ABB INDUSTRIAL DRIVES

# ACS880-204LC IGBT supply modules

## Hardware manual



# ACS880-204LC IGBT supply modules

## Hardware manual

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3AXD50000284436 Rev J
EN
Original instructions
EFFECTIVE: 2026-04-07

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**Further information**

1

# Introduction to the manual

## Contents of this chapter

This chapter gives basic information on the manual.

## Applicability

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

## Safety instructions

Obey all safety instructions of the drive.

- Read the **complete safety instructions** before you install, commission, use or service the drive. The complete safety instructions are given in ACS880 liquid-cooled multidrives cabinets and modules safety instructions (3AXD50000048633 [English]).
- Read the warnings of the software function before you take the function in use or change its default parameter settings. Read the warnings of the parameter before you change its default setting. Refer to the firmware manual.

## Target audience

This manual is intended for people who plan the installation, install, commission, 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 you do work 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 a size identifier.

The module size can be identified from the basic code visible on the type designation label, for example, “ACS880-204LC-0400A-7”, where 0400A is the module size. The option codes of the module are listed after a plus sign. Chapter Ordering information explains the type designation code in detail.

The frame size of the module can be, for example, R7i, R8i or 2×R8i, the latter representing a supply unit consisting of two parallel-connected R8i supply modules. The table under section Ratings (page 372) lists the units and frame sizes.

## Use of component designations

Some device names in the manual include the component designation in brackets (for example, [Q20]). This will help you to identify the components in the circuit diagrams.

## Terms and abbreviations

| Term | Description |
|---|---|
| ACS-AP-… | Assistant control panel |
| BAMU | Auxiliary measurement unit |
| BCON | Type of control board |
| BCU | Type of control unit |
| BDPS | Module internal power supply board |
| CIO | I/O module for controlling cooling fans |
| CL filter | Capacitor-inductor filter |
| CL-ICU | Incoming and CL filter cubicle. Part of the cabinet line-up that contains the chokes of the CL filter, and the input power cable terminals, switching equipment etc. |
| Control unit | Enclosure that contains the control board and related connector boards. The term is also used as a synonym for the control board. |
| Cubicle | One section of a cabinet-installed drive. A cubicle is typically behind a door of its own. |
| DC link | DC circuit between rectifier and inverter |
| DDCS | Distributed Drives Communication System. Optical fiber-based industrial protocol. |
| DI | Digital input |
| Drive | Frequency converter for controlling AC motors |
| EMC | Electromagnetic compatibility |
| EMI | Electromagnetic interference |
| Frame, frame size | Physical size of the drive or power module |
| ICU | Incoming unit |
| IGBT | Insulated gate bipolar transistor |
| 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. |
| Incoming unit | Part of the cabinet line-up that contains the input power cable terminals. Can also contain switching equipment etc. |
| Intermediate circuit | DC circuit between rectifier and inverter |
| INU | Inverter unit |

| Term | Description |
|---|---|
| Inverter module | Inverter bridge, related components and drive DC link capacitors enclosed in a metal frame or enclosure. Intended for cabinet installation. |
| ISU | IGBT supply unit |
| LCL filter | Inductor-capacitor-inductor filter |
| Lineup charging circuit | AC-DC charging circuit for all units in a lineup |
| 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 or converter control program, parameter is a user-adjustable setting, or a read-only monitoring signal.<br>In some (for example fieldbus) contexts, a value that can be accessed as an object. For example, variable, constant, or signal. |
| RDCO | Optical DDCS communication module |
| Supply unit | Supply module(s) under control of one control unit, and related components. |
| UCU | Type of control unit |
| Unit charging circuit | DC-DC charging circuit for a cubicle |
| USCA-02 | Adapter for installing F-series option modules onto the UCU control unit. |

# Related documents

For more documentation, go to www.abb.com/drives/documents.

You can find more documentation related to the multidrive modules on the Internet at https://sites-apps.abb.com/sites/lvacdrivesengineeringsupport/content.

Manuals for ACS880 multidrive modules

2

# Operation principle and hardware description

## Contents of this chapter

This chapter describes how the IGBT supply unit works and the hardware of the ACS880-204LC 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 (or CL 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. A dedicated supply transformer is always required for each unit which has a CL filter. See chapter Guidelines for planning electrical installation.

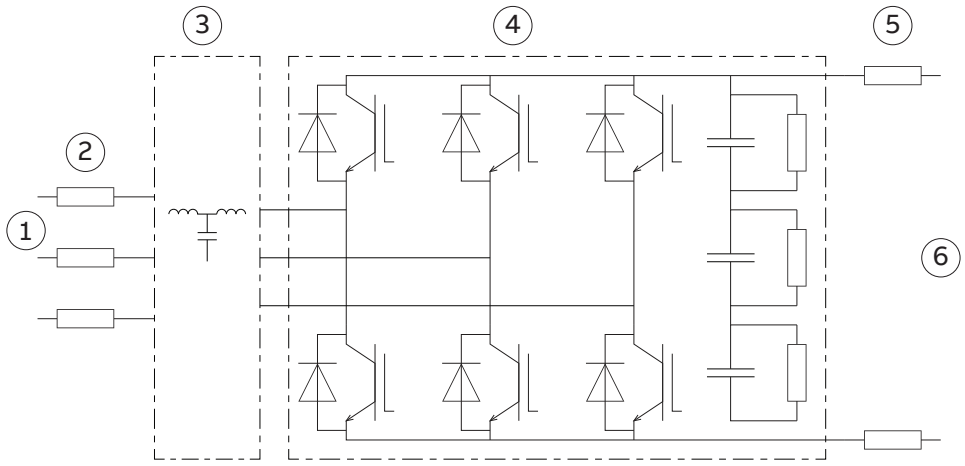
The IGBT supply unit can be equipped with optimal grid control functionality and work as a grid converter. The grid converter can be used to produce an island AC grid. It is also possible to use grid converters in parallel with generators to support the operation of a distributed power system. The grid converter produces sinusoidal three-phase AC voltages from the DC link voltage of the system. AC voltage magnitude and frequency can be defined by the user. A grid converter can be used in eg. marine applications where ordinary power grid connection is not available. For further details, refer to Optimal grid control of ACS880 IGBT supply control program supplement

(3AXD50000164745 [English]) or Optimal grid control of ACS880 IGBT supply control program (YISLX) supplement (3AXD50001096762 [English]).

Optimal grid control functionality is in use only when the license key N8053 has been activated on the memory unit. This has been done at the factory for a unit with the option +N8053. You can see the license information with the Drive Composer PC tool or ACS-AP-x control panel in **System info** - **Licenses**. If the license key for the optimal grid control is missing, the converter indicates fault 6E1F Licensing fault. Auxiliary code in the event logger indicates the plus code of missing license, in this case N8053. For further assistance, contact your local ABB representative.

## Simplified main circuit diagram

This figure shows the simplified main circuit diagram of the rectifier.




| | |
|---|---|
| 1. | AC voltage |
| 2. | AC fuses |
| 3. | LCL filter (or CL filter). In some cases inductor $L_{grid}$ of the LCL filter can be left out and use CL filter instead. |
| 4. | IGBT supply module |
| 5. | DC fuses |
| 6. | DC voltage |

## Charging

A lineup 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.

The control program has a function for controlling the lineup charging circuit. For further information, refer to the firmware manual.

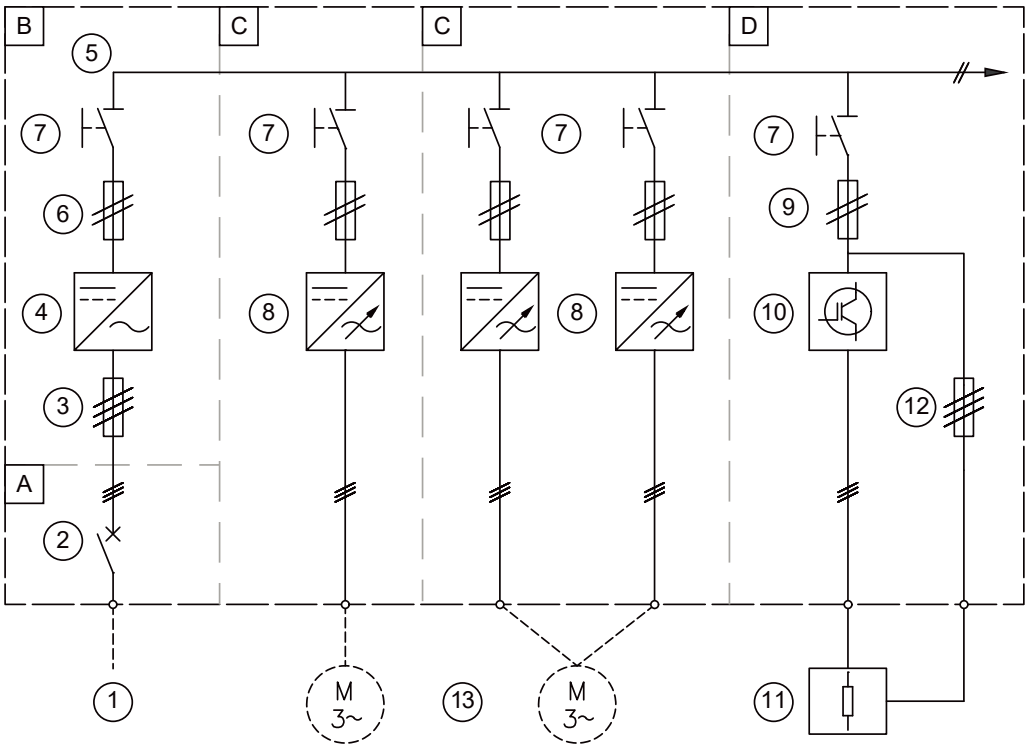
The supply unit must always have an AC-DC lineup charging circuit. It charges all DC capacitors connected to the drive DC link at the drive power up. If the supply module cubicle has a DC switch, the cubicle must also have a DC-DC unit charging circuit. It

charges the DC modules before it is possible to close the DC switch of the module cubicle when the DC link has voltage connected.

DC-DC charging circuit charges the DC capacitors of the supply modules inside one cubicle. It is called the unit charging circuit, and it is used for charging one cubicle. The modules must be charged through the unit charging circuit before the drive power up is possible.

# Overview diagram of the drive

This diagram shows a simplified main circuit diagram.




| | |
|---|---|
| A | Incoming unit |
| B | Supply unit |
| C | Inverter unit |
| D | Brake unit (optional) |
| 1 | AC supply |
| 2 | Main breaker, or main contactor and main switch-disconnector |
| 3 | Input (AC) fuses |
| 4 | Supply module |
| 5 | DC bus |
| 6 | Supply and inverter module DC fuses |
| 7 | DC switch-disconnector (optional) |
| 8 | Inverter modules |
| 9 | Brake chopper fuses |
| 10 | 3-phase brake chopper module (optional) |
| 11 | Brake resistors (optional or acquired by the customer) |
| 12 | Fuses for the brake resistors |
| 13 | Motor(s) (acquired by the customer) |

# Cooling system

See chapter Internal cooling circuit (page 551).

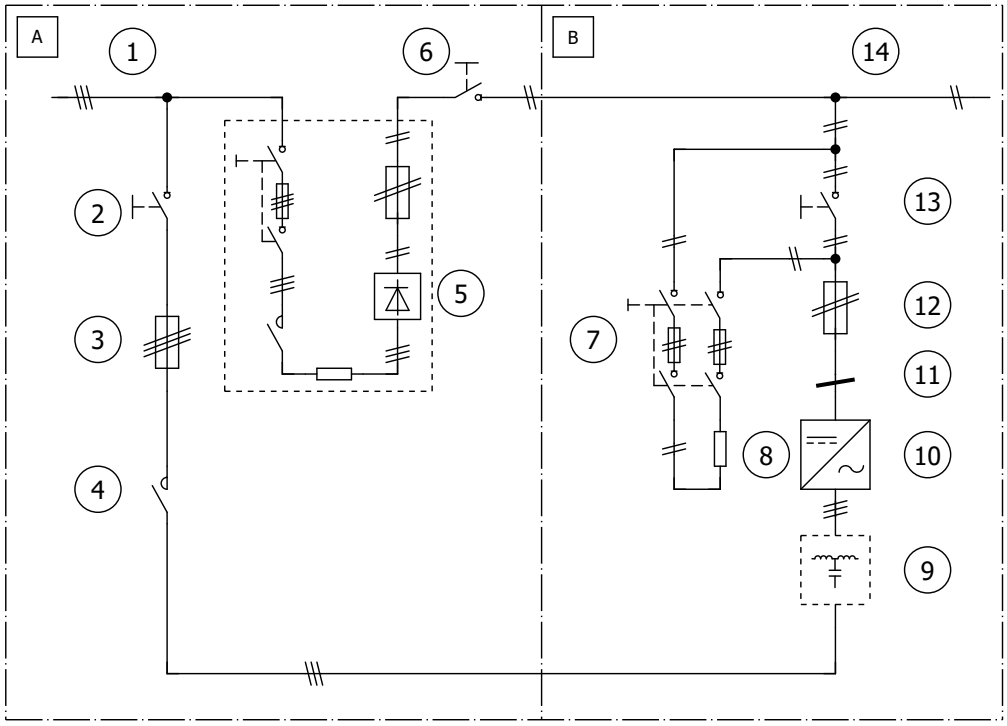
# Single-line circuit diagrams of the supply unit

The following figures are examples of possible IGBT supply unit configurations. The tables give explanations for the numbers and letters of the diagrams. For components, see the chapter Ordering information.

Note that frames 2×R7i…4×R7i are available for special customer-built configurations only, and their offering is limited. Customers have to make detailed mechanical design and cabinet installation by themselves.

## Frame 1×R7i

The following figure shows a connection example of a supply unit with one frame R7i module.

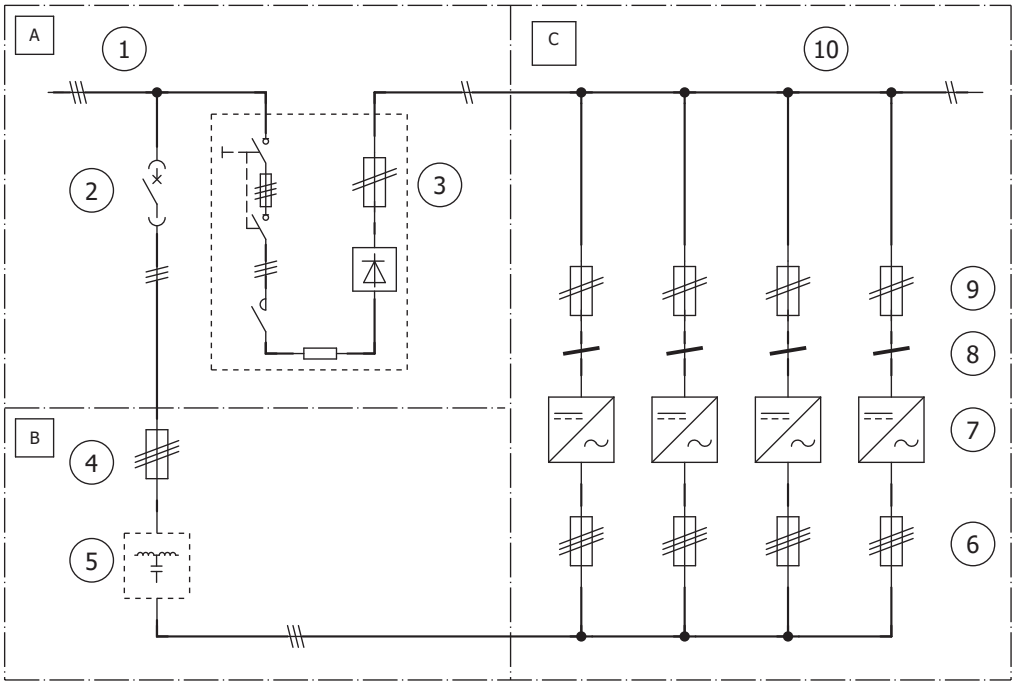



| | |
|---|---|
| A | Incoming cubicle |
| 1 | AC supply |
| 2 | Main switch-disconnector [Q1] |
| 3 | AC fuses [F1] |
| 4 | Main contactor [Q2] |
| 5 | AC-DC charging kit (lineup charging) |
| 6 | DC switch-disconnector for lineup charging [Q40] |
| B | IGBT supply module cubicle |
| 7 | DC-DC charging kit (unit charging) |
| 8 | Resistors for DC-DC charging |
| 9 | LCL filter |
| 10 | IGBT supply module (frame R7i) |
| 11 | Common mode filter [R1] |
| 12 | DC fuses [F2] |

| | |
|---|---|
| 13 | DC switch-disconnector [Q11] (for the supply module DC isolation) |
| 14 | DC link |

## Frame 4×R7i

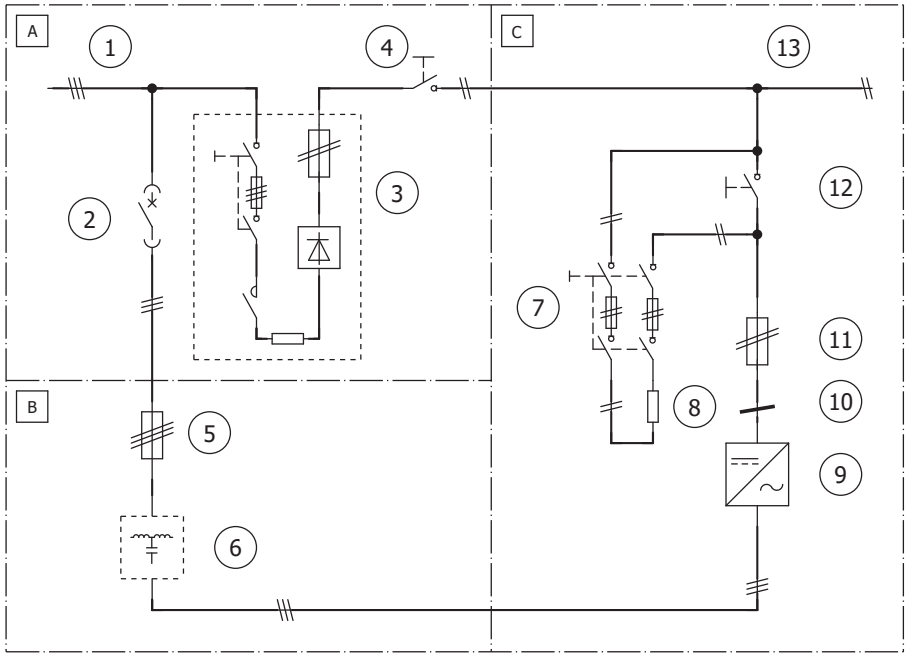
Note that frames 2×R7i…4×R7i are available for special customer-built configurations only, and their offering is limited. Customers have to make detailed mechanical design and cabinet installation by themselves.




| | |
|---|---|
| A | Incoming cubicle |
| 1 | AC supply |
| 2 | Main circuit breaker [Q1] |
| 3 | AC-DC charging kit (lineup charging) |
| B | LCL filter cubicles |
| 4 | AC fuses |
| 5 | LCL filter kit |
| C | IGBT supply module cubicle |
| 6 | AC fuses |
| 7 | IGBT supply modules (frame R7i) |
| 8 | Common mode filters [R1] |
| 9 | DC fuses [F2] |
| 10 | DC link |

## Frame 1×R8i with LCL filter

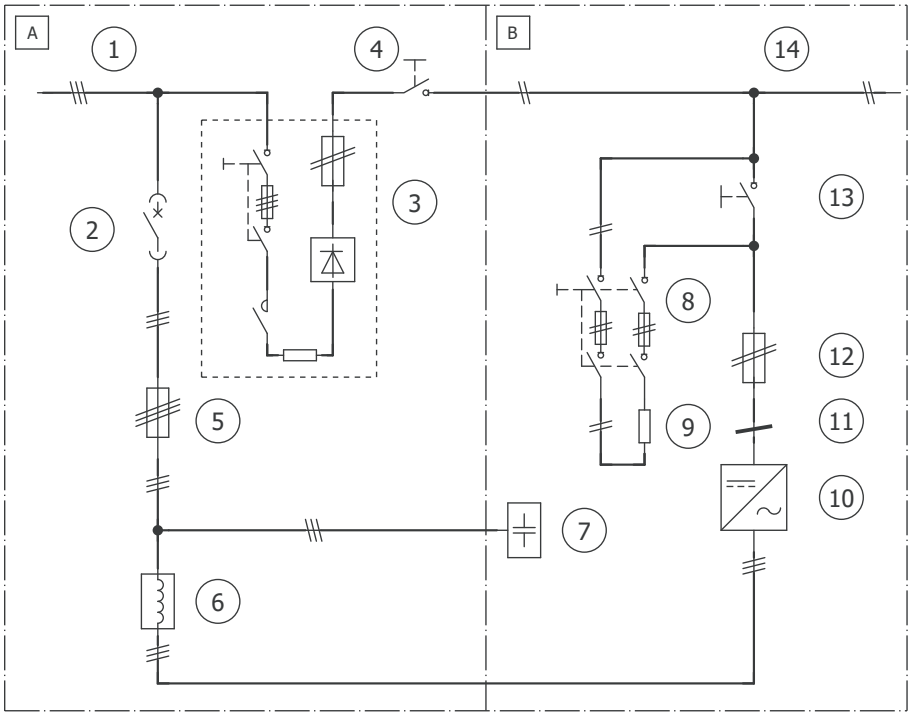
The following figure shows a connection example of a supply unit with one frame R8i module.




| | |
|---|---|
| 1 | AC supply |
| A | Incoming cubicle |
| 2 | Main circuit breaker [Q1] |
| 3 | AC-DC charging kit (lineup charging) |
| 4 | DC switch-disconnector for lineup charging [Q40] |
| B | LCL filter cubicle |
| 5 | AC fuses [F3] |
| 6 | LCL filter kit |
| C | IGBT supply module cubicle |
| 7 | DC-DC charging kit (unit charging) |
| 8 | Resistors for DC-DC charging |
| 9 | IGBT supply module (frame R8i) |
| 10 | Common mode filter [R1] |
| 11 | DC fuses [F2] |
| 12 | DC switch-disconnector [Q11] |
| 13 | DC link |

## Frame 1×R8i with CL filter

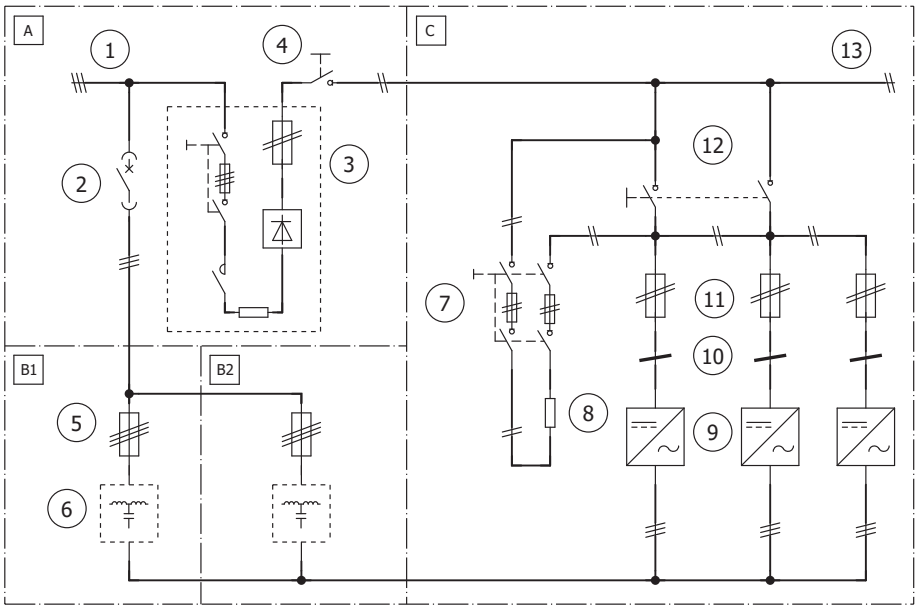
The following figure shows a connection example of a supply unit with one frame R8i module and CL filter.




| | |
|---|---|
| 1 | AC supply |
| A | Incoming and CL filter cubicle |
| 2 | Main circuit breaker [Q1] |
| 3 | AC-DC charging kit (lineup charging) |
| 4 | DC switch-disconnector for lineup charging [Q40] |
| 5 | AC fuses [F3] |
| 6 | Choke $L_{conv}$ of the CL filter |
| B | IGBT supply module cubicle |
| 7 | Capacitor of the CL filter |
| 8 | DC-DC charging kit (unit charging) |
| 9 | Resistors for DC-DC charging |
| 10 | IGBT supply module (frame R8i) |
| 11 | Common mode filter [R1] |
| 12 | DC fuses [F2] |
| 13 | DC switch-disconnector [Q11] |
| 14 | DC link |

## Frame R8i multiples with LCL filter

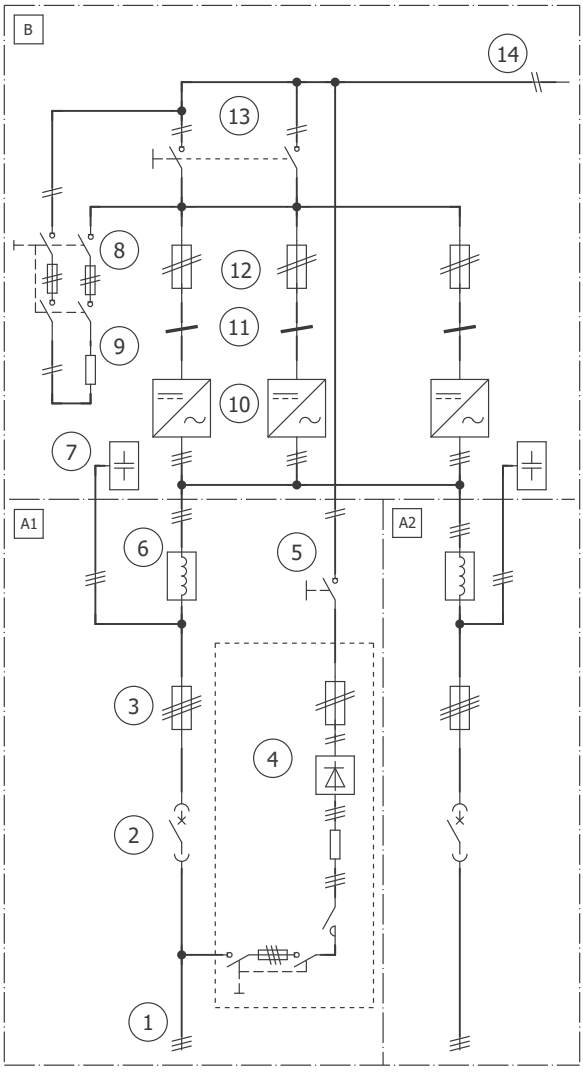
The following figure shows a connection example of a supply unit with multiple frame R8i modules (3×R8i).




| | |
|---|---|
| 1 | AC supply |
| A | Incoming cubicle |
| 2 | Main circuit breaker [Q1] |
| 3 | AC-DC charging kit (lineup charging) |
| 4 | DC switch-disconnector for lineup charging [Q40] |
| B | LCL filter cubicles |
| 5 | AC fuses [F3] |
| 6 | LCL filter kit |
| C | IGBT supply module cubicle |
| 7 | DC-DC charging kit (unit charging) |
| 8 | Resistors for DC-DC charging |
| 9 | IGBT supply modules (frame R8i) |
| 10 | Common mode filters [R1] |
| 11 | DC fuses [F2] |
| 12 | DC switch-disconnector [Q11] |
| 13 | DC link |

## Frame R8i multiples with CL filter

The following figure shows a connection example of a supply unit with 3×R8i modules and CL filter. Refer to section Cabinet configuration overview (page 63) for information on how to construct the cubicles in the cabinet lineup.




| | |
|---|---|
| 1 | AC supply |
| A1, A2 | Incoming and CL filter cubicles |
| 2 | Main circuit breaker [Q1] |
| 3 | AC fuses [F3] |
| 4 | AC-DC charging kit (lineup charging) |
| 5 | DC switch-disconnector for lineup charging [Q40] |
| 6 | Choke $L_{conv}$ of the CL filter |
| B | IGBT supply module cubicle |
| 7 | Capacitor of the CL filter |
| 8 | DC-DC charging kit (unit charging) |
| 9 | Resistors for DC-DC charging |
| 10 | IGBT supply modules (frame R8i) |
| 11 | Common mode filters [R1] |

| | |
|---|---|
| 12 | DC fuses [F2] |
| 13 | DC switch-disconnector [Q11] |
| 14 | DC link |

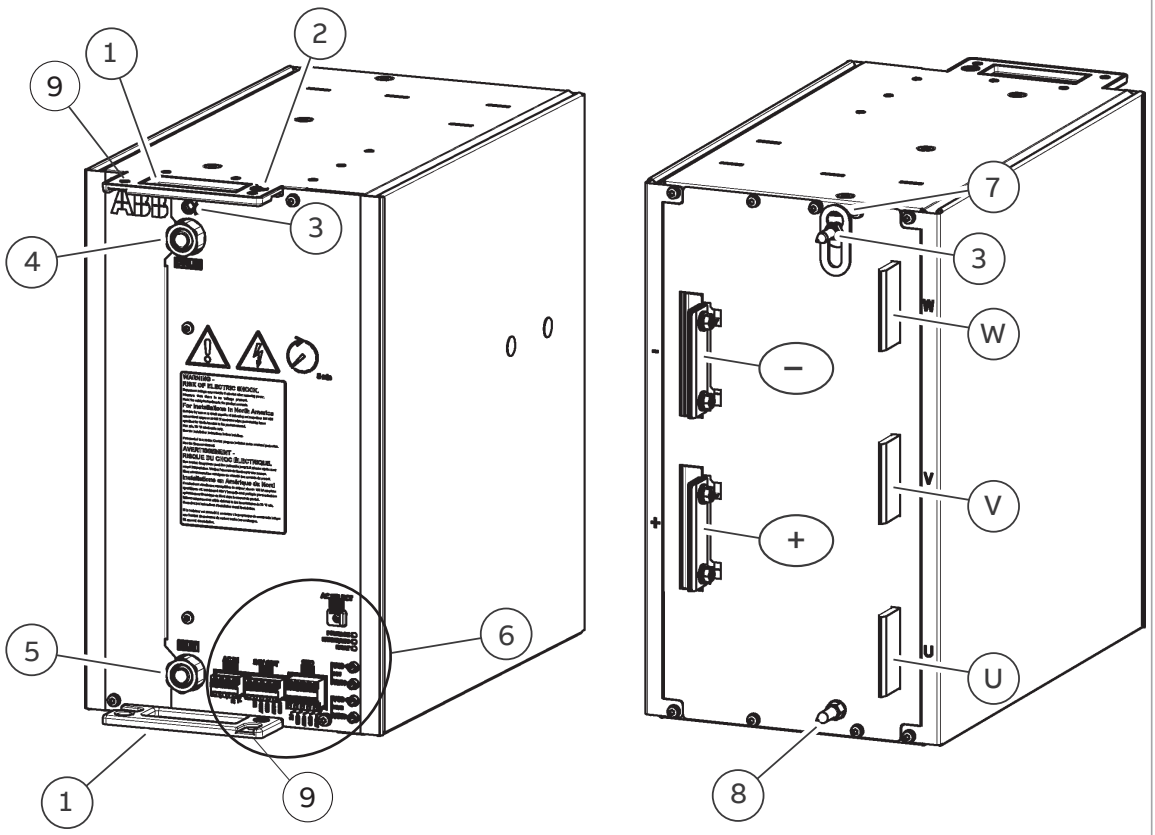
# IGBT supply module hardware

## Frame R7i hardware

Frame R7i modules are used in single or parallel module configurations. The R7i module is designed for mounting in an installation frame, which in turn is mounted into the cubicle. The AC and DC power connectors of the frame are bolted to busbars. When the module is inserted into the frame, the AC and DC power connections of the module engage with quick connectors in the frame. The module is secured by a locking screw that is accessible from the front.

The front cover plate of the module can be pulled out for access to the circuit board compartment without removing the module. This manual presents cubicle designs for one module.

### Module layout




| | |
|---|---|
| 1 | Handle |
| 2 | Lifting eye, front |
| 3 | Locking screw (for 6 mm hex key). Torque: 5 N·m (3.7 lbf·ft) maximum. |
| 4 | Coolant out connector |
| 5 | Coolant in connector |
| 6 | Connectors X50, X52 and X53; fiber optic connectors; LEDs; auxiliary voltage selector X59. |
| 7 | Lifting ring, rear |
| 8 | Guide pin |
| 9 | Unpainted fastening hole. The grounding point between module frame and cabinet frame. |

| | |
|---|---|
| +<br>– | DC connection busbars. The busbars engage with the quick connectors of the installation frame. |
| U<br>V<br>W | AC connection busbars. The busbars engage with the quick connectors of the installation frame. |

**Coolant connectors**

The coolant pipe inlet and outlet connectors are located at the bottom front and top front of the module respectively. The connectors are for 16/13 millimeter PA (polyamide) pipe.

**Installation frame**

See the dimension drawings.

**Connectors X50, X52 and X53; Auxiliary voltage selector X59**

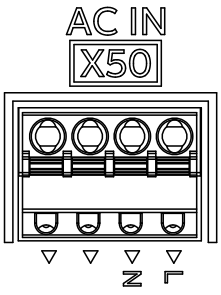
R7i modules contain a power supply board that provides 24 V DC for the circuit boards of the module. The 24 V DC voltage provided by the power supply board is also available on X53, and can be used to power the control unit of a single R7i module. An output power of 60 W is available from X53.

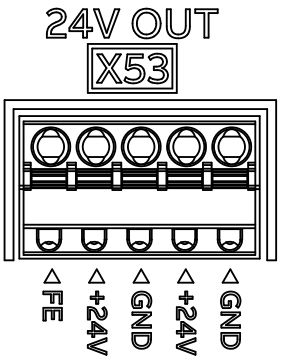
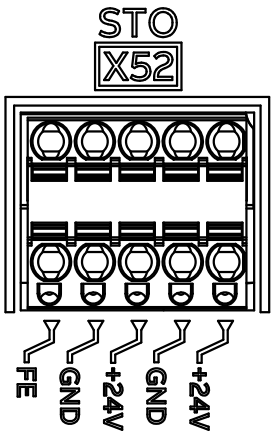
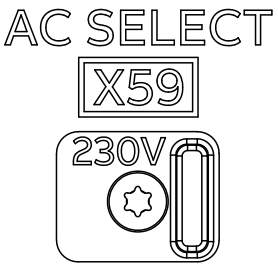
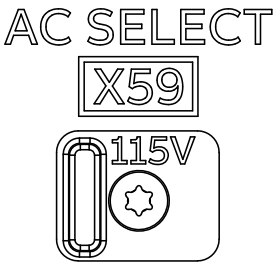
**Note:** With parallel-connected modules, it is strongly recommended to use an external 24 V DC supply to power the control unit.

An auxiliary voltage of 230 V AC or 115 V AC (selectable) must be connected to terminal block X50 to feed the power supply board of the module even when the DC bus is not live. The power supply board of the module is powered internally from the DC bus. Select between 115 V and 230 V with selector plug X59. The setting can be changed by removing the screw, moving the plug into the 115 V position, and reinstalling the screw.

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

The “24V” STO inputs on X52 must be connected to +24 V (on connector X53, for example) on each module. On a new module, a jumper wire set installed at the factory makes this connection.

| | |
|---|---|
|  | Auxiliary voltage input for internal power supply of module. Voltage selected by X59. |

| | |
|---|---|
|  | 24 V DC output (for eg. control unit) |
|  | STO connectors of the module. Must be connected to 24 V DC for the module to start. |
|  | Auxiliary voltage: 230 V AC |
|  | Auxiliary voltage: 115 V AC |

## Fiber optic connectors

| | | |
|---|---|---|
| Control unit connection. Must be connected by the installer. | V20<br>V10 |  |
| Charging controller connection. Must be connected by the installer. | V60<br>V50 |  |

**LEDs**

| LED | Color | Indication |
|---|---|---|
| FAULT | Continuous red | There is an active fault in the module. |
| ENABLE / STO | Continuous green | The module is ready for use. |
| ENABLE / STO | Continuous yellow | XSTO connectors are de-energized. |
| POWER OK | Continuous green | Supply voltage of the internal circuit boards is sufficient (> 21 V). |

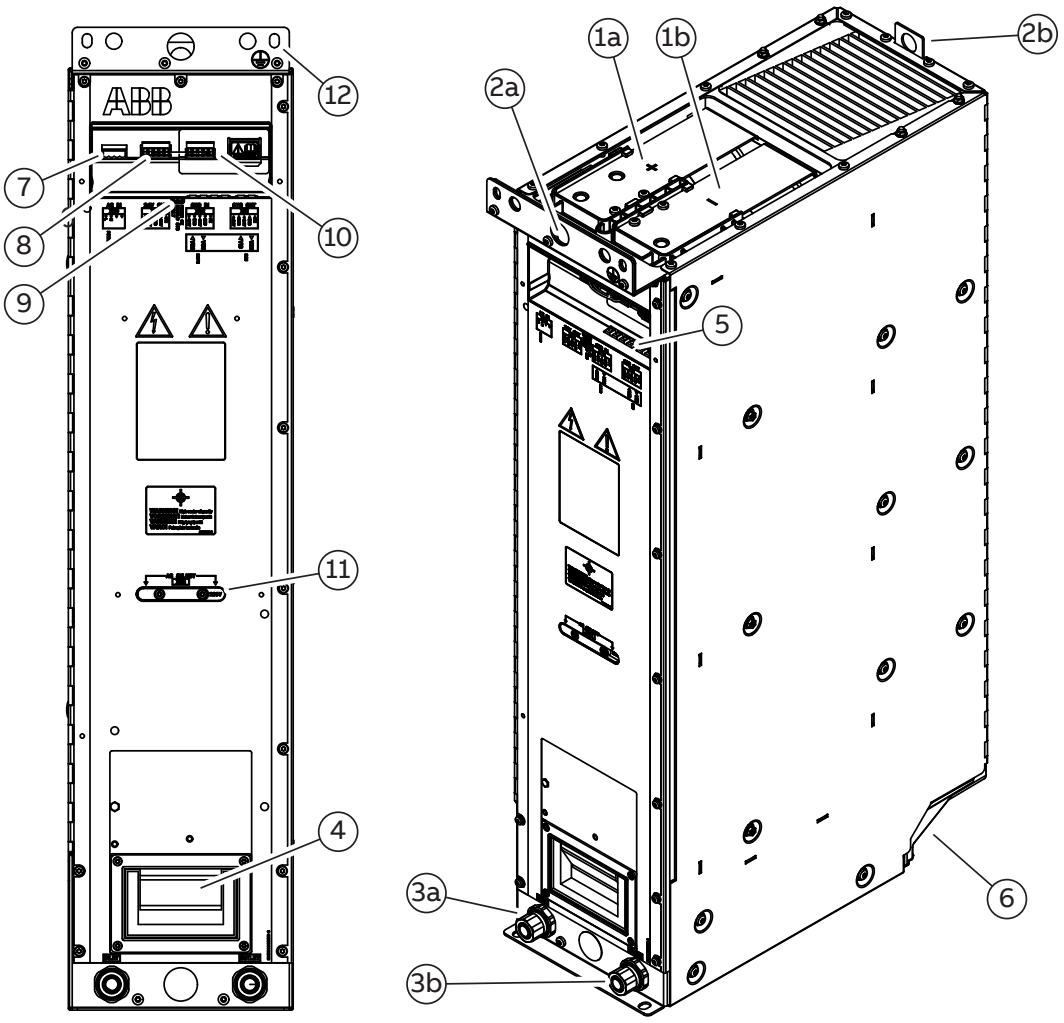
For LCL filter hardware, see chapter Cabinet construction.

