To install the drive with screws

1. Make marks onto the surface for the mounting holes. Refer to Dimensions and weights. Use the included mounting template for frames R3 and R4.
2. Drill the holes for the mounting screws. If necessary, install suitable plugs or anchors into the holes.
3. Install the mounting screws into the holes. Leave a gap between the screw head and mounting surface.
4. Drive the mounting screws onto the drive.
5. Tighten the mounting screws.

To install to a DIN rail

1. Move the locking part to the left. If necessary, use a flat head screwdriver.
2. Push and hold the locking button down.
3. Put the top tabs of the drive onto the top edge of the DIN rail.
4. Move the locking part to the right.
5. Make sure that the drive is correctly locked onto the DIN rail.

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

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 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. Always wait for 5 minutes after disconnecting the input power to let the intermediate circuit capacitance discharge.
- Do not 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.

1. Unpack the delivery

Keep the original packing material in case the drive is ready to install it. After unpacking, protect the drive from dust, debris and moisture. Make sure that these items are included:
- drive
- options, if ordered with an option code
- installation accessories (cable clamps, cable ties, hardware, etc.) mounting template (frames R3 and R4 only)
- safety instructions
- multilingual warning sticker sheet (residual voltage warning)
- user interface guide (under the drive front cover)
- quick installation and start-up guide
- hardware and firmware manuals, if ordered with an option code.

Make sure that there are no signs of damage to the items.

2. Reform the capacitors

If the drive has not been powered up for a year or more, you must reform the DC link capacitors. The reforming data is on the type designation label. Refer to Capacitor reforming instructions (3BFE64059629 [English]).

3. Select the cables and fuses

Select the power cables. Obey the local regulations.
- Input power cable: ABB recommends to use symmetrical shielded cable (VFD cable) for best EMC performance.
- Motor cable: Use symmetrical shielded cable (VFD cable) for the best EMC performance. Symmetrical shielded cable also reduces bearing currents, wear, and stress on motor insulation.
- Power cable types: In DC installations, use copper or aluminum cables (if permitted). In UL installations, use only copper cables.
- Power cable rating: max. 600 V AC
- Voltage rating: min. 600 V AC
- cable installation instructions, select a cable rated for at least 70 °C (158 °F).
- Size refer to: Flows and typical power cable sizes for the typical cable sizes and to Terminal data for the power cables for the maximum cable sizes.

Select the control cables. Use double-shielded twisted-pair cable for analog signals. Use double-shielded or single-shielded cable for the digital, relay and I/O signals. Do not run 24 V and 115/230 V signals in the same cable. Protect the drive and input power cable with the correct fuses. Refer to Flows and typical power cable sizes.

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. It has all necessary protection to protect the drive from dust, debris and moisture.
- There is sufficient free space around the drive for cooling, maintenance, and operation. For the minimum free space requirements, refer to Free space around the drive.
- The ambient conditions meet the requirements. Refer to Ambient conditions.
- The installation surface is as close to vertical as possible and strong enough to carry the drive. 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-phase conductors or transformer coils near the drive. A strong magnetic field can cause interference or inaccuracy in the operation of the drive.

5. Install the drive

You can install the drive with screws, or to a DINrail/top hat type, width + height ≤ 35mm × 15mm (L1×W1) ≤ 0.5 m. 
- Install R0 drives vertically. R0 drives do not have a cooling fan.
- You can install drives side by side by using the DINrail. For 90 degrees, from vertical to fully horizontal orientation.
- You can install a number of drives on the same DINrail.

6. Measure the insulation resistance

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

- Make sure that the motor cable is connected to the motor and disconnected from the drive output terminals T1/T2/T3 and T1/T2/T3W.
- Use of 1000 V DC to measure the insulation resistance between the motor conductor and the protective earth. The insulation resistance of each phase conductor must be more than 100 Mohm (Ω) for 50/60 Hz, except for the insulated internal EMC filter) or metal VAR screw (disconnect the varistor circuit).

