ABB MACHINERY DRIVES

ACS180 drives

Quick installation and start-up guide

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.

- Keep the drive in its package until you install it. After unpacking, protect the drive from dust, debris and moisture.
- Use the required personal protective equipment: safety shoes with metal toe cap, safety glasses, protective gloves and long sleeves, etc.
- When the drive or connected equipment is energized, do not do work on the drive, motor cable, motor, control cables or control circuits.
- 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 power terminals.

Electrical safety precautions

1. Clearly identify the work location and equipment.
2. Disconnect all possible voltage sources. Make sure that re-connection is not possible. Lock out and tag out.
   - Open the main disconnecting device of the drive.
   - If you have a permanent magnet motor connected to the drive, disconnect the motor from the drive.
   - Disconnect any dangerous external voltages from the control circuits.
   - After you disconnect power from the drive, always wait 5 minutes to let the intermediate circuit capacitors discharge before you continue.
3. Protect any other energized parts in the work location against contact.
4. Take special precautions when close to bare conductors.
5. Measure that the installation is de-energized.
   - Use a multimeter with a minimum impedance of 1 Mohm.
   - Make sure that the voltage between the drive input power terminals (L1, L2, L3) and the ground (PE) is close to 0 V.
   - Make sure that the voltage between the drive output terminals (T1/U, T2/V, T3/W) and the ground (PE) is close to 0 V.
6. Install temporary grounding as required by the local regulations.
7. Ask the person in control of the electrical installation work for a permit to work.

See the drive hardware manual for the complete safety instructions.

1. Examine the installation area

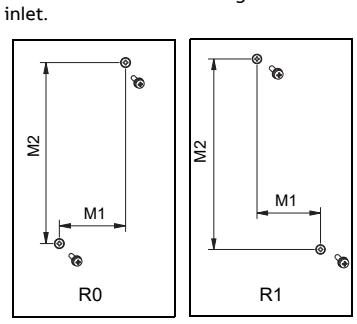
The drive is intended for cabinet installation and has a degree of protection of IP20 / UL open type.

Make sure that in the installation area:
- There is sufficient cooling and hot air does not recirculate.
- The ambient conditions meet the technical specifications. Refer to *Ambient conditions*.
- The mounting surface is non-flammable and can hold the weight of the drive. Refer to *Dimensions and weights*.
- Materials near the drive are non-flammable.
- There is sufficient space above and below the drive for cooling and to do maintenance work.

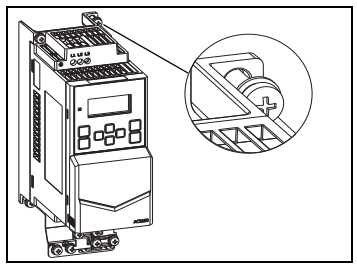
2. Install the drive

Installation requirements:
- Make sure that there is a minimum of 75 mm (3 in) of free space at the top and bottom of the drive for cooling air.
- Install the frame R0 drives upright. The frame R0 drives do not have a fan.
- You can install the frame R1 drives tilted by up to 90 degrees, from vertical to fully horizontal orientation.
- You can install several drives side by side. The maximum surrounding air temperature of the frame R0 drives is 40°C (104°F) when installed side by side.
- Do not install the drive upside down. Make sure that the cooling air exhaust is above or level with the cooling air inlet.

1. Make marks onto the surface for the mounting holes. See the diagrams on the right and *Dimensions and weights*.
2. Make the holes for the mounting screws, and fasten the screws. Use plugs or anchors if needed. See section *Dimensions and weights* for the max. screw diameter.



3. Install the drive onto the mounting screws.
4. Tighten the mounting screws.



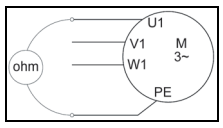
3. Measure the insulation resistance

Measuring the insulation is typically not required in North America.

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:
1. 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.
2. 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 manufacturer's 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.



4. Select the cables

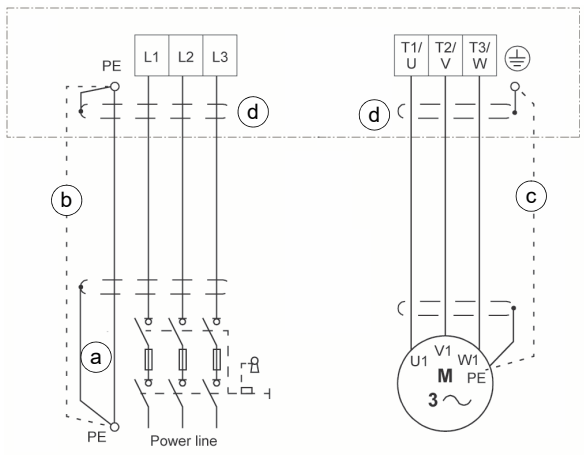
Input power cable: Use two protective earth (ground) conductors to comply with the drive safety standard IEC/EN 61800-5-1. Use symmetrical shielded cable (VFD cable) for the best EMC performance.

