## Quick installation and start-up guide



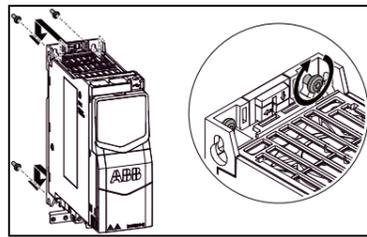
### Drive overview



- |  |   |
|--|---|
| 1. Drive base unit                     | 11. Eject button for the option module          |
| 2. MAC address label                   | 12. Safety option connector cover <sup>1)</sup> |
| 3. EMC filter grounding screw          | 13. USB-C port <sup>2)</sup>                    |
| 4. Type designation label              | 14. Cooling fan                                 |
| 5. Front panel/safety option connector | 15. Model information label                     |
| 6. Option module connector             | 16. Ethernet ports (X1 and X2)                  |
| 7. Control terminals                   | 17. Front panel module                          |
| 8. PE connection (motor)               | 18. Option module                               |
| 9. Brake resistor and motor terminals  | 19. Front cover                                 |
| 10. Input power terminals              | 20. Control terminal names (inside front cover) |

1) Remove the cover only if a safety option is connected.  
 2) The USB-C port does not support external memory devices. Do not use the port to supply power to external devices.

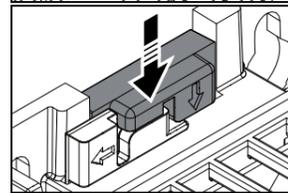
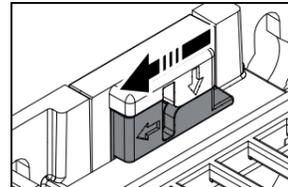
- Drill the holes for the mounting screws.
- If it is necessary, install suitable plugs or anchors.
- Install the mounting screws. Leave a suitable gap between the screw head and the installation surface.
- Put the drive onto the mounting screws. Start with the top mounting screws.
- Carefully tighten the mounting screws to prevent damage to the drive.



The illustration shows the R1 drive. Use a similar procedure for other frame sizes.

### To install the drive on a DIN installation rail

- Move the locking part to the left. If it is necessary, use a flathead screwdriver.
- Push and hold the locking button down.
- Put the top tabs of the drive onto the top edge of the DIN installation rail.
- Put the drive against the bottom edge of the DIN installation rail.
- Release the locking button.
- Move the locking part to the right.
- Make sure that the drive is correctly installed.



To remove the drive, open the locking part and lift the drive from the DIN installation rail.

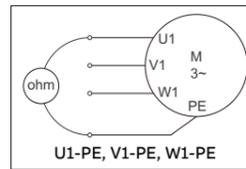
### 7. Measure the insulation resistance

**Drive:** Do not do voltage tolerance or insulation resistance tests on the drive, because this can cause damage to the drive.

**Input power cable:** Before you connect the input power cable, measure the insulation of the input power cable. Obey the local regulations.

#### Motor and motor cable:

- Make sure that the motor cable is connected to the motor and disconnected from the drive output terminals T1/U, T2/V and T3/W.
- Use a voltage of 1000 V DC to measure the insulation resistance between each phase conductor and the protective earth conductor. The insulation resistance of an ABB motor must be more than 100 Mohm (at 25 °C [77 °F]). For the insulation resistance of other motors, refer to the applicable documentation. Moisture in the motor decreases the insulation resistance. If you think that there is moisture in the motor, dry the motor and do the measurement again.



