ABB INDUSTRIAL DRIVES

ACS880 drive module frames R1 to R9 for cabinet installation (options +P940 and +P944)

Supplement
Supplement

ACS880 drive module frames R1 to R9 for cabinet installation (options +P940 and +P944)

Table of contents

1. Safety instructions

5. Mechanical installation

6. Electrical installation
# Table of contents

1. **Safety instructions**
   - What this chapter contains .................................................. 9
   - Use of warnings ........................................................................ 9
   - General safety in installation, start-up and maintenance ............ 10
   - Electrical safety in installation, start-up and maintenance ......... 12
     - Precautions before electrical work ........................................ 12
     - Additional instructions and notes ......................................... 13
   - Grounding .................................................................................. 14
   - Additional instructions for permanent magnet motor drives ....... 15
     - Safety in installation, start-up and maintenance ..................... 15
   - General safety in operation ....................................................... 16

2. **Introduction to the supplement**
   - What this chapter contains ..................................................... 17
   - Applicability ............................................................................. 17
   - Target audience ......................................................................... 17
   - Purpose of the supplement ....................................................... 18
   - Related manuals ....................................................................... 18

3. **Hardware description**
   - What this chapter contains ..................................................... 21
   - Product overview ...................................................................... 21
     - Layout of option +P940 (IP20, UL Open Type) ......................... 22
     - Layout of option +P944 (IP20, UL Open Type) ......................... 23

4. **Guidelines for planning the cabinet installation**
   - What this chapter contains ..................................................... 25
   - Limitation of liability ................................................................ 25
   - Installation position of the drive module ................................ .... 25
   - Basic requirements for the cabinet .......................................... 25
   - Planning the layout of the cabinet ............................................ 26
     - Layout example ....................................................................... 26
   - Arranging the grounding inside the cabinet ............................... 28
   - Selecting the busbar material and preparation of the joints ....... 28
   - Tightening torques .................................................................... 28
   - Planning the attaching of the cabinet ....................................... 29
   - Planning the cabinet placement on a cable channel ................... 29
   - Planning the electromagnetic compatibility (EMC) of the cabinet ... 29
   - Planning the cooling ................................................................. 31
     - Minimum air inlet and outlet grating sizes ............................... 33
     - Preventing the recirculation of hot air .................................... 33
     - Installing drives above one another ...................................... 35
# 6 Table of contents

Required free space ....................................................... 36
Mounting the control panel on the cabinet door .......................... 36
Planning the use of cubicle heaters ...................................... 37
Planning cabling outside the cabinet ..................................... 37
Installing ABB common mode filters (option +E208) ................. 37

## 5. Mechanical installation

What this chapter contains ................................................... 39
Safety ................................................................. 39
Examining the installation site ............................................. 40
Necessary tools .......................................................... 40
Moving the drive module .................................................... 40
Unpacking and examining the delivery (frames R1 to R2) ............ 41
Unpacking and examining the delivery (ACS880-11 and ACS880-31 frame R3) ................. 42
Unpacking and examining the delivery (ACS880-01 frames R3 to R5) ......................... 43
Unpacking and examining the delivery (ACS880-01 frames R6 to R9) ............. 44
Unpacking and examining the delivery (ACS880-11 and ACS880-31 frames R6 to R9) ... 45
Installing the drive .......................................................... 46

## 6. Electrical installation

What this chapter contains ................................................... 47
Warnings ................................................................. 47
Connecting the motor cable at the motor end ............................ 47
Checking the insulation of the assembly .................................. 48
Attaching the residual voltage warning sticker ......................... 48
Power cable connection diagram ........................................... 48
Power cable connection procedure (IEC) ................................ 49
Installing the drive module shelves and connecting the cables – ACS880-01 frames R1 and R2 .......................................................... 51
Connecting the control cables – ACS880-01 frames R1 and R2 ........ 54
Installing the drive module shelves and connecting the cables – ACS880-01 frame R3 ...... 55
Connecting the control cables – ACS880-01 frame R3 .................. 58
Installing the drive module shelves and connecting the cables – ACS880-01 frames R4 and R5 .......................................................... 59
Connecting the control cables – ACS880-01 frames R4 and R5 .......... 63
Installing the drive module shelves and connecting the cables – ACS880-01 frames R6 to R9 .......................................................... 64
Connecting the control cables - ACS880-01 frames R6 to R9 .......... 66

## 7. Installation checklist

What this chapter contains ................................................... 67
Installation checklist ........................................................ 67

## 8. Technical data

What this chapter contains ................................................... 71
Degree of protection ........................................................ 73
9. Dimension drawings – ACS880-01

What this chapter contains ......................................................... 75
R1 (Option +P940, IP20, UL Open Type) ........................................... 76
R1 (Option +P944, IP20, UL Open Type) ........................................... 77
R2 (Option +P940, IP20, UL Open Type) ........................................... 78
R2 (Option +P944, IP20, UL Open Type) ........................................... 79
R3 (Option +P940, IP20, UL Open Type) ........................................... 80
R3 (Option +P944, IP20, UL Open Type) ........................................... 81
R4 (Option +P940, IP20, UL Open Type) ........................................... 82
R4 (Option +P944, IP20, UL Open Type) ........................................... 83
R5 (Option +P940, IP20, UL Open Type) ........................................... 84
R5 (Option +P944, IP20, UL Open Type) ........................................... 85
R6 (Option +P940, IP20, UL Open Type) ........................................... 86
R6 (Option +P944, IP20, UL Open Type) ........................................... 87
R7 (Option +P940, IP20, UL Open Type) ........................................... 88
R7 (Option +P944, IP20, UL Open Type) ........................................... 89
R8 (Option +P940, IP20, UL Open Type) ........................................... 90
R8 (Option +P944, IP20, UL Open Type) ........................................... 91
R9 (Option +P940, IP20, UL Open Type) ........................................... 92
R9 (Option +P944, IP20, UL Open Type) ........................................... 93

10. Dimension drawings – ACS880-11 and ACS880-31

What this chapter contains ......................................................... 95
R3 – Option +P940 (IP20, UL Open Type) ........................................... 96
R6 – Option +P940 (IP20, UL Open Type) ........................................... 97
R8 – Option +P940 (IP20, UL Open Type) ........................................... 98

Further information
Table of contents
Safety instructions

What this chapter contains

This chapter contains the safety instructions which you must obey when you install, operate and do maintenance to the drive. If you ignore the safety instructions, injury, death or damage can occur.

Use of warnings

Warnings tell you about conditions which can cause injury or death, or damage to the equipment. They also tell you how to prevent the danger. Notes draw attention to a particular condition or fact, or give information on a subject. The manual uses these warning symbols.

- **Electricity warning** tells about hazards from electricity which can cause injury or death, or damage to the equipment.
- **General warning** tells about conditions, other than those caused by electricity, which can cause injury or death, or damage to the equipment.
- **Electrostatic sensitive devices warning** tells you about the risk of electrostatic discharge which can cause damage to the equipment.
General safety in installation, start-up and maintenance

These instructions are for all personnel that install the drive module and do maintenance work on it.