Motor cable: Use symmetrical shielded cable (VFD cable) for the best EMC performance, and to comply with the drive EMC standard EN/IEC 61800-3. Symmetrical shielded cable also reduces bearing currents, wear, and stress on motor insulation.

Control cable: Use a double-shielded twisted-pair cable for the analog signals. Use a double- or single-shielded cable for the digital, relay and I/O signals. Do not mix 24 V and 115/230 V signals in the same cable.

5. Connect the power cables

Connection diagram



a. Two grounding conductors. Use two conductors if the cross-section of grounding conductor is less than 10 mm^2 Cu or 16 mm^2 Al (IEC/EN 61800-5-1). For example, use the cable shield in addition to the fourth conductor.

b. Separate grounding cable (line side). Use it if the conductivity of the fourth conductor or shield is not sufficient for the protective grounding.

c. Separate grounding cable (motor side). Use it if the conductivity of the shield is not sufficient for the protective grounding, or there is no symmetrically constructed grounding conductor in the cable.

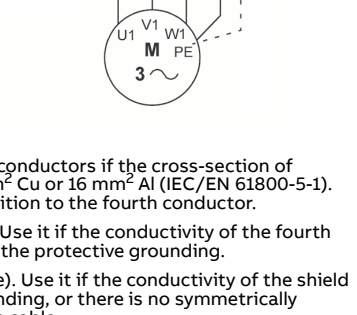
d. 360-degree grounding of the cable shield. Required for the motor cable, and recommended for the input power cable.

Connection procedure

WARNING! Obey the safety instructions. If you ignore them, injury or death, or damage to the equipment can occur.

Make sure that the drive is compatible with the earthing system. You can connect all drive types to a symmetrically grounded TN-S system. For other systems, see the drive hardware manual.

1. Strip the motor cable.
2. Ground the motor cable shield under the grounding clamp.
3. Twist the motor cable shield into a bundle, mark it accordingly and connect it to the grounding terminal.
4. Connect the phase conductors of the motor cable to the T1/U, T2/V and T3/W motor terminals. Torque the terminals to 0.8 N·m (7 lbf·in).
5. Strip the input power cable.
6. If the input power cable has a shield, twist it into a bundle, mark it and connect it to the grounding terminal.
7. Connect the PE conductor of the input power cable to the grounding terminal. Connect the second grounding conductor (requirement of the drive safety standard IEC/EN 61800-5-1).
8. Connect the phase conductors of the input power cable to the L1, L2 and L3 input terminals. Torque the terminals to 0.8 N·m (7 lbf·in).
9. Mechanically attach the cables on the outside of the drive.



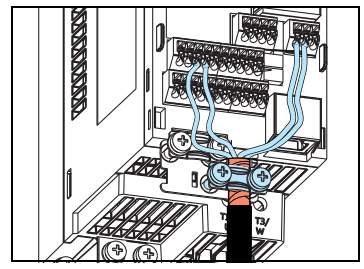
6. Connect the control cables

Connection procedure

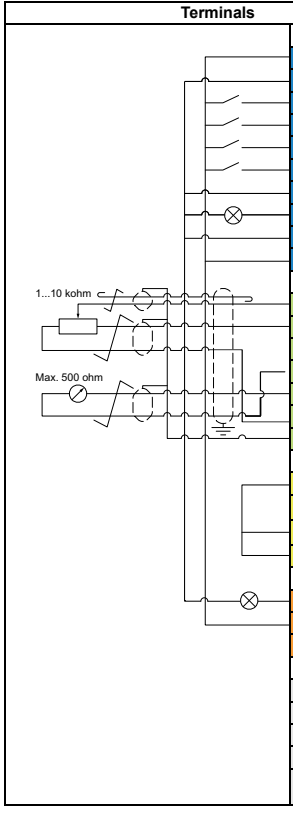
Do the connections according to the default control connections of the application macro that you select. For the connections of the factory default macro (ABB standard macro), refer to *Default I/O connections (ABB standard macro)*. For the other macros, refer to the drive firmware manual.