### 8. Examine compatibility with the grounding system

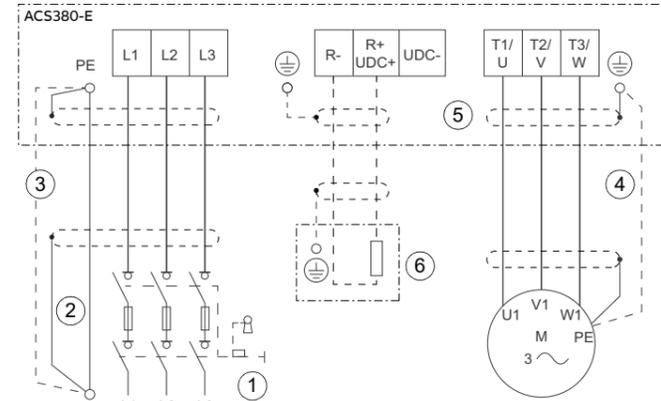
You can connect all drive types to a symmetrically grounded TN-S system (center-grounded wye). The drive is delivered with the EMC screw installed. The material of the screws (plastic or metal) depends on the product variant. The table shows when to remove the metal EMC screw, that is, disconnect the internal EMC filter.

Screw label	Factory default screw material	Grounding systems		
		Symmetrically grounded TN-S systems (center-grounded wye)	Corner-grounded delta, midpoint-grounded delta and TT systems	IT systems (ungrounded or high-resistance grounded)
EMC	Metal	Do not remove	Remove	Remove
	Plastic <sup>1)</sup>	Do not remove <sup>2)</sup>	Do not remove	Do not remove

- Drives sold in North America have a plastic EMC screw.
- Install the metal screw (included in the drive delivery) to connect the internal EMC filter.

### 9. Connect the power cables

Connection diagram (shielded cables):

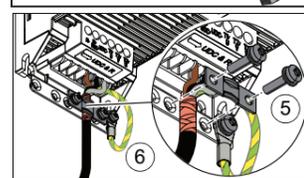
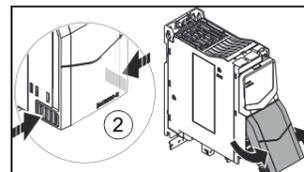


- Disconnecting device.
- Two protective earth (ground) conductors. Drive safety standard IEC/EN 61800-5-1 requires two PE conductors, if the cross-sectional area of the PE conductor is less than 10 mm<sup>2</sup> Cu or 16 mm<sup>2</sup> Al. For example, you can use the cable shield in addition to the fourth conductor.
- Use a separate grounding cable or a cable with a separate PE conductor for the line side, if the conductivity of the fourth conductor or shield does not meet the requirements for the PE conductor.
- Use a separate grounding cable for the motor side, if the conductivity of the shield is not sufficient, or if there is no symmetrically constructed PE conductor in the cable.
- 360° grounding of the cable shield is required for the motor cable and brake resistor cable (if used). It is also recommended for the input power cable.
- Brake resistor and resistor cable (optional).

#### Power cable connection procedure (shielded cables)

For the tightening torques, refer to [Terminal data for the power cables](#).

- Before you start, do the steps in [Electrical safety precautions](#).
- To remove the front cover, squeeze its bottom side edges to free the locking tabs and pull.
- Attach the residual voltage warning sticker in the local language to the drive.
- Strip the motor cable.
- Ground the motor cable shield under the grounding clamp.
- Twist the motor cable shield into a bundle, mark it and connect it to the grounding terminal.
- Connect the phase conductors of the motor cable to terminals T1/U, T2/V and T3/W.
- If you use a brake resistor, connect the brake resistor cable to terminals R- and UDC+. Use a shielded cable and ground the shield under the grounding clamp.
- Make sure that the R- and UDC+ terminal screws are tightened. Do this step also if you do not connect cables to the terminals.
- Strip the input power cable.



### Safety instructions

**WARNING** Obey these instructions. If you ignore them, injury or death, or damage to the equipment can occur. If you are not a qualified electrical professional, do not do electrical installation or maintenance work.

- Do not do work on the drive, motor cable, motor, or control cables when the drive is connected to the input power.
- Before you start the work, isolate the drive from all dangerous voltage sources and make sure that it is safe to start the work.
- Wait for 5 minutes after you disconnect the input power to let the intermediate circuit capacitors discharge.
- Do not do work on the drive when a rotating permanent magnet motor is connected to it. A rotating permanent magnet motor energizes the drive, including its input and output terminals.