## Frame R8i hardware

Frame R8i modules are used in single or parallel module configurations.

The DC connection of the module is by busbars and located at the top. The AC connection is via a quick connector at the back of the module that couples when the module is inserted into the cubicle.

### Module layout




| | |
|---|---|
| 1 | DC connection busbars, + (a) and - (b) |
| 2 | Lifting eyes, front (a) and back (b) |
| 3 | Coolant in (a) and out (b) connectors |
| 4 | Handle |
| 5 | Fiber optic connectors |
| 6 | Terminals for the quick connector (3-phase power connection). The quick connector is attached to the cabinet. |
| 7 | Terminal block X50 (auxiliary power input for internal boards) |
| 8 | Terminal block X53 (24 V DC power output) |
| 9 | Module LEDs |
| 10 | Terminal blocks X51 and X52 (Safe torque off in inverter modules only) |
| 11 | Auxiliary voltage selector X59 (115 or 230 V) |
| 12 | Unpainted fastening hole. The grounding point between the module frame and the cabinet frame. |

### Coolant connectors

The coolant pipe inlet and outlet connectors are located at the bottom front of the module. The connectors are for 16/13 millimeter PA (polyamide) pipe.

### Connectors X50...X59

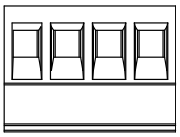
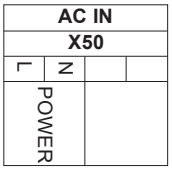
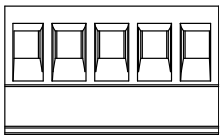
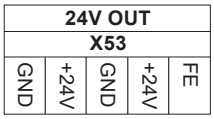
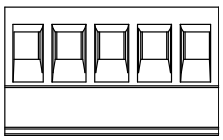
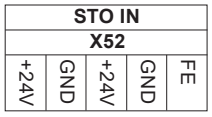
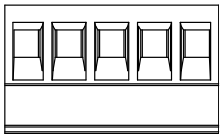
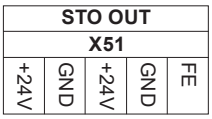
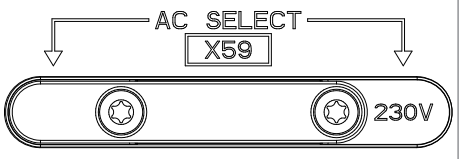
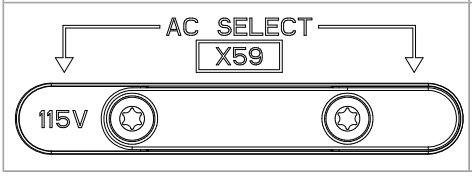
R8i modules contain a power supply (BDPS) that provides 24 V DC for the circuit boards of the module. The 24 V DC voltage provided by the BDPS is also available on X53, and can be used to power the control unit of a single R8i module. An output power of 60 W is available from X53.

**Note:** With parallel-connected modules, it is recommended to use an external 24 V DC supply to power the control unit.

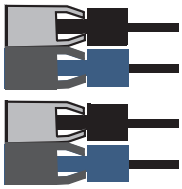
An auxiliary voltage of 230 V AC or 115 V AC (selectable) must be connected to terminal block X50 to power the BDPS even when the DC bus is not live. The BDPS is powered internally from the DC bus. Select between 115 V and 230 V with selector plug X59. The setting can be changed by removing the two screws, turning the plug 180 degrees, and reinstalling the screws.

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

The “24V” inputs on X52 must be connected to +24 V (on connector X53, for example) on each module. On a new module, a jumper wire set installed at the factory makes this connection.

| | | |
|---|---|---|
|  |  | Auxiliary voltage inputs for internal power supply (BDPS) |
|  |  | 24 V DC output (for eg. control unit) |
|  |  | STO connectors of the module. Must be connected to 24 V DC for the supply module to start. |
|  |  | Not in use. |
|  | | Auxiliary voltage: 230 V AC |
|  | | Auxiliary voltage: 115 V AC |

### Fibre optic connectors

| | | |
|---|---|---|
| Control unit connection. Must be connected by the installer. | V20 |  |
| | V10 | |
| Charging controller BSFC connection. Must be connected by the installer. | V60 | |
| | V50 | |

### LEDs

| LED | Color | Indication |
|---|---|---|
| FAULT | Continuous red | There is an active fault in the module. |
| ENABLE / STO | Continuous green | The module is ready for use. |
| ENABLE / STO | Continuous yellow | XSTO connectors are de-energized. |
| POWER OK | Continuous green | Supply voltage of the internal circuit boards is sufficient (> 21 V). |

### LCL and CL filter hardware

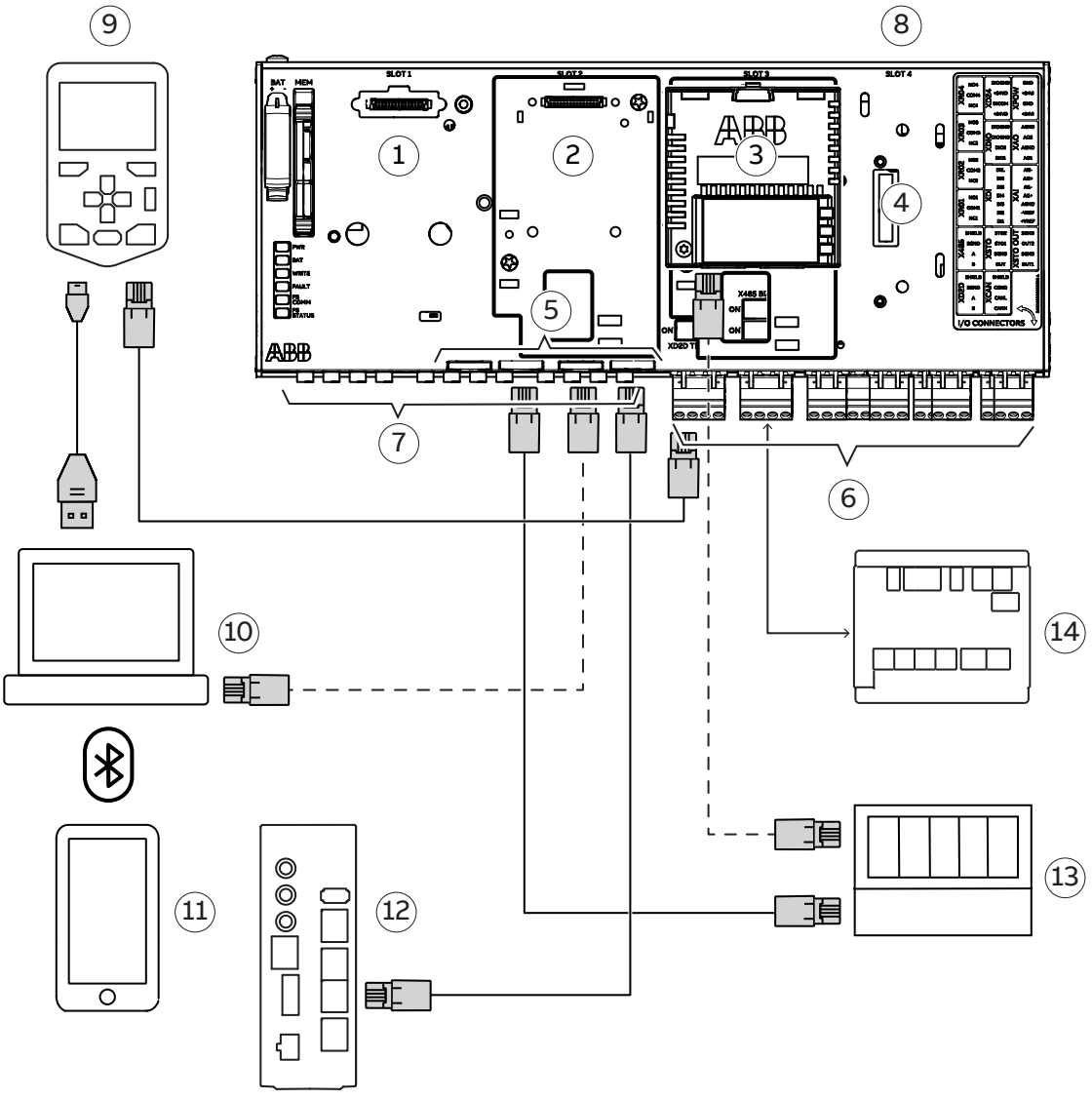
For LCL filter and CL filter hardware, refer to section Type designation key (page 45) and chapter Cabinet construction (page 51).

## Control interfaces

Frame R7i and R8i (and multiples, if any) modules are controlled by a single 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.

## Overview of the control connections of the UCU-22, UCU-23 and UCU-24 control unit

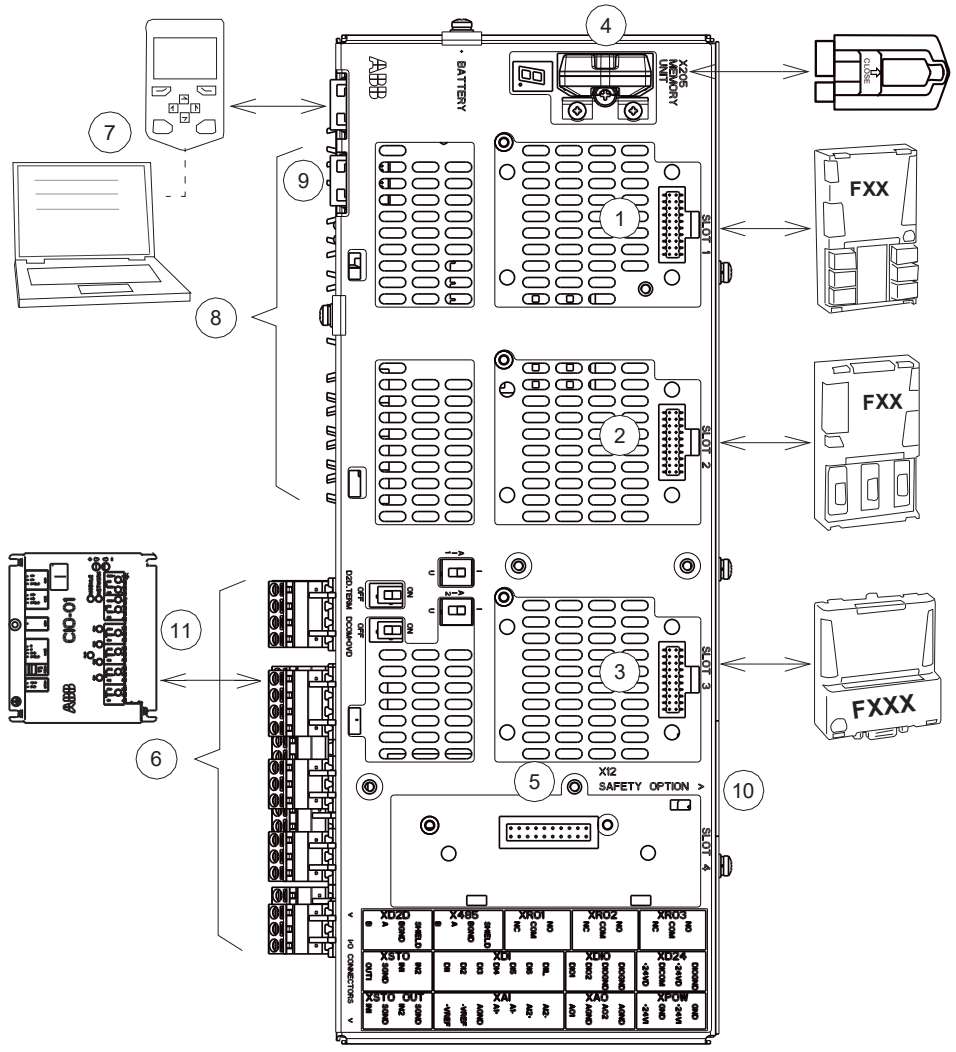
The diagram shows the possible control connections and interfaces of the UCU-22, UCU-23 and UCU-24 control units.




| | | | |
|---|---|---|---|
| 1<br>2<br>3 | Analog and digital I/O extension modules and fieldbus communication modules can be inserted into slots 1, 2 and 3. For F-type modules with USCA-02 adapter. | 9 | Control panel |
| 4 | Slot 4 for RDCO module | 10 | PC with Drive Composer |
| 5 | Ethernet ports | 11 | Mobile device with Drivetune |
| 6 | Terminal blocks | 12 | EGW-02 Connectivity Edge Gateway |
| 7 | Fiber optic links to power modules (inverter, supply, brake or converter) | 13 | Programmable logic controller |
| 8 | Safety option interface. Only in use for the inverter units. | 14 | Distributed I/O bus with CIO-01 modules for cooling fan monitoring and control (in use only if the fan speed control is in use). |

## Overview of the control connections of the BCU control unit

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




| | | | |
|---|---|---|---|
| 1<br>2<br>3 | Analog and digital I/O extension modules and fieldbus communication modules can be inserted into slots 1, 2 and 3. | 8 | Fiber optic links to power modules (inverter, supply, brake or converter) |
| 4 | Memory unit | 9 | Ethernet port. Not in use. |
| 5 | Slot 4 for RDCO module | 10 | Safety option interface. Only in use for the inverter units. |
| 6 | Terminal blocks | 11 | Distributed I/O bus with CIO-01 modules for cooling fan monitoring and control (in use only if the fan speed control is in use). |
| 7 | Control panel | | |

# Supply unit control devices

## Main disconnecting device

The unit must be equipped with a main circuit breaker [Q1], or main switch-disconnector and contactor. With this device, you can isolate the main circuit of the drive from the power line.



**⚠WARNING** The breaker does not isolate network side 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

The unit can be equipped with an auxiliary voltage switch. Using the switch, you can disconnect the auxiliary circuit from the power line.

## Operating switch

The cabinet can be equipped 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 circuit breaker / contactor [Q1] will be closed and the charging contactor [Q4] opened. The module starts operating.
- The OFF position: The control program opens the main circuit breaker [Q1] and the module stops rectifying.

## Emergency stop and emergency stop reset buttons

The cabinet can be equipped with an emergency stop button and an emergency stop reset button. 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 ACS880 liquid-cooled multidrives.

## Control panel [A59]

The control panel is the user interface of the unit. An example control panel is shown below.




With the control panel, the user 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 (control panel) and remote (external device) control.

The Loc/Rem key of the panel selects between the local and remote control modes.

## Lineup charging switch

The supply unit can be equipped with a charging switch for AC-DC lineup charging [Q3].

## Local charging control switch

The cabinet can be equipped with a local charging control switch [S4]. Position "1" enables closing of the DC switch-disconnector [Q11].

## DC switch-disconnector

The supply unit can be equipped with a DC switch-disconnector [Q11] which allows the isolation of the supply modules from the DC link. Before the unit is reconnected to the DC link, the capacitors of the supply module(s) must be charged through a unit charging circuit.

**Note:** If the unit consists of multiple supply module cubicles, each cubicle must be equipped with a DC switch-disconnector and unit charging circuit. The DC switch-disconnector controls only the supply modules within that particular cubicle.

### Charging switch for unit charging

Before closing the DC switch-disconnector [Q11], the user closes the charging switch for DC-DC unit charging [Q10]. After the precharging completes, the DC switch-disconnector [Q11] can be closed, and the charging switch [Q10] opened.

**Note:** The charging switch [Q10] must be opened before the supply unit can be started.



**⚠WARNING** Do not operate the DC switch-disconnectors under load.



**⚠WARNING** With frame n×R8i units, both the DC switch-disconnector [Q11] and the charging switch [Q10] must be opened in every cubicle containing supply modules to disconnect all modules from the DC link. In addition, DC switch-disconnector for lineup charging [Q40] must be opened.

### DC switch-disconnector for lineup charging

The supply unit can be equipped with a DC switch-disconnector for lineup charging [Q40]. DC switch-disconnector [Q40] is needed for isolating the lineup charging circuit from the DC link when the supply unit has the DC switch disconnector [Q11] and AC-DC lineup charging circuit.

### 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

To control the unit through a fieldbus interface, depending on the control unit, either:

- use an optional fieldbus adapter, or
- use the embedded control Ethernet interface.

For information on the available fieldbus protocols and parameters, refer to the firmware manual.

## Use of a CL filter instead of LCL filter

In some cases it is possible to use a CL filter instead of the LCL filter in the IGBT supply unit. The CL filter version of the unit is more compact. Note:

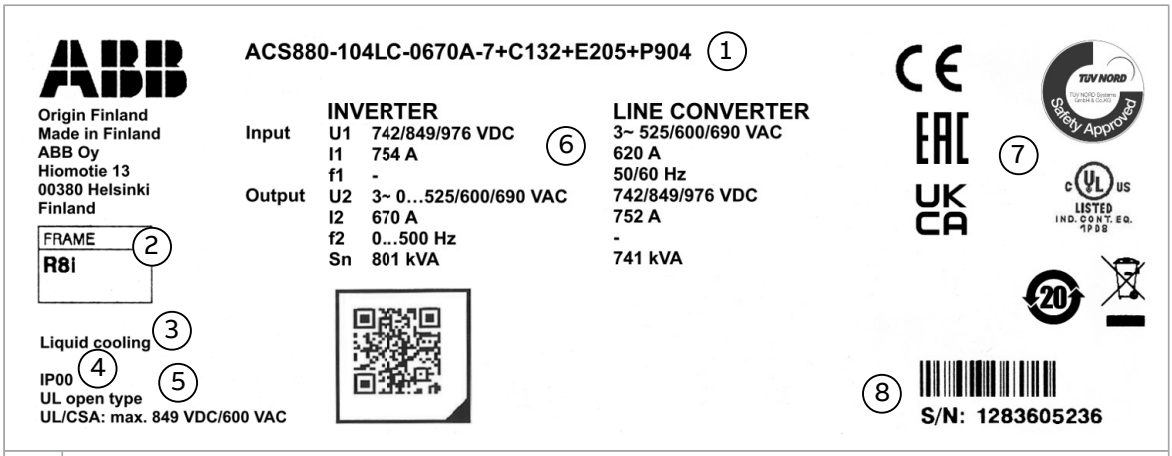
- It is possible to use the CL version only if the supply transformer's leakage reactance compensates the missing grid-side filter inductance of the LCL filter. Refer to chapter Guidelines for planning electrical installation.
- A CL filter version is available only for the supply units with the frame R8i supply module and its multiples.
- If you plan to use the CL filter version in a weak supply network, confirm the applicability from ABB. There are limitations. Refer to Use of CL filter in weak supply networks (page 47).

# Type designation labels

Each IGBT supply 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 module.

Example label is shown below.




| No. | Description |
|---|---|
| 1 | Type designation |
| 2 | Frame size |
| 3 | Cooling method |
| 4 | Degree of protection |
| 5 | UL/CSA data |
| 6 | Ratings |
| 7 | Valid markings. See ACS880 liquid-cooled multidrives cabinets and modules electrical planning (3AXD50000048634 [English]. |
| 8 | 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. |

# Type designation key

## IGBT supply module

Type designation describes the composition of the module in short. Note that in the type designation label of an IGBT supply module (ACS880-204LC), the type of the module is ACS880-104LC. The complete designation code is divided in subcodes:

- The first 1…20 digits form the basic code. It describes the basic construction of the unit. 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 following table lists the fields of basic code ACS880-204LC-0400A-7 as an example, and the plus codes of the IGBT supply module.

| CODE | DESCRIPTION |
|---|---|
| **Basic codes** | |
| ACS880 | Product series |
| 104LC | Construction: liquid-cooled IGBT supply module |
| **Size** | |
| 0400A | Refer to section Ratings (page 372). |
| **Voltage range** | |
| 3 | Input voltage range: 380…415 V AC. This is indicated in the type designation label as typical input voltage level (3~ 400 V AC). |
| 5 | Input voltage range: 380…500 V AC. This is indicated in the type designation label as typical input voltage levels (3~ 400/480/500 V AC). |
| 7 | Input voltage range: 525…690 V. This is indicated in type designation label as typical input voltage levels (3~ 525/600/690 V AC). |
| **Plus codes** | |
| For the plus codes, see chapter Ordering information. | |
| E205 | Frames 2×R7i…4×R7i: Internal du/dt filters<br>Frame R8i: Internal du/dt filters (When the module is used as an IGBT supply module, it must always be ordered with +E205.) |

## LCL filter

| CODE | DESCRIPTION |
|---|---|
| **Basic codes** | |
| BLCL | LCL filter for frame R7i or R8i IGBT supply module |
| **Size** | |
| 13LC, 14LC, 15LC, 24LC or 25LC | Refer to chapter Technical data. |
| **Voltage range** | |
| 5 | Voltage rating up to 500 V AC. This is indicated in the type designation label as typical input voltage levels (3~ 400/480/500 V AC). |
| 7 | Voltage rating up to 690 V AC. This is indicated in type designation label as typical input voltage levels (3~ 525/600/690 V AC, 600 UL, CSA). |

## CL filter

| CODE | DESCRIPTION |
|---|---|
| **Basic codes** | |
| BCL | CL filter for frame R8i IGBT supply module |
| **Size** | |
| 15LC, 24LC or 25LC | Refer to chapter Technical data. |
| **Voltage range** | |
| 7 | Voltage rating up to 690 V AC. This is indicated in type designation label as typical input voltage levels (3~ 525/600/690 V AC, 600 UL, CSA). |

# Weak supply networks

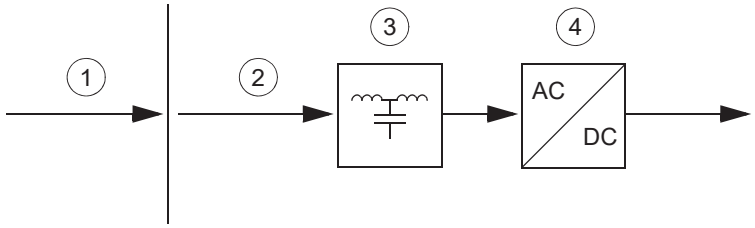
In weak supply networks with a short-circuit ratio less than 3, there is a risk of nuisance DC overvoltage trippings due to disturbances caused by high-voltage THD in the supply voltage. Short-circuit ratio is defined as the supply network's apparent short-circuit power $S_{k,net}$ divided by the drive's nominal apparent power $S_n$:

$SCR_{net} = S_{k,net} / S_n$, where

- $SCR_{net}$ = short-circuit ratio of the supply network
- $S_{k,net}$ = supply network's apparent short-circuit power
- $S_n$ = nominal apparent power of the drive.

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

- short-circuit ratio of the supply network $SCR_{net} > 3$
- short-circuit ratio of the generator $SCR_{gen} = 1/xk > 2$, where
  - xk = relative short-circuit reactance
- generator nominal power $P_{gen} > 0.3 \times P_{N,ISU}$, where
  - $P_{gen}$ = generator nominal power (output)
  - $P_{N,ISU}$ = typical power of the IGBT supply unit in no-overload use
- use active damping functionality. Refer to the firmware manual of the supply unit.




| | |
|---|---|
| 1 | Generator. $SCR_{gen} > 2$ |
| 2 | Supply network. $SCR_{net} > 3$ |
| 3 | LCL filter |
| 4 | IGBT supply module |

## Use of CL filter in weak supply networks

When the CL filter is used and the transformer is small (i.e. the inductance is high) in relation to converter's rated current, the tuning point of the filter will change to lower frequencies. This requires that the resonance frequencies of the filter circuit must be checked against the harmonics in the grid. In these cases, contact ABB for more information. Be prepared to present transformer nameplate information (e.g. transformer MVA, voltage class, frequency, percentage impedance) to ABB technical support.

3

# Moving and unpacking the module

## Contents of this chapter

This chapter gives basic information on unpacking and moving the module.

## Moving and unpacking the module



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

The modules are delivered on a wooden base, boxed in corrugated cardboard. The cardboard box is tied to the base with PET bands.

1. Cut the bands.
2. Remove the cardboard box.
3. Remove the filling material (if any).
4. Cut open the plastic wrapping of the module.
5. Remove the module.
6. Make sure that there are no signs of damage to the module.

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

If you need to pack the modules, see the package information in the technical data.

4

# Cabinet construction

## Contents of this chapter

This chapter gives instructions on how to install the modules and other equipment into a cabinet.

For general instructions, refer to 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 that 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.

### North America

Installations must be compliant with NFPA 70 (NEC)[1)] and/or Canadian Electrical Code (CE code), along with state and local codes for your location and application.

[1)] National Fire Protection Association 70 (National Electric Code).

## Switching, disconnecting and protecting solution

The installation examples in this manual show the construction of the filter and supply module cubicles. They do not contain the line-side switching, disconnecting and protection equipment of the drive, such as main contactor/breaker, etc. Install this equipment in the same cabinet lineup but outside the filter and supply module cubicles.

1. Install a main circuit breaker. If the circuit breaker cannot operate as the main disconnecting (isolating) device, install also a main disconnecting device before the circuit breaker. The circuit breaker available from ABB has the isolating function integrated (it is with-drawable).
2. Install the supply unit AC fuses.
3. Install AC-DC charging circuit (lineup charging).

For more information, refer to chapters Electrical installation and Example circuit diagrams.

## Installation and maintenance of the control unit

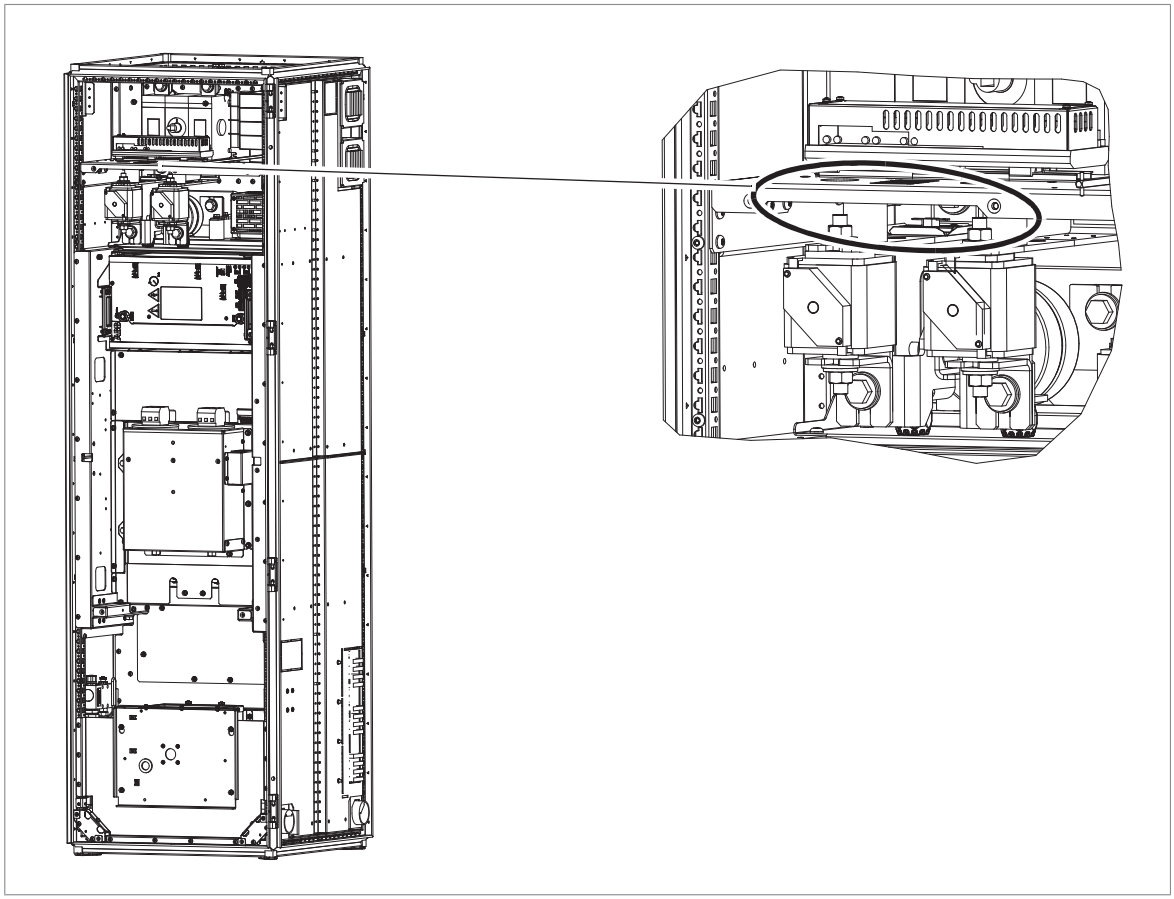
Refer to the hardware manual of the control unit:

| Manual | Code |
|---|---|
| UCU-22, -23, -24 hardware manual | 3AXD50000817726 (English) |
| BCU-02/12/22 hardware manual | 3AUA0000113605 (English) |

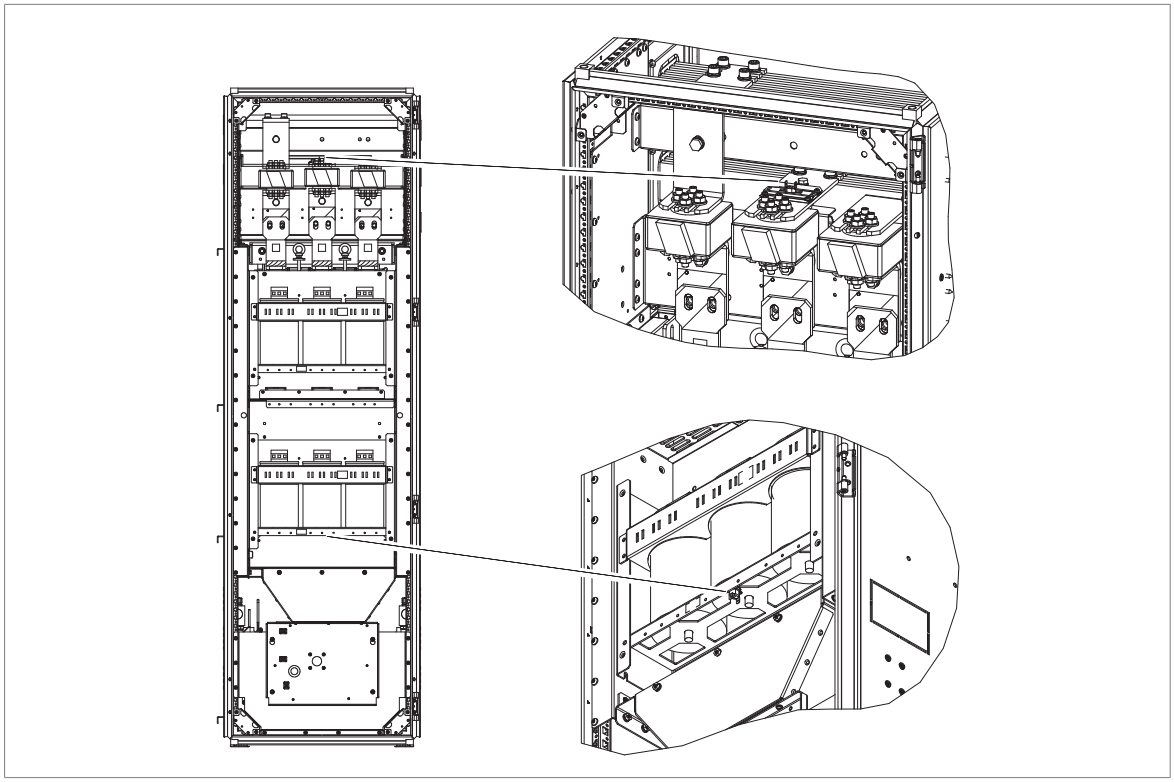
# Cabinet temperature supervision

You must ensure sufficient air flow inside the cabinet to cool down air-cooled components, such as fuses, busbars and filters. In liquid-cooled drive systems, the cabinet can be totally sealed from the ambient air. The air inside the cabinet must be able to circulate freely. You must install a fan inside the cabinet to push air through a heat exchanger. You must also ensure that the temperature inside the cabinet is monitored.

Frame R7i: You can use thermal switches to supervise the temperature inside the module cabinet. Install the thermal switches on the hottest element of the cabinet. In this example, the thermal switch is on the DC busbar above the DC fuses [F45.12]. ABB recommends to use thermal switch with 85 °C (185 °F) temperature limit. Make sure that components located in other cubicles are properly cooled.



Frame R8i and multiples with LCL filter: You can use thermal switches [F6.10…11] to supervise the temperature inside the filter cabinet. Install the thermal switches on the hottest element of the cabinet. In this example, the thermal switches are on the DC busbar above the AC fuses [F6.10] and below the LCL filter capacitors [F6.11]. ABB recommends to use thermal switch with 110 °C (230 °F) temperature limit for the AC fuses and thermal switch with 70 °C (158 °F) temperature limit for the LCL filter capacitors. Make sure that components located in other cubicles are properly cooled.

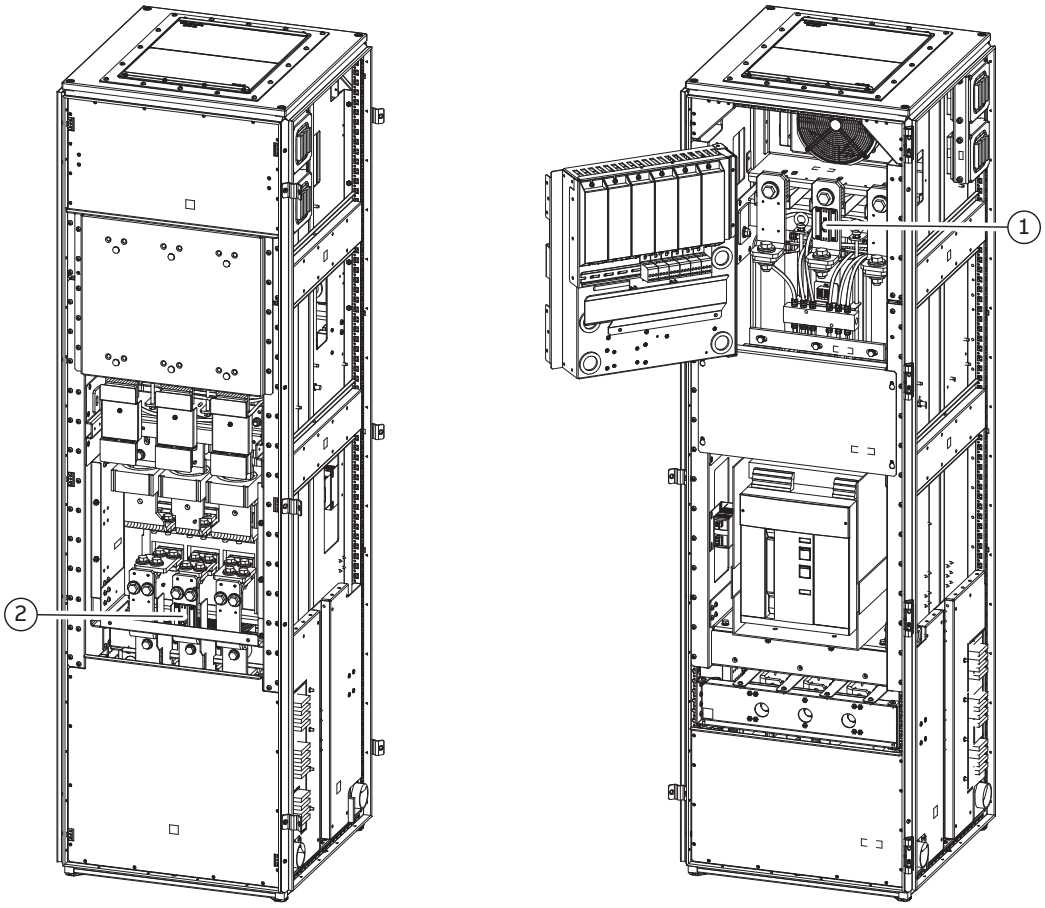


Wire the switches to a digital input (DI) of the supply control unit (1 = OK, 0 = overtemperature). In case of overtemperature, the switch opens and trips the supply unit on a fault. You can adjust the delay time by parameters. For the example wirings, see chapter Example circuit diagrams.

**Note:** If you install the switches on the busbars, make sure there is proper insulation between the busbars and thermal switches. The module has its own temperature supervision. Refer to the firmware manual of the supply unit.

Frame R8i and multiples with CL filter: You can use thermal switches [F6.11, F6.1] to supervise the temperature inside the filter cabinet. Install the thermal switches on the hottest element of the cabinet. In this example, the thermal switches are in the output of the choke of the CL filter [F6.11] and in the input of the main circuit breaker [F6.1]. ABB recommends to use thermal switch with 110 °C (230 °F) temperature limit for the output of the choke and thermal switch with 85 °C (185 °F) temperature limit for the input of the main circuit breaker. Make sure that components located in other cubicles are properly cooled.

Wire the switches to a digital input (DI) of the supply control unit (1 = OK, 0 = overtemperature). In case of overtemperature, the switch opens and trips the supply unit on a fault. You can adjust the delay time by parameters. For the example wirings, see chapter Example circuit diagrams.




| | |
|---|---|
| 1 | Thermal switch F6.11 |
| 2 | Thermal switch F6.1 |

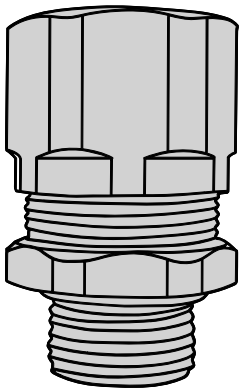
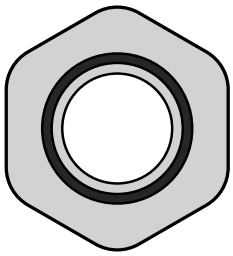
**Note:** If you install the switches on the busbars, make sure there is proper insulation between the busbars and thermal switches. The module has its own temperature supervision. Refer to the firmware manual of the supply unit.

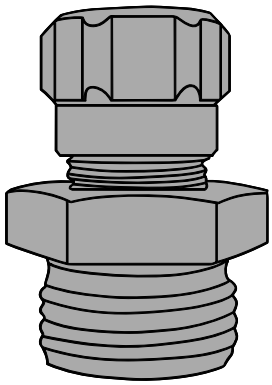
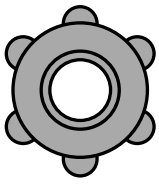
# Liquid pipe connector installation instructions

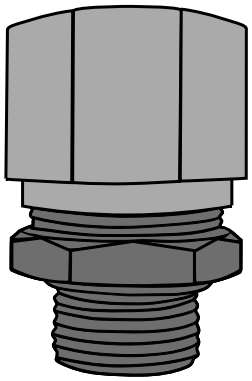
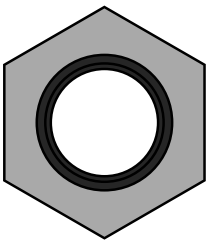
**⚠WARNING** Obey the safety instructions of the drive. If you ignore them, injury or death, or damage to the equipment can occur. If you are not a qualified electrical professional, do not do electrical installation, commissioning or maintenance work.

These instructions apply to the liquid pipe connectors that are used in ABB drives and converters. There are three types of pipe connectors: type A, type B and type C. Refer to the figures that follow. When you install a pipe connector, identify the connector type first. Obey the type-specific instructions carefully.