Keep the signal wire pairs twisted as near to the terminals as possible to prevent inductive coupling.

1. Strip a part of the outer shield of the control cable for grounding.
2. Use a 360-degree grounding clamp to connect the outer shield to the grounding tab.
3. Strip the control cable conductors.
4. Connect the conductors to the correct control terminals. Insert the conductor into a push-in terminal; To release, pull the conductor with pushing the open/close button all the way down firmly with a flathead screwdriver.
5. Mechanically attach the control cables on the outside of the drive.



Default I/O connections (ABB standard macro)



Terminals		Descriptions
Digital I/O connections		
21	24 V	Aux. +24 V DC, max 200 mA
22	DGND	Aux. voltage output common
8	DI1	Stop (0) / Start (1)
9	DI2	Forward (0) / Reverse (1)
10	DI3	Constant speed selection
11	DI4	Constant speed selection
12	DCOM	Digital input common
18	DO	Running
19	DO COM	Digital output common
20	DO SRC	Digital output auxiliary voltage
Analog I/O		
14	AI1/DI5	Speed reference (0…10V)
13	AGND	Analog input circuit common
15	AI2	Not used
16	AGND	Analog output circuit common
17	AO	Output frequency (0...20mA)
23	10V	Ref. voltage +10 V DC
24	SCREEN	Signal cable shield (screen)
Safe torque off (STO) (only on ACS180-04S)		
1	S+	Safe torque off function. Connected at the factory. Drive starts only when both circuits are closed.
2	SGND	
3	S1	
4	S2	
Relay output		
5	NC	No fault [Fault (-1)]
6	COM	
7	NO	
EIA-485 Modbus RTU		
25	B+	Embedded Modbus RTU (EIA-485)
26	A-	
27	AGND	
28	SHIELD	
	Termination	

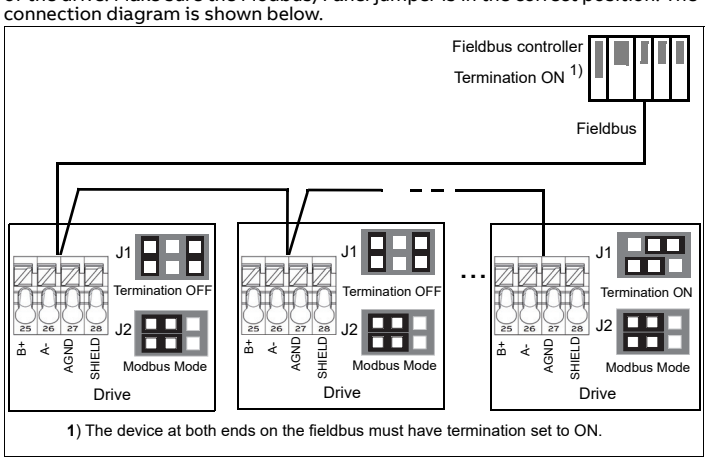
Note: You can select other macros with the control panel. For default IO assignment, please see below:

	Hand/Auto	Alternate	Motor potentionmeter
DI1	Start/Stop (Hand)	Start forward	Start/Stop
DI2	Hand(1)/Auto(0)	Start reverse	Forward/Reverse
DI3	Start/Stop (Auto)	Const speed selection 1	Speed ref. up
DI4	Fault reset	Const speed selection 2	Speed ref. down
AI1/DI5	Speed ref.(Hand)(AI1,0...10V)	Fault reset(DI5)	Const speed selection 1(DI5)
AI2	Speed ref.(Auto)(4...20mA)	Speed ref.(0...10V)	not used
DO	Running		
RO	Fault(-1)		
AO	Output frequency(0...20mA)		

	PID	Hand/PID	Modbus
DI1	Start/Stop	Start/Stop(Hand)	Start/Stop(Hand)
DI2	Internal setpoint sel 1	Hand(1)/PID(0)	Forward/Reverse(Hand)
DI3	Internal setpoint sel 2	Start/Stop(PID)	Hand(1)/Modbus(0)
DI4	Constant speed selection 1	Constant speed selection 1	Fault reset
AI1/DI5	PID set point(AI1, 0…10V)	Hand mode speed ref.(AI1,0...10V)	Constant speed selection 1(DI5)
AI2	Process feedback(4...20mA)	Process feedback(4...20mA)	Speed ref(Hand, 0...10V)
DO	Running		
RO	Fault(-1)		
AO	Output frequency(0...20mA)		

Connecting EIA-485 Modbus RTU terminal to drive

Connect the fieldbus to the EIA-485 Modbus RTU terminal which is on the front of the drive. Make sure the Modbus/Panel jumper is in the correct position. The connection diagram is shown below.