### Electrical safety precautions

Do these steps before you do installation or maintenance work on the drive:

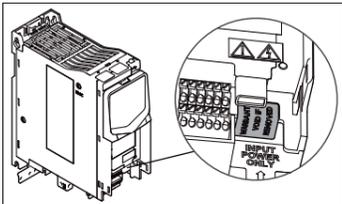
- Prepare for the work.
  - Make sure that you have a work order.
  - Do a risk assessment.
  - Make sure that the workers are qualified and have the correct tools.
  - Select and use the correct personal protective equipment.
  - Stop the drive and motors.
- Clearly identify the work location and equipment.
- Disconnect all possible voltage sources. Make sure that connection is not possible. Lock out and tag out.
  - Open the applicable disconnecting and isolating devices.
  - Disconnect all dangerous external voltages.
  - Disconnect permanent magnet motors from the drive.
- Protect other energized parts in the work location against contact and take special precautions when you are near bare conductors.
- Measure that the installation is de-energized. Use a high-quality voltage tester and verify its operation before use.
  - Make sure that the voltage between the input power terminals of the drive (L1, L2, L3) and the grounding (PE) busbar is zero.
  - Make sure that the voltage between the output power terminals of the drive (T1/U, T2/V, T3/W) and the grounding (PE) busbar is zero.
  - Make sure that the voltage between the drive DC terminals (UDC+ and UDC-) and the grounding (PE) terminal is zero.
- Install temporary grounding as required by the local regulations.
- Ask for a permit to work from the person that is responsible for the electrical installation work.

### 1. Unpack the delivery

**NOTICE** Examine the anti-tamper seals and labels on the drive package and option module packages, and on the drive unit for signs of tampering. Examine the drive and components for damage or missing items. If there are signs of tampering or damage to the drive or components, do not use the product and contact your ABB supplier.

#### Drive unit anti-tamper label

Examine the anti-tamper label on the drive and make sure that it is intact. If an anti-tamper label has damage, contact ABB Sales support or your ABB supplier.



**NOTICE** Keep the drive in its package until you install it. After you remove it from the package, protect the drive from dust, debris and moisture.

Make sure that the package has the correct items:

- Drive unit
- Standard front panel
- Front cover
- EMC plate kit
- Accessories kit
- Ordered options
- Mounting template (for frames R3 and R4 only)
- Multilingual warning sticker sheet (residual voltage warning)
- Quick installation and start-up guide
- Hardware and firmware manuals (if they were ordered as options)

### 2. Reform the capacitors

If the drive was not used for one year or more, reform the DC link capacitors. The manufacturing date is on the type designation label. Refer to [Capacitor reforming instructions \(3BFE64059629 \[English\]\)](#).

### 3. Select the cables and fuses

#### Power cables:

- Obey the local regulations.**
- Input power cable:** Use symmetrical shielded cable (VFD cable) for the best EMC performance.
- Motor power cable:** Use symmetrical shielded cable (VFD cable) for the best EMC performance. This reduces bearing currents, wear, and stress on the motor insulation.
- Power cable types:** In IEC installations, use copper or aluminum cables (if permitted). In UL installations, use only copper cables.
- Current rating:** Maximum load current.
- Voltage rating:** At least 600 V AC.
- Temperature rating:** IEC installations: Power cable rated for at least 70 °C (158 °F) maximum permissible temperature of the conductor in continuous use. UL installations: Power cable rated for at least 75 °C (167 °F).
- Sizes:** Refer to [Fuses and typical power cable sizes](#) for the fuses and typical power cable sizes and to [Terminal data for the power cables](#) for the maximum cable sizes.

#### Control cables:

- Analog signals:** Use double-shielded twisted-pair cable.
- Digital signals:** Use double-shielded or single-shielded cable.
- Conductor sizes:** 0.2...1.5 mm<sup>2</sup> [24...16 AWG] (solid or stranded) Stranded conductor with ferrule: 0.25...1.0 mm<sup>2</sup> [23...17 AWG]
- Ferrules:** 0.25...1.0 mm<sup>2</sup> [24...18 AWG]
- Do not transmit 24 V and 115/230 V signals in the same cable.