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

- Use safety shoes with a metal toe cap to avoid foot injury. Wear protective gloves and long sleeves. Some parts have sharp edges.
- Handle the drive module carefully.
- **Heavy drive modules with high center of gravity (frames R6...R9):**
  - Lift the drive with a lifting device. Use the lifting eyes of the drive.
  - Do not tilt the drive.

- Beware of hot surfaces. Some parts, such as heatsinks of power semiconductors, remain hot for a while after disconnection of the electrical supply.
- Keep the drive module in its package or protect it otherwise from dust and burr from drilling and grinding until you install it. Protect also the installed drive against dust and burr. Electrically conductive debris inside the drive can cause damage or malfunction.
- Vacuum clean the area below the drive before the start-up to prevent the drive cooling fan from drawing the dust inside the drive.
- Do not cover the air inlet and outlet of the drive when it runs.
- Vacuum clean the area below the drive before the start-up to prevent the drive cooling fan from drawing the dust inside the drive.
- Make sure that there is sufficient cooling. See section *Losses, cooling data and noise* in the hardware manual.
- Before you connect voltage to the drive, make sure that the cabinet doors are closed. Keep the doors closed during the operation. Obey the panel builder’s instructions.
• Before you adjust the drive operation limits, make sure that the motor and all driven equipment can operate throughout the set operation limits.

• Before 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 61800-5-1, subclause 6.5.3, for example, “THIS MACHINE STARTS AUTOMATICALLY”.

• The maximum number of drive power-ups is five in ten minutes. Too frequent power-ups can damage the charging circuit of the DC capacitors.

• Make sure that any safety circuits (for example, emergency stop and Safe torque off) are validated in start-up. See chapter Start-up in the hardware manual for reference of the validation instructions.

**Note:**

• If you select an external source for start command and it is on, the drive will start immediately after fault reset unless you configure the drive for pulse start. See the firmware manual.

• Depending on the wiring and parametrization of the drive, the stop key on the control panel may not stop the drive.

• Only authorized persons are allowed to repair a malfunctioning drive.
12 Safety instructions

Electrical safety in installation, start-up and maintenance

- Precautions before electrical work

These warnings are for all personnel that do work on the drive, motor cable or motor.

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 installation or maintenance work. Go through these steps before you begin any installation or maintenance work.

1. Clearly identify the work location.

2. Disconnect all possible voltage sources.
   - Open the main disconnector of the drive.
   - Open the disconnector of the supply transformer as the main disconnector of the drive does not remove the voltage from the input busbars of the drive.
   - Make sure that reconnection is not possible. Lock the disconnectors to open position and attach a warning notice to them.
   - Disconnect any external power sources from the control circuits before you do work on the control cables.
   - After you disconnect the drive, always wait for 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 an impedance of at least 1 Mohm.
   - Make sure that the voltage between the drive module input power terminals (L1, L2, L3) and the grounding (PE) busbar is close to 0 V.
   - Make sure that the voltage between the drive module UDC+ and UDC- terminals and the grounding (PE) busbar is close to 0 V.

6. Install temporary grounding as required by the local regulations.

7. Ask for a permit to work from the person in control of the electrical installation work.
Additional instructions and notes

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

- If you will install the drive on an IT (an ungrounded power system or a high-resistance-grounded [over 30 ohms] power system) or on a corner-grounded TN system, check the compatibility. For instructions, see the hardware manual.
- Do not do insulation or voltage withstand tests on the drive or drive modules.

**Note:**
- The motor cable terminals of the drive are at a dangerous voltage when the input power is on, regardless of whether the motor is running or not.
- The DC bus and brake resistor terminals (UDC+, UDC-, R+ and R-) are at a dangerous voltage.
- External wiring can supply dangerous voltages to the terminals of relay outputs (XRO1, XRO2 and XRO3).
- The Safe torque off function does not remove the voltage from the main and auxiliary circuits. The function is not effective against deliberate sabotage or misuse.

**WARNING!** Use a grounding wrist band when you handle the printed circuit boards. Do not touch the boards unnecessarily. The boards contain components sensitive to electrostatic discharge.
Grounding

These instructions are for all personnel who are responsible for the grounding of the drive.

**WARNING!** Obey these instructions. If you ignore them, injury or death, or equipment malfunction can occur, and electromagnetic interference can increase.

- If you are not a qualified electrical professional, do not do grounding work.
- Always ground the drive, the motor and adjoining equipment. This is necessary for the personnel safety. Proper grounding also reduces electromagnetic emission and interference.
- Make sure that the conductivity of the grounding conductors is sufficient. See section *Selecting the power cables* in the hardware manual. Obey the local regulations.
- Connect the power cable shields to protective earth (PE) of the drive to make sure of personnel safety.
- Make a 360° grounding of the power and control cable shields at the cable entries to suppress electromagnetic disturbances.
- In a multiple-drive installation, connect each drive separately to the protective earth (PE) busbar of the switch board or the transformer.

**Note:**
- You can use power cable shields as grounding conductors only when their conductivity is sufficient.
- Standard IEC/EN 61800-5-1 (section 4.3.5.5.2.) requires that as the normal touch current of the drive is higher than 3.5 mA AC or 10 mA DC, you must use a fixed protective earth (PE) connection. In addition,
  - install a second protective earth conductor of the same cross-sectional area as the original protective earthing conductor,
  or
  - install a protective earth conductor with a cross-section of at least 10 mm² Cu or 16 mm² Al,
  or
  - install a device which automatically disconnects the supply if the protective earth conductor breaks.
Additional instructions for permanent magnet motor drives

Safety in installation, start-up and maintenance

These are additional warnings concerning permanent magnet motor drives. The other safety instructions in this chapter are also valid.

**WARNING!** Obey these instructions. If you ignore them, injury or death and equipment malfunction can occur.

- Do not do work on the drive when the permanent magnet motor is rotating. A rotating permanent magnet motor energizes the drive including its input power terminals.

Before installation, start-up and maintenance work on the drive:

- Stop the motor.
- Disconnect the motor from the drive with a safety switch or by other means.
- If you cannot disconnect the motor, make sure that the motor cannot rotate during work. Make sure that no other system, like hydraulic crawling drives, can rotate the motor directly or through any mechanical connection like felt, nip, rope, etc.
- Measure that the installation is de-energized.
  - Use a multimeter with an impedance of at least 1 Mohm.
  - Make sure that the voltage between the drive output terminals (T1/U, T2/V, T3/W) and the grounding (PE) busbar is close to 0 V.
  - Make sure that the voltage between the drive input power terminals (L1, L2, L3) and the grounding (PE) busbar is close to 0 V.
  - Make sure that the voltage between the drive module UDC+ and UDC- terminals and the grounding (PE) busbar is close to 0 V.
- Install temporary grounding to the drive output terminals (T1/U, T2/V, T3/W). Connect the output terminals together as well as to the PE.

Start-up and operation:

- Make sure that the operator cannot run the motor over the rated speed. Motor overspeed causes overvoltage can damage or explode the capacitors in the intermediate circuit of the drive.
General safety in operation

These instructions are for all personnel that operate the drive.