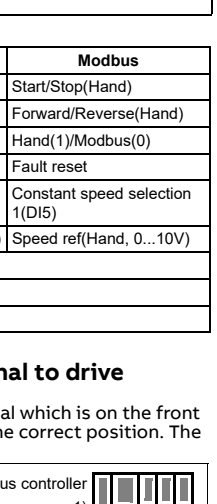


1) The device at both ends on the fieldbus must have termination set to ON.

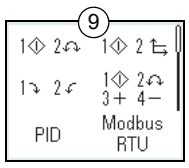
7. Start up the drive

For information on the user interface, refer to the *ACS180 User interface guide* (3AXD50000606696 [English]).

1. Power up the drive.
2. Select the units (international or US). In the *Motor data* view, set the motor type:
   AsynM: Asynchronous motor
   PMSM: Permanent magnet synchronous motor
3. Set the motor control mode:
   Vector: Speed reference. This is suitable for most cases. The drive does an automatic standstill ID run when the drive is started for the first time.
   Scalar: Frequency reference. Do not use this mode for permanent magnet synchronous motors.
   Use this mode when:
   - The number of motors can change.
   - The nominal motor current is less than 20% of the nominal drive current.
4. Set the nominal motor values.
5. Examine the direction of the motor.
   If it is necessary, change the motor direction with the **Phase order** setting or with the phase order of the motor cable.
6. In the *Motor control* view, set the start and stop mode.



7. Set the acceleration and deceleration times.
8. Set the maximum and minimum speeds.
9. In the *Control macros* view, select the applicable macro.
10. Tune the drive parameters to the application. You can also use the Assistant control panel (ACS-AP-...) or the Drive Composer PC tool. Refer to the drive firmware manual.



List of most commonly used parameters

By default, drive shows short parameter list. For the complete list of parameters, refer to the drive firmware manual.