7. Make sure that the drive is compatible with the grounding system

You can connect all drives to a basically grounded TN-S system (center-grounded neutral). The drive is delivered with the EMC and VAR screws installed. If the manufacturer’s documentation describes a grounding system (shielded cable internal EMC filter) or metal VAR screw (disconnect the varistor circuit).

8. Connect the power cables

Connect the shield to the reference terminal. Observe the local regulations.
- If the insulation resistance is 0.5 … 0.6 MΩ (4.4 … 5.3 lbf·in).
- 1. Put the drive onto the mounting cover.
- 2. Put the drive onto the DIN rail.
- 3. Install the mounting screws into the DIN rail.
- 4. Move the locking part to the right.
- 5. Make sure that the drive is correctly locked onto a DIN rail.

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

Connection procedure (shielded cables)

For the tightening torques, refer to Terminal data for the power cables.

1. Remove the screw on the drive front cover, then remove the front cover.
2. Attach the residual voltage warning sticker in the local language and connect it to the ground terminal.
3. Strip the motor cable.
4. Ground the motor cable shield under the grounding clamp. Then twist the shield into a bundle, mark it and connect it to the grounding terminal.
5. Connect the phase conductors of the motor cable to terminals T1 to T2/T3 and T1/T2/T3W.
6. If you need to use a brake, connect the brake resistor cable to terminals R+ and UDC+.
7. Use a separate grounding cable or a cable with a separate PE conductor for the braking system.
8. Make sure that the R+ and UDC+ terminal screws are tightened. If they are not, also do the tightening procedure.
9. Strip the input power cable.
10. If the input power cable has a shield, connect the shield to the ground terminal.
11. Connect the power cable to the grounding terminal. If necessary, use a second PE conductor.

In 3-phase drives, connect the phase conductors of the input power cable to terminals L1/L2 and L3. 1-phase drives, connect the phase and neutral conductors to terminals L1 and L2.

9. Connect the control cables

Do the connections according to the default control connections of the application macro. Keep the signal lines twisted as near to the drive as possible, especially when crossing a magnetic field. The tightening torque for the terminal connections is 0.5 … 0.6 MΩ (4.4 … 5.3 lbf·in).

1. Put the drive onto the mounting cover of the control cable for grounding.
2. A cable tie to ground the outer shield to the grounding terminal.
3. Use metal cable ties for 360-degree grounding.
4. Strip the control cable conductors.
5. Connect the conductors to the correct control terminals.
6. Connect the shields of the twisted pairs and groupings to the terminal grounding clamp.
7. Mechanically attach the control cables on the outside of the drive.

Default I/O connections (ABB standard macro)

The I/O connection diagram on the product page is for the ABB standard macro. The connection diagram for the ABB standard macro is shown below. If you have a drive variant that does not have the BMS-G (1) module, connect only the terminals that are on the basic unit.

Embedded fieldbus connection

You can connect the drive to an E4-A46 serial communication link through the embedded fieldbus interface on the BMS-G1 (1) module. The embedded fieldbus connection is shown below.

To configure Modbus RTU communication with the embedded fieldbus:
1. Connect the fieldbus cables and the necessary I/O signals.
2. Use the jumpers to set the option and bias settings.
3. Power up the drive and set the necessary parameters.

A connection example is shown below.
10. Start up the drive

WARNING! Before you start up the drive, make sure that the installation is completed. Make sure also that it is safe to start the motor.

Disconnect the drive from other machinery, if there is a risk of damage or injury.

For information on the user interface, refer to the ACS380 User interface guide (3AWD00001509 (EN-PL)), which is included with the drive.

1. Power up the drive. The drive software automatically identifies the connected adapter (BMI0-02 module or some of the fieldbus modules) and sets the applicable parameters.

2. Select the units (International or US). In the Motor data view, select the parameters for your drive type.

3. Set the motor control mode.

4. Set the nominal motor voltage.

5. Start the motor and check the direction of rotation. If the direction is incorrect, you can:
   • change the Phase order setting,
   • change the phase order of the motor table

Notes: In vector control mode the drive does an automatic standstill 00 run at the first start.

6. In the Motor controls 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 macro view, select the applicable macros. To configure fieldbus communications, refer to the ACS380 user interface guide.