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

- Do not control the motor with the disconnector at the drive power supply; instead, use the control panel start and stop keys or commands through the I/O terminals of the drive.
- Give a stop command to the drive before you reset a fault. If you have an external source for the start command and the start is on, the drive will start immediately after the fault reset, unless you configure the drive for pulse start. See the firmware manual.
- Before you activate automatic fault reset 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.
Introduction to the supplement

What this chapter contains
This chapter describes the supplement.

Applicability
This supplement is applicable for these drive modules:
- ACS880-01 with options +P940 and +P944
- ACS880-11 with option +P940
- ACS880-31 with option +P940.

It is a supplement to these manuals:
- ACS880-01 hardware manual (3AUA0000078093 [English])
- ACS880-11 hardware manual (3AXD50000045932 [English])
- ACS880-31 hardware manual (3AXD50000045933 [English]).

Target audience
This supplement is intended for people who plan the installation and install the drive module into a customer-designed cabinet. Read the supplement before you work on the drive. You are expected to know the fundamentals of electricity, wiring, electrical components and electrical schematic symbols.

The supplement is written for readers worldwide. Both SI and imperial units are shown.
Introduction to the supplement

Purpose of the supplement

The supplement tells you how to install the drive module into a cabinet.

Related manuals

<table>
<thead>
<tr>
<th>Drive hardware manuals and guides</th>
<th>Code (English)</th>
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<tr>
<td>Cabinet installation supplement for ACS880 drive module frames R1 to R9 (options +P940 and +P944)</td>
<td>3AUA0000145446</td>
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<tr>
<td>ACS880-01 hardware manual</td>
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<td>ACS880-01 quick installation guide for frames R4 and R5</td>
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<td>ACS880-01 quick installation guide for frames R6 to R9</td>
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<td>ACS880-01 assembly drawings for cable entry boxes of IP21 frames R5 to R9</td>
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<td>Vibration dampers for ACS880-01 drives (frames R4 and R5, option +C131) installation guide</td>
<td>3AXD50000010497</td>
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<td>ACX-AP-x Assistant control panels user’s manual</td>
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<td>Manuals and quick guides for I/O extension modules, fieldbus adapters, etc.</td>
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<td>DPMP-01 mounting platform for control panels installation guide</td>
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Introduction to the supplement
Hardware description

What this chapter contains
This chapter briefly describes the construction of the drive module options +P940 and +P944. For the operation principle and type code description, see the hardware manual.

Product overview
Drive with option +P940 is a drive module without front covers (ACS880-01 also without cable box) to be installed in a customer’s cabinet.

Drive with option +P944 is a drive module with front covers but without cable box to be installed in a customer’s cabinet.
## Hardware description

### Layout of option +P940 (IP20, UL Open Type)

The components of the drive module are shown below (view of ACS880-01 frame R5, the other frames and drive module types are similar).

1. Control panel
2. Four attaching points at the back of the drive
3. Heatsink
4. Lifting holes
5. Control unit
Layout of option +P944 (IP20, UL Open Type)

The components of the drive module are shown below (view of ACS880-01 frame R5, the other frames and drive module types are similar).

1 Control panel
2 Front cover
3 Four fastening points at the back of the unit
4 Heatsink
5 Lifting holes
24 Hardware description
Guidelines for planning the cabinet installation

What this chapter contains
This chapter gives guidelines for planning drive cabinets and installing the drive module into a user-defined cabinet. The chapter gives example cabinet layouts and refers to free space requirements around the module for cooling. The guidelines are essential for the safe and trouble-free use of the drive system.

Limitation of liability
You must always plan and make the installation according to applicable local laws and regulations. ABB does not assume any liability whatsoever for any installation which breaches the local laws and/or other regulations.

Installation position of the drive module
The drive module must be installed in an upright position. Vibration dampers are not needed in cabinet installations.

Basic requirements for the cabinet
Use a cabinet which
- has a frame sturdy enough to carry the weight of the drive components, control circuitry and other equipment installed in it
- protects the user and drive module against contact and agrees with the requirements for dust and humidity
- has sufficient air inlet and outlet gratings that allow free flow of cooling air through the cabinet. This is critical for proper cooling of the drive module.
Planning the layout of the cabinet

Plan a spacious layout to ensure easy installation and maintenance. Sufficient cooling air flow, obligatory clearances, cables and cable support structures all require space.

Place the control board(s) away from:
- main circuit components such as contactors, switches and power cables
- hot parts (heat sink, air outlet of the drive module).

Layout example

An example cabinet layout is shown below.

Note: The sizes of the air inlet and outlet gratings are critical for proper cooling of the drive module. For losses and cooling data requirements, see the hardware manual.
### Guidelines for planning the cabinet installation

<table>
<thead>
<tr>
<th>Door closed</th>
<th>Door open</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Air inlet</td>
<td>9 Drive module with control unit and control panel</td>
</tr>
<tr>
<td>2 Air outlet</td>
<td>10 Input power cable including the protective ground conductor (PE) of the drive</td>
</tr>
<tr>
<td>3 Contactor control switch and emergency stop switch (connected to the contactor control circuit inside the cabinet)</td>
<td>11 Motor cable including the protective ground conductor</td>
</tr>
<tr>
<td>4 Operating handle of the disconnector</td>
<td>12 External control cables</td>
</tr>
<tr>
<td>6 Supporting frame of the cabinet</td>
<td>13 Cabinet grounding busbar (PE)</td>
</tr>
<tr>
<td>7 Vertical air baffle that separates the cool and hot areas (leak-proof entries)</td>
<td>14 Disconnector and fuses</td>
</tr>
<tr>
<td>8 Horizontal air baffles</td>
<td>15 Contactor</td>
</tr>
</tbody>
</table>
Guidelines for planning the cabinet installation

Roof air flow viewed from top:

---

Arranging the grounding inside the cabinet

Arrange the grounding of the drive module by leaving the contact surfaces of the fastening points unpainted (bare metal-to-metal contact). The module frame will be grounded to the PE busbar of the cabinet via the fastening surfaces, screws and the cabinet frame. Alternatively, use a separate grounding conductor between the PE terminal of the drive module and the PE busbar of the cabinet.

Ground also the other components in the cabinet according to the principle above.

Selecting the busbar material and preparation of the joints

Note the following when you use busbars:

- We recommend tin-plated copper but you can also use aluminum.
- Remove the oxide layer from aluminum busbar joints and apply suitable anti-oxidant joint compound.

Tightening torques

Use these torques to grade 8.8 screws (with or without joint compound) that tighten electric contacts:

<table>
<thead>
<tr>
<th>Screw size</th>
<th>Torque</th>
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<tbody>
<tr>
<td>M5</td>
<td>3.5 N·m (2.6 lbf·ft)</td>
</tr>
<tr>
<td>M6</td>
<td>9 N·m (6.6 lbf·ft)</td>
</tr>
<tr>
<td>M8</td>
<td>20 N·m (14.8 lbf·ft)</td>
</tr>
<tr>
<td>M10</td>
<td>40 N·m (29.5 lbf·ft)</td>
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<tr>
<td>M12</td>
<td>70 N·m (52 lbf·ft)</td>
</tr>
<tr>
<td>M16</td>
<td>180 N·m (133 lbf·ft)</td>
</tr>
</tbody>
</table>
Planning the attaching of the cabinet

Note the following when you plan the attaching of the cabinet:

- Attach the cabinet to the floor from the front and to the floor or wall from the back.
- Always attach the drive module from its mounting points to the cabinet. For details, see the module installation instructions.