## Pipe connector types

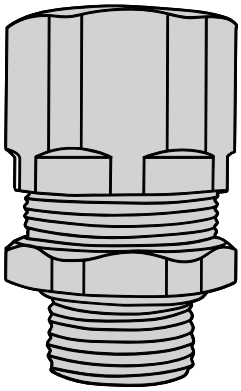
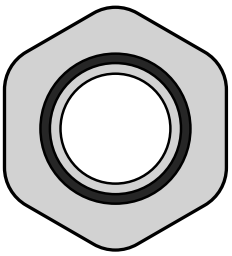
| **Type A pipe connector**<br>**Thread size: G 3/8"** | |
|---|---|
|  |  |

| **Type B pipe connector**<br>**Thread size: G 1/4" or G 3/8"** | |
|---|---|
|  |  |

| Type C pipe connector<br>Thread size: G 3/4" | |
|---|---|
|  |  |

## Installing type A pipe connector

This section is applicable to type A pipe connectors.

| | |
|---|---|
|  |  |

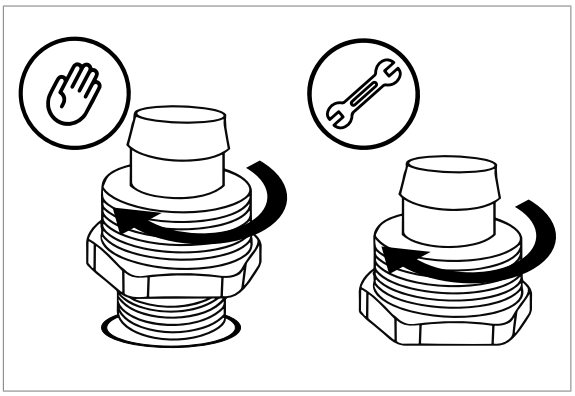
Reserve these tools and materials at hand:

- O-ring lubricant compatible with EPDM and polyurethane materials
- torque wrench.

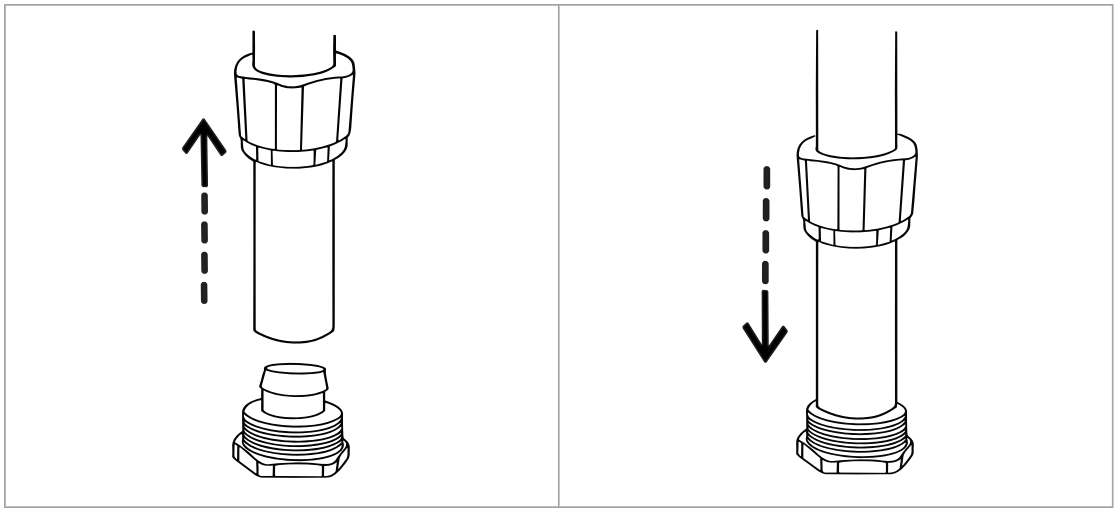
Installation procedure:

1. Do the steps in Electrical safety precautions (page 192) before you start the work.
2. Make sure that the pipe connector has an O-ring.
3. Lubricate the O-ring.

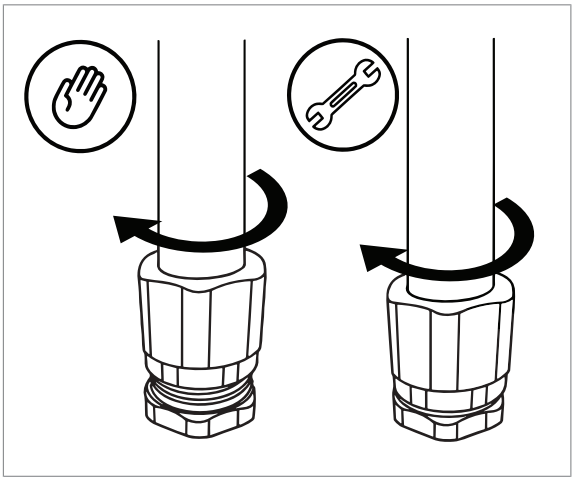
4. Put the pipe connector base carefully onto the threads and start to turn it in by hand. Tighten the pipe connector base to 30 N·m (22.1 lbf·ft).



5. Push the locking ring onto the pipe. Then push the pipe onto the pipe connector base and pull down the locking ring. Make sure that the pipe is perpendicular to the pipe connector base.

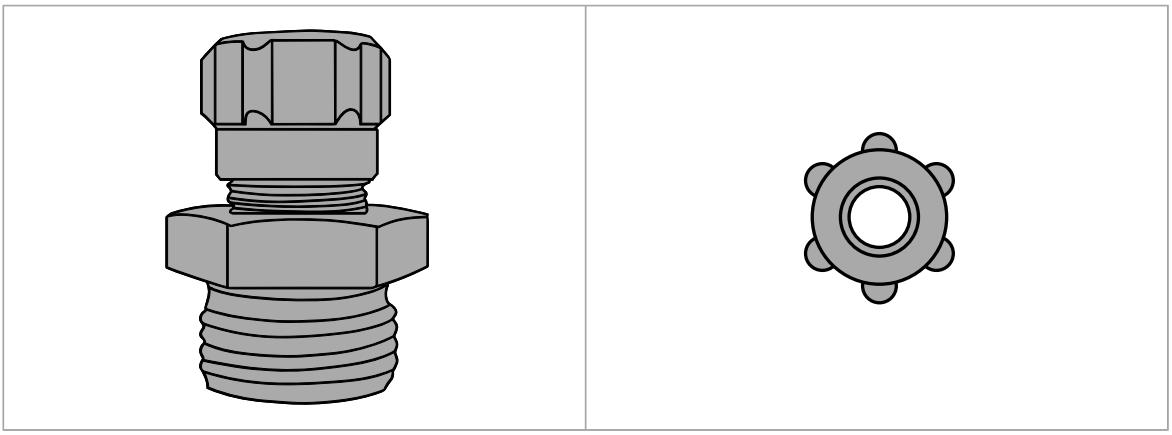


6. Start to turn the locking ring by hand. Tighten the locking ring with a torque wrench to 20 N·m (14.8 lbf·ft).



## Installing type B pipe connector

This section is applicable to type B pipe connectors.

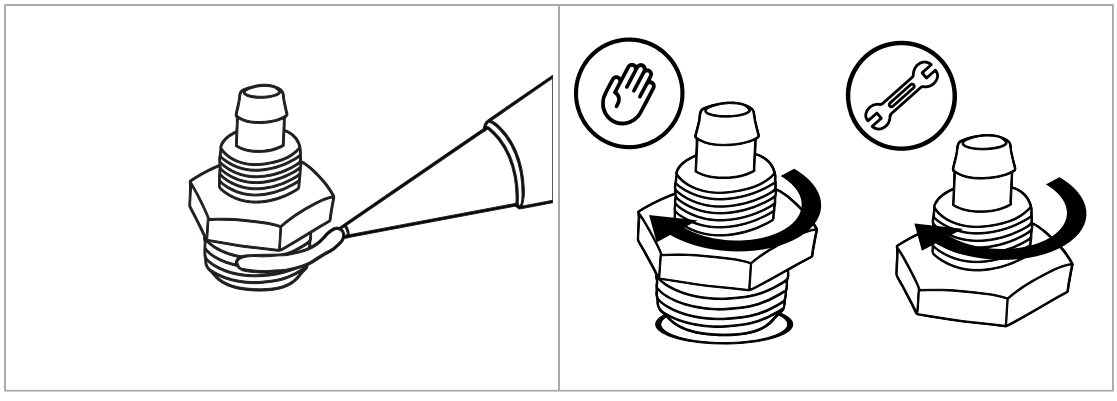


Reserve these materials and tools at hand:

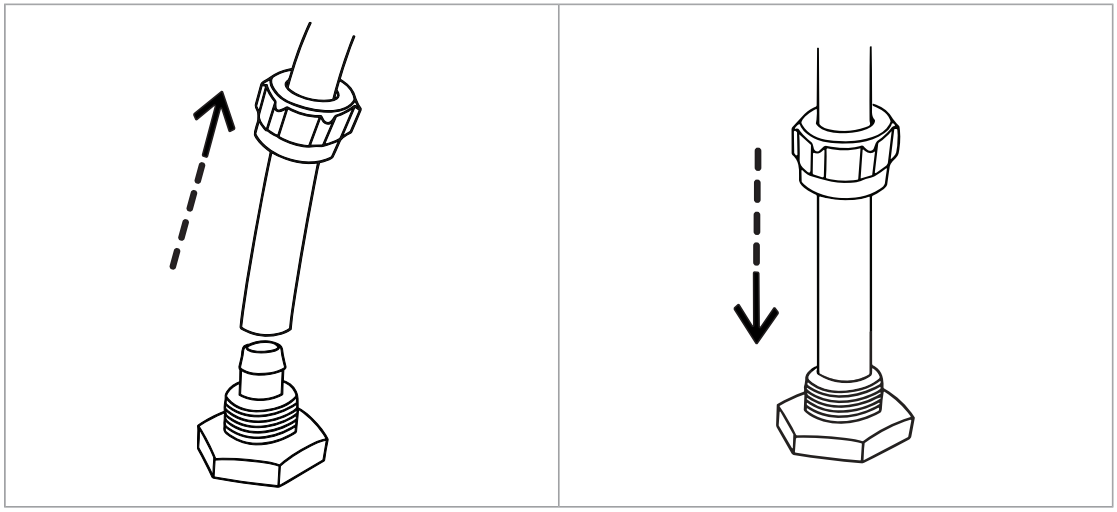
- Loctite® 2700 threadlocker. If Loctite 2700 is not available, use an equivalent threadlocker.
- torque wrench
- adjustable pliers.

Installation procedure:

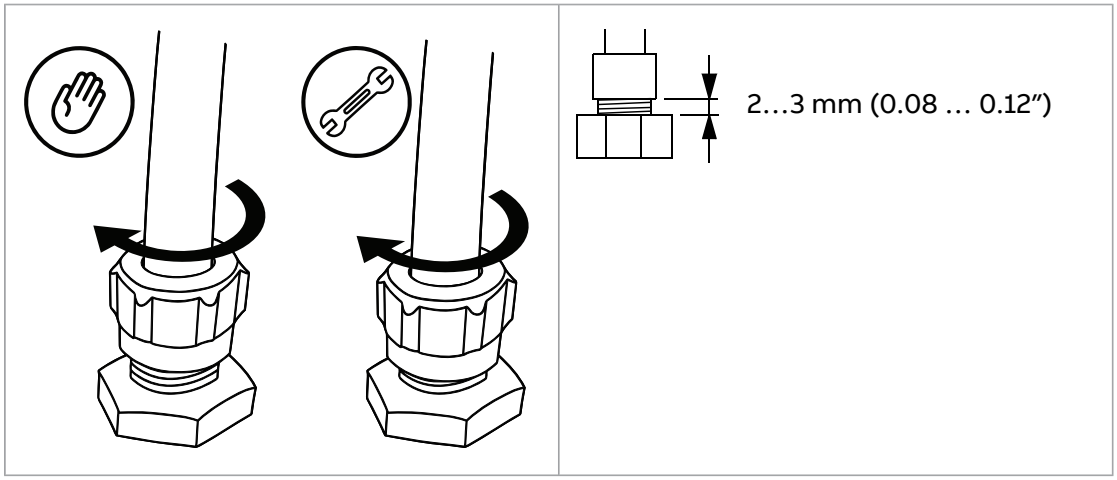
1. Do the steps in Electrical safety precautions (page 192) before you start the work.
2. If the pipe connector has an O-ring, remove and discard the O-ring.
3. Apply threadlocker to the threads of the pipe connector base. Always add the threadlocker onto the outer thread. This prevents the threadlocker from entering the cooling circuit.
4. Put the pipe connector base carefully onto the threads and start to turn it in by hand. Tighten the pipe connector base to 20 N·m (14.8 lbf·ft). Wipe out extra threadlocker.



5. Push the locking ring onto the pipe. Push the pipe onto the pipe connector base and pull down the locking ring. Make sure that the pipe is perpendicular to the pipe connector base.



6. Start to turn the locking ring by hand. Tighten the locking ring with adjustable pliers. Leave 2…3 mm thread visible.

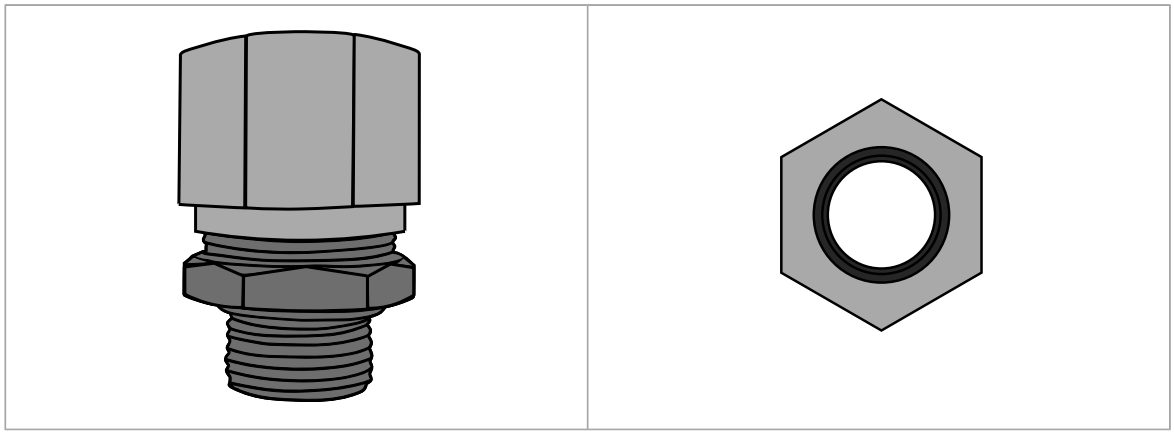



**NOTICE** Do not tighten the locking ring of the pipe connector too much. It can cause damage to the pipe.

7. Let the threadlocker dry completely before you fill the cooling circuit. The drying time for Loctite 2700 is 24 hours at room temperature.

## Installing type C pipe connector

This section is applicable to type C pipe connectors.

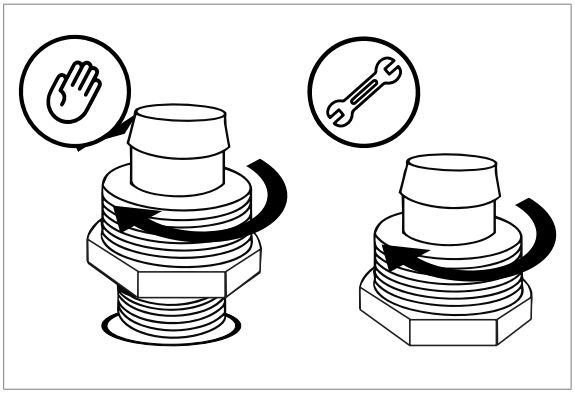


Reserve these tools and materials at hand:

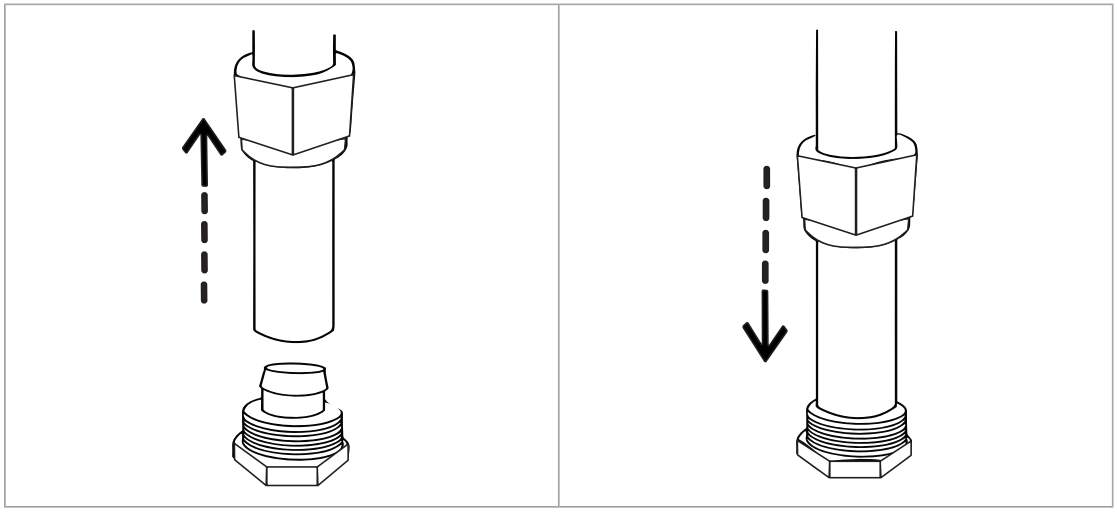
- O-ring lubricant compatible with EPDM and polyurethane materials
- torque wrench.

Installation procedure:

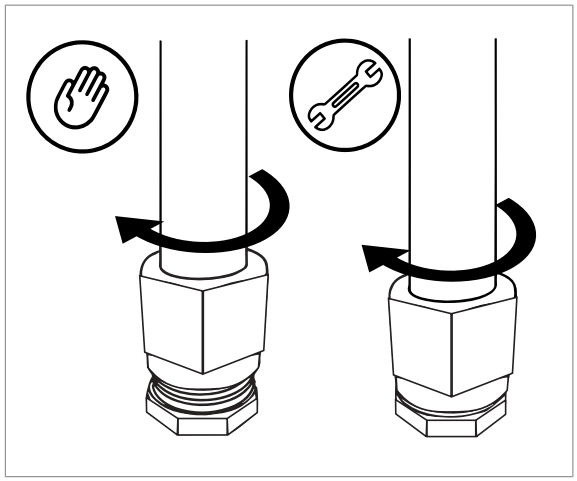
1. Do the steps in Electrical safety precautions (page 192) before you start the work.
2. Make sure that the pipe connector has an O-ring.
3. Lubricate the O-ring.
4. Put the pipe connector base carefully onto the threads and start to turn it in by hand. Tighten the pipe connector base to 60 N·m (44.2 lbf·ft).



5. Push the locking ring onto the pipe. Then push the pipe onto the pipe connector base and pull down the locking ring. Make sure that the pipe is perpendicular to the pipe connector base.



6. Start to turn the locking ring by hand. Tighten the locking ring with a wrench.



**NOTICE** Do not tighten the locking ring of the pipe connector too much. It can cause damage to the pipe.

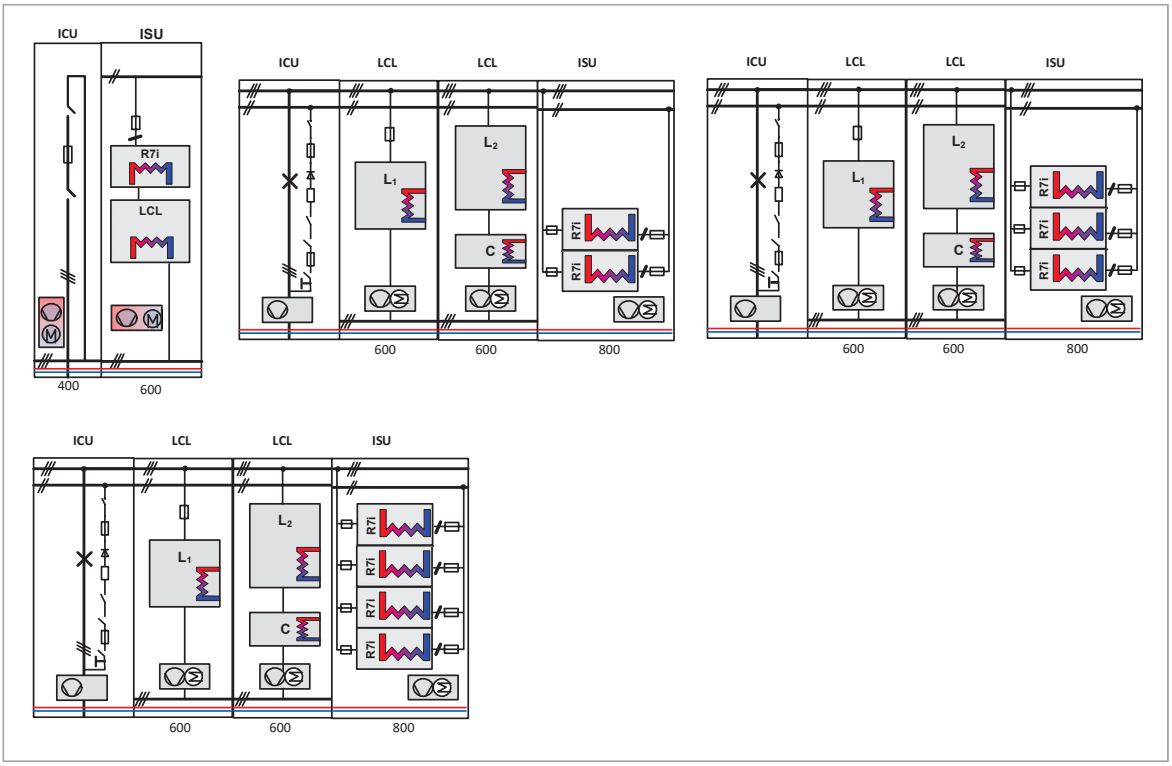
# Cabinet configuration overview

## Frame R7i supply modules and LCL filter

The following figures show examples of ACS880-204LC (frame R7i) configurations with LCL filter.

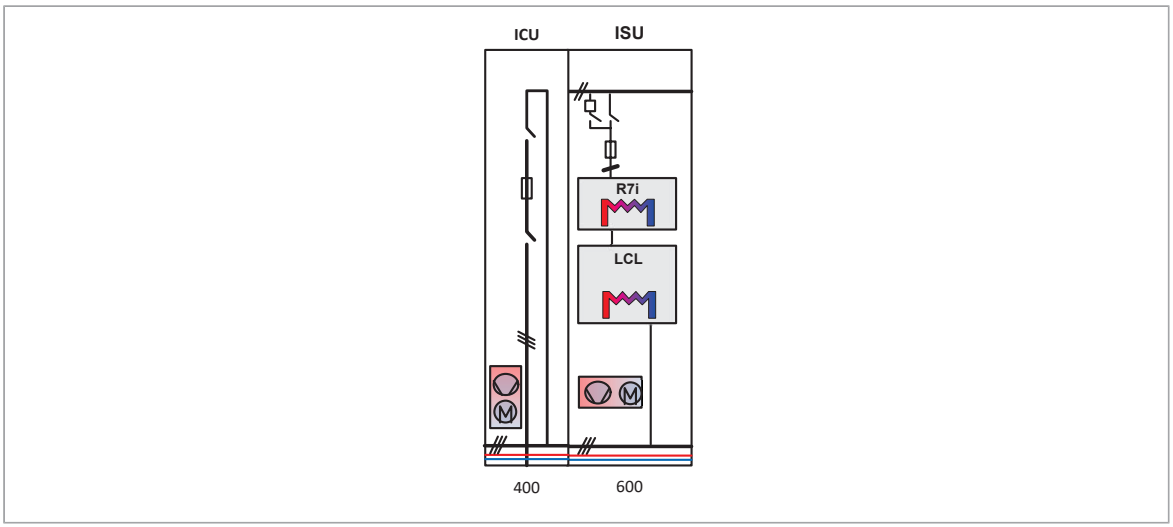
### Frames 1×R7i … 4×R7i (IEC/UL, fuse only)

**Note:** 2×R7i…4×R7i are special configurations with limited support for mechanical installation.



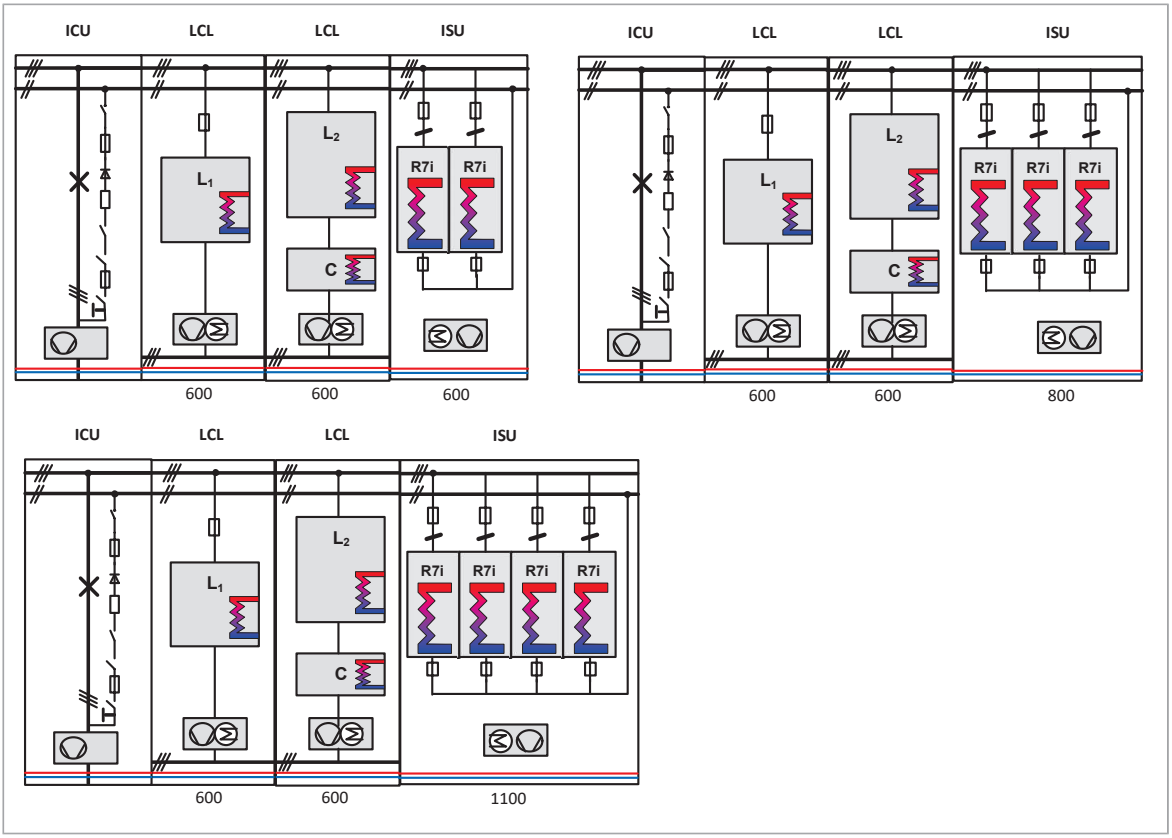
**Frames 1×R7i (IEC/UL, DC switch)**

Note: 2×R7i…4×R7i are not available with DC switch.



### Frames 2×R7i … 4×R7i (IEC/UL, fuse only, horizontal, generic)

**Note:** 2×R7i…4×R7i are special configurations with limited support for mechanical installation.



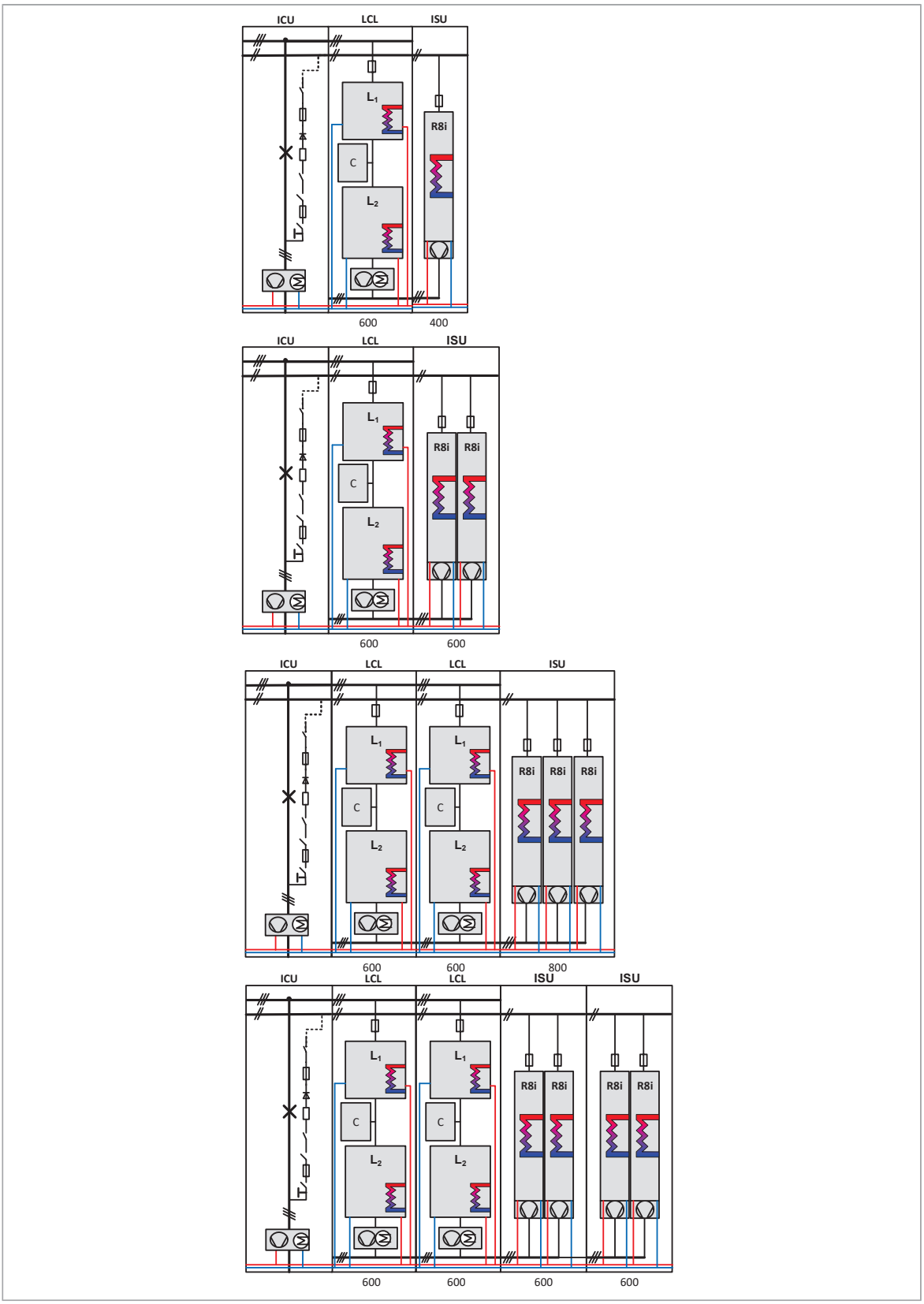
## Frame R8i supply modules and LCL filter

The following figures show examples of ACS880-204LC (frame R8i) configurations with LCL filter.

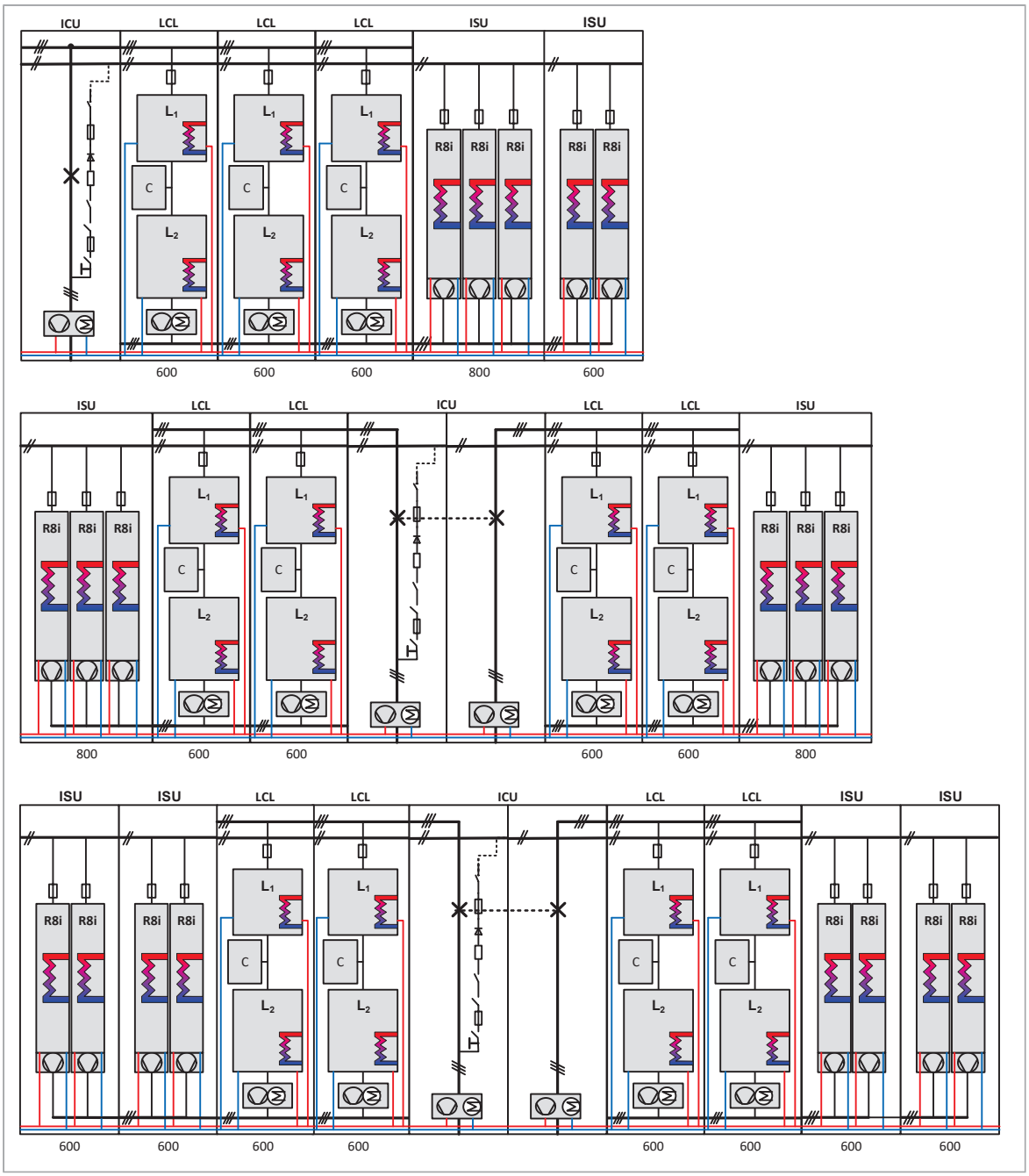
For the high-power units, make sure that each common busbar section can carry its expected load. Refer to Drive modules cabinet design and construction instructions (3AUA0000107668 [English]).

**NOTICE** It may not be possible to build high power supply units (4×R8i or bigger) with Rittal Flat-PLS60 busbars. This limitation can apply even if you divide the load current into two parallel paths, and install supply modules both on the right side and on the left side of the incoming cubicle. The combined load of the four R8i modules can be more than the maximum current-carrying capacity of the Rittal Flat-PLS60 busbars. Contact ABB for more information.