10. Tune the drive parameters to the application. You can also use an assistant for permanent synchronous motors.

The number of motors can change.

For information on the drive, refer to the ACS380 Hardware Manual (3AXD10001323213).

Fieldbus communication

Fieldbus communication with the BMI0-01/L0 module

1. Select Module RTU from the Control macro view. The drive changes some parameter values automatically.

2. Configure Fieldbus communication from the parameter list.

The following set of parameters for Module RTU configuration:

- BMI0191 Set fieldbus type
- BMI0192 Select bus address
- BMI0193 Set fieldbus max. data rate
- BMI0194 Select baud rate
- BMI0195 Set fieldbus comm. type
- BMI0209 Select function
- BMI0303 Set slave address
- BMI0304 Set slave command
- BMI0305 Set master command
- BMI0306 Set diagnostic test
- BMI0307 Set diagnostic test duration
- BMI0308 Set diagnostic test current

Fieldbus communication with a fieldbus adapter module

The drive automatically identifies the connected adapter and selects the correct Fieldbus control macros if necessary. Configure the adapter-specific settings. Refer to the applicable fieldbus adapter documentation.

Warnings and faults

Table A001: Warning information

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A001</td>
<td>Driving current limitation is active at the next start.</td>
</tr>
<tr>
<td>A007</td>
<td>Overload. The actual motor current is higher than the driven rating.</td>
</tr>
<tr>
<td>A027</td>
<td>DC link overvoltage. The nominal drive voltage is too high.</td>
</tr>
<tr>
<td>A039</td>
<td>Short circuit in a short circuit in the motor or the motor cable.</td>
</tr>
<tr>
<td>A044</td>
<td>Set motor configuration - use for motor or cable connections</td>
</tr>
<tr>
<td>A064</td>
<td>Drive will not operate - check input and motor control connection</td>
</tr>
<tr>
<td>A076</td>
<td>Overvoltage, overcurrent.</td>
</tr>
</tbody>
</table>

Table A005: Fault information

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0012</td>
<td>Overload at the drive start.</td>
</tr>
<tr>
<td>0400</td>
<td>Overload at the drive start.</td>
</tr>
<tr>
<td>0401</td>
<td>Overload at the drive start.</td>
</tr>
</tbody>
</table>

Table A006: Error information

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001</td>
<td>Overload at the drive start.</td>
</tr>
<tr>
<td>0002</td>
<td>Overload at the drive start.</td>
</tr>
</tbody>
</table>

Fuses and typical power cable sizes

<table>
<thead>
<tr>
<th>AC/DC voltage</th>
<th>Fuses</th>
<th>Cable conductor sizes (Cu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-phase UN = 480 V</td>
<td>3 A</td>
<td>3×1.5 + 1.5</td>
</tr>
<tr>
<td>3-phase UN = 230 V</td>
<td>3 A</td>
<td>3×1.5 + 1.5</td>
</tr>
</tbody>
</table>

Terminal data for the power cables

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>Current</th>
<th>Voltage drop</th>
<th>Overvoltage</th>
<th>Short circuit current</th>
<th>Overcurrent</th>
</tr>
</thead>
<tbody>
<tr>
<td>480 V</td>
<td>100 A</td>
<td>7 V</td>
<td>120 V</td>
<td>3000 A</td>
<td>500 A</td>
</tr>
<tr>
<td>230 V</td>
<td>50 A</td>
<td>4 V</td>
<td>80 V</td>
<td>1000 A</td>
<td>150 A</td>
</tr>
</tbody>
</table>

Free space requirements

<table>
<thead>
<tr>
<th>Frame size</th>
<th>Above</th>
<th>Below</th>
<th>Right</th>
<th>Below</th>
</tr>
</thead>
<tbody>
<tr>
<td>700</td>
<td>150</td>
<td>100</td>
<td>200</td>
<td>150</td>
</tr>
</tbody>
</table>

Related documents

- ACS380 Hardware Manual
- ACS380 user interface guide
- Ecodeign information (EU 2019/1781)