⚠️ **WARNING!** Do not attach the cabinet by electric welding. ABB does not assume any liability for damages caused by electric welding as the welding circuit can damage electronic circuits in the cabinet.

Planning the cabinet placement on a cable channel

Note the following when you plan to place the cabinet on a cable channel:

- The cabinet structure must be sturdy enough. If the whole cabinet base is not supported from below, the cabinet weight will lie on the sections that the floor carries.
- Equip the cabinet with a sealed bottom plate and cable entries to ensure the degree of protection and to prevent the cooling air flow from the cable channel into the cabinet.

Planning the electromagnetic compatibility (EMC) of the cabinet

Note the following when you plan the electromagnetic compatibility of the cabinet:

- Generally, the fewer and smaller the holes in the cabinet, the better the interference attenuation. The maximum recommended diameter of a hole in
Guidelines for planning the cabinet installation

galvanic metal contact in the covering cabinet structure is 100 mm (3.94 in). Pay special attention to the cooling air inlet and outlet gratings.

• The best galvanic connection between the steel panels is achieved by welding them together as no holes are necessary. If welding is not possible, we recommend to leave the seams between the panels unpainted and equipped with special conductive EMC strips to provide adequate galvanic connection. Usually, reliable strips are made of flexible silicon mass covered with a metal mesh. The non-tightened touch-contact of the metal surfaces is not sufficient, so a conductive gasket between the surfaces is required. The maximum recommended distance between assembly screws is 100 mm (3.94 in).

• Construct sufficient high-frequency grounding network in the cabinet to avoid voltage differences and forming of high-impedance radiator structures. A good high-frequency grounding is made with short flat copper braids for low inductance. One-point high-frequency grounding cannot be used due to the long distances inside the cabinet.

• 360° high frequency grounding of the cable shields at the cable entries improves the EMC shielding of the cabinet.

• ABB recommends 360° high frequency grounding of the motor cable shields at their entries. The grounding can be implemented by a knitted wire mesh screening as shown below. In US installations, you can use cable conduit entry.

---

1 Cable
2 Cable tie
3 Strain relief
4 Bare cable shield
5 Knitted wire mesh
6 Bottom plate
• ABB recommends 360° high frequency grounding of the control cable shields at their entries. The shields can be grounded by means of conductive shielding cushions pressed against the cable shield from both directions as shown below. In US installations, you can use cable conduit entry.

![Diagram of cable grounding](image)

1 Tightening screw
2 EMI conductive cushion
3 Strain relief
4 Grommet
5 Entry plate

**Planning the cooling**

Note the following guidelines when you plan the cooling of the cabinet:

• Ventilate the installation site sufficiently so that the cooling air flow and ambient temperature requirements of the drive module are met, see the hardware manual. The internal cooling fan of the drive module rotates at a constant speed thus blowing constant air flow through the module. Whether the same amount of air must be replaced all the time in the facility depends on how much heat must be removed.

• Make sure that the temperature of the cooling air that goes into the drive does not exceed +40 °C (+104 °F).

• Leave enough free space around the components to ensure sufficient cooling. Observe the minimum clearances given for each component. For the required free space around the drive module, see page 36.

• Also ventilate the heat dissipated by cables and other additional equipment.

• **Make sure that the air inlets and outlets are large enough to allow sufficient air flow in and out of the cabinet.** This is critical for correct cooling of the drive module. See section Minimum air inlet and outlet grating sizes on page 33.
Guidelines for planning the cabinet installation

• Equip the air inlets and outlets with gratings that
  - guide the air flow
  - protect against contact
  - prevent water splashes from entering the cabinet.

• The drawing below shows two typical cabinet cooling solutions. The air inlet is at the bottom of the cabinet, while the outlet is at the top, either on the upper part of the door or on the roof. We recommend that the air outlet is on the cabinet roof. Use an extra exhaust fan if the air outlet is on the cabinet door.

![Diagram of cabinet cooling solutions]

1 Air inlet
2 Air outlet

• The internal cooling fans of the drive module and reactors/chokes are usually sufficient to keep the component temperatures low enough in IP22 cabinets.

• In IP54 cabinets, thick filter mats are used to prevent water splashes from entering the cabinet. This requires the installation of additional cooling equipment, such as a hot air exhaust fan.
Guidelines for planning the cabinet installation

Minimum air inlet and outlet grating sizes

<table>
<thead>
<tr>
<th>Frame size</th>
<th>Minimum effective area of cabinet air inlet (cm²)</th>
<th>Minimum effective area of cabinet air outlet (cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IP22</td>
<td>IP54</td>
</tr>
<tr>
<td>R1</td>
<td>175</td>
<td>250</td>
</tr>
<tr>
<td>R2</td>
<td>225</td>
<td>350</td>
</tr>
<tr>
<td>R3</td>
<td>275</td>
<td>450</td>
</tr>
<tr>
<td>R4</td>
<td>350</td>
<td>550</td>
</tr>
<tr>
<td>R5</td>
<td>400</td>
<td>650</td>
</tr>
<tr>
<td>R6</td>
<td>475</td>
<td>750</td>
</tr>
<tr>
<td>R7</td>
<td>650</td>
<td>1100</td>
</tr>
<tr>
<td>R8</td>
<td>1000</td>
<td>1600</td>
</tr>
<tr>
<td>R9</td>
<td>1500</td>
<td>2400</td>
</tr>
</tbody>
</table>

Preventing the recirculation of hot air

Prevent hot air circulation outside the cabinet by leading the outcoming hot air away from the area where the inlet air to the cabinet is taken. Possible solutions are listed below:

- gratings that guide air flow at the air inlet and outlet
- air inlet and outlet at different sides of the cabinet
- cool air inlet in the lower part of the front door, and an extra exhaust fan on the roof of the cabinet.

Prevent hot air circulation inside the cabinet with leak-proof air baffles or an extra fan at the inlet or outlet of the cabinet. If you use a fan, we recommend an inlet fan with a filter. Such a fan causes an overpressure inside the cabinet which helps to keep the dust out. No gaskets are usually required.
Guidelines for planning the cabinet installation

1  Main air flow in
2  Main air flow out
3  Air baffle plate
4  Drive
5  Air inlet filter
6  Air outlet filter
Installing drives above one another

Make sure that the outlet cooling air flows away from the drive above.

1. Air flow through the drive
2. Air baffle
3. Mounting plate that allows air through flow
4. Minimum spacing between the drives
Required free space

The required free space at the top and bottom of the drive module is shown below. The free space is needed for making sure that sufficient cooling air flows through the module and the module cools correctly.

![Diagram showing required free space (200 mm (7.87 in) at the top and 300 mm (11.81 in) at the bottom).]

Mounting the control panel on the cabinet door

The control panel can be mounted on the cabinet door using a DPMP-01 mounting platform kit (option +J410) or a DPMP-02 (option +J413) mounting platform kit.