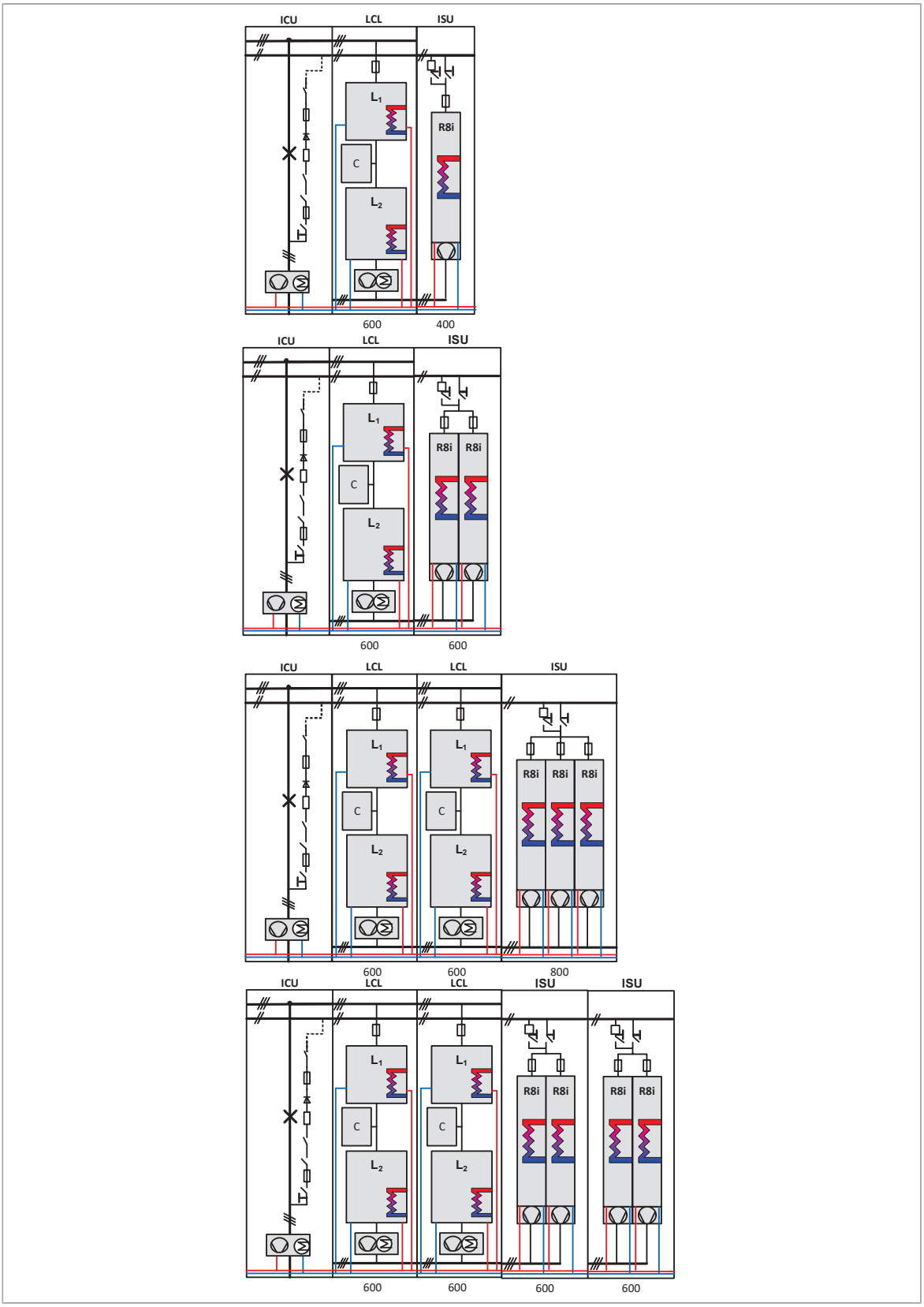
## Frames 1×R8i ... 4×R8i (IEC, fuse only)



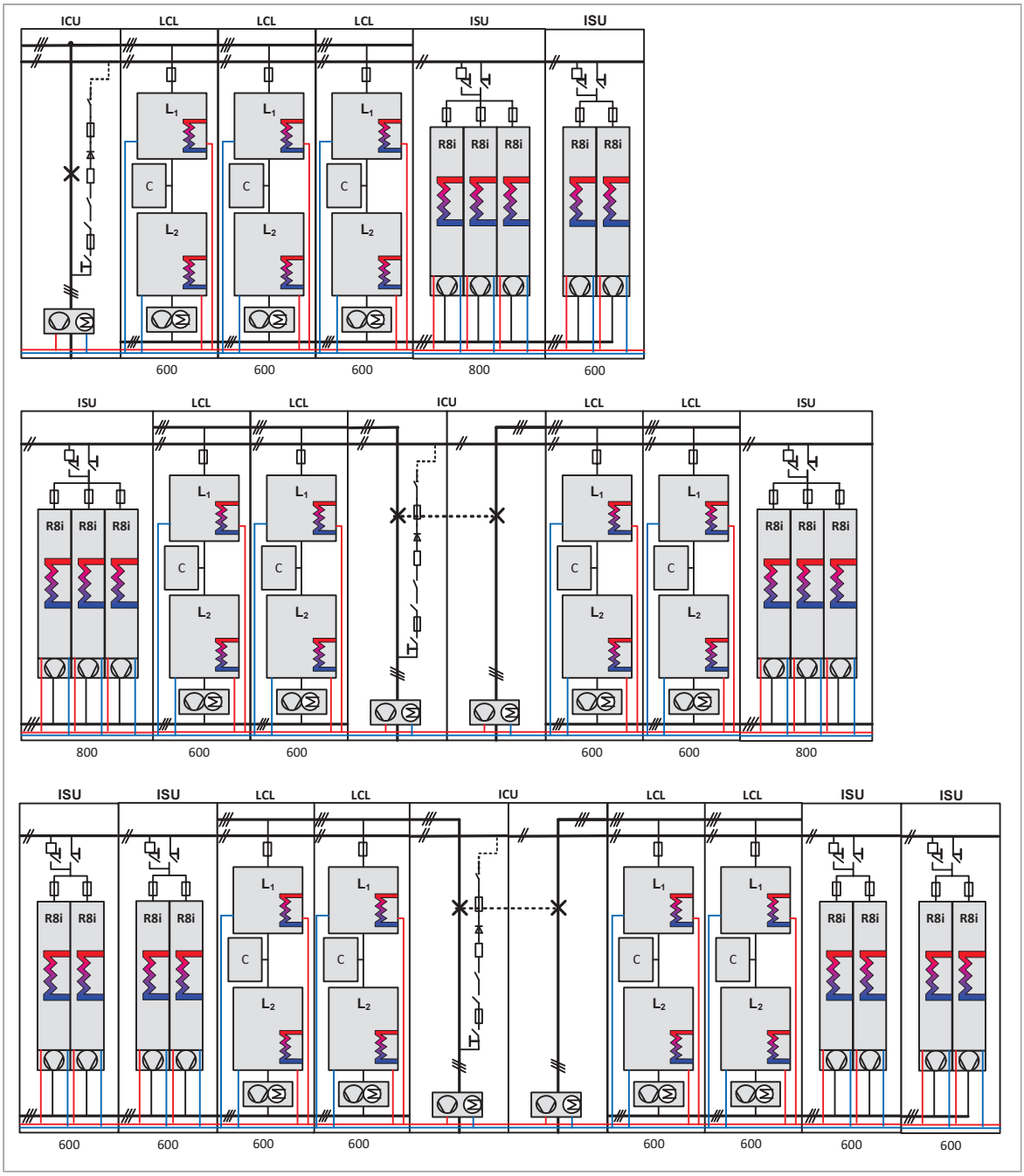
## Frames 5×R8i, 6×R8i, 8×R8i (IEC, fuse only)



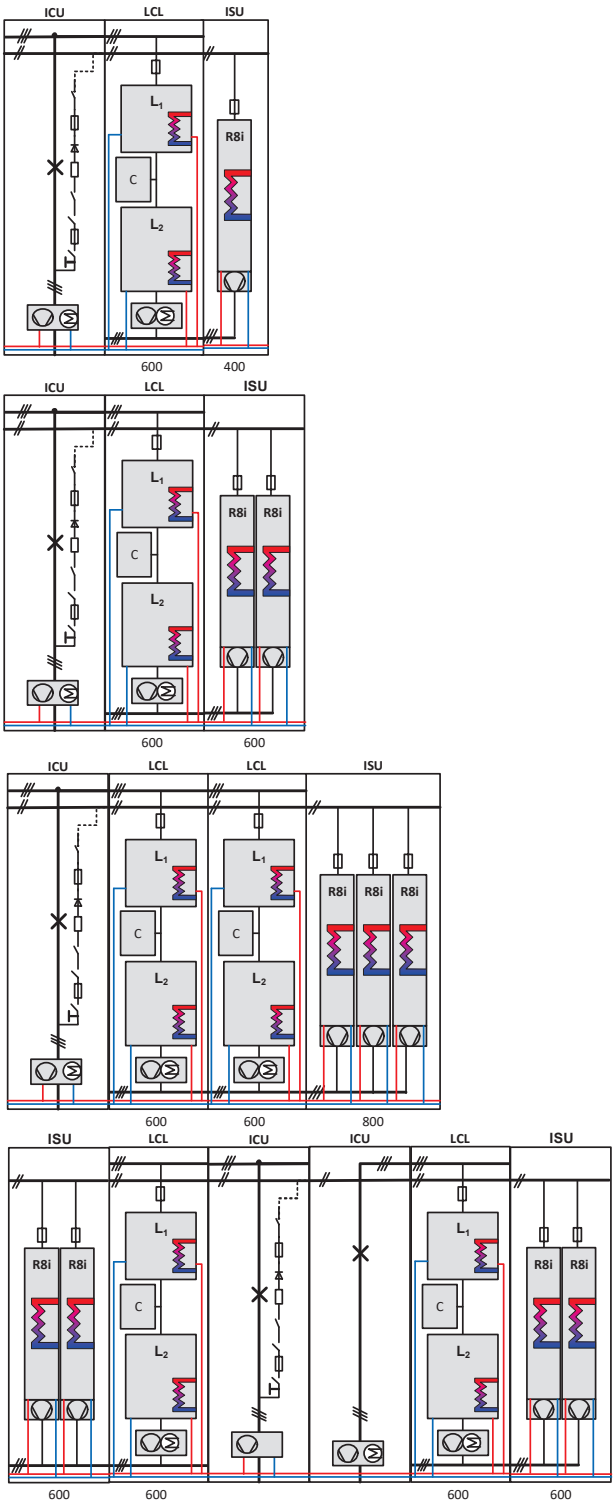
## Frames 1×R8i ... 4×R8i (IEC, DC switch)



## Frames 5×R8i, 6×R8i, 8×R8i (IEC, DC switch)



## Frames 1×R8i … 4×R8i (UL, fuse only)



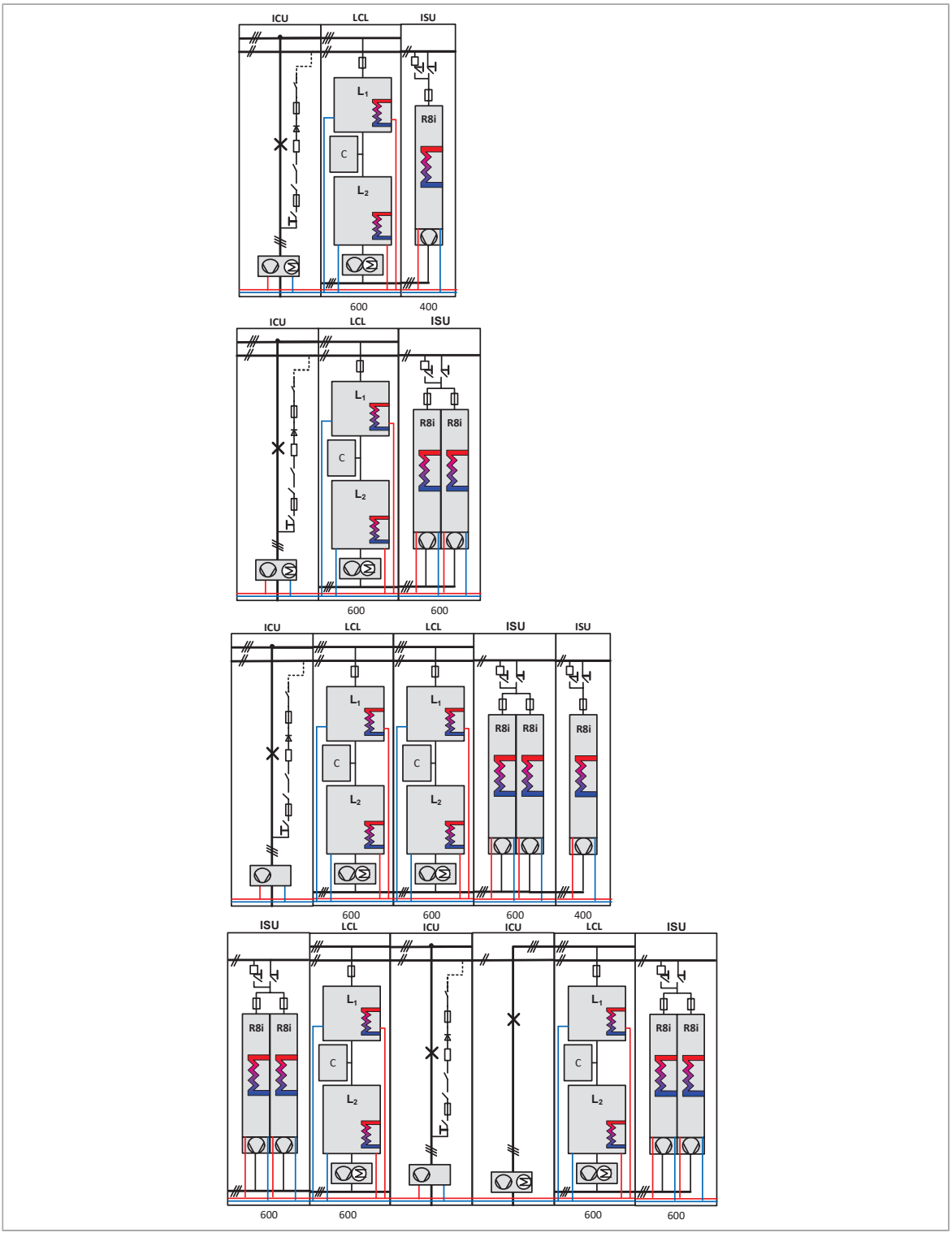
### Frames 5×R8i, 6×R8i, 8×R8i (UL, fuse only)

**Note:** Main circuit breaker EMAX2 is not available for 5×R8i UL version.



### Frames 1×R8i … 4×R8i (UL, DC switch)

**Note:** 3×R8i in one cubicle is not available for UL with DC switch.



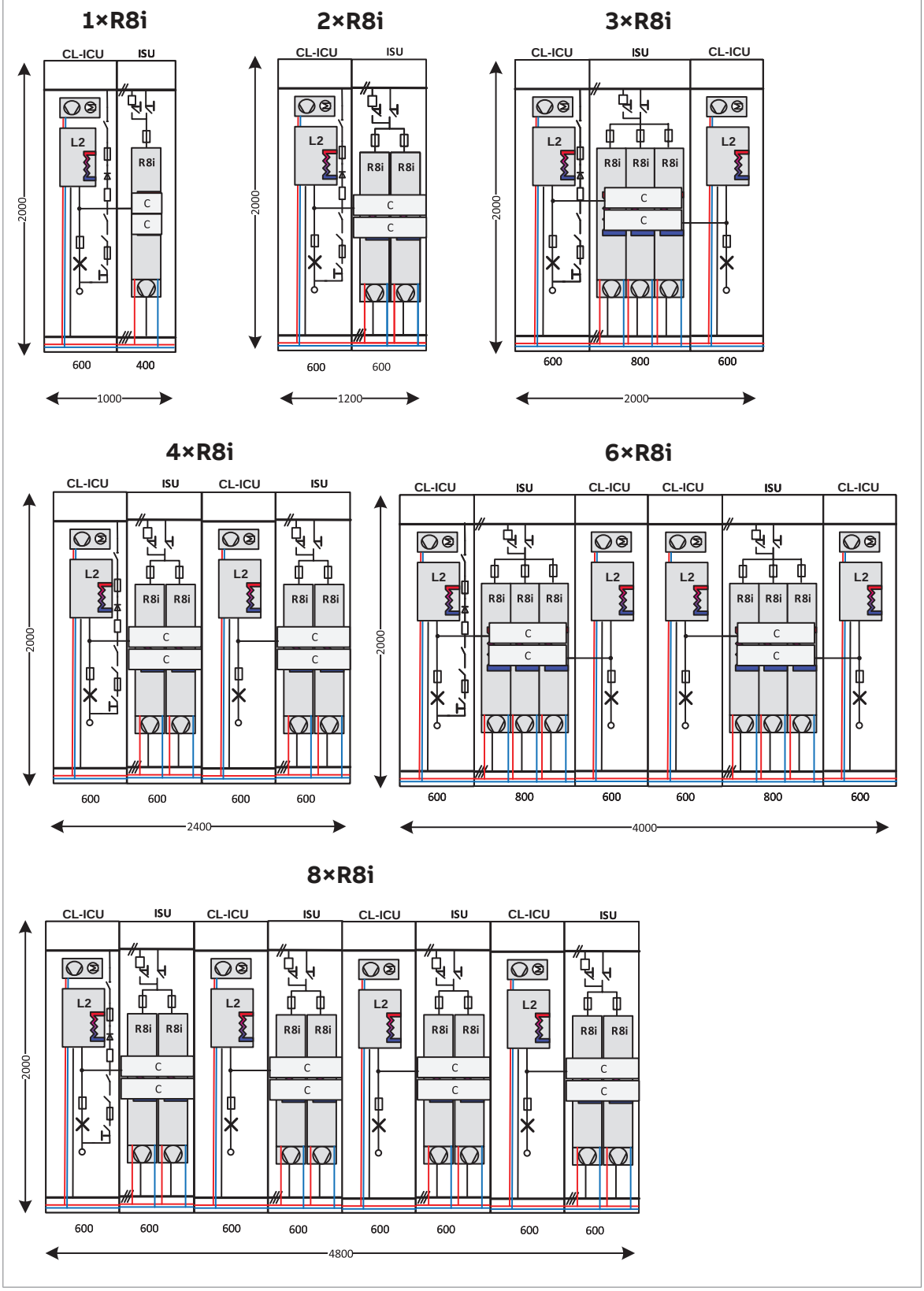
### Frames 5×R8i, 6×R8i, 8×R8i (UL, DC switch)

**Note:** Main circuit breaker EMAX2 is not available for 5×R8i UL version.



## Frame R8i supply modules and CL filter

The following figures show examples of ACS880-204LC configurations with CL filter (IEC, DC switch).



## Abbreviations

| Abbreviation | Description |
|---|---|
| ISU | IGBT supply module cubicle (in this context only, otherwise it means IGBT supply unit) |
| ICU | Incoming cubicle |
| LCL | LCL filter |
| CL-ICU | Incoming and CL filter cubicle |

# Installation examples

This section contains cabinet construction examples. Each example presents the cubicle with the power modules and related main circuit components. These examples do not show the installation and connections of the control unit, or other components in the control circuit or auxiliary power supply circuit.

Each example includes a table with:

- installation stages of the different equipment in the correct installation order
- instruction code of the step-by-step instructions
- equipment kit code
- kit ordering code.

For the kit-specific assembly drawings, step-by-step instructions and kit information, go to https://sites-apps.abb.com/sites/lvacdrivesengineeringsupport/content. If necessary, contact your local ABB representative.

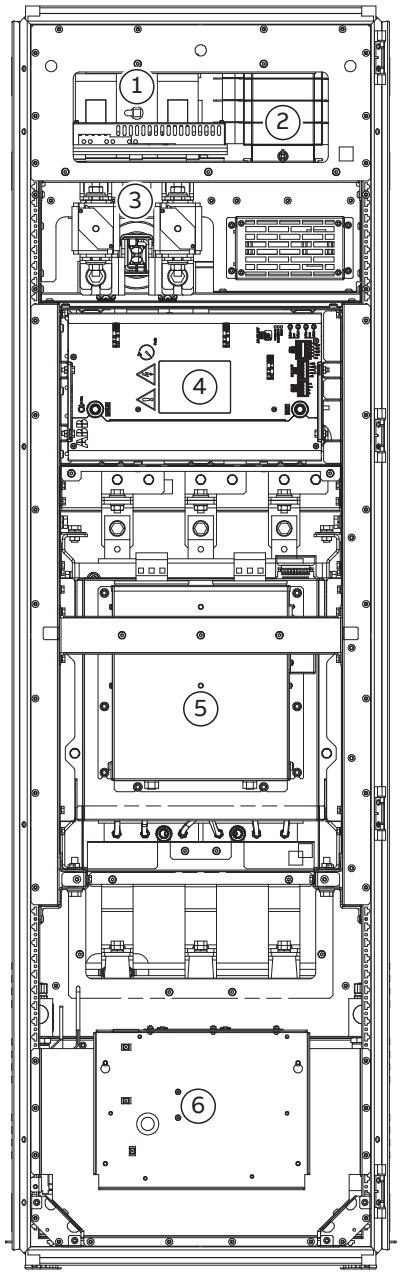
The example includes cabinet assembly drawings that show each stage listed in the table. More detailed steps of each stage are described in the kit-specific assembly drawings. The tightening torques are listed in the kit-specific assembly drawings and in the technical data in the hardware manual.

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

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

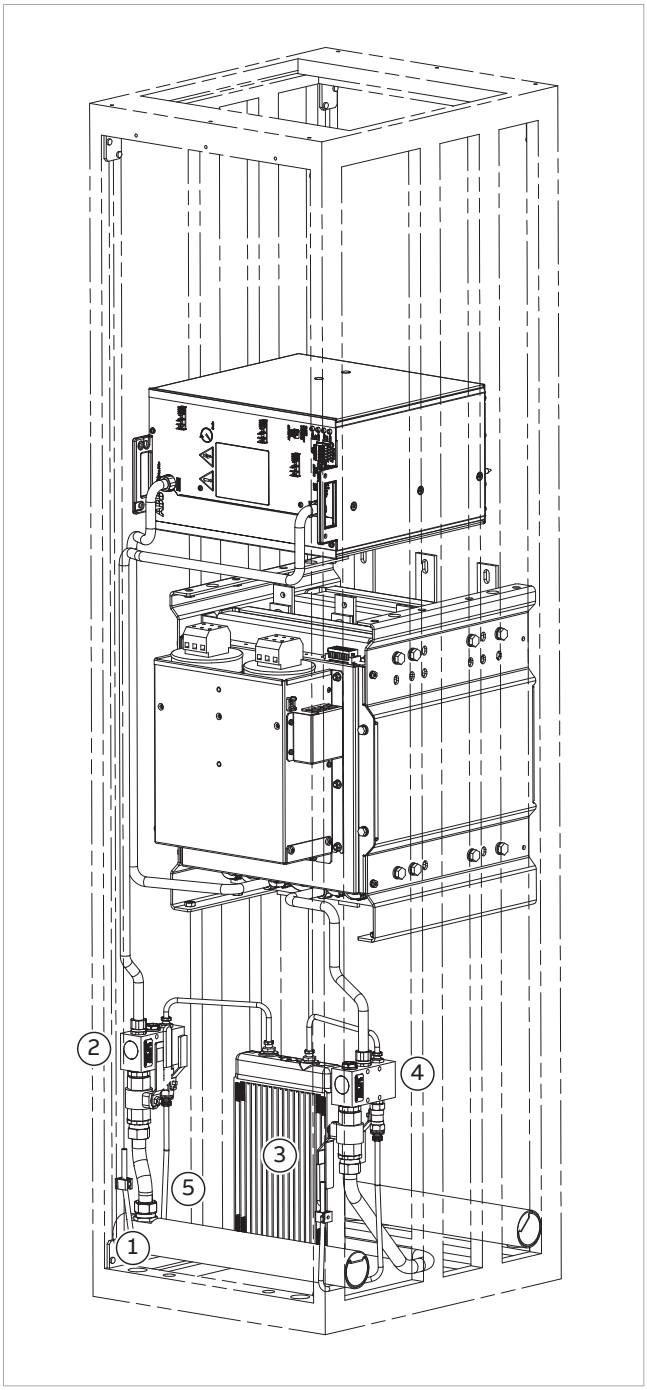
## ■ One R7i module and BLCL-13LC-7 or BLCL-14LC-5 LCL filter in a 600 mm wide Rittal VX25 enclosure

### Layout drawing




| No. | Description |
|---|---|
| 1 | DC switch |
| 2 | Charging circuit disconnector |
| 3 | DC fuses |
| 4 | IGBT supply module of frame size R7i (on its side) |
| 5 | LCL filter |
| 6 | Fan |

### Pipe routing example



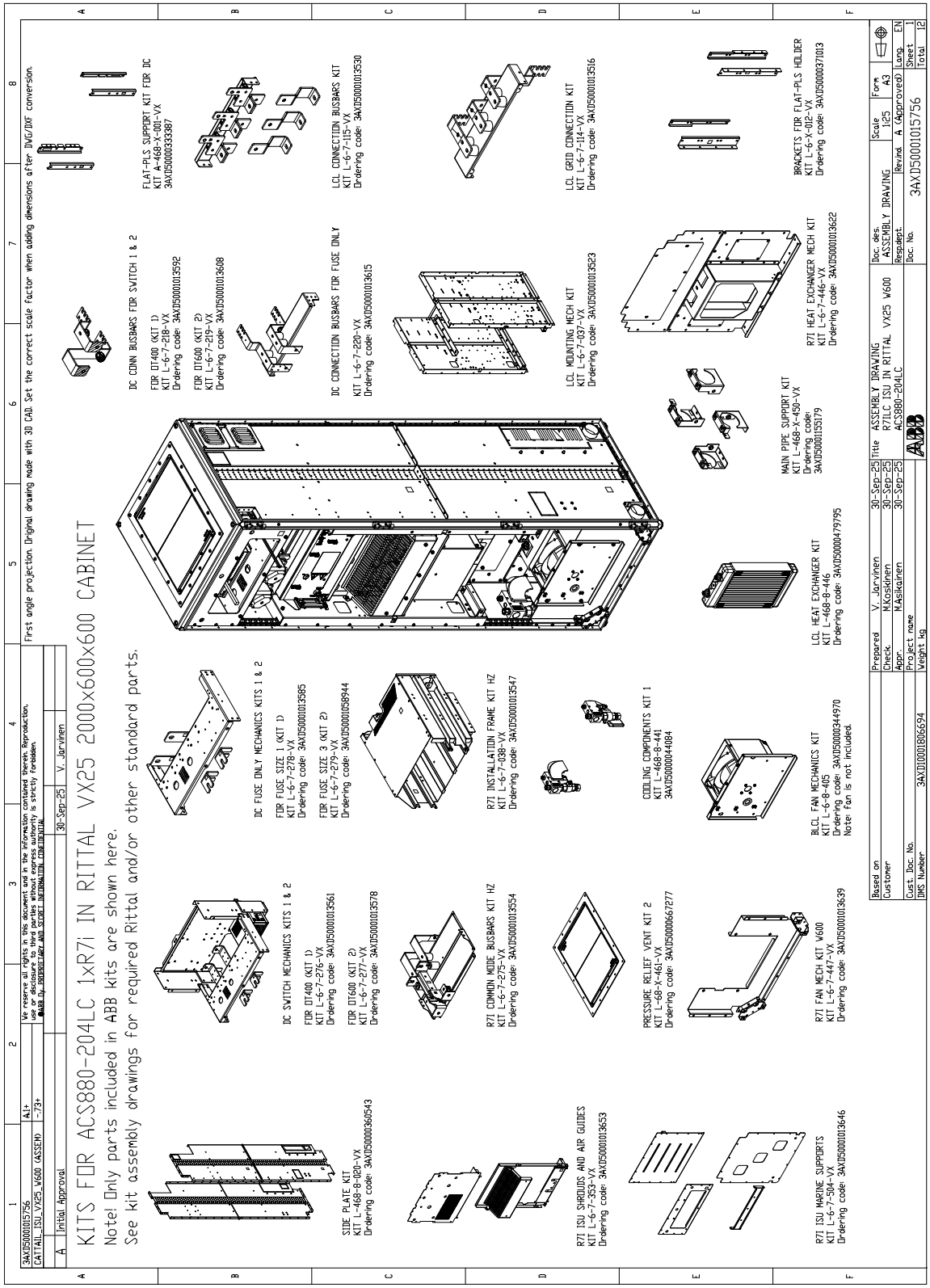

| No. | Description |
|---|---|
| 1 | Coolant in |
| 2 | Inlet manifold with stop and drain valves |
| 3 | Heat exchanger |
| 4 | Outlet manifold with stop and drain valves |
| 5 | Coolant out |

Thicker pipe is of type 16/13 and thinner pipe of type 8/6.

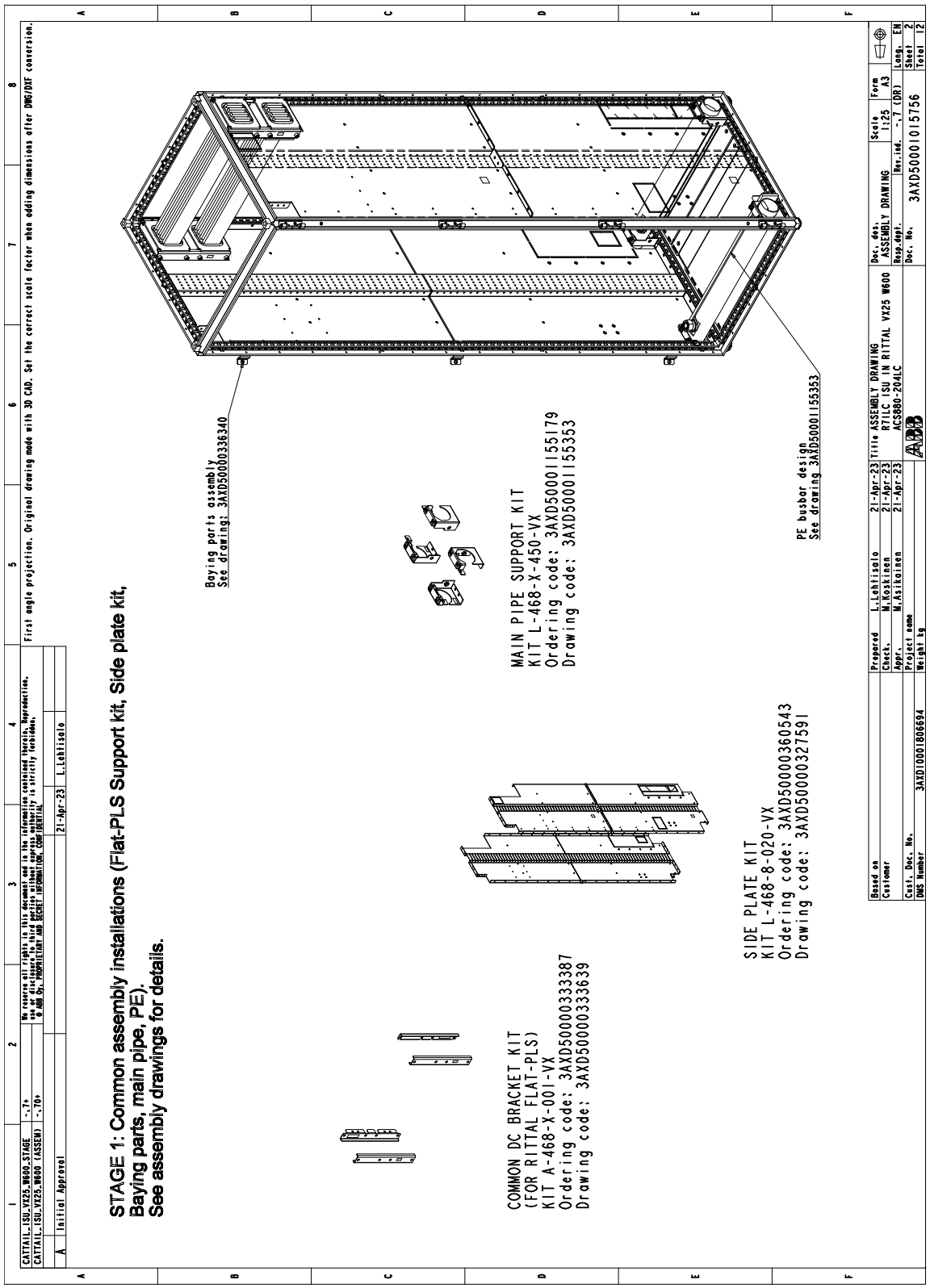
## Installation stages

| No. | Installation stage | Instruction code | Kit code | Kit ordering code |
|---|---|---|---|---|
| 1 | Common parts, DC bus, side plates kit, main pipe support kit, PE busbar | 3AXD50000333639 | A-468-X-001-VX | 3AXD50000333387 |
| | | 3AXD50000327591 | L-468-8-020-VX | 3AXD50000360543 |
| | | 3AXD50001155353 | L-468-X-450-VX | 3AXD50001155179 |
| | | 3AXD50000336340 | - | - |
| | | 3AXD50001155353 | - | - |
| 2 | Common AC input bus | 3AXD50000370870 | L-6-X-012-VX | 3AXD50000371013 |
| 3 | LCL filter related parts | 3AXD50001012540 | L-6-7-114-VX | 3AXD50001013516 |
| | | 3AXD50001012816 | L-6-7-037-VX | 3AXD50001013523 |
| 4 | LCL connection busbars, LCL filter | 3AXD50001013387 | L-6-7-115-VX | 3AXD50001013530 |
| | | - | BLCL-13LC-7 / BLCL-14LC-5 | - |
| 5 | Module installation frame and common mode busbars | 3AXD50001034382 | L-6-7-038-VX | 3AXD50001013547 |
| | | 3AXD50001048426 | L-6-7-275-VX | 3AXD50001013554 |
| 6A | DC connection busbars and DC mechanics kit (fuse only) | 3AXD50001059330 | L-6-7-220-VX | 3AXD50001013615 |
| | | 3AXD50001059767 | L-6-7-278-VX | 3AXD50001013585 |
| | | 3AXD50001059750 | L-6-7-279-VX | 3AXD50001058944 |
| 6B | DC switch mechanics kit and DC connection busbars | 3AXD50001050757 | For OT600 (kit 2): L-6-7-277-VX | 3AXD50001013578 |
| | | 3AXD50001061142 | For OT400 (kit 1): L-6-7-218-VX | 3AXD50001013592 |
| | | 3AXD50001060497 | For OT600 (kit 2): L-6-7-219-VX | 3AXD50001013608 |
| | | 3AXD50001050245 | For OT400 (kit 1): L-6-7-276-VX | 3AXD50001013561 |
| 7 | Cooling related parts | 3AXD50000048217 | L-468-8-441 | 3AXD50000044084 |
| | | - | L-6-8-405 | 3AXD50000344970 |
| | | - | L-468-8-446 | 3AXD50000479795 |
| | | 3AXD50001061906 | L-6-7-446-VX | 3AXD50001013622 |
| | | 3AXD50001062439 | L-6-7-447-VX | 3AXD50001013639 |
| 8 | Module installation | - | - | - |
| 9 | Module marine supports, shrouds and air guides | 3AXD50001062552 | L-6-7-504-VX | 3AXD50001013646 |
| | | 3AXD50001062668 | L-6-7-353-VX | 3AXD50001013653 |
| 10 | Enclosure panels and pressure relief | | L-68-X-461-VX | 3AXD50000667277 |

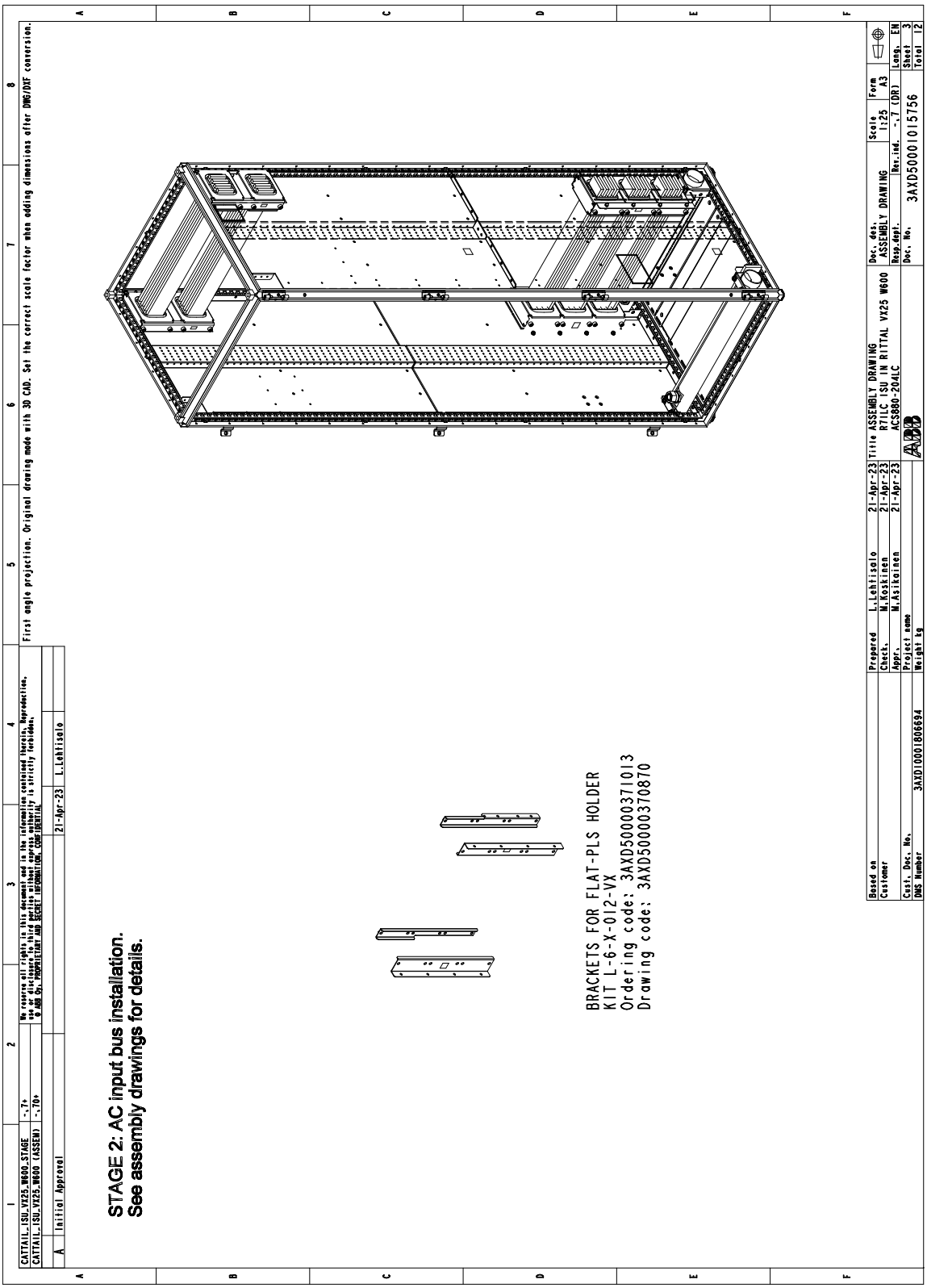
## Overview of kits



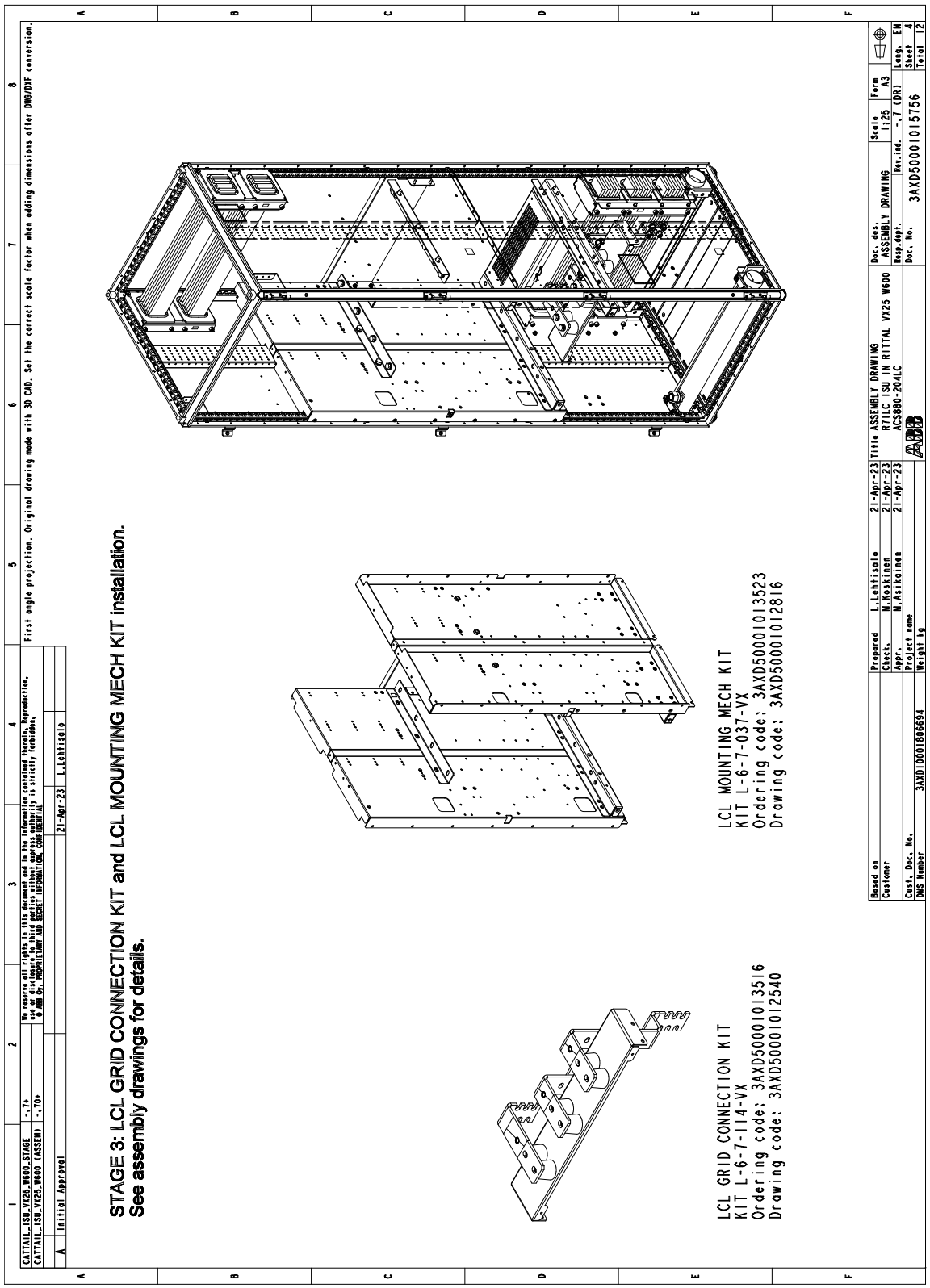
## Stage 1: Installation of common parts