Par. No.	Par. Name	Settings/Range (default value on bold)
Group 99 Motor data		
99.03	Motor type	**[0]Asynchronous motor**, [1]Permanent magnet motor
99.04	Motor control mode	[0]Vector, **[1]Scalar**
99.06	Motor nominal current	depends on rating
99.07	Motor nominal voltage	depends on rating
99.08	Motor nominal frequency	depends on rating
99.09	Motor nominal speed	depends on rating
99.10	Motor nominal power	depends on rating
99.11	Motor nominal cos φ	0.00 … 1.00
99.12	Motor nominal torque	depends on rating
99.16	Motor phase order	**[0]UVW**,[1]UWV
Group 01 Actual values (read-only)		
1.01	Motor speed used	-30000.00 … 30000.00 RPM
1.06	Output frequency	-500.00 … 500.00 Hz
1.07	Motor current	0.00 … 30000.00 A
1.10	Motor Torque	-1600.00% … 1600.00%
1.11	DC voltage	0.00 … 2000.00 V
1.13	Output voltage	0 … 2000 V
1.14	Output power	-32768.00 … 32767.00 kW
Group 5 Diagnostics (read-only)		
5.02	Run-time counter	0 … 65535 days
5.11	Inverter temperature	-40.0 … 160.0 %
Group 10 Standard DI, RO		
10.24	RO1 source	[2]Ready run, **[7]Running**, [14]Fault, [16]Fault/Warning
Group 11 Standard DI, RO		
11.06	DO output source	[2]Ready run, [7]Running, **[14]Fault**, [16]Fault/Warning
11.21	DI5/AI1 configuration	[0]Digital input, **[1]Analog input**
Group 12 Standard AI		
12.15	AI1 unit selection	**[2]V**, [10]mA
12.17	AI1 min	-22.000 … 22.000 mA or V, **0mA** or **0V**
12.18	AI1 max	-22.000 … 22.000 mA or V, **20mA** or **10V**
12.19	AI1 scaled at AI1 min	-32768.000 … 32767.000, **0**
12.20	AI1 scaled at AI1 max	-32768.000 … 32767.000, **50**
12.25	AI2 unit selection	**[2]V**, [10]mA
12.27	AI2 min	-22.000 … 22.000 mA or V, **0mA** or **0V**
12.28	AI2 max	-22.000 … 22.000 mA or V, **20mA** or **10V**
12.29	AI2 scaled at AI2 min	-32768.000 … 32767.000, **0**
12.30	AI2 scaled at AI2 max	-32768.000 … 32767.000, **50**
Group 13 Standard AO		
13.12	AO1 source	**[3]Output frequency**, [4]Motor current
13.15	AO1 unit selection	[2]V, **[10]mA**
13.17	AO1 source min	-32768.000 … 32767.000, **0**
13.18	AO1 source max	-32768.000 … 32767.000, **50**
13.19	AO1 out at AO1 src min	-22.000 … 22.000 mA or V, **0mA** or **0V**
13.20	AO1 out at AO1 src max	-22.000 … 22.000 mA or V, **20mA** or **10V**
Group 19 Operation mode		
19.11	Ext1/Ext2 selection	**[0]EXT1**, [1]EXT2, [3]DI1, [4]DI2, [5]DI3, [6]DI4, [7]DI5, [32]Embeded fieldbus
19.17	Local control disable	**[0]No**, [1]Yes
Group 20 Start/stop/direction		
20.01	Ext1 commands	[0]Not selected, [1]In1 Start, **[2]In1 Start;In2 Dir**, [3]In1 Start fwd;In2 Start rev, [4]In1P Start;In2 Stop,[5]In1P Start;In2 Stop;In3 Dir, [6]In1P Start fwd;In2P Start rev;In3 Stop, [14]Embeded fieldbus
20.03	Ext1 in1 source	[0]Always off, **[2]DI1**, [3]DI2, [4]DI3, [5]DI4, [6]DI5
20.04	Ext1 in2 source	[0]Always off,[2]DI1, **[3]DI2**, [4]DI3, [5]DI4, [6]DI5
20.05	Ext1 in3 source	**[0]Always off**, [2]DI1, [3]DI2, [4]DI3, [5]DI4, [6]DI5
20.06	Ext2 commands	**[0]Not selected**, [1]In1 Start, [2]In1 Start;In2 Dir, [3]In1 Start fwd;In2 Start rev, [4]In1P Start;In2 Stop,[5]In1P Start;In2 Stop;In3 Dir, [6]In1P Start fwd;In2P Start rev;In3 Stop, [14]Embeded fieldbus
20.08	Ext2 in1 source	**[0]Always off**, [2]DI1, [3]DI2, [4]DI3, [5]DI4, [6]DI5
20.09	Ext2 in2 source	**[0]Always off**, [2]DI1, [3]DI2, [4]DI3, [5]DI4, [6]DI5
20.10	Ext2 in3 source	**[0]Always off**, [2]DI1, [3]DI2, [4]DI3, [5]DI4, [6]DI5
20.21	Direction	**[0]Request**, [1]Forward, [2]Reverse
Group 21 Start/stop mode		
21.01	Start mode	[0]Fast, **[1]Const time**, [2]Automatic
21.02	Magnetization time	0 … 10000 ms, **500ms**