![Images of DPMP-01 and DPMP-02 control panel kits.]
Guidelines for planning the cabinet installation 37

Planning the use of cubicle heaters

Use a cubicle heater if there is a risk of condensation in the cabinet. Although the primary function of the heater is to keep the air dry, it may also be required for heating at low temperatures.

Planning cabling outside the cabinet

See section Routing the cables in the hardware manual.

Installing ABB common mode filters (option +E208)

Common mode filter kits are available from ABB. For ACS880-01 drive modules, without the cable entry box, hang the common mode filter ring on the cabinet structure. For the dimensions of the ring and routing of the motor cable through the ring, see:

<table>
<thead>
<tr>
<th>Installation Guide</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common mode filter kit for ACS880-01 drives (frame R6, option +E208) installation guide</td>
<td>3AXD50000015178</td>
</tr>
<tr>
<td>Common mode filter kit for ACS880-01 drives (frame R8, option +E208) installation guide</td>
<td>3AXD50000015180</td>
</tr>
<tr>
<td>Common mode filter kit for ACS880-01 drives (frame R9, option +E208) installation guide</td>
<td>3AXD50000015201</td>
</tr>
<tr>
<td>Common mode filter kit for frames R7 and R8 (option +E208) installation guide</td>
<td>3AXD50000015179</td>
</tr>
</tbody>
</table>
Mechanical installation

What this chapter contains

This chapter gives guidelines for the mechanical installation of the drive module into a cabinet.

Safety

⚠️ WARNING! For frame sizes R6 to R9: 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.
Examining the installation site

The drive modules can be installed tightly side by side.

Make sure that the installation site agrees with these requirements:

- The installation site has sufficient ventilation to prevent overheating of the drive. See section *Losses, cooling data and noise* in the hardware manual.
- The operation conditions of the drive agree with the specifications in section *Ambient conditions* in the hardware manual.
- The mounting plate is vertical, not flammable and strong enough to hold the weight of the drive module. See section *Necessary tools* on page 40.
- The material below the installation is not flammable.
- There is enough free space above and below the drive for cooling air flow, service and maintenance. See pages 36 and 72. There is enough free space in front of the drive for operation, service and maintenance.

Necessary tools

- Drill and drill bits
- Screwdriver and/or wrench with bits.

Moving the drive module

Move the transport package by pallet truck to the installation site.
Unpacking and examining the delivery (frames R1 to R2)

This illustration shows the layout of the transport package. Examine that all items are present and there are no signs of damage. Read the data on the type designation label of the drive to make sure that the drive is of the correct type.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drive with factory installed options. Cable shelves in a plastic bag.</td>
<td>7...9</td>
<td>Cushion</td>
</tr>
<tr>
<td>2</td>
<td>Cushion</td>
<td>10</td>
<td>Cardboard sleeve</td>
</tr>
<tr>
<td>3</td>
<td>Cardboard tray</td>
<td>11</td>
<td>Straps</td>
</tr>
<tr>
<td>4...6</td>
<td>Cardboard support</td>
<td>12</td>
<td>Printed quick guides and manuals, multilingual residual voltage warning sticker, manuals CD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13</td>
<td>Top cardboard cover</td>
</tr>
</tbody>
</table>

To unpack:
- Cut the straps (11).
- Remove the top cardboard cover (13) and cushions (7...9).
- Lift the cardboard sleeve (10).
- Remove the cardboard supports (4...6).
- Lift the drive module.
Unpacking and examining the delivery (ACS880-11 and ACS880-31 frame R3)

The figure below shows the drive package with its contents. Examine that all items are present and there are no signs of damage. Read the data on the type designation label of the drive to make sure that the drive is of the correct type.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mounting template</td>
</tr>
<tr>
<td>2</td>
<td>Straps</td>
</tr>
<tr>
<td>3</td>
<td>Printed quick guides and manuals, multilingual residual voltage warning sticker</td>
</tr>
<tr>
<td>4</td>
<td>Tray</td>
</tr>
<tr>
<td>5</td>
<td>Sleeve</td>
</tr>
<tr>
<td>6</td>
<td>Package cushion</td>
</tr>
<tr>
<td>7</td>
<td>Package cushion</td>
</tr>
<tr>
<td>8</td>
<td>Drive with factory installed options</td>
</tr>
</tbody>
</table>

To unpack:
- Cut the straps (2).
- Remove the tray (4) and sleeve (5).
- Lift the drive.
Unpacking and examining the delivery (ACS880-01 frames R3 to R5)

This illustration shows the layout of the transport package. Examine that all items are present and there are no signs of damage. Read the data on the type designation label of the drive to make sure that the drive is of the correct type.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cable box package</td>
<td>6</td>
<td>Straps</td>
</tr>
<tr>
<td>2</td>
<td>Drive</td>
<td>7</td>
<td>Pallet</td>
</tr>
<tr>
<td>3</td>
<td>Printed quick guides and manuals, multilingual residual voltage warning sticker and manuals CD inside the box</td>
<td>8</td>
<td>Control panel selected in the order (in a separate package) in the option box.</td>
</tr>
<tr>
<td>4</td>
<td>Cardboard box. Mounting template in the cardboard box.</td>
<td>9</td>
<td>Possible options in separate packages, if they have been ordered with a plus code.</td>
</tr>
<tr>
<td>5</td>
<td>Stopper</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To unpack:
- Cut the straps (6).
- Remove the cardboard box (4) and option box (3).
- Remove the stopper (5).
- Lift the drive.
Unpacking and examining the delivery (ACS880-01 frames R6 to R9)

This illustration shows the layout of the transport package. Examine that all items are present and there are no signs of damage. Read the data on the type designation label of the drive to make sure that the drive is of the correct type.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drive with factory installed options</td>
<td>5</td>
<td>VCI bag</td>
</tr>
<tr>
<td>2</td>
<td>Cardboard cover</td>
<td>6</td>
<td>Straps</td>
</tr>
<tr>
<td>3</td>
<td>Stopper</td>
<td>7</td>
<td>Printed quick guides, manuals CD and multilingual residual voltage warning sticker</td>
</tr>
<tr>
<td>4</td>
<td>Pallet tray</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

To unpack:
- Cut the straps (6).
- Remove the top cardboard cover (2).
- Remove the stopper (3).
- Attach lifting hooks to the lifting eyes of the drive module. Lift the drive module with a hoist.
Unpacking and examining the delivery (ACS880-11 and ACS880-31 frames R6 to R9)

This illustration shows the layout of the transport package. Examine that all items are present and there are no signs of damage. Read the data on the type designation label of the drive to make sure that the drive is of the correct type.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Printed quick guides and manuals, multilingual residual voltage warning sticker</td>
<td>6</td>
<td>Plastic bag</td>
</tr>
<tr>
<td>2</td>
<td>Accessories</td>
<td>7</td>
<td>Cardboard sleeve</td>
</tr>
<tr>
<td>3</td>
<td>VCI bag</td>
<td>8</td>
<td>Outer box</td>
</tr>
<tr>
<td>4</td>
<td>Mounting template</td>
<td>9</td>
<td>Pallet</td>
</tr>
<tr>
<td>5</td>
<td>Straps</td>
<td>10</td>
<td>Drive with factory installed options</td>
</tr>
</tbody>
</table>

To unpack:
- Cut the straps (5).
- Remove the outer box (8) and cardboard sleeve (7).
- Open the VCI bag (3).
- Undo the attaching screws (a, b).
- Lift the drive.
Mechanical installation

Installing the drive

1. See the dimensions in chapters *Dimension drawings – ACS880-01* and *Dimension drawings – ACS880-11 and ACS880-31*. Mark the locations for the four mounting holes.