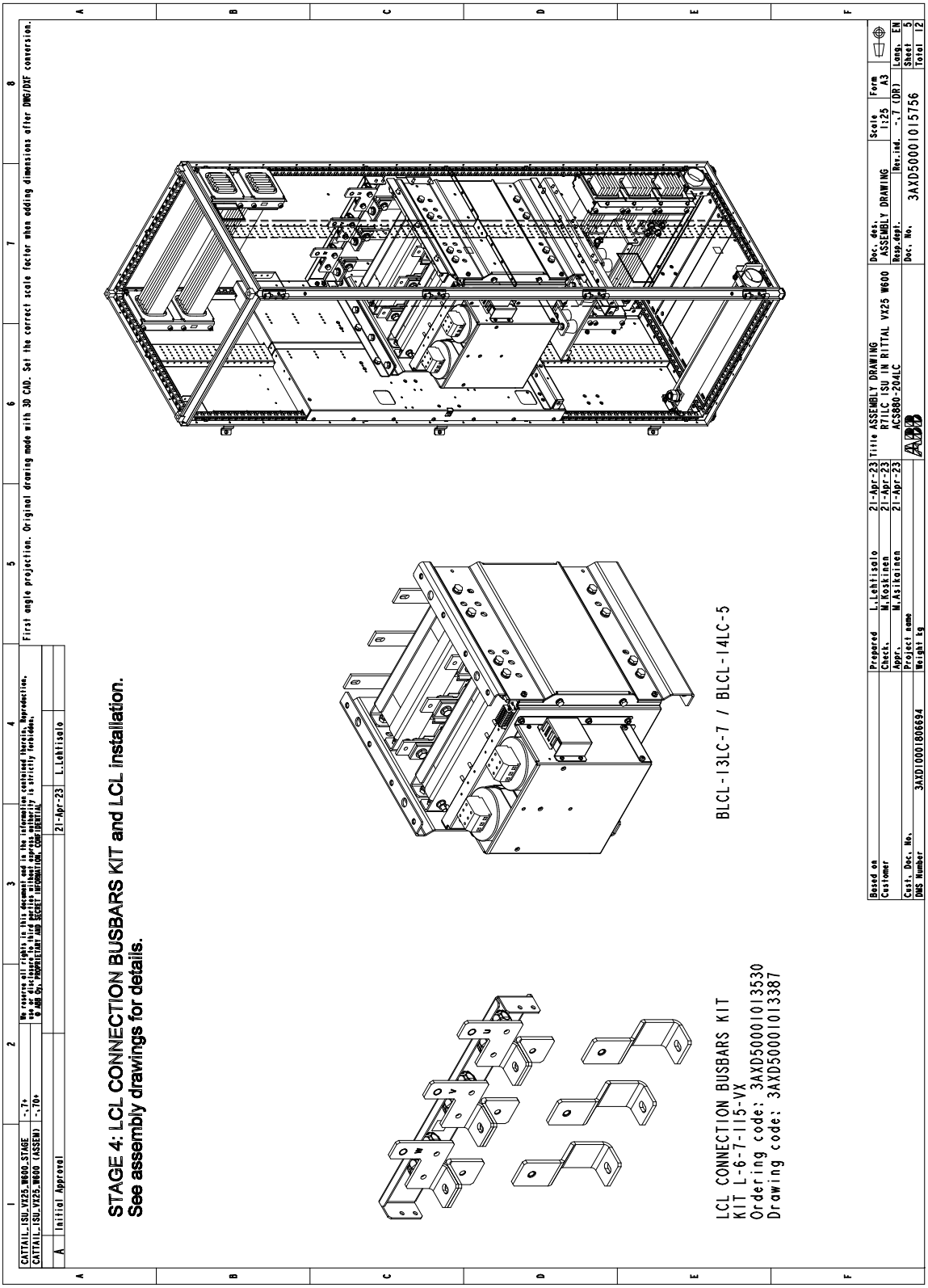
## Stage 2: Common AC input bus installation



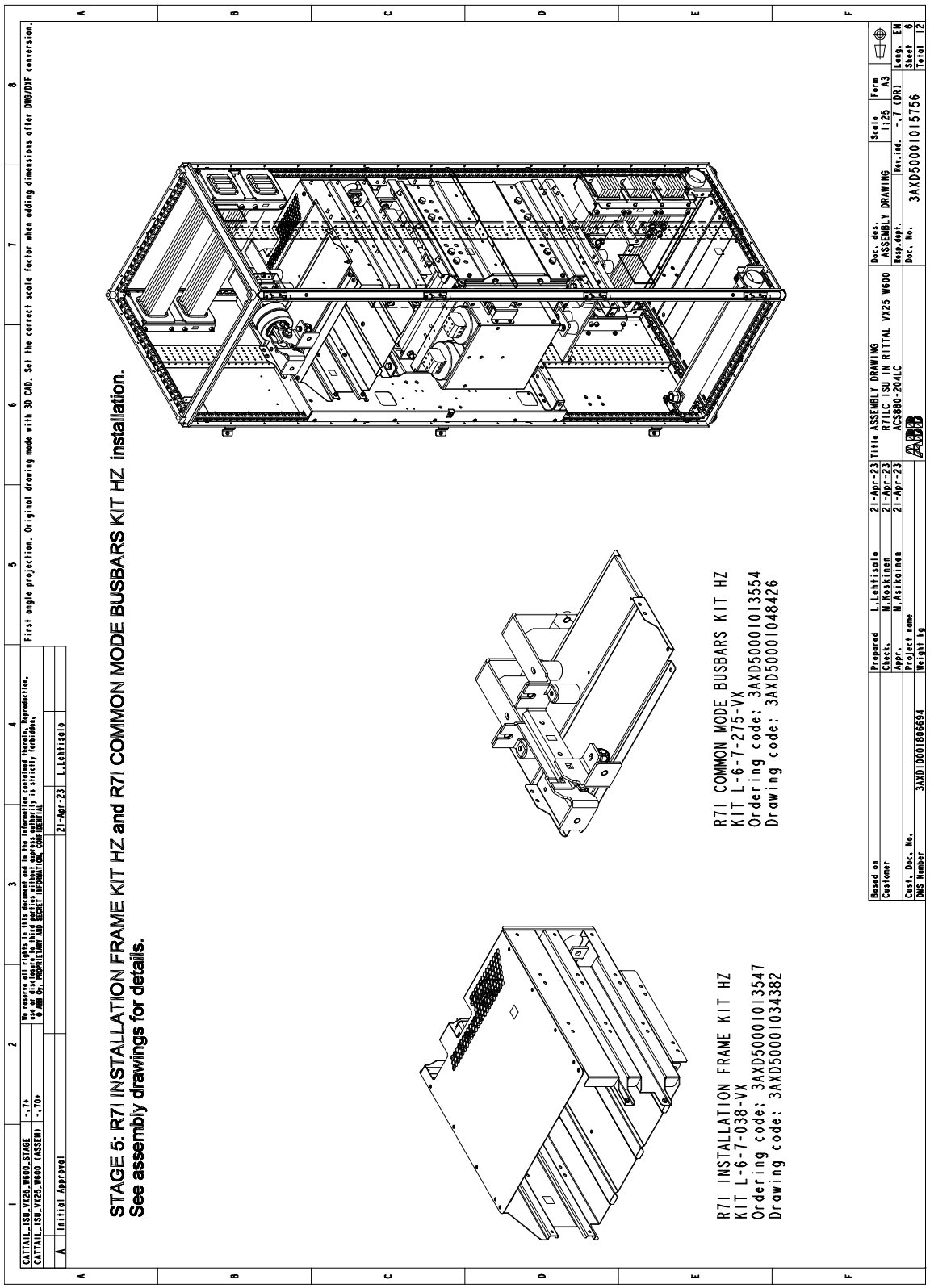
## Stage 3: Installation of LCL filter related parts



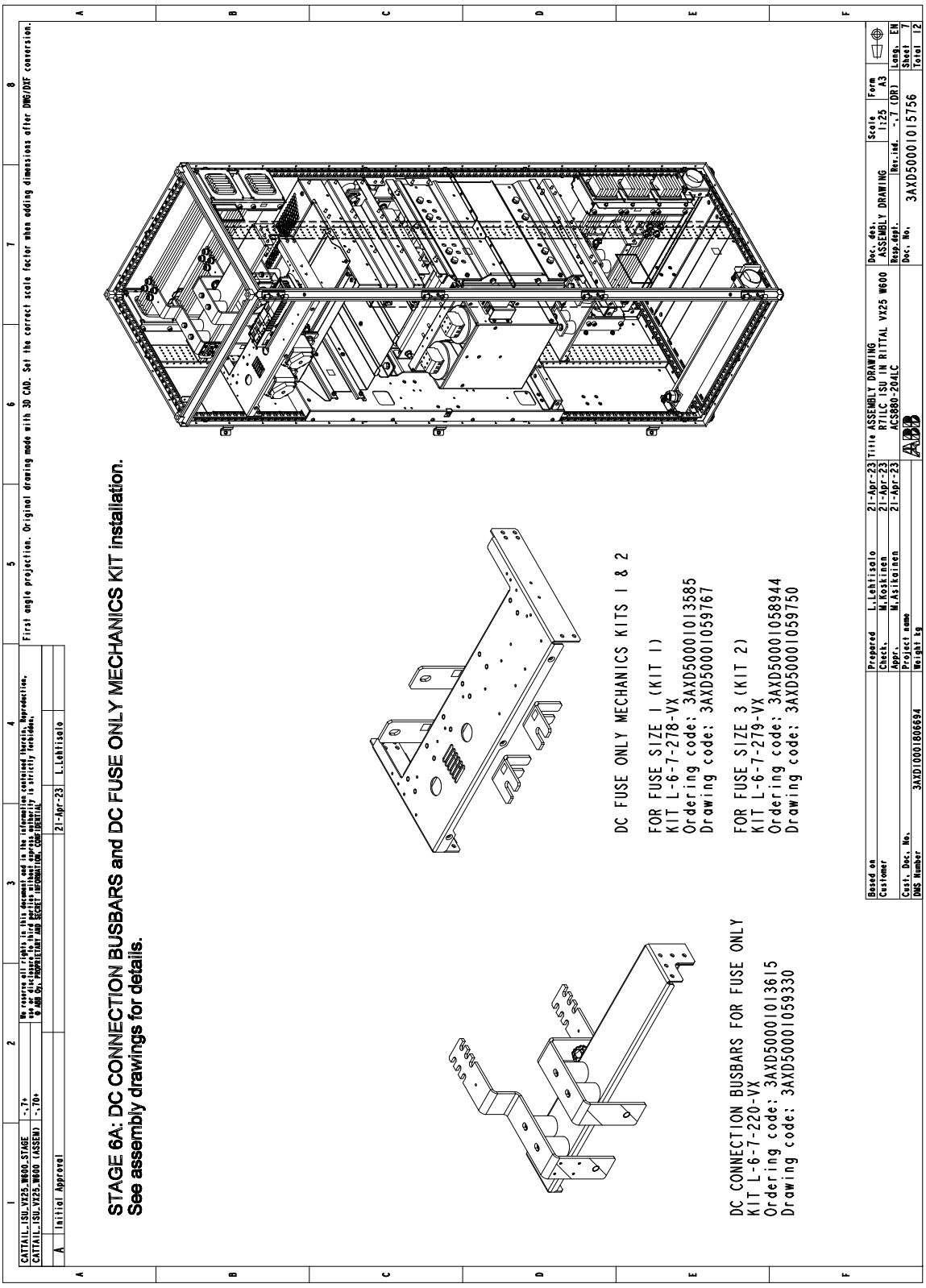
## Stage 4: LCL filter installation



## Stage 5: Installation of module installation frame and common mode busbars



## Stage 6A: DC connection busbars and DC mechanics kit (fuse only) installation

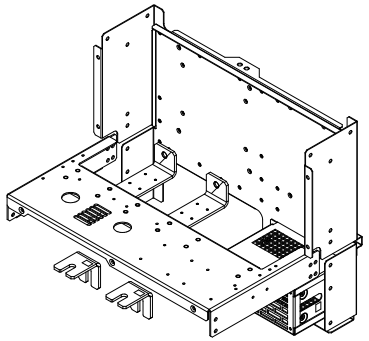


# Stage 6B: DC switch mechanics kit and DC connection busbars installation

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CATTAIL_ISU_VX25_W600_STAGE | -.7+ | We reserve all rights in this document and in the information contained therein. Reproduction, use or disclosure to third parties without express authority is strictly forbidden. © ABB Oy. PROPRIETARY AND SECRET INFORMATION. CONFIDENTIAL | | | | | |
| CATTAIL_ISU_VX25_W600 (ASSEM) | -.70+ | | | | | | |
| A | Initial Approval | | 21-Apr-23 | L.Lehtisalo | | | |

First angle projection. Original drawing made with 3D CAD. Set the correct scale factor when adding dimensions after DWG/DXF conversion.

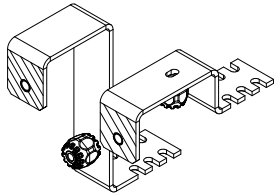
**STAGE 6B: DC SWITCH MECHANICS KIT and DC CONN BUSBARS FOR SWITCH installation.**
**See assembly drawings for details.**



DC SWITCH MECHANICS KITS 1 & 2

FOR OT400 (KIT 1)
KIT L-6-7-276-VX
Ordering code: 3AXD50001013561
Drawing code: 3AXD50001050245

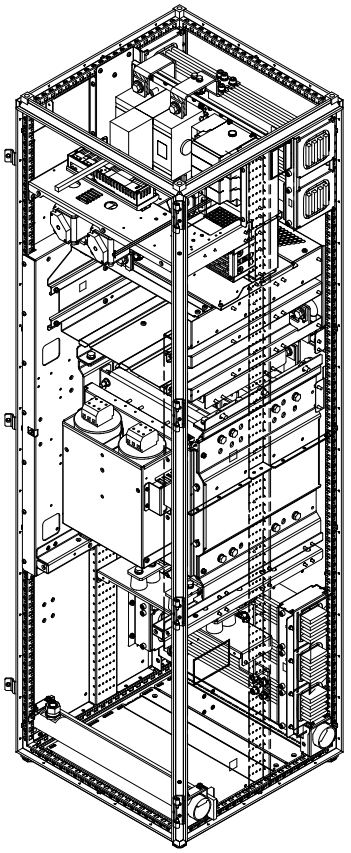
FOR OT600 (KIT 2)
KIT L-6-7-277-VX
Ordering code: 3AXD50001013578
Drawing code: 3AXD50001050757



DC CONN BUSBARS FOR SWITCH 1 & 2

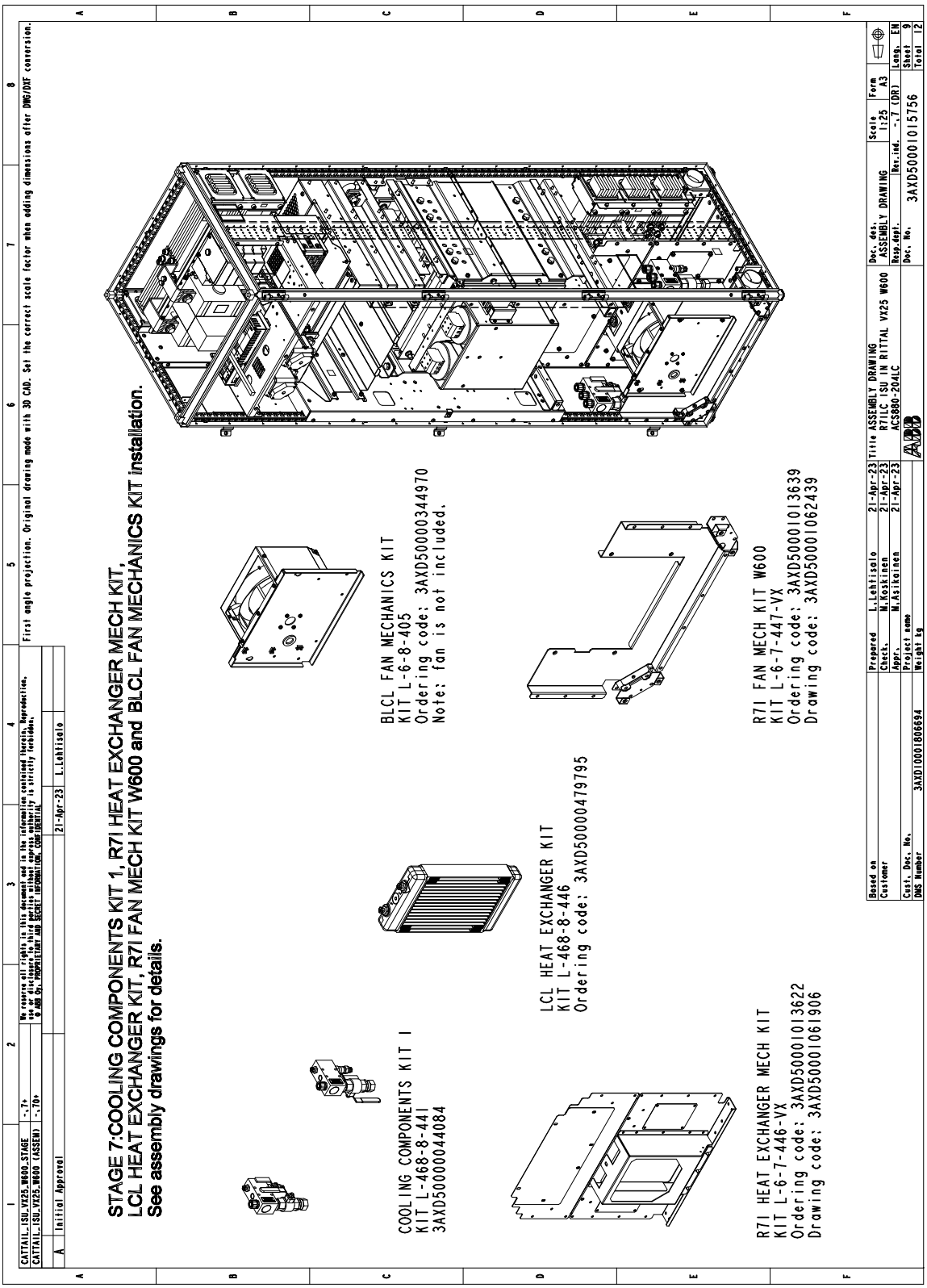
FOR OT400 (KIT 1)
KIT L-6-7-218-VX
Ordering code: 3AXD50001013592
Drawing code: 3AXD50001061142

FOR OT600 (KIT 2)
KIT L-6-7-219-VX
Ordering code: 3AXD50001013608
Drawing code: 3AXD50001060497

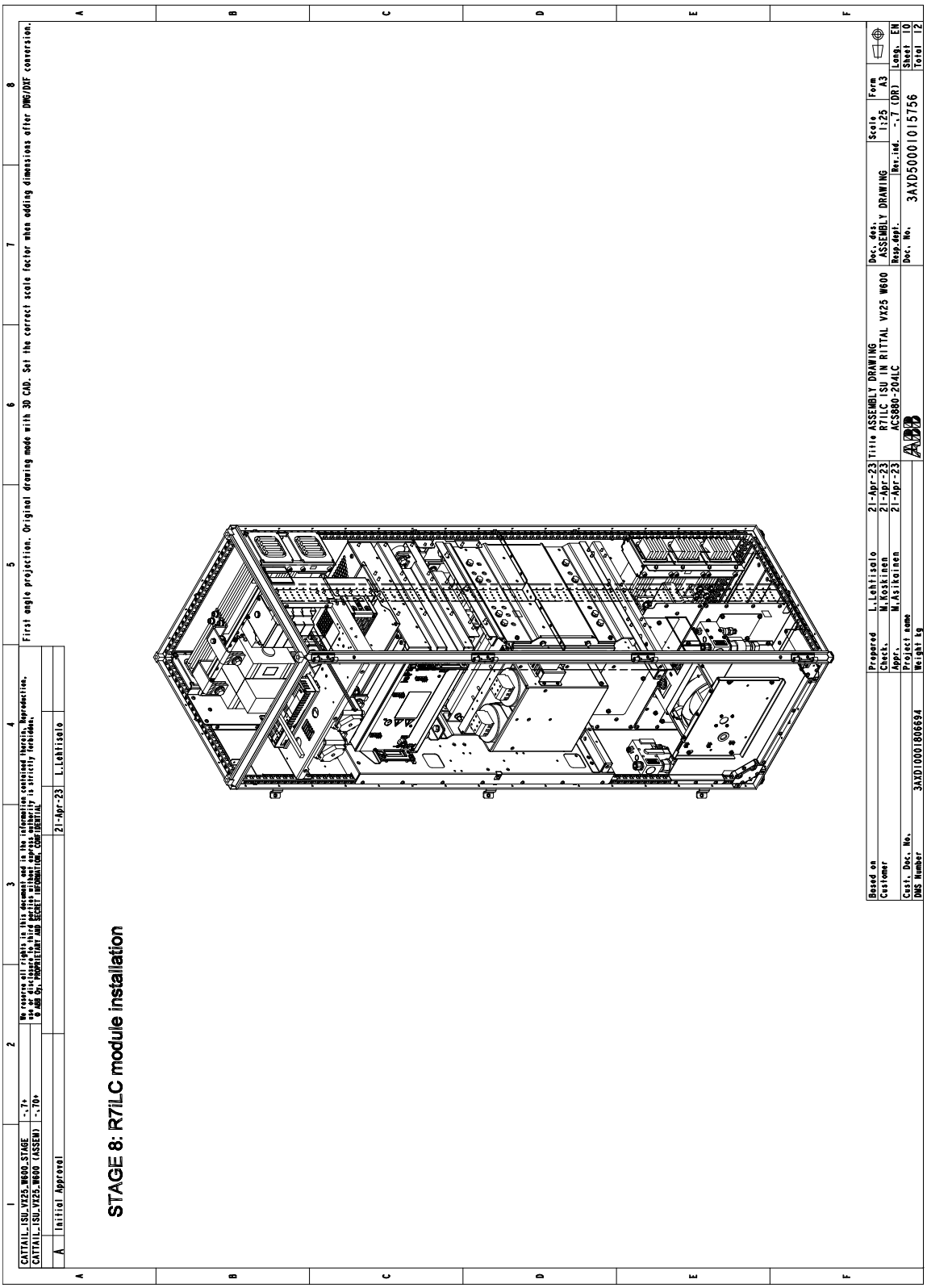


| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Based on | Prepared | L.Lehtisalo | 21-Apr-23 | Title ASSEMBLY DRAWING | Doc. des. | Scale | Form | |
| Customer | Check. | M.Koskinen | 21-Apr-23 | R7ILC ISU IN RITTAL VX25 W600 | ASSEMBLY DRAWING | 1:25 | A3 | |
| | Appr. | M.Asikainen | 21-Apr-23 | ACS880-204LC | Resp.dept. | Rev.ind. | -.7 (DR) | Lang. EN |
| Cust. Doc. No. | Project name | | | | Doc. No. | 3AXD50001015756 | | Sheet 8 |
| DMS Number 3AXD10001806694 | Weight kg | | | | | | | Total 12 |

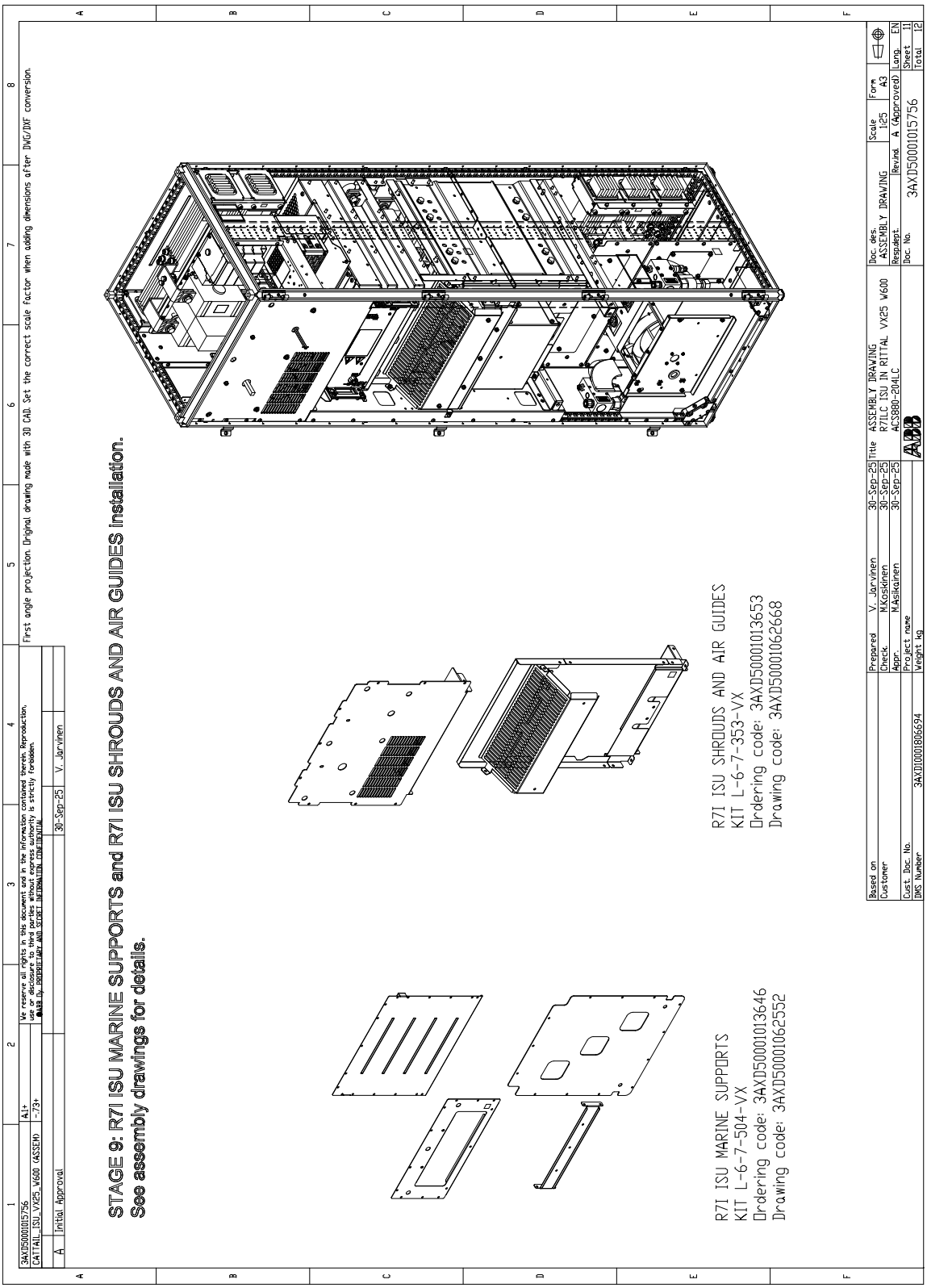
## Stage 7: Installation of cooling related parts



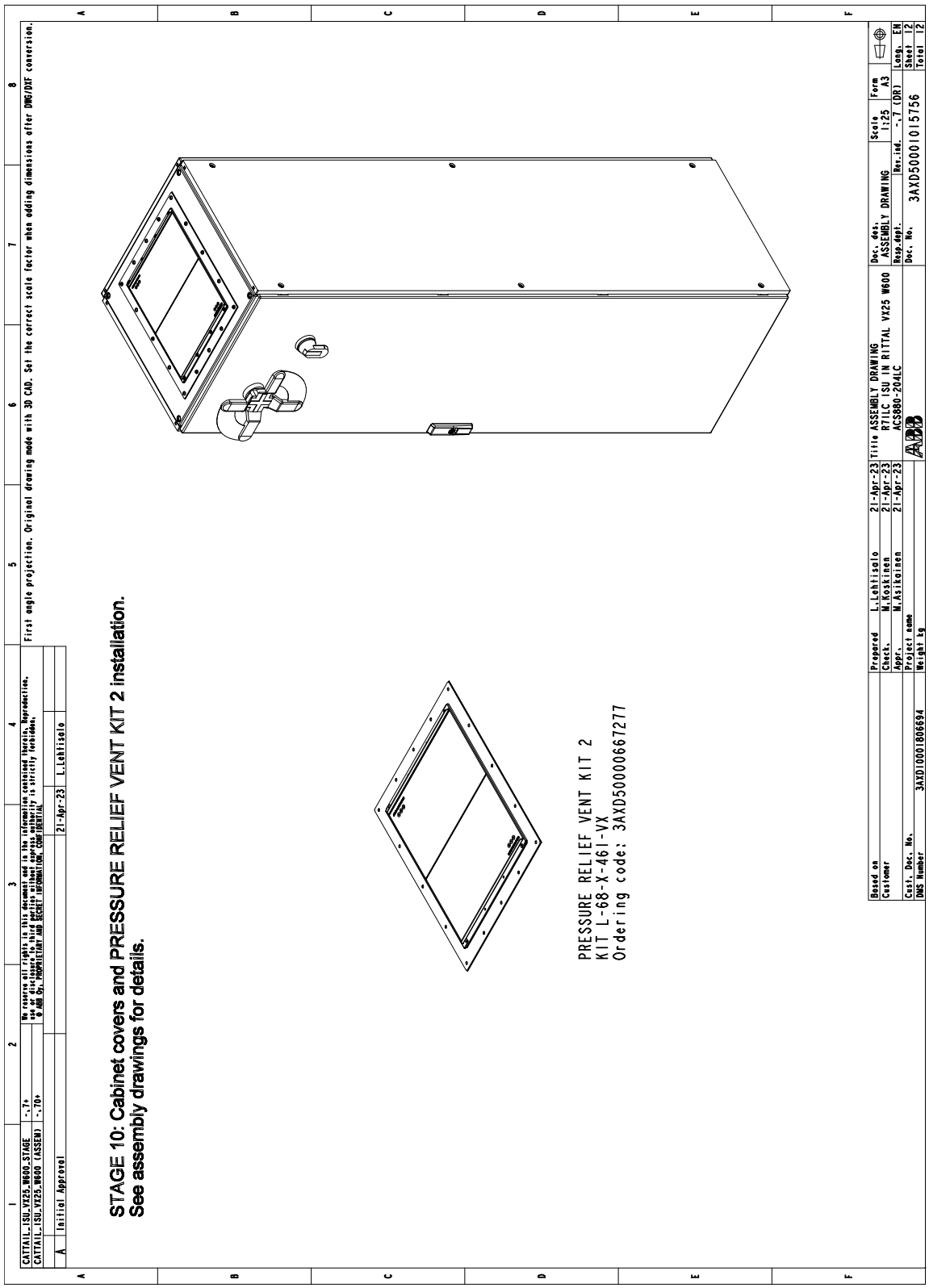
## Stage 8: Module installation



## Stage 9: Installation of module marine supports, shrouds and air guides



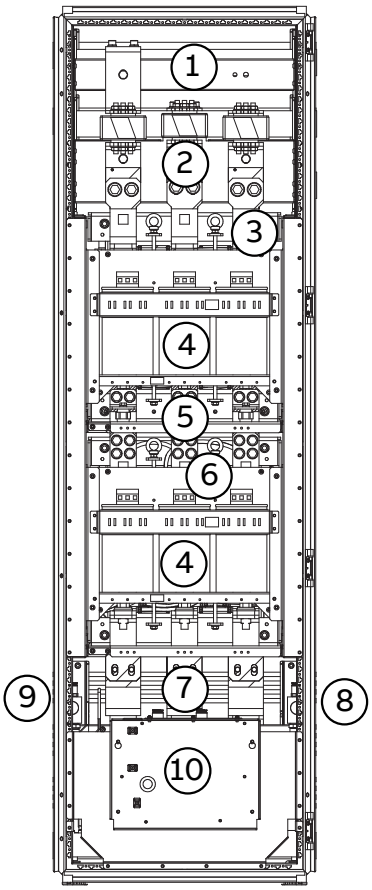
## Stage 10: Installation of enclosure panels and pressure relief



## BLCL-15LC-7 / BLCL-24LC-7 in a 600 mm wide Rittal VX25 enclosure

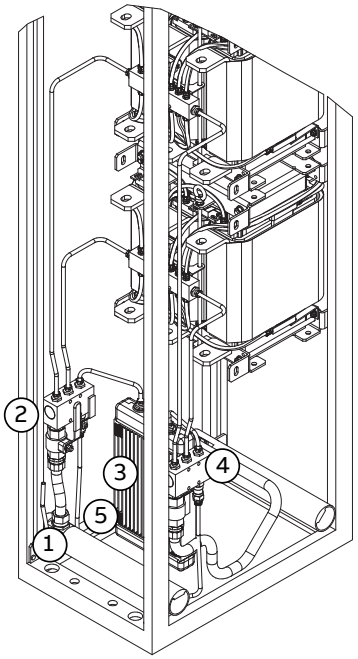
### Layout drawing

Below is an example layout of an LCL filter.




| No. | Description |
|---|---|
| 1 | AC connection from incoming cabinet (Rittal Flat-PLS) |
| 2 | AC fuses |
| 3 | Grid-side choke (behind the capacitors) |
| 4 | Capacitors (amount varies depending on the LCL filter size) |
| 5 | Connection to capacitors by cables |
| 6 | Converter-side choke (behind the capacitors) |
| 7 | AC connection to IGBT supply unit (Rittal Flat-PLS) |
| 8 | Outlet manifold with stop and drain valves |
| 9 | Inlet manifold with stop and drain valves |
| 10 | Cooling fan and heat exchanger |

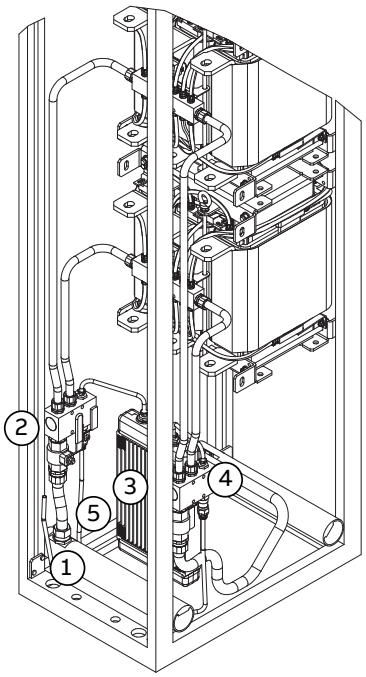
### Pipe routing example (BLCL-15LC-7)




| No. | Description |
|---|---|
| 1 | Coolant in |
| 2 | Inlet manifold with stop and drain valves |
| 3 | Heat exchanger |
| 4 | Outlet manifold with stop and drain valves |
| 5 | Coolant out |

Thicker pipe is of type 16/13 and thinner pipe of type 8/6.