#### Ethernet cables:

- Wiring:** CAT5e/6 S/FTP, S/STP, or SF/FTP
- Connector:** RJ45
- Maximum segment length:** 100 m (328 ft)

### 4. Examine the installation area

The drive is intended for cabinet installation and has a degree of protection of IP20 / UL open type as standard.

Make sure that:

- There is sufficient ventilation and hot air does not recirculate.
- There is sufficient free space around the drive for cooling, maintenance, and operation. Refer to [Free space requirements](#).
- The ambient conditions obey the requirements. Refer to [Ambient conditions](#).
- The installation surface is as close to vertical as possible and can support the drive and any connected equipment. Refer to [Dimensions and weights](#).
- The installation surface, floor and materials near the drive are not flammable.
- There are no sources of strong magnetic fields such as high-current single-core conductors or contactor coils near the drive. A strong magnetic field can cause interference or inaccuracy in the operation of the drive.

### 5. Install the front panel and option modules

**NOTICE** Do not use the drive without a front panel. Install the standard Status display panel or an optional front panel before you connect the drive to a power supply.

As standard, the drive comes with the Status display panel. Other front panel modules are available as options.

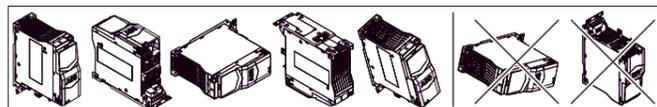
Install the front panel module and any option modules according to the instructions in the applicable product packages.

Refer to the drive hardware manual for more information.

### 6. Install the drive

You can install the drive to a suitable surface with screws, or to a DIN installation rail (top hat type, width × height = 35 mm × 7.5 mm [1.4 in × 0.3 in]).

- The drive can be tilted a maximum of 90 degrees, from vertical to horizontal orientation.



- Do not install the drive upside down.
- You can install several drives side by side.
- Make sure that the exhaust air of a drive or other device does not flow into the cooling air inlet at the bottom of the drive.

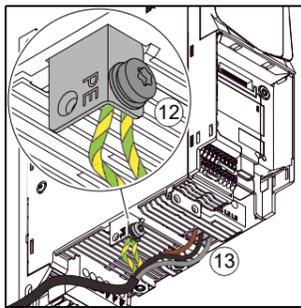
#### To install the drive with screws

##### Notes on the mounting screws:

- Use screws (and plugs, if required) that are suitable for the surface.
- Optimal machine screws are DIN985 pan-head screws:
  - M4 for R1 and R2 frame sizes
  - M5 for R3 and R4 frame sizes
- Optimal self-tapping screws are DIN981 pan-head screws:
  - 4.2 mm for R1 and R2 frame sizes
  - 4.8 mm for R3 and R4 frame sizes
- Use thread-locking compound or spring washers.

- Make marks on the surface for the mounting holes. Refer to [Dimensions and weights](#). Use the supplied mounting template for the R3 and R4 frames.

- If the input power cable has a shield, ground the shield under the grounding clamp. Then twist the shield into a bundle, mark it and connect it to the grounding terminal.
- Connect the PE conductor of the input power cable to the grounding terminal. Connect a second PE conductor.
- In 3-phase drives, connect the phase conductors of the input power cable to terminals L1, L2, and L3. In 1-phase drives, connect the phase and neutral conductors to terminals L1 and L2.
- Mechanically attach the cables on the outside of the drive.