2. Start the screws or bolts into the mounting holes.

3. Position the drive onto the screws.

4. Tighten the screws in the wall securely.
Electrical installation

What this chapter contains

This chapter tells you how to install the power and control cables to the drive module. For other electrical installation instructions that concern the drive, see the hardware manual.

Warnings

⚠️ WARNING! Only qualified electricians are allowed to carry out the work described in this chapter. Obey the safety instructions given in chapter Safety instructions. If you ignore them, injury or death or damage to the equipment can occur.

Connecting the motor cable at the motor end

Connect the motor cable at the motor end.

For minimum radio frequency interference, ground the motor cable shield 360 degrees at the motor terminal box.
Checking the insulation of the assembly
See the hardware manual.

Attaching the residual voltage warning sticker
See the hardware manual.

Power cable connection diagram

| 1 | Use a separate grounding PE cable (1a) or a cable with a separate PE conductor (1b) if the conductivity of the shield does not meet the requirements for the PE conductor. |
| 2 | We recommend 360-degree grounding if shielded cable is used. Ground the other end of the input cable shield or PE conductor at the distribution board. |
| 3 | We require 360-degree grounding. |
| 4 | Switch-disconnector and fuses. See section Selecting the supply disconnecting device in the hardware manual. |
Power cable connection procedure (IEC)

This section gives instructions on how to connect the power cables for ACS880-01 +P940 and +P944. Connect the power cables for ACS880-11 +P940 and ACS880-31 +P940 as described in the hardware manual. For US cabling instructions, see also the quick installation guides.

1. Do the steps in section Safety instructions on page 9 before you start the work.
2. Open the cabinet door.
3. Peel off 3 to 5 cm of the outer insulation of the cables above the bottom plate of the cabinet for the 360° high-frequency grounding. See page 30.
4. If fire insulation is used, make an opening in the mineral wool sheet according to the diameter of the cable.
5. Put the cables through the entries with the conductive sleeves.
6. Attach the conductive sleeves to the cable shields with cable ties.
7. Seal the slot between the cable and mineral wool sheet (if used) with sealing compound (e.g., CSD-F, ABB brand name DXXT-11, code 35080082).
8. Tie up the unused conductive sleeves with cable ties.
9. Prepare the ends of the cables.

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. Connecting its fourth conductor at the motor end increases bearing currents and causes extra wear.
10. Connect the twisted shields of the power cables to the ground bar of the cabinet and the phase conductors to the drive module terminals. See

<table>
<thead>
<tr>
<th>Frame</th>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>R2</td>
<td>Installing the drive module shelves and connecting the cables – ACS880-01 frames R1 and R2</td>
<td>51</td>
</tr>
<tr>
<td>R3</td>
<td>Installing the drive module shelves and connecting the cables – ACS880-01 frame R3</td>
<td>55</td>
</tr>
<tr>
<td>R4, R5</td>
<td>Installing the drive module shelves and connecting the cables – ACS880-01 frames R1 and R2</td>
<td>51</td>
</tr>
<tr>
<td>R6…R9</td>
<td>Installing the drive module shelves and connecting the cables – ACS880-01 frames R6 to R9</td>
<td>64</td>
</tr>
</tbody>
</table>
Installing the drive module shelves and connecting the cables – ACS880-01 frames R1 and R2

1. Go through steps 1 to 9 in section *Power cable connection procedure (IEC)* on page 49.

2. Attach the mechanical support self for the power cables to the drive module.

3. Connect the twisted shields of the power cables to the grounding terminals.

4. Connect the phase conductors of the input cable to the L1, L2 and L3 terminals and the phase conductors of the motor cable to the T1/U, T2/V and T3/W terminals. Connect the brake resistor conductors (if present) to the R+ and R- terminals. Tighten the screws to the torque given in the figure below.

5. Install the shelves for grounding the additional PE conductor of the input cable and the pair-cable shields and grounding wires of the control cables.

6. Connect the additional PE conductor of the input cable to the grounding shelf.

7. Go to section *Connecting the control cables – ACS880-01 frames R1 and R2* on page 54.
**Electrical installation**

### R1, R2

- **M5×50 TX20**: 3 N·m
- **M4×20 TX20**: 1.5 N·m

### Wiring and Connection

- **L1, L2, L3, T1/U, T2/V, T3/W, R-, R+/UDC+, UDC**

<table>
<thead>
<tr>
<th>Connection</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.6 N·m</td>
<td>1.8 N·m</td>
</tr>
</tbody>
</table>
Connecting the control cables – ACS880-01 frames R1 and R2

1. Strip the cable ends and cut to suitable length (note the extra length of the grounding conductors).
2. Ground the outer shields of all control cables 360 degrees at the cabinet entry.
3. Secure the cables mechanically at the clamps.
4. Ground the pair-cable shields to the clamps. Leave the other end of the shields unconnected or ground them indirectly via a high-frequency capacitor with a few nanofarads, eg, 3.3 nF / 630 V.
5. Connect the conductors to the appropriate terminals of the control board (see section Default I/O connections in the hardware manual).
6. Wire the optional modules if included in the delivery.
Installing the drive module shelves and connecting the cables – ACS880-01 frame R3

1. Go through steps 1 to 9 in section *Power cable connection procedure (IEC)* on page 49.

2. Attach the mechanical support self for the power cables to the drive module.

3. Connect the twisted shields of the power cables to the grounding terminals.

4. Connect the phase conductors of the input cable to the L1, L2 and L3 terminals and the phase conductors of the motor cable to the T1/U, T2/V and T3/W terminals. Connect the brake resistor conductors (if present) to the R+ and R- terminals. Tighten the screws to the torque given in the figure below.

5. Install the shelves for grounding the additional PE conductor of the input cable and the pair-cable shields and grounding wires of the control cables.

6. Connect the additional PE conductor of the input cable to the grounding shelf.

7. Go to section *Connecting the control cables – ACS880-01 frame R3* on page 58.
Electrical installation

R3

M5×50 TX20
3 N·m

M4×30 TX20
1.5 N·m

L1, L2, L3, T1/U, T2/V, T3/W, R-, R+/UDC+, UDC

<table>
<thead>
<tr>
<th>L1, L2, L3, T1/U, T2/V, T3/W, R-, R+/UDC+, UDC</th>
<th>±</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.6 N·m</td>
<td>1.8 N·m</td>
</tr>
</tbody>
</table>
Connecting the control cables – ACS880-01 frame R3

1. Strip the cable ends and cut to suitable length (note the extra length of the grounding conductors).
2. Ground the outer shields of all control cables 360 degrees at the cabinet entry.
3. Secure the cables mechanically at the clamps.
4. Ground the pair-cable shields to the clamps. Leave the other end of the shields unconnected or ground them indirectly via a high-frequency capacitor with a few nanofarads, e.g., 3.3 nF / 630 V.
5. Connect the conductors to the appropriate terminals of the control board (see section Default I/O connections in the hardware manual).
6. Wire the optional modules if included in the delivery.
Installing the drive module shelves and connecting the cables – ACS880-01 frames R4 and R5

1. Go through steps 1 to 9 in section Power cable connection procedure (IEC) on page 49.

2. Install the control panel holder.
3. Remove the shroud on the power cable terminals by releasing the clips and lifting the shroud up from the sides with a screwdriver (a). Knock out holes in the shroud for the cables to be installed (b).

4. Attach the mechanical support shelf for the power cables to the drive module. **Note:** This shelf is not included with option +C135.

5. Attach the mechanical support shelf for the power cables to the mounting plate. **Note:** This shelf is not included with option +C135.

6. Connect the twisted shields of the power cables to the grounding terminals.

7. Attach the power cables with the clamps to the power cable support shelf or, with option +C135, to the flange bottom bracket.

8. Connect the phase conductors of the input cable to the L1, L2 and L3 terminals and the phase conductors of the motor cable to the T1/U, T2/V and T3/W terminals. Connect the brake resistor conductors (if present) to the R+ and R- terminals. Tighten the screws to the torque given in the figure below.

9. Reinstall the shroud on the power terminals.

10. Go to section *Connecting the control cables – ACS880-01 frames R4 and R5* on page 63.
R4: M4×20 TX20 3 N·m
R5: M4×30 TX20 3 N·m
M4×30 TX20 1.5 N·m
L1, L2, L3, T1/U, T2/V, T3/W, R-, R+/UDC+, UDC

<table>
<thead>
<tr>
<th></th>
<th>R4</th>
<th>R5</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3.3 N·m</td>
<td>5.6 N·m</td>
</tr>
<tr>
<td>4</td>
<td>2.9 N·m</td>
<td>2.9 N·m</td>
</tr>
</tbody>
</table>
Connecting the control cables – ACS880-01 frames R4 and R5

1. Strip the cable ends and cut to suitable length (note the extra length of the grounding conductors).
2. Ground the outer shields of all control cables 360 degrees at the cabinet entry.
3. Secure the cables mechanically at the clamps.
4. Ground the pair-cable shields to the clamps. Leave the other end of the shields unconnected or ground them indirectly via a high-frequency capacitor with a few nanofarads, eg, 3.3 nF / 630 V.
5. Connect the conductors to the appropriate terminals of the control board (see section Default I/O connections in the hardware manual).
6. Wire the optional modules if included in the delivery.
Installing the drive module shelves and connecting the cables – ACS880-01 frames R6 to R9

1. Go through steps 1 to 9 in section Power cable connection procedure (IEC) on page 49.

2. Remove the shroud on the power cable terminals by releasing the clips and lifting the shroud up from the sides with a screwdriver (a). Knock out holes in the shroud for the cables to be installed (b).

3. Attach the mechanical support shelf for the power cables to the drive module. **Note**: This shelf is not included with option +C135.

4. Attach the mechanical support shelf for the power cables to the mounting plate. **Note**: This shelf is not included with option +C135.

5. Connect the twisted shields of the power cables under the grounding clamps or with cable lugs to the grounding clamp screws.

6. Connect the phase conductors of the input cable to the L1, L2 and L3 terminals and the phase conductors of the motor cable to the T1/U, T2/V and T3/W terminals. Connect the brake resistor conductors (if present) to the R+ and R- terminals. Tighten the screws to the torque given in the figure below.

7. Reinstall the shroud on the power terminals.

8. Go to section Connecting the control cables - ACS880-01 frames R6 to R9 on page 66.
Electrical installation 65

<table>
<thead>
<tr>
<th>L1, L2, L3, T1/U, T2/V, T3/W</th>
<th>R-, R+/UD, C+, UDC-</th>
</tr>
</thead>
<tbody>
<tr>
<td>(N·m)</td>
<td>(N·m)</td>
</tr>
<tr>
<td>R6   30</td>
<td>20</td>
</tr>
<tr>
<td>R7   40 (30*)</td>
<td>30</td>
</tr>
<tr>
<td>R8   40</td>
<td>40</td>
</tr>
<tr>
<td>R9   70</td>
<td>70</td>
</tr>
</tbody>
</table>

* 525...690 V
Connecting the control cables - ACS880-01 frames R6 to R9

1. Strip the cable ends and cut to suitable length (note the extra length of the grounding conductors).
2. Ground the outer shields of all control cables 360 degrees at the cabinet entry.
3. Secure cables mechanically at the clamps.
4. Ground the pair-cable shields to the clamps. Leave the other end of the shields unconnected or ground them indirectly via a high-frequency capacitor with a few nanofarads, eg, 3.3 nF / 630 V.
5. Connect the conductors to the appropriate terminals of the control board (see section Default I/O connections in the hardware manual).
6. Wire the optional modules if included in the delivery.
Installation checklist

What this chapter contains

This chapter contains a list for checking the mechanical and electrical installation of the drive module.

Installation checklist

Go through the checklist below together with another person.

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

<table>
<thead>
<tr>
<th>Check that ...</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cabinet construction</strong></td>
<td></td>
</tr>
<tr>
<td>The drive module is attached correctly to the cabinet. (See chapters Guidelines for planning the cabinet installation and Mechanical installation.)</td>
<td></td>
</tr>
<tr>
<td>Mechanical joints are tightened and not broken.</td>
<td></td>
</tr>
<tr>
<td>Parts are clean and painted surfaces not scratched. The cabinet frame and parts which are in metal to metal contact with the frame (for example seams, component fixing points on assembly plates, back of control unit mounting plate) are not finished with non-conducting paint or material.</td>
<td></td>
</tr>
<tr>
<td>Degree of protection (IPxx)</td>
<td></td>
</tr>
</tbody>
</table>
### Installation checklist

#### Check that …

<table>
<thead>
<tr>
<th>Drive option modules and other components</th>
<th>☑</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type and number of option modules and other equipment is correct. Option modules and other equipment are not damaged.</td>
<td>☐</td>
</tr>
<tr>
<td>Option modules and terminals are labelled correctly.</td>
<td>☐</td>
</tr>
<tr>
<td>The placement of option modules and other equipment inside the cabinet and on the cabinet door is correct.</td>
<td>☐</td>
</tr>
<tr>
<td>The mounting of option modules and other equipment is correct.</td>
<td>☐</td>
</tr>
</tbody>
</table>

#### Internal cabling of the cabinet assembly

Main circuit:
- AC supply input cabling is ok.
- AC output cabling is ok.
- Supply for brake resistor (if used) is ok.

| Cable types, cross-sections, colors and optional markings are correct. | ☐ |
| Cabling is not susceptible to interference. Check the twisting of cables and cable routes. | ☐ |

Connection of cables to devices, terminal blocks and drive module circuit boards:
- Cables are connected to terminals tight enough. (Pull the conductors to check.)
- Cable termination on terminals chaining is done correctly.
- Bare conductors are not too far outside the terminal causing an insufficient clearance or loss of shielding against contact.
- The control unit is wired properly to the drive module.
- The control panel cable is connected correctly.