### Pipe routing example (BLCL-24LC-7 and BLCL-25LC-7)

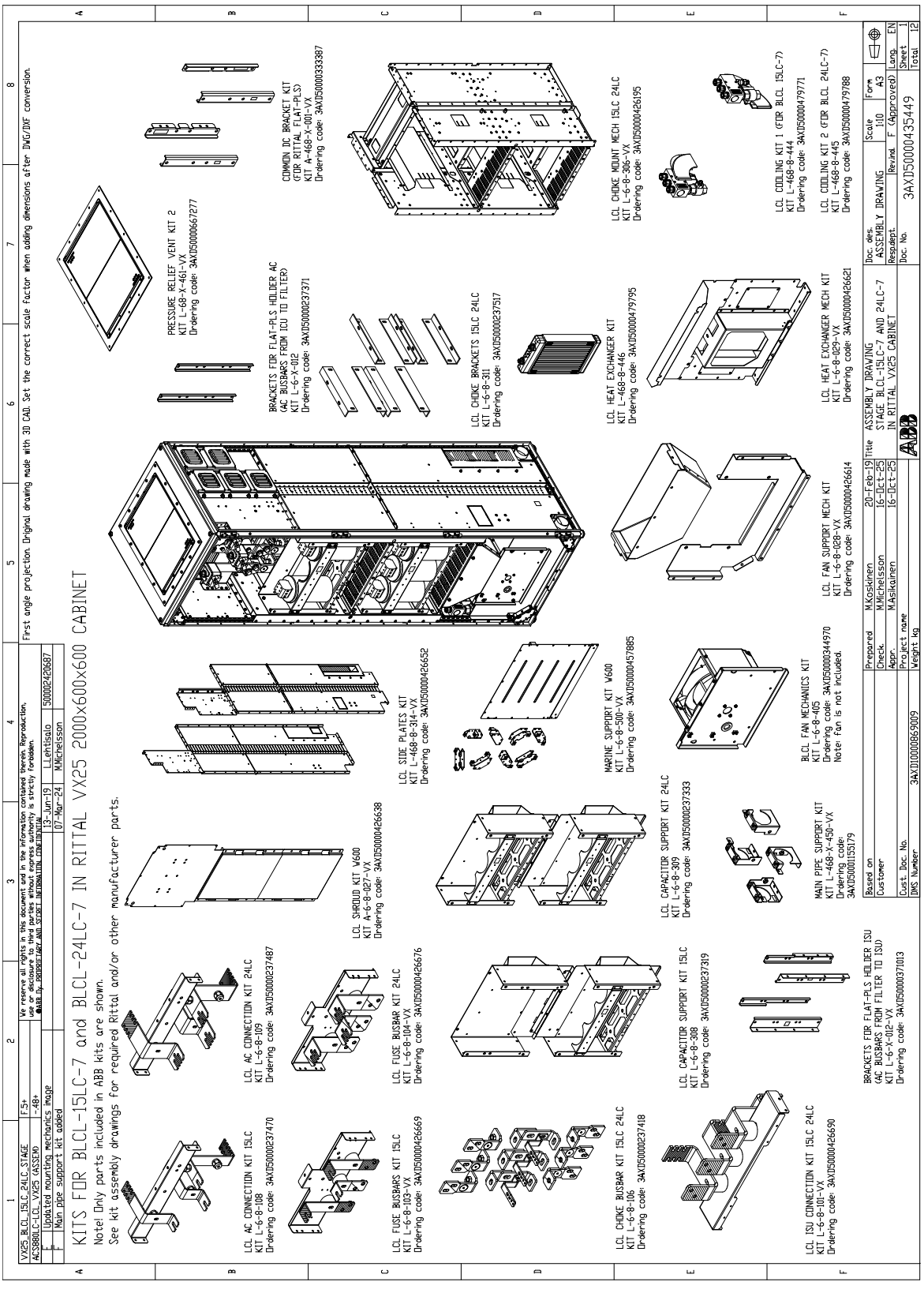



| No. | Description |
|---|---|
| 1 | Coolant in |
| 2 | Inlet manifold with stop and drain valves |
| 3 | Heat exchanger |
| 4 | Outlet manifold with stop and drain valves |
| 5 | Coolant out |

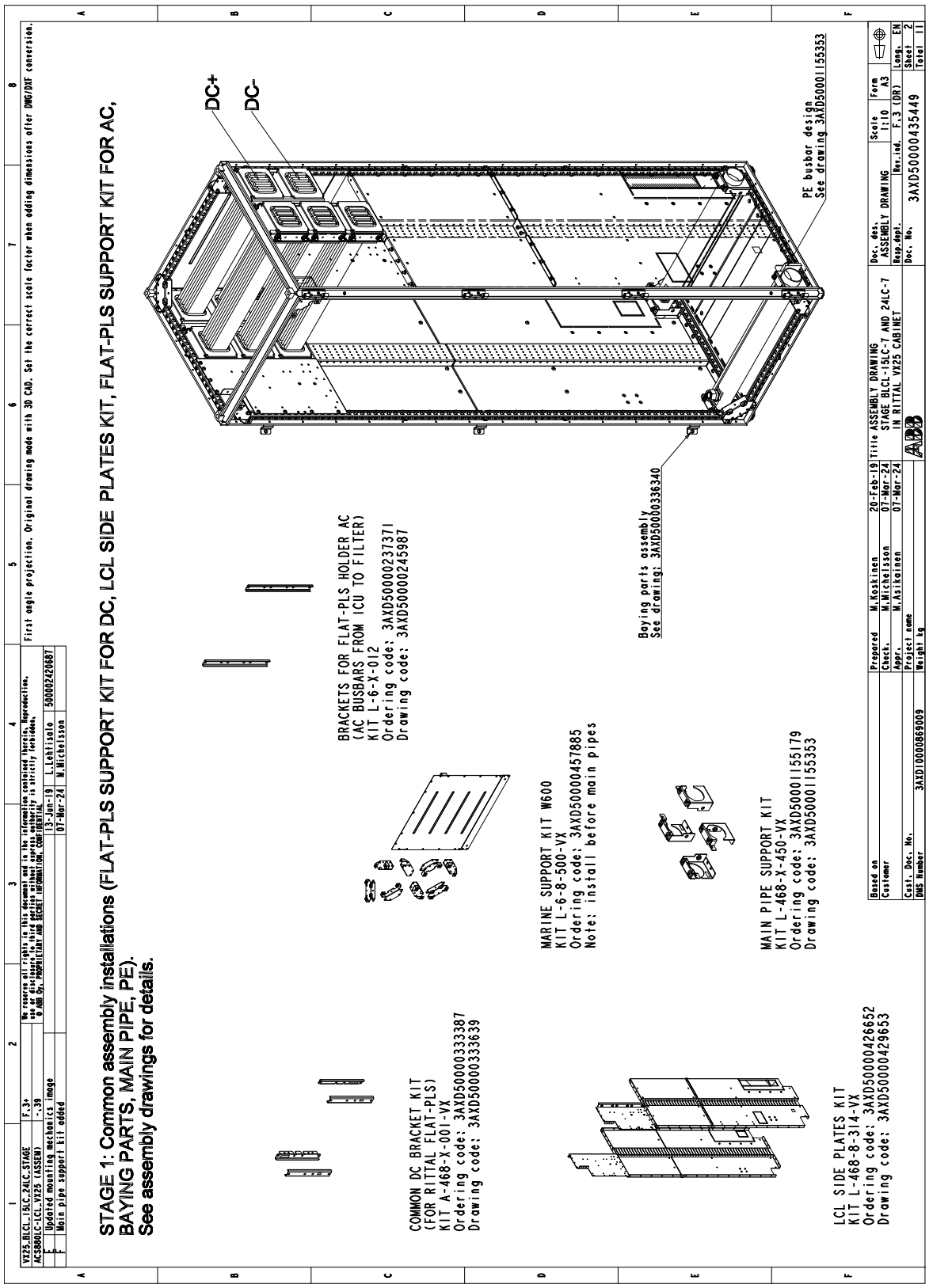
## Installation stages

| No. | Installation stage | Instruction code | Kit code | Kit ordering code |
|---|---|---|---|---|
| 1 | Common AC bus | 3AXD50000245987 | L-6-X-012 | 3AXD50000237371 |
| | Common DC bus | 3AXD50000333639 | A-468-X-001-VX | 3AXD50000333387 |
| | Marine support kit | - | L-6-8-500-VX | 3AXD50000457885 |
| | Baying parts | 3AXD50000336340 | - | - |
| | Main pipe support kit | 3AXD50001155353 | L-468-X-450-VX | 3AXD50001155179 |
| | LCL side plates | 3AXD50000429653 | L-468-8-314-VX | 3AXD50000426652 |
| | PE busbar | 3AXD50001155353 | - | - |
| 2 | Brackets for Flat-PLS holder installation | 3AXD50000370870 | L-6-X-012-VX | 3AXD50000371013 |
| 3A | BLCL-15LC-7: AC connection and fuse busbars | 3AXD50000248476 | L-6-8-108 | 3AXD50000237470 |
| | | 3AXD50000431601 | L-6-8-103-VX | 3AXD50000426669 |
| 3B | BLCL-24LC-7: AC connection and fuse busbars | 3AXD50000249206 | L-6-8-109 | 3AXD50000237470 |
| | | 3AXD50000431403 | L-6-8-104-VX | 3AXD50000426676 |
| 4 | LCL filter choke mounting mechanics and LCL ISU connection | 3AXD50000431915 | L-6-8-306-VX | 3AXD50000426195 |
| | | 3AXD50000431717 | L-6-8-101-VX | 3AXD50000426690 |
| 5 | LCL filter choke and choke busbar installation | 3AXD50000247097 | L-6-8-106 | 3AXD50000237418 |
| | | 3AXD50000249893 | L-6-8-311 | 3AXD50000237517 |
| | | - | BLCL-15LC-7 chokes or BLCL-24LC-7 chokes | - |
| 6 | Heat exchanger, heat exchanger mechanics and cooling components installation | 3AXD50000479498<br>3AXD50000479634 | BLCL-15LC-7: L-468-8-444<br>BLCL-24LC-7: L-468-8-445 | 3AXD50000479771<br>3AXD50000479788 |
| | | 3AXD50000431588 | L-6-8-029-VX | 3AXD50000426621 |
| | | - | L-468-8-446 | 3AXD50000479795 |
| 7A | BLCL-15LC-7: LCL capacitor support, fan support mechanics and fan installation | - | L-6-8-405 | 3AXD50000344970 |
| | | 3AXD50000431397 | L-6-8-028-VX | 3AXD50000426614 |
| | | 3AXD50000244065 | L-6-8-308 | 3AXD50000237319 |
| 7B | BLCL-24LC-7: LCL capacitor support, fan support mechanics and fan installation | - | L-6-8-405 | 3AXD50000344970 |
| | | 3AXD50000431397 | L-6-8-028-VX | 3AXD50000426614 |
| | | 3AXD50000244065 | L-6-8-309 | 3AXD50000237333 |
| 8 | LCL shroud kit installation | 3AXD50000431632 | A-6-8-027-VX | 3AXD50000426638 |
| 9 | Pressure relief kit | 3AXD50000667253 | L-68-X-461-VX | 3AXD50000667277 |

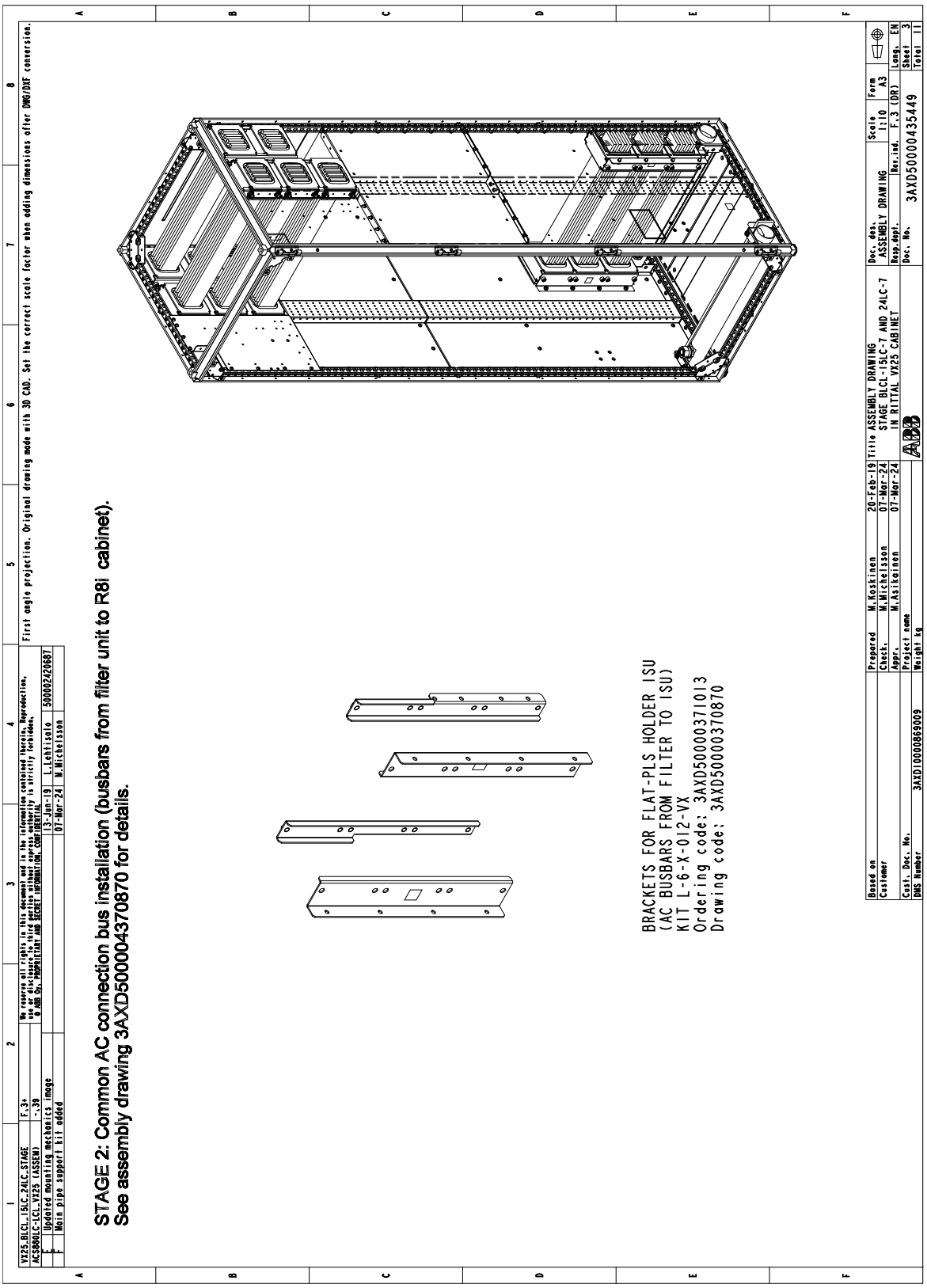
## Overview of kits



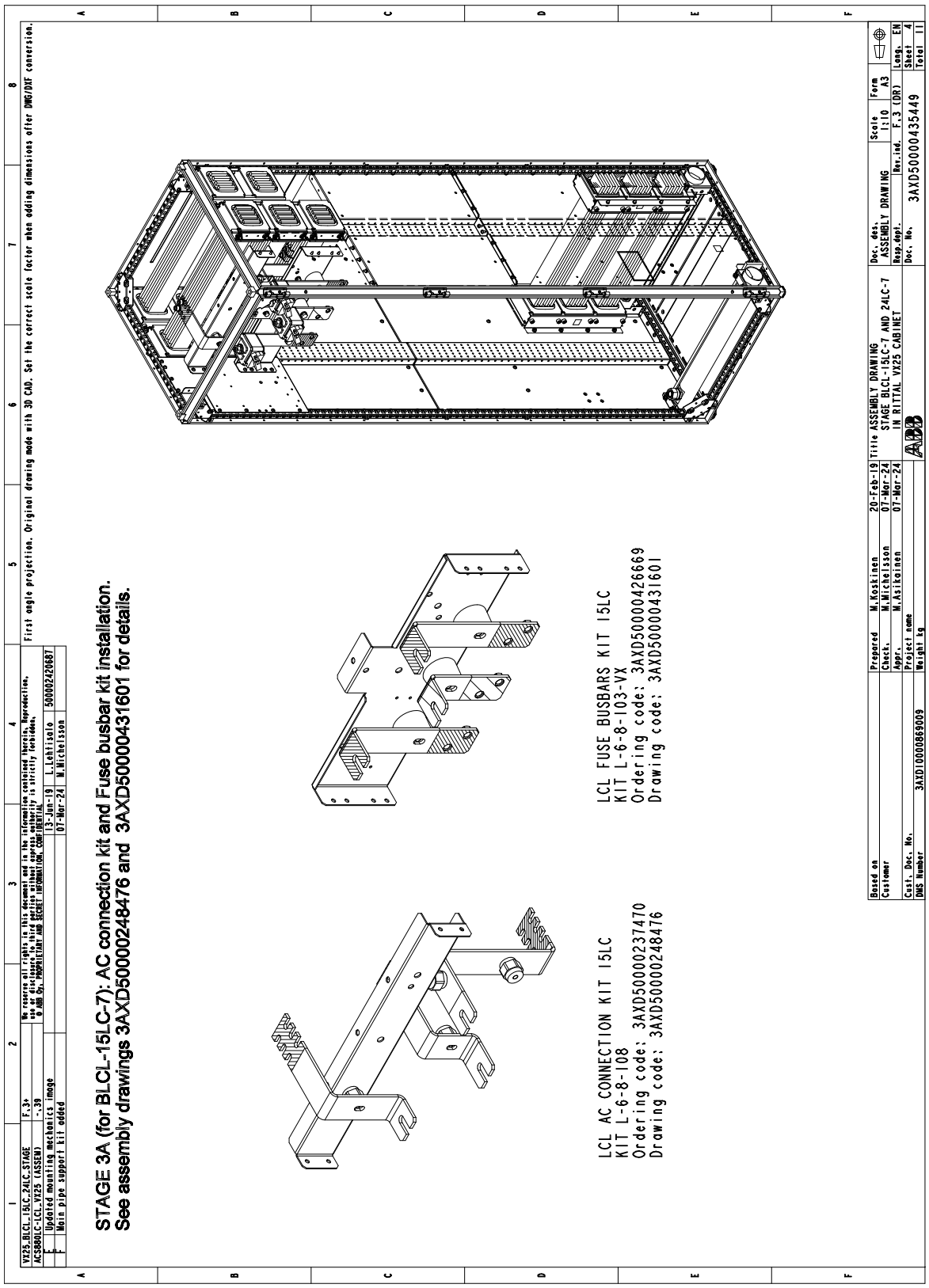
## Stage 1: Installation of common parts



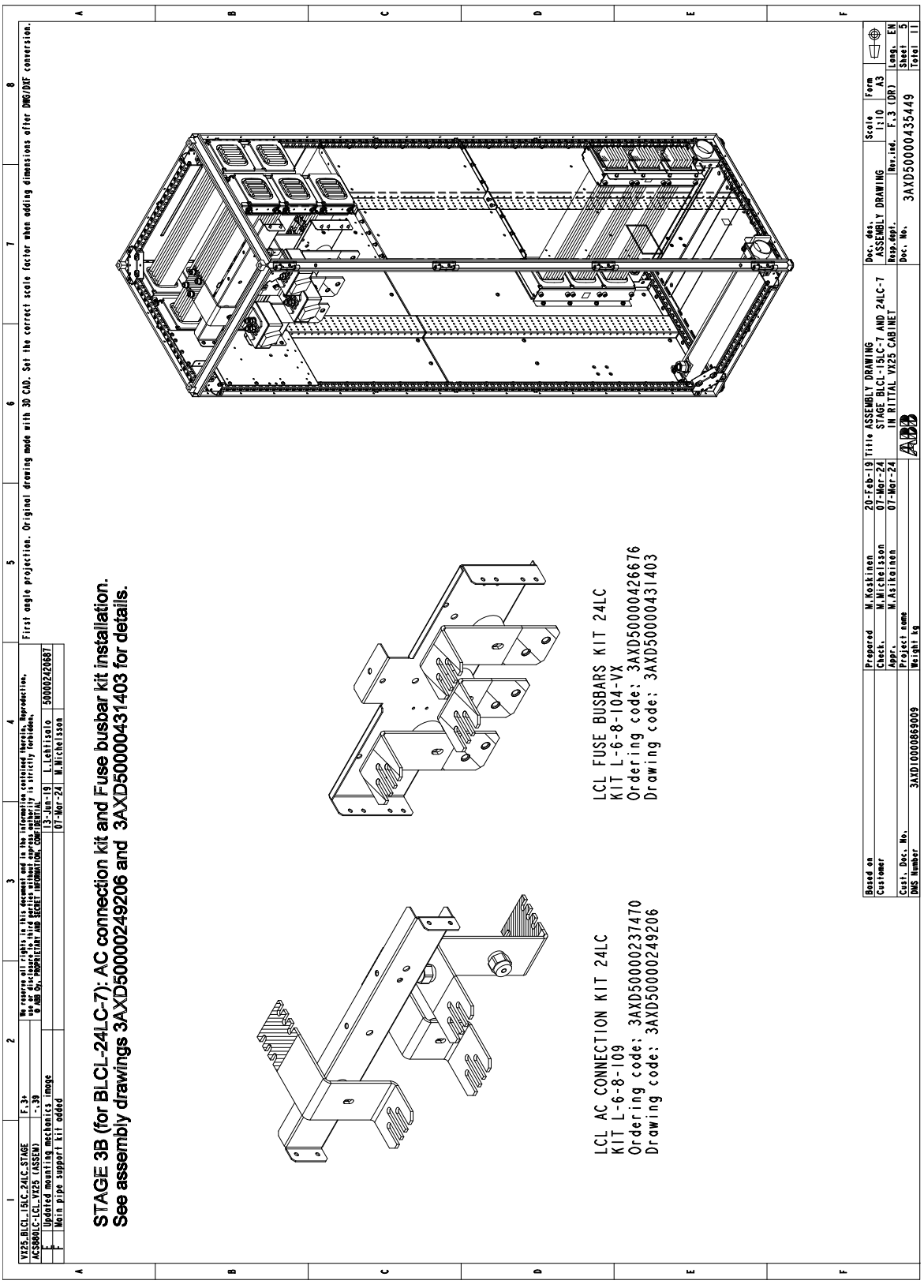
## Stage 2: Installation of brackets for Flat-PLS holder installation



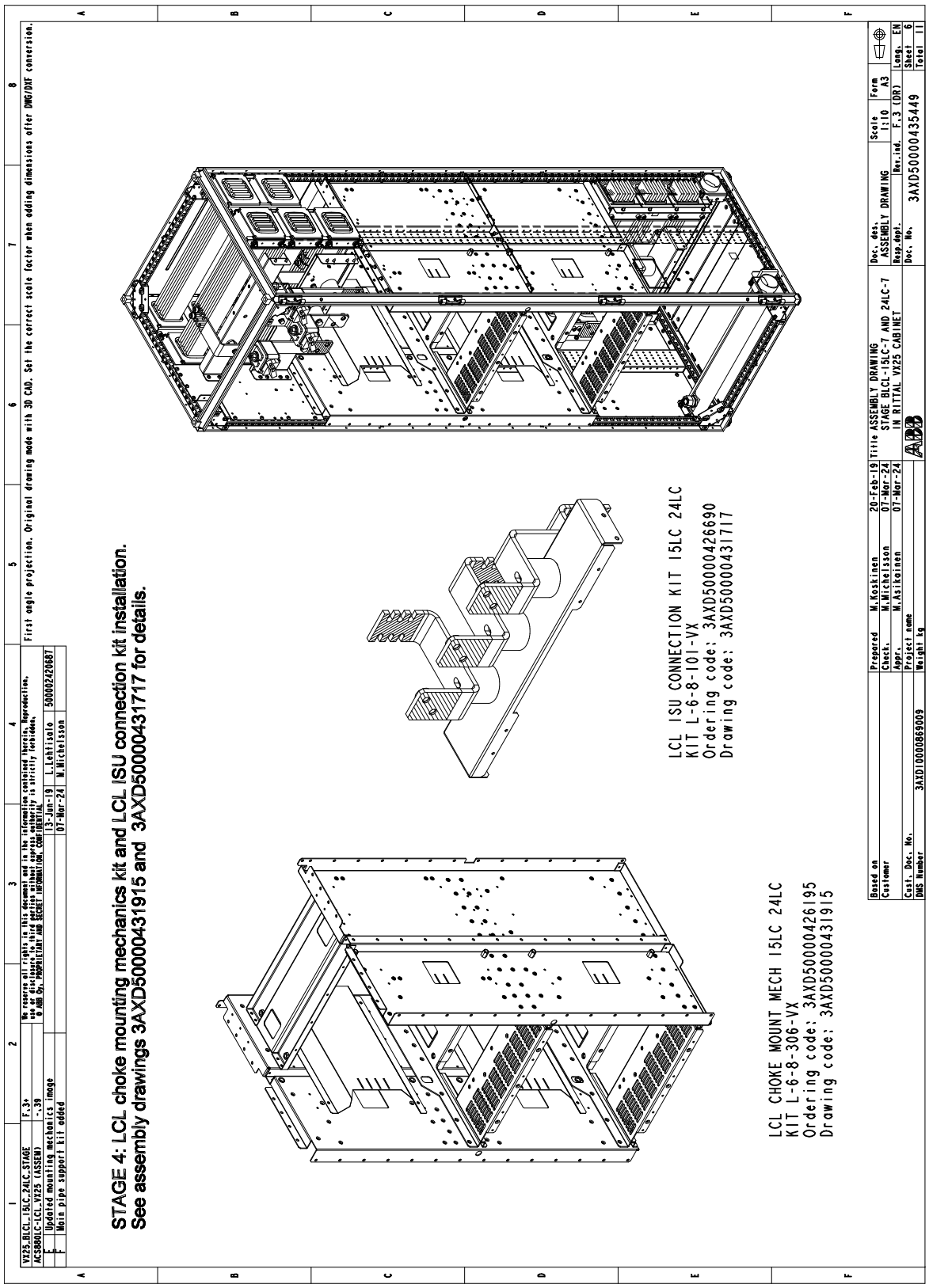
## Stage 3A: BLCL-15LC-7: AC connection and fuse busbars installation



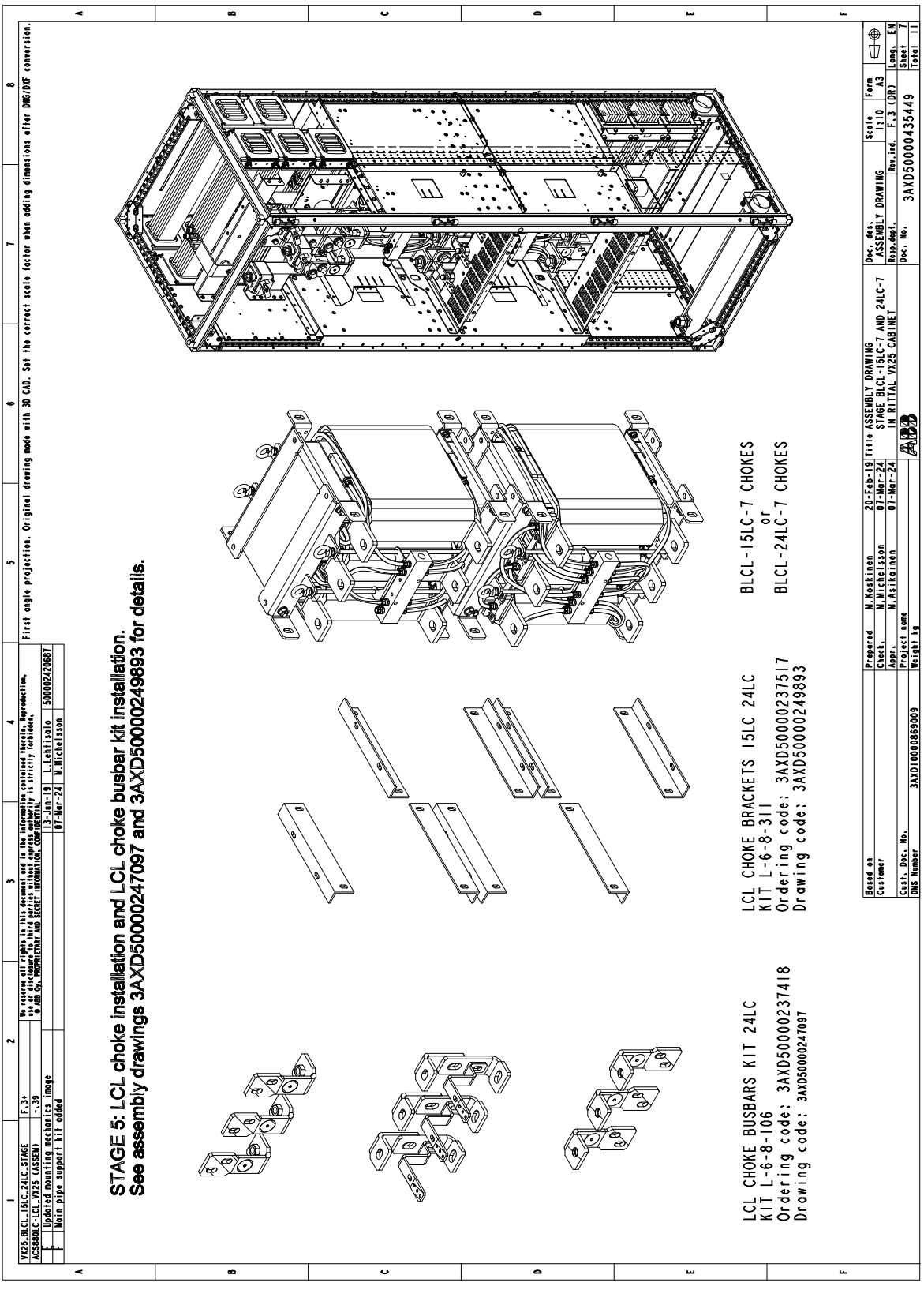
## Stage 3B: BLCL-24LC-7: AC connection and fuse busbars installation



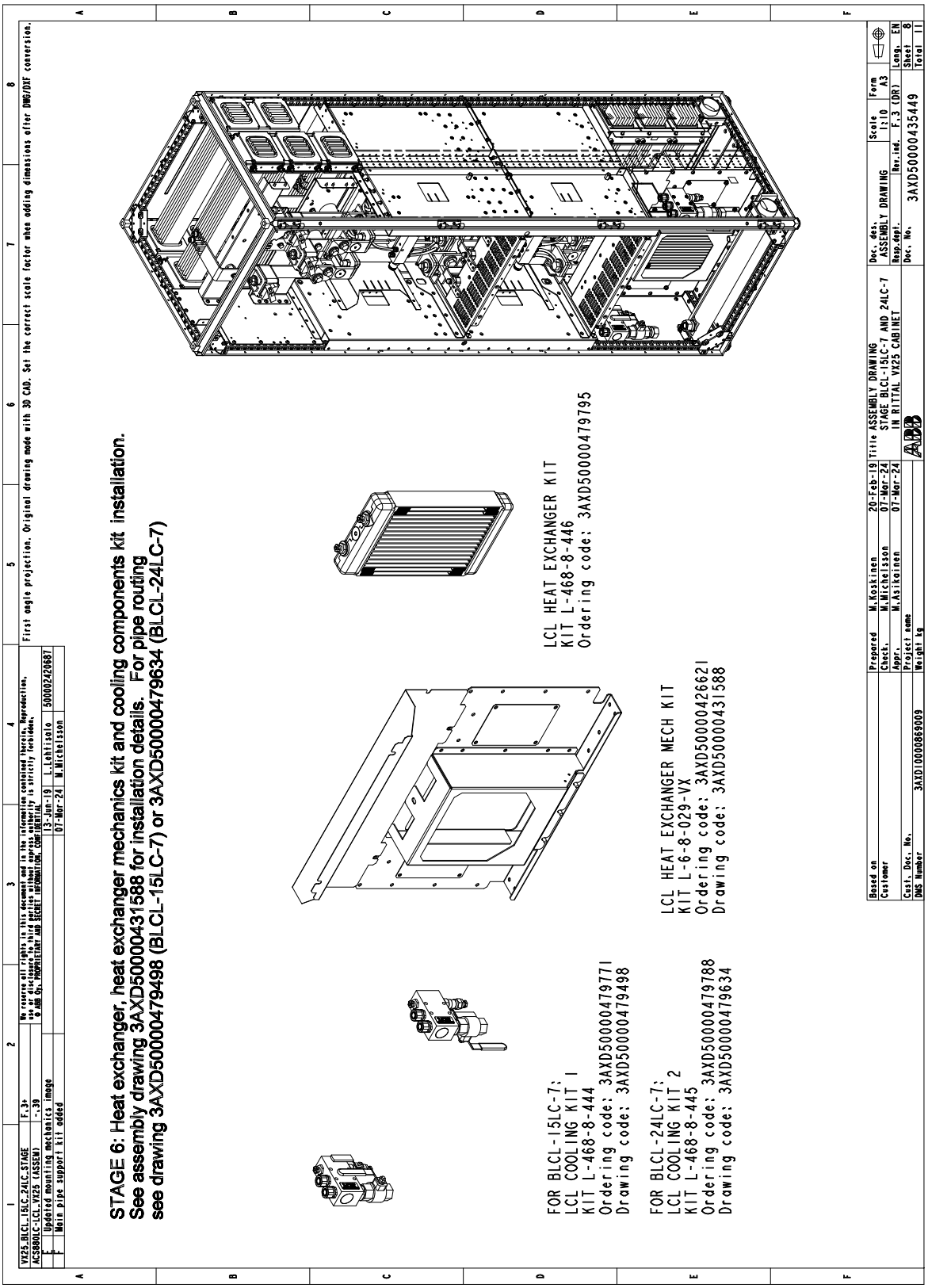
## Stage 4: Installation of LCL filter choke mounting mechanics and LCL ISU connection



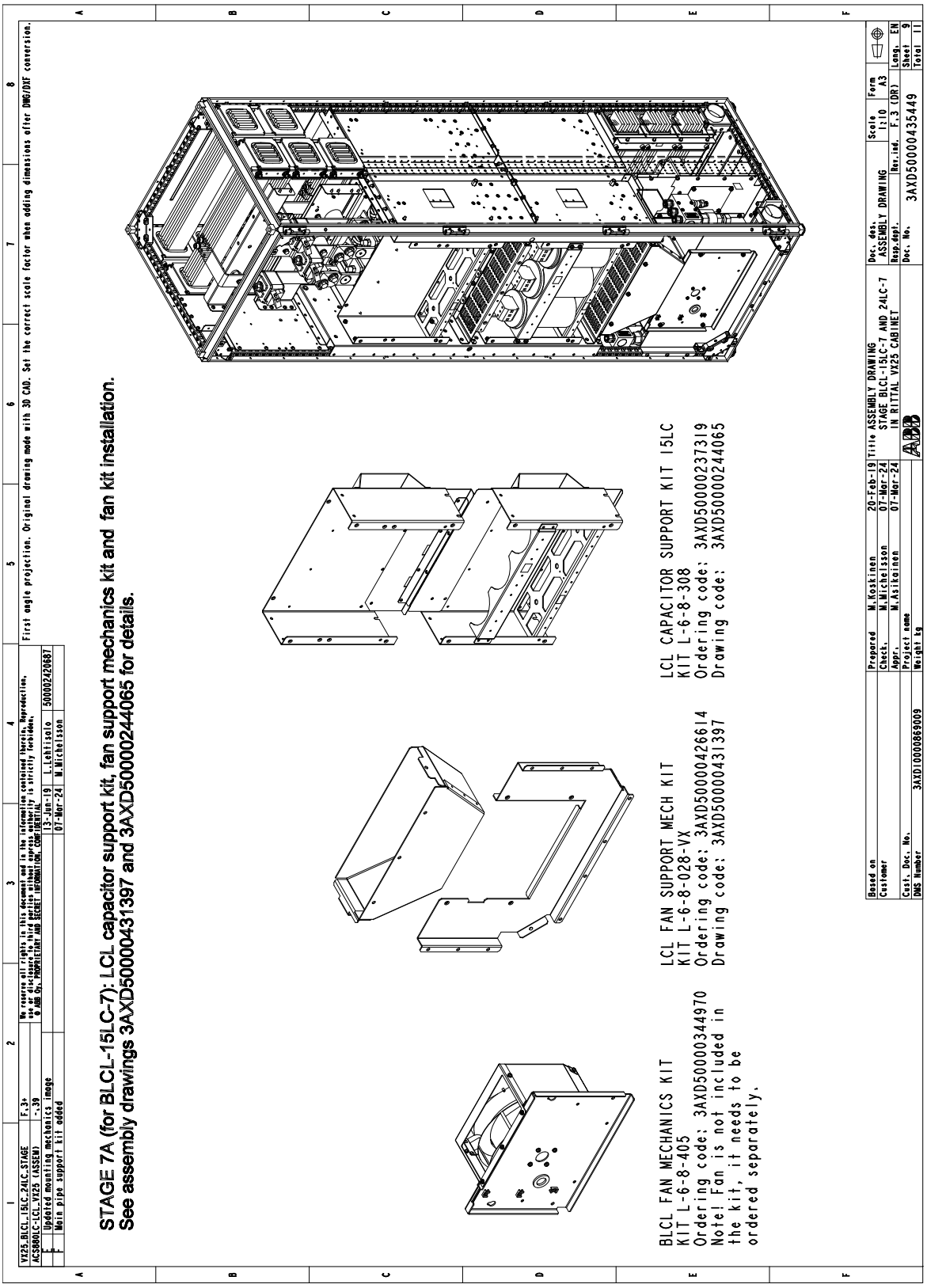
## Stage 5: LCL filter choke and choke busbar installation



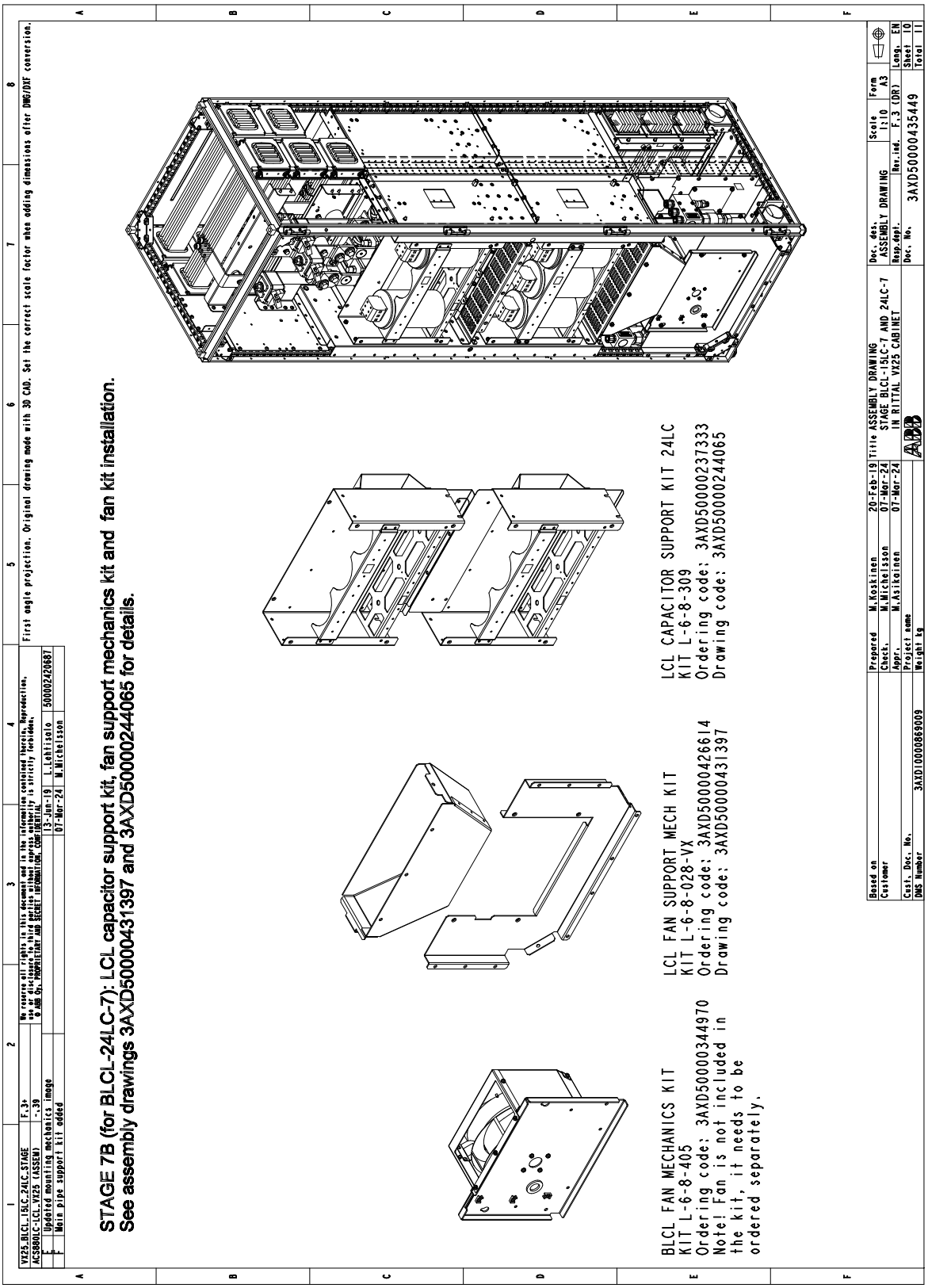
## Stage 6: Heat exchanger, heat exchanger mechanics and cooling components installation



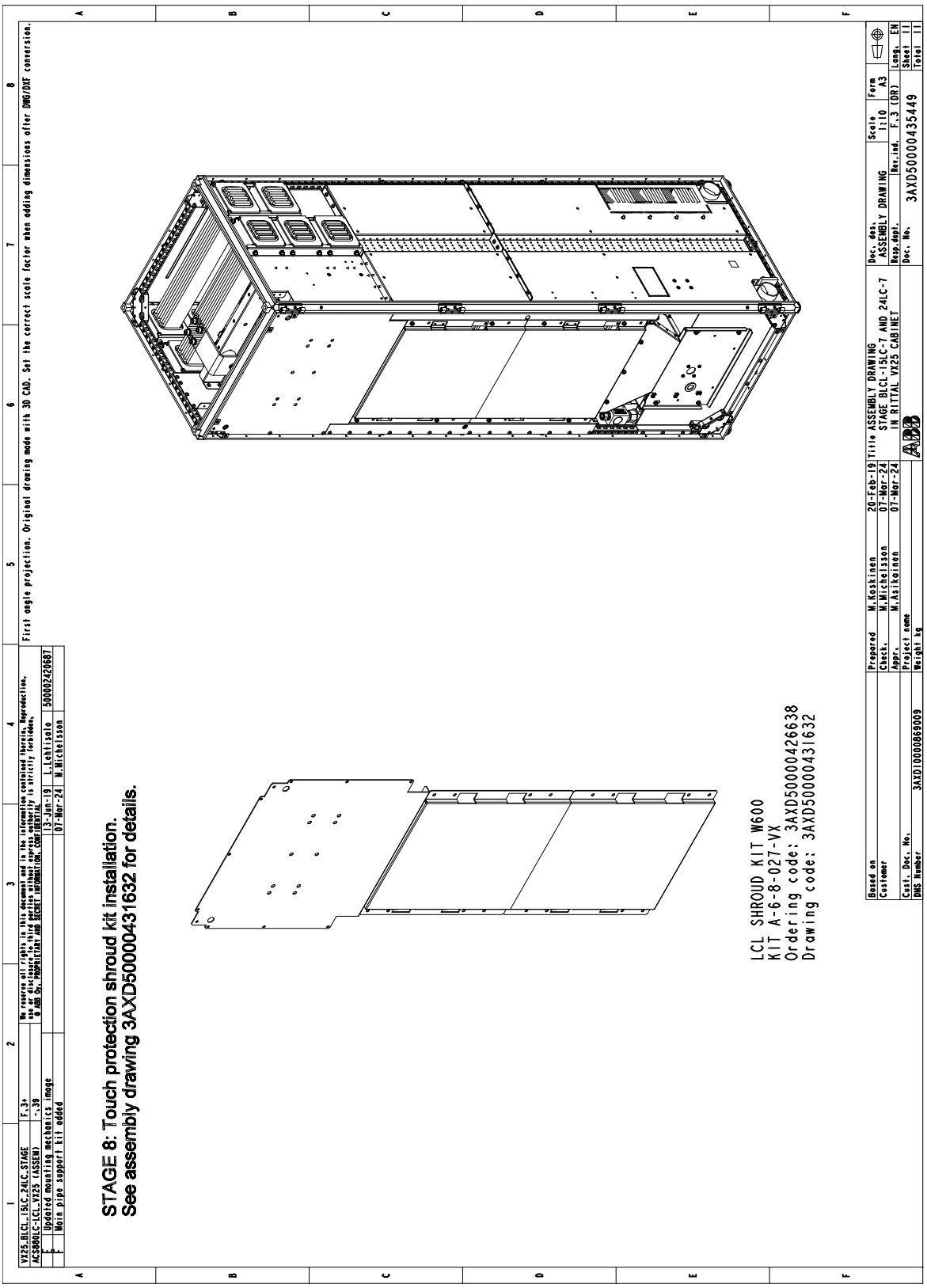
## Stage 7A: BLCL-15LC-7: LCL capacitor support, fan support mechanics and fan installation