## 10. Connect the control cables

### Notes:

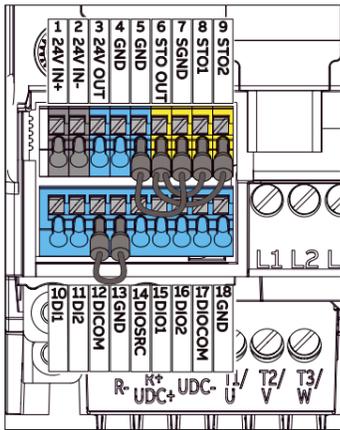
- Strip length: 8.5...9.5 mm [0.33...0.37 in]
- Use suitable ferrules for stranded conductors.
- Keep the signal wire pairs twisted as near to the terminals as possible to prevent inductive coupling.

To connect the control cables:

- Before you start, do the steps in [Electrical safety precautions](#).
- If it is applicable, strip a part of the outer shield of the cable for grounding. Use metallic cable ties and 360° grounding to attach the shield to a grounding tab.
- Strip the control cable conductors.
- For stranded conductors, install ferrules at the ends of the conductors.
- Connect the conductors to the control terminals. Refer to [Standard I/O connections](#). Push the conductors into the spring-loaded terminals and make sure that they do not come loose.
- Attach the control cables on the outside of the drive to prevent mechanical loading at the terminals.

### Standard I/O connections

The standard I/O connections on the base drive unit:



Connection	Terminal	Description
	24V IN+	External +24 V DC input
	24V IN-	External +24 V DC common
	24V OUT	Auxiliary voltage output +24 V DC, max. 200 mA
	GND	Auxiliary voltage output common
	DIO COM	Digital input 1 and 2 common
	DI1	Digital input 1
	DI2	Digital input 2
	DIO1	Digital input/output 1
	DIO2	Digital input/output 2
	DIO SRC	Digital output 1 and 2 auxiliary voltage
	DIO COM	Digital input/output 1 and 2 common
	STO OUT	Safe torque off (STO). Both circuits must be closed for the drive to start. The drawing shows a simplified safety circuit connection. If STO is not used, leave the factory-installed jumpers in place.
	SGND	
	STO1	
	STO2	

### Embedded Ethernet connection

- NOTICE** Do not connect an assistant control panel directly to Ethernet connectors X1 or X2 on the drive. Do not connect the drive to a public or nonsecure data network.

You can control and monitor the drive through the embedded Ethernet connection with these protocols:

- EtherNet/IP (protocol information: [www.odva.org](http://www.odva.org))
- PROFINET (protocol information: [www.profibus.com](http://www.profibus.com))
- Modbus/TCP (protocol information: [modbus.org](http://modbus.org))

### Ethernet connection specifications:

**Compatibility:** Ethernet Standard IEEE802.3/u devices.

**Medium:** 10/100Base-TX with auto-negotiation and auto-MDIX

**Topology:** bus, star, or ring (max. 50 nodes in a ring EtherNet/IP and PROFINET - ring not applicable for Modbus/TCP)

**Serial communications:** Half-duplex or full-duplex

### To set up the drive for Ethernet communication:

- Connect the Ethernet cables and I/O signals. If you use Ethernet devices such as switches, refer to the applicable documentation.
- Power up the drive.
- Enable embedded Ethernet with parameter 50.01.
- Select the protocol with parameter 51.02.

Refer to the drive firmware manual for more information.

## 11. Start up the drive

- WARNING** Before you start the drive, make sure that the installation is completed. Make sure that it is safe to start the motor. If there is a risk of damage or injury, disconnect the motor from other machinery.

To start up the drive, use Drive Composer from a PC over the USB-C connection. For more information, refer to the drive firmware manual.

### Related documents

[ACS380-E document list](#)

[Ecodesign information \(EU 2019/1781\)](#)



3AXD50001141653 Rev. A 2025-03-11  
Original instructions.  
© Copyright 2025 ABB. All rights reserved.



3AXD50001141653A



**WARNING** If you activate the automatic fault reset or automatic restart functions of the drive control program, make sure that no dangerous situations can occur. These functions reset the drive automatically and continue operation after a fault or supply break. If these functions are on, identify the installation clearly as defined in IEC/EN 61800-5-1, subclause 6.5.3, for example, "THIS MACHINE STARTS AUTOMATICALLY".

