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 head and installation surface.
4. Mount the drive onto the mounting screws. Tighten the mounting screws.

5. To install the drive 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. Push the drive against the bottom edge of the DIN rail.
5. Release the locking button.
6. Hold the locking part to the right.
7. Make sure that the drive is correctly mounted.
8. To remove the drive, open the locking part and lift the drive from the DIN rail.

6. 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 resistance of the power cable according to 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/T2/T3 and N.

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 megohms (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. Carefully check that there is moisture in the motor, dry the motor and do the measurement again.

7. Make sure that the drive is compatible with the grounding system
You can connect all drives to a symmetrically grounded TN-S system (centered ground). The drive is delivered with the EMC and IEC screens. The table shows where to install the EMC filter (connect the twist shield to the common terminal of the connection). Connect the shields only to the grounding terminal in the automation controller.

8. Connect the power cables
**Connection diagram (shielded cables):**

9. Install the communication module
To install the communication module (I/O module or fieldbus module):
1. Pull out the locking tab of the communication module.
2. Align the communication module contacts with the contacts on the drive. Carefully push the module into position.
3. Push in the locking tab of the communication module.
4. Tighten the locking screw to fully attach and electrically ground the communication module.

10. Connect the control cables
Keep the signal wire pairs tested as near to the terminals as possible to prevent inductive coupling. The tightening torque for the terminal connections is 0.36 … 0.68 Nm (3 … 6 in-lb).
1. Strip a part of the outer shield of the control cables for grounding.
2. Use a cable tie to ground the outer shield to the grounding tab.
3. Strip the control cable conductors.
4. Connect the control cable conductors to the correct control terminals.
5. Connect the shields of the twisted pairs and grounding conductors.
6. Mechanically attach the control cables on the outside of the drive.

Default I/O connections (HVA default)

Embedded fieldbus connection

You can connect the drive to an A-BAS protocol communication link through the embedded fieldbus Interface on the RIO-01 module. The embedded fieldbus Interface supports the DeviceNet MVP, Modbus RTU, and OPC protocols.
To configure RIO-01 communication with the embedded fieldbus:
1. Connect the fieldbus cables and the necessary I/O signals.
2. Use the termination switch to set the correct termination.
3. Power up the drive and set the necessary parameters.
4. A connection example is shown below.
5. **Termination D0:** On bus side, empty = on RIIO-01 I/O extension module
11. Install the control panel
To install the control panel:
1. Close the front cover and tighten the screws.
2. Put the bottom edge of the control panel into position.
3. Push the top of the control panel until it locks into position.

12. Start the drive up

WARNING! Before you start up the drive, make sure that the Installation is completed safely and that it is safe to start the motor. Disconnect the drive from other machinery if there is a risk of damage or injury.

The control panel has softkeys below the display to access the related commands, and arrow keys to navigate the menu and change parameter values. Push the "F1" button to return to the main function.

Make sure that you have the motor nameplate data available.

1. Power up the drive. The first start assistant runs automatically. Wait until the control panel shows the language selection list.
2. Select the user interface language with the arrow keys, then push the right softkey (OK).

3. Select Commission the drive and push the right softkey (Next).
4. Select the localization and push the right softkey (Next).
5. To complete the first start assistant, enter the settings and values when you are prompted.

You can also use Primary settings in the Main menu to configure the unit.

In Primary settings you can, for example, set operation limits (speed), and acceleration and deceleration ramps as required by the application.
In I/O, you can define external control signal sources (IO or fieldbus).

Warnings and faults

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 activated, the installation must be clearly marked as defined in IEC/EN 61800-5-2, clause 6.5.3, for example, "THIS MACHINE STARTS AUTOMATICALLY."

Fieldbus settings

If necessary, configure the drive for fieldbus communication. The table below shows the minimum set of parameters required to configure the ACH480. If you are using a fieldbus adapter, refer to the applicable fieldbus adapter documentation.

<table>
<thead>
<tr>
<th>Fieldbus</th>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CANopen</td>
<td>IEC 61800-5-2</td>
<td>PL e</td>
</tr>
<tr>
<td>Profinet</td>
<td>IEC 61800-5-2</td>
<td>PL e</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Fieldbus</th>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DeviceNet</td>
<td>IEC 61800-5-2</td>
<td>PL e</td>
</tr>
<tr>
<td>OPC-UA</td>
<td>IEC 61800-5-2</td>
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<td>PL e</td>
</tr>
</tbody>
</table>

Dimensions and weights

1. A side-mounted option requires approximately 20 mm (0.8 in) of space on the right side of the drive.

Markings

The applicable markings are shown on the type designation label of the drive.

Safe torque off (STO)

The drive has a Safe torque off function (STO) in accordance with IEC 61800-5-2. It can be used, for example, as the final actuator device of safety circuits that stop the drive in case of danger (such as an emergency stop circuit).

When activated, the STO function disables the control voltage of the power semiconductors of the drive output stage, thus preventing the drive from rotating. The STO function generates an indication as defined by parameter 31.22. If the motor is running when Safe torque off is activated, it coasts to a stop. Closing the activation switch deactivates the STO. Any faults generated must be reset before restarting.

The STO function has a redundant architecture, that is, both channels must be used in the safety function implementation. The safety data sheet is calculated for redundant use, and does not apply if both channels are not used.

Wiring

The output conductor must open/short within 200 μs of each other. Double-shielded twisted-pair cable is recommended for the connection. The maximum conductor size for the control circuit switch is 300 m (1000 ft). Ground the shield of the cable at the control unit only.

The STO function overrides all other functions of the drive.

Validation

To ensure the operation of a safety function, a validation test is required. The test must be carried out by an competent person with adequate expertise and knowledge of the drive. If the test results are not documented and signed by this person, Validation instructions of the STO function can be found in the drive hardware manual.

Technical data

- Minimum voltage at 60 Hz and 25°C to be interpreted as 72 ± 13 V DC
- STO reaction time (shortest detectable break) 1 ms
- STO response time. 2 ms (typical), 5 ms (maximum)
- Fault detection time. Channels in different states for longer than 200 ms
- Fault reaction time. Fault detection time + 12 ms
- STO fault indication (parameter 22.02) delay: < 500 ms
- Safety integrity level (parameter 22.22) delay: < 1000 ms
- Performance level (EN 13849-1): PL c

The STO is a type A safety component as defined in IEC 62061-2. For the full safety data, see the failure data and failure modes of the drive, refer to IEC 61800-5-2 for more information.

Declarations of conformity

- The minimum specified wire size does not necessarily have sufficient current carrying capacity at maximum load.
- The motors do not accept a conductor that is one size larger than the maximum specified wire size.
- The maximum voltage per terminal is 1 kV.

Ambient conditions

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Rating (applied for stationary use)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-40 °C (0 °F) to 85 °C (185 °F)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 °C (0 °F) to 125 °C (257 °F)</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP66</td>
</tr>
</tbody>
</table>

Free space requirements

- 0 mm to 500 mm (0 in to 20 in) from the drive
- 0 mm to 500 mm (0 in to 20 in) from the drive

Related documents

- ACH480 hardware manual
- ACH480 manual list
- Ecodesign Information (DE) 2019 (TDV)