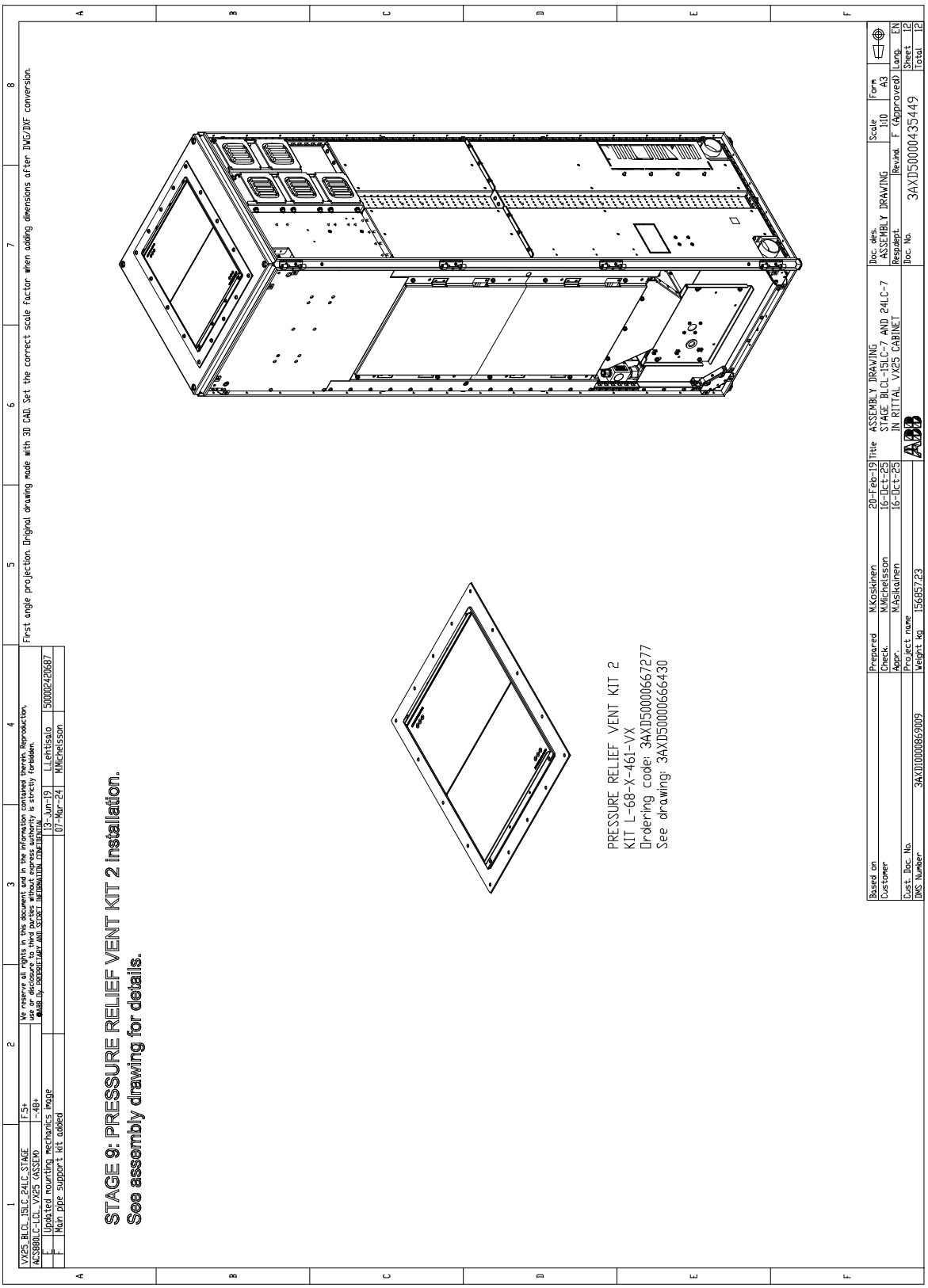
## Stage 7B: BLCL-24LC-7: LCL capacitor support, fan support mechanics and fan installation



## Stage 8: Installation of LCL shroud kit



## Stage 9: Installation of pressure relief kit



## BLCL-15LC-7 / BLCL-24LC-7 in a 600 mm wide generic enclosure

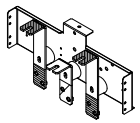
| Parts to be installed | Instruction code | Kit code | Kit ordering code |
|---|---|---|---|
| BLCL-15LC-7: LCL fuse busbars | 3AXD50000431601 | L-6-8-103-VX | 3AXD50000426669 |
| BLCL-24LC-7: LCL fuse busbars | 3AXD50000431403 | L-6-8-104-VX | 3AXD50000426676 |
| BLCL-15LC-7: LCL capacitor support | 3AXD50000244065 | L-6-8-308 | 3AXD50000237319 |
| BLCL-24LC-7: LCL capacitor support | 3AXD50000244065 | L-6-8-309 | 3AXD50000237333 |
| LCL filter choke and choke busbar installation | 3AXD50000247097 | L-6-8-106 | 3AXD50000237418 |
| | AXD50000249893 | L-6-8-311 | 3AXD50000237517 |
| | - | BLCL-15LC-7 chokes or BLCL-24LC-7 chokes | - |
| LCL filter choke mounting mechanics | 3AXD50000431915 | L-6-8-306-VX | 3AXD50000426195 |
| Fan mechanics | - | L-6-8-405 | 3AXD50000344970 |
| Heat exchanger, heat exchanger mechanics and cooling components installation | 3AXD50000479498<br>3AXD50000479634 | BLCL-15LC-7:<br>L-468-8-444<br>BLCL-24LC-7:<br>L-468-8-445 | 3AXD50000479771<br>3AXD50000479788 |
| | 3AXD50000431588 | L-6-8-029-VX | 3AXD50000426621 |
| | - | L-468-8-446 | 3AXD50000479795 |
| Pressure relief kit | 3AXD50000667253 | L-68-X-461-VX | 3AXD50000667277 |

| 3AXD50000707225 | A.1+ | We reserve all rights in this document and in the information contained therein. Reproduction, use or disclosure to third parties without express authority is strictly forbidden. ©ABB Oy. PROPRIETARY AND SECRET INFORMATION. CONFIDENTIAL! | First angle projection. Original drawing made with 3D CAD. Set the correct scale factor when adding dimensions after DWG/DXF conversion. |
|---|---|---|---|
| ACS880LC-LCL_VX25 (ASSEM) | -.48+ | | |

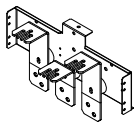
| | | | | |
|---|---|---|---|---|
| A | Initial Approval | | 16-Oct-25 | V. Jarvinen |

# KITS FOR BLCL-15LC-7 and BLCL-24LC-7 IN GENERIC 2000x600x600 CABINET

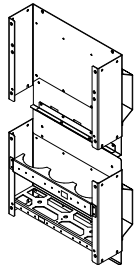
Note! Only parts included in ABB kits are shown.
See kit assembly drawings for required Rittal and/or other manufacturer parts.



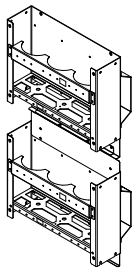
LCL FUSE BUSBARS KIT 15LC
KIT L-6-8-103-VX
Ordering code: 3AXD50000426669



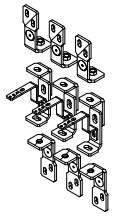
LCL FUSE BUSBAR KIT 24LC
KIT L-6-8-104-VX
Ordering code: 3AXD50000426676



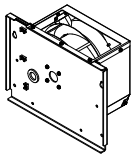
LCL CAPACITOR SUPPORT KIT 15LC
KIT L-6-8-308
Ordering code: 3AXD50000237319



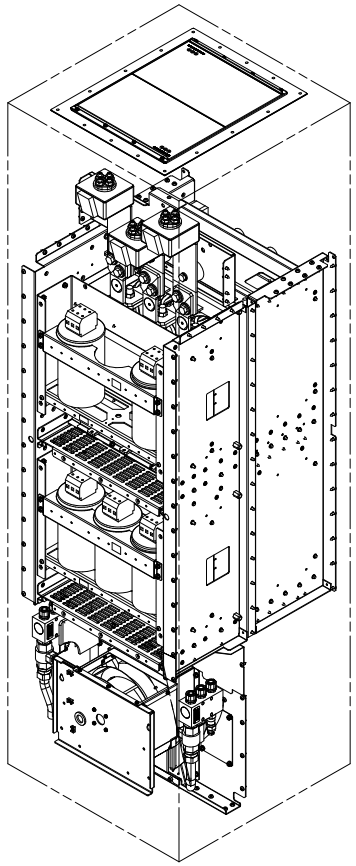
LCL CAPACITOR SUPPORT KIT 24LC
KIT L-6-8-309
Ordering code: 3AXD50000237333

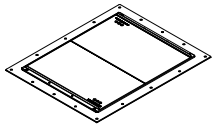


LCL CHOKE BUSBAR KIT 15LC 24LC
KIT L-6-8-106
Ordering code: 3AXD50000237418

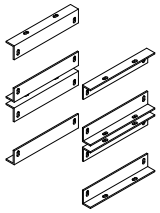


BLCL FAN MECHANICS KIT
KIT L-6-8-405
Ordering code: 3AXD50000344970
Note: fan is not included.



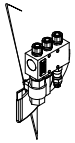


PRESSURE RELIEF VENT KIT 2
KIT L-68-X-461-VX
Ordering code: 3AXD50000667277



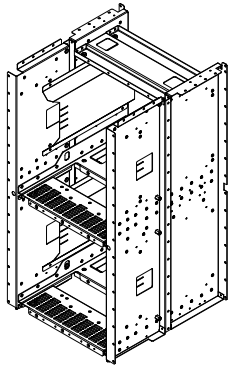
LCL CHOKE BRACKETS 15LC 24LC
KIT L-6-8-311
Ordering code: 3AXD50000237517



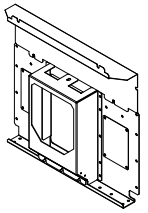


LCL COOLING KIT 1 (FOR BLCL 15LC-7)
KIT L-468-8-444
Ordering code: 3AXD50000479771

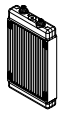
LCL COOLING KIT 2 (FOR BLCL 24LC-7)
KIT L-468-8-445
Ordering code: 3AXD50000479788



LCL CHOKE MOUNT MECH 15LC 24LC
KIT L-6-8-306-VX
Ordering code: 3AXD50000426195



LCL HEAT EXCHANGER MECH KIT
KIT L-6-8-029-VX
Ordering code: 3AXD50000426621



LCL HEAT EXCHANGER KIT
KIT L-468-8-446
Ordering code: 3AXD50000479795

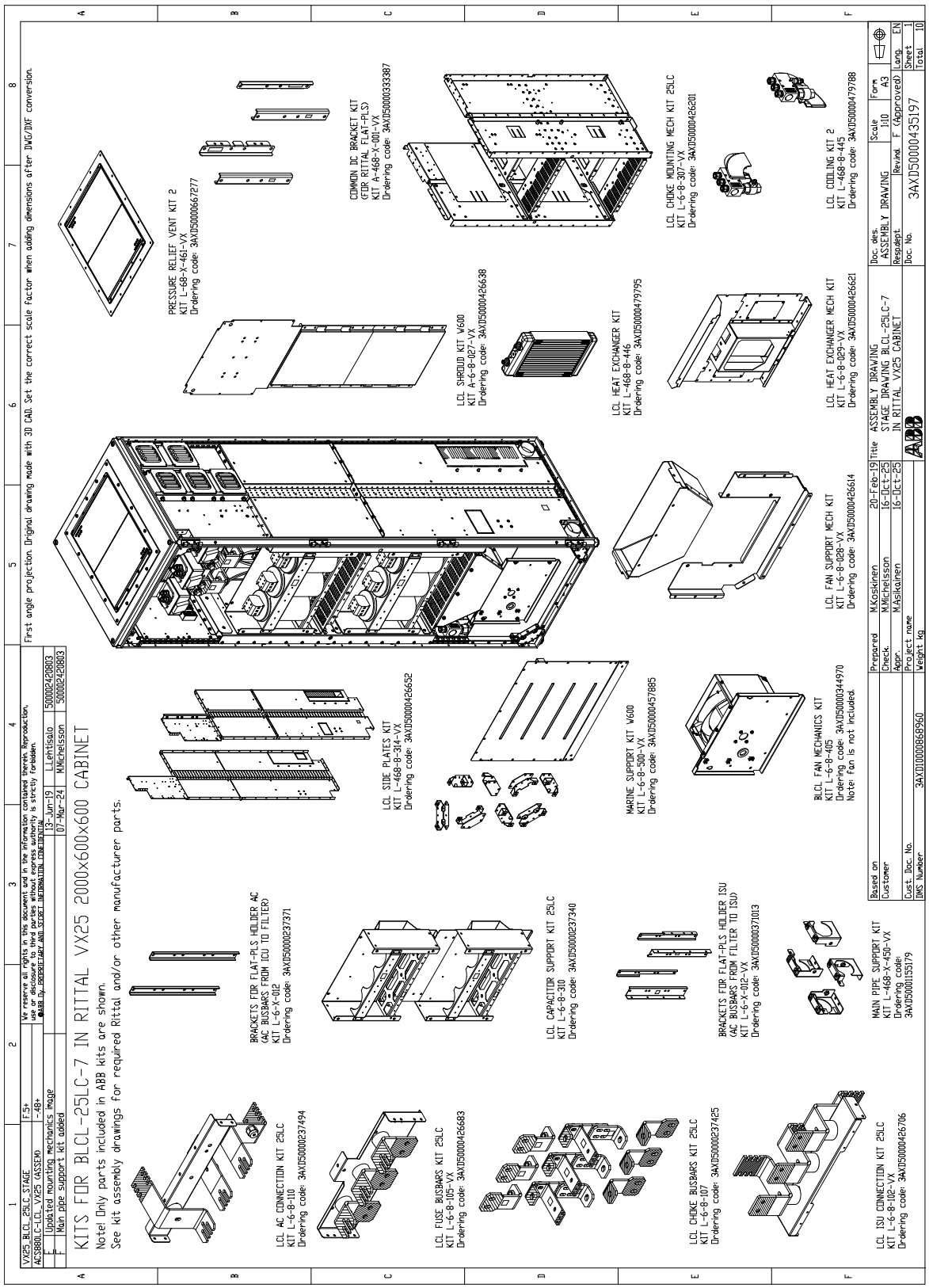
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Based on | | Prepared | V. Jarvinen | 16-Oct-25 | Title | ASSEMBLY DRAWING | Doc. des. | Scale 1:10 | Form A3 |
| Customer | | Check. | M.Michelsson | 16-Oct-25 | | BLCL-15LC-7 AND 24LC-7 | ASSEMBLY DRAWING | | |
| | | Appr. | M.Asikainen | 16-Oct-25 | | IN GENERIC CABINET | Respdept. | Rev.ind. A (Approved) | Lang. EN |
| Cust. Doc. No. | | Project name | | | | | Doc. No. | | Sheet 1 |
| DMS Number | 3AXD10001274022 | Weight kg | 156857.23 | | | | 3AXD50000707225 | | Total 1 |

## BLCL-25LC-7 in a 600 mm wide Rittal VX25 enclosure

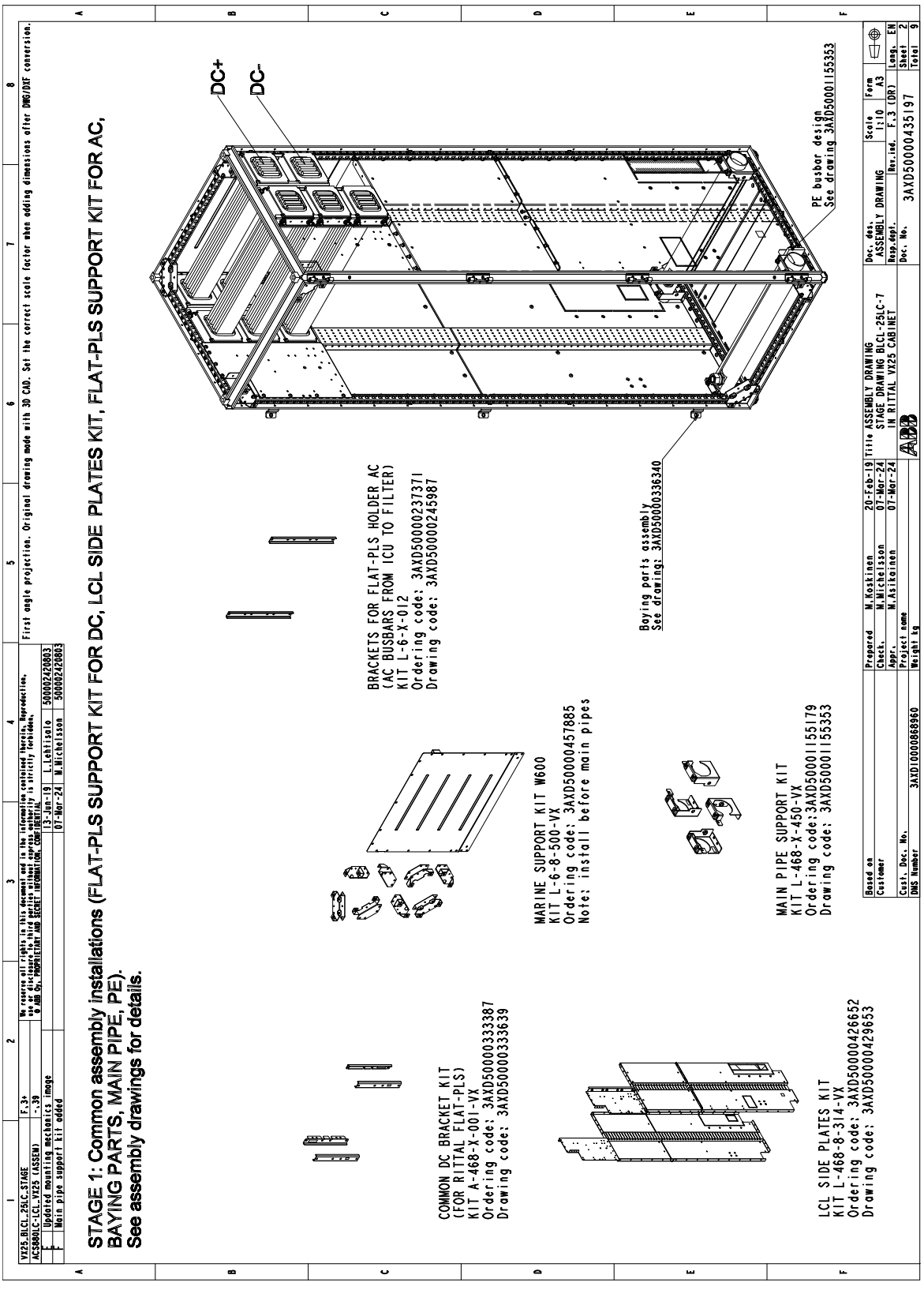
### Installation stages

| No. | Installation stage | Instruction code | Kit code | Kit ordering code |
|---|---|---|---|---|
| 1 | Common AC bus | 3AXD50000245987 | L-6-X-012 | 3AXD50000237371 |
| | Common DC bus | 3AXD50000333639 | A-468-X-001-VX | 3AXD50000333387 |
| | Marine support kit | - | L-6-8-500-VX | 3AXD50000457885 |
| | Baying parts | 3AXD50000336340 | - | - |
| | Main pipe support kit | 3AXD50001155353 | L-468-X-450-VX | 3AXD50001155179 |
| | LCL side plates | 3AXD50000429653 | L-468-8-314-VX | 3AXD50000426652 |
| | PE busbar | 3AXD50001155353 | - | - |
| 2 | Brackets for Flat-PLS holder installation | 3AXD50000370870 | L-6-X-012-VX | 3AXD50000371013 |
| 3 | AC connection and fuse busbars | 3AXD50000249534 | L-6-8-110 | 3AXD50000237494 |
| | | 3AXD50000431724 | L-6-8-105-VX | 3AXD50000426683 |
| 4 | LCL filter choke mounting mechanics and LCL ISU connection | 3AXD50000431816 | L-6-8-307-VX | 3AXD50000426201 |
| | | 3AXD50000431502 | L-6-8-102-VX | 3AXD50000426706 |
| 5 | LCL filter choke and choke busbar installation | 3AXD50000247080 | L-6-8-107 | 3AXD50000237425 |
| | | - | BLCL-25LC-7 chokes | - |
| 6 | Heat exchanger, heat exchanger mechanics and cooling components installation | 3AXD50000479634 | L-468-8-445 | 3AXD50000479788 |
| | | 3AXD50000431588 | L-6-8-029-VX | 3AXD50000426621 |
| | | - | L-468-8-446 | 3AXD50000479795 |
| 7 | LCL capacitor support, fan support mechanics and fan installation | - | L-6-8-405 | 3AXD50000344970 |
| | | 3AXD50000431397 | L-6-8-028-VX | 3AXD50000426614 |
| | | 3AXD50000244065 | L-6-8-310 | 3AXD50000237340 |
| 8 | LCL shroud kit installation | 3AXD50000431632 | A-6-8-027-VX | 3AXD50000426638 |
| 9 | Pressure relief kit | 3AXD50000667253 | L-68-X-461-VX | 3AXD50000667277 |

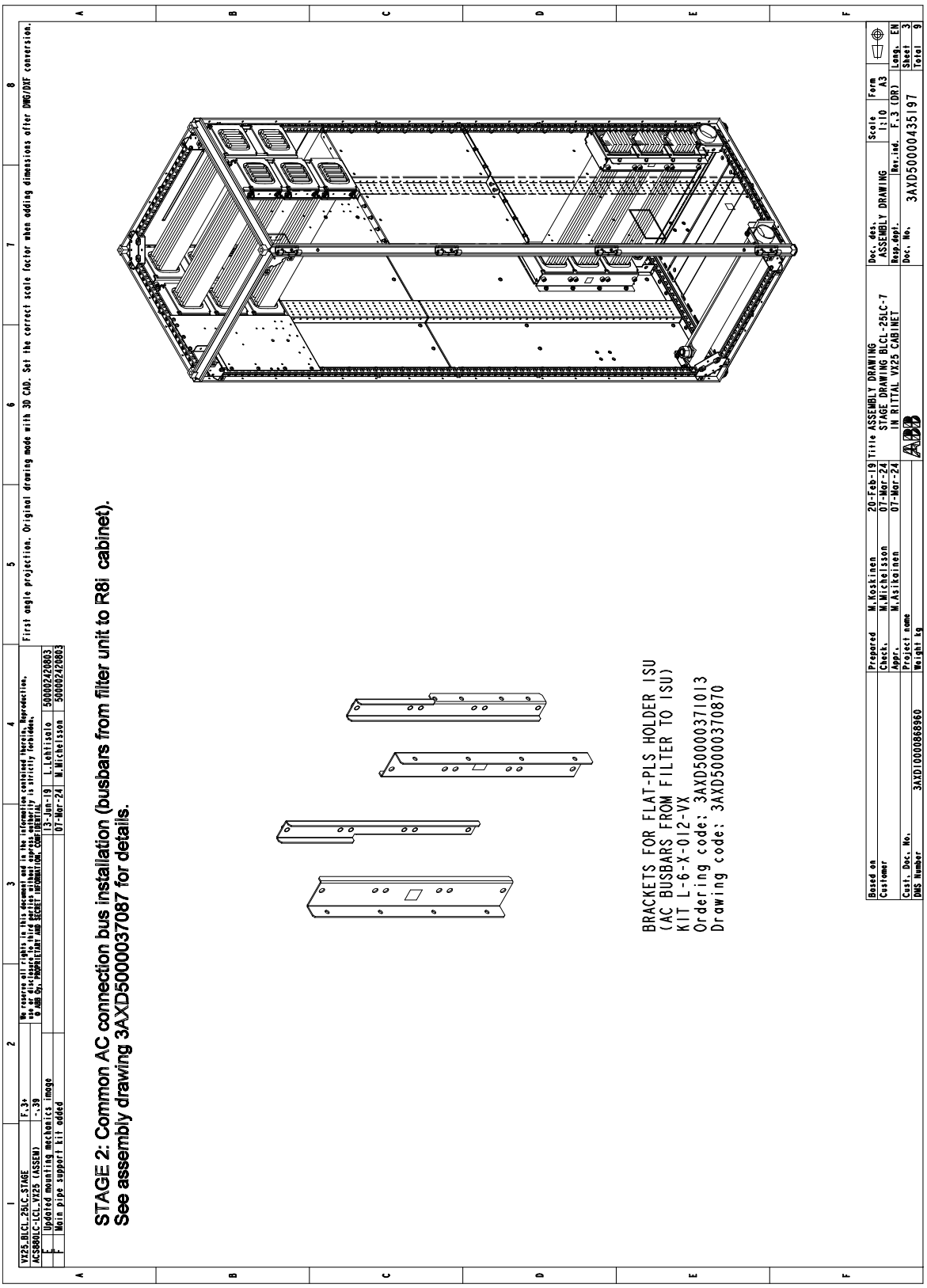
## Overview of kits



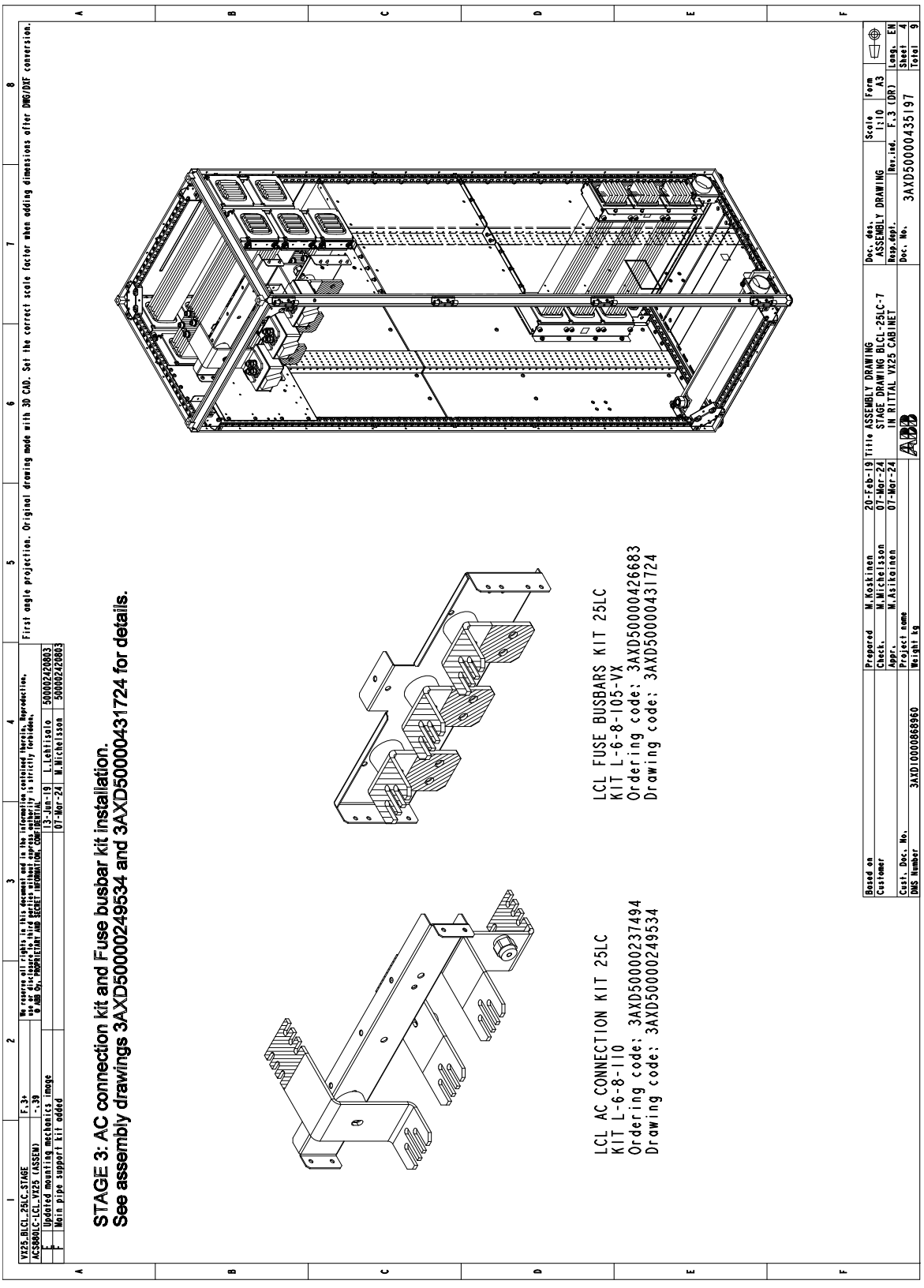
## Stage 1: Installation of common parts



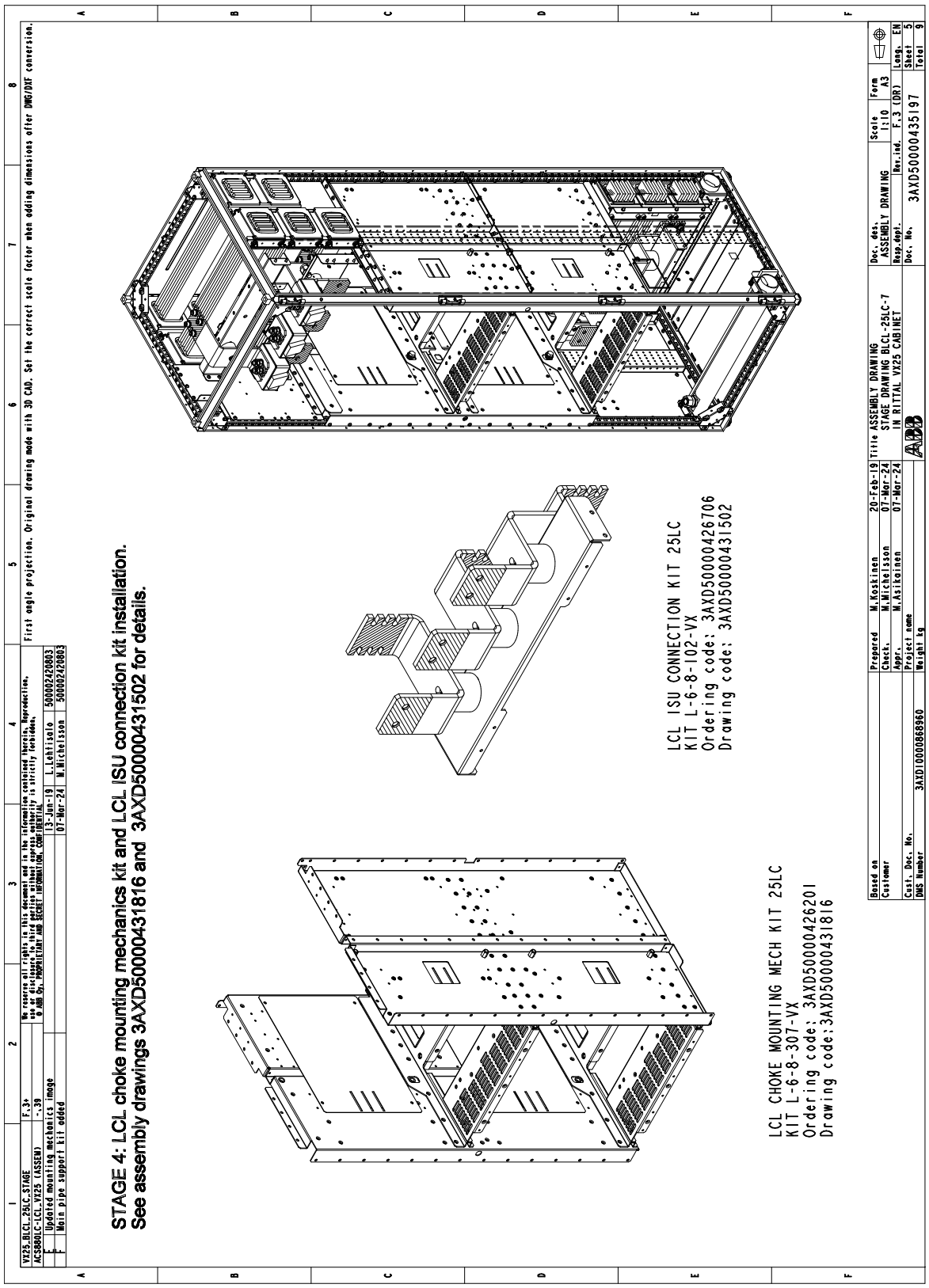
## Stage 2: Installation of brackets for Flat-PLS holder



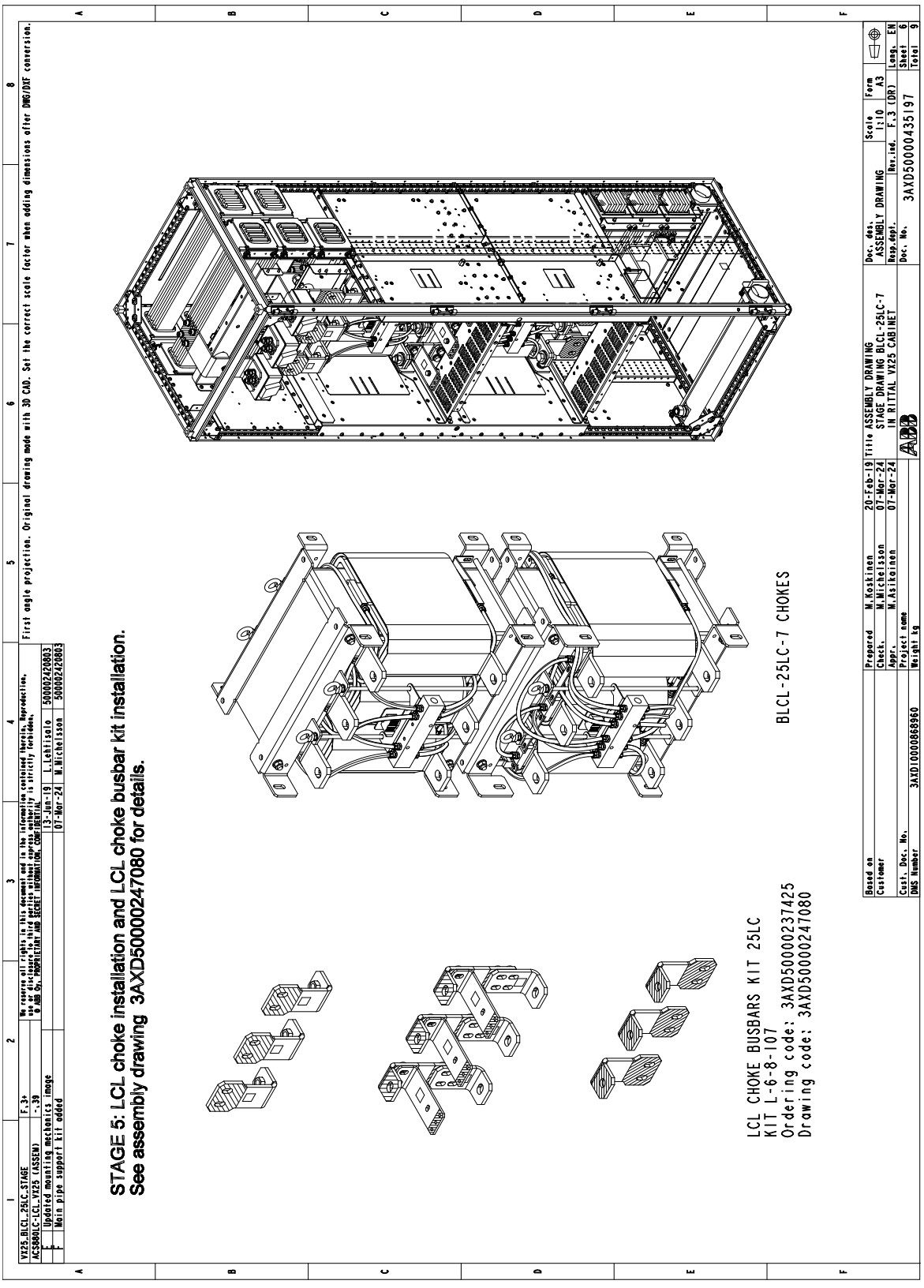
## Stage 3: AC connection and fuse busbars installation



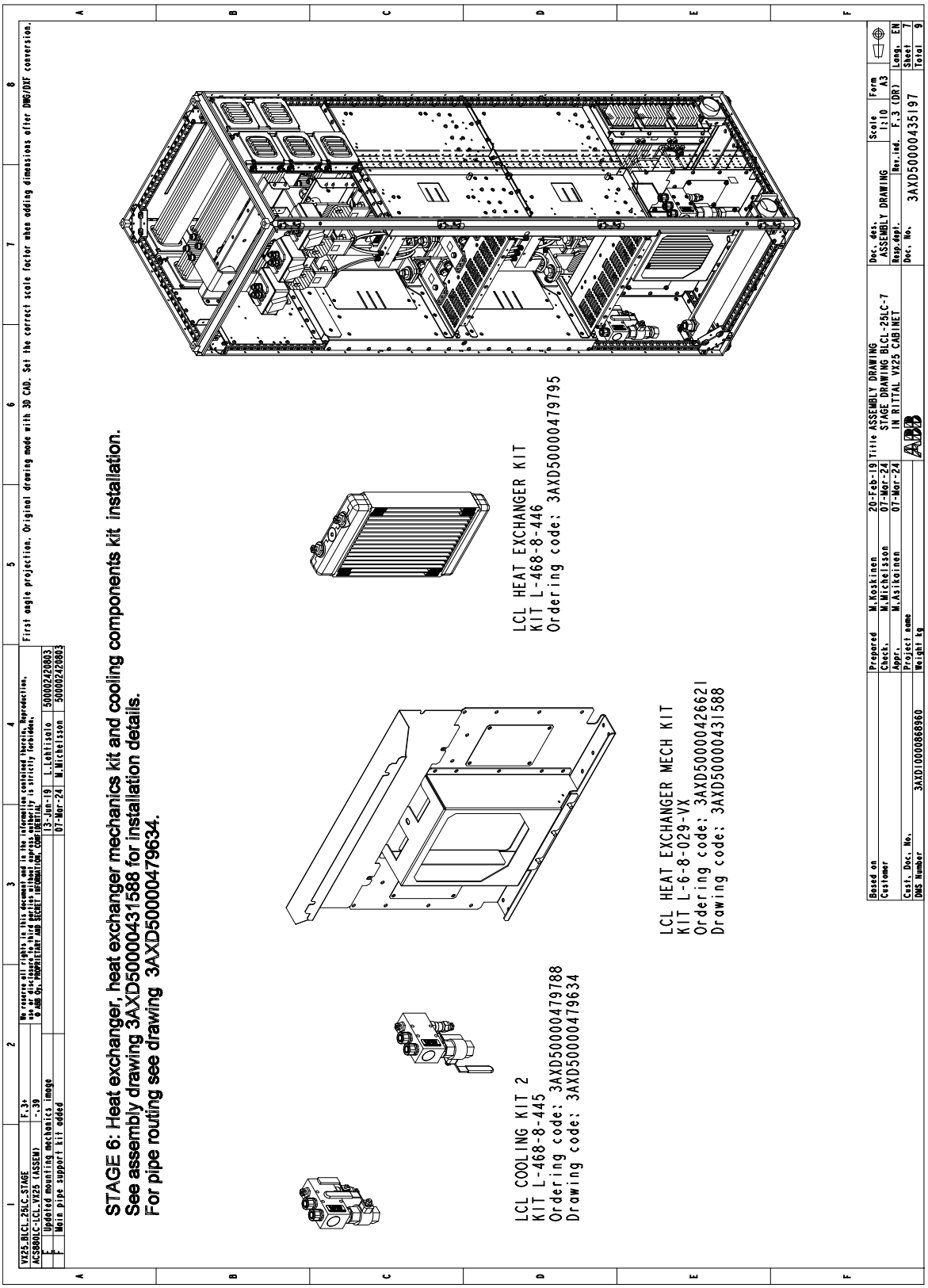
## Stage 4: Installation of LCL filter choke mounting mechanics and LCL ISU connection