## Ratings

ACS380 -E04xx- ...	Input ratings		Output ratings								
	No choke	With choke	Max. current	Nominal use		Light-duty use		Heavy-duty use			
	$I_L$	$I_L$	$I_{max}$	$I_N$	$P_N$	$I_{Ld}$	$P_{Ld}$	$I_{Hd}$	$P_{Hd}$		
	A	A	A	A	kW	A	kW	hp	A	kW	hp
3-phase $U_n = 400$ V											
01A8-4	2.8	1.8	2.2	1.8	0.55	1.7	0.55	-	1.2	0.37	-
02A6-4	3.5	2.6	3.2	2.6	0.75	2.5	0.75	-	1.8	0.55	-
03A3-4	4.8	3.3	4.7	3.3	1.1	3.1	1.1	-	2.6	0.75	-
04A0-4	6.1	4.0	5.9	4.0	1.5	3.8	1.5	-	3.3	1.1	-
05A6-4	8.5	5.6	7.2	5.6	2.2	5.3	2.2	-	4.0	1.5	-
07A2-4	10.1	7.2	10.1	7.2	3.0	6.8	3.0	-	5.6	2.2	-
09A4-4	12.9	9.4	13.0	9.4	4.0	8.9	4.0	-	7.2	3.0	-
12A6-4	16.5	12.6	16.9	12.6	5.5	12.0	5.5	-	9.4	4.0	-
17A0-4	23.4	17.0	22.7	17.0	7.5	16.2	7.5	-	12.6	5.5	-
25A0-4	31.8	25.0	30.6	25.0	11.0	23.8	11.0	-	17.0	7.5	-
033A-4	40.9	32.0	45.0	32.0	15.0	30.5	15.0	-	25.0	11.0	-
038A-4	49.0	38.0	57.6	38.0	18.5	36.0	18.5	-	32.0	15.0	-
045A-4	55.7	45.0	68.4	45.0	22.0	42.8	22.0	-	38.0	18.5	-
050A-4	55.7	50.0	81.0	50.0	22.0	48.0	22.0	-	45.0	22.0	-
3-phase $U_n = 480$ V											
01A8-4	2.2	1.6	2.2	-	-	1.6	-	0.75	1.1	-	0.5
02A6-4	2.7	2.1	3.2	-	-	2.1	-	1.0	1.6	-	0.75
03A3-4	3.9	3.0	4.7	-	-	3.0	-	1.5	2.1	-	1.0
04A0-4	4.5	3.4	5.9	-	-	3.4	-	2.0	3.0	-	1.5
05A6-4	6.6	4.8	7.2	-	-	4.8	-	3.0	3.5	-	2.0
07A2-4	6.2	6.0	10.1	-	-	6.0	-	3.0	4.8	-	3.0
09A4-4	9.8	7.6	13.0	-	-	7.6	-	5.0	6.0	-	3.0
12A6-4	13.9	11.0	16.9	-	-	11.0	-	7.5	7.6	-	5.0
17A0-4	18.8	14.0	22.7	-	-	14.0	-	10.0	11.0	-	7.5
25A0-4	26.6	21.0	30.6	-	-	21.0	-	15.0	14.0	-	10.0
033A-4	33.9	27.0	45.0	-	-	27.0	-	20.0	21.0	-	15.0
038A-4	41.3	34.0	57.6	-	-	34.0	-	25.0	27.0	-	20.0
045A-4	46.9	40.0	68.4	-	-	40.0	-	30.0	34.0	-	25.0
050A-4	46.9	42.0	81.0	-	-	42.0	-	30.0	40.0	-	30.0

$I_L$  Input current for 400 V with motor power  $P_N$  (kW), and for 480 V with motor power  $P_{Ld}$  (hp).

$I_{max}$  Maximum output current. Available for 2 seconds every 10 minutes when the output frequency is less than 9 Hz.

$I_N$  Nominal output current. Maximum continuous rms output current (no overload).