21.03	Stop mode	[0]Coast, **[1]Ramp**
21.19	Scalar start mode	[0]Normal, **[1]Const time**, [2]Automatic, [3]Torque Boost, [5]Flying start
Group 22 Speed reference selection		
22.11	Ext1 speed ref1	**[1]AI1 scaled**, [2]AI2 scaled, [8]EFB ref1, [9]EFB ref2, [16]PID
22.18	Ext2 speed ref1	**[0]Zero**, [1]AI1 scaled, [2]AI2 scaled, [8]EFB ref1, [9]EFB ref2, [16]PID
22.22	Constant speed sel1	[0]Always off, [2]DI1, [3]DI2, **[4]DI3**, [5]DI4, [6]DI5
22.23	Constant speed sel2	[0]Always off, [2]DI1, [3]DI2, [4]DI3, **[5]DI4**, [6]DI5
22.26	Constant speed 1	-30000.00 … 30000.00rpm, **300rpm**
22.27	Constant speed 2	-30000.00 … 30000.00rpm, **600rpm**
22.28	Constant speed 3	-30000.00 … 30000.00rpm, **900rpm**
22.71	Motor potentiometer function	[0]Disabled, [1]Enabled (init at stop/power-up), [2]Enabled (resume always), [3]Enabled (init to actual)
22.72	Motor potentiometer initial value	-32768.00… 32767.00, 0.00
22.73	Motor potentiometer up source	**[0]Not selected**, [2]DI1, [3]DI2, [4]DI3, [5]DI4, [6]DI5
22.74	Motor potentiometer down source	**[0]Not selected**, [2]DI1, [3]DI2, [4]DI3, [5]DI4, [6]DI5
22.75	Motor potentiometer ramp time	0.0…3600.0 s, **40.0s**
22.76	Motor potentiometer min value	-32768.00… 32767.00, **-50.00**
22.77	Motor potentiometer max value	-32768.00… 32767.00, **50.00**
Group 23 Speed reference ramp		
23.12	Acceleration time 1	0.000 … 1800.000s, **3.000s**
23.13	Deceleration time 1	0.000 … 1800.000s, **3.000s**
Group 28 Frequency reference chain		
28.11	Ext1 frequency ref1	**[1]AI1 scaled**, [2]AI2 scaled, [8]EFB ref1, [9]EFB ref2, [16]PID
28.15	Ext2 frequency ref1	**[0]Zero**, [1]AI1 scaled, [2]AI2 scaled, [8]EFB ref1, [9]EFB ref2, [16]PID
28.22	Constant frequency sel1	[0]Always off, [2]DI1, [3]DI2, **[4]DI3**, [5]DI4, [6]DI5
28.23	Constant frequency sel2	[0]Always off, [2]DI1, [3]DI2, [4]DI3, **[5]DI4**, [6]DI5
28.26	Constant freqency 1	-500.00 … 500.00Hz, **5Hz**
28.27	Constant freqency 2	-500.00 … 500.00Hz, **10Hz**
28.28	Constant freqency 3	-500.00 … 500.00Hz, **15Hz**
28.72	Freq acceleration time 1	0.000 … 1800.000 s, **3s**
28.73	Freq deceleration time 1	0.000 … 1800.000 s, **3s**
Group 30 Limits		
30.11	Minimum speed	-30000.00 … 30000.00rpm, **-1500.00rpm**
30.12	Maximum speed	-30000.00 … 30000.00rpm, **1500.00rpm**
30.13	Minimum frequency	-500 … 500 Hz, **-50Hz**
30.14	Maximum frequency	-500 … 500 Hz, **50Hz**
30.17	Maximum current	depends on rating
Group 31 Fault functions		
31.11	Fault reset selection	**[0]not used,** [2]DI1, [3]DI2, [4]DI3, [5]DI4, [6]DI5
Group 40 Process PID set 1		
40.07	Process PID operation mode	**[0]OFF**, [1]ON, [2]ON when drive running
40.08	Set 1 feedback 1 source	**[8]AI1 percent**, [9]AI2 percent
40.16	Set 1 setpoint 1 source	[2]Internal setpoint, [11]AI1 percent, **[12]AI2 percent**
40.24	Set 1 internal setpoint 0	-200000.00 … 200000.00, 0
40.31	Set 1 deviation inversion	**[0]Not inverted (Ref - Fbk)**, [1]Inverted (Fbk - Ref)
40.32	Set 1 gain	0.01 … 100.00, **1**
40.33	Set 1 integration time	0.0 … 9999.0 s, **60s**
Group 45 Energy efficiency		
45.11	Energy optimizer	**[0]Disable**, [1]Enable
Group 58 Embedded fieldbus		
58.01	Protocol enable	**[0]None**, [1]ModbusRTU
58.03	Node address	0 … 255, **1**
58.04	Baud rate	[1]4800, [2]9600, **[3]19200**, [4]38400, [5]57600, [6]76800, [7]115200
58.05	Parity	**[0]8 NONE 1**, [1]8 NONE 2, [2]8 EVEN 1, [3]8 ODD 1
58.06	Communication control	**[0]Enabled**, [1]Refresh settings
58.14	Communication loss action	[0]No action, **[1]Fault**, [2]Last speed, [5]Warning

