**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, motor cable, motor controls or control circuits.

**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.
   - Disconnect any dangerous external voltages from the control circuits.
   - After 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 touch.
4. Take special precautions when close to live 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 (U1, V1, W1) 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.

**Electrical connections**

To install the drive:

1. Fasten the input power cable to the drive.
2. Place the drive onto the DIN rail as shown in the above figure.
3. Set the drive against the wall.
4. To remove the drive, press the release lever on top of the drive.

3. Attach the clamping plates

- Fasten the clamping plate to the plate at the bottom of the drive with the provided screws.
- Fasten the I/O clamping plate to the clamping plate with the provided screws.

4. 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 U2, V2 and W2.
2. Use a voltage of 2000 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 500 Mohm (at 25°C / 77°F) for the insulation resistance of other motors, refer to the manufacturer’s documentation. If you think that there is moisture in the motor, dry the motor and do the measurement again.

**Select the cables**

- Input power cable: IEC 60364-5-53 requires two protective earth (ground) conductors. Prefer a symmetrical shielded cable (VFD cable).
- Motor cable: Use a symmetrical shielded cable (VFD cable) for the best EMC performance and to meet the European EMC requirements.
- Control cable: Use a double-shielded twisted-pair cable for analog signals. Use a double- or single-shielded cable for digital, relay and I/O signals. Do not mix 24 V resistor cable, recommended for the input power cable.

**Connect the cables**

- Connection diagram (shielded cables)

3. Strip the input power cable and ground the shield under the motor cable.
4. Connect the bundle to SCR terminal (terminal 1).
5. Use two grounding conductors if the cross-section of a single grounding conductor is not sufficient for the protective grounding.

1. 360-degree grounding of the guard shield. Required for the motor cable and brake resistor cable, recommended for the input power cable.
2. 10 mm2 single conductor cable (10 mm2 single conductor cable is not sufficient). Smaller (smaller than the conductivity of the phase conductor) for the protective grounding, or there is a non-symmetrically conducting ground conductor in the cable.
3. In one-phase installations, connect phase to U1, V1 and W1, and connect it to the SCR terminal (terminal 1).
4. Use two grounding conductors if the cross-section of a single grounding conductor is less than 50 mm2 (2x 16 mm2 or 2x 20 mm2) for the protective grounding.
5. Use a symmetrical shielded cable (VFD cable) if the conductivity of the fourth conductor or shield is not sufficient for the protective grounding.

**Connection procedure**

To prevent inductive coupling, keep the signal wire pairs twisted all the way up to the terminals.

1. Strip the outer insulation of the cable and ground the bare shield 360 degrees under the clamp.
2. Connect the conductors to the control terminals. Torque the input signals to 0.25 Nm (2 lb ft) and relay input to 0.5 Nm (4.4 lb ft).
3. For double-shielded cables, twist also the grounding conductors of each pair in the cable together and connect to the 520 terminal (terminal 0).
4. Mechanically attach the control cables on the outside of the drive.

**Start up the drive**

**WARNING!** Before you start up the drive, make sure that the installation is complete. Make sure that the cover of the drive is in place. Make sure that the drive does not cause danger when it starts. Disconnect the motor from other machinery, if there is a risk of damage or injury. There is an extensive installation checklist in the drive user’s manual.

Before you start, ensure that you have the motor nameplate data at hand.
**Fault codes**

This is a short list of fault messages.

- **F0000 VOLCCW-CCW/Output current has exceeded trip level 1.**
- **F0001 DEVIATTHEM-Drive output temperature is excessive.**
- **F0002 SHORT CWC-Short circuit in motor cable(s) or motor.**
- **F0003 DEVCCW-CCW/Intermediate circuit DC voltage is too high.**
- **F0004 SHTTFAUT-Drive has detected earth (ground) fault in motor or motor cable.**
- **F0005 OUTDFAUT-Intermediate circuit DC voltage is oscillating due to missing input power (phase or blown fuse).**

**Related documents**

- ACS150 user's manual
- ACS150 manual list

**Free space requirements**

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**Markings**

The applicable markings are shown on the type designation label.

**Ambient conditions**

**Required ambient conditions**

- **Installation altitude**
  - 0000 to 2000 m (6562 ft) above sea level.
  - Above 2000 m (6562 ft), the temperature is more than 40 °C (104 °F).
- **Surrounding air temperature**
  - -10 to 40 °C (14 to 104 °F).
- **Relative humidity**
  - 0…95% without condensation.

**Dimensions and weights**

**IP00 / IP20 / NEMA 1**

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**IP20 / NEMA 1 (drive with optional MUL-xx kit installed)**

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**Note:**

- If 50% overload capacity is needed, use the larger fuse alternative.
- Dimensions and weights calculated.