$I_{Ld}$  Continuous rms output current. Allows 10% overload for 1 minute every 10 minutes.

$I_{Hd}$  Continuous rms output current. Allows 50% overload for 1 minute every 10 minutes.

$P_N$  Typical motor power in nominal use (no overload)

$P_{Ld}$  Typical motor power in light-duty use (10% overload)

$P_{Hd}$  Typical motor power heavy-duty use (50% overload)

The kilowatt ratings are applicable to most IEC 4-pole motors. The horsepower ratings are applicable to most NEMA 4-pole motors.

## Fuses and typical power cable sizes

ACS380 -E04xx- ...	Fuses			Cable conductor sizes (Cu)		Frame size
	gG	gR	UL class T <sup>1)2)</sup> 3) 4)	mm <sup>2</sup>	AWG	
	ABB type	Bussmann type	Bussmann/ Edison type			
3-phase $U_n = 400$ V or 480 V						
01A8-4	OFAF000H4	170M2694	JJS/TJS3	3x1.5 + 1.5	14	R1
02A6-4	OFAF000H6	170M2694	JJS/TJS6	3x1.5 + 1.5	14	R1
03A3-4	OFAF000H6	170M2694	JJS/TJS6	3x1.5 + 1.5	14	R1
04A0-4	OFAF000H10	170M2695	JJS/TJS6	3x1.5 + 1.5	14	R1
05A6-4	OFAF000H10	170M2695	JJS/TJS10	3x1.5 + 1.5	14	R1
07A2-4	OFAF000H16	170M2696	JJS/TJS10	3x1.5 + 1.5	14	R1
09A4-4	OFAF000H16	170M2696	JJS/TJS15	3x2.5 + 2.5	14	R1
12A6-4	OFAF000H25	170M2697	JJS/TJS20	3x2.5 + 2.5	14	R2
17A0-4	OFAF000H32	170M2698	JJS/TJS25	3x6 + 6	10	R3
25A0-4	OFAF000H50	170M2699	JJS/TJS35	3x6 + 6	10	R3
033A-4	OFAF000H63	170M2700	JJS/TJS45	3x10 + 10	8	R3
038A-4	OFAF000H80	170M2701	JJS/TJS60	3x16 + 16	6	R4
045A-4	OFAF000H100	170M2702	JJS/TJS60	3x25 + 16	4	R4
050A-4	OFAF000H100	170M2702	JJS/TJS60	3x25 + 16	4	R4

- The recommended branch protection fuses must be used to maintain the IEC/EN/UL 61800-5-1 listing.
- The drive is suitable for use on a circuit capable of delivering not more than 100000 symmetrical amperes (rms) at 480 V (480 V drives) maximum when protected by these fuses.
- As an alternative to Class T fuses, you can use Class J or Class CF fuses of the same voltage and current rating for branch circuit protection of 3-phase drives.
- Refer to [Alternate Fuses, MMPs and Circuit Breakers for ABB Drives \(3AXD50000645015 \[English\]\)](#) for additional UL fuses and circuit breakers that can be used as branch circuit protection.

## Terminal data for the power cables

Frame size	L1, L2, L3, T1/U, T2/V, T3/W, R-, R+/UDC+, UDC-				PE					
	Min. wire size (solid/stranded)		Max. wire size (solid/stranded)		Tightening torque		Max. wire size (solid/stranded)		Tightening torque	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	N-m	lbf-in	mm <sup>2</sup>	AWG	N-m	lbf-in
R1	0.5/0.5	18	4/2.5	10	0.5...0.6	5	6/4	10	1.2	11
R2	0.5/0.5	18	4/2.5	10	0.5...0.6	5	6/4	10	1.2	11
R3	0.5/0.5	18	10/6	6	1.2...1.5	11...13	6/4	10	1.2	11
R4	0.5/0.5	18	25/16	2	2.5...3.7	22...32	25/16	4	2.9	26

### Notes:

- The minimum specified wire size does not necessarily have sufficient current carrying capacity at maximum load.
- Use a maximum of 1 conductor per terminal.

