ABB DRIVES FOR HVAC

ACH531-01 Drive

Quick installation and start-up guide
Frames R6

Related Manuals

Ecodesign (EU 2019/1781) and SI 2021 No. 745)

About this document

3AXD50000816613
Rev A EN 2022-04-18

3AXD50000816613A

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 electrician, do not do electrical installation work.
- Do not work on the drive, motor cable or motor when main power is applied. If the drive is already connected to the input power, wait for 5 minutes after disconnecting the input power.
- Do not work on the control cables when power is applied to the drive or to the external control circuits.
- Use the lifting eyes of the drive when you lift the drive. Do not tilt the drive. The drive is heavy and its center of gravity is high. An overturning drive can cause physical injury.
- Make sure that debris from borings and grindings does not enter the drive when installing.
- Make sure that the floor below the drive and the wall where the drive is installed are non-flammable.

Check if capacitors need to be reformed

If the drive has been stored for a year or more, you must reform the capacitors.

You can determine the manufacturing time from the serial number, which you find on the type designation label attached to the drive. The serial number is of format MYYWWRXXXX. YY and WW tell the manufacturing year and week as follows:

YY: 13, 14, 15, … for 2013, 2014, 2015, …
WW: 01, 02, 03, … for week 1, week 2, week 3, …

For information on reforming the capacitors, see *Converter module capacitor reforming instructions* (3BFE64059629 [English]), available on the Internet.

Select the power cables

Size the power cables according to local regulations to carry the nominal current given on the type designation label of your drive.

Ensure the cooling

The allowed ambient temperature ranges from -15°C to 40°C (+5 to +104 °F). No condensation or frost is allowed. For limitation on the ambient temperature below 0°C and above +40°C(+104 °F), see chapter *Technical data* of *ACS530 HW manuals*.

Protect the drive and input power cable

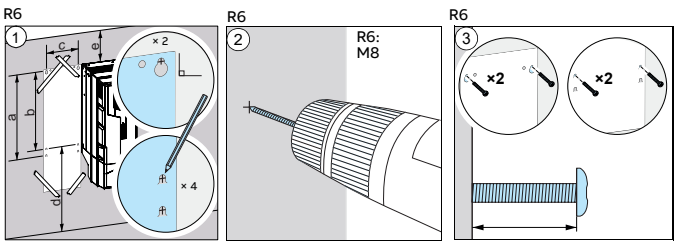
If you use gG fuse, please check the time-current curve to make sure that the operating time of the fuse is below 0.5 seconds. Follow the local regulations.

Install the drive

Warning! The drive module is heavy (45 to 98 kg), Use a suitable lifting device. Do not lift the module manually. Make sure that the wall and the fixing devices can carry the weight.

Installing the drive vertically, frames size R6

1. Mark the hole locations using the mounting template included in the package. Do not leave the mounting template under the drive. **Note:** Only two screws should be used to fix the lower part of the drive instead of four.
2. Drill the mounting holes.
3. Insert the screws or bolts into the holes.

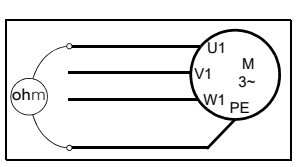


Frame Size (mm)	R6
a	571
b	531
c	213
d	300
e	155
Weight (kg)	45

Check the insulation of the power cables and the motor

Check the insulation of the input cable according to local regulations before connecting it to the drive.

Check the insulation of the motor cable and motor before connecting it to the drive. Measure the insulation resistance between each phase conductor and the Protective Earth conductor using a measuring voltage of 1000 V DC. The insulation resistance of an ABB motor must exceed 100 Mohm (reference value at 25 °C or 77 °F). For the insulation resistance of other motors, see the manufacturer's instructions. **Note:** Moisture inside the motor casing will reduce the insulation resistance. If moisture is suspected, dry the motor and repeat the measurement.