| Cables are not lying against sharp edges or bare live parts. Bending radius of fiber optic cables is at least 3.5 cm (1.38 in.). | ☐ |
| The type, markings, insulation plates and cross connections of terminal blocks are correct. | ☐ |

#### Grounding and protection

| The grounding colors, cross-section and grounding points of modules and other equipment agree with the circuit diagrams. No long routes for pigtails. | ☐ |
| Connections of PE cables and busbars are tight enough. Pull the cable to test that it does not loosen. No long routes for pigtails. | ☐ |
| Doors equipped with electrical equipment are grounded. No long grounding routes. From EMC standpoint best result is achieved with a flat copper braid. | ☐ |
### Installation checklist

#### Fans that can be touched are shrouded.
- [x]

#### Live parts inside the doors are protected against direct contact to at least IP2x.
- [ ]

#### Labels
- The type designation and instruction labels and warning are made according to the local regulations and placed correctly.
- [ ]

#### Switches and doors
- Mechanical switches, main disconnecting switch and cabinet doors function correctly.
- [ ]

#### Installation of the cabinet
- The drive cabinet has been attached to floor and also from top to the wall or roof.
- [ ]

- The ambient operating conditions agree with the specifications given in chapter Technical data in the hardware manual.
- [ ]

- The cooling air will flow freely in and out of the drive cabinet, and air recirculation inside the cabinet will not be possible (air baffle plates are on place).
- [ ]

- If the drive module has been stored over three years: The electrolytic DC capacitors in the DC link of the drive have been reformed. See Converter module capacitor reforming instructions (3BFE64059629 [English]).
- [ ]

- There is an adequately sized protective ground conductor between the drive and the switchboard.
- [ ]

- There is an adequately sized protective ground conductor between the motor and the drive.
- [ ]

- All protective ground conductors have been connected to the appropriate terminals and the terminals have been tightened. (Pull the conductors to check.)
- [ ]

- The enclosures of the equipment in the cabinet have proper galvanic connection to the cabinet protective earth (ground) busbar; The connection surfaces at the fastening points are bare (unpainted) and the connections are tight, or separate grounding conductors have been installed.
- [ ]

- The supply voltage agrees with the nominal input voltage of the drive. Check the type designation label.
- [ ]

- The input power cable has been connected to the appropriate terminals, the phase order is right, and the terminals have been tightened. (Pull the conductors to check.)
- [ ]

- Appropriate AC fuses and a main disconnector have been installed.
- [ ]
## Installation checklist

<table>
<thead>
<tr>
<th>Check that …</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The motor cable has been connected to the appropriate terminals, the phase order is right, and the terminals have been tightened. (Pull the conductors to check.)</td>
<td>☑</td>
</tr>
<tr>
<td>The brake resistor (if present) has been connected to the appropriate terminals, and the terminals have been tightened. (Pull the conductors to check.)</td>
<td>☐</td>
</tr>
<tr>
<td>The motor cable (and brake resistor cable, if present) has been routed away from other cables.</td>
<td>☐</td>
</tr>
<tr>
<td>No power factor compensation capacitors have been connected to the motor cable.</td>
<td>☐</td>
</tr>
<tr>
<td>The control cables (if any) have been connected to the appropriate terminals, and the terminals have been tightened. (Pull the conductors to check.)</td>
<td>☐</td>
</tr>
<tr>
<td><strong>If a drive bypass connection is used:</strong> The direct-on-line contactor of the motor and the drive output contactor are either mechanically or electrically interlocked, i.e., cannot be closed simultaneously.</td>
<td>☐</td>
</tr>
<tr>
<td>There are no tools, foreign objects or dust from drilling inside the drive module and the cabinet.</td>
<td>☐</td>
</tr>
<tr>
<td>All shrouds and cover of the motor connection box are in place. Cabinet doors have been closed.</td>
<td>☐</td>
</tr>
<tr>
<td>The motor and the driven equipment are ready for start.</td>
<td>☐</td>
</tr>
</tbody>
</table>
Technical data

What this chapter contains

This chapter contains some technical data of the drive module. For other data, see the hardware manual.
## Dimensions, weights and free space requirements

**Note:**
For more information on dimensions, see chapters *Dimension drawings – ACS880-01* and *Dimension drawings – ACS880-11 and ACS880-31.*

### ACS880-01 +P940

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<td>mm</td>
<td>kg</td>
<td>in.</td>
<td>in.</td>
<td>in.</td>
<td>lb</td>
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<td>22.35</td>
<td>9.92</td>
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<td>645</td>
<td>284</td>
<td>365</td>
<td>47.6</td>
<td>25.39</td>
<td>11.18</td>
<td>14.35</td>
<td>105</td>
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<tr>
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<td>300</td>
<td>386</td>
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### ACS880-01 +P944

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<td>in.</td>
<td>in.</td>
<td>in.</td>
<td>lb</td>
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<tr>
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<td>284</td>
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<td>48.6</td>
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<td>R8</td>
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<tr>
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<td>413</td>
<td>86.6</td>
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### ACS880-11 and ACS880-31 +P940

<table>
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<tr>
<td></td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>kg</td>
<td>in.</td>
<td>in.</td>
<td>in.</td>
<td>lb</td>
</tr>
<tr>
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<td>16.94</td>
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</tr>
</tbody>
</table>
200 mm (7.87 in.) free space is required at top of the drive module.
300 mm (11.81 in.) free space is required at bottom of the drive module.

**Degree of protection**

IP20 (UL Open Type)
Dimension drawings – ACS880-01

What this chapter contains

This chapter contains dimension drawings of the ACS880-01 drive module.
R1 (Option +P940, IP20, UL Open Type)
R1 (Option +P944, IP20, UL Open Type)
R2 (Option +P940, IP20, UL Open Type)
R2 (Option +P944, IP20, UL Open Type)
R3 (Option +P940, IP20, UL Open Type)
R3 (Option +P944, IP20, UL Open Type)
R4 (Option +P940, IP20, UL Open Type)
R4 (Option +P944, IP20, UL Open Type)
R5 (Option +P940, IP20, UL Open Type)
R5 (Option +P944, IP20, UL Open Type)
R6 (Option +P940, IP20, UL Open Type)
R6 (Option +P944, IP20, UL Open Type)
R7 (Option +P940, IP20, UL Open Type)
R7 (Option +P944, IP20, UL Open Type)
R8 (Option +P940, IP20, UL Open Type)
R8 (Option +P944, IP20, UL Open Type)
R9 (Option +P940, IP20, UL Open Type)
R9 (Option +P944, IP20, UL Open Type)
Dimension drawings – ACS880-11 and ACS880-31

What this chapter contains

This chapter contains dimension drawings of the ACS880-11 and ACS880-31 drive modules.
R3 – Option +P940 (IP20, UL Open Type)
R6 – Option +P940 (IP20, UL Open Type)
R8 – Option +P940 (IP20, UL Open Type)
Further information

Product and service inquiries
Address any inquiries about the product to your local ABB representative, quoting the type designation and serial number of the unit in question. A listing of ABB sales, support and service contacts can be found by navigating to abb.com/searchchannels.

Product training
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