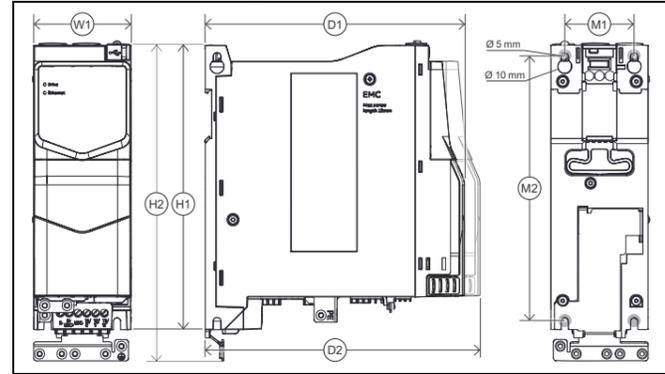
## Free space requirements

Above		Below		Sides	
mm	in	mm	in	mm	in
75	3	75	3	0	0

## Ambient conditions

Requirement	During operation (installed for stationary use)
Installation site altitude	<b>400/480 V drives:</b> 0 ... 4000 m (0 ... 13123 ft) above sea level. At altitudes above 2000 m (6562 ft) only TN-S and TT grounding systems are permitted <b>Derating:</b> The output current must be derated 1% for each 100 m (328 ft) above 1000 m (3281 ft).
Surrounding air temperature	-10 ... +60 °C (14 ... 140 °F). No frost permitted. The output current must be derated at temperatures above +50 °C (122 °F) as follows: • Types 038A-4 and 050A-4: 2% for each added 1 °C (1.8 °F) • Other types: 1% for each added 1 °C (1.8 °F).
Relative humidity	5 ... 95%. No condensation permitted. Maximum permitted relative humidity is 60% in the presence of corrosive gases.
Contamination levels	No conductive dust permitted.
Shock or free fall	Not permitted.

## Dimensions and weights



Frame size	Dimensions							Weight <sup>1)</sup>
	H1	H2	W1	D1	D2	M1	M2	
	mm [in]	mm [in]	mm [in]	mm [in]	mm [in]	mm [in]	mm [in]	kg [lb]
R1	205.0 [8.07]	227.5 [8.96]	70.0 [2.76]	186.8 [7.35]	198.2 [7.80]	50.0 [1.97]	191.0 [7.52]	1.7 [3.8]
R2	205 [8.07]	227.6 [8.96]	95.0 [3.74]	186.8 [7.35]	198.2 [7.80]	75.0 [2.95]	191.0 [7.52]	2.3 [5.0]
R3	205 [8.07]	241.3 [9.50]	170.0 [6.69]	185.7 [7.31]	198.2 [7.80]	148.0 [5.83]	191.0 [7.52]	3.8 [8.3]
R4	205 [8.07]	240.4 [9.46]	260.0 [10.24]	192.0 [7.56]	203.4 [8.01]	234.0 [9.21]	191.0 [7.52]	5.9 [13.0]

1) Total drive weight with the Status display panel and cable clamps. Other front panel options and extension modules can increase the total weight of the drive.

## Safe torque off (STO)



**WARNING** The STO function does not disconnect the voltage from the main and auxiliary circuits of the drive.



**NOTICE** The STO function is bypassed when delivered from the factory. For installed safety options, refer to the safety option documentation.

The drive has a Safe torque off function (STO) in accordance with IEC/EN 61800-5-2. When it activates, the STO function disconnects the control voltage of the power semiconductor of the drive output stage which prevents power output to the motor. If the motor operates when Safe torque off activates, it coasts to a stop. Reset faults before you start the drive.

The STO function has a redundant architecture with two channels. The safety data is for redundant use and applies only when both channels are used.

Refer to the drive hardware manual for detailed STO information such as validation instructions and safety data.

## Markings

The applicable markings are shown on the type label of the product.



## Declarations of conformity

Codes and links to access the documents: