ABB INDUSTRIAL DRIVES

ACS880-204 IGBT supply modules
Hardware manual
ACS880-204 IGBT supply modules

Hardware manual

5. Electrical installation

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Further information
Introduction to the manual

Contents of this chapter
This chapter gives basic information on the manual.

Applicability
The manual is applicable to the ACS880-204 IGBT supply modules for user-defined cabinet installations.

Safety instructions
Obey all safety instructions delivered with the drive.
- Read the complete safety instructions before you install, commission, use or service the drive. The complete safety instructions are given in ACS880 multidrive cabinets and modules safety instructions (3AUA0000102301 [English]).
- Read the software-function-specific warnings and notes before changing the default settings of a function. For each function, the warnings and notes are given in the section describing the related user-adjustable parameters.
- Read the task-specific safety instructions before starting the task. See the section describing the task.

Target audience
This manual is intended for people who plan the installation, install, start up and do maintenance work on the drive, or create instructions for the end user of the drive concerning the installation and maintenance of the drive.

Read the manual before working on the drive. You are expected to know the fundamentals of electricity, wiring, electrical components and electrical schematic symbols.
Categorization by frame size and option code

The instructions and technical data which concern only certain module or frame sizes are marked with the size identifier.

The module size can be identified from the basic code visible on the type designation label, for example, ACS880-204-0420A-3 where 0420A is the module size. The option codes of the module are listed after the plus sign.

The frame size of the IGBT supply module is, for example, R8i.

Use of component designations

Some device names in the manual include the item designation in brackets, for example [Q20], to make it possible to identify the components in the circuit diagrams of the drive.

Terms and abbreviations

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAMU</td>
<td>Auxiliary measurement unit</td>
</tr>
<tr>
<td>BCON</td>
<td>Type of control board</td>
</tr>
<tr>
<td>BCU</td>
<td>Type of control unit</td>
</tr>
<tr>
<td>BDFC</td>
<td>Control board for direct-on-line cooling fan</td>
</tr>
<tr>
<td>BDPS</td>
<td>Module internal power supply board</td>
</tr>
<tr>
<td>BFPS</td>
<td>Control and power supply board for speed-controlled cooling fan</td>
</tr>
<tr>
<td>Control board</td>
<td>Circuit board in which the control program runs</td>
</tr>
<tr>
<td>Control unit</td>
<td>Control board built in a housing (often rail-mountable)</td>
</tr>
<tr>
<td>Cubicle</td>
<td>One section of a cabinet-installed drive. A cubicle is typically behind a door of its own.</td>
</tr>
<tr>
<td>CVAR</td>
<td>Varistor board</td>
</tr>
<tr>
<td>DC link</td>
<td>DC circuit between rectifier and inverter</td>
</tr>
<tr>
<td>DI</td>
<td>Digital input</td>
</tr>
<tr>
<td>Drive</td>
<td>Frequency converter for controlling AC motors</td>
</tr>
<tr>
<td>EMC</td>
<td>Electromagnetic compatibility</td>
</tr>
<tr>
<td>FCNA-01</td>
<td>Optional ControlNet™ adapter module</td>
</tr>
<tr>
<td>FDCO-01</td>
<td>DDCS communication module with two pairs of 10 Mbit/s DDCS channels</td>
</tr>
<tr>
<td>FDNA-01</td>
<td>Optional DeviceNet™ adapter module</td>
</tr>
<tr>
<td>FDPI</td>
<td>Diagnostics and panel interface board</td>
</tr>
<tr>
<td>FECA-01</td>
<td>Optional EtherCAT® adapter module</td>
</tr>
<tr>
<td>FENA-11</td>
<td>Optional Ethernet adapter module for EtherNet/IP™, Modbus TCP® and PROFINET IO® protocols</td>
</tr>
<tr>
<td>FENA-21</td>
<td>Optional Ethernet adapter module for EtherNet/IP™, Modbus TCP® and PROFINET IO® protocols, 2-port</td>
</tr>
<tr>
<td>FEPL-01</td>
<td>Optional Ethernet POWERLINK adapter module</td>
</tr>
<tr>
<td>FIO-01</td>
<td>Optional digital I/O extension module</td>
</tr>
<tr>
<td>FIO-11</td>
<td>Optional analog I/O extension module</td>
</tr>
<tr>
<td>Flat-PLS</td>
<td>Rittal Flat-PLS, a busbar system for standard, commercially available flat busbars</td>
</tr>
<tr>
<td>FPBA-01</td>
<td>Optional PROFIBUS DP® adapter module</td>
</tr>
<tr>
<td>Frame, frame size</td>
<td>Physical size of the drive or power module</td>
</tr>
<tr>
<td>FSCA-01</td>
<td>Optional RS-485 (Modbus/RTU) adapter</td>
</tr>
<tr>
<td>Generic enclosure</td>
<td>See chapter Ordering information.</td>
</tr>
<tr>
<td>ICU</td>
<td>Incoming unit</td>
</tr>
</tbody>
</table>
Term | Description
---|---
**IGBT supply module** | IGBT bridge and related components enclosed inside a metal frame or enclosure. Intended for cabinet installation.
**IGBT supply unit** | IGBT supply module(s) under control of one control unit, and related components.
**Intermediate circuit** | DC circuit between rectifier and inverter
**INU** | Inverter unit
**Inverter** | Converts direct current and voltage to alternating current and voltage.
**Inverter module** | Inverter bridge, related components and drive DC link capacitors enclosed in a metal frame or enclosure. Intended for cabinet installation.
**Inverter unit** | Inverter module(s) under control of one control unit, and related components. One inverter unit typically controls one motor.
**ISU** | IGBT supply unit
**LCL filter** | Inductor-capacitor-inductor filter
**Multidrive** | Drive for controlling several motors which are typically coupled to the same machinery. Includes one supply unit, and one or several inverter units.
**Parameter** | In the drive control program, user-adjustable operation instruction to the drive, or signal measured or calculated by the drive. In some (for example fieldbus) contexts, a value that can be accessed as an object, eg, variable, constant, or signal.
**RDCO** | Optical DDCS communication module
**Rectifier** | Converts alternating current and voltage to direct current and voltage
**Single drive** | Drive for controlling one motor
**Supply unit** | Supply module(s) under control of one control unit, and related components.
**WBCA** | Mounting adapter for WFU filters that enables supply cabling from below.
**WFU** | Series of LCL-filters, for example WFU-11
**ZCON** | Type of control board
**ZCU** | Type of control unit
**ZMU** | Type of memory unit, attached to the control unit

**Related documents**

<table>
<thead>
<tr>
<th>Manual</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General manuals</strong></td>
<td></td>
</tr>
<tr>
<td>ACS880 multidrive cabinets and modules safety instructions</td>
<td>3AUA0000102301</td>
</tr>
<tr>
<td>ACS880 multidrive cabinets and modules electrical planning instructions</td>
<td>3AUA0000102324</td>
</tr>
<tr>
<td>Drive modules cabinet design and construction instructions</td>
<td>3AUA0000107668</td>
</tr>
<tr>
<td>BCU-02/12/22 control units hardware manual</td>
<td>3AUA0000113605</td>
</tr>
<tr>
<td><strong>Supply module manuals</strong></td>
<td></td>
</tr>
<tr>
<td>ACS880-204 IGBT supply modules hardware manual</td>
<td>3AUA0000131525</td>
</tr>
<tr>
<td>ACS880 IGBT supply control program firmware manual</td>
<td>3AUA0000131562</td>
</tr>
<tr>
<td>ACS880 multidrives, Optimal grid control (option N8053) supplement</td>
<td>3AXD50000220717</td>
</tr>
<tr>
<td>Optimal grid control of ACS880 IGBT supply control program supplement</td>
<td>3AXD50000164745</td>
</tr>
<tr>
<td>ACS880-304...+A003 diode supply modules hardware manual</td>
<td>3AUA0000102452</td>
</tr>
<tr>
<td>ACS880-304...+A018 diode supply modules hardware manual</td>
<td>3AXD5000010104</td>
</tr>
<tr>
<td>ACS880 diode supply control program firmware manual</td>
<td>3AUA0000103295</td>
</tr>
<tr>
<td>ACS880-904 regenerative rectifier modules hardware manual</td>
<td>3AXD5000020457</td>
</tr>
<tr>
<td>ACS880 regenerative rectifier control program firmware manual</td>
<td>3AXD5000020827</td>
</tr>
<tr>
<td><strong>Inverter module manuals and guides</strong></td>
<td></td>
</tr>
<tr>
<td>ACS880-104 inverter modules hardware manual</td>
<td>3AUA0000104271</td>
</tr>
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</table>
## Introduction to the manual

<table>
<thead>
<tr>
<th>Manual</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS880 primary control program firmware manual</td>
<td>3AUA0000085967</td>
</tr>
<tr>
<td>ACS880 primary control program quick start-up guide</td>
<td>3AUA0000098062</td>
</tr>
</tbody>
</table>

### Brake module and DC/DC converter module manuals

<table>
<thead>
<tr>
<th>Manual</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS880-604 1-phase brake chopper modules hardware manual</td>
<td>3AUA0000106244</td>
</tr>
<tr>
<td>ACS880-604 3-phase dynamic brake modules as units hardware manual</td>
<td>3AXD50000022033</td>
</tr>
<tr>
<td>ACS880 (3-phase) brake control program firmware manual</td>
<td>3AXD50000020967</td>
</tr>
<tr>
<td>ACS880-1604 DC/DC converter modules hardware manual</td>
<td>3AXD50000023642</td>
</tr>
<tr>
<td>ACS880 DC/DC converter control program firmware manual</td>
<td>3AXD50000024671</td>
</tr>
</tbody>
</table>

### Module package hardware manuals

<table>
<thead>
<tr>
<th>Manual</th>
<th>Code</th>
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<tbody>
<tr>
<td>ACS880-04 single drive module packages (560 to 2200 kW) hardware manual</td>
<td>3AUA0000138495</td>
</tr>
<tr>
<td>ACS880-14 and -34 single drive module packages hardware manual</td>
<td>3AXD5000022021</td>
</tr>
</tbody>
</table>

### Option manuals

<table>
<thead>
<tr>
<th>Manual</th>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>ACS880 +C132 marine type-approved drive modules and module packages supplement</td>
<td>3AXD50000037752</td>
</tr>
<tr>
<td>ACX-AP-x assistant control panels user’s manual</td>
<td>3AUA0000085685</td>
</tr>
<tr>
<td>BAMU-12C auxiliary measurement unit hardware manual</td>
<td>3AXD50000117840</td>
</tr>
<tr>
<td>Drive composer start-up and maintenance PC tool user’s manual</td>
<td>3AUA0000094606</td>
</tr>
<tr>
<td>Drive application programming (IEC 61131-3) manual</td>
<td>3AUA0000127808</td>
</tr>
<tr>
<td>Converter module lifting device for drive cabinets hardware manual</td>
<td>3AXD50000210268</td>
</tr>
<tr>
<td>Installation frames for ACS880 multdrive modules hardware manual</td>
<td>3AXD5000010531</td>
</tr>
</tbody>
</table>

Manuals and quick guides for I/O extension modules, fieldbus adapters, safety functions modules, etc.


You can find all documentation related to the multdrive modules on the Internet at [https://sites-apps.abb.com/sites/lvacdrivesengineeringsupport/content](https://sites-apps.abb.com/sites/lvacdrivesengineeringsupport/content).
Operation principle and hardware description

Contents of this chapter
This chapter describes how the IGBT supply unit works and also the hardware of the ACS880-204 IGBT supply module.

Operation principle
IGBT supply unit rectifies three-phase AC current to direct current for the intermediate DC link of the drive. The intermediate DC link supplies the inverters that run the motors. There can be one inverter unit only (single drives) or several inverter units (multidrives) connected to the intermediate circuit.

The LCL filter is an essential part of the IGBT supply unit. The supply module does not work without the filter. It suppresses the AC voltage distortion and current harmonics. The high AC inductance smooths the line voltage waveform distorted by the high-frequency switching of the converter. Capacitive component of the filter effectively filters the high-frequency (over 1 kHz) harmonics.
Simplified main circuit diagram

The following figure shows the simplified main circuit diagram of the rectifier.

1. AC voltage
2. AC fuses
3. LCL filter
4. IGBT supply module
5. DC fuses
6. DC voltage

Charging

A charging circuit powers up the DC link capacitors of the drive system smoothly. Discharged capacitors cannot be directly connected to the full supply voltage. The charging current must be limited until the capacitors are charged and ready for normal use.

Note: Frames R1i...R4i IGBT supply modules have an inbuilt charging circuit and they do not need external charging components.

The control program has a function for controlling the charging circuit. For further information, see the firmware manual.
Overview diagram of the drive system

The following figure shows a simplified diagram of a common DC bus drive system.

- **1** AC supply
- **2** Input AC fuses
- **3** LCL filter
- **4** IGBT supply unit
- **5** Supply unit DC fuses
- **6** DC bus
- **7** Inverter DC fuses (with or without DC switch-disconnector)
- **8** Inverter units (in the example, one of the two units consists of two inverter modules connected in parallel)
- **9** DC fuses for optional brake chopper
- **10** Optional brake chopper
- **11** Motor(s)
Single-line circuit diagrams of the supply unit

The following figures are examples of possible IGBT supply unit configurations. The connection is the same in both Rittal VX25 and generic enclosures. The tables give explanations for the numbers and letters of the diagrams. They also indicate if the components can be ordered from ABB or if the customer needs to acquire them separately. For components, see the ordering information.

- Frames R1i…R4i

The following figure shows a connection example of a supply unit with a frame size R1i…R4i module.

<p>| | | | |</p>
<table>
<thead>
<tr>
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</tr>
</tbody>
</table>

1. AC supply network -

A IGBT supply module cubicle (ISU)

2a. Main switch-disconnector (OS type) with main AC fuses (IEC) ABB or third party

A ISU

2b. Main switch-disconnector (OT type) (UL, CSA) ABB or third party

A ISU

2c. Main AC fuses (UL, CSA) ABB or third party

A ISU

3. Main contactor ABB or third party

A ISU

4. LCL filter module (WFU-xx) ABB

A ISU

5. IGBT supply module (frame R1i…R4i) ABB

A ISU

6. DC fuses ABB or third party

A ISU

7. DC link -
### Frame R6i

The following figure shows a connection example of a supply unit with a frame size R6i module.

<table>
<thead>
<tr>
<th></th>
<th>AC supply network</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>IGBT supply module cubicle (ISU)</td>
<td>2. Main switch-disconnector</td>
</tr>
<tr>
<td>3.</td>
<td>Charging switch-fuse</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>4.</td>
<td>Charging contactor</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>5.</td>
<td>Charging resistors</td>
<td>ABB</td>
</tr>
<tr>
<td>6.</td>
<td>Charging fuses</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>7.</td>
<td>Main contactor</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>8.</td>
<td>LCL filter</td>
<td>ABB</td>
</tr>
<tr>
<td>9.</td>
<td>IGBT supply module (frame R6i)</td>
<td>ABB</td>
</tr>
<tr>
<td>10.</td>
<td>Common mode filter</td>
<td>ABB</td>
</tr>
<tr>
<td>11.</td>
<td>DC fuses</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>12.</td>
<td>DC link</td>
<td></td>
</tr>
</tbody>
</table>
## Frame 1×R8i

The following figure shows a connection example of a supply unit with one frame R8i module.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>AC supply network</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>Main switch-disconnector</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>3.</td>
<td>AC fuses</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>4.</td>
<td>Charging switch fuse</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>5.</td>
<td>Charging contactor</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>6.</td>
<td>Charging resistors</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>7.</td>
<td>Main contactor</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>8.</td>
<td>LCL filter</td>
<td>ABB</td>
</tr>
<tr>
<td>9.</td>
<td>IGBT supply module (frame R8i)</td>
<td>ABB</td>
</tr>
<tr>
<td>10.</td>
<td>Common mode filter</td>
<td>ABB</td>
</tr>
<tr>
<td>11.</td>
<td>DC fuses</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>12.</td>
<td>DC link</td>
<td>-</td>
</tr>
</tbody>
</table>
### Frame R8i multiples

The following figure shows a connection example of a supply unit with multiple frame R8i modules (2×8i).

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AC supply network</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Incoming cubicle (ICU)</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>A</td>
<td>ICU</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>AC fuses</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>A</td>
<td>Charging switch fuse</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>A</td>
<td>Charging contactor</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>A</td>
<td>Charging resistors</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>A</td>
<td>Main contactor</td>
<td>ABB or third party</td>
</tr>
<tr>
<td>B</td>
<td>LCL filter</td>
<td>ABB</td>
</tr>
<tr>
<td>B</td>
<td>ISU</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>IGBT supply module (frame R8i)</td>
<td>ABB</td>
</tr>
<tr>
<td>B</td>
<td>ISU</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Common mode filter</td>
<td>ABB</td>
</tr>
<tr>
<td>B</td>
<td>ISU</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>DC fuses</td>
<td>ABB or third party</td>
</tr>
<tr>
<td></td>
<td>DC link</td>
<td></td>
</tr>
</tbody>
</table>
IGBT supply module hardware

The following figures show the layout of the IGBT supply modules and LCL filters.

Frame R1i layout

Frame R1i is pictured (frame R2i has a similar layout).

<table>
<thead>
<tr>
<th>Item</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC connection (obscured)</td>
</tr>
<tr>
<td>2</td>
<td>AC connection (obscured)</td>
</tr>
<tr>
<td>3</td>
<td>Grounding/clamping plates for power cables</td>
</tr>
<tr>
<td>4</td>
<td>ZCU control unit</td>
</tr>
<tr>
<td>5</td>
<td>Power unit</td>
</tr>
<tr>
<td>6</td>
<td>Slots for optional I/O modules</td>
</tr>
<tr>
<td>7</td>
<td>I/O terminal blocks</td>
</tr>
<tr>
<td>8</td>
<td>Grounding/clamping plate for control cables</td>
</tr>
<tr>
<td>9</td>
<td>Memory unit</td>
</tr>
<tr>
<td>10</td>
<td>Control panel connector</td>
</tr>
<tr>
<td>11</td>
<td>Air temperature sensor</td>
</tr>
<tr>
<td>12</td>
<td>Cover with recess for control panel (can optionally be left out)</td>
</tr>
</tbody>
</table>
Frame R4i layout
Frame R4i is pictured (frame R3i has a similar layout).

<table>
<thead>
<tr>
<th>Item</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC connection (under connector cover)</td>
</tr>
<tr>
<td>2</td>
<td>AC connection (under connector cover)</td>
</tr>
<tr>
<td>3</td>
<td>Grounding/clamping plates for power cables</td>
</tr>
<tr>
<td>4</td>
<td>ZCU control unit</td>
</tr>
<tr>
<td>5</td>
<td>Power unit</td>
</tr>
<tr>
<td>6</td>
<td>Slots for optional I/O modules</td>
</tr>
<tr>
<td>7</td>
<td>I/O terminal blocks</td>
</tr>
<tr>
<td>8</td>
<td>Grounding/clamping plate for control cables</td>
</tr>
<tr>
<td>9</td>
<td>Memory unit</td>
</tr>
<tr>
<td>10</td>
<td>Control panel connector</td>
</tr>
<tr>
<td>11</td>
<td>Air temperature sensor</td>
</tr>
<tr>
<td>12</td>
<td>Cover with panel mounting platform (can optionally be left out)</td>
</tr>
</tbody>
</table>
### Frame R6i layout

<table>
<thead>
<tr>
<th>Item</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC connection</td>
</tr>
<tr>
<td>2</td>
<td>AC connection</td>
</tr>
<tr>
<td>3</td>
<td>ZCU control unit (with slots for optional I/O modules)</td>
</tr>
<tr>
<td>4</td>
<td>I/O terminal blocks</td>
</tr>
<tr>
<td>5</td>
<td>Control panel connector, memory unit</td>
</tr>
<tr>
<td>6</td>
<td>Grounding/clamping plates for control cables</td>
</tr>
<tr>
<td>7</td>
<td>Cooling fan holder</td>
</tr>
<tr>
<td>8</td>
<td>Lifting eyes</td>
</tr>
<tr>
<td>9</td>
<td>The grounding point (PE) between module frame and cabinet frame</td>
</tr>
</tbody>
</table>
## Frame R8i hardware

Frame R8i modules are used in single or parallel configurations. R8i modules run on wheels, and can easily be removed from the cubicle for cable installation or service.

The quick connector at the back of the module couples when the module is inserted into the cubicle.

Each parallel-connected module is cabled separately, or connected by busbars to adjacent modules to reduce the number of cables.

The internal electronics of the R8i module need to be powered from an external auxiliary voltage source. The R8i speed-controlled cooling fan (delivered as standard) is supplied internally from DC.

If a direct-on-line fan (option +C188) is used, the user must connect the fan supply (400 V AC / 50/60 Hz or 320 V AC / 60 Hz) to the terminal block [X50].

Frame R8i (and multiples, if any) modules are controlled by a single BCU control unit installed separately from the module(s). The control unit is connected to each module by a fiber optic link. The control unit can be powered from the module (terminal block X53), from an external 24 V DC supply, or both for redundancy. The control unit contains the basic I/Os and slots for optional I/O modules. Other equipment is primarily installed on separate mounting plates.
This figure shows the layout of the R8i module.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>R8i module, front</td>
</tr>
<tr>
<td>B</td>
<td>R8i module, back</td>
</tr>
<tr>
<td>1</td>
<td>DC busbars</td>
</tr>
<tr>
<td>2</td>
<td>Handle</td>
</tr>
<tr>
<td>3</td>
<td>LEDs and fiber optic connectors</td>
</tr>
<tr>
<td>4</td>
<td>Fan (standard speed-controlled fan shown; a direct-on-line fan is available as option +C188)</td>
</tr>
<tr>
<td>5</td>
<td>Quick connector (three phases). The counterpart is fastened to the cabinet behind the module.</td>
</tr>
<tr>
<td>6</td>
<td>Wheels</td>
</tr>
<tr>
<td>7</td>
<td>Type designation label</td>
</tr>
<tr>
<td>8</td>
<td>Terminal block [X50] (power supply for internal boards and module heating element, option +C183; DOL fan supply, option +C188)</td>
</tr>
<tr>
<td>9</td>
<td>Connectors [X51], [X52], [X53]</td>
</tr>
<tr>
<td>10</td>
<td>The unpainted grounding point (PE) between module frame and cabinet frame.</td>
</tr>
<tr>
<td>11</td>
<td>Lifting eyes</td>
</tr>
<tr>
<td>12</td>
<td>Circuit board compartment fan</td>
</tr>
</tbody>
</table>
Connectors X50…X53

The cabinet builder must arrange an auxiliary voltage of 230 V AC (or 115 V AC with option +G304) to connector X50 to power the electronics of the power module. Also, the cabinet builder must arrange an auxiliary voltage of 230 V AC to connector X50 to power the main circuit interface board of the module during charging.

There is an internal power supply (BDPS) in the module that produces 24 V DC from the auxiliary voltage for the internal circuit boards. The 24 V DC voltage is available on X53 and it can be used to power the BCU control unit. It is not allowed to use the 24 V DC output on terminal X53 for any other purpose than for powering the BCU control unit. If the unit consists of parallel-connected R8i modules, ABB recommends to use an external 24 V DC supply to power the BCU control unit.

If a direct-on-line fan (option +C188) is used, the user must connect the fan supply (400 V AC 50 Hz or 60 Hz) to the module control connector [X50.1]. If an internal heating element (option +C183) is used, the user must connect the supply for the heating element to the module control connector [X50.7].

### Connector X50

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Not in use.</td>
</tr>
<tr>
<td>8</td>
<td>N 115/230 V AC (50/60 Hz) input for optional heating element (+C183). The cabinet builder must connect this when the option is in use.</td>
</tr>
<tr>
<td>7</td>
<td>L Not in use.</td>
</tr>
<tr>
<td>6</td>
<td>Not in use.</td>
</tr>
<tr>
<td>5</td>
<td>N 115/230 V AC 50 Hz input for internal power supply (BDPS) (115 V AC 60 Hz with option +G304). The cabinet builder must connect this.</td>
</tr>
<tr>
<td>4</td>
<td>L Not in use.</td>
</tr>
<tr>
<td>3</td>
<td>W 400 V AC (50/60 Hz) supply for optional DOL (direct-online) cooling fan (option +C188). The cabinet builder must connect this when the option is in use.</td>
</tr>
<tr>
<td>2</td>
<td>V Not in use.</td>
</tr>
<tr>
<td>1</td>
<td>U Not in use.</td>
</tr>
</tbody>
</table>

Note: In modules without +C188, the DOL wiring is present but not in use.

### Connectors X51, X52, X53

<table>
<thead>
<tr>
<th>X51</th>
<th>X52</th>
<th>X53</th>
<th>STO OUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>FE</td>
<td>GND</td>
<td>2AV</td>
<td>GND</td>
</tr>
<tr>
<td>2AV</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Connectors X51, X52, X53

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X52</td>
<td>STO IN connector of the module. Must be connected to 24 V DC for the module to start.</td>
</tr>
<tr>
<td>X53</td>
<td>24 V OUT connector. 24 V DC for BCU and for STO IN to enable the module operation.</td>
</tr>
</tbody>
</table>

**Note:** The Safe torque off (STO) safety function is only implemented in inverter units. Therefore, the STO function cannot be used in supply, rectifier, DC/DC converter and brake units. In these units, de-energizing any connection of STO IN (X52) connector stops the unit. Note that this stop is not safety related and must not be used for safety function purposes.
- **LCL filter module (filter for frames R1i...R4i)**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Input terminals</td>
</tr>
<tr>
<td>2</td>
<td>Cooling fan</td>
</tr>
<tr>
<td>3</td>
<td>LCL filter</td>
</tr>
<tr>
<td>4</td>
<td>Connector X102</td>
</tr>
<tr>
<td>5</td>
<td>Connector X103</td>
</tr>
<tr>
<td>6</td>
<td>Pre-wired output cable</td>
</tr>
</tbody>
</table>

![Diagram of LCL filter module](image_url)
Connectors X102 and X103

<table>
<thead>
<tr>
<th>WFU-xx module connector X102</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>1. 0 V</td>
</tr>
<tr>
<td>2. Fan power supply, 24 V / 0 V</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WFU-xx module connector X103</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>1. Fan on/off, 24 V / 0 V</td>
</tr>
<tr>
<td>2. 0 V</td>
</tr>
<tr>
<td>3. Thermistor, TH</td>
</tr>
<tr>
<td>4. Thermistor, TH</td>
</tr>
</tbody>
</table>

![Diagram of WFU-xx module connectors X102 and X103]
LCL filter module (type ALCL-05-5 for frame R6i)

1. Input (AC) connection
2. Output (AC) connection
3. Cooling fan
4. Terminal block X50 (power supply for module fan and temperature switch)
## Connectors X50 and X1

### ALCL-05-5 module connector X50

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. DOL fan L (230 V AC or option +G304: 115 V AC)</td>
</tr>
<tr>
<td>2. DOL fan N (230 V AC or option +G304: 115 V AC)</td>
</tr>
<tr>
<td>3. Temperature switch in</td>
</tr>
<tr>
<td>4. Not in use</td>
</tr>
<tr>
<td>5. Not in use</td>
</tr>
<tr>
<td>6. Not in use</td>
</tr>
<tr>
<td>7. Not in use</td>
</tr>
<tr>
<td>8. Not in use</td>
</tr>
<tr>
<td>9. Temperature switch out</td>
</tr>
</tbody>
</table>

### ALCL-05-5 module fan connector X1

**Note:** Connections of the connector X1 are ready-made at the factory.

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. PE</td>
</tr>
<tr>
<td>3. Not in use</td>
</tr>
<tr>
<td>2. DOL fan N (230 V AC or option +G304: 115 V AC)</td>
</tr>
<tr>
<td>1. DOL fan L (230 V AC or option +G304: 115 V AC)</td>
</tr>
</tbody>
</table>
LCL filter module (type BLCL-1x-x for frame 1×R8i)

- **A** LCL filter module, front
- **B** LCL filter module, back

1. Input (AC) connection
2. Output (AC) connection
3. Terminal block [X55] (power supply for module heating element, option +C183; direct-on-line fan supply, option +C188) (ready-connected)
4. Handle
5. Fan
6. Wheels
7. Fiber optic connections and LEDs of the BDFC board
8. Terminal block [X30] (power supply for module direct-on-line fan, option +C188 and heating element, option +C183; module thermal cutoff circuit)
9. Type designation label
10. The unpainted grounding point (PE)
### Connectors X30 and X55

#### Connector X30

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>+C183: Heating element N (230 V AC or 115 V AC)</td>
</tr>
<tr>
<td>8</td>
<td>+C183: Heating element L (230 V AC or 115 V AC)</td>
</tr>
<tr>
<td>7</td>
<td>Not in use</td>
</tr>
<tr>
<td>6</td>
<td>TP2, thermal cutoff circuit</td>
</tr>
<tr>
<td>5</td>
<td>TP1, thermal cutoff circuit</td>
</tr>
<tr>
<td>4</td>
<td>Not in use</td>
</tr>
<tr>
<td>3</td>
<td>Not in use</td>
</tr>
<tr>
<td>2</td>
<td>+C188: DOL fan N (230 V AC or option +G304: 115 V AC)</td>
</tr>
<tr>
<td>1</td>
<td>+C188: DOL fan L (230 V AC or option +G304: 115 V AC)</td>
</tr>
</tbody>
</table>

#### Connector X55

**Note:** Connections of the connector X55 are ready-made at the factory.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>+C183: Heating element N (230 V AC or 115 V AC)</td>
</tr>
<tr>
<td>3</td>
<td>+C183: Heating element L (230 V AC or 115 V AC)</td>
</tr>
<tr>
<td>2</td>
<td>+C188: DOL fan N (230 V AC or option +G304: 115 V AC)</td>
</tr>
<tr>
<td>1</td>
<td>+C188: DOL fan L (230 V AC or option +G304: 115 V AC)</td>
</tr>
</tbody>
</table>
LCL filter module (type BLCL-2x-x for frame R8i multiples)

A LCL filter module, front
B LCL filter module, back

1. Input (AC) connection
2. Output (AC) connection
3. Terminal block [X55] (power supply for module heating element, option +C183; direct-on-line fan supply, option +C188) (ready-connected)
4. Handle
5. Fan
6. Wheels
7. Fiber optic connections and LEDs of the BDFC board
8. Terminal block [X30] (power supply for module direct-on-line fan, option +C188 and heating element, option +C183; module thermal cutoff circuit)
9. Type designation label
10. The unpainted grounding point (PE)
40 Operation principle and hardware description

Connectors X30 and X55

<table>
<thead>
<tr>
<th>Connector X30</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>+C183: Heating element N (230 V AC or 115 V AC)</td>
</tr>
<tr>
<td>8</td>
<td>+C183: Heating element L (230 V AC or 115 V AC)</td>
</tr>
<tr>
<td>7</td>
<td>Not in use</td>
</tr>
<tr>
<td>6</td>
<td>TP2, thermal cutoff circuit</td>
</tr>
<tr>
<td>5</td>
<td>TP1, thermal cutoff circuit</td>
</tr>
<tr>
<td>4</td>
<td>Not in use</td>
</tr>
<tr>
<td>3</td>
<td>+C188: DOL fan W</td>
</tr>
<tr>
<td>2</td>
<td>+C188: DOL fan V</td>
</tr>
<tr>
<td>1</td>
<td>+C188: DOL fan U</td>
</tr>
</tbody>
</table>

400 V AC or option +G427: 208 V AC

<table>
<thead>
<tr>
<th>Connector X55</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

400 V AC or option +G427: 208 V AC

Note: Connections of the connector X55 are ready-made at the factory.
Control interfaces

- **Overview of control connections of ZCU-14 control unit**

It is possible to:

- control the unit through the control panel and fieldbus
- read the status information of the supply unit through the control panel, fieldbus and relay output.
- stop the unit with an externally wired emergency stop button (if the unit is equipped with an emergency stop option).

ZCU control unit is used with frame sizes R1i...R4i and R6i IGBT supply modules. The control unit is attached to the IGBT supply module.

The diagram shows the control connections and interfaces of the ZCU control unit.

| 1 | Analog and digital I/O extension modules and fieldbus communication modules can be inserted into slots 1, 2 and 3. |
| 2 |  |
| 3 |  |
| 4 | Memory unit |
| 5 | Not in use in supply modules |
| 6 | Terminal blocks |
Overview of the control connections of the BCU control unit

The diagram shows the control connections and interfaces of the BCU control unit.

<table>
<thead>
<tr>
<th></th>
<th>Control panel</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Analog and digital I/O extension modules and fieldbus communication modules can be inserted into slots 1, 2 and 3.</td>
</tr>
<tr>
<td>2</td>
<td>7 Control panel.</td>
</tr>
<tr>
<td>3</td>
<td>8 Fiber optic links to power modules (inverter, supply, brake or converter)</td>
</tr>
<tr>
<td>4</td>
<td>Memory unit</td>
</tr>
<tr>
<td>5</td>
<td>Slot 4 for RDCO-0x</td>
</tr>
<tr>
<td>6</td>
<td>Terminal blocks.</td>
</tr>
<tr>
<td>7</td>
<td>9 Ethernet port. Not in use.</td>
</tr>
<tr>
<td>8</td>
<td>10 Safety option interface. Only in use for the inverter units.</td>
</tr>
</tbody>
</table>
Supply unit control devices

■ Main disconnecting device
You must equip the supply unit with a main disconnecting device. For example, you can use a main switch-disconnector [Q1.1] or a withdrawable main circuit breaker [Q1]. With this switch, you can isolate the main circuit of the drive from the power line.

WARNING!
The main disconnecting device does not isolate the input power terminals or the auxiliary circuit from the power line. To isolate the input power terminals, open the main breaker of the supply transformer and lock it to the open position.

■ Auxiliary voltage switch
You can equip the unit with an auxiliary voltage switch [Q21]. Using the switch, you can disconnect the auxiliary circuit from the power line.

■ Operating switch
You can equip the cabinet with an operating switch [S21].
By default, the operating switch controls the unit as follows:

• The ENABLE/RUN position: The control program closes the charging contactor [Q4] and the main DC link is charged. After the DC link is charged, the main contactor [Q2] will be closed and the charging contactor [Q4] opened. The module starts operating.

• The OFF position: The control program opens the main contactor [Q2] and the module stops rectifying.

■ Emergency stop and emergency stop reset buttons
The cabinet can be equipped with an emergency stop button [S61] and an emergency stop reset button [S62]. Pressing the emergency stop button activates the emergency stop function of the supply unit. The button locks to open position automatically. You must release the button before you can return to the normal operation. Before the restart, you also need to reset the emergency stop circuit with the reset button.

Note: The customer is fully responsible for implementing and testing the functional safety circuits according to the relevant legislation and acceptance testing regulations. The functional safety option manuals give examples on implementing the safety circuits in cabinet-installed ACS880 multidrives.

■ The control unit
The supply modules of frame sizes R1i...R4i and R6i are controlled by a ZCU control unit. The supply modules of frame size R8i are controlled by a BCU control unit.
Control panel
The control panel is the user interface of the unit. With the control panel, you can:
• start and stop the unit
• view and reset the fault and warning messages, and view the fault history
• view actual signals
• change parameter settings
• change between local and external control.
To be able to start and stop the unit by the control panel, you must have the Run enable signal and Start enable signal on (1) on the control board. Normally this means, that you must have the operating switch on the cabinet door in ENABLE/RUN position. The control panel must also be in local control mode. You can select the mode with the Loc/Rem key on the panel.
For the instructions on the use of the panel, see ACX-AP-x Assistant control panels user’s manual (3AU0000085685 [English]).

PC connection
There is a USB connector on the front of the control panel that can be used to connect a PC to the drive. When a PC is connected to the control panel, the control panel keypad is disabled.

Fieldbus control
You can control the unit through a fieldbus interface if the unit is equipped with an optional fieldbus adapter and when you have configured the control program for the fieldbus control with the parameters. For information on the parameters, see the firmware manual.

Note: To be able to switch the main contactor [Q2] or main circuit breaker [Q1] and the supply unit on and off (Run enable signal) through the fieldbus, the Run enable command at digital input DI2 must be on (1).
Type designation labels of the supply module and LCL filter module

Each IGBT supply module and LCL filter module has a type designation label attached to it. The type designation stated on the label contains information on the specifications and configuration of the unit.

Quote the complete type designation and serial number when contacting technical support on the subject of individual IGBT supply modules or LCL filter modules.

Example labels are shown below.

**Supply module**

![Supply module label](image1)

**LCL filter module**

![LCL filter module label](image2)

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Type designation</td>
</tr>
<tr>
<td>2</td>
<td>Frame size</td>
</tr>
<tr>
<td>3</td>
<td>Cooling method and additional information</td>
</tr>
<tr>
<td>4</td>
<td>Degree of protection</td>
</tr>
<tr>
<td>5</td>
<td>UL/CSA data</td>
</tr>
<tr>
<td>6</td>
<td>Ratings</td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>7</td>
<td>Valid markings. See <em>Electrical planning instructions for ACS880 multidrive cabinets and modules</em> (3AU000102324 [English]).</td>
</tr>
<tr>
<td>8</td>
<td>Serial number. The first digit of the serial number refers to the manufacturing plant. The next four digits refer to the unit’s manufacturing year and week, respectively. The remaining digits complete the serial number so that there are no two units with the same number.</td>
</tr>
</tbody>
</table>
Type designation key

- **IGBT supply module**

Type designation describes the composition of the module in short. The complete designation code is divided in subcodes:

- The first digits form the basic code. It describes the basic construction of the module. The fields in the basic code are separated by hyphens.
- The plus codes follow the basic code. Each plus code starts with an identifying letter (common for the whole product series), followed by descriptive digits. The plus codes are separated by plus signs.

The subcodes are described below.

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic codes</strong></td>
<td></td>
</tr>
<tr>
<td>ACS880</td>
<td>Product series</td>
</tr>
<tr>
<td>104</td>
<td>Construction: Inverter, supply, converter or brake module.</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td></td>
</tr>
<tr>
<td>xxxxxx</td>
<td>Refer to the ratings table in the technical data.</td>
</tr>
<tr>
<td><strong>Voltage range</strong></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>DC voltage corresponding AC input voltages 3 ~ 380…415 V. This is indicated in the type designation label as typical input voltage level 566 V DC.</td>
</tr>
<tr>
<td>5</td>
<td>DC voltage corresponding AC input voltages 3 ~ 380…500 V. This is indicated in the type designation label as typical input voltage level 566/679/707 V DC.</td>
</tr>
<tr>
<td>7</td>
<td>DC voltage corresponding AC input voltages 3 ~ 525…690 V. This is indicated in the type designation label as typical input voltage level 742/849/976 V DC.</td>
</tr>
<tr>
<td><strong>Option codes (plus codes)</strong></td>
<td></td>
</tr>
<tr>
<td>C132</td>
<td>Frames R6i and R8i: Marine type-approved</td>
</tr>
<tr>
<td>C183</td>
<td>Internal heating element</td>
</tr>
<tr>
<td>C188</td>
<td>Direct-on-line (DOL) cooling fan</td>
</tr>
<tr>
<td>E205</td>
<td>Internal du/dt filtering.</td>
</tr>
<tr>
<td>G304</td>
<td>115 V auxiliary voltage supply</td>
</tr>
<tr>
<td>N2200</td>
<td>Frames R1i…R4i, R6i: IGBT supply control program</td>
</tr>
<tr>
<td>P904</td>
<td>Extended warranty 24/30</td>
</tr>
<tr>
<td>P909</td>
<td>Extended warranty 36/42</td>
</tr>
</tbody>
</table>

- **LCL filter**

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic codes</strong></td>
<td></td>
</tr>
<tr>
<td>WFU</td>
<td>LCL filter for frames R1i…R4i IGBT supply modules. The delivery includes direct-on-line cooling fan as standard.</td>
</tr>
<tr>
<td>ALCCL</td>
<td>LCL filter for frame R6i IGBT supply module. The delivery includes direct-on-line cooling fan as standard.</td>
</tr>
<tr>
<td>ACS880-BLCL</td>
<td>LCL filter for frame R8i IGBT supply module. The delivery includes on/off-controlled cooling fan as standard.</td>
</tr>
</tbody>
</table>
### Code Description

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size</strong></td>
<td></td>
</tr>
<tr>
<td>01, 02, 11, 21, 22, 05, 13, 15, 24 or 25</td>
<td>Refer to the LCL filter module table in the technical data.</td>
</tr>
<tr>
<td><strong>Voltage range</strong></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Voltage rating: 380...500 V. This is indicated in type designation label as typical input voltage levels (3~ 400/480/500 V AC).</td>
</tr>
<tr>
<td>7</td>
<td>Voltage rating: 525...690 V. This is indicated in type designation label as typical input voltage levels (3~ 525/600/690 V AC, 600 UL, CSA).</td>
</tr>
<tr>
<td><strong>Plus codes</strong></td>
<td></td>
</tr>
<tr>
<td>For the plus codes, see chapter <em>Ordering information</em>.</td>
<td></td>
</tr>
<tr>
<td>A013</td>
<td>ALCL-05-5 only: 60 Hz frequency</td>
</tr>
<tr>
<td>C183</td>
<td>BLCL-1x-x and BLCL-2x-x only: Internal heating element (included in the delivery as standard)</td>
</tr>
<tr>
<td>C188</td>
<td>BLCL-1x-x and BLCL-2x-x only: Direct-on-line cooling fan (included in the delivery as standard with 230 V supply for BLCL-1x-x / 400 V AC supply for BLCL-2x-x)</td>
</tr>
<tr>
<td>G304</td>
<td>ALCL-05-5 and BLCL-1x-x only: 115 V AC 1-phase fan supply</td>
</tr>
<tr>
<td>G427</td>
<td>BLCL-2x-x only: 208 V AC 3-phase fan supply</td>
</tr>
<tr>
<td>V991</td>
<td>BLCL-1x-x and BLCL-2x-x only: Hardware version. LCL filter modules with or without this code are interchangeable.</td>
</tr>
</tbody>
</table>
Moving and unpacking the module

Contents of this chapter
This chapter gives basic information on moving, unpacking and lifting the modules.

WARNING!
Obey the safety instructions of the drive. If you ignore them, injury or death, or damage to the equipment can occur.

Moving and lifting the transport package
Move the transport package by a pallet truck or lift. Lift the transport package in a horizontal position. Use soft lifting slings.

Unpacking
- Frames R1i…R5i
The module is delivered in a corrugated cardboard box. The module and its parts (such as grounding/clamp plates, terminal blocks, etc.) are placed in the different compartments of the box.
  1. Remove any banding and lift off the cover of the box.
  2. Lift the module out of the box.
  3. Check all the compartments in the box for accessories.
    Note: Some parts may be placed in a compartment directly underneath the module.
Dispose of or recycle the packaging according to the local regulations.
The module is delivered on a wooden base, boxed in corrugated cardboard. The cardboard box is tied to the base with PET bands.
1. Cut off the bands.
2. Lift off the cardboard box.
3. Remove any filling material.
4. Cut open the plastic wrapping of the module.
5. Lift off the module.
6. Check that there are no signs of damage.

Dispose of or recycle the packaging according to the local regulations.

**Lifting the modules**

Lift the unpacked module only by its lifting eyes.

**Moving the modules**

---

**WARNING!**

For general safety instructions for moving the module, see *ACS880 multidrive cabinets and modules safety instructions* (3UA0000102301 [English]).
Cabinet construction

Contents of this chapter
This chapter instructs in placing the modules and additional equipment into a cabinet.
For general instructions, see Drive modules cabinet design and construction instructions (3AUA0000107668 [English]).

Limitation of liability
The installation must always be designed and made 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. Furthermore, if the recommendations given by ABB are not followed, the drive may experience problems that the warranty does not cover.

Switching, disconnecting and protecting solution
To arrange the switching, disconnection and protection of the ACS880-204 module, you can use the following solutions depending on the frame size.

- Frames R1i...R4i
  The switching, disconnecting and protecting equipment can be placed inside the drive cabinet in the following way:
  1. The AC supply coming to the drive cabinet is first connected to the main switch-disconnector [Q1].
  2. The drive is equipped with the main contactor connected between the main switch-disconnector [Q1] and the LCL filter. See section Single-line circuit diagrams of the supply unit (page 22).

For the connection diagram, see chapter Electrical installation.
Frame R6i

The switching, disconnecting and protecting equipment can be placed inside the drive cabinet in the following way:

1. The AC supply coming to the drive cabinet is first connected to the main switch-disconnector [Q1] containing AC fuses.
2. The drive is equipped with the main contactor connected between the main switch-disconnector [Q1] and the LCL filter.
3. A charging circuit for precharging the DC link capacitors is connected over the main switch-disconnector [Q1] and the main contactor [Q2]. See section Single-line circuit diagrams of the supply unit (page 22).

For the connection diagram, see chapter Electrical installation.

Frame R8i

The switching, disconnecting and protecting equipment can be placed outside the drive cabinet in the following way:

1. The AC supply is first connected to the main switch-disconnector or main circuit breaker [Q1].
2. The AC fuses are connected after the switch-disconnector.
3. The main contactor [Q2] is connected between the AC fuses and the LCL filter.
4. A charging circuit for precharging the DC link capacitors is connected over the main contactor [Q2]. See section Single-line circuit diagrams of the supply unit (page 22).

For the connection diagram, see chapter Electrical installation.
Cabinet configuration overview

- ACS880-204 configurations in Rittal VX25 enclosures

The following figures show examples of ACS880-204 configurations that can be installed in the Rittal VX25 enclosure.
ACS880-204 configurations in generic enclosures

The following figures show examples of ACS880-204 configurations that can be installed in generic enclosure.
- IGBT supply unit with frame R1i...R4i module

The following figure shows an example of the R1i module in 400 mm wide Rittal VX25 enclosure. The power cables are routed to the cabinet through the bottom.

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cubicle including:</td>
</tr>
<tr>
<td>1. IGBT supply module [T01]</td>
</tr>
<tr>
<td>2. Control unit [A51] (attached to the IGBT supply module, under the control panel cover)</td>
</tr>
<tr>
<td>3. LCL filter module [R03]</td>
</tr>
<tr>
<td>4. WBCA bottom connection adapter</td>
</tr>
<tr>
<td>5. Air guide</td>
</tr>
<tr>
<td>6. Roof fan</td>
</tr>
</tbody>
</table>
IGBT supply unit with frame R6i module

The following figure shows an example of the R6i module in 600 mm wide Rittal VX25 enclosure. The power cables are routed to the cabinet through the bottom.

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cubicle including:</td>
</tr>
<tr>
<td>1. AC input</td>
</tr>
<tr>
<td>2. DC output</td>
</tr>
<tr>
<td>3. Main switch-disconnector [Q1]</td>
</tr>
<tr>
<td>4. Main contactor [Q2]</td>
</tr>
<tr>
<td>5. Charging contactor [Q4]</td>
</tr>
<tr>
<td>6. IGBT supply module [T01]</td>
</tr>
<tr>
<td>7. Control unit [A51]</td>
</tr>
<tr>
<td>8. LCL filter module [R03]</td>
</tr>
<tr>
<td>9. DC fuses [F2]</td>
</tr>
<tr>
<td>10. Charging fuse switch [Q21]</td>
</tr>
</tbody>
</table>
- **IGBT supply unit with frame R8i module**

The following figure shows an example of the 1×R8i module in 600 mm wide Rittal VX25 enclosure. The customer must place the control equipment in a separate cabinet.

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cubicle including:</td>
</tr>
<tr>
<td>1. AC input</td>
</tr>
<tr>
<td>2. LCL filter module (type BLCL-1x-x)</td>
</tr>
<tr>
<td>3. Common DC busbars</td>
</tr>
<tr>
<td>4. DC output with common mode filters and DC fuses</td>
</tr>
<tr>
<td>5. R8i IGBT supply module</td>
</tr>
</tbody>
</table>
IGBT supply unit with frame 2×R8i modules

The following figure shows an example of the 2×R8i modules in 1000 mm wide Rittal VX25 enclosure. The customer must place the control equipment in a separate cabinet.

Description

Cubicle including:

1. AC input with AC fuses
2. LCL filter module (type BLCL-2x-x)
3. Common DC busbars
4. DC output with common mode filters and DC fuses
5. R8i IGBT supply module
Incoming cubicle

Example of the AC fuse cooling

The AC fuses must be cooled by forced cooling. If the fuses are not located in the same cubicle with the supply/rectifier module, the module cooling fan does not supply the cooling air for the fuses but you must use a separate cooling fan.

The following figures show an example of the cooling system using a thermal switch for the air temperature monitoring near the AC fuses.

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

Note: The connection of temperature monitoring requires proper insulation between busbars and thermal switch.
- **RFI filter**

  The RFI filter is used for improving the EMC characteristics of the unit. The following figure shows an example of installing RFI filter to the cabinet. For more information about EMC requirements, see *ACS880 multidrive cabinets and modules electrical planning instructions* (3AUA0000102324 [English]).
Installation examples

This section instructs in placing the drive and additional equipment into a Rittal VX25 enclosure.

Each example includes a table that lists:

- installation stages of different equipment in the order in which the installation into the enclosure should be performed
- code of the step-by-step instructions
- equipment kit code
- kit ordering code.

You can find the kit-specific assembly drawings, step-by-step instructions and kit information on the Internet. Go to https://sites-apps.abb.com/sites/lvacdrivesengineeringsupport/content. If needed, contact your local ABB representative.

The example includes also cabinet assembly drawings that show each stage listed in the table. More detailed steps of each stage are described in the kit-specific assembly drawings. The tightening torques are listed in the kit-specific assembly drawings. See the hardware manual for the tightening torques of drive module input and output terminals.

For general instructions, see Drive modules cabinet design and construction instructions (3AUA0000107668 [English]).

WARNING!
Remove the code labels attached to mechanical parts such as busbars, shrouds and sheet metal parts before installation. They may cause bad electrical connections, or, after peeling off and collecting dust in time, cause arcing or block the cooling air flow.

---

R1i…R4i module in a 400/600/800 mm wide Rittal VX25 enclosure

### Installation stages

<table>
<thead>
<tr>
<th>#</th>
<th>Installation stage</th>
<th>Instruction code</th>
<th>Kit code</th>
<th>Kit ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Air guide kit for WFU-01/02</td>
<td>3AXD50000477692</td>
<td>A-468-12-426</td>
<td>3AXD50000008728</td>
</tr>
<tr>
<td></td>
<td>Air guide kit for WFU-11</td>
<td>A-468-3-427</td>
<td>3AXD50000008730</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Air guide kit for WFU-21/22</td>
<td>A-68-34-428</td>
<td>3AXD50000008741</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Air guide kit for IGBT supply module (frame R1i)</td>
<td>3AXD50000477692</td>
<td>A-468-1-422</td>
<td>3AUA0000114398</td>
</tr>
<tr>
<td></td>
<td>Air guide kit for IGBT supply module (frame R2i)</td>
<td>A-468-2-423</td>
<td>3AUA0000114330</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Air guide kit for IGBT supply module (frame R3i)</td>
<td>A-468-3-424</td>
<td>3AUA0000114404</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Air guide kit for IGBT supply module (frame R4i)</td>
<td>A-468-4-425</td>
<td>3AUA0000114405</td>
<td></td>
</tr>
</tbody>
</table>
KITS FOR R1i-R4i ISU

NOTE: Only parts included in ABB kits are shown here.

ABB GUIDE KITS:
- A-468-12-36 (6AX239999987288) for R1i- 01 & 02
- A-468-12-37 (6AX239999987263) for R1i- 01
- A-468-12-38 (6AX239999987264) for R4i- 01 & 22

NOTE: In this example R1i-01 & R4i-01 are presented in 40mm wide cabinet, select correct cabinet width for your application.
### R6i module in a 600 mm wide Rittal VX25 enclosure

#### Installation stages

<table>
<thead>
<tr>
<th>#</th>
<th>Installation stage</th>
<th>Instruction code</th>
<th>Kit code</th>
<th>Kit ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Installation of common parts:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Baying parts</td>
<td>3AXD50000336340</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>PE busbar [PE]</td>
<td>3AXD5000036104</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Divider panel</td>
<td>3AXD5000036692</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Common DC Flat-PLS assembly</td>
<td>3AXD50000333639</td>
<td>A-468-X-001-VX</td>
<td>3AXD50000333387</td>
</tr>
<tr>
<td>2</td>
<td>Rittal supports installation</td>
<td>3AXD50000477623</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>DC kit installation</td>
<td>3AXD50000478071</td>
<td>A-6-6-284-VX</td>
<td>3AXD50000477487</td>
</tr>
<tr>
<td>4</td>
<td>Switching and charging installation</td>
<td>3AXD50000477784</td>
<td>A-6-6-405-VX</td>
<td>3AXD50000477494</td>
</tr>
<tr>
<td>5</td>
<td>AC supply, varistor board location and EMC shield examples</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Module installation parts</td>
<td>3AXD50000477920</td>
<td>A-6-6-308-VX</td>
<td>3AXD50000477470</td>
</tr>
<tr>
<td>7</td>
<td>Cabling example for main cabling, charging cabling and module ground cabling</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>Shroud installation parts</td>
<td>3AXD50000479849</td>
<td>A-6-6-355-VX</td>
<td>3AXD50000477500</td>
</tr>
</tbody>
</table>
Kits for R61 module in 600 mm Rittal VX25 enclosure

KITS FOR R61 IN RITTAL VX25 2000x600x600 CABINET

Note: Only parts included in ABB kits are shown here.
See kit assembly drawings for required Rittal and/or standard parts.
Stage 1: Installation of common parts

Note: See general cabinet engineering manual for common assembly principles.
STAGE 1: Common assembly installations (Baying parts, PE Bus bar, Divider panel and Common DC).
See assembly drawings for details.
Stage 2: Rittal supports installation for ISU R6i

See assembly drawing 3AXD50000477623 for details.
STAGE 3: R6i ISU DC KIT INSTALLATION

See assembly drawing 3AXD50000478971 for details and required additional Rittal and standard parts.

Ordering code: 3AXD50000477487
KIT A-6-6-284-VX
Stage 4: R6i TSU Switch and Charging Installation

See assembly drawing 3AXD50000477784 for details and required additional Rittal and standard parts.

Ordering code: 3AXD50000477794
RIT A-6-6-405-VX
Stage 5: AC supply, varistor board location and EMC shield examples

These parts are not included in kits.
Stage 6: R6i ISU Module Installation Parts Installation

See assembly drawing 3AXD50000477920 for details and required additional Rittal and standard parts.

Ordering code: 3AXD50000477470
KIT A-6-6-308-VX

Seal the gaps between the frames and supports and air blockers to avoid hot air backflow from the module.
Stage 7: Cabling example for main cabling, charging cabling and ground cabling
Stage 8: Shroud installation parts
1×R8i module in a 600 mm wide Rittal VX25 enclosure

Installation stages

<table>
<thead>
<tr>
<th>#</th>
<th>Installation stage</th>
<th>Instruction code</th>
<th>Kit code</th>
<th>Kit ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Installation of common parts:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Baying parts</td>
<td>3AXD50000336340</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>PE busbar [PE]</td>
<td>3AXD50000336104</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Divider panel</td>
<td>3AXD50000336692</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Common AC Flat-PLS assembly</td>
<td>3AXD50000372782</td>
<td>A-468-X-011-VX</td>
<td>3AXD50000360772</td>
</tr>
<tr>
<td></td>
<td>Common DC Flat-PLS assembly</td>
<td>3AXD500003333639</td>
<td>A-468-X-001-VX</td>
<td>3AXD50000333387</td>
</tr>
<tr>
<td>2</td>
<td>LCL filter installation parts</td>
<td>3AXD50000384914</td>
<td>A-6-8-306-VX</td>
<td>3AXD50000416486</td>
</tr>
<tr>
<td>3</td>
<td>BLCL AC busbars and quick connectors</td>
<td>3AXD50000384945</td>
<td>A-6-8-130-VX</td>
<td>3AXD50000416493</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A-468-8-100</td>
<td>3AXD50000416493</td>
<td>3AU000019227</td>
</tr>
<tr>
<td>4</td>
<td>DC connection</td>
<td>3AXD50000384990</td>
<td>A-6-8-204-VX</td>
<td>3AXD50000416714</td>
</tr>
<tr>
<td>5</td>
<td>Common mode filter busbars and DC connection flanges</td>
<td>3AXD5000002502</td>
<td>A-468-8-231</td>
<td>3AXD5000002492</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3AXD5000003403</td>
<td>A-468-8-232</td>
<td>3AXD5000003411</td>
</tr>
<tr>
<td>6</td>
<td>BLCL AC connection</td>
<td>3AXD5000002577</td>
<td>A-468-8-131</td>
<td>3AXD50000002576</td>
</tr>
<tr>
<td>7</td>
<td>Shroud installation parts</td>
<td>3AXD5000035022</td>
<td>A-6-8-360-VX</td>
<td>3AXD50000337378</td>
</tr>
<tr>
<td>8</td>
<td>Module installation</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Kits for R8i module in 600 mm Rittal VX25 enclosure

See kit assembly drawings for required Rittal and/or other standard parts.
Stage 1: Installation of common parts

Note: Cabinet design and construction instructions for ACS800 multifunction modules (3A0000000768). English.

See instruction drawings for details:

- BUS BAR DESIGN: 3AxD00038340
- DIVIDER PANEL: 3AxD00038692
- COMMON DC FLAT-PLS: 3AxD00003782
- COMMON AC FLAT-PLS: 3AxD00003699
- COMMON AC FLAT-PLS: 3AxD00003696
- COMMON AC FLAT-PLS: 3AxD00003697
Stage 2: Module installation parts

See assembly drawing 3AXD50000384914 for details and required additional Rittal and standard parts.

Ordering code: 3AXD50000416486
KIT A-6-8-306-VX
STAGE 3: BLCL IX-X ISU AC BUSBARS W600 and X8X QUICK CONNECTORS FOR MODULE installation

See assembly drawing 3AX050000584945 for details and required additional Hittal and standard parts.

Ordering Code: 3AX050000416493
KIT A-68-180-VX

Ordering Code: 34U40000119227
KIT A-468-8-100
(1 kit/module)
STAGE 4: R8i DC CONNECTION W600 installation

See assembly drawing 3AXD50000384990 for details and required additional Rittal and standard parts.

Ordering code: 3AXD50000416714
KIT A-6-8-204-VX
Stage 5: COMMON MODE FILTER BUSBARS and R8i DC CONNECTION FLANGES installation

See instruction drawings 3AXD50000002502 and 3AXD50000003403 for details.

Ordering Code: 3AXD50000002492
KIT A-468-8-231
(1 kit/module)

Ordering Code: 3AXD50000003411
KIT A-468-8-232
(1 kit/module)
STAGE 6: BLCL IX-X AC CONNECTION W600 installation

See assembly drawing 3AXD500000002577 for details and required additional Rittal and standard parts.

Ordering code: 3AXD500000002576
KIT A-488-8-181
Stage 7: X8X W609 SHROUD installation

See instruction drawing 8AXD50000885922 for details

Ordering Code: 8AXD50000887878
KIT A-6-8-360-XX
Stage 8: MODULE INSTALLATION

See ACS880-204 Hardware Manual for details
- **1×R8i module in a 600 mm wide generic enclosure**

**Parts to be installed**

<table>
<thead>
<tr>
<th>Parts to be installed</th>
<th>Instruction code</th>
<th>Kit code</th>
<th>Kit ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module installation parts</td>
<td>3AXD50000013903</td>
<td>A-6-8-328</td>
<td>3AXD50000013842</td>
</tr>
<tr>
<td>Quick connectors</td>
<td>3AUA0000118667</td>
<td>A-468-8-100</td>
<td>3AUA0000119227</td>
</tr>
<tr>
<td>AC busbars</td>
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1) This kit is not included in ABB’s standard design but may be used if you wish to have AC fuses on top of the LCL filter module.
### 2×R8i modules in a 1000 mm wide Rittal VX25 enclosure

#### Installation stages

<table>
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<th>Installation stage</th>
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<th>Kit ordering code</th>
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Kits for 2×R8i modules in 1000 mm Rittal VX25 enclosure
Stage 1: Installation of common parts

Note: Cabinet design and construction instructions for ACS880 multivariable modules (3A0V0033688 English).
Stage 2: Module installation parts
Stage 3: REAR AC BUSBARS W1800 and X8X QUICK CONNECTORS FOR MODULE installation

See instruction drawing 3AXD50000353477 for details

Ordering Code: 3AXD50000361687
KIT A-X-8-142-VX

Ordering Code: 3AUA0000119227
KIT A-468-8-100
(1 kit/module)
Stage 4: BLXX 2X-X TOP AC BUSBARS and AC FLANGES installation

See instruction drawings 3AXD500000353491 and 3AXD50000012934 for details.

Ordering Code: 3AXD50000011084
KIT A-468-8-106

Ordering Code: 3AXD500000360796
KIT A-4-8-107-VX

Only BLCL 2X-X cabinet shown
Stage 5: 2x8i DC BUSBARS installation

See instruction drawing 3AXD50000353507 for details.

Ordering Code: 3AXD50000861668
KIT A-6-8-212-VX

Only R8i cabinet shown.
Stage 6: Common mode filter busbars and DC connection flanges installation

See instruction drawings 3AXD5000002502 and 3AXD5000003403 for details.

Ordering Code: 3AXD5000002492
KIT A-468-8-281
(1 kit/module)

Ordering Code: 3AXD5000003411
KIT A-468-8-232
(1 kit/module)

Only R8i cabinet shown.
Stage 7: Shroud installation parts
Stage 8: Modules installation

See ACS880-204 Manual for details
- 2×R8i modules in an 800 mm wide generic enclosure

### Parts to be installed

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KITS FOR ISU 2xRBI MODULES IN GENERIC 2000x600x800 CABINET

Note! Only parts included in ABB kits are shown here.
See kit assembly drawings for required kit and/or other standard parts.
### 3×R8i modules in a 1600 mm wide Rittal VX25 enclosure

#### Installation stages

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Kits for 3×R8i modules in 1600 mm Rittal VX25 enclosure

Kits for 3×R8i in Rittal VX25 Cabinets

Note: Only parts included in 499 kits are shown here.

100 Cabinet construction
Stage 1: Installation of common parts
Stage 2: Module installation parts.

See instruction drawings 8AXD500003851930, 8AXD50000372985 and 8AXD50000851756 for details.

Ordering Code: 8AXD50000361700
KIT A-6-8-322-VX

Ordering Code: 8AXD50000371112
KIT A-4-8-324-VX

Ordering Code: 8AXD50000361670
KIT A-6-8-323-VX
Stage 3: BLCL 2X-X REAR AC BUSBARS and X8X QUICK CONNECTORS FOR MODULE installation

See instruction drawing 3AXD500036444 for details.

Ordering Code: 3AUA0000119227
KIT A-488-8-100
(1 kit/module)

Ordering Code: 3AXD5000371129
KIT A-X-8-143-VX
Stage 4: BLCL 2X-X TOP AC BUSBARS and AC FLANGES installation

See instruction drawings 8AXD50000852999 and 8AXD50000912984 for details.

Ordering Code: 3AXD50000011084
KIT A-488-8-106
2 kit required

Ordering Code: 3AXD50000037143
KIT A-6-8-108-VX

Only BLCL 2X-X Cabinet shown
Stage 5: DC connection

See instruction drawing 3AX05000036987 and 3AX05000035587 for details.

Ordering Code: 3AX05000036663

Ordering Code: 3AX05000037136
Stage 6: Common mode filter busbars and DC connection flanges installation

See instruction drawings 3AXD50000002502 and 3AXD50000003403 for details

Ordering Code: 3AXD50000002492
KIT A-468-8-251
(1 kit/module)

Ordering Code: 3AXD50000003411
KIT A-468-8-282
(1 kit/module)

Only R8i cabinet shown
Stage 7: SHROUDS installation

See instruction drawings 3AXD50000385169 and 3AXD50000385022 for details.

Ordering Code: 3AXD50000337378
KIT A-6-B-360-VX
2 kit required

Ordering Code: 3AXD50000337484
KIT A-4-B-359-VX
Stage 8: BLCL 2X-X and R8i modules installation

See ACS880-204 Manual for details.
- **3×R8i modules in a 1400 mm wide generic enclosure**

### Parts to be installed

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</table>
Electrical installation

Contents of this chapter

This chapter describes the electrical installation of the modules.

The wiring diagrams in this chapter are simplified presentations. For details, see the example circuit diagrams included in the manual.

Note: The instructions do not cover all possible cabinet constructions.

For more information on electrical installation, see ACS880 multidrive cabinets and modules electrical planning instructions (3AUA0000102324 [English]).

Safety and liability

WARNING!
Only qualified electrical professionals are allowed to do the work described in this chapter. Read the complete safety instructions before you install, commission, use or service the drive. The complete safety instructions are given in ACS880 multidrive cabinets and modules safety instructions (3AUA0000102301 [English]).

Note: The installation must always be designed and made 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. Furthermore, if the recommendations given by ABB are not followed, the drive system may experience problems that the warranty does not cover.

Electrical safety precautions

These electrical safety precautions are for all personnel who 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 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.
   - Open the charging switch if present.
   - Open the disconnector of the supply transformer. (The main disconnecting device in the drive cabinet does not disconnect the voltage from the AC input power busbars of the drive cabinet.)
   - If the drive is equipped with a DC/DC converter unit (optional): Open the DC switch-disconnector [Q11] of the DC/DC converter. Open the disconnecting device of the energy storage connected to the DC/DC converter unit (outside the drive cabinet).
   - Open the auxiliary voltage switch-disconnector (if present), and all other possible disconnecting devices that isolate the drive from dangerous voltage sources.
   - If you have a permanent magnet motor connected to the drive, disconnect the motor from the drive with a safety switch or by other means.
   - Disconnect all dangerous external voltages from the control circuits.
   - After you 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 contact.
4. Take special precautions when close to bare conductors.
5. Measure that the installation is de-energized. If the measurement requires removal or disassembly of shrouding or other cabinet structures, obey the local laws and regulations applicable to live working (including – but not limited to – electric shock and arc protection).
   - Before and after measuring the installation, verify the operation of the voltage tester on a known voltage source.
   - Make sure that the voltage between the drive input power terminals (L1, L2, L3) and the grounding (PE) busbar is zero.
   - Make sure that the voltage between the drive output terminals (T1/U, T2/V, T3/W) and the grounding (PE) busbar is zero.
   - Make sure that the voltage between the drive DC terminals (UDC+ and UDC-) and the grounding (PE) terminal is zero. In cabinet-built drives, measure between the drive DC busbars (+ and -) and the grounding (PE) busbar.
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.
General notes

■ Printed circuit boards

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

■ Optical components

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

- Handle the fiber optic cables with care.
- When you unplug the fiber optic cables, always hold the connector, not the cable itself.
- Do not touch the ends of the fibers with bare hands as the ends are extremely sensitive to dirt.
- Do not bend the fiber optic cables too tightly. The minimum allowed bend radius is 35 mm (1.4 in).

Checking the insulation of the assembly

■ Measuring the insulation of the drive

WARNING!
Do not do any voltage withstand or insulation resistance tests on any part of the drive as testing can damage the drive. Every drive has been tested for insulation between the main circuit and the chassis at the factory. Also, there are voltage-limiting circuits inside the drive which cut down the testing voltage automatically.

■ Measuring the insulation of the input power cable

Before you connect the input power cable to the drive, measure its insulation according to local regulations.

Checking the compatibility with IT (ungrounded) systems

The RFI filter is not suitable for use in IT (ungrounded) systems. Disconnect the filter before connecting the drive to the supply network. For instructions on how to do this, contact your local ABB representative.

WARNING!
If a drive with an RFI filter is installed on an IT system (an ungrounded power system), the system will be connected to earth potential through the filter capacitors of the drive. This can cause danger, or damage the unit.
Connecting the input power cables

- Connection diagram (frames R1i…R4i)

**Note:** If the LCL filter is mounted onto the WBCA adapter, the LCL filter can be grounded through the fastening screws of the WBCA adapter (no additional grounding conductors are needed).

Use a separate PE cable (1a) or a cable with a separate PE conductor (1b) in addition if the conductivity of the shields does not meet the requirement for the PE conductor. See *Electrical planning instructions for ACS880 multidrive cabinets and modules* (3AUA0000102324 [English]).

For the cable selection instructions, see *Electrical planning instructions for ACS880 multidrive cabinets and modules* (3AUA0000102324 [English]).

For the tightening torques, see *Cabinet design and construction instructions for ACS880 multidrive modules* (3AUA0000107668 [English]).
Note: Use a separate grounding PE cable (1a) or a cable with a separate PE conductor (1b) in addition if the conductivity of the shields does not meet the requirement for the PE conductor. See Electrical planning instructions for ACS880 multidrive cabinets and modules (3AUA0000102324 [English]).

For the cable selection instructions, see Electrical planning instructions for ACS880 multidrive cabinets and modules (3AUA0000102324 [English]).

For the tightening torques, see Cabinet design and construction instructions for ACS880 multidrive modules (3AUA0000107668 [English]).

1) For details, see the example circuit diagrams.
Connection diagram (frame 1×R8i)

Note: Use a separate grounding PE cable (1a) or a cable with a separate PE conductor (1b) in addition if the conductivity of the shields does not meet the requirement for the PE conductor. See *Electrical planning instructions for ACS880 multidrive cabinets and modules* (3AUA0000102324 [English]).

For the cable selection instructions, see *Electrical planning instructions for ACS880 multidrive cabinets and modules* (3AUA0000102324 [English]).

For the tightening torques, see *Cabinet design and construction instructions for ACS880 multidrive modules* (3AUA0000107668 [English]).

1) For details, see the example circuit diagrams.
**Connection diagram (frame R8i multiples)**

Note: Use a separate grounding PE cable (1a) or a cable with a separate PE conductor (1b) in addition if the conductivity of the shields does not meet the requirement for the PE conductor. See *Electrical planning instructions for ACS880 multidrive cabinets and modules* (3AUA0000102324 [English]).

For the cable selection instructions, see *Electrical planning instructions for ACS880 multidrive cabinets and modules* (3AUA0000102324 [English]).

For the tightening torques, see *Cabinet design and construction instructions for ACS880 multidrive modules* (3AUA0000107668 [English]).

1) For details, see the example circuit diagrams.
Connection procedure (frames R1i…R4i)

**WARNING!**
Read the safety instructions given in *Safety instructions for ACS880 multidrive cabinets and modules* (3AUA0000102301 [English]). If you ignore them, injury or death, or damage to the equipment can occur.

For cabling drawings for each frame size, see sections *Frame R1i … Frames R3i and R4i (connector covers removed)* below.

1. Stop the drive and do the steps in section *Electrical safety precautions (page 111)* before you start the work.
2. Frames R3i and R4i only: Remove the two plastic connector covers at the top and bottom of the supply module. Each cover is fastened with two screws.
3. On IT (ungrounded) systems and corner grounded TN systems, disconnect the EMC and varistor screws from the LCL filter module.
   - Remove the cover of the LCL filter module.
   - WFU-11, WFU-21 and WFU-22 only: Remove the fan.
   - Remove the two screws labeled FILTER and one screw labeled VARISTOR. The locations of the screws are shown in the pictures below.
   - Reinstall the cover.
   - WFU-11, WFU-21 and WFU-22 only: Reinstall the fan.

---

**WFU-01, WFU-02**

**WFU-21, WFU-22**

1. Filter
Note: When the internal EMC filter is disconnected, the IGBT supply module is not EMC compatible.

**WARNING!**

If a supply module whose varistors are not disconnected is installed on an IT system (an ungrounded power system or a high resistance grounded [over 30 ohms] power system), the system is connected to earth potential through the varistors of the supply module. This may cause danger or damage the supply module.

If a supply module whose varistors are not disconnected is installed on a corner grounded TN system, the supply module will be damaged.

4. Fasten the two cable clamp plates included in the supply module, one at the top, one at the bottom. The clamp plates are identical. Using the cable clamp plates will provide better EMC compliance, as well as act as a strain relief for the power cables.

5. Strip the power cables so that the shields are bare at the cable clamps.

6. Twist the ends of the cable shield wires into pigtails.

7. Strip the ends of the phase conductors.

8. Connect the phase conductors to the input terminals of the main switch-disconnector [Q1]. For the tightening torques, see *Cabinet design and construction instructions for ACS880 multidrive modules* (3AUA0000107668 [English]).

9. Connect the output terminals of the main switch-disconnector [Q1] to the main contactor [Q2] input terminals.

10. Connect the contactor [Q2] output terminals to the WFU-xx LCL filter module input terminals (L1/L2/L3). See section *Connecting the WBCA adapter to the LCL filter (frames R1i…R4i)* (page 131).

11. Connect the phase conductors of the WFU-xx LCL filter module output terminals (U2/V2/W2) to the phase conductors of the AC input terminals (U2/V2/W2) of the IGBT supply module. See section *Connecting WFU-xx LCL filter module (frames R1i…R4i)* (page 132).

12. Connect the phase conductors of the DC output cable to the UDC+ and UDC- terminals of the IGBT supply module.

13. Tighten the cable clamps onto the bare cable shields.

14. Crimp a cable lug onto each shield pigtail. Fasten the lugs to ground terminals.

15. Cover visible bare shield and pigtail with insulating tape.

16. With frames R3i or R4i, cut suitable slots on the edges of the connector covers to accommodate the AC and DC cables. Refit the covers. (Tighten the screws to 3 N·m [25 lbf-in]).

17. Secure the cables outside the unit mechanically.
18. Ground the other end of the input power cable shield or PE conductor(s) at the distribution board.

19. Connect the module DC busbars into the cabinet common DC busbars.

**Frame R1i**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC output cable</td>
</tr>
<tr>
<td>2</td>
<td>Cable clamp on bare shield, 1.5 N·m (13 lbf·in)</td>
</tr>
<tr>
<td>3</td>
<td>Below cable clamp, cover bare shield with insulating tape</td>
</tr>
<tr>
<td>4</td>
<td>Above cable clamp, cover bare shield with insulating tape</td>
</tr>
<tr>
<td>5</td>
<td>Cable clamp on bare shield, 1.5 N·m (13 lbf·in)</td>
</tr>
<tr>
<td>6</td>
<td>AC input cable (from WFU-xx)</td>
</tr>
<tr>
<td>7</td>
<td>Brake resistor cable (if present)</td>
</tr>
</tbody>
</table>
Frame R2i

1. DC output cable
2. Cable clamp on bare shield, 1.5 N·m (13 lbf·in)
3. Below cable clamp, cover bare shield with insulating tape
4. Above cable clamp, cover bare shield with insulating tape
5. Cable clamp on bare shield, 1.5 N·m (13 lbf·in)
6. AC input cable (from WFU-xx)
7. Brake resistor cable (if present)
Frames R3i and R4i (connector covers removed)

1 DC output cable
2 Cable clamp on bare shield, 1.5 N·m (13 lbf·in)
3 Below cable clamp, cover bare shield with insulating tape
4 Cable clamp on bare shield, 1.5 N·m (13 lbf·in)
5 AC input cable (from WFU-xx)
6 Brake resistor cable (if present)
### Direct lug connection
Instead of using the screw lugs included, the conductors of power cables can be connected to the drive terminals by removing the screw lugs and using crimp lugs.

<table>
<thead>
<tr>
<th>Screw lug detail</th>
<th>15 N·m (11 lbf·ft)</th>
</tr>
</thead>
</table>

![Image of screw lug detail](image-url)

![Image of direct lug connection](image-url)
Connection procedure (frame R6i)

**WARNING!**
Read the safety instructions given in *Safety instructions for ACS880 multidrive cabinets and modules* (3AUA0000102301 [English]). If you ignore them, injury or death, or damage to the equipment can occur.

1. Stop the drive and do the steps in section *Electrical safety precautions (page 111)* before you start the work.
2. Lead the cables into the inside of the cabinet. 360° grounding of the cable shield at the lead-through is recommended to suppress interference.
3. Twist the cable shields to bundles and connect to cabinet PE (ground) busbar. Connect the separate ground conductors/cables to cabinet PE (ground) busbar.
4. Connect the phase conductors to the input terminals of the main switch-disconnector [Q1]. For the tightening torques, see *Cabinet design and construction instructions for ACS880 multidrive modules* (3AUA0000107668 [English]).
5. Connect the output terminals of the main switch-disconnector [Q1] to the main contactor [Q2] input terminals.
6. Ground the module.
   - Ground the module from the module front plate at top of the module. The grounding point is marked on the module. Connect the frame support bracket on the module front plate with screws. The frame support bracket should have galvanic connection to the PE busbar through the cabinet frame.

**Note:** If the cabinet frame is painted (for example, Rittal VX25 cabinets), it is important to make sure that good galvanic connection to ground (PE busbar) is achieved. You can, for example, remove the paint from the connection points and use star washers.

**Note:** Connection to ground through fixing screws and the cabinet chassis is not always good enough. To ensure the continuity of the protective bonding circuit, you can connect the modules to the cabinet PE busbar with a copper busbar or cable. The inductance and impedance of the PE conductor/cable (grounding wire) must be rated according to permissible touch voltage appearing under fault conditions (so that the fault point voltage will not rise excessively when a ground fault occurs). See *Electrical planning instructions for ACS880 multidrive cabinets and modules* (3AUA0000102324 [English]).

7. Connect the contactor [Q2] output terminals to the module input terminals or to the AC connection busbars.
8. Connect the module DC busbars into the cabinet common DC busbars.
Note that figure 2 is an example of a cable lead-through that has to be acquired by the customer.

Connection procedure (frame R8i)

**WARNING!**
Obey the safety instructions given in *ACS880 multidrive cabinets and modules safety instructions* (3AUΛ0000102301 [English]). If you ignore the safety instructions, 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.

**WARNING!**
Apply grease to stripped aluminum conductors before attaching them to non-coated aluminum cable lugs. Obey the grease manufacturer’s instructions. Aluminum-aluminum contact can cause oxidation in the contact surfaces.
With the R8i modules, the input power cables are connected outside the supply/rectifier unit cabinet, typically inside the incoming cubicle.

1. Stop the drive and do the steps in section Electrical safety precautions (page 111) before you start the work.

2. Lead the cables into the inside of the cabinet. 360° grounding of the cable shield at the entry is recommended to suppress interference.

3. Twist the cable shields to bundles and connect to the cabinet PE (ground) busbar. Connect the separate ground conductors/cables to the cabinet PE (ground) busbar.

4. Connect the phase conductors to the input terminals of the main switch-disconnector [Q1]. For tightening torques, see Drive modules cabinet design and construction instructions (3AU0000107668 [English]).

5. Connect the output terminals of the main switch-disconnector [Q1] to the main fuses [F1.x].

6. Connect the main fuses [F1.x] to the main contactor [Q2] input terminals.

7. Connect the contactor [Q2] output terminals to the AC busbars of the filter in the supply/rectifier unit cabinet by cabling, busbars or equivalent.

8. Inside the supply/rectifier unit cabinet, push the R8i module into the quick connectors. • LCL filter module of type BLCL-1x-x: Push the LCL filter module into the quick connectors. • LCL filter module of type BLCL-2x-x: Remove the fan of the LCL filter module (see the instructions in the maintenance chapter). Push the LCL filter module into its place. Connect the filter output busbars (behind the filter module) to the busbars on the cabinet frame. Reinstall the fan of the LCL filter module.

9. Ground the modules:

   • Ground the modules by the top edge of the front plate. The grounding point is marked on the module. Connect the front plate to the frame support bracket with screws. The frame support bracket should have a galvanic connection to the PE busbar through the cabinet frame.

   Note: If the cabinet frame is painted (such as with, Rittal VX25 enclosures), it is important to make sure that good galvanic connection to ground (PE busbar) is achieved. You can, for example, remove the paint from the connection points and use star washers.

   Note: The connection to ground merely through the mounting screws and the cabinet chassis is not always good enough. To make sure the continuity of the protective bonding circuit, you can connect the modules to the cabinet PE busbar with a copper busbar or cable. The inductance and impedance of the PE conductor must be rated according to permissible touch voltage appearing under fault conditions (so that the fault point voltage will not rise excessively when a ground fault occurs). See ACS880 multidevice cabinets and modules electrical planning instructions (3AU0000102324 [English]).

10. Connect the DC busbars of the rectifier module into the cabinet common DC busbars.
Note that figure 2 is an example of a cable entry that has to be acquired by the customer.

6. AC input of the LCL filter module

BLCL-1x-x

BLCL-2x-x
7. AC output of the LCL filter module

BLCL-1x-x
BLCL-2x-x

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Connecting the LCL filter

By default, the LCL filter is protected against overheating (caused by a faulty fan, for example) with a thermistor. If the filter temperature becomes too high, the IGBT supply module is automatically stopped. The thermistor must always be connected to digital input XDI1 on the control unit.

**WARNING!**
If the overheating protection is removed with parameter settings, the filter may be damaged permanently or cause a fire.

**Frames R1...R4 only:** The 24 V DC power supply needed for the cooling fan is not included in the delivery. For selecting a supply, see the auxiliary circuit current consumption in the technical data.

**WARNING!**
Use the LCL filter only with an ACS880-204 IGBT supply module. Use the filter only with an IGBT supply module of an appropriate frame size.

**WARNING!**
Do not lengthen the output cables.
Connecting the WBCA adapter to the LCL filter (frames R1i…R4i)

1. Connect the cable (included) of the WBCA adapter to the L1/L2/L3 input terminals of the WFU-xx LCL filter module.

2. Connect the power input to the L1/L2/L3/PE terminals of the WBCA adapter.

Tightening torques:
- WFU-01: 1.7 … 1.8 N·m (15…16 lbf·in)
- WFU-11, -21, -22: 15 N·m (11 lbf·ft)
- WBCA-01: 1.7 … 1.8 N·m (15…16 lbf·in)
- WBCA-11, -21: 15 N·m (11 lbf·ft)
- **Connecting WFU-xx LCL filter module (frames R1i...R4i)**

1. **Input terminals (L1, L2, L3 and PE)**
   Connection from the WBCA adapter and the main contactor Q2.

2. **Cooling fan power supply connection**
   No fan supply is included in the delivery. Use a supply that meets the requirements given in the technical data.

3. **Fan control cable**
   (24 V = on / 0 V = off)
   Length: 1 m (3.3 ft)
   Connect to XRO3 on the ZCU control unit.

4. **Filter temperature sensor cable**
   Length: 1 m (3.3 ft)
   Connect to the thermistor input XDI1 on the ZCU control unit.

5. **Connection to the IGBT supply module**
   Length: 1 m (3.3 ft)
   Connect to the AC input terminals (U2, V2, W2 and PE) of the IGBT supply module.
- **Internal circuit diagrams for LCL filters**

The following circuit diagrams show the internal connections of the LCL filter modules.

**WFU-01 and WFU-02**
WFU-21 and WFU-22
ACS880 BLCL +V991 - Main Circuit

FILTER MODULE

* AMOUNT OF CAPACITORS

2 PCS
3 PCS
2 PCS
3 PCS

AC INPUT

- Lgrid

- Lconv

AC OUTPUT

- X30

1
L FAN
2
N FAN
3
4
TP1
5
TP2
6
7
L HEATER
8
N HEATER

- X55

L FAN
1
N FAN
2
L HEATER
3
N HEATER
4

L1 L2 L3

U2 V2 W2

-C1...3

-R1

PE

4

FRAME

5

H07Z-K

1,5

-F1

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Main contactor

A main contactor is needed for the following reasons:

- If the filter module is connected to the AC input power supply while the supply/regenerative rectifier module is not modulating/active, there is a risk that the filter responds to disturbance frequencies in a distorted AC input and starts resonating, which may cause permanent damage to the supply/rectifier module, filter and equipment connected to the DC bus. If the supply/rectifier module is stopped, faulty or otherwise inactive, it cannot counteract the resonance of the filter.

- The supply/rectifier module and the filter module cannot prevent power flow from the AC input to the DC bus and further to the ACS880-104 inverter module(s). Even if the modulation of the supply/rectifier module is stopped, the anti-parallel diodes in it enable power flow to the DC bus and to the inverter(s). In other words, merely stopping the supply/rectifier module does not stop the system.

- The supply/rectifier module is not protected against excessive current drawn from the DC bus. If the motoring power (power demanded from the DC bus) exceeds the supplying capability of the supply/rectifier module, it trips. If the current demand remains or increases, the supply/rectifier module is damaged.

See also ACS880 multidrive cabinets and modules electrical planning instructions (3AU0000102324 [English]).

Checking the charging capacity (frames R1i…R4i)

IGBT supply modules of frames R1i…R4i have internal charging circuit. When the power is switched on in the common DC system, the DC link capacitors in each inverter and supply module are charged. The charging current is fed through the supply module(s) connected to the AC. Due to this, the charging capacity of the supply module(s) has to be checked.

The ACS880 inverter and supply modules of frame sizes R1i…R4i have a charging circuit in series with the capacitor bank.

- In common DC connection, the charging circuits act in parallel.
- The sum of the charging currents is fed from the supply.

**Note:** IGBT supply modules of frames R1i…R4i are allowed to be used only with inverter modules that have charging circuit (eg, ABB inverter modules ACS880-104).

The charging circuit data for each IGBT supply module (ACS880-204) and inverter module (ACS880-104) are shown in the following tables.

<table>
<thead>
<tr>
<th>ACS880-204-</th>
<th>Frame</th>
<th>R</th>
<th>R&lt;sub&gt;min&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ohm</td>
<td>ohm</td>
</tr>
<tr>
<td>008A0-3</td>
<td>006A6-5</td>
<td>R1i</td>
<td>50</td>
</tr>
<tr>
<td>0018A-3</td>
<td>0015A-5</td>
<td>R2i</td>
<td>130</td>
</tr>
<tr>
<td>0035A-3</td>
<td>0029A-5</td>
<td>R3i</td>
<td>66</td>
</tr>
<tr>
<td>0050A-3</td>
<td>0041A-5</td>
<td>R3i</td>
<td>66</td>
</tr>
<tr>
<td>0093A-3</td>
<td>0077A-5</td>
<td>R4i</td>
<td>33</td>
</tr>
</tbody>
</table>

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Charging resistance of the supply or inverter module.  

\( R_{\min} \) The minimum value of the total effective charging resistance allowed for the supply or inverter module.

| \( R \) | Charging resistance of the supply or inverter module. |
| \( R_{\min} \) | The minimum value of the total effective charging resistance allowed for the supply or inverter module. |

The user must activate and tune the charging function in the control program. For information on tuning the parameters, see *ACS880 IGBT supply control program firmware manual* (3AUA0000131562 [English]).

### Single AC input

Calculate the total effective charging resistance \( R_{\text{tot}} \) from the inverter/supply modules connected to the DC link.

\[
R_{\text{tot}} = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \cdots + \frac{1}{R_n}}
\]

\( R_1 \ldots R_n \) are the charging resistance values of each module. The following condition must be fulfilled: \( R_{\text{tot}} > R_{\text{min}} \)

### Installing the charging circuit (frames R6i and R8i)

The cabinet builder must install and connect the charging circuit. For connections, see the example circuit diagrams. Consult ABB for more information on the components and wirings needed.

Activate and tune the charging function in the control program. For information on tuning the parameters, see the firmware manual.

### Connecting the external power supply cable for the auxiliary circuit

- **IGBT supply module (frames R1i...R4i, R6i)**

  The cabinet builder must arrange an auxiliary voltage of 24 V DC to power up the ZCU control unit. For more information, see chapter *The control unit*.

- **IGBT supply module (frame R8i) and LCL filter module (frames R6i and R8i)**

  Connectors are described in chapter *Operation principle and hardware description*.  

<table>
<thead>
<tr>
<th>ACS880-104-</th>
<th>Frame</th>
<th>( R )</th>
</tr>
</thead>
<tbody>
<tr>
<td>004A8-3, 006A0-3, 008A0-5, 003A6-5, 004A8-5, 006A0-5, 008A0-5</td>
<td>R1i</td>
<td>50</td>
</tr>
</tbody>
</table>
Connecting the control cables

- Default I/O connection diagrams
  See chapter *The control unit*.

- Connection procedure

  **Note:** The instructions below are based on an example cabinet construction. They are not applicable to all possible solutions but only clarify the principles.

  **Note:** The I/O of the supply/rectifier unit is mostly reserved for the internal use.

  The following procedure instructs how to connect the control cables. In the example, the power cables are routed to the cabinet through the bottom. Note that the figures in the procedure are examples.

1. Stop the drive and do the steps in section *Electrical safety precautions (page 111)* before you start the work.
2. Open the cubicle door.
3. Remove the shrouds (if any) from the cubicle.
4. Run the cables into the inside of the cabinet through a cable gland or grommet.
   - 360° grounding of the cable shield is recommended to suppress interference. In case a grounding cable gland is available, remove the outer jacket of the cable where it passes through the cable gland.
   - Seal the cable with a grommet.
     **Note:** Note that the figure is an example of a control cable lead-through that has to be acquired by the customer.
5. Run the cables to the appropriate terminals. Wherever possible:
   - Use the existing cable trunking in the cabinet.
   - Use sleeving wherever the cables are laid against sharp edges.
   - Tie the cables to provide strain relief.
6. Cut the cables to suitable length. Strip the cables and conductors.
7. Twist the cable shields into bundles and connect them to the ground terminal nearest to the terminal block. Keep the unshielded portion of the cables as short as possible.

8. Connect the conductors to appropriate terminals.

9. Fasten the shrouds (if any).

10. Close the doors.

- **Module fiber optic connectors (frame R8i)**

The following figure shows the R8i module fiber optic connections.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSFC</td>
<td>Control connection for the direct-on-line cooling fan of the LCL filter.</td>
</tr>
<tr>
<td></td>
<td>Must be done by the user.</td>
</tr>
<tr>
<td>BFPS</td>
<td>Control connection of the speed-controlled cooling fan</td>
</tr>
<tr>
<td></td>
<td>Connected at the factory.</td>
</tr>
<tr>
<td>BCU</td>
<td>Control unit connection.</td>
</tr>
<tr>
<td></td>
<td>Must be done by the user.</td>
</tr>
</tbody>
</table>

The following figure shows the filter module fiber optic connections.

<table>
<thead>
<tr>
<th>BLCL-1x-x</th>
<th>Fan control signal</th>
<th>Fan control signal feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>V2</td>
<td>V1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BLCL-2x-x</th>
<th>Fan control signal</th>
<th>Fan control signal feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>V2</td>
<td>V1</td>
<td></td>
</tr>
</tbody>
</table>
The following figures show example fiber optic connections related to fan control.

### Direct-on-line cooling fan (option +C188) in IGBT supply module and LCL filter module

![Diagram of Direct-on-line cooling fan (option +C188) in IGBT supply module and LCL filter module]

- **BCU**
- 400 V AC
- 230 V AC
- **BLCL-1x-x**
- **Contactor**
- **BDFC-01**
- **Fan**
- **Fan unit**
- **BINT-12**
- **R8i**

### Direct-on-line cooling fan (option +C188) in LCL filter module and speed-controlled fan (standard) in IGBT supply module

![Diagram of Direct-on-line cooling fan (option +C188) in LCL filter module and speed-controlled fan (standard) in IGBT supply module]

- **BCU**
- 230 V AC
- **LCL**
- **R8i**
- **BLCL-1x-x**
- **Contactor**
- **BDFC-01**
- **Fan**
- **Fan unit**
- **BFPS-48**
- **Fan unit**
- **BINT-12**
- **R8i**
Note: Connection between BINT board and BDFC board in the module is ready-made at the factory.

Connecting a PC

WARNING!
Do not connect the PC directly to the control panel connector of the control unit as this can cause damage.

A PC (with eg, the Drive composer PC tool) can be connected as follows:

1. Connect an ACx-AP-x control panel to the unit either
   • by inserting the control panel into the panel holder or platform, or
   • by using an Ethernet (eg, Cat 5e) networking cable.

2. Remove the USB connector cover on the front of the control panel.

3. Connect an USB cable (Type A to Type Mini-B) between the USB connector on the control panel (3a) and a free USB port on the PC (3b).

4. The panel will display an indication whenever the connection is active.

5. See the documentation of the PC tool for setup instructions.

Installing option modules

WARNING!
Obey the safety instructions of the drive. If you ignore them, injury or death, or damage to the equipment can occur.

Pay attention to the free space required by the cabling or terminals coming to the option modules.
1. Repeat the steps described in *Electrical safety precautions (page 111)*.

2. Pull out the lock.
   
   **Note:** The location of the lock depends on the module type.

3. Install the module to a free option module slot on the control unit.

4. Push in the lock.

5. Tighten the grounding screw to a torque of 0.8 N·m (7 lbf·in).
   
   **Note:** The screw tightens the connections and grounds the module. It is essential for fulfilling the EMC requirements and for proper operation of the module.

   **WARNING!**
   Do not use excessive force, or leave the screw too loose. Over-tightening can damage the screw or module. A loose screw can cause an operation failure.

6. Connect the wiring to the module. Obey the instructions given in the documentation of the module.
Installation checklist

Contents of this chapter
This chapter contains a checklist of the mechanical and electrical installation of the drive.

Checklist
Examine the mechanical and electrical installation of the drive before start-up. Go through the checklist together with another person.

WARNING!
Obey the safety instructions of the drive. 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.

WARNING!
Stop the drive and do the steps in section Electrical safety precautions (page 111) before you start the work.

<table>
<thead>
<tr>
<th>Make sure that …</th>
<th>☑</th>
</tr>
</thead>
<tbody>
<tr>
<td>The ambient operating conditions meet the drive ambient conditions specification, and enclosure rating (IP code or UL enclosure type).</td>
<td>☑</td>
</tr>
<tr>
<td>The supply voltage matches the nominal input voltage of the drive. See the type designation label.</td>
<td>☐</td>
</tr>
<tr>
<td>The insulation resistance of the input power cable, motor cable and motor is measured according to local regulations and the manuals of the drive.</td>
<td>☐</td>
</tr>
<tr>
<td>The drive cabinet is attached to the floor, and if necessary due to vibration etc, also by its top to the wall or roof.</td>
<td>☐</td>
</tr>
<tr>
<td>The drive module is fastened properly to the enclosure.</td>
<td>☐</td>
</tr>
</tbody>
</table>
Make sure that …

<table>
<thead>
<tr>
<th>Task</th>
<th>Completed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>The cooling air flows freely in and out of the drive. Air recirculation inside the cabinet is not possible (air baffle plates are on place, or there is another air guiding solution).</td>
<td>☑️</td>
</tr>
<tr>
<td>If the drive is connected to a network other than a symmetrically grounded TN-S system: You have done all the required modifications (for example, you may need to disconnect the EMC filter or ground-to-phase varistor). See the electrical installation instructions in the supply unit manual.</td>
<td>☑️</td>
</tr>
<tr>
<td>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.</td>
<td>☑️</td>
</tr>
<tr>
<td>The main circuit connections inside the drive cabinet correspond to the circuit diagrams.</td>
<td>☑️</td>
</tr>
<tr>
<td>The control unit has been connected. See the circuit diagrams.</td>
<td>☑️</td>
</tr>
<tr>
<td>Appropriate AC fuses and main disconnecting device are installed.</td>
<td>☑️</td>
</tr>
<tr>
<td>There is an adequately sized protective earth (ground) conductor(s) between the drive and the switchboard, the conductor is connected to correct terminal, and the terminal is tightened to the correct torque. Proper grounding has also been measured according to the regulations.</td>
<td>☑️</td>
</tr>
<tr>
<td>If the drive is equipped with a DC/DC converter unit: There is an adequately sized protective earth (ground) conductor between the energy storage and the DC/DC converter, the conductor has been connected to appropriate terminal, and the terminal has been tightened to the proper torque. Proper grounding has also been measured according to the regulations.</td>
<td>☑️</td>
</tr>
<tr>
<td>If the drive is equipped with a DC/DC converter unit: The energy storage cable has been connected to the correct terminals of the DC/DC converter and energy storage, and the terminals have been tightened to the proper torque.</td>
<td>☑️</td>
</tr>
<tr>
<td>If the drive is equipped with a DC/DC converter unit: The energy storage has been equipped with fuses for protecting energy storage cable in a cable short-circuit situation.</td>
<td>☑️</td>
</tr>
<tr>
<td>If the drive is equipped with a DC/DC converter unit: The energy storage has been equipped with a disconnecting device.</td>
<td>☑️</td>
</tr>
<tr>
<td>The input power cable is connected to the correct terminals, the phase order is correct, and the terminals are tightened to the correct torque.</td>
<td>☑️</td>
</tr>
<tr>
<td>There is an adequately sized protective earth (ground) conductor between the motor and the drive, and the conductor is connected to the correct terminal, and the terminal is tightened to the correct torque. Proper grounding has also been measured according to the regulations.</td>
<td>☑️</td>
</tr>
<tr>
<td>The motor cable is connected to the correct terminals, the phase order is correct, and the terminals are tightened to the correct torque.</td>
<td>☑️</td>
</tr>
<tr>
<td>The motor cable is routed away from other cables.</td>
<td>☑️</td>
</tr>
<tr>
<td>No power factor compensation capacitors are connected to the motor cable.</td>
<td>☑️</td>
</tr>
<tr>
<td>If an external brake resistor is connected to the drive: There is an adequately sized protective earth (ground) conductor between the brake resistor and the drive, and the conductor is connected to the correct terminal, and the terminals are tightened to the correct torque. Proper grounding has also been measured according to the regulations.</td>
<td>☑️</td>
</tr>
<tr>
<td>If an external brake resistor is connected to the drive: The brake resistor is connected to the correct terminals, and the terminals are tightened to the correct torque.</td>
<td>☑️</td>
</tr>
<tr>
<td>If an external brake resistor is connected to the drive: The brake resistor cable is routed away from other cables.</td>
<td>☑️</td>
</tr>
<tr>
<td>The control cables are connected to the correct terminals, and the terminals are tightened to the correct torque.</td>
<td>☑️</td>
</tr>
<tr>
<td>If a drive bypass connection will be used: The direct-on-line contactor of the motor and the drive output contactor are either mechanically and/or electrically interlocked, that is, they cannot be closed at the same time. A thermal overload device must be used for protection when bypassing the drive. Refer to local codes and regulations.</td>
<td>☑️</td>
</tr>
<tr>
<td>There are no tools, foreign objects or dust from drilling inside the drive.</td>
<td>☑️</td>
</tr>
</tbody>
</table>
Make sure that …

<table>
<thead>
<tr>
<th>Make sure that …</th>
<th>✔️</th>
</tr>
</thead>
<tbody>
<tr>
<td>The area in front of the drive is clean: the drive cooling fan cannot draw any dust or dirt inside.</td>
<td></td>
</tr>
<tr>
<td>Cover(s) of the motor connection box are in place. Cabinet shrouds are in place and doors are closed.</td>
<td></td>
</tr>
<tr>
<td>The motor and the driven equipment are ready for power-up.</td>
<td></td>
</tr>
</tbody>
</table>
Start-up

Contents of this chapter

This chapter instructs how to start up the IGBT supply unit.

The instructions are valid for the example IGBT supply unit with ACS880-204 IGBT supply modules. The default device designations (if any) are given in square brackets, for example, main contactor [Q2]. The same device designations are also used in the circuit diagrams, typically. They refer to the circuit diagram of the example installation by ABB.

Note: The instructions do not cover all possible cabinet constructions.

WARNING!
Only qualified electricians are allowed to do the work described in this chapter. Read the complete safety instructions and repeat the steps described in section Electrical safety precautions (page 111). The complete safety instructions are given in Safety instructions for ACS880 multidrive cabinets and modules (3AUA00000102301 [English]). Ignoring the instructions can cause physical injury or death, or damage to the equipment.

WARNING!
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".

If you select an external source for the start command and it is on, the drive will start immediately after fault reset. See the firmware manual.
## Start-up procedure

### Tasks

<table>
<thead>
<tr>
<th>Safety</th>
</tr>
</thead>
</table>

**WARNING!**  
Follow the safety instructions during the start-up procedure. See *Safety instructions for ACS880 multidrive cabinets and modules* (3AUA0000102301 [English]). Only qualified electricians are allowed to start-up the drive.

### Safety

**WARNING!**  
Follow the safety instructions during the start-up procedure. See *Safety instructions for ACS880 multidrive cabinets and modules* (3AUA0000102301 [English]). Only qualified electricians are allowed to start-up the drive.

### Checks/Settings with no voltage connected

**WARNING!**  
Make sure that the disconnector of the supply transformer is locked to the off (0) position, that means no voltage is, or can not be, connected to drive inadvertently.

The no-load current of the IGBT supply unit must be taken into account if pretests (e.g., factory tests) are made on the IGBT supply unit by using a temporary main AC supply. The no-load current circulates between the supply network and the LCL filter capacitors and therefore stresses the supply transformer. To avoid supply transformer overload, the supply transformer must be dimensioned according to 15% of IGBT supply unit nominal current. The transformer should be dedicated for the IGBT supply unit only, no other (sensitive) load shall be connected in same transformer secondary to avoid disturbance and malfunction.

In case a generator is used as a supply, it should be dimensioned according to the nominal current of the IGBT supply unit.

**If a generator is used as a supply:** The recommendation for ACS880 IGBT supply unit with generator supply is:

- always use BAMU auxiliary measurement unit
- short-circuit ratio of the grid \( > 3 \)
- short-circuit ratio of the generator \( 1/X_k > 2 \)
- generator nominal power \( P_{\text{gen}} > 0.3 \times P_{\text{ISU}} \)

**Drives with a main switch-disconnector [Q1]:** Make sure the main switch-disconnector is switched off.

**Drives with a main circuit breaker [Q21]:** Crank the main circuit breaker to DISCONNECTED position.

Open the auxiliary voltage switch [Q21].

Open the charging circuit switch [Q3].
### Tasks

Supply unit with a main circuit breaker: Set the current trip limits of the breaker. The trip limits have been preset to generic values by the breaker manufacturer. The generic limits do not correspond the protection requirements of the application. For the limit rules, see below.

**General rule**
Make sure that the selectivity condition is fulfilled, that is the breaker trips at a lower current than the protection device of the supplying network, and that the limit is high enough not to cause unnecessary trips during the intermediate DC circuit load peak at start.

**Long term current limit**
Rule of thumb: Set to the rated AC current of the module.

**Peak current limit**
Rule of thumb: Set to a value 3…4 times the rated AC current of the module.

- Check the mechanical and electrical installation.
- Check the settings of breakers/switches in the auxiliary circuits.
- If time relays, or relays with delayed make contact or break contact are used in emergency stop circuits, check the relay time settings. See delivery-specific circuit diagrams and safety function specific documentation (if applicable).
- Check the voltage settings of the auxiliary voltage transformers (if any) are according to the actual power line voltage. See the final circuit diagrams by the designer of the cabinet-installed drive.
- Disconnect the unfinished or unchecked 230 V AC cables that lead from the terminal blocks to the outside of the equipment.
- Check that both circuits of STO terminals on the supply control unit are closed (IN1 and IN2 must be connected to OUT). The supply unit cannot start if either circuit is open. See the wiring diagrams delivered with the drive and chapter "The control unit."
- **Frame R8i:** Check that both channels of STO IN (X52) connector on IGBT supply module are connected to 24 V DC for the supply unit to start.
- **Frames R1i…R4i:** Connect the relay outputs XRO1 and XRO3 in parallel on the ZCU control unit, since the IGBT supply modules have internal charging circuit. See chapter "Example circuit diagrams."

### Powering up the IGBT supply unit

Make sure that it is safe to connect voltage. Make sure that:
- nobody is working on the unit or circuits that are wired from outside into the cabinets,
- covers of the motor terminal boxes are on.

- Close the circuit breakers supplying the auxiliary circuits [F22,…, F26].
- Close the cabinet doors.
- Close the main breaker of the supply transformer.
- Switch the auxiliary voltage switch [Q21] on.
### Setting up the supply unit parameters

Check the correct voltage range, parameter 195.01 Supply voltage.

Supply modules with option +C188 (direct-on-line cooling fan): Set bit 14 of 195.20 HW options word 1.

If your supply unit consists of more than one module, parameter 195.31 Parallel connection rating id needs to be set first.

- Select the correct voltage range with parameter 195.30 Parallel type filter.
- Then select the correct supply unit type with parameter 195.31 Parallel connection rating id.
- Reboot the control unit by parameter 196.08 Control board boot.
- Check the correct voltage range, parameter 195.01 Supply voltage.
- Reboot the control unit by parameter 196.08 Control board boot.

<table>
<thead>
<tr>
<th>ACS800-204-…</th>
<th>Frame</th>
<th>Parameter 195.31 selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1130A-3</td>
<td>2×R8i</td>
<td>ACS880-20X-1130A-3 (7072)</td>
</tr>
<tr>
<td>1330A-3</td>
<td>2×R8i</td>
<td>ACS880-20X-1330A-3 (7082)</td>
</tr>
<tr>
<td>1580A-3</td>
<td>2×R8i</td>
<td>ACS880-20X-1580A-3 (7102)</td>
</tr>
<tr>
<td>2350A-3</td>
<td>3×R8i</td>
<td>ACS880-20X-2350A-3 (7103)</td>
</tr>
<tr>
<td>3110A-3</td>
<td>4×R8i</td>
<td>ACS880-20X-3110A-3 (7104)</td>
</tr>
<tr>
<td>4620A-3</td>
<td>6×R8i</td>
<td>ACS880-20X-4620A-3 (7106)</td>
</tr>
<tr>
<td>1040A-5</td>
<td>2×R8i</td>
<td>ACS880-20X-1040A-5 (7172)</td>
</tr>
<tr>
<td>1420A-5</td>
<td>2×R8i</td>
<td>ACS880-20X-1420A-5 (7202)</td>
</tr>
<tr>
<td>2120A-5</td>
<td>3×R8i</td>
<td>ACS880-20X-2120A-5 (7203)</td>
</tr>
<tr>
<td>2800A-5</td>
<td>4×R8i</td>
<td>ACS880-20X-2800A-5 (7204)</td>
</tr>
<tr>
<td>4150A-5</td>
<td>6×R8i</td>
<td>ACS880-20X-4150A-5 (7206)</td>
</tr>
<tr>
<td>0720A-7</td>
<td>2×R8i</td>
<td>ACS880-20X-0720A-7 (7272)</td>
</tr>
<tr>
<td>1050A-7</td>
<td>2×R8i</td>
<td>ACS880-20X-1050A-7 (7302)</td>
</tr>
<tr>
<td>1570A-7</td>
<td>3×R8i</td>
<td>ACS880-20X-1570A-7 (7303)</td>
</tr>
<tr>
<td>2070A-7</td>
<td>4×R8i</td>
<td>ACS880-20X-2070A-7 (7304)</td>
</tr>
<tr>
<td>3080A-7</td>
<td>6×R8i</td>
<td>ACS880-20X-3080A-7 (7306)</td>
</tr>
</tbody>
</table>

If you need more information on the use of the control panel, see ACX-AP-x assistant control panels user's manual (3AUA0000085685 [English]).

Switch the control panel to the remote mode (Loc/Rem key) to enable control of the supply unit with the operating switch [S21].

### Switching the supply unit on

**WARNING!**

If the drive is equipped with a brake unit, make sure there are inverters connected to the intermediate circuit before closing the main contactor [Q2]. A rule of thumb: The sum capacitance of the inverters connected must be at least 50% of the sum capacitance of all inverters.

If there is not enough capacitive load at start, the DC voltage will overshoot the overvoltage limit, causing immediate start of the brake unit. Constant braking will overload brake choppers and resistors and cause overheating.

Drives with a main switch-disconnector [Q1]: Close the main switch-disconnector.

Drives with a main circuit breaker [Q1]: Crank the breaker in.

**WARNING!** Start button of the main circuit breaker bypasses charging circuit and may damage the module.
Tasks

<table>
<thead>
<tr>
<th>Task</th>
<th>Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drives with a charging switch [Q3]; Close the charging switch.</td>
<td></td>
</tr>
<tr>
<td>Turn the operating switch [S21] to on (1) position to activate the Run enable signal and switch the main contactor [Q2] on.</td>
<td></td>
</tr>
</tbody>
</table>

On-load checks

<table>
<thead>
<tr>
<th>Task</th>
<th>Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check that the supply module cooling fan rotates freely in the right direction.</td>
<td></td>
</tr>
<tr>
<td>Validate the operation of safety functions (for example, emergency stop).</td>
<td></td>
</tr>
</tbody>
</table>

**WARNING!**
The safety functions are not safe before they are validated according to the instructions. Safety functions are optional. See the function-specific manual for the validation tasks.

Switching the supply unit off

1. Stop the motors connected to inverter units.

2. Deactivate the Run enable signal to open the main contactor [Q2]. This can be done, for example, with an operating switch [S21].
Maintenance

Contents of this chapter

This chapter instructs how to maintain the IGBT supply module and how to interpret its fault indications. The information is valid for ACS880-204 IGBT supply modules and example cabinet installations of the modules.

Note: The instructions do not cover all possible cabinet constructions.

**WARNING!**
Only qualified electricians are allowed to do the work described in this chapter. Read the complete safety instructions before you install, commission, use or service the converter. The complete safety instructions are given in Safety instructions for ACS880 multidrive cabinets and modules (3AUA0000102301 [English]).

Maintenance intervals

The table below shows the maintenance tasks which can be done by the end user. The complete maintenance schedule is available on the Internet (www.abb.com/drivesservices). For more information, consult your local ABB Service representative (www.abb.com/searchchannels).
<table>
<thead>
<tr>
<th>Maintenance task/object</th>
<th>Years from start-up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Cooling fans</strong></td>
<td></td>
</tr>
<tr>
<td>Cooling fan of supply module (frames R1i...R4i, R6i)</td>
<td></td>
</tr>
<tr>
<td>Cooling fan of supply module (frame R8i, speed-controlled)</td>
<td></td>
</tr>
<tr>
<td>Cooling fan of supply module (frame R8i, 50 Hz, direct-on-line (option +C188))</td>
<td></td>
</tr>
<tr>
<td>Cooling fan of supply module (frame R8i, 60 Hz, direct-on-line (option +C188))</td>
<td></td>
</tr>
<tr>
<td>Cooling fan of LCL filter (50 Hz, direct-on-line)</td>
<td></td>
</tr>
<tr>
<td>Cooling fan of LCL filter (60 Hz, direct-on-line)</td>
<td></td>
</tr>
<tr>
<td>Internal circuit board compartment fan</td>
<td></td>
</tr>
<tr>
<td>Cabinet cooling fans (internal, door, IP54) 50 Hz</td>
<td></td>
</tr>
<tr>
<td>Cabinet cooling fans (internal, IP54) 60 Hz</td>
<td></td>
</tr>
<tr>
<td>Cabinet cooling fan (door) 60 Hz</td>
<td></td>
</tr>
<tr>
<td><strong>Batteries</strong></td>
<td></td>
</tr>
<tr>
<td>Control panel battery</td>
<td></td>
</tr>
<tr>
<td>Control unit battery</td>
<td></td>
</tr>
<tr>
<td><strong>Connections and environment</strong></td>
<td></td>
</tr>
<tr>
<td>Cabinet door filters IP54</td>
<td></td>
</tr>
<tr>
<td>Quality of supply voltage</td>
<td></td>
</tr>
<tr>
<td><strong>Spare parts</strong></td>
<td></td>
</tr>
<tr>
<td>Spare parts</td>
<td>I</td>
</tr>
<tr>
<td>Reforming of DC circuit capacitors (spare modules and spare capacitors)</td>
<td>P</td>
</tr>
<tr>
<td><strong>Inspections by user</strong></td>
<td></td>
</tr>
<tr>
<td>Cleaning IP22 and IP42 air inlet and outlet meshes</td>
<td>I</td>
</tr>
<tr>
<td>Checking tightness of cable and busbar terminals. Tightening if needed.</td>
<td>I</td>
</tr>
<tr>
<td>Checking ambient conditions (dustiness, corrosion, temperature)</td>
<td>I</td>
</tr>
<tr>
<td>Cleaning the heatsink of the supply module</td>
<td>I</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
</tr>
<tr>
<td>ABB-SACE main circuit breaker maintenance</td>
<td>I</td>
</tr>
</tbody>
</table>
### Functional safety

<table>
<thead>
<tr>
<th>Maintenance task/object</th>
<th>Years from start-up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8 9 10 11 12 ...</td>
</tr>
<tr>
<td>Safety function test</td>
<td>I</td>
</tr>
<tr>
<td>Safety component expiry (Mission time, $T_M$)</td>
<td>20 years</td>
</tr>
</tbody>
</table>

1) 6 years interval if fan supply voltage is 400 V instead of 320 V.

### Symbols

| I | Inspection (visual inspection and maintenance action if needed) |
| P | Performance of on/off-site work (commissioning, tests, measurements or other work) |
| R | Replacement |

### Note:

- Maintenance and component replacement intervals are based on the assumption that the equipment is operated within the specified ratings and ambient conditions. ABB recommends annual drive inspections to ensure the highest reliability and optimum performance.
- Long term operation near the specified maximum ratings or ambient conditions may require shorter maintenance intervals for certain components. Consult your local ABB Service representative for additional maintenance recommendations.

### Maintenance timers and counters

The control program has maintenance timers and counters that can be configured to generate a warning when a pre-defined limit is reached. Each timer/counter can be set to monitor any parameter. This feature is especially useful as a service reminder. For more information, see the firmware manual.

### Cabinet

- **Cleaning the interior of the cabinet**

  **WARNING!**
  Obey the safety instructions given in *ACS880 multidrive cabinets and modules safety instructions* (3AUA0000102301 [English]). If you ignore the safety instructions, 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.

  **WARNING!**
  Use a vacuum cleaner with antistatic hose and nozzle, and wear a grounding wristband. Using a normal vacuum cleaner creates static discharges which can damage circuit boards.
1. Stop the drive and do the steps in section *Electrical safety precautions (page 111)* before you start the work.

2. Open the cabinet door.

3. Clean the interior of the cabinet. Use a vacuum cleaner and a soft brush.

4. Clean the air inlets of the fans and air outlets of the modules (top).

5. Clean the air inlet gratings (if any) on the door.

6. Close the door.

---

**Cleaning the door air inlets (IP22 and IP42)**

Check the dustiness of the air inlet meshes. If the dust cannot be removed by vacuum cleaning from outside through the grating holes with a small nozzle, proceed as follows:

1. Stop the drive and do the steps in section *Electrical safety precautions (page 111)* before you start the work.

2. Remove the fasteners at the top of the grating.

3. Lift the grating and pull it away from the door.

4. Vacuum clean or wash the grating on both sides.

5. Reinstall the grating in reverse order.
Replacing the inlet door filters (IP54)

1. Stop the drive and do the steps in section *Electrical safety precautions (page 111)* before you start the work.
2. Remove the fasteners at the top of the grating.
3. Lift the grating and pull it away from the door.
4. Remove the air filter mat.
5. Place the new filter mat in the grating the metal wire side facing the door.
6. Reinstall the grating in reverse order.

Cleaning the roof outlet filters (IP54)

The outlet filters on the roof of IP54 units can be accessed by pulling the gratings upwards.
Power connections

- Retightening the power connections

**WARNING!**
Obey the safety instructions given in *ACS880 multidrive cabinets and modules safety instructions* (3AU0000102301 [English]). If you ignore the safety instructions, 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.

1. Stop the drive and do the steps in section *Electrical safety precautions (page 111)* before you start the work.
2. Examine the tightness of the cable connections. Use the tightening torques given in the technical data.
Fans

The lifespan of the cooling fans of the drive depends on the running time, ambient temperature and dust concentration. See the firmware manual for the actual signal which indicates the running time of the cooling fan. Reset the running time signal after fan replacement.

Replacement fans are available from ABB. Do not use other than ABB specified spare parts.

Replacing the R1i and R2i module cooling fan

1. Stop the drive and do the steps in section *Electrical safety precautions (page 111)* before you start the work.
2. Detach the power cable clamp plate and terminal blocks.
3. Release the retaining clips (arrowed) carefully using a screwdriver.
4. Pull the fan holder out.
5. Disconnect the fan cable.
6. Carefully bend the clips on the fan holder to free the fan.
7. Install new fan in reverse order.

**Note:** The airflow direction is bottom-to-top. Install the fan so that the arrow on it points up.

In the drawing, the direction of airflow is from right to left.
Replacing the R3i and R4i module cooling fan

**WARNING!**
Read the safety instructions given in *Safety instructions for ACS880 multidrive cabinets and modules* (3AUA0000102301 [English]). If you ignore them, injury or death, or damage to the equipment can occur.

1. Stop the drive and do the steps in section *Electrical safety precautions (page 111)* before you start the work.
2. To remove the fan, release the retaining clip (arrowed) carefully using a screwdriver.
3. Pull the fan holder out.
4. Disconnect the fan cable.
5. Carefully bend the clips on the fan holder to free the fan.
6. Install new fan in reverse order.

**Note:** The airflow direction is bottom-to-top. Install the fan so that the airflow arrow points up.

In the picture direction of airflow is from right to left.
Replacing the R6i module cooling fan

WARNING!
Read the safety instructions given in Safety instructions for ACS880 multidrive cabinets and modules (3AUA0000102301 [English]). If you ignore them, injury or death, or damage to the equipment can occur.

1. Stop the drive and do the steps in section Electrical safety precautions (page 111) before you start the work.
2. Open the door. Remove any shrouding in front of the fan unit.
3. Remove the front plate.
4. Remove the two screws that lock the fan unit.
5. Unplug the power supply wire of the fan.
6. To free the fan holder, pull it slightly outwards (about 5 mm), then downwards.
7. Detach the fan from the fan holder.
8. Install new fan in reverse order to the above.

Note: The airflow direction is bottom-to-top. Make sure that the airflow direction arrow on the fan points upward.
Replacing R8i module cooling fan (speed-controlled version)

The module is equipped with a fan unit that contains two cooling fans.

**WARNING!**
Obey the safety instructions given in ACS880 multidrive cabinets and modules safety instructions (3AUA0000102301 [English]). If you ignore the safety instructions, 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.

**WARNING!**
Use the required personal protective equipment. Wear protective gloves and long sleeves. Some parts have sharp edges.

1. Stop the drive and do the steps in section Electrical safety precautions (page 111) before you start the work.
2. Open the cubicle door.
3. Remove the shroud in front of the fan (if any).
4. Remove the screws holding the front cover plate. Lift the cover plate somewhat to release it.
5. Disconnect the fan wiring.
6. Remove the unit below the fan.
7. Remove the screws of the fan unit.
8. Pull out the fan unit.
9. Install a new fan in reverse order.
Replacing R8i module cooling fan (direct-on-line version)

**WARNING!**
Obey the safety instructions given in *ACS880 multidrive cabinets and modules safety instructions* (3UA0000102301 [English]). If you ignore the safety instructions, 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.

**WARNING!**
Use the required personal protective equipment. Wear protective gloves and long sleeves. Some parts have sharp edges.

1. Stop the drive and do the steps in section *Electrical safety precautions (page 111)* before you start the work.
2. Open the door.
3. Remove the shroud in front of the fan (if any).
4. Remove the screws holding the front cover plate. Lift the cover plate somewhat to release it.
5. Remove the bracket.
6. Disconnect the wiring of the fan unit.
7. Remove the screws of the fan unit.
8. Pull out the fan unit.
9. Disconnect the fan wire from the fan unit.
10. Remove the screws of the fan.
11. Install a new fan in reverse order.
Replacing the circuit board compartment fan

Frame R8i modules are equipped with a fan blowing air through the circuit board compartment. The fan is accessible from the front of the module.

**WARNING!**

Obey the safety instructions given in *ACS880 multidrive cabinets and modules safety instructions* (3UA0000102301 [English]). If you ignore the safety instructions, 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.

1. Stop the drive and do the steps in section *Electrical safety precautions (page 111)* before you start the work.
2. Open the door of the module cubicle.
3. Remove the two M4×12 (T20) screws which lock the fan holder.
4. Pull the fan holder out of the module.
5. Disconnect the fan cable.

6. Remove the four M3 (5.5 mm) nuts which hold the fan.
7. Remove the fan from the fan holder.

8. Put the fan onto the threaded studs on the fan holder with the airflow direction arrow pointing towards the fan holder.

9. Install and tighten the four nuts removed earlier.

10. Connect the fan cable.

11. Align and push the fan holder into the module.

12. Install and tighten the two M4×12 (T20) screws.
Replacing the fan of the LCL filter (filter for frames R1i...R4i)

WARNING!
Read the safety instructions given in Safety instructions for ACS880 multidrive cabinets and modules (3AUA0000102301 [English]). If you ignore them, injury or death, or damage to the equipment can occur.

1. Stop the drive and do the steps in section Electrical safety precautions (page 111) before you start the work.
2. Open the door.
3. Release the retaining clips (arrowed, see the figures below).
4. Pull the fan holder out.
5. Disconnect the fan cable.
6. Carefully bend the clips on the fan holder to free the fan.
7. Install a new fan in reverse order.

Note: The airflow direction is bottom-to-top. Install the fan so that the airflow arrow points up.
Replacing the fan of the LCL filter (filter for frame R6i)

WARNING!
Read the safety instructions given in Safety instructions for ACS880 multidrive cabinets and modules (3AUA0000102301 [English]). If you ignore them, injury or death, or damage to the equipment can occur.

1. Stop the drive and do the steps in section Electrical safety precautions (page 111) before you start the work.
2. Open the door.
3. Disconnect the wire plug.
4. Remove the two screws holding the fan unit.
5. Pull the fan unit out.
6. Install new fan in reverse order.
# Replacing the fan of the LCL filter (BLCL-1x-x)

**WARNING!**

Obey the safety instructions given in *ACS880 multidrive cabinets and modules safety instructions* (3AUA0000102301 [English]). If you ignore the safety instructions, 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.

1. Stop the drive and do the steps in section *Electrical safety precautions (page 111)* before you start the work.
2. Open the door.
3. Remove the two locking screws of fan supply plug connector.
4. Pull the plug connector downwards to unplug the fan wiring.
5. Remove two screws in front of the fan unit.
6. Pull the fan unit out.
7. Install a new fan in reverse order.
Replacing the fan of the LCL filter (BLCL-2x-x)

**WARNING!**
Obey the safety instructions given in *ACS880 multidrive cabinets and modules safety instructions* (3AUA0000102301 [English]). If you ignore the safety instructions, 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.

1. Stop the drive and do the steps in section *Electrical safety precautions (page 111)* before you start the work.

2. Open the door.

3. Remove the two locking screws of fan supply plug connector.

4. Pull the plug connector downwards to unplug the fan wiring.

5. Remove the screws in front of the fan unit.

6. Pull the fan unit out.

7. Install a new fan in reverse order.
Replacing the cabinet cooling fans

Cabinets with ABB air outlet kits

WARNING!
Obey the safety instructions given in ACS880 multidrive cabinets and modules safety instructions (3AUA0000102301 [English]). If you ignore the safety instructions, 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.

1. Stop the drive and do the steps in section Electrical safety precautions (page 111) before you start the work.

2. The instruction mentioned at each air outlet kit in chapter Ordering information contains an exploded view of the outlet. Remove all gratings and filters, and finally remove the plate on top of the outlet. Unscrew all necessary screws securing the fan and remove it.

3. Install new fan in reverse order.

Cabinets with other fan types

WARNING!
Obey the safety instructions given in ACS880 multidrive cabinets and modules safety instructions (3AUA0000102301 [English]). If you ignore the safety instructions, 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.

1. Stop the drive and do the steps in section Electrical safety precautions (page 111) before you start the work.

2. Follow the instructions of the manufacturer of the air outlet or enclosure system.
IGBT supply module

- Cleaning the heatsink

The drive module heatsink fins pick up dust from the cooling air. The drive runs into overtemperature warnings and faults if the heatsink is not clean. When necessary, clean the heatsink as follows.

WARNING!
Use the required personal protective equipment. Wear protective gloves and long sleeves. Some parts have sharp edges.

WARNING!
Use a vacuum cleaner with antistatic hose and nozzle, and wear a grounding wristband. Using a normal vacuum cleaner creates static discharges which can damage circuit boards.

1. Stop the drive and do the steps in section Electrical safety precautions (page 111) before you start the work.
2. Remove the drive module from the cabinet.
3. Remove the module cooling fan(s). See the separate instructions.
4. Blow dry, clean and oil-free compressed air from bottom to top and simultaneously use a vacuum cleaner at the air outlet to trap the dust. If there is a risk of dust entering adjoining equipment, do the cleaning in another room.
5. Reinstall the cooling fan.
Replacing the R6i module

WARNING!
Read the safety instructions given in Safety instructions for ACS880 multidrive cabinets and modules (3AUA0000102301 [English]). If you ignore them, injury or death, or damage to the equipment can occur.

1. Stop the drive and do the steps in section Electrical safety precautions (page 111) before you start the work.
2. Open the cubicle door.
3. Undo the screws of the shrouds and remove the shrouds.
4. Remove the module fan. For the instructions, see section Replacing the R6i module cooling fan (page 165).
5. Undo the screws of the PE cable (in front of the module, on left side). Remove the PE cable.
6. Undo the screws of the sheet metal plate located in front of the module. Remove the plate.
7. Undo the module screws.
8. Remove the fastening bolts of the DC busbars.
9. Remove the fastening bolts of the AC cables.
10. Unplug the signal connector cable (if any) in front of the module.
11. Pull the module out enough to attach a lifting chain to chain holes on top of the module. A lifting device for R6i module is available from ABB (order code: 3AXD50000196661, instruction code: 3AXD50000210268). Pull the module out.
12. To replace the module, perform the steps 1…11 in reverse order.
Replacing R8i module

WARNING!
Obey the safety instructions given in ACS880 multidrive cabinets and modules safety instructions (3AUA0000102301 [English]). If you ignore the safety instructions, 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.
WARNING!

- Do not use the module extraction/installation ramp with plinth heights which exceed the maximum allowed height.
- Secure the module extraction/installation ramp carefully.
- Push the module into the cabinet and pull it from the cabinet carefully preferably with help from another person. Keep a constant pressure with one foot on the base of the module to prevent the module from falling on its back. Keep your fingers away from the edges of the front flange of the module.

- Do not roll the module on its wheels for a longer distance than what is required for inserting or extracting the module. To move the module to or from the vicinity of the cabinet, lay the module on its side on a pallet or equivalent, and use a forklift or pallet truck.

- Be careful when handling a tall module. The module over turns easily because it is heavy and has a high center of gravity. Whenever possible, secure the module with chains. Do not leave an unsupported module unattended especially on a sloping floor.

- Wear protective gloves and long sleeves! Some parts have sharp edges.

1. Stop the drive and do the steps in section Electrical safety precautions (page 111) before you start the work.
2. Open the cubicle door.
3. Remove the shrouds (if any).

4. Unplug the wiring on the front of the module. Unplug the connector (X50) at the top of the module. Move the wires aside.

5. Use a module pull out ramp or other lifting device to remove the module from the cabinet. If the ramp designed for Rittal enclosures is used, install it by placing the hooks of the ramp between the bottom plate and enclosure frame.

6. Remove the two fastening bolts in the DC output busbars. Remove the two fastening screws on the top part of the module.

7. Remove the module fastening screws on the lower part of the module.

8. Pull the module carefully out of the cabinet along the ramp, or use another lifting device to remove the module.

9. Replace the module:
   - Push the module back in and fasten. Tighten the fastening screws of the module to 22 N·m (16.2 lbf·ft) and fastening bolts of the DC input busbars to 70 N·m (51.6 lbf·ft).
   - Reconnect connector X50 at the top of the module.
   - Reconnect the wiring and fiber optic cables to their respective terminals on the front of the module.
   - Remove the module pull-out ramp, attach the shrouds (if any) and close the cabinet doors.
LCL filter

■ Replacing the LCL filter (frame R6i)

WARNING!
Read the safety instructions given in Safety instructions for ACS880 multidrive cabinets and modules (3AUA0000102301 [English]). If you ignore them, injury or death, or damage to the equipment can occur.

1. Stop the drive and do the steps in section Electrical safety precautions (page 111) before you start the work.
2. Open the cubicle door.
3. Undo the screws of the shrouds and remove the shrouds.
4. Unplug the signal connector cable on top part of the LCL filter module.
5. Remove the screws below the main switch-disconnector.
6. Unfasten the cables [L1, L2, L3] on the side of the LCL filter module.
7. Unfasten the power cables.
8. Remove the screws on the metal sheet and remove the sheet.
9. Remove the screws below the main switch-disconnector.
10. Remove the screws on the metal sheet and lift the sheet up.
11. Remove the screws on the bottom of the LCL filter module.
12. Pull the module carefully out of the cabinet.
13. To replace the LCL filter, perform the steps 1...12 in reverse order.
Replacing the LCL filter (frame R8i)

WARNING!
Read the safety instructions given in Safety instructions for ACS880 multidrive cabinets and modules (3UA0000102301 [English]). If you ignore them, injury or death, or damage to the equipment can occur.
WARNING!

- Do not use the module extraction/installation ramp with plinth heights which exceeds the maximum allowed height.
- Secure the module extraction/installation ramp carefully.
- Push the module into the cabinet and pull it from the cabinet carefully preferably with help from another person. Keep a constant pressure with one foot on the base of the module to prevent the module from falling on its back. Keep your fingers away from the edges of the front flange of the module.

- Do not roll the module on its wheels for a longer distance than what is required for inserting or extracting the module. To move the module to or from the vicinity of the cabinet, lay the module on its side on a pallet or equivalent, and use a forklift or pallet truck.
- Be careful when handling a tall module. The module overturns easily because it is heavy and has a high center of gravity. Whenever possible, secure the module with chains. Do not leave an unsupported module unattended especially on a sloping floor.

- Wear protective gloves and long sleeves! Some parts have sharp edges.

1. Stop the drive and do the steps in section Electrical safety precautions (page 111) before you start the work.
2. Open the cubicle door.
3. Remove the shrouds (if any).
4. Unplug the signal connector cable on top of the LCL filter module.
5. Remove the five screws in the upper part of the LCL filter module.
6. Remove the four screws in the lower part of the LCL filter module.
7. Use a module pull out ramp or other lifting device to remove the module from the cabinet. If the ramp is used, install it by placing the hooks of the ramp between the bottom plate and Rittal frame.
8. Pull the module carefully out of the cabinet along the ramp or use any other lifting device to remove the module.
9. Replace the module:
   • Push the module back in and fasten. Be careful not to break the fastening screws: tighten the fastening screws to 22 N·m (16.2 lbf·ft) and fastening bolts to 70 N·m (51.6 lbf·ft).
   • Plug the module signal wire set to the module signal connector.
   • Remove the module pull-out ramp, attach the shrouds (if any) and close the cabinet doors.
Capacitors

The DC link of the drive contains several electrolytic capacitors. Operating time, load, and surrounding air temperature have an effect on the life of the capacitors. Capacitor life can be extended by decreasing the surrounding air temperature.

Capacitor failure is usually followed by damage to the unit and an input cable fuse failure, or a fault trip. If you think that any capacitors in the drive have failed, contact ABB.

- Reforming the capacitors

The capacitors must be reformed if the drive has not been powered (either in storage or unused) for a year or more. The manufacturing date is on the type designation label. For information on reforming the capacitors, see Capacitor reforming instructions (3BFE64059629 [English]) in the ABB Library (https://library.abb.com/en).
Replacing the LCL filter capacitor (frames R3i and R4i)

**WARNING!**
Read the safety instructions given in *Safety instructions for ACS880 multidrive cabinets and modules* (3AUA0000102301 [English]). If you ignore them, injury or death, or damage to the equipment can occur.

1. Stop the drive and do the steps in section *Electrical safety precautions (page 111)* before you start the work.
2. Open the cubicle door.
3. Remove the filter cover.
4. Disconnect the three cables.
5. Unfasten the four screws.
6. Lift the capacitor out of the filter module.
7. Remove the rings.
8. Unfasten the nut at the bottom of the capacitor so you can detach the capacitor from the plate.
9. Install a new capacitor in reverse order.

**Note:** When installing a new capacitor, you can connect the three cables in any order.
Control panel

For detailed information on the control panel, see ACx-AP-x assistant control panels user’s manual (3AUA0000085685) [English].

- Cleaning the control panel

Use a soft damp cloth to clean the control panel. Avoid harsh cleaners which could scratch the display window.

- Replacing the battery

The instructions below describe how to replace the battery that powers the real-time clock of the control panel.

1. Turn the lid on the back of the control panel counter-clockwise until the lid opens.
2. Remove the battery gently.
3. Replace the battery with a new CR2032 battery. The battery holder has grip nails.
   First slide the battery and then press on the other side. The battery will snap in.
4. Make sure that the battery polarity shows positive on the upside.
5. Put the lid back and tighten it by turning it clockwise.
6. Dispose of the old battery according to local disposal rules or applicable laws.

Control units

- BCU control unit types

There are three variants of the BCU control unit used in ACS880: BCU-02, BCU-12 and BCU-22. These have a different number of converter module connections (2, 7 and 12 respectively) but are otherwise identical. The three BCU types are interchangeable as long as the number of connections is sufficient. For example, the BCU-22 can be used as a direct replacement for both BCU-02 and BCU-12.

- Replacing the memory unit

After replacing a control unit, you can keep the existing parameter settings by transferring the memory unit from the defective control unit to the new control unit.
WARNING!
Do not remove or insert the memory unit when the control unit is powered.

1. Stop the drive and do the steps in section Electrical safety precautions (page 111) before you start the work.
2. Make sure that the control unit is not powered.
3. Remove the fastening screw and pull the memory unit out.
4. Install a memory unit in reverse order.

- Replacing the BCU control unit battery

Replace the real-time clock battery if the BATT OK LED is not illuminated when the control unit is powered.

1. Stop the drive and do the steps in section Electrical safety precautions (page 111) before you start the work.
2. Undo the fastening screw and remove the battery.
3. Replace the battery with a new BR2032 battery.
4. Dispose of the old battery according to local disposal rules or applicable laws.
5. Set the real-time clock.
LEDs and other status indicators

Warnings and faults reported by the control program are displayed on the control panel or in the Drive composer PC tool. For further information, see the firmware manual delivered with the supply module.

Control panel and panel platform/holder LEDs

The ACS-AP-… control panel has a status LED. The control panel mounting platform or holder has two status LEDs. For their indications, see the following table.

<table>
<thead>
<tr>
<th>Location</th>
<th>LED</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control panel</td>
<td>Continuous green</td>
<td>The unit is functioning normally.</td>
</tr>
<tr>
<td></td>
<td>Flickering green</td>
<td>Data is transferred between the PC and the unit through the USB connection of the control panel.</td>
</tr>
<tr>
<td></td>
<td>Blinking green</td>
<td>There is an active warning in the unit.</td>
</tr>
<tr>
<td></td>
<td>Continuous red</td>
<td>There is an active fault in the unit.</td>
</tr>
<tr>
<td></td>
<td>Blinking red</td>
<td>There is a fault that requires the stopping and restarting of the drive/converter/inverter.</td>
</tr>
<tr>
<td></td>
<td>Blinking blue (ACS-AP-W only)</td>
<td>The Bluetooth interface is enabled, in discoverable mode, and ready for pairing.</td>
</tr>
<tr>
<td></td>
<td>Flickering blue (ACS-AP-W only)</td>
<td>Data is being transferred through the Bluetooth interface of the control panel.</td>
</tr>
<tr>
<td>Control panel mounting platform or holder (with the control panel removed)</td>
<td>Red</td>
<td>There is an active fault in the unit.</td>
</tr>
<tr>
<td></td>
<td>Green</td>
<td>Power supply for the control unit is OK.</td>
</tr>
</tbody>
</table>

R8i module LEDs

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAULT</td>
<td>Continuous red</td>
<td>There is an active fault in the module.</td>
</tr>
<tr>
<td>ENABLE / STO</td>
<td>Continuous green</td>
<td>The module is ready for use.</td>
</tr>
<tr>
<td>ENABLE / STO</td>
<td>Continuous yellow</td>
<td>XSTO connectors are de-energized.</td>
</tr>
<tr>
<td>POWER OK</td>
<td>Continuous green</td>
<td>Supply voltage of the internal circuit boards is OK (&gt; 21 V).</td>
</tr>
</tbody>
</table>

Reduced run

A “reduced run” function is available for supply/rectifier units consisting of parallel-connected modules. The function makes it possible to continue operation with limited current even if one (or more) module is out of service, for example, because of maintenance work.

In principle, reduced run is possible with only one module, but the physical requirements of operating the motor still apply; for example, the modules remaining in use must be able to provide enough current. For allowed configurations when using reduced run function, see ACS880 IGBT supply control program firmware manual (3AUA0000131562 [English]).
## Starting reduced run operation

**WARNING!**
Obey the safety instructions given in *ACS880 multidrive cabinets and modules safety instructions* (3AUA0000102301 [English]). If you ignore the safety instructions, 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.

1. Stop the drive and do the steps in section *Electrical safety precautions (page 111)* before you start the work.

2. If the control unit is powered from the faulty module, connect the control unit to another 24 V DC power supply. ABB strongly recommends using an external power supply with supply/rectifier units consisting of parallel-connected modules.

3. Remove the module to be serviced from its bay.

4. Install an air baffle (for example, plexiglass) to the top module guide to block the airflow through the empty module bay.

5. Switch on the power to the supply/rectifier unit.

6. Enter the number of supply/rectifier modules present into parameter 195.13 *Reduced run mode*.

7. Reset all faults and start the supply/rectifier unit. The maximum current limit is now automatically set according to the new configuration. A mismatch between the number of detected modules (parameter 195.14) and the value set in 195.13 will generate a fault.

## Resuming normal operation

**WARNING!**
Obey the safety instructions given in *ACS880 multidrive cabinets and modules safety instructions* (3AUA0000102301 [English]). If you ignore the safety instructions, 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.

1. Stop the drive and do the steps in section *Electrical safety precautions (page 111)* before you start the work.

2. Remove the air baffle from the module bay.

3. Reinstall the module into its bay.

4. Switch on the power to the supply/rectifier unit.

5. Enter "0" into parameter 195.13 *Reduced run mode*.
Functional safety components

The mission time of functional safety components is 20 years which equals the time during which failure rates of electronic components remain constant. This applies to the components of the standard Safe torque off circuit as well as any modules, relays and, typically, any other components that are part of functional safety circuits.

The expiry of mission time terminates the certification and SIL/PL classification of the safety function. The following options exist:

- Renewal of the whole drive and all optional functional safety module(s) and components.
- Renewal of the components in the safety function circuit. In practice, this is economical only with larger drives that have replaceable circuit boards and other components such as relays.

Note that some of the components may already have been renewed earlier, restarting their mission time. The remaining mission time of the whole circuit is however determined by its oldest component.

Contact your local ABB service representative for more information.
Ordering information

Contents of this chapter

This chapter lists the types and ordering codes of the unit components.

You can find the kit-specific assembly drawings, step-by-step instructions and detailed kit information on the Internet. Go to https://sites-apps.abb.com/sites/lvacdrivesengineeringsupport/content. If necessary, contact your local ABB representative.

Note:

• This chapter only lists the installation accessories available from ABB. All other parts must be sourced from a third party (such as Rittal) by the system integrator. For a listing, refer to the kit-specific installation instructions available at https://sites-apps.abb.com/sites/lvacdrivesengineeringsupport/content. For access, contact your local ABB representative.

• Parts that are labeled suitable for generic enclosures are not designed for any specific enclosure system. These parts are intended as a basis for further engineering, and may require additional parts to be fully usable.

Installation accessories designed for generic enclosures are in fact designed for an inside width of 50 mm less than the nominal width of the enclosure. For example, a mechanical kit intended for 800 mm wide generic enclosure is designed for an inside width of 750 mm, and will not fit a 800 mm wide Rittal VX25 enclosure.
Kit code key

The kit codes shown in this chapter break down as follows.

The format of the kit code is x-w-s-yyy(-VX), for example, L-6-8-401 where:

- **x** = cooling method
  - A = air-cooled (some of these kits are also used with liquid-cooled drives)
  - L = liquid-cooled
- **w** = cabinet width
  - 4 = 400 mm
  - 6 = 600 mm
  - 8 = 800 mm
- **s** = module frame size / sizes
  - 1 = R1i
  - 2 = R2i
  - 3 = R3i
  - 4 = R4i
  - 5 = R5i
  - 6 = R6i/D6D
  - 7 = R7i/D7D/D7T
  - 8 = R8i/D8D/D8T
- **X** = any, or not defined.
• yyy = consecutive numbering
  • 001…099 = Kits related to cabinets, for example, adapter plates
    001…019 Common AC- and DC-related kits
    020…049 Cabinet mechanics kits
    050…059 Swing frame kits

  • 100…199 = Kits related to AC connection, for example, busbars
    100…129 Kits with connection to AC
    130…149 Kits with connection to module
    150…199 Other kits related to AC connection

  • 200…299 = Kits related to DC connection, for example, busbars
    200…229 Kits with connection to common DC
    230…249 Kits with connection to module
    250…299 Other kits related to DC connection

  • 300…399 = Kits related to module installation, for example, mechanical supports
    300…330 Module supporting kits, basic mechanical support
    350…379 Shroud kits

  • 400…499 = Other kits
    400…419 Fan kits
    420…439 Air guides
    440…459 Cooling circuit kits

  • VX = Kit specifically designed for the Rittal VX25 enclosure system. Many kits without this designation are also used with the VX25 system.
Frames R1i...R4i

- IGBT supply modules

As standard, IGBT supply modules come with IGBT supply control program (+N2200). As standard, frame R1i...R4i IGBT supply modules come with a cover that also acts as a control panel holder. The modules can be ordered without the cover by specifying option code +0J414.

<table>
<thead>
<tr>
<th>IGBT supply unit</th>
<th>Modules used</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td><strong>Frame size</strong></td>
<td><strong>Qty</strong></td>
</tr>
<tr>
<td>ACS880-204-008A0-3</td>
<td>R1i</td>
<td>1</td>
</tr>
<tr>
<td>ACS880-204-0018A-3</td>
<td>R2i</td>
<td>1</td>
</tr>
<tr>
<td>ACS880-204-0035A-3</td>
<td>R3i</td>
<td>1</td>
</tr>
<tr>
<td>ACS880-204-0050A-3</td>
<td>R3i</td>
<td>1</td>
</tr>
<tr>
<td>ACS880-204-0093A-3</td>
<td>R4i</td>
<td>1</td>
</tr>
</tbody>
</table>

**$U_N = 400\ \text{V (Range 380 ... 415 V):}$**

<table>
<thead>
<tr>
<th>Ordering code format</th>
<th>Option codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Module type] + code [code] ...</td>
<td>+N2200: IGBT supply control program</td>
</tr>
<tr>
<td>For example, ACS880-104-0093A-3+N2200</td>
<td>+0J414: No control panel holder</td>
</tr>
</tbody>
</table>

**$U_N = 500\ \text{V (Range 380 ... 500 V):}$**

<table>
<thead>
<tr>
<th>Ordering code format</th>
<th>Option codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Module type] + code [code] ...</td>
<td>+N2200: IGBT supply control program</td>
</tr>
<tr>
<td>For example, ACS880-104-0093A-3+N2200</td>
<td>+0J414: No control panel holder</td>
</tr>
</tbody>
</table>

**Note:** The following components are always required to construct a working unit and must be ordered separately:

- LCL filter module. For more information, see *LCL filters (page 203).*

The other parts listed in this chapter

- may be required by the application, or
- make the installation or use of the module easier.
- **LCL filters**

LCL filter module has to be ordered separately.

<table>
<thead>
<tr>
<th>IGBT supply unit type</th>
<th>Frame size</th>
<th>LCL filter</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS880-204-...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>$U_N = 400,\text{V (Range } 380 \ldots 415,\text{V):}$</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>008A0-3</td>
<td>R1i</td>
<td>WFU-01</td>
<td>1</td>
<td>3AUA0000049816</td>
<td></td>
</tr>
<tr>
<td>0018A-3</td>
<td>R2i</td>
<td>WFU-02</td>
<td>1</td>
<td>3AUA0000049815</td>
<td></td>
</tr>
<tr>
<td>0035A-3</td>
<td>R3i</td>
<td>WFU-11</td>
<td>1</td>
<td>3AUA0000066536</td>
<td></td>
</tr>
<tr>
<td>0050A-3</td>
<td>R3i</td>
<td>WFU-21</td>
<td>1</td>
<td>3AUA0000049814</td>
<td></td>
</tr>
<tr>
<td>0093A-3</td>
<td>R4i</td>
<td>WFU-22</td>
<td>1</td>
<td>3AUA0000049812</td>
<td></td>
</tr>
<tr>
<td><strong>$U_N = 500,\text{V (Range } 380 \ldots 500,\text{V):}$</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>006A6-5</td>
<td>R1i</td>
<td>WFU-01</td>
<td>1</td>
<td>3AUA0000049816</td>
<td></td>
</tr>
<tr>
<td>0015A-5</td>
<td>R2i</td>
<td>WFU-02</td>
<td>1</td>
<td>3AUA0000049815</td>
<td></td>
</tr>
<tr>
<td>0029A-5</td>
<td>R3i</td>
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<td>1</td>
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<tr>
<td>0041A-5</td>
<td>R3i</td>
<td>WFU-21</td>
<td>1</td>
<td>3AUA0000049814</td>
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</tr>
<tr>
<td>0077A-5</td>
<td>R4i</td>
<td>WFU-22</td>
<td>1</td>
<td>3AUA0000049812</td>
<td></td>
</tr>
</tbody>
</table>

*WFU-xx filter module*
## Control panel

The control panel is not included with the module but must be ordered separately. One control panel is required for the commissioning of an ACS880 drive system, even if the Drive composer PC tool is used.

The control panel can be flush mounted on the cabinet door with the help of a door mounting kit. For more information on the control panel, see *ACX-AP-x assistant control panels user’s manual* (3AUA0000085685 [English]).

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Ordering code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS-AP-W</td>
<td>Control panel with Bluetooth</td>
<td>3AXD50000025965</td>
<td></td>
</tr>
<tr>
<td>DPMP-01</td>
<td>Door mounting kit (IP55)</td>
<td>3AUA00000108878</td>
<td></td>
</tr>
</tbody>
</table>

The door mounting kit contains:
- front cover
- flat cable (between DDPI-01 board and the panel)
- DDPI-01 board, cover and M4×8 combi screw for the cover
- EMC shield
- control panel mounting platform
- grounding wire
- Ethernet cable (3 m [9.8 ft]).

*DPMP-01 mounting platform for ACS-AP control panel installation guide* (3AUA0000100140 [English]).
Mechanical installation accessories and tools

Air guide kits for LCL filter modules

Air guide kits are used on top of the modules to guide cooling air. WFU filter air guides are designed to be used together with WFU filter and WBCA bottom connection adapter.

<table>
<thead>
<tr>
<th>ACS880-204-…</th>
<th>LCL filter type</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>U_N = 400 V (Range 380 … 415 V):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>008A0-3</td>
<td>WFU-01</td>
<td>1</td>
<td>3AXD50000008728</td>
<td>A-468-12-426</td>
<td></td>
</tr>
<tr>
<td>0018A-3</td>
<td>WFU-02</td>
<td>1</td>
<td>3AXD50000008728</td>
<td>A-468-12-426</td>
<td></td>
</tr>
<tr>
<td>0035A-3</td>
<td>WFU-11</td>
<td>1</td>
<td>3AXD50000008730</td>
<td>A-468-3-427</td>
<td></td>
</tr>
<tr>
<td>0050A-3</td>
<td>WFU-21</td>
<td>1</td>
<td>3AXD50000008741</td>
<td>A-68-34-428</td>
<td></td>
</tr>
<tr>
<td>0093A-3</td>
<td>WFU-22</td>
<td>1</td>
<td>3AXD50000008741</td>
<td>A-68-34-428</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>U_N = 500 V (Range 380 … 500 V):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>006A6-5</td>
<td>WFU-01</td>
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</tr>
<tr>
<td>0015A-5</td>
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<td>A-468-12-426</td>
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</tr>
<tr>
<td>0029A-5</td>
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<tr>
<td>0041A-5</td>
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<td>A-68-34-428</td>
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</tr>
<tr>
<td>0077A-5</td>
<td>WFU-22</td>
<td>1</td>
<td>3AXD50000008741</td>
<td>A-68-34-428</td>
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</tr>
</tbody>
</table>
Air guide kits for IGBT supply modules

<table>
<thead>
<tr>
<th>ACS880-204-...</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>008A-3</td>
<td>1</td>
<td>3UA0000114398</td>
<td>A-468-1-422</td>
</tr>
<tr>
<td></td>
<td>0018A-3</td>
<td>1</td>
<td>3UA0000114330</td>
<td>A-468-2-423</td>
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<tr>
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<td>0035A-3</td>
<td>1</td>
<td>3UA0000114404</td>
<td>A-468-3-424</td>
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<tr>
<td></td>
<td>0050A-3</td>
<td>1</td>
<td>3UA0000114404</td>
<td>A-468-3-424</td>
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<tr>
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<td>0093A-3</td>
<td>1</td>
<td>3UA0000114405</td>
<td>A-468-4-425</td>
</tr>
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</table>

- $U_N = 400$ V (Range 380 … 415 V):

<table>
<thead>
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<th>ACS880-204-...</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>006A-5</td>
<td>1</td>
<td>3UA0000114398</td>
<td>A-468-1-422</td>
</tr>
<tr>
<td></td>
<td>0015A-5</td>
<td>1</td>
<td>3UA0000114330</td>
<td>A-468-2-423</td>
</tr>
<tr>
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<td>0029A-5</td>
<td>1</td>
<td>3UA0000114404</td>
<td>A-468-3-424</td>
</tr>
<tr>
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<td>0041A-5</td>
<td>1</td>
<td>3UA0000114404</td>
<td>A-468-3-424</td>
</tr>
<tr>
<td></td>
<td>0077A-5</td>
<td>1</td>
<td>3UA0000114405</td>
<td>A-468-4-425</td>
</tr>
</tbody>
</table>

- $U_N = 500$ V (Range 380 … 500 V):
WBCA-xx bottom connection adapters

The WBCA-xx bottom connection adapter enables the supply connection from the bottom side of the WFU-xx filter module mounted onto it.

<table>
<thead>
<tr>
<th>IGBT supply module type</th>
<th>LCL filter type</th>
<th>Adapter type</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS880-204-...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$U_N = 400 \text{ V (Range 380 ... 415 V)}$:

<table>
<thead>
<tr>
<th>Kit code</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>008A0-3</td>
<td>1</td>
<td>3AUA0000070424</td>
<td></td>
</tr>
<tr>
<td>008A0-3</td>
<td>1</td>
<td>3AUA0000070424</td>
<td></td>
</tr>
<tr>
<td>008A0-3</td>
<td>1</td>
<td>3AUA0000070424</td>
<td></td>
</tr>
<tr>
<td>008A0-3</td>
<td>1</td>
<td>3AUA0000070424</td>
<td></td>
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<tr>
<td>008A0-3</td>
<td>1</td>
<td>3AUA0000070424</td>
<td></td>
</tr>
</tbody>
</table>

$U_N = 500 \text{ V (Range 380 ... 500 V)}$:

<table>
<thead>
<tr>
<th>Kit code</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>006A6-5</td>
<td>1</td>
<td>3AUA0000070424</td>
<td></td>
</tr>
<tr>
<td>006A6-5</td>
<td>1</td>
<td>3AUA0000070424</td>
<td></td>
</tr>
<tr>
<td>006A6-5</td>
<td>1</td>
<td>3AUA0000070424</td>
<td></td>
</tr>
<tr>
<td>006A6-5</td>
<td>1</td>
<td>3AUA0000070424</td>
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<tr>
<td>006A6-5</td>
<td>1</td>
<td>3AUA0000070424</td>
<td></td>
</tr>
</tbody>
</table>

### AC-side components

**Main switch-disconnector kits**

You must equip the electric supply of a machinery with a main disconnecting device (IEC/EN60204-1). The main power line is equipped with a main switch-disconnector or a main circuit breaker [Q1]. This section lists suitable main switch-disconnectors.

<table>
<thead>
<tr>
<th>Frame size</th>
<th>Main switch-disconnector (IEC)</th>
<th>Qty</th>
<th>Ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R1i...R4i</td>
<td>Switch kit OS-type IEC 160 GD03</td>
<td>1</td>
<td>3AXD50000014449</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frame size</th>
<th>Main switch-disconnector (UL, CSA)</th>
<th>Qty</th>
<th>Ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R1i...R4i</td>
<td>Switch kit OT-type UL 160 E03</td>
<td>1</td>
<td>3AXD50000014450</td>
</tr>
</tbody>
</table>

The main switch-disconnector kit contains:
- main switch disconnector unit
- auxiliary contact (N.O.), type OA1G10
AC fuses

The AC fuses protect the input cables, main contactor [Q2] and the module against short circuits.

<table>
<thead>
<tr>
<th>ACS880-204-…</th>
<th>Fuse (IEC)</th>
<th>Fuse (UL, CSA)</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type</td>
<td>Data</td>
<td>Ordering code</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>U\textsubscript{N} = 400 V (Range 380 ... 415 V):</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>008A0-3</td>
<td>170M1559D</td>
<td>16 A, 690 V, gR, size 000</td>
<td>3AU0000115358</td>
</tr>
<tr>
<td>0018A-3</td>
<td>170M1562D</td>
<td>32 A, 690 V, gR, size 000</td>
<td>10008131</td>
</tr>
<tr>
<td>0035A-3</td>
<td>170M1565D</td>
<td>63 A, 690 V, gR, size 000</td>
<td>09838775</td>
</tr>
<tr>
<td>0050A-3</td>
<td>170M1566D</td>
<td>80 A, 690 V, aR, size 000</td>
<td>09838791</td>
</tr>
<tr>
<td>0093A-3</td>
<td>170M1569D</td>
<td>160 A, 690 V, aR size 000</td>
<td>10003521</td>
</tr>
<tr>
<td><strong>U\textsubscript{N} = 500 V (Range 380 ... 500 V):</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>006A6-5</td>
<td>170M1559D</td>
<td>16 A, 690 V, gR, size 000</td>
<td>3AU0000115358</td>
</tr>
<tr>
<td>0015A-5</td>
<td>170M1562D</td>
<td>32 A, 690 V, gR, size 000</td>
<td>10008131</td>
</tr>
<tr>
<td>0029A-5</td>
<td>170M1565D</td>
<td>63 A, 690 V, gR, size 000</td>
<td>09838775</td>
</tr>
<tr>
<td>0041A-5</td>
<td>170M1566D</td>
<td>80 A, 690 V, aR, size 000</td>
<td>09838791</td>
</tr>
<tr>
<td>0077A-5</td>
<td>170M1569D</td>
<td>160 A, 690 V, aR size 000</td>
<td>10003521</td>
</tr>
</tbody>
</table>

Fuse bases for AC fuses (UL, CSA)

<table>
<thead>
<tr>
<th>ACS880-204-…</th>
<th>Fuse base (UL, CSA)</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type</td>
<td>Data</td>
</tr>
<tr>
<td><strong>U\textsubscript{N} = 400 V (Range 380 ... 415 V):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>008A0-3</td>
<td>J60030-1CR</td>
<td>0.5 ... 30 A</td>
</tr>
<tr>
<td>0018A-3</td>
<td>J60030-1CR</td>
<td>0.5 ... 30 A</td>
</tr>
<tr>
<td>0035A-3</td>
<td>J60030-1CR</td>
<td>31 ... 60 A</td>
</tr>
<tr>
<td>0050A-3</td>
<td>JM60100-1CR</td>
<td>70 ... 100 A</td>
</tr>
<tr>
<td>0093A-3</td>
<td>J60200-1CR</td>
<td>101 ... 200 A</td>
</tr>
<tr>
<td><strong>U\textsubscript{N} = 500 V (Range 380 ... 500 V):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>006A6-5</td>
<td>J60030-1CR</td>
<td>0.5 ... 30 A</td>
</tr>
<tr>
<td>0015A-5</td>
<td>J60030-1CR</td>
<td>0.5 ... 30 A</td>
</tr>
<tr>
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<td>J60030-1CR</td>
<td>31 ... 60 A</td>
</tr>
<tr>
<td>0041A-5</td>
<td>JM60100-1CR</td>
<td>70 ... 100 A</td>
</tr>
<tr>
<td>0077A-5</td>
<td>J60200-1CR</td>
<td>101 ... 200 A</td>
</tr>
</tbody>
</table>
EMC/RFI filter

EMC is the ability of electrical/electronic equipment to operate without problems within an electromagnetic environment. Likewise, the equipment must not disturb or interfere with any other product or system within its locality.

EMC/RFI filters are used to attenuate conducted disturbances in a line connecting point where the filter leads the disturbances to earth.

The recommended filter types are given in the following table.

<table>
<thead>
<tr>
<th>ACS880-204-…</th>
<th>RFI filter (IEC, UL, CSA)</th>
<th>Type</th>
<th>Data</th>
<th>Qty</th>
<th>Ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>$U_N = 400 \text{ V (Range 380 ... 415 V):}$</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>008A0-3</td>
<td>SCHAEFFNER FN 3120H-25-33</td>
<td>25 A (50 °C) 520 V AC</td>
<td>1</td>
<td></td>
<td>RFI filters are not available from ABB. They must be acquired by the customer.</td>
</tr>
<tr>
<td>0018A-3</td>
<td>SCHAEFFNER FN 3120H-25-33</td>
<td>25 A (50 °C) 520 V AC</td>
<td>1</td>
<td></td>
<td>For more specific information about the EMC/RFI filters, see <a href="http://www.schaffner.com">www.schaffner.com</a> (SCHAEFFNER FN 3120 brochure). See Electrical planning instructions for ACS880 multdrive cabinets and modules (3AU000102324 [English]).</td>
</tr>
<tr>
<td>0035A-3</td>
<td>SCHAEFFNER FN 3120H-50-53</td>
<td>50 A (50 °C) 520 V AC</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0050A-3</td>
<td>SCHAEFFNER FN 3120H-80-35</td>
<td>80 A (50 °C) 520 V AC</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0093A-3</td>
<td>SCHAEFFNER FN 3120H-110-35</td>
<td>110 A (50 °C) 520 V AC</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>$U_N = 500 \text{ V (Range 380 ... 500 V):}$</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>006A6-5</td>
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<td></td>
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<td>1</td>
<td></td>
<td>For more specific information about the EMC/RFI filters, see <a href="http://www.schaffner.com">www.schaffner.com</a> (SCHAEFFNER FN 3120 brochure). See Electrical planning instructions for ACS880 multdrive cabinets and modules (3AU000102324 [English]).</td>
</tr>
<tr>
<td>0029A-5</td>
<td>SCHAEFFNER FN 3120H-50-53</td>
<td>50 A (50 °C) 520 V AC</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0041A-5</td>
<td>SCHAEFFNER FN 3120H-80-35</td>
<td>80 A (50 °C) 520 V AC</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0077A-5</td>
<td>SCHAEFFNER FN 3120H-110-35</td>
<td>110 A (50 °C) 520 V AC</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Main contactors

The main power line is equipped with main contactors [Q2]. Contactors are used for the on-off control of the main AC input power. Contactors are suitable for both IEC and UL/CSA installations.

<table>
<thead>
<tr>
<th>ACS880-204-…</th>
<th>Main contactor (IEC, UL, CSA)</th>
<th>Qty</th>
<th>Ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type</td>
<td>Data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$U_N = 400$ V (Range 380 … 415 V):</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>008A0-3</td>
<td>AF09-30-10-13</td>
<td>$I_{th} = 35$ A, 690 V</td>
</tr>
<tr>
<td></td>
<td>008A0-3</td>
<td>AF09-30-10-13</td>
<td>$I_{th} = 35$ A, 690 V</td>
</tr>
<tr>
<td></td>
<td>0035A-3</td>
<td>AF26-30-00-13</td>
<td>$I_{th} = 50$ A, 690 V</td>
</tr>
<tr>
<td></td>
<td>0050A-3</td>
<td>AF96-30-22-13</td>
<td>$I_{th} = 125$ A, 690 V</td>
</tr>
<tr>
<td></td>
<td>0093A-3</td>
<td>AF96-30-22-13</td>
<td>$I_{th} = 125$ A, 690 V</td>
</tr>
<tr>
<td></td>
<td>$U_N = 500$ V (Range 380 … 500 V):</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>006A6-5</td>
<td>AF09-30-10-13</td>
<td>$I_{th} = 35$ A, 690 V</td>
</tr>
<tr>
<td></td>
<td>0015A-5</td>
<td>AF09-30-10-13</td>
<td>$I_{th} = 35$ A, 690 V</td>
</tr>
<tr>
<td></td>
<td>0029A-5</td>
<td>AF26-30-00-13</td>
<td>$I_{th} = 50$ A, 690 V</td>
</tr>
<tr>
<td></td>
<td>0041A-5</td>
<td>AF96-30-22-13</td>
<td>$I_{th} = 125$ A, 690 V</td>
</tr>
<tr>
<td></td>
<td>0077A-5</td>
<td>AF96-30-22-13</td>
<td>$I_{th} = 125$ A, 690 V</td>
</tr>
</tbody>
</table>

Definitions

$I_{th}$ Conventional free-air thermal current
$U_E$ Rated operational voltage

The contactor package includes:

- contactor unit.

**DC-side components**

**DC bus installation parts (for Rittal VX25 enclosures)**

The brackets in this kit act as a mounting base for the busbar supports of the Rittal Flat-PLS DC bus and ensure its correct placement and alignment inside the cabinet line-up.

**Note:** The designs presented in this manual for Rittal VX25 enclosures employ the Rittal Flat-PLS busbar system. Make sure that the current carrying capability of the busbars is not exceeded at any point of the drive system.

<table>
<thead>
<tr>
<th>Used with …</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>400/600/800 mm VX25 enclosure</td>
<td>1 kit per cubicle</td>
<td>3AXD5000033387</td>
<td>A-468-X-001-VX</td>
<td>[Illustration] Instruction code: 3AXD50000333639</td>
</tr>
</tbody>
</table>
DC fuses

DC fuses protect the module and drive DC bus against short circuits.

<table>
<thead>
<tr>
<th>ACS880-204-…</th>
<th>Fuse (IEC, UL, CSA)</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type</td>
<td>Data</td>
</tr>
<tr>
<td>UN = 400 V (Range 380 ... 415 V):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>008A0-3</td>
<td>FWP-15A14F</td>
<td>15 A, 660 V</td>
</tr>
<tr>
<td>0018A-3</td>
<td>FWP-32A14F</td>
<td>32 A, 660 V</td>
</tr>
<tr>
<td>0035A-3</td>
<td>6,921 CP URQ 27x60/63</td>
<td>63 A, 690 V</td>
</tr>
<tr>
<td>0050A-3</td>
<td>6,921 CP URQ 27x60/100</td>
<td>100 A, 690 V</td>
</tr>
<tr>
<td>0093A-3</td>
<td>6,921 CP URQ 27x60/200</td>
<td>200 A, 690 V</td>
</tr>
<tr>
<td>UN = 500 V (Range 380 ... 500 V):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>006A6-5</td>
<td>FWP-20A14F</td>
<td>20 A, 660 V</td>
</tr>
<tr>
<td>0015A-5</td>
<td>6,921 CP URQ 27x60/50</td>
<td>50 A, 690 V</td>
</tr>
<tr>
<td>0029A-5</td>
<td>6,921 CP URQ 27x60/80</td>
<td>80 A, 690 V</td>
</tr>
<tr>
<td>0041A-5</td>
<td>6,921 CP URQ 27x60/100</td>
<td>100 A, 690 V</td>
</tr>
<tr>
<td>0077A-5</td>
<td>6,921 CP URQ 27x60/200</td>
<td>200 A, 690 V</td>
</tr>
</tbody>
</table>
## Fuse bases for DC fuses (IEC, UL, CSA)

**212 Ordering information**

### Fuse bases for DC fuses (IEC, UL, CSA)

<table>
<thead>
<tr>
<th>ACS880-204-…</th>
<th>Fuse (IEC, UL, CSA)</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type</td>
<td>Data</td>
</tr>
<tr>
<td><strong>$U_N = 400$ V (Range 380 … 415 V):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>008A0-3</td>
<td>US141 (Z331153F)</td>
<td>14 × 51 mm, 50 A, 690 V Microswitch</td>
</tr>
<tr>
<td></td>
<td>USMSW1</td>
<td></td>
</tr>
<tr>
<td>0018A-3</td>
<td>US141 (Z331153F)</td>
<td>14 × 51 mm 50 A, 690 V Microswitch</td>
</tr>
<tr>
<td></td>
<td>USMSW1</td>
<td></td>
</tr>
<tr>
<td>0035A-3</td>
<td>US271MI (R227600C)*</td>
<td>27 × 60 mm, 140 A, 800 V Microswitch</td>
</tr>
<tr>
<td>0050A-3</td>
<td>US271MI (R227600C)*</td>
<td>27 × 60 mm, 140 A, 800 V Microswitch</td>
</tr>
<tr>
<td>0093A-3</td>
<td>US271MI (R227600C)*</td>
<td>27 × 60 mm, 140 A, 800 V Microswitch</td>
</tr>
<tr>
<td><strong>$U_N = 500$ V (Range 380 … 500 V):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>006A6-5</td>
<td>US141 (Z331153F)</td>
<td>14 × 51 mm, 50 A, 690 V Microswitch</td>
</tr>
<tr>
<td></td>
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<td></td>
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<tr>
<td>0015A-5</td>
<td>US141 (Z331153F)</td>
<td>14 × 51 mm 50 A, 690 V Microswitch</td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td>0029A-5</td>
<td>US271MI (R227600C)*</td>
<td>27 × 60 mm, 140 A, 800 V Microswitch</td>
</tr>
<tr>
<td>0041A-5</td>
<td>US271MI (R227600C)*</td>
<td>27 × 60 mm, 140 A, 800 V Microswitch</td>
</tr>
<tr>
<td>0077A-5</td>
<td>US271MI (R227600C)*</td>
<td>27 × 60 mm, 140 A, 800 V Microswitch</td>
</tr>
</tbody>
</table>

* Microswitch is included.
### Frame R6i

#### IGBT supply modules

<table>
<thead>
<tr>
<th>IGBT supply unit</th>
<th>Modules used</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Qty</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td><strong>Frame size</strong></td>
</tr>
<tr>
<td>U&lt;sub&gt;N&lt;/sub&gt; = 400 V (Range 380 ... 415 V):</td>
<td></td>
</tr>
<tr>
<td>ACS880-204-0210A-3</td>
<td>1×R6i</td>
</tr>
<tr>
<td>U&lt;sub&gt;N&lt;/sub&gt; = 500 V (Range 380 ... 500 V):</td>
<td></td>
</tr>
<tr>
<td>ACS880-204-0210A-5</td>
<td>1×R6i</td>
</tr>
</tbody>
</table>

**Note:** The following components are always required to construct a working unit and must be ordered separately:

- LCL filter module. For more information, see LCL filters (page 213), and LCL filters (+G304+A013) (page 214).
- Common mode filter (consists of two toroidal cores, 2 × 3AUA0000032859). For more information, see Common mode filters (page 224).
- Varistor board CVAR-01C (UL/CSA installations only). For more information, see Varistor kit ACS880 for UL/CSA installations (page 222).

The other parts listed in this chapter
- may be required by the application, or
- make the installation or use of the module easier.

#### LCL filters

LCL filter module has to be ordered separately.

<table>
<thead>
<tr>
<th>IGBT supply unit type</th>
<th>LCL filter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td><strong>Frame size</strong></td>
</tr>
<tr>
<td></td>
<td>Qty</td>
</tr>
<tr>
<td><strong>Contents</strong></td>
<td></td>
</tr>
<tr>
<td><strong>U&lt;sub&gt;N&lt;/sub&gt; = 400 V (Range 380 ... 415 V):</strong></td>
<td></td>
</tr>
<tr>
<td>0210A-3</td>
<td>1×R6i</td>
</tr>
<tr>
<td><strong>U&lt;sub&gt;N&lt;/sub&gt; = 500 V (Range 380 ... 500 V):</strong></td>
<td></td>
</tr>
<tr>
<td>0210A-5</td>
<td>1×R6i</td>
</tr>
</tbody>
</table>
### LCL filters (+G304+A013)

<table>
<thead>
<tr>
<th>IGBT supply unit type</th>
<th>Frame size</th>
<th>LCL filter</th>
<th>Qty</th>
<th>Ordering code (115 V)</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS880-204-...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**$U_N = 400 \text{ V (Range } 380 \ldots 415 \text{ V)}$:**

| 0210A-3 | 1×R6i | ALCL-05-5+G304+A013 | 1   | 68625131              | •LCL filter module  
**+G304+A013:**  
115 V AC / 60 Hz supply |

**$U_N = 500 \text{ V (Range } 380 \ldots 500 \text{ V)}$:**

| 0210A-5 | 1×R6i | ALCL-05-5+G304+A013 | 1   | 68625131              |          |
Control panel

The control panel is not included with the module but must be ordered separately. One control panel is required for the commissioning of an ACS880 drive system, even if the Drive composer PC tool is used.

The control panel can be flush mounted on the cabinet door with the help of a door mounting kit. For more information on the control panel, see ACX-AP-\(x\) assistant control panels user’s manual (3UA0000085685 [English]).

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Ordering code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS-AP-W</td>
<td>Control panel with Bluetooth</td>
<td>3AXD50000025965</td>
<td></td>
</tr>
<tr>
<td>DPMP-01</td>
<td>Door mounting kit (IP55)</td>
<td>3UA0000108878</td>
<td></td>
</tr>
</tbody>
</table>

The door mounting kit contains:

- front cover
- flat cable (between DDPI-01 board and the panel)
- DDPI-01 board, cover and M4×8 combi screw for the cover
- EMC shield
- control panel mounting platform
- grounding wire
- Ethernet cable (3 m [9.8 ft]).

*DPMP-01 mounting platform for ACS-AP control panel installation guide* (3UA0000100140 [English]).
Mechanical installation accessories and tools

Module installation parts
Module installation parts include, for example, top and bottom supports and air baffles for the supply module.

<table>
<thead>
<tr>
<th>Used with ...</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>R6i; 600 mm Rittal VX25</td>
<td>1</td>
<td>3AXD50000477470</td>
<td>A-6-6-308-VX</td>
<td><img src="image1" alt="Illustration" /></td>
</tr>
</tbody>
</table>

Instruction code: 3AXD50000477920

Shrouds
Shrouds are used for IP20 touch protection with the cabinet doors open.

<table>
<thead>
<tr>
<th>Used with ...</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>R6i; 600 mm Rittal VX25</td>
<td>1</td>
<td>3AXD50000477500</td>
<td>A-6-6-355-VX</td>
<td><img src="image2" alt="Illustration" /></td>
</tr>
</tbody>
</table>

Instruction code: 3AXD50000479849

Lifting device
The lifting device is used for replacing converter modules in the ABB drives ACx enclosure and the Rittal VX25 enclosure.

<table>
<thead>
<tr>
<th>Used with ...</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Instruction code</th>
</tr>
</thead>
<tbody>
<tr>
<td>R6i; 600 mm Rittal VX25</td>
<td>1</td>
<td>3AXD50000439997</td>
<td>3AXD50000210268</td>
</tr>
<tr>
<td>R6i; 600 mm ACx cabinet</td>
<td>1</td>
<td>3AXD5000047447</td>
<td>3AXD50000210268</td>
</tr>
</tbody>
</table>
**AC-side components**

**AC bus installation parts (for Rittal VX25 enclosures)**

The brackets in this kit act as a mounting base for the busbar supports of the Rittal Flat-PLS AC bus and ensure its correct placement and alignment inside the cabinet line-up.

**Note:** The designs presented in this manual for Rittal VX25 enclosures employ the Rittal Flat-PLS busbar system. Make sure that the current carrying capability of the busbars is not exceeded at any point of the drive system.

<table>
<thead>
<tr>
<th>Used with ...</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>400/600/800 mm Rittal VX25 enclosure</td>
<td>1 kit per cubicle</td>
<td>3AXD50000360772</td>
<td>A-468-X-011-VX</td>
<td></td>
</tr>
</tbody>
</table>

Instruction code: 3AXD50000372782
Main switch-disconnector kits

You must equip the electric supply of a machinery with a main disconnecting device (IEC/EN60204-1). The main power line is equipped with a main switch-disconnector or a main circuit breaker [Q1]. This section lists suitable main switch-disconnectors.

<table>
<thead>
<tr>
<th>Frame size</th>
<th>Main switch-disconnector (IEC)</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Shaft</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type</td>
<td></td>
<td>Dimensions</td>
<td></td>
</tr>
<tr>
<td>R6i</td>
<td>Switch kit OS-type IEC 400 D03</td>
<td>50 kA, 600 V, 1000 A</td>
<td>1</td>
<td>3AXD50000002801</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frame size</th>
<th>Main switch-disconnector (UL, CSA)</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Shaft</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type</td>
<td></td>
<td>Dimensions</td>
<td></td>
</tr>
<tr>
<td>R6i</td>
<td>Switch kit OS-type UL 400 J03</td>
<td>50 kA, 600 V, 1000 A</td>
<td>1</td>
<td>3AXD50000002793</td>
</tr>
</tbody>
</table>

Shaft dimensions

D  Shaft diameter
L  Shaft length

The main switch-disconnector kit contains:

- main switch disconnector unit
- shaft
- OHB95J12 handle with ON/OFF indication
- N.O. auxiliary contact OA1G10
- terminal shroud for input terminals.

AC fuses

The AC fuses protect the input cables, main contactor [Q2] and the module against short circuits.

<table>
<thead>
<tr>
<th>ACS880-204-…</th>
<th>Fuse (IEC)</th>
<th>Fuse (UL, CSA)</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type</td>
<td>Data</td>
<td>Ordering code</td>
</tr>
</tbody>
</table>

$U_N = 400 \text{ V (Range 380 ... 415 V)}$:

| Qty | 0210A-3 | Cooper-Bussmann 170M5808D | 400 A, 690 V | 64683926 | DFJ-300 | 300 A, 600 V | 3AU0000073035 | 3 |

$U_N = 500 \text{ V (Range 380 ... 500 V)}$:

| Qty | 0210A-5 | Cooper-Bussmann 170M5808D | 400 A, 690 V | 64683926 | DFJ-300 | 300 A, 600 V | 3AU0000073035 | 3 |
RFI filters

RFI filter is used for improving the EMC characteristics of the unit and to fulfill category C2 requirements. See Electrical planning instructions for ACS880 multidrive cabinets and modules (3AUA0000102324 [English]).

<table>
<thead>
<tr>
<th>ACS880-204-…</th>
<th>RFI filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Data</td>
</tr>
<tr>
<td>$U_N = 400$ V (Range 380 ... 415 V):</td>
<td></td>
</tr>
<tr>
<td>0210A-3</td>
<td>B84143B0250S080</td>
</tr>
<tr>
<td>$U_N = 500$ V (Range 380 ... 500 V):</td>
<td></td>
</tr>
<tr>
<td>0210A-5</td>
<td>B84143B0250S080</td>
</tr>
</tbody>
</table>

When using RFI filter and related accessories, check the number of common mode filters to be used.

Main contactors

The main power line is equipped with a main contactor [Q2]. Contactors are used for the on-off control of the main AC input power. Contactors are suitable for both IEC and UL/CSA installations.

<table>
<thead>
<tr>
<th>ACS880-204-…</th>
<th>Main contactor (IEC, UL, CSA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Data</td>
</tr>
<tr>
<td>$U_N = 400$ V (Range 380 ... 415 V):</td>
<td></td>
</tr>
<tr>
<td>0210A-3</td>
<td>AF205-30-22-13</td>
</tr>
<tr>
<td>$U_N = 500$ V (Range 380 ... 500 V):</td>
<td></td>
</tr>
<tr>
<td>0210A-5</td>
<td>AF205-30-22-13</td>
</tr>
</tbody>
</table>

Definitions

$I_{Th}$ Conventional free-air thermal current

$U_E$ Rated operational voltage

The contactor package includes:

- contactor unit.
Switching and charging kit (mechanical parts)

The switching and charging kit contains mechanical parts for installing switching and charging components into frame R6i IGBT supply module cubicle.

<table>
<thead>
<tr>
<th>Used with …</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
</table>
| R6i; 600 mm Rittal VX25 | 1   | 3AXD50000477494 | A-6-6-405-VX | Instruction code:
                            |      | 3AXD50000477784 |            | 3AXD50000477784 |
Charging kits

The capacitor bank of the IGBT supply module needs to be charged during the start-up before connecting the module to a three-phase power line.

**Note:** The charging components are dimensioned for DC link capacitance equal to 3 × IGBT supply unit DC capacitance (1×ISU + 2×INU), 5 × IGBT supply unit DC capacitance (1×ISU + 4×INU) and 7 × IGBT supply unit DC capacitance (1×ISU + 6×INU). If the total DC link capacitance (including IGBT supply and inverter module DC capacitances) exceeds these limits, the components must be redimensioned. Contact ABB representative for more information. The capacitances of the IGBT supply module types and the inverter module types are specified in their technical data tables. Two attempts in five minutes is allowed to prevent charging circuit overheating.

The following table shows the charging kits available for each module type.

<table>
<thead>
<tr>
<th>Ordering code (IEC)</th>
<th>Ordering code (UL)</th>
<th>1×ISU + 2×INU</th>
<th>1×ISU + 4×INU</th>
<th>1×ISU + 6×INU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. capacitance (mF)</td>
<td>Max. capacitance (mF)</td>
<td>Max. capacitance (mF)</td>
<td>Max. capacitance (mF)</td>
<td></td>
</tr>
<tr>
<td>0210A-3 3AXD50000002789</td>
<td>0210A-3 3AXD50000002790</td>
<td>0210A-3 3AXD50000002790</td>
<td></td>
<td></td>
</tr>
<tr>
<td>63 AXD50000002789</td>
<td>63 AXD50000002790</td>
<td>63 AXD50000002790</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ordering information 221**

The charging kit contains:

- switch disconnector unit (switch fuse type)
- terminal covers for the switch disconnector (4 pcs)
- contactor
- fuses (4 pcs, IEC: gG type, UL: class J)
- resistor
- fuse holders
- N.O. auxiliary contact
- shaft OXP6X360
- handle OHB65J6 with ON/OFF indication.

Minimum recommended wire sizes for the charging kits:
• Consult ABB.

Use double-insulated wire.

For more detailed information on the charging components, see the technical data.

**Varistor kit ACS880 for UL/CSA installations**

The CVAR varistor board is used to protect the supply/rectifier module against excessive voltage peaks. The board shunts the current created by high voltage.

The CVAR board must be:

• installed into the cabinet,

• connected to the main circuit after the main contactor [Q2], and

• connected to the PE.

For the best results, use the shortest possible wiring when connecting the CVAR board. For the detailed connection, see the example circuit diagrams.

<table>
<thead>
<tr>
<th>Module type</th>
<th>Type</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Varistor board kit</td>
<td>1</td>
<td>3AXD50000005122</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frame 2×R8i</td>
<td>Varistor board kit</td>
<td>2</td>
<td>3AXD50000005122</td>
<td></td>
</tr>
<tr>
<td>Frame 3×R8i</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frame 4×R8i</td>
<td>Varistor board kit</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The varistor kit for ACS880 contains:

• CVAR varistor board with fastening items (stand-offs and fastening screws).

For the dimensions of the CVAR board, see the dimension drawings.
DC-side components

DC bus installation parts (for Rittal VX25 enclosures)

The brackets in this kit act as a mounting base for the busbar supports of the Rittal Flat-PLS DC bus and ensure its correct placement and alignment inside the cabinet line-up.

**Note:** The designs presented in this manual for Rittal VX25 enclosures employ the Rittal Flat-PLS busbar system. Make sure that the current carrying capability of the busbars is not exceeded at any point of the drive system.

<table>
<thead>
<tr>
<th>Used with ...</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>400/600/800 mm Rittal VX25 enclosure</td>
<td>1 kit per cubicle</td>
<td>3AXD50000333387</td>
<td>A-468-X-001-VX</td>
<td><img src="image1.png" alt="Illustration" /></td>
</tr>
</tbody>
</table>

Module and common mode filter busbars

A common mode filter is needed with IGBT supply module. There is space for up to four toroidal cores. See the dimension drawings.

<table>
<thead>
<tr>
<th>Used with ...</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>R6i; 600 mm Rittal VX25</td>
<td>1</td>
<td>3AXD50000477487</td>
<td>A-6-6-284-VX</td>
<td><img src="image2.png" alt="Illustration" /></td>
</tr>
<tr>
<td>R6i; generic enclosure</td>
<td>1</td>
<td>3AXD5000014088</td>
<td>A-0-67-242</td>
<td><img src="image3.png" alt="Illustration" /></td>
</tr>
</tbody>
</table>

**Note:** Filters (2×3AUA0000032859 per module) are to be ordered separately.
## Common mode filters
You must equip each module with a common mode filter.
Common mode filtering reduces bearing currents and is required for electromagnetic compatibility (EMC). The filtering is implemented by installing two toroidal cores onto the DC busbars. The cores must be ordered separately.

<table>
<thead>
<tr>
<th>Used with</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>All enclosure types</td>
<td>2 per module*</td>
<td>3AUA0000032859</td>
<td>-</td>
<td><img src="image" alt="" /></td>
</tr>
</tbody>
</table>

* For EMC category C2 in case of 1×R6i or 1×R8i, 4 pcs. As standard, 2 pcs per module.

## DC fuses
DC fuses protect the module and drive DC bus against short circuits.

<table>
<thead>
<tr>
<th>Fuse (IEC, UL, CSA)</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS880-204...</td>
<td></td>
</tr>
</tbody>
</table>

### UCS 400 V (Range 380 ... 415 V):
- 0210A-3 Cooper-Bussmann 170M4413 450 A, 690 V, size 1 68731623 2

### UCS 500 V (Range 380 ... 500 V):
- 0210A-5 Cooper-Bussmann 170M4413 450 A, 690 V, size 1 68731623 2
Frame R8i and multiples

**IGBT supply modules**

IGBT supply units consisting of frame R8i supply modules are to be ordered as separate modules.

<table>
<thead>
<tr>
<th>IGBT supply unit</th>
<th>Modules used</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td><strong>Frame size</strong></td>
<td><strong>Qty</strong></td>
</tr>
<tr>
<td>ACS880-204-0420A-3</td>
<td>R8i</td>
<td>1</td>
</tr>
<tr>
<td>ACS880-204-0580A-3</td>
<td>R8i</td>
<td>1</td>
</tr>
<tr>
<td>ACS880-204-0810A-3</td>
<td>R8i</td>
<td>1</td>
</tr>
<tr>
<td>ACS880-204-1130A-3</td>
<td>2×R8i</td>
<td>2</td>
</tr>
<tr>
<td>ACS880-204-1330A-3</td>
<td>2×R8i</td>
<td>2</td>
</tr>
<tr>
<td>ACS880-204-1580A-3</td>
<td>2×R8i</td>
<td>2</td>
</tr>
<tr>
<td>ACS880-204-2350A-3</td>
<td>3×R8i</td>
<td>3</td>
</tr>
<tr>
<td>ACS880-204-3110A-3</td>
<td>4×R8i</td>
<td>4</td>
</tr>
<tr>
<td>ACS880-204-4620A-3</td>
<td>6×R8i</td>
<td>6</td>
</tr>
<tr>
<td><strong>Uₙ = 400 V (Range 380 … 415 V):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACS880-204-0440A-5</td>
<td>R8i</td>
<td>1</td>
</tr>
<tr>
<td>ACS880-204-0590A-5</td>
<td>R8i</td>
<td>1</td>
</tr>
<tr>
<td>ACS880-204-0810A-5</td>
<td>R8i</td>
<td>1</td>
</tr>
<tr>
<td>ACS880-204-1040A-5</td>
<td>2×R8i</td>
<td>2</td>
</tr>
<tr>
<td>ACS880-204-1420A-5</td>
<td>2×R8i</td>
<td>2</td>
</tr>
<tr>
<td>ACS880-204-2120A-5</td>
<td>3×R8i</td>
<td>3</td>
</tr>
<tr>
<td>ACS880-204-2800A-5</td>
<td>4×R8i</td>
<td>4</td>
</tr>
<tr>
<td>ACS880-204-4150A-5</td>
<td>6×R8i</td>
<td>6</td>
</tr>
<tr>
<td><strong>Uₙ = 500 V (Range 380 … 500 V):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACS880-204-0310A-7</td>
<td>R8i</td>
<td>1</td>
</tr>
<tr>
<td>ACS880-204-0370A-7</td>
<td>R8i</td>
<td>1</td>
</tr>
<tr>
<td>ACS880-204-0540A-7</td>
<td>R8i</td>
<td>1</td>
</tr>
<tr>
<td>ACS880-204-0720A-7</td>
<td>2×R8i</td>
<td>2</td>
</tr>
<tr>
<td>ACS880-204-1050A-7</td>
<td>2×R8i</td>
<td>2</td>
</tr>
<tr>
<td>ACS880-204-1570A-7</td>
<td>3×R8i</td>
<td>3</td>
</tr>
<tr>
<td>ACS880-204-2070A-7</td>
<td>4×R8i</td>
<td>4</td>
</tr>
<tr>
<td>ACS880-204-3080A-7</td>
<td>6×R8i</td>
<td>6</td>
</tr>
<tr>
<td><strong>Uₙ = 690 V (Range 525 … 690 V):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACS880-204-0300A-7</td>
<td>R8i</td>
<td>1</td>
</tr>
<tr>
<td>ACS880-204-0370A-7</td>
<td>R8i</td>
<td>1</td>
</tr>
<tr>
<td>ACS880-204-0540A-7</td>
<td>R8i</td>
<td>1</td>
</tr>
<tr>
<td>ACS880-204-0720A-7</td>
<td>2×R8i</td>
<td>2</td>
</tr>
<tr>
<td>ACS880-204-1050A-7</td>
<td>2×R8i</td>
<td>2</td>
</tr>
<tr>
<td>ACS880-204-1570A-7</td>
<td>3×R8i</td>
<td>3</td>
</tr>
<tr>
<td>ACS880-204-2070A-7</td>
<td>4×R8i</td>
<td>4</td>
</tr>
<tr>
<td>ACS880-204-3080A-7</td>
<td>6×R8i</td>
<td>6</td>
</tr>
</tbody>
</table>
## Ordering information

<table>
<thead>
<tr>
<th>Ordering code format</th>
<th>Option codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Module type] +code [+code] ...</td>
<td>+C32: Marine type approval. For more information, see ACS880+C32 marine type-approved drive modules and module packages supplement (3AXD50000037752 [English]).</td>
</tr>
<tr>
<td>ACS880-104-0470A-3 +E205 +C188</td>
<td>+C183: Heating element mounted to module base</td>
</tr>
<tr>
<td></td>
<td>+C188: Direct-on-line cooling fan</td>
</tr>
<tr>
<td></td>
<td>+E205: Internal du/dt filters (When the module is used as an IGBT supply module, it must always be ordered with +E205.)</td>
</tr>
<tr>
<td></td>
<td>+G304: 115 V auxiliary voltage supply</td>
</tr>
</tbody>
</table>

**Note:** The following components are always required to construct a working unit and must be ordered separately (amounts given here are for one IGBT supply module):

- LCL filter module(s). For more information, see LCL filters (+C183+C188) (page 227), and LCL filters (+C183+C188 and +G304 or +G427) (page 229).
- Common mode filter (consists of two toroidal cores, 2 × 3AU000032859). For more information, see Common mode filters (page 224).
- BCU control unit kit. For the contents of the kit, see Control unit (page 232).
- Fiber optic cables (page 232)
- 1 × Control circuit plug connector (3AU000059813)
- 2 × Quick connectors (3AU0000119227). For the contents of the kit, see Busbars and quick connectors (page 259).
- Varistor board CVAR-01C (UL/CSA installations only). For more information, see Varistor kit ACS880 for UL/CSA installations (page 222).

The other parts listed in this chapter
- may be required by the application, or
- make the installation or use of the module easier.
LCL filters (+C183+C188)

LCL filter modules have to be ordered separately.

<table>
<thead>
<tr>
<th>IGBT supply unit type</th>
<th>Frame size</th>
<th>LCL filter</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS880-204-…</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **U_N = 400 V (Range 380 … 415 V):**
| 0420A-3              | 1×R8i      | BLCL-13-5+C183+C188+V991 | 1   | 3AXD50000621149 | ++C183: Internal heating element  
++C188: Direct-on-line (DOL) cooling fan with 230 V supply for BLCL-1x-x / 400 V AC supply for BLCL-2x-x  
++V991: Hardware version |
| 0580A-3              | 1×R8i      | BLCL-13-5+C183+C188+V991 | 1   | 3AXD50000621149 |          |
| 0810A-3              | 1×R8i      | BLCL-15-5+C183+C188+V991 | 1   | 3AXD50000621156 |          |
| 1130A-3              | 2×R8i      | BLCL-24-5+C183+C188+V991 | 1   | 3AXD50000621163 |          |
| 1330A-3              | 2×R8i      | BLCL-24-5+C183+C188+V991 | 1   | 3AXD50000621163 |          |
| 1580A-3              | 2×R8i      | BLCL-25-5+C183+C188+V991 | 1   | 3AXD50000621170 |          |
| 2350A-3              | 3×R8i      | BLCL-24-5+C183+C188+V991 | 2   | 3AXD50000621163 |          |
| 3110A-3              | 4×R8i      | BLCL-25-5+C183+C188+V991 | 2   | 3AXD50000621170 |          |
| 4620A-3              | 6×R8i      | BLCL-25-5+C183+C188+V991 | 3   | 3AXD50000621170 |          |
| **U_N = 500 V (Range 380 … 500 V):**
| 0400A-5              | 1×R8i      | BLCL-13-5+C183+C188+V991 | 1   | 3AXD50000621149 |          |
| 0530A-5              | 1×R8i      | BLCL-13-5+C183+C188+V991 | 1   | 3AXD50000621149 |          |
| 0730A-5              | 1×R8i      | BLCL-15-5+C183+C188+V991 | 1   | 3AXD50000621156 |          |
| 1040A-5              | 2×R8i      | BLCL-24-5+C183+C188+V991 | 1   | 3AXD50000621163 |          |
| 1420A-5              | 2×R8i      | BLCL-25-5+C183+C188+V991 | 1   | 3AXD50000621170 |          |
| 2120A-5              | 3×R8i      | BLCL-24-5+C183+C188+V991 | 2   | 3AXD50000621163 |          |
| 2800A-5              | 4×R8i      | BLCL-25-5+C183+C188+V991 | 2   | 3AXD50000621170 |          |
| 4150A-5              | 6×R8i      | BLCL-25-5+C183+C188+V991 | 3   | 3AXD50000621170 |          |
| **U_N = 690 V (Range 525 … 690 V):**
| 0310A-7              | 1×R8i      | BLCL-13-7+C183+C188+V991 | 1   | 3AXD50000621187 |          |
| 0370A-7              | 1×R8i      | BLCL-13-7+C183+C188+V991 | 1   | 3AXD50000621187 |          |
| 0540A-7              | 1×R8i      | BLCL-15-7+C183+C188+V991 | 1   | 3AXD50000621194 |          |
### Ordering information

<table>
<thead>
<tr>
<th>IGBT supply unit type</th>
<th>Frame size</th>
<th>LCL filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS880-204-…</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Qty</th>
<th>Ordering code</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3AXD50000621200</td>
<td>BLCL-24-7+C183+C188+V991</td>
</tr>
<tr>
<td>1</td>
<td>3AXD50000621217</td>
<td>BLCL-25-7+C183+C188+V991</td>
</tr>
<tr>
<td>2</td>
<td>3AXD50000621200</td>
<td>BLCL-24-7+C183+C188+V991</td>
</tr>
<tr>
<td>2</td>
<td>3AXD50000621217</td>
<td>BLCL-25-7+C183+C188+V991</td>
</tr>
<tr>
<td>3</td>
<td>3AXD50000621217</td>
<td>BLCL-25-7+C183+C188+V991</td>
</tr>
</tbody>
</table>
### LCL filters (+C183+C188 and +G304 or +G427)

LCL filter modules have to be ordered separately.

<table>
<thead>
<tr>
<th>IGBT supply unit type</th>
<th>Frame size</th>
<th>Type</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS880-204-…</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### $U_N = 400 \text{ V (Range 380} \ldots 415 \text{ V):}$

| 0420A-3     | 1×R8i   | BLCL-13-5+C183+C188+G304+V991 | 1 | 3AXD50000621255 |         |
| 0580A-3     | 1×R8i   | BLCL-13-5+C183+C188+G304+V991 | 1 | 3AXD50000621255 |         |
| 0810A-3     | 1×R8i   | BLCL-15-5+C183+C188+G304+V991 | 1 | 3AXD50000621262 |         |
| 1130A-3     | 2×R8i   | BLCL-24-5+C183+C188+G427+V991 | 1 | 3AXD50000621293 |         |
| 1330A-3     | 2×R8i   | BLCL-24-5+C183+C188+G427+V991 | 1 | 3AXD50000621293 |         |
| 1580A-3     | 2×R8i   | BLCL-25-5+C183+C188+G427+V991 | 1 | 3AXD50000621309 |         |
| 2350A-3     | 3×R8i   | BLCL-24-5+C183+C188+G427+V991 | 2 | 3AXD50000621293 |         |
| 3110A-3     | 4×R8i   | BLCL-25-5+C183+C188+G427+V991 | 2 | 3AXD50000621309 |         |
| 4620A-3     | 6×R8i   | BLCL-25-5+C183+C188+G427+V991 | 3 | 3AXD50000621309 |         |

#### $U_N = 500 \text{ V (Range 380} \ldots 500 \text{ V):}$

| 0400A-5     | 1×R8i   | BLCL-13-5+C183+C188+G304+V991 | 1 | 3AXD50000621255 |         |
| 0530A-5     | 1×R8i   | BLCL-13-5+C183+C188+G304+V991 | 1 | 3AXD50000621255 |         |
| 0730A-5     | 1×R8i   | BLCL-15-5+C183+C188+G304+V991 | 1 | 3AXD50000621262 |         |
| 1040A-5     | 2×R8i   | BLCL-24-5+C183+C188+G427+V991 | 1 | 3AXD50000621293 |         |
| 1420A-5     | 2×R8i   | BLCL-25-5+C183+C188+G427+V991 | 1 | 3AXD50000621309 |         |
| 2120A-5     | 3×R8i   | BLCL-24-5+C183+C188+G427+V991 | 2 | 3AXD50000621293 |         |
| 2800A-5     | 4×R8i   | BLCL-25-5+C183+C188+G427+V991 | 2 | 3AXD50000621309 |         |
| 4150A-5     | 6×R8i   | BLCL-25-5+C183+C188+G427+V991 | 3 | 3AXD50000621309 |         |

#### $U_N = 690 \text{ V (Range 525} \ldots 690 \text{ V):}$

| 0310A-7     | 1×R8i   | BLCL-13-7+C183+C188+G304+V991 | 1 | 3AXD50000621279 |         |
| 0370A-7     | 1×R8i   | BLCL-13-7+C183+C188+G304+V991 | 1 | 3AXD50000621279 |         |
| 0540A-7     | 1×R8i   | BLCL-15-7+C183+C188+G304+V991 | 1 | 3AXD50000621286 |         |

- **+C183**: Internal heating element
- **+C188**: Direct-on-line (DOL) cooling fan
- **+G304**: 115 V AC 1-phase fan supply for BLCL-1x-x
- **+G427**: 208 V AC 3-phase fan supply for BLCL-2x-x
- **+V991**: Hardware version

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*Ordering information 229*
### RFI filters

RFI filter is used for improving the EMC characteristics of the unit and to fulfill category C2 requirements. See *Electrical planning instructions for ACS880 multidrive cabinets and modules* (3AUA0000102324 [English]).

<table>
<thead>
<tr>
<th>IGBT supply unit type ACS880-204-...</th>
<th>Frame size</th>
<th>LCL filter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Type</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Content</strong></td>
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<tr>
<td></td>
<td></td>
<td><strong>Ordering code</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Qty</strong></td>
</tr>
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<td>0720A-7</td>
<td>2xR8i</td>
<td>ACS880-...</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BLCL-24-7+C183+C188+G427+V991</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3AXD50000621316</td>
</tr>
<tr>
<td>1050A-7</td>
<td>2xR8i</td>
<td>ACS880-...</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BLCL-25-7+C183+C188+G427+V991</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3AXD50000621323</td>
</tr>
<tr>
<td>1570A-7</td>
<td>3xR8i</td>
<td>ACS880-...</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BLCL-24-7+C183+C188+G427+V991</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3AXD50000621316</td>
</tr>
<tr>
<td>2070A-7</td>
<td>4xR8i</td>
<td>ACS880-...</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BLCL-25-7+C183+C188+G427+V991</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3AXD50000621323</td>
</tr>
<tr>
<td>3080A-7</td>
<td>6xR8i</td>
<td>ACS880-...</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BLCL-25-7+C183+C188+G427+V991</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3AXD50000621323</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACS880-204-...</th>
<th>RFI filter</th>
<th>Assembly kit for toroid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Type</strong></td>
<td><strong>Data</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>U_N = 400 V (Range 380 ... 415 V):</strong></td>
</tr>
<tr>
<td>0420A-3</td>
<td>B84143B</td>
<td>1250 A, 500 V</td>
</tr>
<tr>
<td>0580A-3</td>
<td>B84143B</td>
<td>1250 A, 500 V</td>
</tr>
<tr>
<td>0810A-3</td>
<td>B84143B</td>
<td>1250 A, 500 V</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>U_N = 500 V (Range 380 ... 500 V):</strong></td>
</tr>
<tr>
<td>0400A-5</td>
<td>B84143B</td>
<td>1250 A, 500 V</td>
</tr>
<tr>
<td>0530A-5</td>
<td>B84143B</td>
<td>1250 A, 500 V</td>
</tr>
<tr>
<td>0730A-5</td>
<td>B84143B</td>
<td>1250 A, 500 V</td>
</tr>
</tbody>
</table>

For more information, see the dimension drawings. When using RFI filter and related accessories, check the number of common mode filters to be used.
Control panel

The control panel is not included with the module but must be ordered separately. One control panel is required for the commissioning of an ACS880 drive system, even if the Drive composer PC tool is used.

The control panel can be flush mounted on the cabinet door with the help of a door mounting kit. For more information on the control panel, see *ACX-AP-x assistant control panels user’s manual* (3AUA0000085685 [English]).

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Ordering code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS-AP-W</td>
<td>Control panel with Bluetooth</td>
<td>3AXD50000025965</td>
<td><img src="image" alt="Illustration of ACS-AP-W" /></td>
</tr>
<tr>
<td>DPMP-01</td>
<td>Door mounting kit (IP55)</td>
<td>3AUA00000108878</td>
<td><img src="image" alt="Illustration of DPMP-01" /></td>
</tr>
</tbody>
</table>

The door mounting kit contains:

- front cover
- flat cable (between DDPI-01 board and the panel)
- DDPI-01 board, cover and M4×8 combi screw for the cover
- EMC shield
- control panel mounting platform
- grounding wire
- Ethernet cable (3 m [9.8 ft]).
- *DPMP-01 mounting platform for ACS-AP control panel installation guide* (3AUA0000100140 [English]).
Control electronics

Cabling of the electronics outside the module must be done by the customer. For the current consumption of the main components in the auxiliary circuit, see the technical data.

Control unit

You must equip each IGBT supply unit with one control unit (and memory unit). The delivery includes control unit.

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty</th>
<th>Ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td>( U_N = 400 \text{ V} ) (Range 380 … 415 V):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCU-02 ISU KIT</td>
<td>1</td>
<td>3AXD50000002937</td>
</tr>
<tr>
<td>BCU-02 ISU KIT</td>
<td>1</td>
<td>3AXD50000002937</td>
</tr>
<tr>
<td>BCU-02 ISU KIT</td>
<td>1</td>
<td>3AXD50000002937</td>
</tr>
<tr>
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<td>3AXD50000002937</td>
</tr>
<tr>
<td>BCU-02 ISU KIT</td>
<td>1</td>
<td>3AXD50000002937</td>
</tr>
<tr>
<td>BCU-02 ISU KIT</td>
<td>1</td>
<td>3AXD50000002937</td>
</tr>
<tr>
<td>BCU-02 ISU KIT</td>
<td>1</td>
<td>3AXD50000002937</td>
</tr>
<tr>
<td>BCU-02 ISU KIT</td>
<td>1</td>
<td>3AXD50000002937</td>
</tr>
<tr>
<td>( U_N = 500 \text{ V} ) (Range 380 … 500 V):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCU-02 ISU KIT</td>
<td>1</td>
<td>3AXD50000002937</td>
</tr>
<tr>
<td>BCU-02 ISU KIT</td>
<td>1</td>
<td>3AXD50000002937</td>
</tr>
<tr>
<td>BCU-02 ISU KIT</td>
<td>1</td>
<td>3AXD50000002937</td>
</tr>
<tr>
<td>BCU-02 ISU KIT</td>
<td>1</td>
<td>3AXD50000002937</td>
</tr>
<tr>
<td>BCU-12 ISU KIT</td>
<td>1</td>
<td>3AXD50000015806</td>
</tr>
<tr>
<td>BCU-12 ISU KIT</td>
<td>1</td>
<td>3AXD50000015806</td>
</tr>
<tr>
<td>BCU-12 ISU KIT</td>
<td>1</td>
<td>3AXD50000015806</td>
</tr>
<tr>
<td>( U_N = 690 \text{ V} ) (Range 525 … 690 V):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCU-02 ISU KIT</td>
<td>1</td>
<td>3AXD50000002937</td>
</tr>
<tr>
<td>BCU-02 ISU KIT</td>
<td>1</td>
<td>3AXD50000002937</td>
</tr>
<tr>
<td>BCU-02 ISU KIT</td>
<td>1</td>
<td>3AXD50000002937</td>
</tr>
<tr>
<td>BCU-02 ISU KIT</td>
<td>1</td>
<td>3AXD50000002937</td>
</tr>
<tr>
<td>BCU-12 ISU KIT</td>
<td>1</td>
<td>3AXD50000015806</td>
</tr>
<tr>
<td>BCU-12 ISU KIT</td>
<td>1</td>
<td>3AXD50000015806</td>
</tr>
<tr>
<td>BCU-12 ISU KIT</td>
<td>1</td>
<td>3AXD50000015806</td>
</tr>
</tbody>
</table>

The BCU control unit kit contains:
- BCU control unit
- ZMU-02 memory unit with ACS880 IGBT supply control program.

Fiber optic cables
The fiber optic cables are needed for supply modules and LCL filters. You need one pair of cables (kit) per each module. Select a kit with suitable length.

The following kits, each consisting of a pair of plastic fiber optic cables, are available from ABB:

<table>
<thead>
<tr>
<th>Length</th>
<th>Kit type designation</th>
<th>Ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 m</td>
<td>NLWC-02</td>
<td>58988821</td>
</tr>
<tr>
<td>3 m</td>
<td>NLWC-03</td>
<td>58948233</td>
</tr>
<tr>
<td>5 m</td>
<td>NLWC-05</td>
<td>58948250</td>
</tr>
<tr>
<td>7 m</td>
<td>NLWC-07</td>
<td>58948268</td>
</tr>
<tr>
<td>10 m</td>
<td>NLWC-10</td>
<td>58948276</td>
</tr>
</tbody>
</table>

**Control circuit plug connectors**

The control circuit plug connector X50 is not included in the module kit and you must order it separately.

**Note:** Plug connectors for X51, X52 and X53 are included in the module kit.

<table>
<thead>
<tr>
<th>Connector</th>
<th>Data</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>X50 for R8i X30 for LCL filter module</td>
<td>STV S 9 SB 9-pole 6 KV/3 (female) 4 mm², 500 V, 32 A</td>
<td>1 per module</td>
<td>3AU00000059813</td>
<td><img src="image1.png" alt="Illustration" /></td>
</tr>
</tbody>
</table>

Plug connectors for X51, X52 and X53 are included in the module kit. Plug connectors can be ordered separately as spare parts.

<table>
<thead>
<tr>
<th>Connector</th>
<th>Data</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>X51-X53</td>
<td>1 × MSTB 2,5/5-ST-5,08 BK 2 × MSTB 2,5/5-ST-5,08 YE 2.50 mm², 320 V, 12 A</td>
<td>1 per module</td>
<td>3AXD0000003541</td>
<td><img src="image2.png" alt="Illustration" /></td>
</tr>
</tbody>
</table>
Mechanical installation accessories and tools

Module installation parts

Module installation parts include, for example, top and bottom supports and air baffles for the supply and LCL filter modules.

<table>
<thead>
<tr>
<th>Used with …</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1×R8i; 600 mm Rittal</td>
<td>1</td>
<td>3AXD50000416486</td>
<td>A-6-8-306-VX</td>
<td>[Image]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Instruction code: 3AXD50000384914</td>
</tr>
<tr>
<td>1×R8i; 600 mm generic</td>
<td>1</td>
<td>3AXD50000013842</td>
<td>A-6-8-328</td>
<td>[Image]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Instruction code: 3AXD50000013903</td>
</tr>
<tr>
<td>2×R8i, 3×R8i; 600 mm Rittal</td>
<td>1</td>
<td>3AXD50000361670</td>
<td>A-6-8-323-VX</td>
<td>[Image]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Instruction code: 3AXD50000351756</td>
</tr>
<tr>
<td>Used with ...</td>
<td>Qty</td>
<td>Ordering code</td>
<td>Kit code</td>
<td>Illustration</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-----</td>
<td>--------------------</td>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td>3×R8i; 400 mm Rittal</td>
<td>1</td>
<td>3AXD50000371112</td>
<td>A-4-8-324-VX</td>
<td><img src="image1.png" alt="Illustration" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Instruction code:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3AXD50000372935</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3×R8i; 800 mm generic</td>
<td>1</td>
<td>3AXD50000011160</td>
<td>A-8-8-327</td>
<td><img src="image2.png" alt="Illustration" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Instruction code:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3AXD50000013813</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2×R8i; 400 mm Rittal</td>
<td>1</td>
<td>3AXD50000360802</td>
<td>A-4-8-321-VX</td>
<td><img src="image3.png" alt="Illustration" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Instruction code:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3AXD50000349982</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3×R8i; 600 mm Rittal</td>
<td>1</td>
<td>3AXD50000361700</td>
<td>A-6-8-322-VX</td>
<td><img src="image4.png" alt="Illustration" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Instruction code:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3AXD50000351930</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Shrouds
Shrouds are used for IP20 touch protection with the cabinet doors open.

<table>
<thead>
<tr>
<th>Used with …</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>R8i; 600 mm enclosure</td>
<td>1 per cubicle</td>
<td>3AXD5000033738</td>
<td>A-6-8-360-VX</td>
<td><img src="" alt="Illustration" /></td>
</tr>
<tr>
<td>R8i; 400 mm enclosure</td>
<td>1 per cubicle</td>
<td>3AXD5000033748</td>
<td>A-4-8-359-VX</td>
<td><img src="" alt="Illustration" /></td>
</tr>
</tbody>
</table>
Ramp

The ramp can be used when installing or removing an R8i module.

Do not use the ramp with plinth heights over 100 mm (3.93 in). The ramp is designed for a plinth height of 100 mm (the standard plinth height of Rittal VX25 enclosures).

<table>
<thead>
<tr>
<th>Used with ...</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>All VX25 enclosures</td>
<td>1</td>
<td>3AXD50000438037</td>
<td>A-468-8-304-VX</td>
<td></td>
</tr>
</tbody>
</table>

**AC-side components**

**AC bus installation parts (for Rittal VX25 enclosures)**

The brackets in this kit act as a mounting base for the busbar supports of the Rittal Flat-PLS AC bus and ensure its correct placement and alignment inside the cabinet line-up.

**Note:** The designs presented in this manual for Rittal VX25 enclosures employ the Rittal Flat-PLS busbar system. Make sure that the current carrying capability of the busbars is not exceeded at any point of the drive system.

<table>
<thead>
<tr>
<th>Used with ...</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>400/600/800 mm</td>
<td>1 kit per</td>
<td>3AXD50000360772</td>
<td>A-468-X-011-VX</td>
<td></td>
</tr>
<tr>
<td>Rittal VX25 enclosure</td>
<td>cubicle</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Instruction code: 3AXD50000372782
Main switch-disconnector kits

You must equip the electric supply of a machinery with a main disconnecting device (IEC/EN60204-1). The main power line is equipped with a main switch-disconnector or a main circuit breaker [Q1]. This section lists suitable main switch-disconnectors.

**Note:** For some of the IEC and UL high power units, you can use withdrawable main circuit breaker instead of the main switch-disconnector. In the table below, these high power units are marked with *. See section *Main circuit breakers and wagons (page 240)*.

<table>
<thead>
<tr>
<th>ACS880-204…</th>
<th>Main switch-disconnector (IEC)</th>
<th>Ordering code</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>U&lt;sub&gt;N&lt;/sub&gt; = 400 V (Range 380 … 415 V):</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0420A-3</td>
<td>Switch kit OT-type IEC 1000 E03</td>
<td>50 kA, 690 V, 1000 A</td>
<td>3AXD50000000894</td>
</tr>
<tr>
<td>0580A-3</td>
<td>Switch kit OT-type IEC 1000 E03</td>
<td>50 kA, 690 V, 1000 A</td>
<td>3AXD50000000894</td>
</tr>
<tr>
<td>0810A-3</td>
<td>Switch kit OT-type IEC 1000 E03</td>
<td>50 kA, 690 V, 1000 A</td>
<td>3AXD50000000894</td>
</tr>
<tr>
<td>1130A-3*</td>
<td>Switch kit OT-type IEC 2000 E12</td>
<td>55 kA, 1000 V, 2000 A</td>
<td>3AXD50000006186</td>
</tr>
<tr>
<td>1330A-3*</td>
<td>Switch kit OT-type IEC 2000 E12</td>
<td>55 kA, 1000 V, 2000 A</td>
<td>3AXD50000006186</td>
</tr>
<tr>
<td>1580A-3*</td>
<td>Switch kit OT-type IEC 2000 E12</td>
<td>55 kA, 1000 V, 2000 A</td>
<td>3AXD50000006186</td>
</tr>
<tr>
<td><strong>U&lt;sub&gt;N&lt;/sub&gt; = 500 V (Range 380 … 500 V):</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0400A-5</td>
<td>Switch kit OT-type IEC 1000 E03</td>
<td>50 kA, 690 V, 1000 A</td>
<td>3AXD50000000894</td>
</tr>
<tr>
<td>0530A-5</td>
<td>Switch kit OT-type IEC 1000 E03</td>
<td>50 kA, 690 V, 1000 A</td>
<td>3AXD50000000894</td>
</tr>
<tr>
<td>0730A-5</td>
<td>Switch kit OT-type IEC 1000 E03</td>
<td>50 kA, 690 V, 1000 A</td>
<td>3AXD50000000894</td>
</tr>
<tr>
<td>1040A-5</td>
<td>Switch kit OT-type IEC 1250 E12</td>
<td>50 kA, 1000 V, 1250 A</td>
<td>3AXD50000006185</td>
</tr>
<tr>
<td>1420A-5*</td>
<td>Switch kit OT-type IEC 2000 E12</td>
<td>55 kA, 1000 V, 2000 A</td>
<td>3AXD50000006186</td>
</tr>
<tr>
<td><strong>U&lt;sub&gt;N&lt;/sub&gt; = 690 V (Range 525 … 690 V):</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0310A-7</td>
<td>Switch kit OT-type IEC 1250 E12</td>
<td>50 kA, 1000 V, 1250 A</td>
<td>3AXD50000006185</td>
</tr>
<tr>
<td>0370A-7</td>
<td>Switch kit OT-type IEC 1250 E12</td>
<td>50 kA, 1000 V, 1250 A</td>
<td>3AXD50000006185</td>
</tr>
<tr>
<td>0540A-7</td>
<td>Switch kit OT-type IEC 1250 E12</td>
<td>50 kA, 1000 V, 1250 A</td>
<td>3AXD50000006185</td>
</tr>
<tr>
<td>0720A-7</td>
<td>Switch kit OT-type IEC 1250 E12</td>
<td>50 kA, 1000 V, 1250 A</td>
<td>3AXD50000006185</td>
</tr>
<tr>
<td>1050A-7</td>
<td>Switch kit OT-type IEC 1250 E12</td>
<td>50 kA, 1000 V, 1250 A</td>
<td>3AXD50000006185</td>
</tr>
<tr>
<td>1570A-7*</td>
<td>Switch kit OT-type IEC 2000 E12</td>
<td>55 kA, 1000 V, 2000 A</td>
<td>3AXD50000006186</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACS880-204…</th>
<th>Main switch-disconnector (UL, CSA)</th>
<th>Ordering code</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>U&lt;sub&gt;N&lt;/sub&gt; = 400 V (Range 380 … 415 V):</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0420A-3</td>
<td>Switch kit OT-type UL 1200 U03</td>
<td>50 kA, 600 V, 1200 A</td>
<td>3AXD50000002795</td>
</tr>
<tr>
<td>0580A-3</td>
<td>Switch kit OT-type UL 1200 U03</td>
<td>50 kA, 600 V, 1200 A</td>
<td>3AXD50000002795</td>
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<td>Switch kit OT-type UL 1200 U03</td>
<td>50 kA, 600 V, 1200 A</td>
<td>3AXD50000002795</td>
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<tr>
<td><strong>U&lt;sub&gt;N&lt;/sub&gt; = 500 V (Range 380 … 500 V):</strong></td>
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<tr>
<td>0400A-5</td>
<td>Switch kit OT-type UL 1200 U03</td>
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<td>Switch kit OT-type UL 1200 U03</td>
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<tr>
<td>0310A-7</td>
<td>Switch kit OT-type UL 1200 U12</td>
<td>50 kA, 600 V, 1200 A</td>
<td>3AXD500000010814</td>
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### Main switch-disconnector (UL, CSA) Ordering information

<table>
<thead>
<tr>
<th>ACS880-204-...</th>
<th>Type</th>
<th>Data</th>
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<td>0370A-7</td>
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<tr>
<td>0720A-7</td>
<td>Switch kit OT-type UL 1200 U12</td>
<td>50 kA, 600 V, 1200 A</td>
<td>3AXD50000010814</td>
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<tr>
<td>1050A-7</td>
<td>Switch kit OT-type UL 1200 U12</td>
<td>50 kA, 600 V, 1200 A</td>
<td>3AXD50000010814</td>
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### Shaft

<table>
<thead>
<tr>
<th>Type</th>
<th>Dimensions</th>
<th>D</th>
<th>L</th>
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<tbody>
<tr>
<td>OXP12X280</td>
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<td>12</td>
<td>280</td>
</tr>
</tbody>
</table>

**Shaft dimensions**

- **D** Shaft diameter
- **L** Shaft length

The main switch-disconnector kit contains:

- main switch disconnector unit
- shaft
- OHB274J12 handle with ON/OFF indication
- N.O. auxiliary contact OA1G10.
Main circuit breakers and wagons

You can use the main circuit breakers below for the on-off control of the AC input power. The breakers can make and break the full load current and also break a fault current. When installed in a wagon, the breakers are withdrawable and operate as main disconnecting device for the supply units.

You must equip the electric supply of a machinery with a main disconnecting device (IEC/EN60204-1). The main power line is equipped with a main switch-disconnector or a main circuit breaker [Q1]. This section lists suitable main circuit breakers. For illustrations and dimensions, see the ABB SACE catalogs in the Internet https://new.abb.com/low-voltage/products/circuit-breakers/emax2.

Note: For some of the IEC lower power units, you can use either the main switch-disconnector or the main circuit breaker. In the table, these lower power units are marked with * in the first column.

Note: UL-type main circuit breakers have IEC certification according to IEC 60947. See ABB SACE catalogs for further details.

<table>
<thead>
<tr>
<th>Ordering code</th>
<th>Main circuit breaker (IEC, 230 V)</th>
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<tbody>
<tr>
<td>ACS880-204-…</td>
<td>Qty</td>
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<tr>
<td>Type</td>
<td>Data</td>
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<tr>
<td>U_N = 400 V (Range 380 ... 415 V):</td>
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<tr>
<td>1130A-3*</td>
<td>E2.2S-A 1200 1200 A, 690 V, 3P, 65 kA, UL</td>
</tr>
<tr>
<td>1330A-3*</td>
<td>E2.2S-A 1600 1600 A, 690 V, 3P, 65 kA, UL</td>
</tr>
<tr>
<td>1580A-3*</td>
<td>E2.2S-A 2000 2000 A, 690 V, 3P, 65 kA, UL</td>
</tr>
<tr>
<td>2350A-3</td>
<td>E4.2S-A 2500 2500 A, 690 V, 3P, 65 kA, UL</td>
</tr>
<tr>
<td>3110A-3</td>
<td>E4.2S 3200 3200 A, 690 V, 3P, 66 kA, IEC</td>
</tr>
<tr>
<td>4620A-3</td>
<td>E6.2V-A 5000 5000 A, 690 V, 3P, 100 kA, UL</td>
</tr>
<tr>
<td>U_N = 500 V (Range 380 ... 500 V):</td>
<td></td>
</tr>
<tr>
<td>1420A-5*</td>
<td>E2.2S-A 1600 1600 A, 690 V, 3P, 65 kA, UL</td>
</tr>
<tr>
<td>2120A-5</td>
<td>E4.2S-A 2500 2500 A, 690 V, 3P, 65 kA, UL</td>
</tr>
<tr>
<td>2800A-5</td>
<td>E4.2S 3200 3200 A, 690 V, 3P, 66 kA, IEC</td>
</tr>
<tr>
<td>4150A-5</td>
<td>E6.2V-A 5000 5000 A, 690 V, 3P, 100 kA, UL</td>
</tr>
<tr>
<td>U_N = 690 V (Range 525 ... 690 V):</td>
<td></td>
</tr>
<tr>
<td>1570A-7*</td>
<td>E2.2S-A 2000 2000 A, 690 V, 3P, 65 kA, UL</td>
</tr>
<tr>
<td>2070A-7</td>
<td>E4.2S-A 2500 2500 A, 690 V, 3P, 65 kA, UL</td>
</tr>
<tr>
<td>3080A-7</td>
<td>E4.2S 3200 3200 A, 690 V, 3P, 66 kA, IEC</td>
</tr>
</tbody>
</table>

Content of the 230 V main circuit breakers:

• Ekip Dip LI 3p WMP
  1SDA077648R1 (E2.2S-A 1200)
  1SDA077658R1 (E2.2S-A 1600)
  1SDA077668R1 (E2.2S-A 2000)
  1SDA078458R1 (E4.2S-A 2500)
  1SDA072501R1 (E4.2S 3200)
  1SDA079138R1 (E6.2V-A 5000)

• YO E1.2..E6.2 220-240 Vac/dc
  1SDA073674R1

• YC E1.2..E6.2 220-240 Vac/dc
  1SDA073687R1
• YU E1.2..E6.2 220-240 Vac/dc 1SDA073700R1
• M E2.2..E6.2 220-250 Vac/dc 1SDA073725R1
• MOC E2.2..E6.2 1SDA073781R1
• AUX 6Q 400V E2.2..E6.2 1SDA073756R1
• KLC-S Key lock open N.20005 E2.2..E6.2 1SDA073792R1
• KLP-S Key lock racked in/out N.20005 E2.2..E6.2 1st key 1SDA073807R1
• TRIPLE CERTIFIC: UL/IEC/CCC * 1SDA083022R1 (E2.2S), 1SDA083025R1 (E4.2S), 1SDA083028R1 (E6.2V)

* = Certificate not included in E4.2S 3200.

For adapting E2.2S-A, E4.2S-A and E6.2V-A main circuit breakers to IEC busbars, use busbar shim kit. See IEC busbar shim kit (page 248).

<table>
<thead>
<tr>
<th>Ordering information 241</th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>ACS880-204-…</th>
<th>Wagon (IEC, 230 V)</th>
<th>Qty</th>
<th>Ordering code</th>
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<tbody>
<tr>
<td><strong>U_N = 400 V (Range 380 ... 415 V):</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1130A-3* E2.2-A_W_FP_2000HR-HR_UL</td>
<td>3-pole, rear hor. term., UL</td>
<td>1</td>
<td>3AXD50000048354</td>
</tr>
<tr>
<td>1330A-3* E2.2-A_W_FP_2000HR-HR_UL</td>
<td>3-pole, rear hor. term., UL</td>
<td>1</td>
<td>3AXD50000048354</td>
</tr>
<tr>
<td>1580A-3* E2.2-A_W_FP_2000HR-HR_UL</td>
<td>3-pole, rear hor. term., UL</td>
<td>1</td>
<td>3AXD50000048354</td>
</tr>
<tr>
<td>2350A-3 E4.2-A_W_FP_2500HR-HR_UL</td>
<td>3-pole, rear hor. term., UL</td>
<td>1</td>
<td>3AXD50000039281</td>
</tr>
<tr>
<td>3110A-3 E4.2_W_FP_3200_HR_I</td>
<td>3-pole, rear hor. term., IEC</td>
<td>1</td>
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</tr>
<tr>
<td>4620A-3 E6.2-A_W_FP_5000HR-HR_UL</td>
<td>3-pole, rear hor. term., UL</td>
<td>1</td>
<td>3AXD50000048402</td>
</tr>
</tbody>
</table>

| **U_N = 500 V (Range 380 ... 500 V):** | | | |
| 1420A-5* E2.2-A_W_FP_2000HR-HR_UL | 3-pole, rear hor. term., UL | 1 | 3AXD50000048354 |
| 2120A-5 E4.2-A_W_FP_2500HR-HR_UL | 3-pole, rear hor. term., UL | 1 | 3AXD50000039281 |
| 2800A-5 E4.2_W_FP_3200_HR_I | 3-pole, rear hor. term., IEC | 1 | 3AXD50000048356 |
| 4150A-5 E6.2-A_W_FP_5000HR-HR_UL | 3-pole, rear hor. term., UL | 1 | 3AXD50000048402 |

| **U_N = 690 V (Range 525 ... 690 V):** | | | |
| 1570A-7* E2.2-A_W_FP_2000HR-HR_UL | 3-pole, rear hor. term., UL | 1 | 3AXD50000048354 |
| 2070A-7 E4.2-A_W_FP_2500HR-HR_UL | 3-pole, rear hor. term., UL | 1 | 3AXD50000039281 |
| 3080A-7 E4.2_W_FP_3200_HR_I | 3-pole, rear hor. term., IEC | 1 | 3AXD50000048356 |
242 Ordering information

Content of the 230 V wagons:

- W FP lu=2000 3p HR HR UL /
- W FP lu=2500 3p HR HR UL /
- WAGON W FP lu=5000 HR HR UL

- AUP 5 contacts 400V E2.2...E6.2 - left set

The exception is E4.2_W_FP_3200_HR-HR_IEC:

- W FP lu=3200 HR HR, IEC
- AUP 5 contacts 400V E2.2...E6.2, IEC

For adapting E2.2S-A, E4.2S-A and E6.2V-A main circuit breakers to IEC busbars, use busbar shim kit. See IEC busbar shim kit (page 248).

<table>
<thead>
<tr>
<th>Ordering code</th>
<th>Qty</th>
<th>Type</th>
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<th>Ordering code</th>
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<td>E2.2S-A 1200</td>
<td>1200 A, 690 V, 3P</td>
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<td>1330A-3*</td>
<td>E2.2S-A 1600</td>
<td>1600 A, 690 V, 3P</td>
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<td>3AXD50000048342</td>
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<td>E2.2S-A 2000</td>
<td>2000 A, 690 V, 3P</td>
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<td>E4.2S-A 2500</td>
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<td>E4.2S 3200</td>
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<td>4620A-3</td>
<td>E6.2V-A 5000</td>
<td>5000 A, 690 V, 3P</td>
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<td>3200 A, 690 V, 3P</td>
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<tr>
<td>3AXD50000048349</td>
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<td>4150A-5</td>
<td>E6.2V-A 5000</td>
<td>5000 A, 690 V, 3P</td>
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<td>2000 A, 690 V, 3P</td>
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<td>2500 A, 690 V, 3P</td>
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<td>3080A-7</td>
<td>E4.2S 3200</td>
<td>3200 A, 690 V, 3P</td>
</tr>
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</table>
Content of the 115 V main circuit breakers:

- Ekip Dip LI 3p WMP
  - 1SDA077648R1 (E2.2S-A 1200)
  - 1SDA077658R1 (E2.2S-A 1600)
  - 1SDA077668R1 (E2.2S-A 2000)
  - 1SDA078458R1 (E4.2S-A 2500)
  - 1SDA072501R1 (E4.2S 3200)
  - 1SDA079138R1 (E6.2V-A 5000)

- YO E1.2..E6.2 110-120 Vac/dc
  - 1SDA073672R1

- YC E1.2..E6.2 110-120 Vac/dc
  - 1SDA073685R1

- YU E1.2..E6.2 110-120 Vac/dc
  - 1SDA073698R1

- M E2.2...E6.2 100-130 Vac/dc
  - 1SDA073724R1

- MOC E2.2..E6.2
  - 1SDA073781R1

- AUX 6Q 400V E2.2..E6.2
  - 1SDA073756R1

- KLC-S Key lock open N.20005 E2.2..E6.2
  - 1SDA073792R1

- KLP-S Key lock racked in/out N.20005 E2.2...E6.2 1st key
  - 1SDA073807R1

- TRIPLE CERTIFIC: UL/IEC/CCC *
  - 1SDA083022R1 (E2.2S),
  - 1SDA083025R1 (E4.2S),
  - 1SDA083028R1 (E6.2V)

* = Certificate not included in E4.2S 3200.

For adapting E2.2S-A, E4.2S-A and E6.2V-A main circuit breakers to IEC busbars, use busbar shim kit. See IEC busbar shim kit (page 248).
### Ordering information

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<th>Qty</th>
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<tr>
<td><strong>Uₐ = 400 V (Range 380 ... 415 V):</strong></td>
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<tr>
<td>1130A-3*</td>
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<td>3AXD50000048354</td>
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<td>1330A-3*</td>
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<tr>
<td>1580A-3*</td>
<td>1</td>
<td>3AXD50000048354</td>
</tr>
<tr>
<td>2350A-3</td>
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<tr>
<td>3110A-3</td>
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</tr>
<tr>
<td>4620A-3</td>
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<td>3AXD50000048402</td>
</tr>
<tr>
<td><strong>Uₐ = 500 V (Range 380 ... 500 V):</strong></td>
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<tr>
<td>1420A-5*</td>
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<tr>
<td>4150A-5</td>
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</tr>
<tr>
<td><strong>Uₐ = 690 V (Range 525 ... 690 V):</strong></td>
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<tr>
<td>1570A-7*</td>
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</tr>
<tr>
<td>3080A-7</td>
<td>1</td>
<td>3AXD50000048356</td>
</tr>
</tbody>
</table>

Content of the 115 V wagons:

- **WFPIₐ = 2000 HR-UL**
  - 3-pole, rear hor. term., UL
  - 1SDA079698R1 (E2.2-A W FP 2000)
  - 1SDA079700R1 (E4.2-A W FP 2500)
  - 1SDA079706R1 (E6.2-A W FP 5000)
- **WFPIₐ = 2500 HR-UL**
  - 3-pole, rear hor. term., UL
  - 1SDA079698R1 (E2.2-A W FP 2000)
  - 1SDA079700R1 (E4.2-A W FP 2500)
  - 1SDA079706R1 (E6.2-A W FP 5000)
- **WFPIₐ = 5000 HR-UL**
  - 3-pole, rear hor. term., UL
  - 1SDA079698R1 (E2.2-A W FP 2000)
  - 1SDA079700R1 (E4.2-A W FP 2500)
  - 1SDA079706R1 (E6.2-A W FP 5000)
- **AUP 5 contacts 400V E2.2...E6.2 - left set**
  - 1SDA080373R1

The exception is **E4.2_W_FP_3200_HR-IEC**:

- **WFPIₐ = 3200 HR-IEC**
  - 3-pole, rear hor. term., IEC
  - 1SDA079698R1 (E2.2-A W FP 2000)
  - 1SDA079700R1 (E4.2-A W FP 2500)
  - 1SDA079706R1 (E6.2-A W FP 5000)
- **AUP 5 contacts 400V E2.2...E6.2, IEC**
  - 1SDA079698R1 (E2.2-A W FP 2000)
  - 1SDA079700R1 (E4.2-A W FP 2500)
  - 1SDA079706R1 (E6.2-A W FP 5000)

For adapting E2.2S-A, E4.2S-A and E6.2V-A main circuit breakers to IEC busbars, use busbar shim kit. See *IEC busbar shim kit (page 248)*.
<table>
<thead>
<tr>
<th>Ordering code</th>
<th>Qty</th>
<th>Main circuit breaker (UL, CSA: 230 V)</th>
</tr>
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<tbody>
<tr>
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<td>1</td>
<td>E2.2S-A 1200 1200 A, 600 V, 65 kA, UL</td>
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<tr>
<td>3AXD50000048327</td>
<td>1</td>
<td>E2.2S-A 1600 1600 A, 600 V, 65 kA, UL</td>
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<td>3AXD50000048330</td>
<td>1</td>
<td>E2.2S-A 2000 2000 A, 600 V, 65 kA, UL</td>
</tr>
<tr>
<td>3AXD50000048343</td>
<td>1</td>
<td>E4.2S-A 2500 2500 A, 600 V, 65 kA, UL</td>
</tr>
<tr>
<td>3AXD50000048348</td>
<td>1</td>
<td>E6.2V-A 4000 4000 A, 600 V, 100 kA, UL</td>
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<tr>
<td>3AXD50000048352</td>
<td>1</td>
<td>E6.2V-A 5000 5000 A, 600 V, 100 kA, UL</td>
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<tr>
<td>3AXD50000048327</td>
<td>1</td>
<td>E2.2S-A 1600 1600 A, 600 V, 65 kA, UL</td>
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<tr>
<td>3AXD50000048343</td>
<td>1</td>
<td>E4.2S-A 2500 2500 A, 600 V, 65 kA, UL</td>
</tr>
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<td>3AXD50000048348</td>
<td>1</td>
<td>E6.2V-A 4000 4000 A, 600 V, 100 kA, UL</td>
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<td>3AXD50000048330</td>
<td>1</td>
<td>E2.2S-A 2000 2000 A, 600 V, 65 kA, UL</td>
</tr>
<tr>
<td>3AXD50000048343</td>
<td>1</td>
<td>E4.2S-A 2500 2500 A, 600 V, 65 kA, UL</td>
</tr>
<tr>
<td>3AXD50000048348</td>
<td>1</td>
<td>E6.2V-A 4000 4000 A, 600 V, 100 kA, UL</td>
</tr>
<tr>
<td>3AXD50000048352</td>
<td>1</td>
<td>E6.2V-A 5000 5000 A, 600 V, 100 kA, UL</td>
</tr>
</tbody>
</table>

Content of the 230 V main circuit breakers:

- **Ekip Dip Li 3p WMP**
  - 1SDA077648R1 (E2.2S-A 1200)
  - 1SDA077658R1 (E2.2S-A 1600)
  - 1SDA077668R1 (E2.2S-A 2000)
  - 1SDA078458R1 (E4.2S-A 2500)
  - 1SDA079128R1 (E6.2V-A 4000)
  - 1SDA079138R1 (E6.2V-A 5000)

- **YO E1.2..E6.2 220-240 Vac/dc**
  - 1SDA073674R1

- **YC E1.2..E6.2 220-240 Vac/dc**
  - 1SDA073687R1

- **YU E1.2..E6.2 220-240 Vac/dc**
  - 1SDA073700R1

- **M E2.2..E6.2 220-250 Vac/dc**
  - 1SDA073725R1

- **MOC E2.2..E6.2**
  - 1SDA073781R1

- **AUX 60 400V E2.2..E6.2**
  - 1SDA073756R1

- **KLC-S Key lock open N.20005 E2.2..E6.2**
  - 1SDA073792R1

- **KLP-S Key lock racked in/out N.20005 E2.2..E6.2 1st key**
  - 1SDA073807R1

- **TRIPLE CERTIFIC: UL/IEC/CCC**
  - 1SDA083022R1 (E2.2S)
  - 1SDA083025R1 (E4.2S)
  - 1SDA083028R1 (E6.2V)
## 246 Ordering information

<table>
<thead>
<tr>
<th>Ordering code</th>
<th>Qty</th>
<th>Main circuit breaker (UL, CSA: 115 V)</th>
</tr>
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<tbody>
<tr>
<td>3AXD5000004835111200A,600V,65kA,ULE2.2S-A12001130A-3</td>
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<td>1130A-3 E2.2S-A 1200 1200 A, 600 V, 65 kA, UL</td>
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<td>1580A-3 E2.2S-A 2000 2000 A, 600 V, 65 kA, UL</td>
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<tr>
<td>3AXD5000004834512500A,600V,65kA,ULE2.2S-A25002350A-3</td>
<td>1</td>
<td>2350A-3 E4.2S-A 2500 2500 A, 600 V, 65 kA, UL</td>
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<td>3AXD5000004834714000A,600V,100kA,ULE2.2S-A40001130A-3</td>
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<td>3110A-3 E6.2V-A 4000 4000 A, 600 V, 100 kA, UL</td>
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<td>3AXD5000004834915000A,600V,100kA,ULE2.2S-A50004620A-3</td>
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<td>4620A-3 E6.2V-A 5000 5000 A, 600 V, 100 kA, UL</td>
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### \( U_N = 400 \text{ V (Range 380 ... 415 V):} \)

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<tr>
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</tr>
<tr>
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<td>2120A-5 E4.2S-A 2500 2500 A, 600 V, 65 kA, UL</td>
</tr>
<tr>
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<td>1</td>
<td>2800A-5 E6.2V-A 4000 4000 A, 600 V, 100 kA, UL</td>
</tr>
<tr>
<td>3AXD5000004834915000A,600V,100kA,ULE2.2S-A50004150A-5</td>
<td>1</td>
<td>4150A-5 E6.2V-A 5000 5000 A, 600 V, 100 kA, UL</td>
</tr>
</tbody>
</table>

### \( U_N = 500 \text{ V (Range 380 ... 500 V):} \)

<table>
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<tr>
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<td>1</td>
<td>1420A-5 E2.2S-A 1600 1600 A, 600 V, 65 kA, UL</td>
</tr>
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<td>1</td>
<td>2120A-5 E4.2S-A 2500 2500 A, 600 V, 65 kA, UL</td>
</tr>
<tr>
<td>3AXD5000004834714000A,600V,100kA,ULE2.2S-A40002800A-5</td>
<td>1</td>
<td>2800A-5 E6.2V-A 4000 4000 A, 600 V, 100 kA, UL</td>
</tr>
<tr>
<td>3AXD5000004834915000A,600V,100kA,ULE2.2S-A50004150A-5</td>
<td>1</td>
<td>4150A-5 E6.2V-A 5000 5000 A, 600 V, 100 kA, UL</td>
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### \( U_N = 690 \text{ V (Range 525 ... 690 V):} \)

<table>
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<th>Main circuit breaker (UL, CSA: 115 V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3AXD5000004832911600A,600V,65kA,ULE2.2S-A16001420A-5</td>
<td>1</td>
<td>1420A-5 E2.2S-A 1600 1600 A, 600 V, 65 kA, UL</td>
</tr>
<tr>
<td>3AXD5000004834512500A,600V,65kA,ULE2.2S-A25002120A-5</td>
<td>1</td>
<td>2120A-5 E4.2S-A 2500 2500 A, 600 V, 65 kA, UL</td>
</tr>
<tr>
<td>3AXD5000004834714000A,600V,100kA,ULE2.2S-A40002800A-5</td>
<td>1</td>
<td>2800A-5 E6.2V-A 4000 4000 A, 600 V, 100 kA, UL</td>
</tr>
</tbody>
</table>

### Content of the 115 V main circuit breakers:

- Ekip Dip LI 3p WMP
  - 1SDA077648R1 (E2.2S-A 1200)
  - 1SDA077658R1 (E2.2S-A 1600)
  - 1SDA077668R1 (E2.2S-A 2000)
  - 1SDA078458R1 (E4.2S-A 2500)
  - 1SDA079128R1 (E6.2V-A 4000)
  - 1SDA079138R1 (E6.2V-A 5000)

- YO E1.2...E6.2 110-120 Vac/dc
  - 1SDA073672R1

- YC E1.2...E6.2 110-120 Vac/dc
  - 1SDA073685R1

- YU E1.2...E6.2 110-120 Vac/dc
  - 1SDA073698R1

- M E2.2...E6.2 100-130 Vac/dc
  - 1SDA073724R1

- MOC E2.2...E6.2
  - 1SDA073781R1

- AUX 60 400V E2.2...E6.2
  - 1SDA073756R1

- KLC-S Key lock open N.20005 E2.2...E6.2
  - 1SDA073792R1

- KLP-S Key lock racked in/out N.20005 E2.2...E6.2 1st key
  - 1SDA073807R1

- TRIPLE CERTIFIC: UL/IEC/CCC
  - 1SDA083022R1 (E2.2S),
  - 1SDA083025R1 (E4.2S),
  - 1SDA083028R1 (E6.2V)
### Ordering information 247

#### Wagon (UL, CSA)

<table>
<thead>
<tr>
<th>Type</th>
<th>Data</th>
<th>Qty</th>
<th>Ordering code</th>
</tr>
</thead>
</table>

#### $U_N = 400 \text{ V (Range 380 ... 415 V):}$

- **1130A-3**  
  E2.2-A_W_FP_2000HR-HR_UL  
  3-pole, rear hor. term., UL  
  1  
  3AXD50000048354

- **1330A-3**  
  E2.2-A_W_FP_2000HR-HR_UL  
  3-pole, rear hor. term., UL  
  1  
  3AXD50000048354

- **1580A-3**  
  E2.2-A_W_FP_2000HR-HR_UL  
  3-pole, rear hor. term., UL  
  1  
  3AXD50000048354

- **2350A-3**  
  E4.2-A_W_FP_2500HR-HR_UL  
  3-pole, rear hor. term., UL  
  1  
  3AXD50000039281

- **3110A-3**  
  E6.2-A_W_FP_5000HR-HR_UL  
  3-pole, rear hor. term., UL  
  1  
  3AXD50000048402

- **4620A-3**  
  E6.2-A_W_FP_5000HR-HR_UL  
  3-pole, rear hor. term., UL  
  1  
  3AXD50000048402

#### $U_N = 500 \text{ V (Range 380 ... 500 V):}$

- **1420A-5**  
  E2.2-A_W_FP_2000HR-HR_UL  
  3-pole, rear hor. term., UL  
  1  
  3AXD50000048354

- **2120A-5**  
  E4.2-A_W_FP_2500HR-HR_UL  
  3-pole, rear hor. term., UL  
  1  
  3AXD50000039281

- **2800A-5**  
  E6.2-A_W_FP_5000HR-HR_UL  
  3-pole, rear hor. term., UL  
  1  
  3AXD50000048402

- **4150A-5**  
  E6.2-A_W_FP_5000HR-HR_UL  
  3-pole, rear hor. term., UL  
  1  
  3AXD50000048402

#### $U_N = 690 \text{ V (Range 525 ... 690 V):}$

- **1570A-7**  
  E2.2-A_W_FP_2000HR-HR_UL  
  3-pole, rear hor. term., UL  
  1  
  3AXD50000048354

- **2070A-7**  
  E4.2-A_W_FP_2500HR-HR_UL  
  3-pole, rear hor. term., UL  
  1  
  3AXD50000039281

- **3080A-7**  
  E6.2-A_W_FP_5000HR-HR_UL  
  3-pole, rear hor. term., UL  
  1  
  3AXD50000048402

**Content of the UL/CSA wagons:**

- W FP $I_{Lu}=2000 \text{ 3p HR HR UL} /$  
  1SDA079698R1 (E2.2-A W FP 2000)

- W FP $I_{Lu}=2500 \text{ 3p HR HR UL} /$  
  1SDA079700R1 (E4.2-A W FP 2500)

- WAGON W FP $I_{Lu}=5000 \text{ HR HR UL}$  
  1SDA079706R1 (E6.2-A W FP 5000)

- AUP 5 contacts 400V E2.2...E6.2 - left set  
  1SDA080373R1
IEC busbar shim kit
The following shim kits are available for adapting E2.2S-A, E4.2S-A and E6.2V-A main circuit breakers to IEC busbars.

<table>
<thead>
<tr>
<th>Type</th>
<th>Data</th>
<th>Ordering code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>E2.2S-A</td>
<td>EMAX2 E2.2 busbar shim kit</td>
<td>3AXD50000286324</td>
<td>Instruction code: 3AXD50000286072</td>
</tr>
<tr>
<td>E4.2S-A</td>
<td>EMAX2 E4.2 busbar shim kit</td>
<td>3AXD50000286782</td>
<td>Instruction code: 3AXD50000286973</td>
</tr>
<tr>
<td>E6.2V-A</td>
<td>EMAX2 E6.2 busbar shim kit</td>
<td>3AXD50000287369</td>
<td>Instruction code: 3AXD50000287468</td>
</tr>
</tbody>
</table>

Main circuit breaker and wagon cover
One cover is needed for each main circuit breaker/wagon pair. See ACS880 multidrive modules cabinet design and construction instructions (3AUA0000107668 [English]) for further details regarding arc protection.

IEC: IP54 flange, key N.20005 E2.2…E6.2, 1SDA073869R1, ordering code: 3AXD50000049760
UL: Hinged Window, APWK2016H, ordering code 3AUA0000222786
Main AC fuses in incoming cubicle

The AC fuses protect the input cables, main contactor \([Q2]\) and the module against short circuits. Main AC fuses are used only with the main contactor \([Q2]\) solution. Module-specific AC fuses are used with the main circuit breaker \([Q1]\) solution.

<table>
<thead>
<tr>
<th>ACS880-204-...</th>
<th>Frame size</th>
<th>Fuse (IEC)</th>
<th>Qty</th>
<th>Ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Type</td>
<td>Data</td>
<td></td>
</tr>
<tr>
<td>(U_N = 400 \text{ V (Range 380 ... 415 V)}):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0420A-3</td>
<td>1×R8i</td>
<td>170M6410</td>
<td>630 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>0580A-3</td>
<td>1×R8i</td>
<td>170M6414</td>
<td>1000 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>0810A-3</td>
<td>1×R8i</td>
<td>170M6416</td>
<td>1250 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>1130A-3</td>
<td>2×R8i</td>
<td>170M7062 (OT(^1))</td>
<td>2000 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>1330A-3</td>
<td>2×R8i</td>
<td>170M7063 (OT(^1))</td>
<td>2500 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>1580A-3</td>
<td>2×R8i</td>
<td>170M7063 (OT(^1))</td>
<td>2500 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>(U_N = 500 \text{ V (Range 380 ... 500 V)}):</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>0400A-5</td>
<td>1×R8i</td>
<td>170M6410</td>
<td>630 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>0530A-5</td>
<td>1×R8i</td>
<td>170M6414</td>
<td>1000 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>0730A-5</td>
<td>1×R8i</td>
<td>170M6416</td>
<td>1250 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>1040A-5</td>
<td>2×R8i</td>
<td>170M6419</td>
<td>1600 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>1420A-5</td>
<td>2×R8i</td>
<td>170M7063 (OT(^1))</td>
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<tr>
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<td>1×R8i</td>
<td>170M6408</td>
<td>500 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>0370A-7</td>
<td>1×R8i</td>
<td>170M6410</td>
<td>630 A, 690 V</td>
<td>3</td>
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<tr>
<td>0540A-7</td>
<td>1×R8i</td>
<td>170M6413</td>
<td>900 A, 690 V</td>
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<tr>
<td>0720A-7</td>
<td>2×R8i</td>
<td>170M6416</td>
<td>1250 A, 690 V</td>
<td>3</td>
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<tr>
<td>1050A-7</td>
<td>2×R8i</td>
<td>170M6419</td>
<td>1600 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>1570A-7</td>
<td>3×R8i</td>
<td>170M7063 (OT(^1))</td>
<td>2500 A, 690 V</td>
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1) When there is OT-type main switch-disconnector in use.

<table>
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<tr>
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<th>Frame size</th>
<th>Fuse (UL, CSA)</th>
<th>Qty</th>
<th>Ordering code</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Type</td>
<td>Data</td>
<td></td>
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<tr>
<td>(U_N = 400 \text{ V (Range 380 ... 415 V)}):</td>
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<td>0420A-3</td>
<td>1×R8i</td>
<td>170M6410</td>
<td>630 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>0580A-3</td>
<td>1×R8i</td>
<td>170M6414</td>
<td>1000 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>0810A-3</td>
<td>1×R8i</td>
<td>170M6416</td>
<td>1250 A, 690 V</td>
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<td>(U_N = 500 \text{ V (Range 380 ... 500 V)}):</td>
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</tr>
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<td>0530A-5</td>
<td>1×R8i</td>
<td>170M6414</td>
<td>1000 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>0730A-5</td>
<td>1×R8i</td>
<td>170M6416</td>
<td>1250 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>1040A-5</td>
<td>2×R8i</td>
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### Ordering Information

**ACS880-204-...**

<table>
<thead>
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<th>Frame size</th>
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<tbody>
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<tr>
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<tr>
<td>0310A-7</td>
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<td>0370A-7</td>
<td>1×R8i</td>
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<td>630 A, 690 V</td>
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<td>0540A-7</td>
<td>1×R8i</td>
<td>170M6413</td>
<td>900 A, 690 V</td>
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<tr>
<td>0720A-7</td>
<td>2×R8i</td>
<td>170M6416</td>
<td>1250 A, 690 V</td>
</tr>
<tr>
<td>1050A-7</td>
<td>2×R8i</td>
<td>170M6419</td>
<td>1600 A, 690 V</td>
</tr>
</tbody>
</table>
AC fuses in IGBT supply module cubicle or LCL filter cubicle

When using main circuit breaker, the AC fuses protect the modules against short circuits.

<table>
<thead>
<tr>
<th>ACS880-204-…</th>
<th>Frame size</th>
<th>Fuse (IEC)</th>
<th>Qty</th>
<th>Ordering code</th>
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<tbody>
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<td></td>
<td>Type</td>
<td>Data</td>
<td></td>
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<tr>
<td>$U_N = 400$ V (Range 380 ... 415 V):</td>
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<td></td>
</tr>
<tr>
<td>1130A-3</td>
<td>2×R8i</td>
<td>170M7062 (MCB$^2$)</td>
<td>2000 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>1330A-3</td>
<td>2×R8i</td>
<td>170M7063 (MCB$^2$)</td>
<td>2500 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>1580A-3</td>
<td>2×R8i</td>
<td>170M7063 (MCB$^2$)</td>
<td>2500 A, 690 V</td>
<td>3</td>
</tr>
<tr>
<td>2350A-3</td>
<td>3×R8i</td>
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2) When there is a main circuit breaker in use.

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<tr>
<td>$U_N = 690$ V (Range 525 ... 690 V):</td>
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<td>6×R8i</td>
<td>170M7062</td>
<td>2000 A, 690 V</td>
<td>9</td>
</tr>
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</table>
Main contactors

The main power line is equipped with a main contactor [Q2]. Contactors are used for the on-off control of the main AC input power.

Note: For the high power units, you can use a withdrawable main circuit breaker instead of the main contactor and main switch-disconnector.

See also Main switch-disconnector kits (page 238) and Main circuit breakers and wagons (page 240).

<table>
<thead>
<tr>
<th>Ordering information</th>
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</table>

## Main contactors (IEC)

The main power line is equipped with a main contactor [Q2]. Contactors are used for the on-off control of the main AC input power.

### Note:
For the high power units, you can use a withdrawable main circuit breaker instead of the main contactor and main switch-disconnector.

See also **Main switch-disconnector kits (page 238)** and **Main circuit breakers and wagons (page 240)**.

### Ordering information

**ACS880-204-…**

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<td>0810A-3 AF750-30-22-70</td>
<td>1</td>
<td>64399772</td>
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<tr>
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<td>64731378</td>
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### Main Contactor (IEC)

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### Main Contactor (UL/CSA)

#### $U_N = 400\text{ V (Range 380} \ldots 415\text{ V)}:

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<td>0810A-3</td>
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<td>64399772</td>
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</table>

#### $U_N = 500\text{ V (Range 380} \ldots 500\text{ V)}:

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<th>Qty</th>
<th>Ordering code</th>
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#### $U_N = 690\text{ V (Range 525} \ldots 690\text{ V)}:

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<tr>
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</table>

### Definitions

- $I_{Th}$: Conventional free-air thermal current
- $U_E$: Rated operational voltage

The contactor package includes:
- contactor unit.
Charging kits

The capacitor bank of the IGBT supply module needs to be charged during the start-up before connecting the module to a three-phase power line.

Note: The charging components are dimensioned for DC link capacitances equal to 3 × IGBT supply unit DC capacitance (1×ISU + 2×INU), 5 × IGBT supply unit DC capacitance (1×ISU + 4×INU) and 7 × IGBT supply unit DC capacitance (1×ISU + 6×INU). If the total DC link capacitance (including IGBT supply and inverter module DC capacitances) exceeds these limits, the components must be redimensioned. Contact ABB representative for more information. The capacitances of the IGBT supply module types and the inverter module types are specified in their technical data tables. The maximum allowed number of charging cycles of the DC capacitors (ie, power-ups by applying power) is two in five minutes.

Dimensioning of these charging kits is based on the assumptions that the modules are supplied with 230/115 V AC auxiliary voltage in connector X50. The following tables show the charging kits available for each module type.

<table>
<thead>
<tr>
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<th>Ordering code (IEC)</th>
<th>Max. capacitance (mF)</th>
<th>Ordering code (IEC)</th>
<th>Max. capacitance (mF)</th>
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### Ordering information 255

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</table>

<table>
<thead>
<tr>
<th>$U_N = 690$ V (Range 525 ... 690 V):</th>
</tr>
</thead>
<tbody>
<tr>
<td>0310A-7</td>
</tr>
<tr>
<td>0370A-7</td>
</tr>
<tr>
<td>0540A-7</td>
</tr>
<tr>
<td>0720A-7</td>
</tr>
<tr>
<td>1050A-7</td>
</tr>
<tr>
<td>1570A-7</td>
</tr>
<tr>
<td>2070A-7</td>
</tr>
<tr>
<td>3080A-7</td>
</tr>
</tbody>
</table>
The charging kit contains:

- switch disconnector unit (switch fuse type)
- terminal covers for the switch disconnector (2 × 4 pcs)
- contactor
- fuses (4 pcs, IEC: gG type, UL: class J)
- resistors
- N.O. auxiliary contact
- shaft OXP6X161 or OXP6X210, see also content of OS_P switches
- handle OHB65J6 or OHB45J6 with ON/OFF indication, see also content of OS_P switches.

Minimum recommended wire sizes for the charging kits:

- Consult ABB.

Use double-insulated wire.

For more detailed information on the charging components, see the technical data.

**Varistor kit ACS880 for UL/CSA installations**

The CVAR varistor board is used to protect the supply/rectifier module against excessive voltage peaks. The board shunts the current created by high voltage.

The CVAR board must be:

- installed into the cabinet,
- connected to the main circuit after the main contactor [Q2], and
- connected to the PE.

For the best results, use the shortest possible wiring when connecting the CVAR board. For the detailed connection, see the example circuit diagrams.

<table>
<thead>
<tr>
<th>Module type</th>
<th>Type</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Varistor board kit</td>
<td>1</td>
<td>3AXD50000005122</td>
<td></td>
</tr>
<tr>
<td>Frame 2×R8i</td>
<td>Varistor board kit</td>
<td>2</td>
<td>3AXD50000005122</td>
<td></td>
</tr>
<tr>
<td>Frame 3×R8i</td>
<td>Varistor board kit</td>
<td>2</td>
<td>3AXD50000005122</td>
<td></td>
</tr>
<tr>
<td>Frame 4×R8i</td>
<td>Varistor board kit</td>
<td>3</td>
<td>3AXD50000005122</td>
<td></td>
</tr>
</tbody>
</table>

The varistor kit for ACS880 contains:

- CVAR varistor board with fastening items (stand-offs and fastening screws).

For the dimensions of the CVAR board, see the dimension drawings.
### AC connection of the LCL filter

<table>
<thead>
<tr>
<th>Used with …</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLCL-xx-x; All enclosures</td>
<td>1 per module</td>
<td>3AXD50000002576</td>
<td>A-468-8-131</td>
<td><img src="image" alt="Illustration" /></td>
</tr>
<tr>
<td>BLCL-1x-x; Rittal</td>
<td>1 per module</td>
<td>3AXD500000416509</td>
<td>A-6-8-110-VX</td>
<td><img src="image" alt="Illustration" /></td>
</tr>
<tr>
<td>BLCL-1x-x; generic</td>
<td>1 per module</td>
<td>3AXD50000019279</td>
<td>A-6-8-111</td>
<td><img src="image" alt="Illustration" /></td>
</tr>
<tr>
<td>BLCL-2x-x; All enclosures</td>
<td>1 per module</td>
<td>3AXD50000011084</td>
<td>A-468-8-106</td>
<td><img src="image" alt="Illustration" /></td>
</tr>
</tbody>
</table>

*Note:* This kit is not included in ABB’s standard design but may be used if you wish to have AC fuses on top of the LCL filter module.

Ordering information 257
<table>
<thead>
<tr>
<th>Used with …</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLCL-2x-x; Rittal</td>
<td>1 per module</td>
<td>3AXD50000360796</td>
<td>A-4-8-107-VX</td>
<td><img src="3AXD50000353491.png" alt="Illustration" /></td>
</tr>
<tr>
<td>BLCL-2x-x; generic</td>
<td>1 per module</td>
<td>3AXD500001155</td>
<td>A-468-8-109</td>
<td><img src="3AXD5000013246.png" alt="Illustration" /></td>
</tr>
<tr>
<td>BLCL-2x-x; 3×R8i Rittal</td>
<td>1 per module</td>
<td>3AXD5000371143</td>
<td>A-6-8-108-VX</td>
<td><img src="3AXD5000352999.png" alt="Illustration" /></td>
</tr>
</tbody>
</table>
**Busbars and quick connectors**

The power input of the supply module is connected to the module through a quick connector.

<table>
<thead>
<tr>
<th>Used with ...</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1×R8i; 600 mm Rittal</td>
<td>1</td>
<td>3AXD50000416493</td>
<td>A-6-8-130-VX</td>
<td><img src="image1" alt="Illustration" /> Instruction code: 3AXD50000384945</td>
</tr>
<tr>
<td>1×R8i; 600 mm Rittal</td>
<td>1</td>
<td>3AXD50000702251</td>
<td>A-6-8-154-VX</td>
<td><img src="image2" alt="Illustration" /> Instruction code: 3AXD50000700998</td>
</tr>
<tr>
<td>1×R8i; 600 mm generic</td>
<td>1</td>
<td>3AXD5000013790</td>
<td>A-6-8-146</td>
<td><img src="image3" alt="Illustration" /> Instruction code: 3AXD5000013902</td>
</tr>
<tr>
<td>2×R8i; 1000 mm Rittal</td>
<td>1</td>
<td>3AXD50000361687</td>
<td>A-X-8-142-VX</td>
<td><img src="image4" alt="Illustration" /> Instruction code: 3AXD50000353477</td>
</tr>
</tbody>
</table>

*Note: This kit is mirror image of kit A-6-8-130-VX.*
<table>
<thead>
<tr>
<th>Used with ...</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2×R8i; 1000 mm Rittal</td>
<td>1</td>
<td>3AXD500000702268</td>
<td>A-X-8-155-VX</td>
<td>![Image] Instruction code: 3AXD50000701674</td>
</tr>
<tr>
<td>Note: This kit is mirror image of kit A-X-8-142-VX.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2×R8i; 800 mm generic</td>
<td>1</td>
<td>3AXD50000011156</td>
<td>A-8-8-144</td>
<td>![Image] Instruction code: 3AXD50000013187</td>
</tr>
<tr>
<td>3×R8i; 1600 mm Rittal</td>
<td>1</td>
<td>3AXD50000371129</td>
<td>A-X-8-143-VX</td>
<td>![Image] Instruction code: 3AXD50000360444</td>
</tr>
<tr>
<td>![Image] Instruction code: 3AXD50000360444</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3×R8i; 1600 mm Rittal</td>
<td>1</td>
<td>3AXD50000702275</td>
<td>A-X-8-156-VX</td>
<td>![Image] Instruction code: 3AXD50000701773</td>
</tr>
<tr>
<td>Note: This kit is mirror image of kit A-X-8-143-VX.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3×R8i; 1400 mm generic</td>
<td>1</td>
<td>3AXD50000011157</td>
<td>A-X-8-145</td>
<td>![Image] Instruction code: 3AXD50000013810</td>
</tr>
<tr>
<td>![Image] Instruction code: 3AXD50000013810</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Quick connector

The power input is connected to the module through a quick connector.

<table>
<thead>
<tr>
<th>Used with</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
</table>
| All enclosure types| 1 per   | 3AU0000119227 | A-468-8-100 | ![Illustration](image)

Instruction code: 3AU0000118667
DC-side components

DC bus installation parts (for Rittal VX25 enclosures)

The brackets in this kit act as a mounting base for the busbar supports of the Rittal Flat-PLS DC bus and ensure its correct placement and alignment inside the cabinet line-up.

**Note:** The designs presented in this manual for Rittal VX25 enclosures employ the Rittal Flat-PLS busbar system. Make sure that the current carrying capability of the busbars is not exceeded at any point of the drive system.

<table>
<thead>
<tr>
<th>Used with …</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>400/600/800 mm VX25 enclosure</td>
<td>1 kit per cubicle</td>
<td>3AXD50000333387</td>
<td>A-468-X-001-VX</td>
<td></td>
</tr>
</tbody>
</table>

**DC busbars**

DC busbars connect the Flat-PLS busbars to the DC fuses.

<table>
<thead>
<tr>
<th>Used with …</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>3×R8i; 400 mm Rittal</td>
<td>1</td>
<td>3AXD50000371136</td>
<td>A-4-8-205-VX</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Used with …</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2×R8i, 3×R8i; 600 mm Rittal</td>
<td>1</td>
<td>3AXD50000361663</td>
<td>A-6-8-212-VX</td>
<td></td>
</tr>
</tbody>
</table>
### Module and common mode filter busbars

A common mode filter is needed with each IGBT supply module. There is space for up to four toroidal cores.

<table>
<thead>
<tr>
<th>Used with …</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>R8i; generic</td>
<td>1</td>
<td>3AXD50000025659</td>
<td>A-468-8-245</td>
<td></td>
</tr>
<tr>
<td>R8i; All enclosures</td>
<td>1</td>
<td>3AXD50000003411</td>
<td>A-468-8-232</td>
<td></td>
</tr>
</tbody>
</table>

### Common mode filters

You must equip each module with a common mode filter.

Common mode filtering reduces bearing currents and is required for electromagnetic compatibility (EMC). The filtering is implemented by installing two toroidal cores onto the DC busbars. The cores must be ordered separately.

<table>
<thead>
<tr>
<th>Used with</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>R8i; All enclosures</td>
<td>1 per module</td>
<td>3AXD50000002492</td>
<td>A-468-8-231</td>
<td></td>
</tr>
</tbody>
</table>

* For EMC category C2 in case of 1×R6i or 1×R8i, 4 pcs. As standard, 2 pcs per module.
DC fuses
DC fuses protect the module and drive DC bus against short circuits.

<table>
<thead>
<tr>
<th>ACS880-204-...</th>
<th>Fuse (IEC, UL, CSA)</th>
<th>Qty</th>
<th>Ordering code</th>
<th>2nd type fuse</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type</td>
<td>Data</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>$U_N = 400 \text{ V (Range 380 ... 415 V):}$</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0420A-3</td>
<td>Cooper-Bussmann 170M6413</td>
<td>900 A, 690 V, size 3</td>
<td>2</td>
<td>3AXD50000000148</td>
</tr>
<tr>
<td>0580A-3</td>
<td>Cooper-Bussmann 170M6415</td>
<td>1100 A, 690 V, size 3</td>
<td>2</td>
<td>68731658</td>
</tr>
<tr>
<td>0810A-3</td>
<td>Cooper-Bussmann 170M6419</td>
<td>1600 A, 690 V, size 3*</td>
<td>2</td>
<td>68393108</td>
</tr>
<tr>
<td>1130A-3</td>
<td>Cooper-Bussmann 170M6415</td>
<td>1100 A, 690 V, size 3</td>
<td>4</td>
<td>68731658</td>
</tr>
<tr>
<td>1330A-3</td>
<td>Cooper-Bussmann 170M6417</td>
<td>1400 A, 690 V, size 3</td>
<td>4</td>
<td>3AXD50000000150</td>
</tr>
<tr>
<td>1580A-3</td>
<td>Cooper-Bussmann 170M6419</td>
<td>1600 A, 690 V, size 3*</td>
<td>4</td>
<td>68393108</td>
</tr>
<tr>
<td>2350A-3</td>
<td>Cooper-Bussmann 170M6419</td>
<td>1600 A, 690 V, size 3*</td>
<td>6</td>
<td>68393108</td>
</tr>
<tr>
<td>3110A-3</td>
<td>Cooper-Bussmann 170M6419</td>
<td>1600 A, 690 V, size 3*</td>
<td>8</td>
<td>68393108</td>
</tr>
<tr>
<td>4620A-3</td>
<td>Cooper-Bussmann 170M6419</td>
<td>1600 A, 690 V, size 3*</td>
<td>12</td>
<td>68393108</td>
</tr>
<tr>
<td><strong>$U_N = 500 \text{ V (Range 380 ... 500 V):}$</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0400A-5</td>
<td>Cooper-Bussmann 170M6413</td>
<td>900 A, 690 V, size 3</td>
<td>2</td>
<td>3AXD50000000148</td>
</tr>
<tr>
<td>0530A-5</td>
<td>Cooper-Bussmann 170M6415</td>
<td>1100 A, 690 V, size 3</td>
<td>2</td>
<td>68731658</td>
</tr>
<tr>
<td>0730A-5</td>
<td>Cooper-Bussmann 170M6419</td>
<td>1600 A, 690 V, size 3*</td>
<td>2</td>
<td>68393108</td>
</tr>
<tr>
<td>1040A-5</td>
<td>Cooper-Bussmann 170M6415</td>
<td>1100 A, 690 V, size 3</td>
<td>4</td>
<td>68731658</td>
</tr>
<tr>
<td>1420A-5</td>
<td>Cooper-Bussmann 170M6417</td>
<td>1400 A, 690 V, size 3</td>
<td>4</td>
<td>3AXD50000000150</td>
</tr>
<tr>
<td>2120A-5</td>
<td>Cooper-Bussmann 170M6417</td>
<td>1400 A, 690 V, size 3</td>
<td>6</td>
<td>3AXD50000000150</td>
</tr>
<tr>
<td>2800A-5</td>
<td>Cooper-Bussmann 170M6417</td>
<td>1400 A, 690 V, size 3</td>
<td>8</td>
<td>3AXD50000000150</td>
</tr>
<tr>
<td>4150A-5</td>
<td>Cooper-Bussmann 170M6417</td>
<td>1400 A, 690 V, size 3</td>
<td>12</td>
<td>3AXD50000000150</td>
</tr>
<tr>
<td><strong>$U_N = 690 \text{ V (Range 525 ... 690 V)}$</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0310A-7</td>
<td>Cooper-Bussmann 170M6544</td>
<td>630 A, 1250 V, size 3</td>
<td>2</td>
<td>63903167</td>
</tr>
<tr>
<td>ACS880-204-...</td>
<td>Fuse (IEC, UL, CSA)</td>
<td>Qty</td>
<td>Ordering code</td>
<td>2nd type fuse</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------</td>
<td>-----</td>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>Type</td>
<td>Data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0370A-7</td>
<td>Cooper-Bussmann 170M6546</td>
<td>800 A, 1250 V, size 3</td>
<td>2</td>
<td>63919128</td>
</tr>
<tr>
<td>0540A-7</td>
<td>Cooper-Bussmann 170M6549</td>
<td>1100 A, 1000 V, size 3</td>
<td>2</td>
<td>68736021</td>
</tr>
<tr>
<td>0720A-7</td>
<td>Cooper-Bussmann 170M6546</td>
<td>800 A, 1250 V, size 3</td>
<td>4</td>
<td>63919128</td>
</tr>
<tr>
<td>1050A-7</td>
<td>Cooper-Bussmann 170M6549</td>
<td>1100 A, 1000 V, size 3</td>
<td>4</td>
<td>68736021</td>
</tr>
<tr>
<td>1570A-7</td>
<td>Cooper-Bussmann 170M6549</td>
<td>1100 A, 1000 V, size 3</td>
<td>6</td>
<td>68736021</td>
</tr>
<tr>
<td>2070A-7</td>
<td>Cooper-Bussmann 170M6549</td>
<td>1100 A, 1000 V, size 3</td>
<td>8</td>
<td>68736021</td>
</tr>
<tr>
<td>3080A-7</td>
<td>Cooper-Bussmann 170M6549</td>
<td>1100 A, 1000 V, size 3</td>
<td>12</td>
<td>68736021</td>
</tr>
</tbody>
</table>
## Cabinet ventilation

- **Air inlet kits**

**Air inlet kits 400 mm cabinet**

<table>
<thead>
<tr>
<th>Used with ...</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP20</td>
<td>1</td>
<td>3AUA0000117002</td>
<td>A-4-X-021</td>
<td>![Illustration] Instruction code: 3AUA0000116879</td>
</tr>
<tr>
<td>IP42</td>
<td>1</td>
<td>3AUA0000117007</td>
<td>A-4-X-024</td>
<td>![Illustration] Instruction code: 3AUA0000116873</td>
</tr>
<tr>
<td>IP54</td>
<td>1</td>
<td>3AXD5000009184</td>
<td>A-4-X-027</td>
<td>![Illustration] Instruction code: 3AXD5000009989</td>
</tr>
</tbody>
</table>
### Air inlet kits 600 mm cabinet

<table>
<thead>
<tr>
<th>Used with ...</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP20</td>
<td>1</td>
<td>3AUA0000117003</td>
<td>A-6-X-022</td>
<td><img src="image1.png" alt="Illustration" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Instruction code: 3AUA0000116880</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP42</td>
<td>1</td>
<td>3AUA0000117008</td>
<td>A-6-X-025</td>
<td><img src="image2.png" alt="Illustration" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Instruction code: 3AUA0000116874</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP54</td>
<td>1</td>
<td>3AXD500009185</td>
<td>A-6-X-028</td>
<td><img src="image3.png" alt="Illustration" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Instruction code: 3AXD500009990</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Air inlet kits 800 mm cabinet

<table>
<thead>
<tr>
<th>Used with ...</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP20</td>
<td>1</td>
<td>3AUA0000117005</td>
<td>A-8-X-023</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Instruction code: 3AUA0000116887</td>
</tr>
<tr>
<td>IP42</td>
<td>1</td>
<td>3AUA0000117009</td>
<td>A-8-X-026</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
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<td></td>
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<tr>
<td>IP54</td>
<td>1</td>
<td>3AXD5000009186</td>
<td>A-8-X-029</td>
<td><img src="image3.png" alt="Image" /></td>
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<tr>
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<td></td>
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<td>Instruction code: 3AXD50000010001</td>
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</table>
### Air outlet kits

**Air outlet kits 400 mm cabinet**

<table>
<thead>
<tr>
<th>Used with ...</th>
<th>Qty</th>
<th>Ordering code</th>
<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
</table>
| IP20 (IEC)    | 1   | 3AUA0000125201     | A-4-X-062| ![Illustration](img1.png) Instruction code: 3AXD50000001982  
Note: Fan to be ordered separately |
| IP42 (IEC)    | 1   | 3AUA0000114967     | A-4-X-060| ![Illustration](img2.png) Instruction code: 3AUA0000115290  
Note: Fan to be ordered separately |
| IP54 (IEC)    | 1   | 3AXD5000009187     | A-4-X-064| ![Illustration](img3.png) Instruction code: 3AXD50000010284  
Note: Fan to be ordered separately |
## 270 Ordering information

<table>
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<th>Kit code</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP54 (UL)</td>
<td>1</td>
<td>3AXD50000010362</td>
<td>A-4-X-067</td>
<td><img src="image" alt="Illustration" /></td>
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Instruction code: 3AXD50000010284

Note: Fan to be ordered separately

### Air outlet kits 600 mm cabinet

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<td>IP20 (IEC)</td>
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Instruction code: 3AXD5000001981

| IP42 (IEC)    | 1   | 3AUA0000114789      | A-6-X-041| ![Illustration](image) |

Instruction code: 3AUA0000115166

| IP54 (IEC)    | 1   | 3AXD50000009189     | A-6-X-065| ![Illustration](image) |

Instruction code: 3AXD50000010004

Note: Fan to be ordered separately
### Air outlet kits 800 mm cabinet

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**Note:** Fan to be ordered separately
## 272 Ordering Information

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<th>Kit code</th>
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</thead>
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Instruction code: 3AXD50000010284

**Note:** Fan to be ordered separately
## Cooling fans (frames R1i...R4i)

<table>
<thead>
<tr>
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<th>Component</th>
<th>Qty</th>
<th>Ordering code</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Name</td>
<td>Data</td>
<td></td>
</tr>
<tr>
<td>400 mm, 600 mm / IP20, IP42 / 230 V, 50/60 Hz</td>
<td>Fan</td>
<td>0.77 A; 230 V; 96 W; 50/60 Hz</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Connector</td>
<td>PLUG; 12 AWG; 2.50 mm²</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Connector</td>
<td>SOCKET; 12 AWG; 2.50 mm²</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enclosure / Degree of protection</th>
<th>Component</th>
<th>Qty</th>
<th>Ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Name</td>
<td>Data</td>
<td></td>
</tr>
<tr>
<td>400 mm / IP54 / 230 V, 50/60 Hz</td>
<td>Fan</td>
<td>1.1 A; 230 V; 240 W; 50 Hz 1.45 A; 230 V; 350 W; 60 Hz</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Capacitor</td>
<td>6 µF, 600 V</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Connector</td>
<td>PLUG; 12 AWG; 2.50 mm²</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Connector</td>
<td>SOCKET; 12 AWG; 2.50 mm²</td>
<td>1</td>
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<table>
<thead>
<tr>
<th>Enclosure / Degree of protection</th>
<th>Component</th>
<th>Qty</th>
<th>Ordering code</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Name</td>
<td>Data</td>
<td></td>
</tr>
<tr>
<td>400 mm, 600 mm / IP20, IP42 / 115 V, 60 Hz)</td>
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<td>1.68 A; 115 V; 200 W; 60 Hz</td>
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<tr>
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<tr>
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<td>Connector</td>
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<tr>
<td></td>
<td>Connector</td>
<td>SOCKET; 12 AWG; 2.50 mm²</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enclosure / Degree of protection</th>
<th>Component</th>
<th>Qty</th>
<th>Ordering code</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Name</td>
<td>Data</td>
<td></td>
</tr>
<tr>
<td>400 mm / IP54 / 230 V, 50/60 Hz</td>
<td>Fan</td>
<td>1.1 A; 230 V; 240 W; 50 Hz 1.45 A; 230 V; 350 W; 60 Hz</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Capacitor</td>
<td>6 µF, 600 V</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Connector</td>
<td>PLUG; 12 AWG; 2.50 mm²</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Connector</td>
<td>SOCKET; 12 AWG; 2.50 mm²</td>
<td>1</td>
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<table>
<thead>
<tr>
<th>Enclosure / Degree of protection</th>
<th>Component</th>
<th>Qty</th>
<th>Ordering code</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Name</td>
<td>Data</td>
<td></td>
</tr>
<tr>
<td>400 mm / IP54 / 115 V, 50/60 Hz</td>
<td>Fan</td>
<td>3.1 A; 115 V; 300 W; 50 Hz 3.9 A; 115 V; 430 W; 60 Hz</td>
<td>1</td>
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<tr>
<td></td>
<td>Capacitor</td>
<td>25 µF; 220 V</td>
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<td>Connector</td>
<td>PLUG; 12 AWG; 2.50 mm²</td>
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<tr>
<td></td>
<td>Connector</td>
<td>SOCKET; 12 AWG; 2.50 mm²</td>
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</tr>
</tbody>
</table>

The example circuit diagrams show a cabinet cooling fan circuit that energizes the fan when at least one module installed in the cabinet is running. The fan will continue to run for 20 minutes after all modules have been stopped.

The following parts (or equivalent) are used to implement the circuit. These parts are to be sourced by the customer.
Phoenix Contact ST 2,5-DIO/L-R - 3036262 spring cage component terminal block with a 1N4007 diode

Relpol PI84-24DC-M41G relay
- Rated load (capacity): 8 A / 24 V DC
- Rated power consumption: 0.4 ... 0.48 W DC
- GZT80 relay socket

600 mm of AWG24, 300 V, UL1569 (or equivalent material, valid for PVC insulation only) wire

Favier SEP-4 light brown 4 kV fiberglass sleeving.

Cooling fans (frame R6i)

<table>
<thead>
<tr>
<th>IEC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Enclosure / Degree of protection</strong></td>
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<tr>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
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</table>

<table>
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<tr>
<th>UL, CSA</th>
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</thead>
<tbody>
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<td><strong>Enclosure / Degree of protection</strong></td>
</tr>
<tr>
<td>600 mm / IP54 / 230 V, 50/60 Hz</td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td>600 mm / IP54 / 115 V, 50/60 Hz</td>
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</tbody>
</table>
Cooling fans (frame R8i)

<table>
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<th>Component</th>
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<th>Ordering code</th>
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</thead>
<tbody>
<tr>
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<tr>
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<td>Capacitor</td>
<td>2</td>
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</tr>
<tr>
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<td>Connector</td>
<td>2</td>
<td>3AXD50000000723</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>3AXD50000000724</td>
</tr>
<tr>
<td>400 mm / IP54 / 115 V, 50/60 Hz</td>
<td>Fan</td>
<td>2</td>
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<tr>
<td></td>
<td>Capacitor</td>
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<tr>
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UL, CSA

<table>
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<th>Component</th>
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<th>Ordering code</th>
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<tbody>
<tr>
<td>400 mm / IP54 / 230 V, 50/60 Hz</td>
<td>Fan</td>
<td>2</td>
<td>3AXD50000006934</td>
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<tr>
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<td>Capacitor</td>
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<td>Connector</td>
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<tr>
<td>400 mm / IP54 / 115 V, 50/60 Hz</td>
<td>Fan</td>
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<td>3AXD50000000724</td>
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</table>

Miscellaneous

BAMU voltage/current measurement unit

BAMU voltage/current measurement unit is not included in the module delivery but must be ordered separately.

<table>
<thead>
<tr>
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<th>Data</th>
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<tbody>
<tr>
<td>BAMU-12C</td>
<td>BAMU voltage/current measurement board</td>
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</table>

For further information, see ACS880 multidrives, Optimal grid control (option +N8053) supplement (3AXD50000220717 [English]) and BAMU-12C auxiliary measurement unit hardware manual (3AXD50000117840 [English]).

Weak supply networks: In weaker supply networks with a short-circuit ratio less than 8, it is highly recommended to install a BAMU auxiliary measurement unit to the drive. In such networks, there is a risk of nuisance DC overvoltage tripping due to disturbances caused by probable high-voltage THD in the supply voltage. Short-circuit ratio is defined as the supply network’s apparent short-circuit power $S_{k, \text{net}}$ divided by the drive’s nominal apparent power $S_n$ ($S_{k, \text{net}} / S_n < 8$).
**Note:** You must have BCU-12 control unit to have enough fiber optic connections if you use BAMU auxiliary measurement unit for 2×R8i IGBT supply modules.

If a generator is used as a supply: The recommendation for ACS880 IGBT supply unit with generator supply is:

- always use BAMU auxiliary measurement unit
- short-circuit ratio of the grid > 3
- short-circuit ratio of the generator 1/Xk > 2
- generator nominal power $P_{\text{gen}} > 0.3 \times P_{\text{ISU}}$
Technical data

Contents of this chapter

This chapter contains the technical data for ACS880-204 IGBT supply modules.
## Ratings

### ACS880-204-... Frames

<table>
<thead>
<tr>
<th>Frame</th>
<th>No-overload use</th>
<th>Light-overload use</th>
<th>Heavy-duty use</th>
<th>Capacitance</th>
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<td>$I_N$</td>
<td>$I_{max}$</td>
<td>$P_N$</td>
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<tr>
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<td>A (AC)</td>
<td>A (DC)</td>
<td>kW</td>
<td>kVA</td>
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</table>

### $U_N = 400$ V (with $U_{input} = 3~400$ V AC and $U_{output} = 566$ V DC)

<table>
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<th>$I_N$</th>
<th>$I_N$</th>
<th>$I_{max}$</th>
<th>$P_N$</th>
<th>$S_N$</th>
<th>$I_{Ld}$</th>
<th>$P_{Ld}$</th>
<th>$I_{Hd}$</th>
<th>$P_{Hd}$</th>
<th>$C$</th>
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<tbody>
<tr>
<td>R1i</td>
<td>9.7</td>
<td>8</td>
<td>12.6</td>
<td>5.5</td>
<td>5.5</td>
<td>9.3</td>
<td>5.3</td>
<td>7.3</td>
<td>4.1</td>
<td>0.28</td>
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<tr>
<td>R2i</td>
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<td>18</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>21</td>
<td>12</td>
<td>16</td>
<td>9</td>
<td>0.87</td>
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<tr>
<td>R3i</td>
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<td>55</td>
<td>24</td>
<td>24</td>
<td>41</td>
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<td>58</td>
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<td>45</td>
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<td>1.18</td>
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<td>290</td>
<td>293</td>
<td>492</td>
<td>279</td>
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<td>670</td>
<td>379</td>
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<td>296</td>
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<td>R8i</td>
<td>982</td>
<td>810</td>
<td>1277</td>
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<td>561</td>
<td>943</td>
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<td>1332</td>
<td>2100</td>
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<td>1550</td>
<td>877</td>
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<td>1043</td>
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<td>3703</td>
<td>1611</td>
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<td>2734</td>
<td>1547</td>
<td>2130</td>
<td>1205</td>
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<td>4894</td>
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<td>1593</td>
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<td>7278</td>
<td>3167</td>
<td>3199</td>
<td>5374</td>
<td>3040</td>
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<td>2369</td>
<td>108.00</td>
</tr>
</tbody>
</table>

### $U_N = 500$ V (with $U_{input} = 3~400/480/500$ V AC and $U_{output} = 566/679/707$ V DC)

<table>
<thead>
<tr>
<th>Frame</th>
<th>$I_N$</th>
<th>$I_N$</th>
<th>$I_{max}$</th>
<th>$P_N$</th>
<th>$S_N$</th>
<th>$I_{Ld}$</th>
<th>$P_{Ld}$</th>
<th>$I_{Hd}$</th>
<th>$P_{Hd}$</th>
<th>$C$</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1i</td>
<td>6.0</td>
<td>6.6</td>
<td>10.4</td>
<td>6</td>
<td>5.7</td>
<td>7.7</td>
<td>5.4</td>
<td>6</td>
<td>4.2</td>
<td>0.28</td>
</tr>
<tr>
<td>R2i</td>
<td>18</td>
<td>15</td>
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<td>17</td>
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<td>34</td>
<td>24</td>
<td>26</td>
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### $U_N = 690$ V (with $U_{input} = 3~525/600/690$ V AC and $U_{output} = 742/849/976$ V DC)

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<th>$I_{max}$</th>
<th>$P_N$</th>
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### Definitions

**Nominal ratings**

- $U_N$: supply voltage range (see the technical data)
- $I_N$: nominal output current (available continuously with no over-loading)
- $I_{\text{max}}$: maximum output current. Available for 10 s at start, otherwise as long as allowed by module temperature.
- $P_N$: nominal output power
- $S_N$: nominal apparent power

**Light-overload use (10% overload capability) ratings**

- $I_{Ld}$: continuous rms current. 10% overload is allowed for one minute every 5 minutes.
- $P_{Ld}$: output power in light-overload use

**Heavy-duty use (50% overload capability) ratings**

- $I_{Hd}$: continuous rms current. 50% overload is allowed for one minute every 5 minutes.
- $P_{Hd}$: output power in heavy-duty use

**Capacitance**

- $C$: Nominal DC link capacitance

**Note:** The ratings apply to units without option +C132 (marine type approval). For ratings of units with option +C132, see *ACS880 +C132 marine type-approved drive modules and module packages supplement* (3AXD5000037752 [English]).

For input frequency $f_1$, see *Electrical power network specification (page 298)*.

**Note:** The ratings apply at an ambient temperature of 40 °C (104 °F).
Derating

Surrounding air temperature derating

In the temperature range +40…50 °C (+104…122 °F), the rated output current is derated by 1 percentage point for every added 1 °C (1.8 °F). The output current can be calculated by multiplying the current given in the rating table by the derating factor \((k)\):

\[
\begin{array}{c|c}
T & k \\
+40 °C & 1.00 \\
+104 °F & 1.00 \\
+50 °C & 0.90 \\
+122 °F & 0.90 \\
\end{array}
\]

Altitude derating

At altitudes 1000 … 2000 m (3281 … 6562 ft) above sea level, the output current derating is 1 percentage point for every added 100 m (328 ft). For example, the derating factor for 1500 m (4921 ft) is 0.95. For altitudes above 2000 m (6562 ft), contact ABB.

If surrounding air temperature is below +40 °C, the derating can be reduced by 1.5 percentage points for every 1 °C reduction in temperature. A few altitude derating curves are shown below.
For a more accurate derating, use the DriveSize PC tool.

**Derating for output voltage boosting**

**Note:** This information is only valid for drives whose BLCL filters have the type code marking +V991.

The drive can output a higher motor voltage than the supply voltage. This can require derating of the drive output power depending on the difference between the supply voltage and the output voltage to the motor for continuous operation.

This drawing shows the required derating. It is valid for all supply voltage ranges.

**Note:** The drive voltage rating must always be selected according to the boosted voltage value.

**Note:** Auxiliary voltage transformer must be set according to supply voltage levels. If drive selection based on boosted voltage level causes an unsuitable tap setting of the auxiliary voltage transformer, consult your local ABB representative.
## Type equivalence table

<table>
<thead>
<tr>
<th>Cabinet-installed type ACS880-207-... 1)</th>
<th>IGBT supply unit type ACS880-204-... 2)</th>
<th>Basic module type ACS880-104-... 3)</th>
<th>Frame</th>
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1) Cabinet-installed units available from ABB
2) IGBT supply unit types available from ABB as modules
3) IGBT supply modules used. The quantity of the modules is shown in the Frame column.

**Fuses**

For fuse types, see the ordering information.

**Note:** The recommended fuses are for branch circuit protection per NEC as required for the UL/CSA approval.

Forced cooling is recommended for the AC fuses of the R8i supply modules to keep the fuse temperature under 100 °C. Monitoring of cooling fan status or fuse temperature is also recommended.

If the AC fuses are located in another cabinet (eg. ICU), the suitable fan unit for AC fuse cooling depends on the cabinet design. It is recommended to install the fan in such a way that it directly cools the fuses.

- **Fuses on BFPS board**

The fuse type is Mersen (Ferraz-Shawmut) A070GRB05T13 (5 A 690 V AC).

- **Fuses on CVAR board**

The fuse type is Mersen (Ferraz-Shawmut) A070GRB10T13/G330010 (10 A 700 V AC).

- **Fuses on BDFC board**

1 A, 400 V DC, 500 V AC.
## Charging kit contents

### IEC

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**$U_N = 400$ V (Range 380 ... 415 V)**

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| 0370A-7           | 1397   | 55    | 240   | 9.45   | 583    | 22.95  | 125    | 276    |
| 0540A-7           | 1397   | 55    | 240   | 9.45   | 583    | 22.95  | 125    | 276    |
| 0720A-7           | 1397   | 55    | 240   | 9.45   | 583    | 22.95  | 125    | 276    |
| 1050A-7           | 1397   | 55    | 240   | 9.45   | 583    | 22.95  | 125    | 276    |
| 1570A-7           | 1397   | 55    | 240   | 9.45   | 583    | 22.95  | 125    | 276    |
| 2070A-7           | 1397   | 55    | 240   | 9.45   | 583    | 22.95  | 125    | 276    |
| 3080A-7           | 1397   | 55    | 240   | 9.45   | 583    | 22.95  | 125    | 276    |

With module covers and without strain relief clamps (R1i to R4i).

#### LCL filter module

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| 0018A-3         | 315    | 12.4  | 213   | 8.4    | 218    | 8.6    | 11     | 24.5   |
| 0035A-3         | 386    | 15.2  | 288   | 11.3   | 256    | 10.1   | 34     | 74.9   |
| 0050A-3         | 406    | 16.0  | 318   | 12.5   | 299    | 11.8   | 45     | 99.2   |
| 0093A-3         | 406    | 16.0  | 318   | 12.5   | 299    | 11.8   | 51     | 112.4  |
| 0210A-3         | 845    | 33.3  | 377.8 | 14.8   | 304.5  | 12.0   | 100.0  | 220.5  |
| 0420A-3         | 1355   | 53.3  | 240   | 9.45   | 505    | 19.9   | 195    | 429.9  |
| 0580A-3         | 1355   | 53.3  | 240   | 9.45   | 505    | 19.9   | 195    | 429.9  |
| 0810A-3         | 1355   | 53.3  | 240   | 9.45   | 505    | 19.9   | 220    | 485.0  |
| 1130A-3         | 1397   | 55.0  | 240   | 9.45   | 581    | 22.9   | 321    | 707.7  |
| 1330A-3         | 1397   | 55.0  | 240   | 9.45   | 581    | 22.9   | 321    | 707.7  |
| 1580A-3         | 1397   | 55.0  | 240   | 9.45   | 581    | 22.9   | 329    | 725.3  |
| 2350A-3         | 1397   | 55.0  | 240   | 9.45   | 581    | 22.9   | 321    | 707.7  |
| 2×ACS880-BLCL-24-5+C183+C188+V991 | 1397 | 55.0 | 240 | 9.45 | 581 | 22.9 | 321 | 707.7 |
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\( U_N = 500 \text{ V (Range 380 \ldots 500 V)} \)

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\( U_N = 690 \text{ V (Range 525 \ldots 690 V)} \)

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### Definitions

**Above**  Free space to enable cooling air flow  
**Front**  Free space for cabling  
**Left**  Free space for smooth installation  
**Right**  Free space for smooth installation  

### Allowable mounting orientations

The modules must be mounted upright unless other orientations are expressly allowed below.

Frame R6i: Installation on right-hand side (viewed from the front) allowed.

![Frame R6i Diagram](image)

Frame R8i: Installation on right-hand side (viewed from the front) allowed.

![Frame R8i Diagram](image)

BLCL-1x-x modules: Installation on left-hand side (viewed from the front) allowed.

![BLCL-1x-x Diagram](image)

BLCL-2x-x modules: Installation on left-hand side (viewed from the front) allowed.

![BLCL-2x-x Diagram](image)
## Losses, cooling data and noise

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<tr>
<th>ACS880-204-…</th>
<th>$P_{\text{lossSU}}$</th>
<th>$P_{\text{lossLCL}}$</th>
<th>Air flow for IGBT supply module</th>
<th>Noise</th>
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<td>ft³/min</td>
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294 Technical data

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<th>( P_{\text{lossLCL}} )</th>
<th>Air flow for IGBT supply module</th>
<th>Noise</th>
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**Definitions**

\( P_{\text{lossISU}} \)  Heat dissipation. Total losses of the ISU module at nominal power

\( P_{\text{lossLCL}} \)  Heat dissipation. Total losses of the LCL filter module at nominal power

**Noise**  Noise with direct-on-line fans running at nominal speed

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<td>BLCL-2x-x</td>
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Tightening torques

Unless a tightening torque is specified in the text, the following torques can be used.

### Electrical connections

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<th>Strength class</th>
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<td>4.6...8.8</td>
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<tr>
<td>M4</td>
<td>1 N·m (9 lbf·in)</td>
<td>4.6...8.8</td>
</tr>
<tr>
<td>M5</td>
<td>4 N·m (35 lbf·in)</td>
<td>8.8</td>
</tr>
<tr>
<td>M6</td>
<td>9 N·m (6.6 lbf·ft)</td>
<td>8.8</td>
</tr>
<tr>
<td>M8</td>
<td>22 N·m (16 lbf·ft)</td>
<td>8.8</td>
</tr>
<tr>
<td>M10</td>
<td>42 N·m (31 lbf·ft)</td>
<td>8.8</td>
</tr>
<tr>
<td>M12</td>
<td>70 N·m (52 lbf·ft)</td>
<td>8.8</td>
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<td>120 N·m (90 lbf·ft)</td>
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### Mechanical connections

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<tr>
<td>M6</td>
<td>10 N·m (7.4 lbf·ft)</td>
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</tr>
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<td>M8</td>
<td>24 N·m (17.7 lbf·ft)</td>
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### Insulation supports

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<th>Strength class</th>
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</thead>
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</tr>
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<td>M8</td>
<td>9 N·m (6.6 lbf·ft)</td>
<td>8.8</td>
</tr>
<tr>
<td>M10</td>
<td>18 N·m (13.3 lbf·ft)</td>
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</tr>
<tr>
<td>M12</td>
<td>31 N·m (23 lbf·ft)</td>
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</table>

### Cable lugs

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<th>Strength class</th>
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<td>M10</td>
<td>32 N·m (23.5 lbf·ft)</td>
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<tr>
<td>M12</td>
<td>50 N·m (37 lbf·ft)</td>
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</table>
Typical power cable sizes

The tables below give current carrying capacity ($I_{\text{Lmax}}$) for aluminum and copper PVC/XLPE insulated cables. A correction factor $K = 0.70$ is used. Time const is the temperature time constant of the cable.

The cable sizing is based on max. 9 cables laid on the cable trays side by side, three ladder type trays one on top of the other, ambient temperature 30 °C (EN 60204-1 and IEC 60364-5-52).

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<th>PVC insulation</th>
<th>XLPE insulation</th>
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<td>67</td>
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<tr>
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<tr>
<td>3 x 70 + 21 Cu</td>
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<td>105</td>
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<tr>
<td>3 x 95 + 29 Cu</td>
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<td>3 x 120 + 41 Cu</td>
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<tr>
<td>3 x 150 + 41 Cu</td>
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<td>3 x 185 + 57 Cu</td>
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<tr>
<td>3 x 240 + 72 Cu</td>
<td>54</td>
<td>231</td>
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<tr>
<td>3 x 300 + 88 Cu</td>
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</tr>
<tr>
<td>2 x (3 x 70 + 21 Cu)</td>
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<td>6×(3×185+95)</td>
<td>6×50</td>
<td>1530</td>
</tr>
<tr>
<td>6×(3×240+120)</td>
<td>6×55</td>
<td>1806</td>
</tr>
<tr>
<td>6×(3×300+150)</td>
<td>6×58</td>
<td>2087</td>
</tr>
<tr>
<td>7×(3×240+120)</td>
<td>7×55</td>
<td>2107</td>
</tr>
<tr>
<td>7×(3×300+150)</td>
<td>7×58</td>
<td>2435</td>
</tr>
<tr>
<td>8×(3×240+120)</td>
<td>8×55</td>
<td>2408</td>
</tr>
<tr>
<td>8×(3×300+150)</td>
<td>8×58</td>
<td>2783</td>
</tr>
</tbody>
</table>
## Electrical power network specification

| Voltage ($U_1$) | 400 V units: 380...415 V AC 3-phase ± 10%. This is indicated in the type designation label as typical input voltage level (3~400 V AC).
| 500 V units: 380...500 V AC 3-phase ± 10%. This is indicated in the type designation label as typical input voltage levels (3~400/480/500 V AC).
| 690 V units: 525...690 V AC 3-phase ± 10% (525...600 V AC ± 10% in UL/CSA installations, or corner-grounded TN systems). This is indicated in the type designation label as typical input voltage levels (3~525/600/690 V AC).

| Network type | TN (grounded) and IT (ungrounded) systems |
| Frequency | 50/60 Hz, variation ± 5% of nominal frequency |
| Imbalance | Max. ± 3% of nominal phase-to-phase input voltage |

| Short-circuit withstand strength (IEC/EN 61439-1) | For supply units with one R1i...R4i module: |
| Maximum allowable prospective shortcircuit current $I_{cc}$ is 65 kA. In this case, the input cable must be equipped with fuses as follows: |
| • maximum 10 A gG* for frame size R1i (basic module type ACS880-104-008A0) |
| • maximum 25 A gG* for frame size R2i (basic module type ACS880-104-0018A) |
| • maximum 50 A gG* for frame size R3i (basic module type ACS880-104-0035A) |
| • maximum 63 A gG* for frame size R3i (basic module type ACS880-104-0050A) |
| • maximum 125 A gG* for frame size R4i (basic module type ACS880-104-0035A) |

| *) Type gG according to IEC 60269 |
| Maximum allowed operating time is <0.1 s for fuses mentioned above. |

| For supply units with one R6i module: |
| Maximum allowable prospective shortcircuit current $I_{cc}$ is 65 kA. In this case, the input cable must be equipped with fuses as follows: |
| • maximum 400 A gG* for frame size R6i |

| *) Type gG according to IEC 60269 |
| Maximum allowed operating time is <0.1 s for fuses mentioned above. |

| For supply units with R8i module(s): |
| Supply units with the ABB-defined main switch-disconnector and fuses: |
| • Rated peak withstand current $I_{pk}$ = 105 kA |
| • Rated short-time withstand current $I_{cw}$ = 50 kA/1 s |

| Supply units with ABB-defined main circuit breaker and fuses: |
| • Rated peak withstand current $I_{pk}$ = 143 kA |
| • Rated short-time withstand current $I_{cw}$ = 65 kA/1 s |

| Short-circuit current protection (UL 508A, CSA C22.2 No. 14-13) | The drive is suitable for use on a circuit capable of delivering not more than 100,000 rms symmetrical amperes at 600 V maximum when the input cable is protected with class T fuses. |

| Fundamental power factor ($\cos \phi_1$) | 0.99 |
Harmonics are below the limits defined in IEEE519.

<table>
<thead>
<tr>
<th>( R_{sc} )</th>
<th>THD Voltage [%]</th>
<th>THD Current [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>3</td>
<td>2.5 (^1)</td>
</tr>
<tr>
<td>100</td>
<td>0.8</td>
<td>2.5 (^1)</td>
</tr>
</tbody>
</table>

\[ \text{THD} = \sqrt{\sum_{n=2}^{\infty} \left( \frac{I_n}{I_N} \right)^2} \]

\( I_n \) \( n^{th} \) harmonic component  
\( I_N \) nominal current

\(^1\) Other loads may influence the THD value.

THD = Total Harmonic Distortion (THD). The voltage THD depends on the short-circuit ratio \( (R_{sc}) \). The spectrum of the distortion also contains interharmonics.

\[ R_{sc} = \frac{I_{sc}}{I_N} \]

\( I_{sc} \) = short-circuit current at point of common coupling (PCC)  
\( I_N \) = IGBT supply unit nominal current

### DC connection data

**Voltage \( U_2 \)**

ACS880-204-xxxxA-3: 513…560 V DC. This is indicated in the type designation label as typical output voltage level 540 V DC.

ACS880-204-xxxxA-5: 513…675 V DC. This is indicated in the type designation label as typical output voltage levels 540/648/675 V DC

ACS880-204-xxxxA-7: 709…932 V DC (709…810 V DC for UL/CSA). This is indicated in the type designation label as typical output voltage levels 709/810/932 V DC (810 V DC for UL/CSA).

**Output terminals**

Frame R1i

UDC+, UDC-: 0.25 … 4 mm², 0.5 … 0.6 N·m (4.4 … 5.3 lbf·in)  
PE: 1.5 N·m (13 lbf·in)

Frame R2i

UDC+, UDC-: 0.5 … 6 mm², 1.2 … 1.5 N·m (10.6 … 13.3 lbf·in)  
PE: 1.5 N·m (13 lbf·in)

Frames R3i and R4i

UDC+, UDC-: 6…70 mm². Allen screw torque 15 N·m (11 lbf·ft), connection post torque 4 N·m (30 lbf·in). Other conductor sizes can be used by replacing the original lug with a suitable crimp ring terminal.

PE: Screw size M5, torque 3 N·m (25 lbf·in)  
Connector cover screws: Torque 3 N·m (25 lbf·in)

Frame R6i

See the dimension drawings.

Frame R8i and multiples

M12, maximum intrusion into module 20 mm (0.8 in). See also the dimension drawings.

### Control unit connection data (ZCU/BCU)

See chapter *The control unit*.

### Efficiency

96.0…98.2% at nominal power level.
Protection classes for module

<table>
<thead>
<tr>
<th>Degrees of protection (IEC/EN 60529)</th>
<th>IP00 (frames R6i, R8i)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP20 (frames R1i…R4i)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enclosure types (UL 61800-5-1)</th>
<th>UL Type Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overvoltage category (IEC/EN 60664-1)</td>
<td>III</td>
</tr>
<tr>
<td>Protective class (IEC/EN 61800-5-1)</td>
<td>I</td>
</tr>
</tbody>
</table>

Optical components

The specifications of the optic cable are as follows:

- Storage temperature: -55 … +85 °C (-67 … +185 °F)
- Installation temperature: -20 … +70 °C (-4 … +158 °F)
- Maximum short-term tensile force: 50 N (11.2 lbf)
- Minimum short-term bend radius: 25 mm (1.0 in)
- Minimum long-term bend radius: 35 mm (1.4 in)
- Maximum long-term tensile load: 1 N (3.6 ozf)
- Flexing: Max. 1000 cycles

ABB drive products in general utilize 5 and 10 MBd (megabaud) optical components from Avago Technologies’ Versatile Link range. Note that the optical component type is not directly related to the actual communication speed.

**Note:** The optical components (transmitter and receiver) on a fiber optic link must be of the same type.

Plastic optical fiber (POF) cables can be used with both 5 MBd and 10 MBd optical components. 10 MBd components also enable the use of Hard Clad Silica (HCS®) cables, which allow longer connection distances thanks to their lower attenuation. HCS® cables cannot be used with 5 MBd optical components.

The maximum lengths of fiber optic links for POF and HCS® cables are 20 and 200 meters (65.6 ft and 656 ft) respectively.
# Ambient conditions

The unit is to be used in a heated, indoor, controlled environment.

<table>
<thead>
<tr>
<th>Installation site altitude above sea level</th>
<th>Operation</th>
<th>Storage</th>
<th>Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>installed for stationary use</td>
<td>in the protective package</td>
<td>in the protective package</td>
</tr>
<tr>
<td>0 ... 14,000 m (13123 ft) 0 ... 20,000 m (6561 ft)) Output derated above 1000 m (3281 ft). See <em>Altitude derating (page 280)</em>.</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

1. Frames R1i...R8i: Neutral-grounded TN and TT network systems, non-comergrounded IT network systems
   - Frame R8i: Corner-grounded TN, TT and IT networks up to 600 V
2. Frame R1i...R6i: Corner-grounded TN, TT and IT network systems up to 500 V

<table>
<thead>
<tr>
<th>Air temperature</th>
<th>Operation</th>
<th>Storage</th>
<th>Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ... +40 °C (+32 ... +104 °F), no condensation allowed</td>
<td>-40 ... +70 °C (-40 ... +158 °F) derating 1%/1°C (+1.8 °F) above 40 °C (+104 °F). For more information, see <em>Surrounding air temperature derating (page 280)</em>.</td>
<td>-40 ... +70 °C (-40 ... +158 °F)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relative humidity</th>
<th>Operation</th>
<th>Storage</th>
<th>Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum 95%, no condensation allowed</td>
<td>Maximum 95%, no condensation allowed</td>
<td>Maximum 95%, no condensation allowed</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vibration</th>
<th>Operation</th>
<th>Storage</th>
<th>Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC/EN 61800-5-1 IEC 60068-2-6:2007, EN 60068-2-6:2008 Environmental testing Part 2-6: Tests -Test Fc: Vibration (sinusoidal)</td>
<td>10...57 Hz, max. 0.075 mm amplitude 58 ... 150 Hz 1 g Tested in ABB multidrive cabinet (ACS880-x07) according to: Max. 1 mm (0.04 in) (5 ... 13.2 Hz), max. 0.7 g, (13.2 ... 100 Hz) sinusoidal</td>
<td>For modules and cabinets in packages: IEC/EN 60721-3-1:1997 Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 1: Storage</td>
<td>For module package: IEC/EN 60721-3-1:1997 Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 2: Transportation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shock</th>
<th>Operation</th>
<th>Storage</th>
<th>Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC 60068-2-27:2008 EN 60068-2-27:2009 Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock</td>
<td>Not allowed</td>
<td>With packing max. 100 m/s² (330 ft./s²) 11 ms</td>
<td>With packing max. 100 m/s² (330 ft./s²) 11 ms</td>
</tr>
</tbody>
</table>
IEC60721-3-2:2002: Classification of environmental conditions - Part 3-3: Classification of groups of environmental parameters and their severities
Stationary use of weather protected locations

<table>
<thead>
<tr>
<th>Contamination</th>
<th>IEC/EN 60721-3-3:2002: Classification of environmental conditions - Part 3-3: Classification of groups of environmental parameters and their severities</th>
<th>IEC 60721-3-1</th>
<th>IEC 60721-3-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical gases: Class 3C2</td>
<td>Chemical gases: Class 1C2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid particles: Class 3S1 with IP20/21, 3S2 with higher IP class</td>
<td>Solid particles: Class 1S3 (packing must support this, otherwise 1S2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No conductive dust allowed.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Materials

#### Module housing
- Zinc coated steel sheet
- PC/ABS, color RAL 9002 and RAL 9017 (frames R1i…R5i)
- PC+10%GF, color RAL 9017 (frames R1i…R3i), and PA66+25%GF
- Front plate covered with Lexan 8B35 polycarbonate film, color PMS 1C Cool Gray and PMS Process Black (frames R6i…R8i)

#### Fire safety of materials (IEC 60332-1)
- Insulating materials and non-metallic items: mostly self-extinctive

#### Package
- Plywood base, corrugated cardboard, PET straps.
- Product wrapping: polyethylene sheet or VCI protection bag

#### Disposal
- The main parts of the drive can be recycled to preserve natural resources and energy. Product parts and materials should be dismantled and separated.
- Generally all metals, such as steel, aluminum, copper and its alloys, and precious metals can be recycled as material. Plastics, rubber, cardboard and other packaging material can be used in energy recovery. Printed circuit boards and large electrolytic capacitors need selective treatment according to IEC 62635 guidelines. To aid recycling, plastic parts are marked with an appropriate identification code.
- Contact your local ABB distributor for further information on environmental aspects and recycling instructions for professional recyclers. End of life treatment must follow international and local regulations.

### Auxiliary circuit current consumption

<table>
<thead>
<tr>
<th>Type</th>
<th>$U_N$</th>
<th>$f$</th>
<th>$I_{cont}$</th>
<th>$I_{start}$</th>
<th>$P_{cont}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>V</td>
<td>Hz</td>
<td>A</td>
<td>A</td>
<td>W</td>
</tr>
<tr>
<td>ZCU/BCU control unit</td>
<td>$24$ V DC $\pm 10%$</td>
<td>-</td>
<td>$2.0$</td>
<td>-</td>
<td>$48$</td>
</tr>
<tr>
<td>R8i module: internal electronics</td>
<td>$230$ V AC $(+15%-20%)$</td>
<td>$50/60$</td>
<td>$0.45$</td>
<td>-</td>
<td>$105$</td>
</tr>
<tr>
<td>+Option +G304</td>
<td>$115$ V AC $(+15%-20%)$</td>
<td>$50/60$</td>
<td>$0.90$</td>
<td>-</td>
<td>$105$</td>
</tr>
<tr>
<td>R8i module: direct-on-line fan</td>
<td>$400$ V AC</td>
<td>$50$</td>
<td>$1.50$</td>
<td>$3.00$</td>
<td>-</td>
</tr>
<tr>
<td>(option +C188)</td>
<td>$400$ V AC</td>
<td>$60$</td>
<td>$1.90$</td>
<td>$3.80$</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>$320$ V AC</td>
<td>$60$</td>
<td>$1.50$</td>
<td>$4.40$</td>
<td>-</td>
</tr>
<tr>
<td>LCL filter module (WFU-01/02) fan</td>
<td>$24$ V DC</td>
<td>-</td>
<td>$0.32$</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Type</td>
<td>$U_N$ V</td>
<td>$f$ Hz</td>
<td>$I_{cont}$ A</td>
<td>$I_{start}$ A</td>
<td>$P_{cont}$ W</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>--------</td>
<td>-------</td>
<td>--------------</td>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>LCL filter module (WFU-11/21/22) fan</td>
<td>24 V DC</td>
<td>-</td>
<td>1.67</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>LCL filter module (ALCL-05-5) fan (+C188)</td>
<td>230 V AC</td>
<td>50</td>
<td>0.23</td>
<td>0.37</td>
<td>-</td>
</tr>
<tr>
<td>+Options +A013+C188+G304</td>
<td>230 V AC</td>
<td>60</td>
<td>0.29</td>
<td>0.37</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>115 V AC</td>
<td>60</td>
<td>0.59</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>LCL filter module (BLCL-1x-x) fan (+C188)</td>
<td>230 V AC</td>
<td>50</td>
<td>1.4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>+Options +C188+G304</td>
<td>230 V AC</td>
<td>60</td>
<td>1.4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>115 V AC</td>
<td>60</td>
<td>2.4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>LCL filter module (BLCL-2x-x) fan (+C188)</td>
<td>400 V AC</td>
<td>50</td>
<td>1.50</td>
<td>3.00</td>
<td>-</td>
</tr>
<tr>
<td>+Options +C188+G427</td>
<td>400 V AC</td>
<td>60</td>
<td>1.90</td>
<td>3.80</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>320 V AC</td>
<td>60</td>
<td>-</td>
<td>4.40</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>208 V AC</td>
<td>60</td>
<td>2.88</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>R8i module: heating element (option +C183)</td>
<td>115 V AC</td>
<td>60</td>
<td>-</td>
<td>-</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>230 V AC</td>
<td>50/60</td>
<td>-</td>
<td>-</td>
<td>40</td>
</tr>
<tr>
<td>LCL filter module: heating element (option +C183)</td>
<td>115 V AC</td>
<td>60</td>
<td>-</td>
<td>-</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>230 V AC</td>
<td>50/60</td>
<td>-</td>
<td>-</td>
<td>13</td>
</tr>
</tbody>
</table>

Cooling fans

<table>
<thead>
<tr>
<th>Cabinet fans</th>
<th>$U_N$ V AC</th>
<th>$f$ Hz</th>
<th>$I_{cont}$ A</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1i…R4i roof fan</td>
<td>230</td>
<td>50</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>230</td>
<td>60</td>
<td>0.9</td>
</tr>
<tr>
<td>R1i…R8i IP54 roof fan</td>
<td>230</td>
<td>50</td>
<td>1.10</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>1.45</td>
<td></td>
</tr>
<tr>
<td></td>
<td>230</td>
<td>50</td>
<td>2.30</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>3.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>115</td>
<td>50</td>
<td>3.1</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>3.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>115</td>
<td>50</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>6.3</td>
<td></td>
</tr>
</tbody>
</table>

- $f$ Supply frequency
- $I_{cont}$ Continuous current consumption
- $I_{start}$ Calculated load current at start
- $P_{cont}$ Continuous input power
- $U_N$ Voltage requirement

Applicable standards

See Electrical planning instructions for ACS880 multidrive cabinets and modules (3AUA0000102324 [English]).
Markings

See Electrical planning instructions for ACS880 multidrive cabinets and modules (3AUA0000102324 [English]).

Disclaimers

- **Generic disclaimer**

  The manufacturer shall have no obligation with respect to any product which (i) has been improperly repaired or altered; (ii) has been subjected to misuse, negligence or accident; (iii) has been used in a manner contrary to the manufacturer’s instructions; or (iv) has failed as a result of ordinary wear and tear.

- **Cybersecurity disclaimer**

  This product is designed to be connected to and to communicate information and data via a network interface. It is Customer’s sole responsibility to provide and continuously ensure a secure connection between the product and Customer network or any other network (as the case may be). Customer shall establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.
The control unit

Contents of this chapter

This chapter
  • describes the connections of the control unit
  • contains the specifications of the inputs and outputs of the control unit.

General

The ZCU-14 control unit is used with IGBT supply module frame sizes R1i…R4i and R6i. The ZCU units consists of a ZCON control board contained in a plastic housing. The control unit is mounted on the IGBT supply module.

The BCU-x2 control unit is used with frame size R8i and multiples. The BCU-x2 consists of a BCON-12 control board (and a BIOC-01 I/O connector board and power supply board) built in a metal housing. The control unit is connected to the IGBT supply module(s) by fiber optic cables.

In this manual, the name “BCU-x2” represents the control unit types BCU-02, BCU-12 and BCU-22. These have a different number of power module connections (2, 7 and 12 respectively) but are otherwise similar.
### ZCU-14 layout

<table>
<thead>
<tr>
<th>Description</th>
<th>XPOW</th>
<th>XAI</th>
<th>XAO</th>
<th>XD2D</th>
<th>XRO1</th>
<th>XRO2</th>
<th>XRO3</th>
<th>XD24</th>
<th>XDIO</th>
<th>XDI</th>
<th>XSTO</th>
</tr>
</thead>
<tbody>
<tr>
<td>External power input</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Analog inputs</td>
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<tr>
<td>Analog outputs</td>
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</tr>
<tr>
<td>Drive-to-drive link</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Relay output RO1</td>
<td></td>
<td></td>
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<tr>
<td>Relay output RO2</td>
<td></td>
<td></td>
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<tr>
<td>Relay output RO3</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital input interlock (DIIL) and +24 V output</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Digital input/outputs</td>
<td></td>
<td></td>
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<tr>
<td>Digital inputs</td>
<td></td>
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</tr>
</tbody>
</table>

**Note:** This connection only acts as a true Safe torque off input when the ZCU is controlling an inverter unit. When the ZCU is controlling a supply unit, de-energizing the inputs will stop the unit but will not constitute a true safety function.

<table>
<thead>
<tr>
<th>Description</th>
<th>X12</th>
<th>X13</th>
<th>X202</th>
<th>X203</th>
<th>X204</th>
<th>X205</th>
<th>J1, J2</th>
<th>J3</th>
<th>J6</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection for FSO-xx safety functions module</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(inverter unit only).</td>
</tr>
<tr>
<td>Control panel connection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option slot 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option slot 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option slot 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory unit connection (memory unit inserted in the drawing)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage/Current selection jumpers (J1, J2) for analog inputs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drive-to-drive link termination switch (J3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common digital input ground selection jumper (J6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
BCU-x2 layout

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/O</td>
</tr>
<tr>
<td>I/O terminals (see following diagram)</td>
</tr>
</tbody>
</table>

| SLOT 1       |
| I/O extension, encoder interface or fieldbus adapter module connection. (This is the sole location for an FDP1-02 diagnostics and panel interface.) |

| SLOT 2       |
| I/O extension, encoder interface or fieldbus adapter module connection |

| SLOT 3       |
| I/O extension, encoder interface, fieldbus adapter or FSO-xx safety functions module connection |

| SLOT 4       |
| RDCO-0x DDCS communication option module connection |

| X205         |
| Memory unit connection |

| BATTERY      |
| Holder for real-time clock battery (BR2032) |

| AI1          |
| Mode selector for analog input AI1 (I = current, U = voltage) |

| AI2          |
| Mode selector for analog input AI2 (I = current, U = voltage) |

| D2D TERM     |
| Termination switch for drive-to-drive link (D2D) |

| DICOM= DIOGND |
| Ground selection. Determines whether DICOM is separated from DIOGND (i.e. the common reference for the digital inputs floats). See the ground isolation diagram. |

**7-segment display**

Multicharacter indications are displayed as repeated sequences of characters

- **0**
  - ("U" is indicated briefly before "o").
  - Control program running

- **1**
  - Control program startup in progress

- **2**
  - (Flashing) Firmware cannot be started.
  - Memory unit missing or corrupted

- **3**
  - Firmware download from PC to control unit in progress

- **4**
  - At power-up, the display may show short indications of eg. "1", "2", "b" or "U". These are normal indications immediately after power-up. If the display ends up showing any other value than those described, it indicates a hardware failure.
<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>XAI</td>
</tr>
<tr>
<td>XAO</td>
</tr>
<tr>
<td>XDI</td>
</tr>
<tr>
<td>XDIO</td>
</tr>
<tr>
<td>XD2D</td>
</tr>
<tr>
<td>XD24</td>
</tr>
<tr>
<td>XETH</td>
</tr>
<tr>
<td>XPOW</td>
</tr>
<tr>
<td>XRO1</td>
</tr>
<tr>
<td>XRO2</td>
</tr>
<tr>
<td>XRO3</td>
</tr>
<tr>
<td>XSTO</td>
</tr>
<tr>
<td>XSTO OUT</td>
</tr>
<tr>
<td>X12</td>
</tr>
<tr>
<td>X13</td>
</tr>
<tr>
<td>X485</td>
</tr>
<tr>
<td>V1T/V1R, V2T/V2R</td>
</tr>
<tr>
<td>V3T/V3R, V4T/V4R</td>
</tr>
<tr>
<td>V5T/V5R, V6T/V6R</td>
</tr>
<tr>
<td>SD CARD</td>
</tr>
<tr>
<td>BATT OK</td>
</tr>
<tr>
<td>FAULT</td>
</tr>
<tr>
<td>PWR OK</td>
</tr>
<tr>
<td>WRITE</td>
</tr>
</tbody>
</table>
### Default I/O diagram of the supply control unit

The diagram below shows the default I/O connections on the supply control unit (A51), and describes the use of the connections in the supply unit.

The wire size accepted by all screw terminals (for both stranded and solid wire) is 0.5 … 2.5 mm² (24…12 AWG). The torque is 0.5 N·m (5 lbf·in).

<table>
<thead>
<tr>
<th>XU2D</th>
<th>Drive-to-drive link</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B</td>
</tr>
<tr>
<td>2</td>
<td>A</td>
</tr>
<tr>
<td>3</td>
<td>BOND</td>
</tr>
<tr>
<td>4</td>
<td>SGND</td>
</tr>
<tr>
<td>D2D.TERM</td>
<td>Drive-to-drive link termination</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>X485</th>
<th>RS485 connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>B</td>
</tr>
<tr>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>7</td>
<td>BOND</td>
</tr>
<tr>
<td>8</td>
<td>SGND</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>XR01, XR02</th>
<th>Relay outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 NC</td>
<td>XRO1: Charging (Energized = Closes charging contactor.)</td>
</tr>
<tr>
<td>12 COM</td>
<td></td>
</tr>
<tr>
<td>13 NO</td>
<td></td>
</tr>
<tr>
<td>21 NC</td>
<td>XRO2: Fault (Energized = Indicates no fault.)</td>
</tr>
<tr>
<td>22 COM</td>
<td></td>
</tr>
<tr>
<td>23 NO</td>
<td></td>
</tr>
<tr>
<td>31 NC</td>
<td>XRO3: MCB ctrl (Energized = Closes main contactor/breaker.)</td>
</tr>
<tr>
<td>32 COM</td>
<td></td>
</tr>
<tr>
<td>33 NO</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>XSTO</th>
<th>XSTO connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OUT</td>
</tr>
<tr>
<td>2</td>
<td>IN1</td>
</tr>
<tr>
<td>3</td>
<td>IN2</td>
</tr>
<tr>
<td>4</td>
<td>BOND</td>
</tr>
<tr>
<td>5</td>
<td>SGND</td>
</tr>
</tbody>
</table>

#### Notes:

1) Must be set to ON when the supply unit is the first or last unit on the drive-to-drive (D2D) link. On intermediate units, set termination to OFF.
2) Use of the signal in the control program. When parameter 120.30 External charge enable has value Yes (default setting), the control program reserves this I/O terminal for external charging circuit control and monitoring, and parameters 110.24 RO1 source and 110.30 RO3 source are write-protected. If the value is No, you can use the I/O terminal for other purposes.

3) Use of the signal in the control program (fixed). See also the delivery-specific circuit diagrams.

4) This input only acts as a true Safe torque off input in inverter control units. In other applications (such as a supply or brake unit), de-energizing the IN1 and/or IN2 terminal will stop the unit but not constitute a true safety function.

5) Total load capacity of these outputs is 4.8 W (200 mA at 24 V) minus the power taken by DIO1 and DIO2.

6) Determines whether DICOM is separated from DIOGND (ie, common reference for digital inputs floats).

DICOM=DIOGND ON: DICOM connected to DIOGND. OFF: DICOM and DIOGND separate.

7) Current [0(4)…20 mA, \( R_{in} = 100 \text{ ohm} \)] or voltage [0(2)…10 V, \( R_{in} > 200 \text{ kohm} \)] input selected by switch AI1. Change of setting requires reboot of control unit.

8) Current [0(4)…20 mA, \( R_{in} = 100 \text{ ohm} \)] or voltage [0(2)…10 V, \( R_{in} > 200 \text{ kohm} \)] input selected by switch AI2. Change of setting requires reboot of control unit.

**External power supply for the control unit (XPOW)**

The control unit is powered from a 24 V DC, 2 A supply through terminal block XPOW. With a type BCU control unit, a second supply can be connected to the same terminal block for redundancy.

Using an external supply is recommended if

- the control unit needs to be kept operational during input power breaks, for example, because of continuous fieldbus communication
- immediate restart is needed after a power break (that is, no control unit power-up delay is allowed).

**Safe torque off (XSTO, XSTO OUT)**

*Note: The XSTO input only acts as a true Safe torque off input on the inverter control unit. De-energizing the IN1 and/or IN2 terminals of other units (supply, DC/DC converter, or brake unit) will stop the unit but not constitute a true safety function.

**FSO-xx safety functions module connection (X12)**

See the user manual of the FSO-xx module. Note that the FSO-xx safety functions module is not in use in supply, DC/DC converter or brake units.

**SDHC memory card slot**

The BCU-x2 has an on-board data logger that collects real-time data from the power modules to help fault tracing and analysis. The data is stored onto the SDHC memory card inserted into the SD CARD slot and can be analyzed by ABB service personnel.
### Connector data

<table>
<thead>
<tr>
<th>Description</th>
<th>Connector pitch 5 mm, wire size 2.5 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power supply (XPOW)</strong></td>
<td>24 V (±10%) DC, 2 A</td>
</tr>
<tr>
<td></td>
<td>External power input.</td>
</tr>
<tr>
<td></td>
<td>Two supplies can be connected to the BCU-x2 for redundancy.</td>
</tr>
<tr>
<td><strong>Relay outputs RO1…RO3 (XRO1…XRO3)</strong></td>
<td>Connector pitch 5 mm, wire size 2.5 mm²</td>
</tr>
<tr>
<td></td>
<td>250 V AC / 30 V DC, 2 A</td>
</tr>
<tr>
<td></td>
<td>Protected by varistors</td>
</tr>
<tr>
<td><strong>+24 V output (XD24:2 and XD24:4)</strong></td>
<td>Connector pitch 5 mm, wire size 2.5 mm²</td>
</tr>
<tr>
<td></td>
<td>Total load capacity of these outputs is 4.8 W (200 mA / 24 V) minus the power taken by DIO1 and DIO2.</td>
</tr>
<tr>
<td><strong>Digital inputs DI1…DI6 (XDI:1…XDI:6)</strong></td>
<td>Connector pitch 5 mm, wire size 2.5 mm²</td>
</tr>
<tr>
<td></td>
<td>24 V logic levels: &quot;0&quot; &lt; 5 V, &quot;1&quot; &gt; 15 V</td>
</tr>
<tr>
<td></td>
<td>( R_{\text{in}} ): 2.0 kohm</td>
</tr>
<tr>
<td></td>
<td>Input type: NPN/PNP (DI1…DI5), PNP (DI6)</td>
</tr>
<tr>
<td></td>
<td>Hardware filtering: 0.04 ms, digital filtering up to 8 ms</td>
</tr>
<tr>
<td></td>
<td>DI6 (XDI:6) can alternatively be used as an input for a PTC sensor.</td>
</tr>
<tr>
<td></td>
<td>( f_{\text{max}} ): 15 mA (DI1…DI5), 5 mA (DI6)</td>
</tr>
<tr>
<td><strong>Start interlock input DIIL (XD24:1 [ZCU-1x], XDI:7 [BCU-x2])</strong></td>
<td>Connector pitch 5 mm, wire size 2.5 mm²</td>
</tr>
<tr>
<td></td>
<td>24 V logic levels: &quot;0&quot; &lt; 5 V, &quot;1&quot; &gt; 15 V</td>
</tr>
<tr>
<td></td>
<td>( R_{\text{in}} ): 2.0 kohm</td>
</tr>
<tr>
<td></td>
<td>Input type: NPN/PNP</td>
</tr>
<tr>
<td></td>
<td>Hardware filtering: 0.04 ms, digital filtering up to 8 ms</td>
</tr>
<tr>
<td><strong>Digital inputs/outputs DIO1 and DIO2</strong></td>
<td>Connector pitch 5 mm, wire size 2.5 mm²</td>
</tr>
<tr>
<td>(XDIO:1 and XDIO:2)</td>
<td>As inputs: 24 V logic levels: &quot;0&quot; &lt; 5 V, &quot;1&quot; &gt; 15 V, ( R_{\text{in}} ): 2.0 kohm. Filtering: 1 ms.</td>
</tr>
<tr>
<td></td>
<td>As outputs: Total output current from +24VD is limited to 200 mA</td>
</tr>
<tr>
<td></td>
<td>+24VD</td>
</tr>
<tr>
<td></td>
<td>( R_L )</td>
</tr>
<tr>
<td></td>
<td>( \text{DIOGND} )</td>
</tr>
<tr>
<td><strong>Reference voltage for analog inputs</strong></td>
<td>Connector pitch 5 mm, wire size 2.5 mm²</td>
</tr>
<tr>
<td>+VREF and -VREF (XAI:1 and XAI:2)</td>
<td>10 V ±1% and −10 V ±1%, ( R_{\text{load}} ): 1…10 kohm</td>
</tr>
<tr>
<td></td>
<td>Maximum output current: 10 mA</td>
</tr>
<tr>
<td><strong>Analog inputs AI1 and AI2</strong> (XAI:4 ... XAI:7)</td>
<td>Connector pitch 5 mm, wire size 2.5 mm²</td>
</tr>
<tr>
<td>Current/voltage input mode selection by jumpers (ZCU-1x) or switches (BCU-x2)</td>
<td>Current input: −20…20 mA, ( R_{\text{in}} ): 100 ohm</td>
</tr>
<tr>
<td></td>
<td>Voltage input: −10…10 V, ( R_{\text{in}} ): &gt; 200 kohm</td>
</tr>
<tr>
<td></td>
<td>Differential inputs, common mode range ±30 V</td>
</tr>
<tr>
<td></td>
<td>Sampling interval per channel: 0.25 ms</td>
</tr>
<tr>
<td></td>
<td>Hardware filtering: 0.25 ms, adjustable digital filtering up to 8 ms</td>
</tr>
<tr>
<td></td>
<td>Resolution: 11 bit + sign bit</td>
</tr>
<tr>
<td></td>
<td>Inaccuracy: 1% of full scale range</td>
</tr>
</tbody>
</table>
### Analog outputs AO1 and AO2 (XAO)

<table>
<thead>
<tr>
<th>Connector pitch 5 mm, wire size 2.5 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>0...20 mA, $R_{\text{load}} &lt; 500$ ohm</td>
</tr>
<tr>
<td>Frequency range: 0...300 Hz (ZCU-1x), 0...500 Hz (BCU-x2)</td>
</tr>
<tr>
<td>Resolution: 11 bit + sign bit</td>
</tr>
<tr>
<td>Inaccuracy: 2% of full scale range</td>
</tr>
</tbody>
</table>

### XD2D connector

<table>
<thead>
<tr>
<th>Connector pitch 5 mm, wire size 2.5 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical layer: RS-485</td>
</tr>
<tr>
<td>Transmission rate: 8 Mbit/s</td>
</tr>
<tr>
<td>Cable type: Shielded twisted-pair cable with a twisted pair for data and a wire or another pair for signal ground (nominal impedance 100 ... 165 ohm, for example Belden 9842)</td>
</tr>
<tr>
<td>Maximum length of link: 50 m (164 ft)</td>
</tr>
<tr>
<td>Termination by jumper (ZCU-1x) or switch (BCU-x2)</td>
</tr>
</tbody>
</table>

### RS-485 connection (X485) (BCU-x2 only)

<table>
<thead>
<tr>
<th>Connector pitch 5 mm, wire size 2.5 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical layer: RS-485</td>
</tr>
</tbody>
</table>

### Safe torque off connection (XSTO)

<table>
<thead>
<tr>
<th>Connector pitch 5 mm, wire size 2.5 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage range: -3...30 V DC</td>
</tr>
<tr>
<td>Logic levels: &quot;0&quot; &lt; 5 V, &quot;1&quot; &gt; 17 V.</td>
</tr>
</tbody>
</table>

**Note:** For the unit to start, both connections must be "1". This applies to all control units (including drive, inverter, supply, brake, DC/DC converter etc. control units), but true Safe torque off functionality is only achieved through the XSTO connector of the drive/inverter control unit. EMC (immunity) according to IEC 61326-3-1

### Safe torque off output (XSTO OUT) (BCU-x2 only)

<table>
<thead>
<tr>
<th>Connector pitch 5 mm, wire size 2.5 mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>To STO connector of inverter module.</td>
</tr>
</tbody>
</table>

### Control panel connection (X13)

<table>
<thead>
<tr>
<th>Connector: RJ-45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable length &lt; 3 m</td>
</tr>
</tbody>
</table>

### Ethernet connection (XETH) (BCU-x2 only)

<table>
<thead>
<tr>
<th>Connector: RJ-45</th>
</tr>
</thead>
<tbody>
<tr>
<td>This connection is not supported by the firmware.</td>
</tr>
</tbody>
</table>

### SDHC memory card slot (SD CARD) (BCU-x2 only)

<table>
<thead>
<tr>
<th>Memory card type: SDHC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum memory size: 4 GB</td>
</tr>
</tbody>
</table>

The terminals of the control unit fulfill the Protective Extra Low Voltage (PELV) requirements. The PELV requirements of a relay output are not fulfilled if a voltage higher than 48 V is connected to the relay output.
**Ground selector (DICOM=DIOGND) settings**

### DICOM=DIOGND: ON
All digital inputs share a common ground (DICOM connected to DIOGND). This is the default setting.

### DICOM=DIOGND: OFF
Ground of digital inputs D1…DIS and DIIL (DICOM) is isolated from DIO signal ground (DIOGND). Isolation voltage 50 V.

**Common mode voltage between each AI input and AGND is +30 V**
ZCU-1x ground isolation diagram

* Ground selector (J6) settings

All digital inputs share a common ground (DICOM connected to DIOGND). This is the default setting.

Ground of digital inputs D11...D15 and DIIL (DICOM) is isolated from DIO signal ground (DIOGND).
Isolation voltage 50 V.
Dimension drawings

Contents of this chapter
This chapter shows dimensions of the ACS880-204 IGBT supply modules and accessories.
IGBT supply module (frame R2i)
IGBT supply module (frame R3i)
IGBT supply module (frame R4i)
IGBT supply module (frame R6i)
IGBT supply module (frame R8i)
Quick connectors of IGBT supply module (frame R8i)
LCL filter module (filter for frames R1i and R2i)
LCL filter module (filter for frame R3i)
LCL filter module (filter for frames R3i and R4i)
LCL filter module (filter for frame R6i)
LCL filter module (filter for frame 1×R8i)
LCL filter module (filter for frame R8i multiples)
WBCA-01

330 Dimension drawings
WBCA-21

332 Dimension drawings
Main switch-disconnector

- R1i…R4i

OS160GD03 (IEC)
336 Dimension drawings

- R6i

OS400D03 (IEC)

Dimensions in mm
1 mm = 0.0394 in

www.abb.com
R8i

OT1000E03 (IEC), OT1200U03 (UL, CSA)

Dimensions in mm

1 mm = 0.0394 in
Dimensions in mm
1 mm = 0.0394 in
OT1200U12 (UL, CSA)

Dimensions in mm
1 mm = 0.0394 in

Auxiliary contact OA1G10

2×0.75…2.5 mm² (2×18…14 AWG)
0.8 N-m (7 lbf-in)
Pozidriv M3.5 Form 2
Main contactor

- R1i…R4i

AF09-30-10-13 (IEC, UL, CSA)
AF26-30-00-13 (IEC, UL, CSA)

AF26, AF30, AF38

Dimensions:
- 45 (1.77"
- 80 (3.15"
- 6 (0.24"
- 86 (3.39"
- 80 (3.15"
- 10 (0.39"

Drilling pattern:
- 35 (1.38"
- ø 4.2 (0.17"
- 2 x M4 8-32 UNC

www.abb.com
AF96-30-22-13 (IEC, UL, CSA)

R6i

AF205-30-22-13 (IEC, UL, CSA)
- R8i
AF580-30-22-70 and AF750-30-22-70 (IEC, UL, CSA)
346 Dimension drawings

AF1250-30-22-70 (IEC, UL, CSA)

Dimensions in mm
1 mm = 0.0394 in
Dimensions in mm

1 mm = 0.0394 in
Charging switches

- **OS30FAJ22F**

Dimensions in mm

1 mm = 0.0394 in
350 Dimension drawings

**OS60GJ22FP**

![OS60GJ22FP Diagram]

<table>
<thead>
<tr>
<th>mm (in)</th>
<th>J11</th>
<th>J12</th>
<th>J13</th>
<th>J22</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>74.5 (2.93)</td>
<td>148 (5.82)</td>
<td>183.5 (7.20)</td>
<td>179.5/8.58</td>
</tr>
<tr>
<td>B</td>
<td>118 (4.65)</td>
<td>118 (4.65)</td>
<td>118 (4.65)</td>
<td>118 (4.65)</td>
</tr>
<tr>
<td>C</td>
<td>-</td>
<td>35 (1.38)</td>
<td>35 (1.38)</td>
<td>35 (1.38)</td>
</tr>
<tr>
<td>D</td>
<td>71.5 (2.81)</td>
<td>71.5 (2.81)</td>
<td>71.5 (2.81)</td>
<td>71.5 (2.81)</td>
</tr>
<tr>
<td>E</td>
<td>36 (1.41)</td>
<td>36 (1.41)</td>
<td>36 (1.41)</td>
<td>36 (1.41)</td>
</tr>
<tr>
<td>F</td>
<td>55.5 (2.19)</td>
<td>55.5 (2.19)</td>
<td>55.5 (2.19)</td>
<td>90.5 (3.56)</td>
</tr>
<tr>
<td>G</td>
<td>91.5 (3.6)</td>
<td>91.5 (3.6)</td>
<td>91.5 (3.6)</td>
<td>126.5 (4.98)</td>
</tr>
<tr>
<td>A1</td>
<td>81.5 (3.21)</td>
<td>116.5 (4.59)</td>
<td>151.5 (5.96)</td>
<td>151.5 (5.96)</td>
</tr>
<tr>
<td>A2</td>
<td>40.5 (1.59)</td>
<td>40.5 (1.59)</td>
<td>40.5 (1.59)</td>
<td>75.5 (2.97)</td>
</tr>
<tr>
<td>B1</td>
<td>111.5 (4.39)</td>
<td>146.5 (5.77)</td>
<td>181.5 (7.15)</td>
<td>181.5 (7.15)</td>
</tr>
<tr>
<td>B2</td>
<td>70.5 (2.78)</td>
<td>70.5 (2.78)</td>
<td>70.5 (2.78)</td>
<td>105.5 (4.15)</td>
</tr>
</tbody>
</table>
### OS100GJ22FP

The measurements in the dimension drawings are preliminary and may be altered.
### OS160GD04F

**Dimensions in mm**

1 mm = 0.0394 in
OS200J04FP

**OS200**

<table>
<thead>
<tr>
<th>mm (in)</th>
<th>J01</th>
<th>J02</th>
<th>J03</th>
<th>J04</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>89.5 (3.52)</td>
<td>135.5 (5.34)</td>
<td>181.5 (7.15)</td>
<td>227.5 (8.96)</td>
</tr>
<tr>
<td>A1</td>
<td>60.5 (2.38)</td>
<td>106.5 (4.19)</td>
<td>152.5 (6.00)</td>
<td>198.5 (7.82)</td>
</tr>
<tr>
<td>B1</td>
<td>79.5 (3.13)</td>
<td>125.5 (4.94)</td>
<td>171.5 (6.75)</td>
<td>217.5 (8.56)</td>
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<tr>
<td>C1</td>
<td>96.5 (3.80)</td>
<td>142.5 (5.61)</td>
<td>188.5 (7.42)</td>
<td>234.5 (9.23)</td>
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</tbody>
</table>
Charging resistors
Handles

- **OH45-275**

<table>
<thead>
<tr>
<th>Handle type (A)</th>
<th>L (mm)</th>
<th>B (mm)</th>
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</thead>
<tbody>
<tr>
<td>OHB 45J6</td>
<td>45</td>
<td>6</td>
</tr>
<tr>
<td>OHB 45J10</td>
<td>45</td>
<td>10</td>
</tr>
<tr>
<td>OHB 65J6</td>
<td>64</td>
<td>6</td>
</tr>
<tr>
<td>OHB 65J8</td>
<td>64</td>
<td>8</td>
</tr>
<tr>
<td>OHB 65J10</td>
<td>64</td>
<td>10</td>
</tr>
<tr>
<td>OHB 80J6</td>
<td>80</td>
<td>6</td>
</tr>
<tr>
<td>OHB 80J8</td>
<td>80</td>
<td>8</td>
</tr>
<tr>
<td>OHB 80J10</td>
<td>80</td>
<td>10</td>
</tr>
<tr>
<td>OHB 95J10</td>
<td>95</td>
<td>10</td>
</tr>
<tr>
<td>OHB 95J12</td>
<td>95</td>
<td>12</td>
</tr>
<tr>
<td>OHB 125J10</td>
<td>125</td>
<td>10</td>
</tr>
<tr>
<td>OHB 125J12</td>
<td>125</td>
<td>12</td>
</tr>
<tr>
<td>OHB 145J12</td>
<td>145</td>
<td>12</td>
</tr>
<tr>
<td>OHB 175J12</td>
<td>175</td>
<td>12</td>
</tr>
<tr>
<td>OHB 274J12</td>
<td>274</td>
<td>12</td>
</tr>
<tr>
<td>OHB 275J12</td>
<td>275</td>
<td>12</td>
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Dimensions in mm
1 mm = 0.0394 in
## OHB150J12P

![Diagram of OHB150J12P handle](image)

<table>
<thead>
<tr>
<th>Handle type</th>
<th>L (mm)</th>
<th>Shaft (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>OHB150J12P</td>
<td>300</td>
<td>* (12 × 395 mm) or ** (12 × 465 mm)</td>
<td>Used with OT1250E12 *, OT2000E12 ** and OT1200U12 *</td>
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</tbody>
</table>

Dimensions in mm

1 mm = 0.0394 in
AC fuses

- R1i...R4i

170M1559D, 170M1562D, 170M1565D, 170M1566D, 170M1569D (IEC)
DFJ-12, DFJ-25, DFJ-50, DFJ-70, DFJ-125 (UL, CSA)

1A to 30A

35A to 60A

70A to 100A

110A to 200A

1 in = 25.4 mm

www.cooperindustries.com
### R6i

170M5808D (IEC)

<table>
<thead>
<tr>
<th>Size</th>
<th>A</th>
<th>B</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>68 + 2.5</td>
<td>150 + 2.5</td>
<td>72</td>
<td>54</td>
<td>48</td>
<td>25</td>
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</tbody>
</table>

1 mm = 0.0394 in

www.cooperindustries.com

### DFJ-300 (UL, CSA)

225A to 400A

www.cooperindustries.com
360 Dimension drawings

- **R8i**

1170M6408, 170M6410, 170M6414, 170M6416

<table>
<thead>
<tr>
<th>Size</th>
<th>A</th>
<th>B</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>51</td>
<td>53</td>
<td>92</td>
<td>76</td>
<td>M12</td>
<td>10</td>
<td>ø30</td>
</tr>
</tbody>
</table>

1 mm = 0.0394 in

www.cooperindustries.com
170M7059, 170M7062, 170M7063

<table>
<thead>
<tr>
<th>Size</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>4B</td>
<td>M10</td>
<td>33</td>
</tr>
</tbody>
</table>

1 mm = 0.0394 in

www.cooperindustries.com
DC fuses

- **R1i...R4i**

FUSE, 14 × 51 mm (IEC, UL, CSA)

Mersen (Ferraz-Shawmut) US141 (Z331153F) fuse disconnector (for 14 × 51 mm fuses) (IEC, UL, CSA)
Fuse, 27 × 60 mm (IEC, UL, CSA)

Mersen (Ferraz-Shawmut) US271MI (R227600C) fuse disconnector (for 27 × 60 mm fuses) (IEC, UL, CSA)
R6i

170M4413 (IEC, UL, CSA)

<table>
<thead>
<tr>
<th>Size</th>
<th>A</th>
<th>B</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>51</td>
<td>69</td>
<td>53</td>
<td>M8</td>
<td>8</td>
<td>ø20</td>
</tr>
</tbody>
</table>

1 mm = 0.0394 in

www.cooperindustries.com
R8i

170M6413, 170M6415, 170M6417, 170M6419 (IEC, UL, CSA)

<table>
<thead>
<tr>
<th>Size</th>
<th>A</th>
<th>B</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>51</td>
<td>53</td>
<td>92</td>
<td>76</td>
<td>M12</td>
<td>10</td>
<td>φ30</td>
</tr>
<tr>
<td>3*</td>
<td>51</td>
<td>65</td>
<td>92</td>
<td>76</td>
<td>M12</td>
<td>10</td>
<td>φ30</td>
</tr>
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</table>

*For size 3 1600 … 2000 A
1 mm = 0.0394 in

www.cooperindustries.com
366 Dimension drawings

170M6544, 170M6546, 170M6549 (IEC, UL, CSA)

<table>
<thead>
<tr>
<th>Size</th>
<th>A</th>
<th>B</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>81</td>
<td>83</td>
<td>92</td>
<td>76</td>
<td>M12</td>
<td>10</td>
<td>Ø30</td>
</tr>
</tbody>
</table>

1 mm = 0.0394 in

www.cooperindustries.com
Main circuit breakers

- E2.2S-A (UL/CSA/IEC)


1. Horizontal terminals 1600 A ... 2000 A
2. Vertical terminals 1600 A ... 2000 A
3. Tightening torque 8.6 N·m (76 lbf·in)
4. Door position
5. Grounding
6. Mounting fixed part screws
7. Moving part
8. Fixed part
9. Segregation
10. Connected, test, disconnected distances
11. Roof insulation or insulated material

---

Dimension drawings 367
368 Dimension drawings

**E4.2S (IEC)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Horizontal terminals 3200 A</td>
</tr>
<tr>
<td>2</td>
<td>Vertical terminals 3200 A</td>
</tr>
<tr>
<td>3</td>
<td>Horizontal terminals 4000 A</td>
</tr>
<tr>
<td>4</td>
<td>Vertical terminals 4000 A</td>
</tr>
<tr>
<td>5</td>
<td>Tightening torque 3200 A 20 N·m (177 lbf·in)</td>
</tr>
<tr>
<td>6</td>
<td>Tightening torque 4000 A 20 N·m (177 lbf·in)</td>
</tr>
<tr>
<td>7</td>
<td>Door position</td>
</tr>
<tr>
<td>8</td>
<td>Earthing device</td>
</tr>
<tr>
<td>9</td>
<td>Mobile part</td>
</tr>
<tr>
<td>10</td>
<td>Fixed part</td>
</tr>
<tr>
<td>11</td>
<td>Segregation (where envisaged)</td>
</tr>
<tr>
<td>12</td>
<td>Distance from connected for testing to isolated</td>
</tr>
</tbody>
</table>

HR/VR

E4.2 N/S/H 3200A

E4.2 N/S/H 4000A

E4.2 V 2000...4000A
### E4.2S-A (UL/CSA/IEC)

#### E4.2 S-A, H-A, V-A 800A - 2500A

<table>
<thead>
<tr>
<th>1</th>
<th>Horizontal terminals 2500 A</th>
<th>7</th>
<th>Moving part</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Vertical terminals 2500 A</td>
<td>8</td>
<td>Fixed part</td>
</tr>
<tr>
<td>3</td>
<td>Tightening torque 20 N·m (177 lbf·in)</td>
<td>9</td>
<td>Segregation</td>
</tr>
<tr>
<td>4</td>
<td>Door position</td>
<td>10</td>
<td>Connected, test, disconnected distances</td>
</tr>
<tr>
<td>5</td>
<td>Grounding</td>
<td>11</td>
<td>Roof insulation or insulated material</td>
</tr>
<tr>
<td>6</td>
<td>Mounting fixed part screws</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1 Horizontal terminals 5000 A  
2 Vertical terminals 5000 A  
3 Tightening torque 20 N·m (177 lbf·in)  
4 Door position  
5 Mounting fixed part screws M8×25 provided  
   Tightening torque 20 N·m (177 lbf·in)  
6 Moving part  
7 Fixed part  
8 Segregation  
9 Roof insulation or insulated material
ZCU control unit
BCU control unit

372 Dimension drawings
BAMU voltage/current measurement unit
ACS-AP-x control panel with DPMP-01 door mounting kit

Cutting in the cabinet door: 109 mm × 223 mm (4.29 in × 8.78 in)

Plate thickness: 1.5 … 2.5 mm (0.06 … 0.10 in)
CVAR board

Common mode filter
RFI filter and related accessories

- RFI filter

![Dimension drawings of RFI filter and related accessories](image)
Oval toroid
Example circuit diagrams

Contents of this chapter

This chapter contains example circuit diagrams of a IGBT supply module.

Note: These diagrams do not necessarily match the installation-specific circuit diagrams of a tailor-made cabinet-installed unit.

The purpose of these diagrams is to help in:

• understanding the internal connections and operation of the cabinet-installed drive with an IGBT supply unit, and
• learning how to wire an (ACS880-204) IGBT supply module when installed in a user-defined cabinet.

Component designations used in the diagrams

- Frames R1i…R4i

<table>
<thead>
<tr>
<th>Designation</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>A11</td>
<td>RFI filter</td>
</tr>
<tr>
<td>A51</td>
<td>ZCU control unit</td>
</tr>
<tr>
<td>A59</td>
<td>ACS-AP-x control panel</td>
</tr>
<tr>
<td>Fxx.xx</td>
<td>Fuses</td>
</tr>
<tr>
<td>Q1</td>
<td>Main switch-disconnector</td>
</tr>
<tr>
<td>Q2</td>
<td>Main contactor</td>
</tr>
<tr>
<td>R03</td>
<td>LCL filter module (type WFU-xx)</td>
</tr>
<tr>
<td>T01</td>
<td>Supply module (type ACS880-204)</td>
</tr>
</tbody>
</table>
### Frame R6i

<table>
<thead>
<tr>
<th>Designation</th>
<th>Component</th>
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<tbody>
<tr>
<td>A1</td>
<td>Varistor board CVAR-01C in UL/CSA installations</td>
</tr>
<tr>
<td>A51</td>
<td>ZCU control unit</td>
</tr>
<tr>
<td>A59</td>
<td>ACS-AP-x control panel</td>
</tr>
<tr>
<td>Fxx.xx</td>
<td>Fuses</td>
</tr>
<tr>
<td>Q1</td>
<td>Main switch-disconnector</td>
</tr>
<tr>
<td>Q2</td>
<td>Main contactor</td>
</tr>
<tr>
<td>Rx.x</td>
<td>Common mode filter</td>
</tr>
<tr>
<td>R03</td>
<td>LCL filter module (type ALCL-05-5)</td>
</tr>
<tr>
<td>T01</td>
<td>Supply module (type ACS880-204)</td>
</tr>
</tbody>
</table>

### Frame R8i and multiples

<table>
<thead>
<tr>
<th>Designation</th>
<th>Component</th>
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<tbody>
<tr>
<td>A1</td>
<td>Varistor board CVAR-01C in UL/CSA installations</td>
</tr>
<tr>
<td>A51</td>
<td>BCU control unit</td>
</tr>
<tr>
<td>A59</td>
<td>ACS-AP-x control panel</td>
</tr>
<tr>
<td>Fxx.xx</td>
<td>Fuses</td>
</tr>
<tr>
<td>Q1</td>
<td>Main switch-disconnector / main circuit breaker</td>
</tr>
<tr>
<td>Q2</td>
<td>Main contactor</td>
</tr>
<tr>
<td>Q3</td>
<td>Charging switch</td>
</tr>
<tr>
<td>Q4</td>
<td>Charging contactor</td>
</tr>
<tr>
<td>Rx.x</td>
<td>Common mode filter</td>
</tr>
<tr>
<td>R4.x</td>
<td>Charging resistors</td>
</tr>
<tr>
<td>R03</td>
<td>LCL filter module(s) (type BLCL-1x-x for frame 1×R8i, and type BLCL-2x-x for frame R8i multiples)</td>
</tr>
<tr>
<td>T01</td>
<td>Supply module(s) (type ACS880-204)</td>
</tr>
</tbody>
</table>

The main difference between 1×R8i and 4×R8i is that in 4×R8i, the main AC fuses [F1.x], main switch-disconnector [Q1] and main contactor [Q2] are replaced with one component, main circuit breaker [Q1].

---

382 Example circuit diagrams

---
Circuit diagram set contents

The contents of each circuit diagram set are listed below:

ACS880-204 IGBT supply unit R1i…R4i with one supply module (3AXD10001261175)

• Main fuse switch
• IGBT supply module
• LCL filter module WFU-xx
• Internal auxiliary voltage supply
• IEC/UL roof fan unit
• ZCU-14 control unit
• Control panel

ACS880-204 IGBT supply unit 1×R6i (3AXD10001238362)

• Main fuse switch
• IGBT supply module
• LCL filter module
• Internal auxiliary voltage supply
• ZCU-14 control unit
• Control panel

ACS880-204 IGBT supply unit 1×R8i (3AXD10001239966)

• Main switch-disconnector
• Charging circuit
• IGBT supply module
• LCL filter module
• Module heaters (+C183)
• Internal auxiliary voltage supply
• BCU-02 control unit
• Control panel
• EMC filters Cat. C2 1st Env.

ACS880-204 IGBT supply unit 4×R8i (3AXD10001090391)

• Main circuit breaker
• Charging circuit
• IGBT supply module
• LCL filter module
• Internal auxiliary voltage supply
• BCU-12 control unit
• Control panel
Project type: Example Circuit Diagrams
Converter type: ACS880-204
IGBT Supply Unit
Frame Size: R1i-R4i
Type Code: ACS880-204-0077A-5
Revision: Revision A
## Table of Contents

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<th>Page Description</th>
<th>Revision</th>
<th>Page</th>
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</thead>
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<td>Title page / cover sheet</td>
<td>000A</td>
<td>A</td>
</tr>
<tr>
<td>Structured identifier overview</td>
<td>000C</td>
<td>A</td>
</tr>
<tr>
<td>Summarized parts list</td>
<td>000D</td>
<td>A</td>
</tr>
<tr>
<td>Symbol Overview</td>
<td>300A</td>
<td>A</td>
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<tr>
<td>MAIN CIRCUIT</td>
<td>001A</td>
<td>A</td>
</tr>
<tr>
<td>MAIN CIRCUIT</td>
<td>003A</td>
<td>A</td>
</tr>
<tr>
<td>MODULE CONTROL CONNECTION</td>
<td>005A</td>
<td>A</td>
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## Example Circuit Diagrams

- R1i-R4i
- ACS880-204
- ISU
- Oleg Vanin
- 16.11.2020
- RD129608 / 4181
- 3AFE
- 5
- 3AFE
- -
- -
- Example Circuit Diagrams: 385
### Function designations

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- Cabinet: 3AUA00000401192
- Control Panel: 3AUA00000401194
- Filter Module: 3AUA00000401196
- Fuse: 3AUA00000401198
- Main Contactor: 3AUA00000401200
- Panel Interface: 3AUA00000401202
- Panel mounting kit: 3AUA00000401204
- Supply Module: 3AUA00000401206
- Switch #S1: 3AUA00000401208

### Example Circuit Diagrams

- 386 Example circuit diagrams

---

**Note:** The diagram includes multiple sections indicating various components and their descriptions, which are not listed exhaustively here. The sections appear to be part of a larger project or case study, possibly related to electrical systems or industrial automation, given the context and the referenced material codes.
Example Circuit Diagrams
Example circuit diagrams
394 Example circuit diagrams
Control and status signals

Terminal | Description |
--- | --- |
+501 | DIGITAL IN | 0-1 |
+501 | TEMPERATURE FAULT | 0-1 |
+501 | RUN / ENABLE | 1-0 |
-501 | MOTOR PWR | 1-0 |
-501 | CIRCUIT BREAKER | 1-0 |
-501 | EARTH FAULT | 1-0 |
-501 | RESET | 1-0 |

Example Circuit Diagrams

1. Example Circuit Diagram 1
2. Example Circuit Diagram 2
3. Example Circuit Diagram 3
4. Example Circuit Diagram 4
5. Example Circuit Diagram 5
6. Example Circuit Diagram 6
7. Example Circuit Diagram 7
8. Example Circuit Diagram 8
### Control and Status Signals

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### Jumper Diagrams

- Jumper in J1A: CURRENT INPUT
- Jumper in J1B: VOLTAGE INPUT
- Jumper in J2A: CURRENT INPUT
- Jumper in J2B: VOLTAGE INPUT

### Circuit Diagrams

- **Example Circuit Diagrams**
  - **Header**
    - **Example Circuit Diagrams**
    - **AC8880-204**
      - **RSU-RH**
  - **Control and Status Signals**
    - **Terminal Pins**
      - **-A5I**
      - **-A5I**
      - **-XAI**
      - **-XAI**
  - **Diagram Details**
    - **Title**: CONTROL UNIT
    - **Circuit Diagram**: AC8880-204-007/0-5
    - **Date**: 16.11.2020
    - **Author**: Oleg Vanin

---

**Example circuit diagrams 397**
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### Example Circuit Diagrams

**Project type**: Example Circuit Diagrams

**Converter type**: ACS880-204

**IGBT Supply Unit**

**Frame Size**: R6i

**Type Code**: ACS880-204-0210A-5

**Revision**: Revision B

---

**Used EPLAN version**: P8.14734
### Higher-level function

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### Example Circuit Diagrams

- **ACS880-204**
  - Anna Mariia Zhiglova
  - 11/27/2020

- **R5**
  - Mika Asikainen
  - 10/12/2020

---

*ABB*
**Function designations**

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**Electrical option designations**

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**Example Circuit Diagrams**

1. IGBT Supply Cubicle
2. CM Filter
3. Charging Kit
4. Control Panel
5. Filter Module
6. Main Contactor
7. Panel mounting kit
8. Supply Module
9. Switch Kit
Example Circuit Diagrams

- **GENERAL RELAY COIL, WITH PROTECTIVE CIRCUIT DISCONE AND R + L**
  - No Switch, Operated by Turning, 2 Positions
  - Protective Switch, Connected to Terminal, 1 Position

- **GENERAL RELAY COIL**
  - Limiter Switch, NC Contact, Mechanically Operated
  - Functional Dampering, Connected to Terminal

- **SWITCH DISCONNECTOR WITH FUSES, THREE-POLE**
  - Switch Disconnect, Operated by Turning, 2 Positions
  - Protective Switch, Connected to Terminal, 1 Position

- **EMERGENCY STOP PUSH BUTTON**
  - Push Button, NC Contact
  - Push Button, With Closing Delay

- **PHASE SELECTING SWITCH**
  - Switch Disconnect, Operated by Turning, 2 Positions
  - Protective Switch, Connected to Terminal, 1 Position

- **FUSE**
  - Fuse
  - Fuse, DISCONNECTOR

- **CIRCUIT BREAKER**
  - Switch Disconnect, Operated by Turning, 2 Positions
  - Protective Switch, Connected to Terminal, 1 Position

- **MOTOR OVERLOAD SWITCH WITH SWITCH MECHANISM**
  - Motor Overload Switch, With Switch Mechanism

- **DISCONNECT SW, OPERATED BY TURNING, 2 POSITIONS**
  - Disconnect, Operated by Turning, 2 Positions
  - Protective Switch, Connected to Terminal, 1 Position

- **DISCONNECT SWITCH, THREE-POLE**
  - Disconnect Switch, Operated by Turning, 2 Positions
  - Protective Switch, Connected to Terminal, 1 Position

- **FUNCTIONAL EARTHING CONNECTED TO TERMINAL / PE BUSBAR**
  - Functional Bonding, Connected to Terminal

- **INDUCTOR**
  - Inductor

- **TRANSFORMER**
  - Transformer

- **VOLTAGE TERMINATION, ISOLATED**
  - Voltage Termination, Isolated

- **PHASE SELECTING SW**
  - Phase Selecting Switch

- **PUSH BUTTON**
  - Push Button, NC Contact

- **THERMAL OPERATION**
  - Thermal Operation

- **LEAD WIRE TERMINATION, INSULATED**
  - Lead Wire Termination, Insulated

- **TERMINAL BLOCK WITH 4 CONNECTION POINTS**
  - Terminal Block with 4 Connection Points

- **FEMALE AND MALE PLUG**
  - Female and Male Plug

- **FUNCTIONAL BONDING TO FRAME**
  - Functional Bonding to Frame

- **EMERGENCY STOP PUSH BUTTON**
  - Emergency Stop Push Button

- **COIL WITH OFF DELAY**
  - NC Switch, Temperature Operated

- **RESISTOR**
  - Resistor

- **POWER RESISTOR WITH FUSE**
  - Power Resistor with Fuse

- **CORRECTIVE FILTER**
  - Corrective Filter

- **SHIELDED CABLE**
  - Shielded Cable

- **2 WIRE TERMINATION, INSULATED**
  - 2 Wire Termination, Insulated

- **PUSH BUTTON**
  - Push Button, With No Contact

- **WIRE TERMINATION, INSULATED**
  - Wire Termination, Insulated

- **INDUCTOR**
  - Inductor

- **TRANSFORMER**
  - Transformer

- **VOLTAGE METER**
  - Voltage Meter

- **CURRENT TRANSFORMER**
  - Current Transformer

- **VOLTAGE TRANSFORMER**
  - Voltage Transformer

- **AMPERE METER**
  - Amperemeter

- **DISCONNECT**
  - Disconnect

- **DISCONNECT, CAN BE OPERATED WHILE NOMINAL CURRENT IS APPLIED**
  - Disconnect, Can Be Operated While Nominal Current Is Applied

- **BREAKER, SHORTCIRCUIT BREAKING CAPABILITY**
  - Breaker, Short-Circuit Breaking Capability

- **TERMINAL, FOUR POLE**
  - Terminal, Four Pole

- **TERMINAL, TWO POLE**
  - Terminal, Two Pole

- **FUSE**
  - Fuse

- **CURRENT TRANSFORMER**
  - Current Transformer

- **VOLTAGE METER**
  - Voltage Meter

- **AMPERE METER**
  - Amperemeter

- **DISCONNECT**
  - Disconnect
NOTE! SENSOR ISOLATED FROM MAIN BUSBAR

TEMPERATURE THERMOSTAT

- F6.1

1

Θ

MAIN CONTACTOR

MAIN SUPPLY FUSE SWITCH

CONTROL VOLTAGE DISTRIBUTION

EXTERNAL MAIN SUPPLY CABINET COMMON PE BUSBAR

- RU

- RV

- RW

- RPE

- A1

VARISTOR BOARD

U1

V1

W1

U2

V2

W2

NOTE! CVAR board A1 needed only in UL/CSA-installations

3L2

4T2

- Q4/021b/1D

3L3

4T3

- Q2/021b/2D

5L3

6T3

342

- X22

352
406 Example circuit diagrams
408 Example circuit diagrams
Example circuit diagrams 409
410 Example circuit diagrams
Control and status signals

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Frame 1×R8i

Example Circuit Diagrams

ACS880-204
IGBT Supply Unit
Rev B

ACS880-204-0730A-5+C183

Project type
Converter type
Frame Size
Type Code
Revision

Used EPLAN version: P8.14734
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Example Circuit Diagrams

ACS880-204

R8

03.02.2021

Oleg Vanin

Mika Asikainen

3.02.2021
416 Example circuit diagrams
Example Circuit Diagrams 417
Example Circuit Diagrams

INCOMING CUBICLE (External)

*) EMC filters R2.1 and R2.2 for Cat. C2 1st Env. Earthen Network (TN) 400V, 500V

NOTE: CVAR board A1 needed only in UL/CSA-installations

---

**4.18 Example circuit diagrams**
Example Circuit Diagrams
Example Circuit Diagrams 421
422 Example circuit diagrams
Example circuit diagrams 423
424 Example circuit diagrams
Control and status signals | Terminal | Rm |
--- | --- | --- |
-J5 TEMPERATURE FAULT | -XD1 | 1 |
-J5 RUN / ENABLE | -XD2 | 2 |
-J5 MAIN BREAKER FB | -XD3 | 3 |
-J5 CIRCUIT BRK FAULT | -XD4 | 4 |
-J5 EARTH LEAKAGE | -XD5 | 5 |
-J5 RESET | -XD6 | 6 |
-J5 EMERGENCY STOP | -XD7 | 7 |

Example circuit diagrams 427
Example Circuit Diagrams 429

**AUXILIARY CONTROL CUBICLE (External)**

- Control Unit: BCU-02
- 1/051a/1C
- A57: X1
- SD Card: X9
- Battery (BR 2032): X205
- Memory Unit: X205-A51
- RJ45: X13
- SAFETY OPTION: X12
- RJ45 not in use: XETH
- SD Card: X9
- Battery (BR 2032): X205
- Memory Unit: X205-A51
- Control Unit: BCU-02
- 1/051a/1C
- A57: X1

**Circuit diagram**
Example circuit diagrams 431
### Example Circuit Diagrams

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Converter type: ACS880-204  
IGBT Supply Unit

Frame Size: 4×R8i

Type Code: ACS880-204-3110A-3+C183+C188

Revision: Revision C
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### Function designations

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### Electrical option designations

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**Example Circuit Diagrams**

- ACS880-104-0900A-3
- 3AUA0000032859
- 3AXD50000016058
- 3AXD50000025965
- 3AXD50000015806
- 3AXD50000621170
- 68752591, 68393108
### Example Circuit Diagrams

**Symbol Overview**

- **Symbol: Fuse**
- **Symbol: Disconnect Switch, Three-Pole**
- **Symbol: Switch Disconnecter, Three-Pole**
- **Symbol: NC Switch, Temperature Operated**
- **Symbol: Motor Overload Switch, With Switch Mechanism**
- **Symbol: LED**
- **Symbol: Symbol Overview**
- **Symbol: Phase Selection Switch**
- **Symbol: Circuit Breaker**
- **Symbol: Common Mode Filter**
- **Symbol: EMC Filter**
- **Symbol: Transformer**
- **Symbol: Ammeter**
- **Symbol: Voltmeter**
- **Symbol: Thermistor**
- **Symbol: Temperature Sensor**
- **Symbol: Power Resistor With Fuse**
- **Symbol: Inductor**
- **Symbol: Resistor**
- **Symbol: Capacitor**
- **Symbol: Transformer, Primary, Voltage Selection**
- **Symbol: Female And Male Plug**
- **Symbol: Shielded Cable**
- **Symbol: Thermal Operation**
- **Symbol: No Contact, With Closing Delay**
- **Symbol: Two No Contacts, One Input, Two Outputs**
- **Symbol: Two Connected Change Over Contacts**
- **Symbol: Power No Contact Of A Contactor**
- **Symbol: Push Button With NC Contact**
- **Symbol: Push Button With NC Contact**

### Part List

- **Example Circuit Diagrams**: AC5890-204
- **EPLAN Doc. No.**: 3AFE
- **Cust. Doc. No.**: 3AFE
- **Cust. Ref. No.**: 3AFE
- **Customer**: Example
- **Prep.**: Mika Asikainen
- **Rev.**: 3.02.2021
- **Prep.**: Mika Asikainen
- **Rev.**: 3.02.2021
- **Prep.**: Oleg Vanin
- **Rev.**: 3.02.2021

### Diagram Details

- **Terminals**:
  - A
  - B
  - C
  - D
  - E
  - F

- **Terminal Block**: Four Pole
- **Terminal Block**: Four Connection Points
- **Female And Male Plug**
- **SAP Doc. No.**: 3AXD10001090391
- **EPLAN Doc. No.**: 3AXD10001090391
- **ABB Ref. No.**: 3AXD10001090391
- **Resp. Dept.**: 3AXD10001090391
- **Sheet Title**: 3AXD10001090391
- **Sheet Prep.**: 3AXD10001090391
- **Sheet App.**: 3AXD10001090391
- **Project**: 3AXD10001090391
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440 Example circuit diagrams
Example Circuit Diagrams

AUXILIARY CONTROL CUBICLE (External)

AUXILIARY VOLTAGE DISCONNECT MONITORING

CHARGING CONTROLLER

AUXILIARY VOLTAGE DISTRIBUTION

CHARGING CONTACTOR

AC5880-204

Mika Asikainen

3.02.2021
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1. INCOMING CUBICLE (External)

2. AUXILIARY CONTROL CUBICLE (External)
Control and status signals

-051 CHARGING CONTROLLER
-051 FAULT (-1) 1 - NO FAULT
-051 MAIN FUSIBLE CONTROLE

DIGITAL INPUTS

-051 -XPOW 12
-051 -XRO1 13
-051 -XRO2 22
-051 -XRO3 31

Digital Outputs

-051 -XQ1 14
-051 -XQ2 22
-051 -XQ3 32

Example Circuit Diagrams

ABB Ref. No.

No. of Sheets: 050a

Rev.: 01

Cust. Ref. No.

Cust. Doc. No.

050b/1E

050c/1A

050d/1D

051a/1E
Control and status signals

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**Example Circuit Diagrams**

- ACS880-204
- 3110A-3-C183+C188
- 400V

**AUXILIARY CONTROL CUBICLE (External)**

- CONTROL BOARD
  - 3110 Supply Unit
  - DMS doc. nr. 3AXD10001090391
  - IG68 Supply Unit

**Example Circuit Diagrams**

- ACS880-204
- 400V

**ABB Reference**

- ABB Ref. No.
- Resp. Dept.
- Item Des.
- SAP Doc. No.
- EPLAN Doc. No.
- No. of Sheets
- Rev.
- Prep.
- App.
- Project
- Cust. Doc. No.
- Cust. Ref. No.
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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 www.abb.com/searchchannels.

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