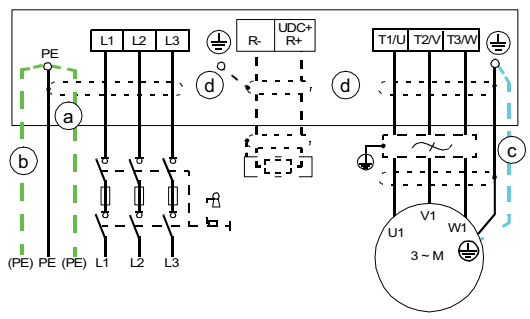
Check the compatibility with IT (ungrounded) system

WARNING! Do not install the drive with the internal EMC filter and VAR varistor connected on an IT system (an ungrounded power system or a high-resistance-grounded [over 30 ohms] power system).

If you connect the drive to an IT (ungrounded), disconnect the EMC filter and varistor before connecting the drive to the supply network. For more information, see chapter *Electrical installation* of *ACH531-01 (0.75 to 75 kW, 1 to 100 hp) hardware manual* (3AXD50000815319 [EN]).

Connecting the power cable

Connection diagram



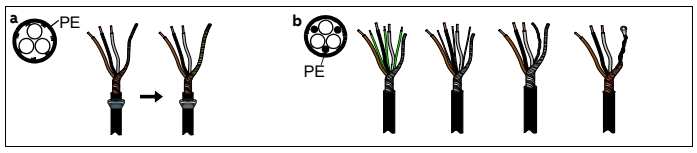
a	Two protective earth (ground) conductors. Drive safety standard IEC/EN/ 61800-5-1 requires two PE conductors, if the cross-sectional area of the PE conductor is less than 10 mm^2 Cu or 16 mm^2 Al.
b	Use a separate grounding cable or a cable with a separate PE conductor for the line side, if the conductivity of the fourth conductor or shield does not meet the requirements for the PE conductor.
c	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.
d	360-degree 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.

Note:
If there is a symmetrically constructed grounding conductor on the motor cable in addition to the conductive shield, connect the grounding conductor to the grounding terminal at the drive and motor ends.
Do not use an asymmetrically constructed motor cable for motors above 30 kW. Earthing at the motor increases bearing current and power consumption, damages the motor bearing and even the motor.

Motor cables

Prepare the ends of the cable as illustrated in the figure. Two different motor cable types are shown in the figures (a.b).

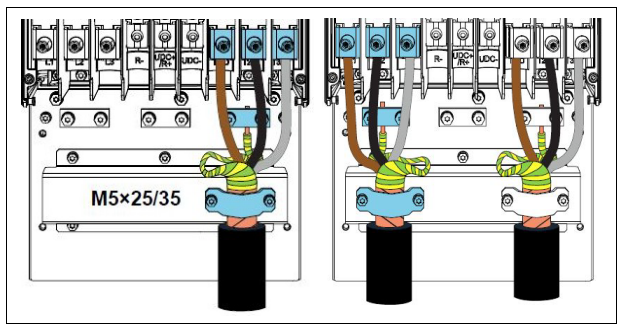
Note: The bare shield will be grounded 360 degrees.

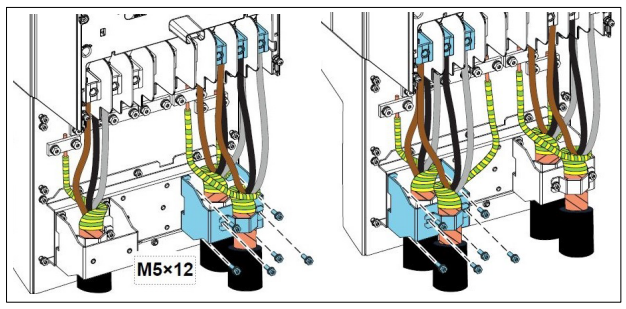


Connection procedure

（When selecting the ABB terminal box）

1. Attach the residual voltage warning sticker in the local language next to the control board.
2. Remove the shroud on the power cable terminals by releasing the clips with a screwdriver.
3. Connect the input power cables and motor cables as illustrated in the figure. **Note:** The bare shield will be grounded 360 degrees. Mark the pigtail made from the shield as a PE conductor with yellow-and-green color.
4. Slide the cables through the holes of the bottom plate , the motor cable to the right and the input power cable to the left.
5. Connect the motor cable:
   - Ground the shield 360 degrees under the grounding clamps.
   - Connect the twisted shield of the cable to the grounding terminal.
   - Connect the phase conductors of the cable to the T1/U, T2/V and T3/W terminals.
6. Connect the input power cables with the L1, L2 and L3 terminals according to step 5.
7. Install the control cables with grounding frame.
8. Reinstall the cover plate of the power cable terminals.
9. Secure the cables outside the unit mechanically.
10. Ground the motor cable shield at the motor end. For minimum radio frequency interference, ground the motor cable shield 360 degrees at the lead-through of the motor terminal box.



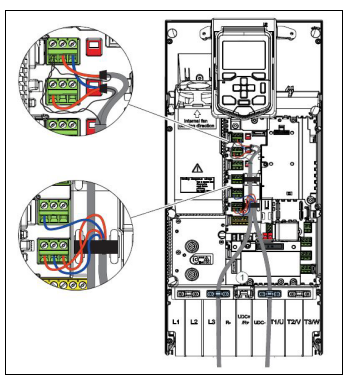


Connect the control cables

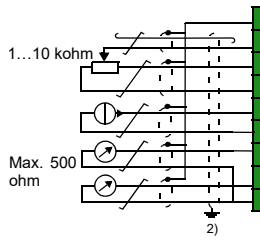
See the right figure. It is the example of one analog signal and one digital signal cable. Do the connections according to the connection macro in use.

Example of analog signal cable connection:

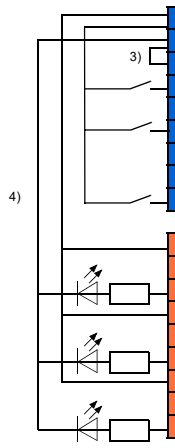
1. Slide the cables through the holes of the bottom plate
2. Ground the outer shield of the cable 360 degrees under the grounding clamp. Keep the cable unstripped as close to the terminals of the control board as possible. For analog signal cables, ground also the pair-cable shields and grounding wire at the SCR1 terminal. Secure the cables mechanically at the clamps below the control unit.
3. Route the cable as shown in the figure.
4. Connect the conductors to the appropriate terminals of the control board and tighten to 0.5…0.6 N·m (0.3....0.4lbf·ft).
5. Tie all control cables to the provided cable tie mounts.



Default I/O connections（Hand/Auto macro）



XI		Voltage and analog input and output reference
1	SCR	Signal cable shield (screen)
2	AI1	**Hand frequency reference**: 0…10 V[1]
3	AGND	Analog input circuit, common ground
4	+10V	10 V DC reference power
5	AI2	**Auto frequency reference** 4-20 mA
6	AGND	Analog input circuit, common ground
7	AO1	**Output frequency:** 0…20 mA
8	AO2	**Motor current:** 0…20 mA
9	AGND	Analog output circuit, common



X2 and		Aux. voltage output and programmable digital
10	+24V	Auxiliary voltage output +24 V DC, Max
11	DGND	Auxiliary voltage output common
12	DCOM	Digital input common use
13	DI1	**Manual Stop (1) / Start (0)**
14	DI2	Fault reset
15	DI3	**Manual control (0)/Auto control (1)**
16	DI4	Not configured
17	DI5	Not configured
18	DI6	**Auto start (1)/Stop (0)**
X6 X7		Relay outputs
19	RO1C	**Ready run** 250 V AC / 30 V DC 2 A
20	RO1A	
21	RO1B	
22	RO2C	**Running** 250 V AC / 30 V DC 2 A
23	RO2A	
24	RO2B	
25	RO3C	**Fault (-1)** 250 V AC / 30 V DC 2 A
26	RO3A	
27	RO3B	
X5		Embedded fieldbus
29	B+	Embedded Modbus RTU (EIA-485)
30	A-	
31	DGND	
S100	TERM	Termination resistor switch
S200	BIAS	Bias resistor switch
X4		Safe torque off
34	OUT1	Safe torque off. Factory connection. Both circuits must be closed for the drive to start. See chapter *Safe torque off* in hardware manual.
35	OUT2	
36	SGND	
37	IN1	
38	IN2	

Terminal size:

- R1…R6: 0.14…1.5 mm^2(all terminals)
- Tightening torque：0.5…0.6 N·m (0.4 lbf·ft)

Notes:

1) The signal source is powered externally. See the manufacturer's instructions. To use sensors supplied by the drive auxiliary voltage output, see chapter *Electrical installation*", *section Connection examples of two-wire and three-wire sensors* in the *Hardware manual* of the drive.
2) Ground the outer shield of the cable 360 degrees under the grounding clamp on the grounding frame for the control cables.
3) Connected with jumpers at the factory.
4) **Note:** Use shielded twisted-pair cables for digital signals.

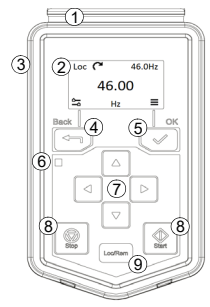
Input signal	Output signal
• Control location (Hand or Auto) selection (DI3) • Frequency reference, Hand (AI1) • Start/stop selection, Hand (DI1) • Fault reset（DI2） • Frequency reference, Auto(AI2) • Start/stop selection, Auto (DI6)	• Analog output AO1: Output frequency • Analog output AO2: Motor current • Relay output 1: Ready run • Relay output 2: Running • Relay output 3: Fault (-1)

Install optional modules, if any

See chapterACH531-01 (0.75 to 75 kW, 1 to 100 hp) hardware manual (3AXD50000815319 [EN]).

Start up and use

To start up the drive, you need to set the motor data, motor control, connection macro and drive parameters. See ACH531 HVAC control program firmware manual (3AXD50000810710[EN]) for start-up details.

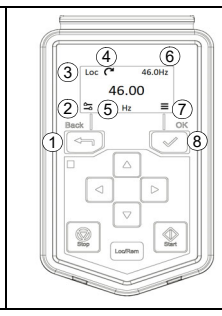


1. Clip - press down to remove the panel.
2. Display - shows the selected settings and menus.
3. RJ-45 connector slot on the back of the panel.
4. Back button - return to previous menu.
5. OK button - select settings and open submenus.
6. Status leds - green and red colors indicate the state and potential problems.
7. Arrow buttons - move in the menus.
8. Start and Stop buttons - start and stop the operation.
9. Loc/Rem button - switch to local or remote control mode.

Display

Options menu

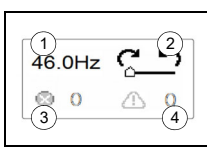
1. The return button: opens the Options menu.
2. Options menu.
3. Control mode.
4. Rotation direction: forward or reverse.
5. Frequency: Active
6. Frequency: Reference



Main menu

7. Main menu
8. Press OK button: opens the Main menu.

The Options menu

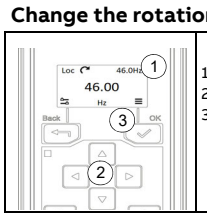


1. Frequency setting
2. Rotation direction - forward or reverse
3. Active faults
4. Active warnings

Start and stop the drive

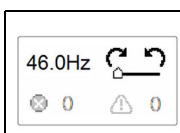
To start the drive, press the **Start** button on the basic control panel. To stop the drive, press the **Stop** button on the basic control panel.

Change the rotation direction

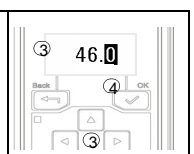


1. In the *Options* menu ,
2. Move to the rotation direction item with the arrow buttons.
3. Press the OK button to change the rotation direction.

Set the frequency reference



1. In the *Options* menu , move to the frequency reference item with the arrow buttons.
2. Press the OK button to open the item.
3. Press the arrow buttons to set the frequency.
4. Press the OK button to confirm the change.



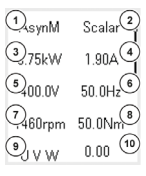
Main menu

1. Motor data - motor parameters
2. Motor control - motor curve settings
3. Control macros - I/O and fieldbus presettings
4. Diagnostics - faults, warnings, fault log and connection status
5. Energy efficiency - energy savings
6. Backup and reset
7. Parameters

Submenus

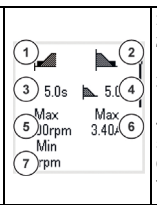
The Main menu items have a submenu where you can change settings and set actions. Some submenus also have menus and/or option lists. The content of the submenus depend on the drive type.

Motor data



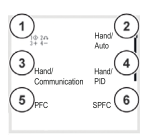
1. Nominal power
2. Nominal current
3. Nominal voltage
4. Nominal frequency
5. Nominal speed
6. Nominal torque
7. Phase order - U V W、U W V
8. Power factor

Motor control



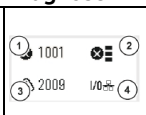
1. Start mode - Auto, Scan
2. Stop mode - Coast, DC hold, Ramp
3. Acceleration time - Automatic, Flying start
4. Deceleration time
5. Maximum allowed speed
6. Maximum allowed current
7. Minimum allowed speed

Connection macro



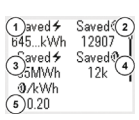
1. Motor potentiometer
2. Hand/Auto
3. Hand / communacation
4. Hand / PID
5. PFC
6. SPFC

Diagnose



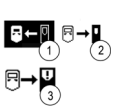
1. Present Fault - the fault code is displayed
2. Fault History - list of latest fault codes (newest first)
3. Present Warnings - the warning code is shown
4. I/O status - I/O settings

Energy Efficiency



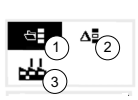
1. Saved energy in kWh
2. Saved money
3. Saved energy in MWh
4. Saved money x 1000
5. Cost per kWh

Backup



1. Backup from the drive to the control panel.
2. Fully restore the back up from the panel to the drive.
3. Partly restore the back up from the panel to the drive.
   A progress view is shown during the backup.

Parameter



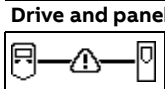
1. Complete parameter list - Groups menu with complete parameters and parameter levels
2. Modified parameters list - non-default value
3. Restore the factory settings.

Fault and Warning

The display shows warnings and faults messages if a problem has been detected. A fault message needs your immediate attention.
1. Identify and eliminate the cause.
2. For detailed information, refer to the Firmware manual.
3. Press *Reset*.

To view the warning messages:
1. Open the *Main* menu.
2. Select *Diagnostics*.
3. Scroll down the list if there are multiple warnings.

Drive and panel communication failure



There is a general communication failure, e.g., the drive does not respond to the panel commands.

The drive and panel are not compatible, e.g., the drive does not support the basic panel.

Status light

Continuous green		The drive is running normally.
Green, blinking		There is an active warning in the drive.
Red, continuous		There is an active fault in the drive.