Ratings

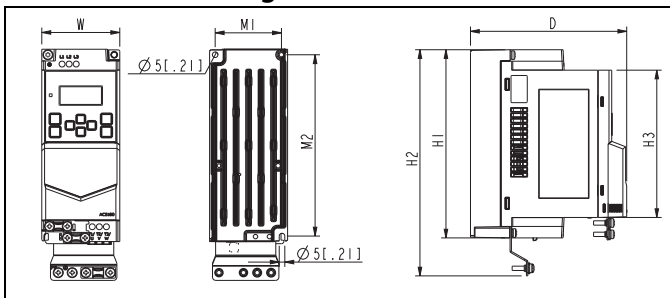
IEC ratings

Type ACS180-04x	Input current	Input with choke	Output ratings							Frame size
			Max. current	Nominal use		Light-duty use		Heavy-duty use		
	I_{1N}	I_{1N}	I_{max}	I_N	P_N	I_{Ld}	P_{Ld}	I_{Hd}	P_{Hd}	
	A	A	A	A	kW	A	kW	A	kW	
3-phase U_N = 400 V (range 380 … 480 V)										
-01A8-4	2.8	1.5	2.2	1.8	0.55	1.7	0.55	1.2	0.37	R0
-02A6-4	3.6	1.9	3.2	2.6	0.75	2.5	0.75	1.8	0.55	R0
-03A3-4	4.9	2.5	4.3	3.3	1.1	3.1	1.1	2.4	0.75	R0
-04A0-4	6.3	3.3	5.9	4.0	1.5	3.8	1.5	3.3	1.1	R1
-05A6-4	9.1	4.6	7.2	5.9	2.2	5.3	2.2	4	1.5	R1
-07A2-4	12.0	5.9	10.1	7.2	3	6.8	3	5.6	2.2	R1
-09A4-4	14	7.9	13	9.4	4	8.9	4	7.2	3	R1
1-phase U_N = 230 V (range 200 … 240 V)										
-02A4-1	5.0	3.3	3.2	2.4	0.37	2.3	0.37	1.8	0.25	R0
-03A7-1	6.9	4.8	4.3	3.7	0.55	3.5	0.55	2.4	0.37	R0
-04A8-1	9.0	6.2	6.7	4.8	0.75	4.6	0.75	3.7	0.55	R0
-06A9-1	12.6	9.2	8.1	6.9	1.1	6.6	1.1	4.5	0.75	R1
-07A8-1	17.3	12	11.9	7.8	1.5	7.4	1.5	6.6	1.1	R1
-09A8-1	21.8	17	13.3	9.8	2.2	9.3	2.2	7.4	1.5	R1

UL (NEC) ratings

Type ACS180-04x	Input current	Input with choke	Output ratings					Frame size
			Max. current	Light-duty use		Heavy-duty use		
	I_{1N}	I_{1N}	I_{max}	I_{Ld}	P_{Ld}	I_{Hd}	P_{Hd}	
	A	A	A	A	hp	A	hp	
3-phase U_N= 460 V (range 440 … 480 V)								
-01A8-4	1.9	1.3	2.2	1.6	0.75	1.1	0.5	R0
-02A6-4	2.4	1.6	3.2	2.1	1	1.6	0.75	R0
-03A3-4	3.5	2.1	4.3	3	1.5	2.1	1	R0
-04A0-4	4.6	2.8	5.9	3.5	2.0	3	1.5	R1
-05A6-4	6.9	3.8	7.2	4.7	3	3.4	2	R1
-07A2-4	9.2	5.0	10.1	6	3	4.8	3	R1
-09A4-4	10.3	6.7	13	7.6	5	6.3	3	R1
1-phase U_N = 220 V (range 200 … 240 V)								
-02A4-1	5.0	3.3	3.2	2.3	0.5	1.8	0.33	R0
-03A7-1	6.9	4.8	4.3	3.5	0.75	2.4	0.5	R0
-04A8-1	9.0	6.2	6.7	4.6	1	3.7	0.75	R0
-06A9-1	12.6	9.2	8.1	6.6	1.5	4.5	1	R1
-07A8-1	17.3	12	11.9	7.4	2	6.6	1.5	R1
-09A8-1	21.8	17	13.3	9.3	3	7.4	2	R1

Dimensions and weights



Symbols	H1	H2	H3	W	D	M1	M2
	Height back	Height with EMC plate	Height front	Width	Depth	Mounting hole distance 1	Mounting hole distance 2

Frame size	ACS180 IP20 / UL open type															
	H1		H2		H3		W		D		M1		M2		Weight	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	kg	lb
R0	174	6.85	209	8.23	136	5.35	70	2.76	143	5.63	60	2.36	164	6.46	1.27	2.80
R1	190	7.48	220	8.66	152	5.98	70	2.76	143	5.63	60	2.36	180	7.09	1.59	3.51

Fuses

For more information on fuses and circuit breakers, see the drive hardware manual.