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. No.	Settings/Range (default value on bold)
Group 99 Motor data		
99.04	Motor control mode	0…1
99.06	Motor nominal current	0.0…6400.0
99.07	Motor nominal voltage	0.0...960.0
99.08	Motor nominal frequency	0.0 … 500.0
99.09	Motor nominal speed	0 … 30000
99.10	Motor nominal power	0.00… 10000.00 kW or 0.00… 13404.83 hp
99.11	Motor nominal cos φ	0.00 … 1.00
99.12	Motor nominal torque	0.000…4000000.000 N·m or 0.000…2950248.597 lb·ft
99.15	Motor polepairs calculated	0…1000
99.16	Motor phase order	0…1
Group 01 Actual values (read-only)		
01.01	Motor speed used	-30000.00…30000.00
01.06	Output frequency	-500.00…500.00
01.07	Motor current	0.00…30000.00
01.10	Motor torque	-1600.0…1600.0
01.11	DC voltage	0.00…2000.00
01.13	Output voltage	0…2000
01.14	Output power	-32768.00…32767.00
Group 5 Diagnostics (read-only)		
05.02	Run-time counter	0 … 65535 d
05.11	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
10.27	RO2 source	[2] Ready run, **[7] Running**, [14] Fault, [15] Fault(-1)
10.30	RO3 source	[2] Ready run, [7] Running, [14] Fault, **[15] Fault(-1)**
Group 12 Standard AI		
12.15	AI1 unit selection	**[2]V**， [10]mA
12.16	AI1 filter time	0.000…30.000, S
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 minimum scaled value	-32768.000 … 32767.000， **0**
12.20	AI1 maximum scaled value	-32768.000 … 32767.000， **50**
12.25	AI2 AI2 unit selection	**[2]V**， [10]mA
12.26	AI2 filter time	0.000…30.000, S
12.27	AI2 min	-22.000 … 22.000 mA or V， **20mA** or **10V**
12.28	AI2 max	-32768.000 … 32767.000， **0**
12.29	AI2 minimum scaled value	-32768.000 … 32767.000， **50**
12.30	AI2 maximum scaled value	-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**
13.16	AO1 Filtering time	0.000…30.000
13.17	AO1 source min	-32768.000 … 32767.000， **50**
13.18	AO1 source max	-22.000 … 22.000 mA or V， **0mA** or **0V**
13.19	AO1 out at AO1 src min	-22.000 … 22.000 mA or V， **20mA** or **10V**
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
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, **[7]DI6**
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		
21.02	Magnetization time	0 … 10000 ms, **500ms**
21.03	Stop mode	**[0]Coast**, [1]Ramp
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 sel 1	**[0]Always off**, [2]DI1, [3]DI2, [4]DI3, [5]DI4, [6]DI5
28.23	Constant frequency sel 2	**[0]Always off**, [2]DI1, [3]DI2, [4]DI3, [5]DI4, [6]DI5
28.26	Constant freqency1	-500.00 … 500.00Hz， **5Hz**
28.27	Constant freqency2	-500.00 … 500.00Hz， **10Hz**
28.28	Constant freqency3	-500.00 … 500.00Hz， **15Hz**
28.72	Freq acceleration time 1	0.000 … 1800.000 s， **30s**
28.73	Freq deceleration time 1	0.000 … 1800.000 s， **30s**
Group 30 Limits		
30.13	Minimum frequency	-500.00…500.00
30.14	Maximum frequency	-500.00…500.00
30.17	Maximum current	0.00…30000.00
30.19	Minimum torque 1	-1600.0…0.0
30.20	Maximum torque 1	0.0…1600.0
Group 31 Fault functions		
31.11	Fault reset selection	[0]Disable, [2] DI1, **[3]DI2**, [4]DI3, [5]DI4, [6]DI5
31.12	Auto reset selection	0000h…FFFFh
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	**[2]AI2 scaled,** [8]AI1 percent， [9]AI2 percent
40.16	Set 1 setpoint 1 source	**[0]Not selected,** [2]Internal setpoint, [11]AI1 percent, [12]AI2 percent
40.24	Set 1 internal setpoint 0	-200000.00 … 200000.00， 0
40.31	Deviation inversion	**[0] Not inverted （Ref-Fbk）**， [1] Inverted （Fbk-Ref）
40.32	Gain	0.01 … 100.00， **2**
40.33	Integration time	0.0 … 9999.0 s， **15s**
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]8NONE 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
Group 76 PFC configuration		
76.01	PFC status	0000h…FFFFh
76.02	PFC system status	0…3, 100…103, 200…202, 300…302, 400, 500, 600, 700, 800…801, 4…9
76.11	Pump status 1	0000h…FFFFh
76.12	Pump status 2	0000h…FFFFh
76.21	PFC configuration	
76.30	Start point 1	0.00…32767.00
76.41	Stop point 1	0.00…32767.00
Group 77 PFC maintenance and monitoring		
77.10	PFC runtime change	-
77.11	Pump 1 running time	0.00…42949672.95
77.12	Pump 2 running time	0.00…42949672.95
77.13	Pump 3 running time	0.00…42949672.95
77.14	Pump 4 running time	0.00…42949672.95
Group 96 System		
96.01	Language	[0]Not selected，[1033]EN，[2052]CN
96.04	Marco selection	[0]Finalization，[13]Motor potentiometer macro [27] Manual/ Auto Macro，[28] Manual/ communacation macro [29] Manual/PID macro，[30] PFC ，[31] SPFC
96.06	Parameter restore	[0]Finalization [34560]Restore defaults

Warnings and faults

Warning	Fault	Aux. code	Description
A2A1	**2281**	Current calibration	**Warning:** Current offset and gain measurement calibration will occurs at next start. **Fault:** Output phase current measurement fault.
A2B1	**2310**	Overcurrent	Output current has exceeded internal fault limit. In addition to an actual overcurrent situation, this warning may also be caused by an earth fault or supply phase loss.
A2B3	**2330**	Earth leakage	Drive has detected load unbalance typically due to earth fault in motor or motor cable.
A2B4	**2340**	Short circuit	Short-circuit in motor cable(s) or motor.
-	**3130**	Input phase loss	Intermediate circuit DC voltage is oscillating due to missing input power line phase or blown fuse.
-	**3181**	Wiring or earth fault	Incorrect input power and motor cable connection (ie. input power cable is connected to drive motor connection).
A3A1	**3210**	DC link overvoltage	Intermediate circuit DC voltage too high (when the drive is stopped).
A3A2	**3220**	DC link undervoltage	Intermediate circuit DC voltage too low (when the drive is stopped).
-	**3381**	Output phase loss	Motor circuit fault due to missing motor connection (all three phases are not connected).
-	**5090**	STO hardware failure	STO hardware diagnostics has detected hardware failure.
A5A0	**5091**	Safe torque off	Safe torque off function is active.
A7CE	**6681**	EFB comm loss	Communication break in embedded fieldbus (EFB) communication.
A7C1	**7510**	FBA A communication	Cyclical communication between drive and fieldbus adapter module A or between PLC and fieldbus adapter module A is lost.
A7AB	**-**	Extension I/O configuration failure	Installed C-type module is not the same as configured or the communication between the drive and module has been disturbed.
AFF6	**-**	Identification run	Motor ID run will occur at next start.
-	**FA81**	Safe torque off 1	Safe torque off function is active, ie. STO circuit 1 is broken.
-	**FA82**	Safe torque off 2	Safe torque off function is active, ie. STO circuit 2 is broken.

Ratings, fuses and power cable dimensions

ACH531-01	Ratings			Fuses		Typical power cable sizes，Cu		Frame size
	input current (A)	output current (A)	Motor power (kW)	gG Fuses (IEC 60269)	uR/aR Fuses (DIN 43620)			
	I_1	I_N	P_N	ABB type	Bussman	mm2	AWG	
145A-4	145	145	75	OFAF00H160	170M3817	3×95 + 50	3/0	R6

Terminal data for the power cables

Frame size	T1/U, T2/V, T3/W, L1, L2, L3, R-, R+/UDC+						PE			
	Min. wire size (solid/stranded)		Max. wire size (solid/stranded)		Tightening torque		Max. wire size (solid/stranded)		Tightening torque	
	mm^2	AWG	mm^2	AWG	N·m	lbf·ft	mm^2	AWG	N·m	lbf·ft
R6	25	4	150	300 MCM	30	22.1	180	350 MCM	9.8	7.2

Markings

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

CE　TÜV Nord　EIP green　WEEE

Declaration of conformity

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

ACQ531-01-xxAx-4 (Frame R1-R9, 3ph 400-480Vac)

ACQ531-01-xxAx-4 (Frame B0-B2, 3ph 400-480Vac)

ACH531-01-xxAx-4 (Frame R1-R9, 3ph 400-480Vac)

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
Delegated Directive (EU)	2015/863	
Ecodesign Directive	2009/125/EC	Ecodesign

Individual EU Declaration of Conformity:

Product	LVD	EMC	MD	RoHS	Ecodesign
ACQ531-01-xxAx-4(R1-R9)	3AXD10000706371		3AXD10000706373	3AXD10000706372	3AXD10001394400
ACQ531-01-xxAx-4(B0-B2)					
ACH531-01-xxAx-4(R1-R9)					

Beijing, 28 May 2021

Signed for and on behalf of:

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

XuMing Wang
Product Engineering and Quality Manager
ABB Beijing Drive Systems Co., Ltd

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3AXD10000706374 Rev. C

3AXD50000816613 Rev A EN 2022-04-18