Free space requirements

Frame size	Above		Below		Sides	
	mm	in	mm	in	mm	in
R0	75	3	75	3	50	2
R1	75	3	75	3	0	0

Note: Frame size R0 requires 50mm sides space under 50°C ambient temperature. If installed side-by-side, the ambient temperature should be within 40°C.

Warnings and faults

Warning	Fault	Description
A2R1	2310	Overcurrent. The output current is more than the internal limit. This can be caused by an earth fault or phase loss.
A2B3	2330	Earth leakage. A load unbalance that is typically caused by an earth fault in the motor or the motor cable.
A2B4	2340	Short circuit. There is a short circuit in the motor or the motor cable.
	3130	Input phase loss. The intermediate DC circuit voltage oscillates.
	3181	Cross connection. The input and motor cable connections are incorrect.
A3A1	3210	DC link overvoltage. There is an overvoltage in the intermediate DC circuit.
A3A2	3220	DC link undervoltage. There is an undervoltage in the intermediate DC circuit.
	3381	Output phase loss. All three phases are not connected to the motor.
A5A0	5091	Safe torque off. The Safe torque off (STO) function is on.
	6681	EFB communication loss. Break in embedded fieldbus communication.
AFF6		Identification run. The motor ID run occurs at the next start.

For the complete list of warnings and faults, refer to the drive firmware manual.

Ambient conditions

	Operation installed for stationary use	Storage in the protective package	Transportation in the protective package
Installation site altitude	0 … 1000 m above sea level without derating. 1000 … 2000 m above sea level with derating.	-	-
Surrounding Air temperature	For frame size R0: -10 … +50 °C (14 …122 °F) without derating. For frame size R1: -10 … +50 °C (14 … 122 °F) without derating. 50 … 60 °C (122 … 140 °F) with derating. No frost allowed.	-40 … +70 °C (-40 … 158 °F)	-40 … +70 °C (-40 … 158 °F)
Relative humidity	<95% (IEC 60068-2-78) without condensation		
Contamination levels (IEC 60721-3-3)	Class 3C2	Class 1C2	Class 2C2
	Class 3S2	Class 1S2	Class 2S2
Sinusoidal vibration (IEC 61800-5-1 to comply with EN 50178)	Class 3M4	-	-
Shock (EN 60068-2-31 to comply with EN 50178)	Not allowed	According to ISTA 1A. Max. 100 m/s^2 (330 ft/s^2), 11 ms.	According to ISTA 1A. Max. 100 m/s^2 (330 ft/s^2), 11 ms.
Free fall	Not allowed	76 cm (30 in)	76 cm (30 in)

Markings

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

CE TÜV Nord EIP green WEEE UL RCM

Declaration of conformity

ABB

EU Declaration of Conformity

We
Manufacturer: ABB Beijing Drive Systems Co., Ltd.
Address: No.1, Block D, A-10 Jiuxianqiao Beilu, Chaoyang District, Beijing 100015, P.R. China.
Phone: +86 010 58217788

Declare under our sole responsibility that the following products:

Frequency converters

ACS180-04x-xxAx-1 (Frame R0, 1ph 200-240Vac)
ACS180-04x-xxAx-4 (Frame R0, 3ph 380-480Vac)
ACS180-04x-xxAx-1 (Frame R1, 1ph 200-240Vac)
ACS180-04x-xxAx-4 (Frame R1, 3ph 380-480Vac)

are in conformity with the relevant requirements of European Union Directives, which have been notified in this single declaration that consists of individual Declarations of conformity, provided that the equipment is selected, installed and used according to given instructions.

The harmonised standards and other standards, which have been applied, are specified on the individual Declarations of conformity for particular EU directive.

EU Directives		
Low Voltage Directive	2014/35/EU	LVD
EMC Directive	2014/30/EU	EMC
Machinery Directive	2006/42/EC	MD
RoHS Directive	2011/65/EU	RoHS

Individual EU Declaration of Conformity:

Product	LVD	EMC	MD	RoHS
ACS180-04x-xxAx-4	3AXD10001117585		3AXD10001117586	3AXD10001117587

Beijing, 19 August 2020

Manufacturer representative:

Petri Sullstrom
Local Business Line Manager
ABB Beijing Drive Systems Co., Ltd.

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3AXD10001117584 Rev. A

Related documents

Document	Code (English)
ACS180 User interface guide	3AXD50000606696
ACS180 Hardware manual	3AXD50000467945
ACS180 Firmware manual	3AXD50000467860

Online list of the manuals applicable to this product:

3AXD50000510344 Rev B EN 2020-12-04