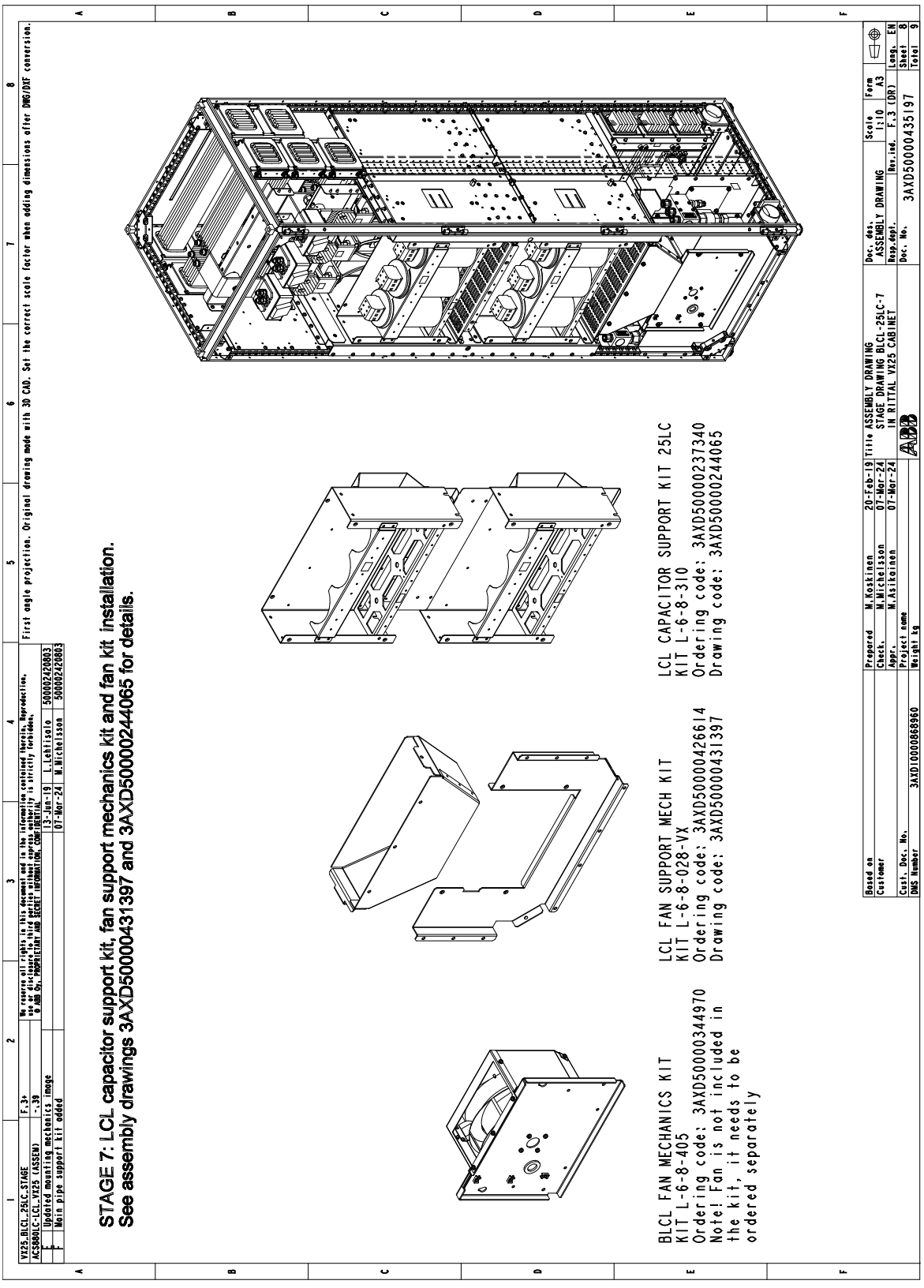
## Stage 5: LCL filter choke and choke busbar installation



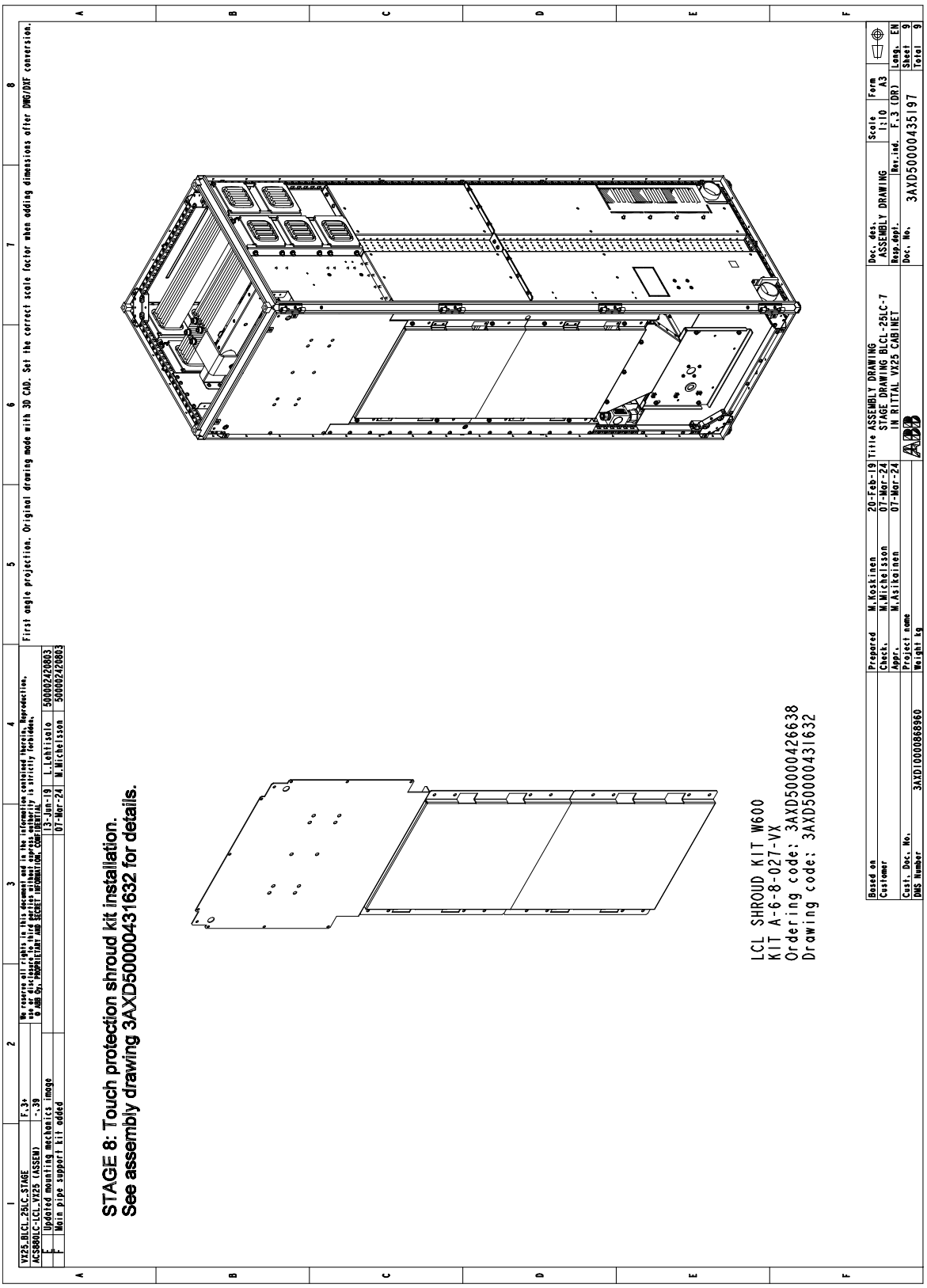
## Stage 6: Heat exchanger, heat exchanger mechanics and cooling components installation



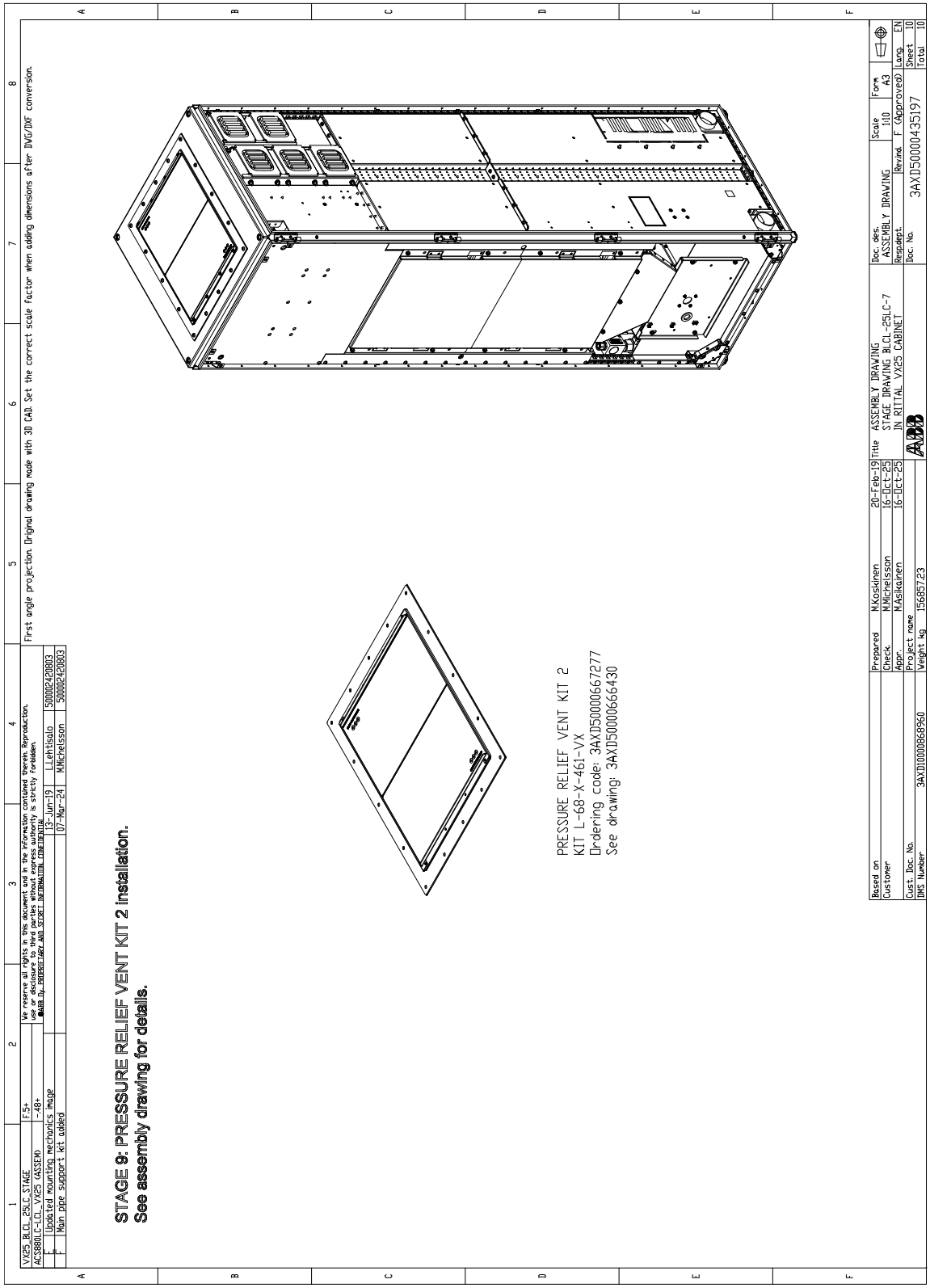
## Stage 7: LCL capacitor support, fan support mechanics and fan installation



## Stage 8: Installation of LCL shroud kit

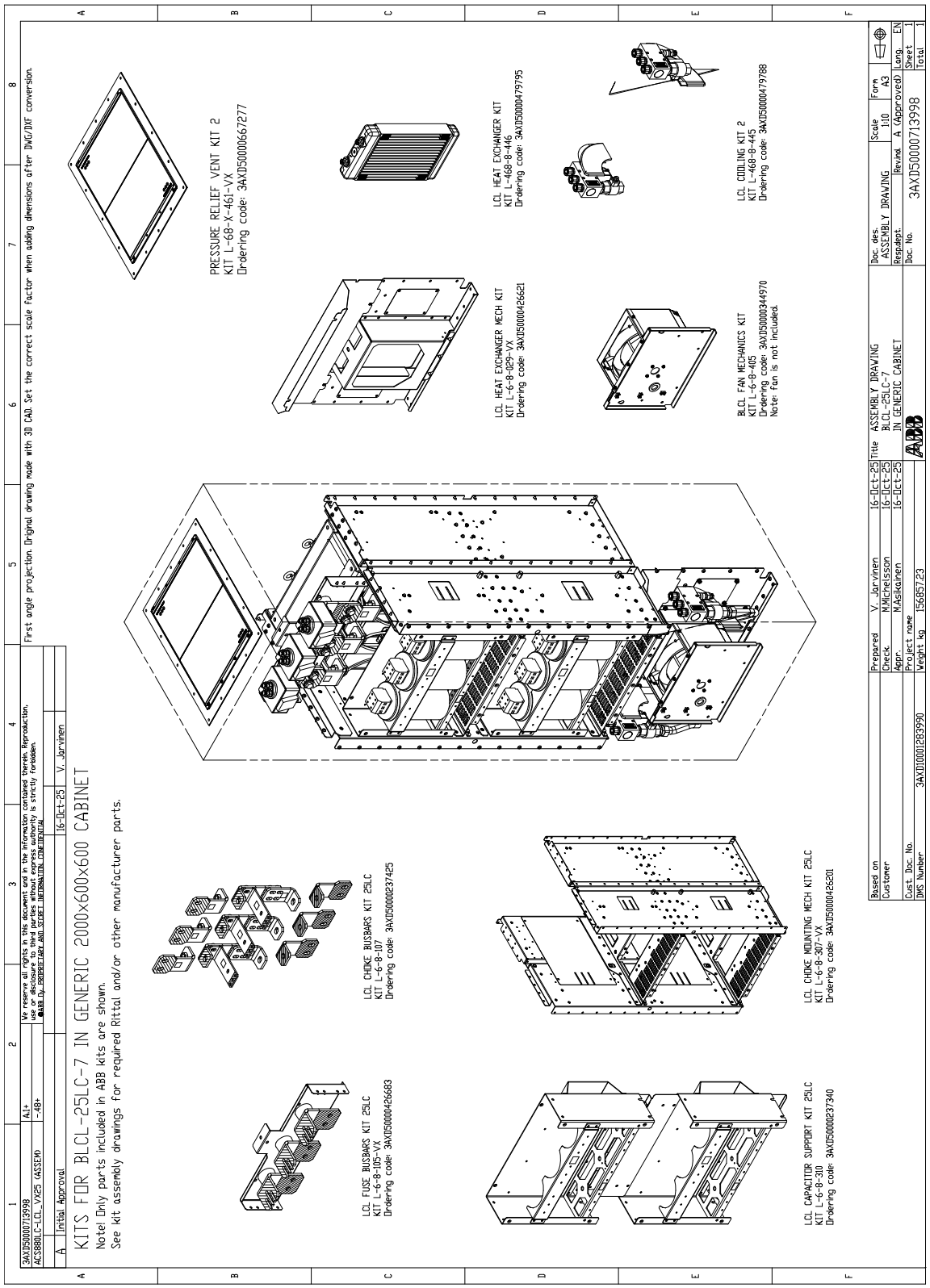


## Stage 9: Installation of pressure relief kit



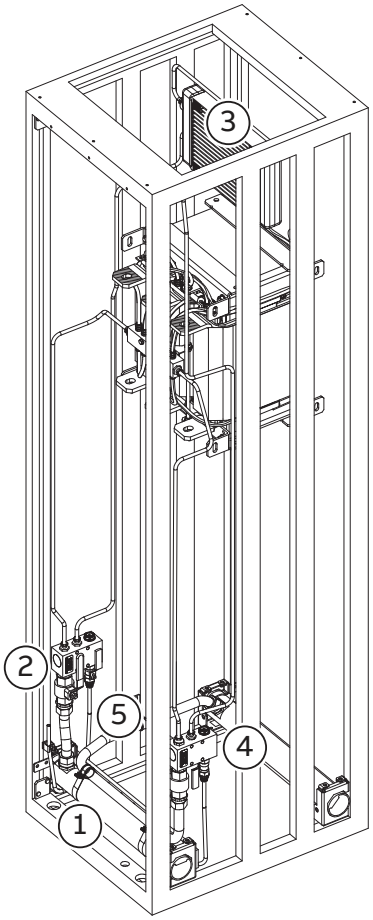
## BLCL-25LC-7 in a 600 mm wide generic enclosure

| Parts to be installed | Instruction code | Kit code | Kit ordering code |
|---|---|---|---|
| LCL fuse busbars | 3AXD50000431724 | L-6-8-105-VX | 3AXD50000426683 |
| LCL filter choke and choke busbar installation | 3AXD50000247080 | L-6-8-107 | 3AXD50000237425 |
| | - | BLCL-25LC-7 chokes | - |
| LCL filter choke mounting mechanics | 3AXD50000431816 | L-6-8-307-VX | 3AXD50000426201 |
| LCL capacitor support | 3AXD50000244065 | L-6-8-310 | 3AXD50000237340 |
| Fan mechanics | - | L-6-8-405 | 3AXD50000344970 |
| Heat exchanger, heat exchanger mechanics and cooling components installation | 3AXD50000479634 | L-468-8-445 | 3AXD50000479788 |
| | 3AXD50000431588 | L-6-8-029-VX | 3AXD50000426621 |
| | - | L-468-8-446 | 3AXD50000479795 |
| Pressure relief kit | 3AXD50000667253 | L-68-X-461-VX | 3AXD50000667277 |


3AXD50000713998
ACS880LC-LCL_VX25 (ASSEM)
A Initial Approval
16-Oct-25 V. Jarvinen
KITS FOR BLCL-25LC-7 IN GENERIC 2000x600x600 CABINET
Note! Only parts included in ABB kits are shown.
See kit assembly drawings for required Rittal and/or other manufacturer parts.
First angle projection. Original drawing made with 3D CAD. Set the correct scale factor when adding dimensions after DWG/DXF conversion.
PRESSURE RELIEF VENT KIT 2
KIT L-68-X-461-VX
Ordering code: 3AXD50000667277
LCL HEAT EXCHANGER KIT
KIT L-468-8-446
Ordering code: 3AXD50000479795
LCL HEAT EXCHANGER MECH KIT
KIT L-6-8-029-VX
Ordering code: 3AXD50000426621
LCL COOLING KIT 2
KIT L-468-8-445
Ordering code: 3AXD50000479788
BLCL FAN MECHANICS KIT
KIT L-6-8-405
Ordering code: 3AXD50000344970
Note: Fan is not included.
LCL FUSE BUSBARS KIT 25LC
KIT L-6-8-105-VX
Ordering code: 3AXD50000426683
LCL CHOKE BUSBARS KIT 25LC
KIT L-6-8-107
Ordering code: 3AXD50000237425
LCL CHOKE MOUNTING MECH KIT 25LC
KIT L-6-8-307-VX
Ordering code: 3AXD50000426201
LCL CAPACITOR SUPPORT KIT 25LC
KIT L-6-8-310
Ordering code: 3AXD50000237340
Prepared V. Jarvinen 16-Oct-25
Check. M.Michelsson 16-Oct-25
Appr. M.Asikainen 16-Oct-25
Project name
Weight kg 156857.23
Title ASSEMBLY DRAWING
BLCL-25LC-7
IN GENERIC CABINET
Doc. des. ASSEMBLY DRAWING
Respdept.
Doc. No. 3AXD50000713998
Scale 1:10
Form A3
Revind A (Approved)
Lang. EN
Sheet 1
Total 1
Based on
Customer
Cust. Doc. No.
DMS Number 3AXD10001283990

## Incoming and CL filter cubicle in a 600 mm wide Rittal VX25 enclosure

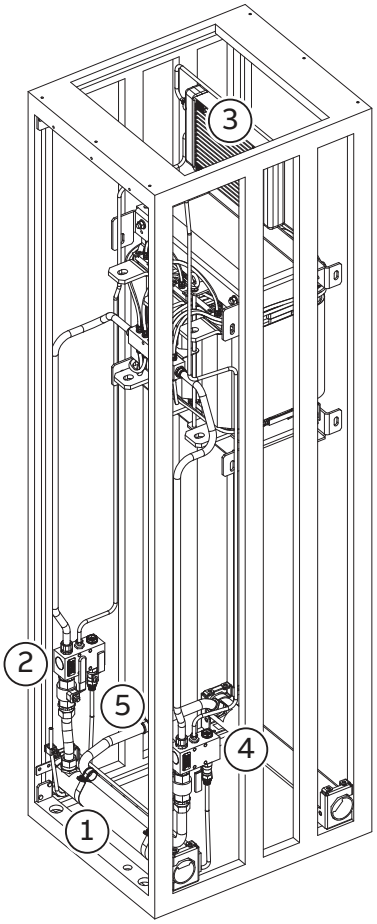
### Pipe routing example (BCL-15LC-7)




| No. | Description |
|---|---|
| 1 | Coolant in |
| 2 | Inlet manifold with stop and drain valves |
| 3 | Heat exchanger |
| 4 | Outlet manifold with stop and drain valves |
| 5 | Coolant out |

Pipe is of type 8/6.

### Pipe routing example (BCL-24LC-7 and BCL-25LC-7)



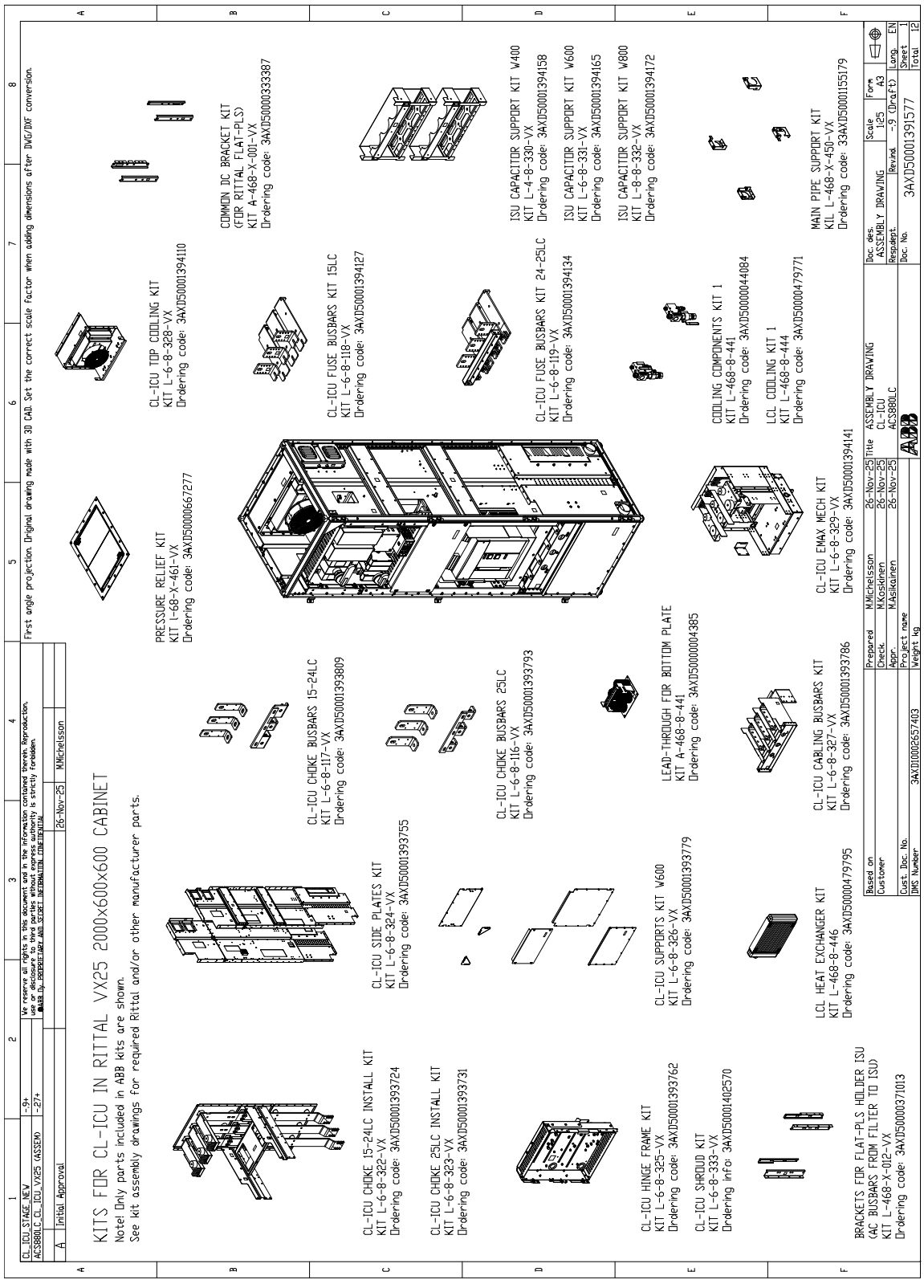

| No. | Description |
|---|---|
| 1 | Coolant in |
| 2 | Inlet manifold with stop and drain valves |
| 3 | Heat exchanger |
| 4 | Outlet manifold with stop and drain valves |
| 5 | Coolant out |

Thicker pipe is of type 16/13 and thinner pipe of type 8/6.

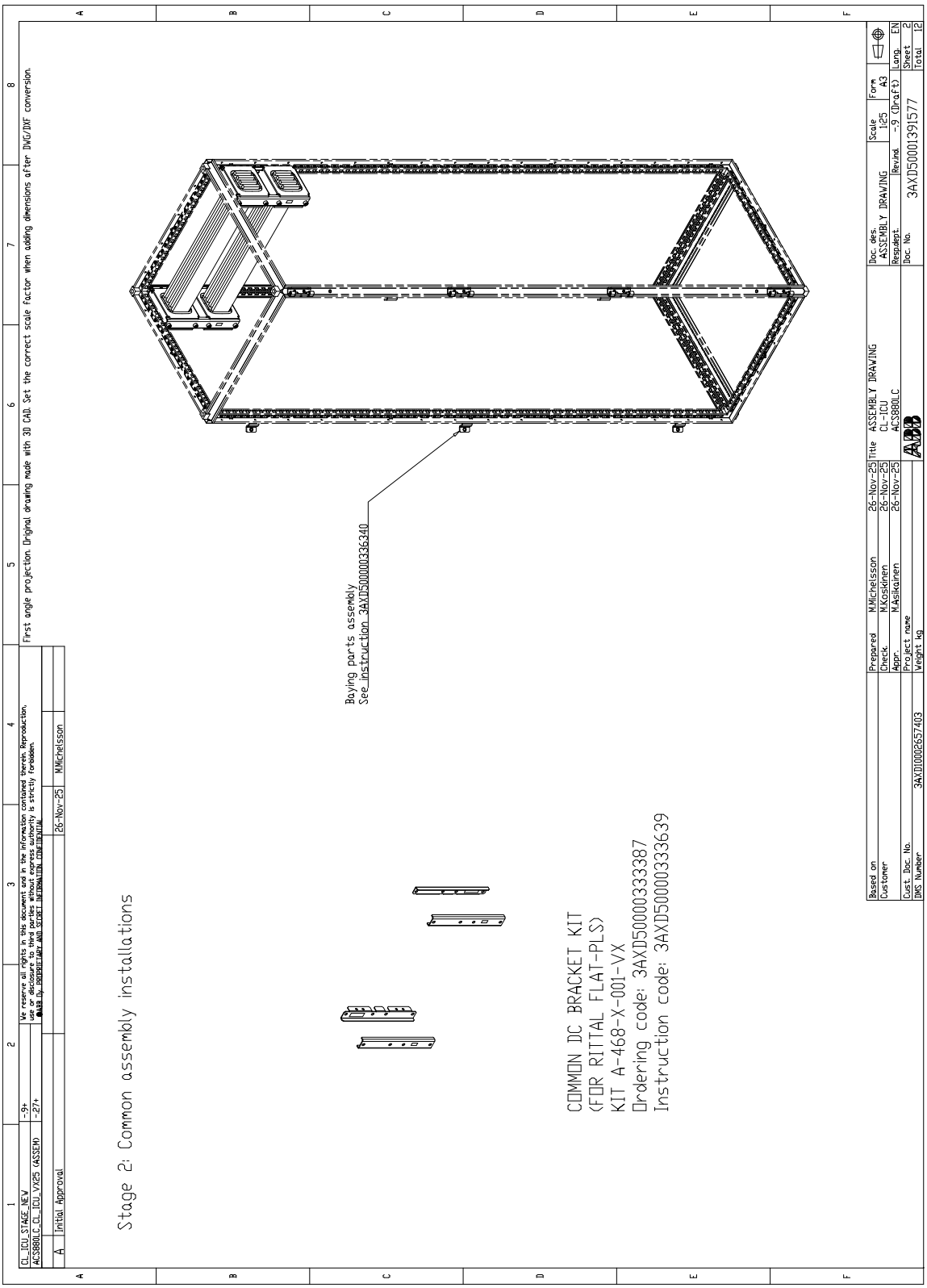
## Installation stages

| No. | Installation stage | Instruction code | Kit code | Kit ordering code |
|---|---|---|---|---|
| 2 | Common DC bracket kit | 3AXD50000333639 | A-468-X-001-VX | 3AXD50000333387 |
| | Baying parts | 3AXD50000336340 | - | - |
| 3 | Brackets for Flat-PLS holder installation | 3AXD50000370870 | L-6-X-012-VX | 3AXD50000371013 |
| | CL-ICU side plates kit | 3AXD50001410322 | L-6-8-324-VX | 3AXD50001393755 |
| 4 | Main pipe support kit | 3AXD50001155353 | L-468-X-450-VX | 3AXD50001155179 |
| | Cooling components kit 1 | 3AXD50000048217 | L-468-8-441 | 3AXD50000044084 |
| | Cooling kit 1 | 3AXD50000479498 | BCL-15LC-7: L-468-8-444 | 3AXD50000479771 |
| | Lead-through for bottom plate | 3AXD50000004817 | A-468-8-441 | 3AXD50000004385 |
| 5 | Cabling and main circuit breaker mechanical installation | 3AXD50001413262 | L-6-8-327-VX | 3AXD50001393786 |
| | | 3AXD50001408206 | L-6-8-329-VX | 3AXD50001394141 |
| 6A | Choke and fuse installation for BCL-15LC-7 | 3AXD50001412289 | L-6-8-322-VX | 3AXD50001393724 |
| | | 3AXD50001408961 | L-6-8-117-VX | 3AXD50001393809 |
| | | 3AXD50001409210 | L-6-8-118-VX | 3AXD50001394127 |
| 6B | Choke and fuse installation for BCL-24LC-7 | 3AXD50001412289 | L-6-8-322-VX | 3AXD50001393724 |
| | | 3AXD50001408961 | L-6-8-117-VX | 3AXD50001393809 |
| | | 3AXD50001409494 | L-6-8-119-VX | 3AXD50001394134 |
| 6C | Choke and fuse installation for BCL-25LC-7 | 3AXD50001411534 | L-6-8-323-VX | 3AXD50001393731 |
| | | 3AXD50001408794 | L-6-8-116-VX | 3AXD50001393793 |
| | | 3AXD50001409494 | L-6-8-119-VX | 3AXD50001394134 |
| 7 | Pipe and top cooling mechanics installation | 3AXD50000431588 | L-468-8-446 | 3AXD50000479795 |
| | | 3AXD50001413194 | L-6-8-328-VX | 3AXD50001394110 |
| 8 | Hinge frame or front shroud installation | 3AXD50001413088 | L-6-8-325-VX | 3AXD50001393762 |
| | | 3AXD50001413200 | L-6-8-333-VX | 3AXD50001402570 |
| 9 | Supports and pressure relief kit installation | 3AXD50001413095 | L-6-8-326-VX | 3AXD50001393779 |
| | | 3AXD50000667253 | L-68-X-461-VX | 3AXD50000667277 |
| 10 | Capacitor installation to module cubicle | 3AXD50001413071 | L-4-8-330-VX | 3AXD50001394158 |
| | | 3AXD50001412784 | L-6-8-331-VX | 3AXD50001394165 |
| | | 3AXD50001413316 | L-8-8-332-VX | 3AXD50001394172 |

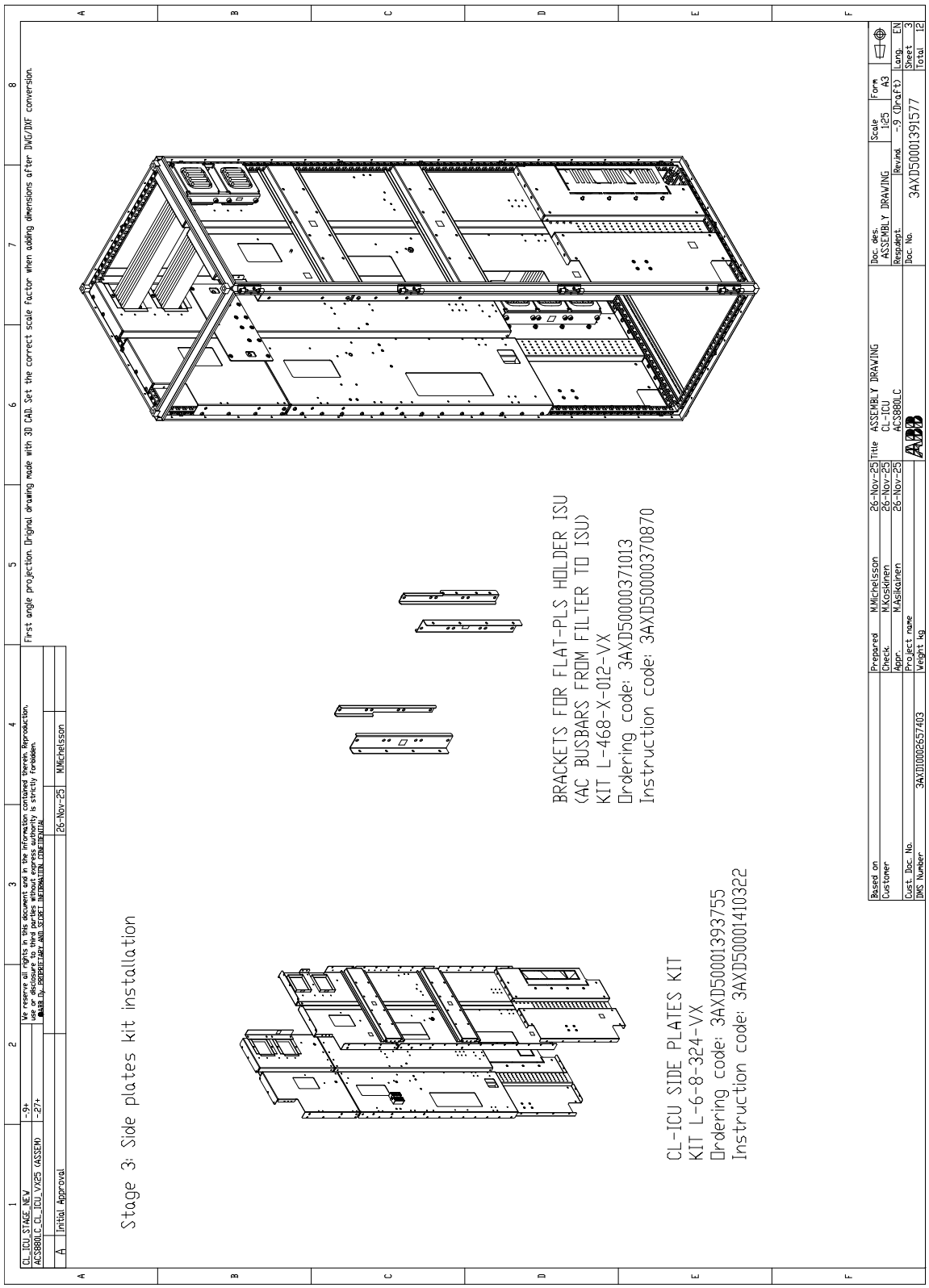
## Overview of kits



## Stage 2: Common assembly installations



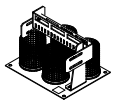
## Stage 3: Side plates kit installation



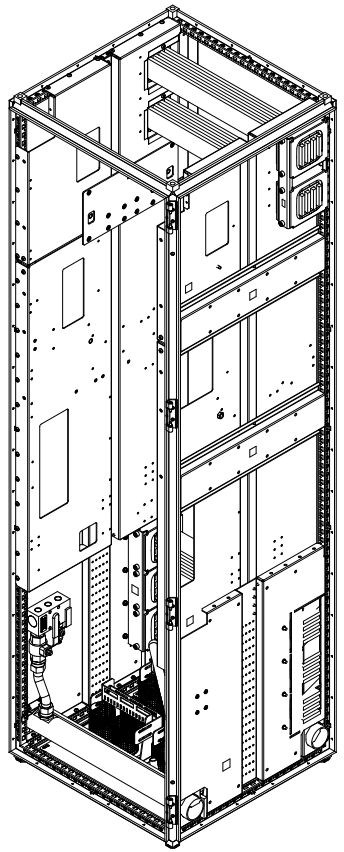
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| CL_ICU_STAGE_NEW | -.9+ | We reserve all rights in this document and in the information contained therein. Reproduction, use or disclosure to third parties without express authority is strictly forbidden. ©ABB Oy. PROPRIETARY AND SECRET INFORMATION. CONFIDENTIAL | | First angle projection. Original drawing made with 3D CAD. Set the correct scale factor when adding dimensions after DWG/DXF conversion. | |
| ACS880LC_CL_ICU_VX25 (ASSEM) | -.27+ | | | | |
| A | Initial Approval | | 26-Nov-25 | MMichelsson | |

Stage 4: Cooling- and bottom mech installation

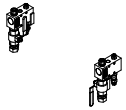


LEAD-THROUGH FOR BOTTOM PLATE
KIT A-468-8-441
Ordering code: 3AXD50000004385
1-4 kits needed.
Instruction code: 3AXD50000004817





MAIN PIPE SUPPORT KIT
KIL L-468-X-450-VX
Ordering code: 33AXD50001155179
Instruction code: 3AXD50001155353

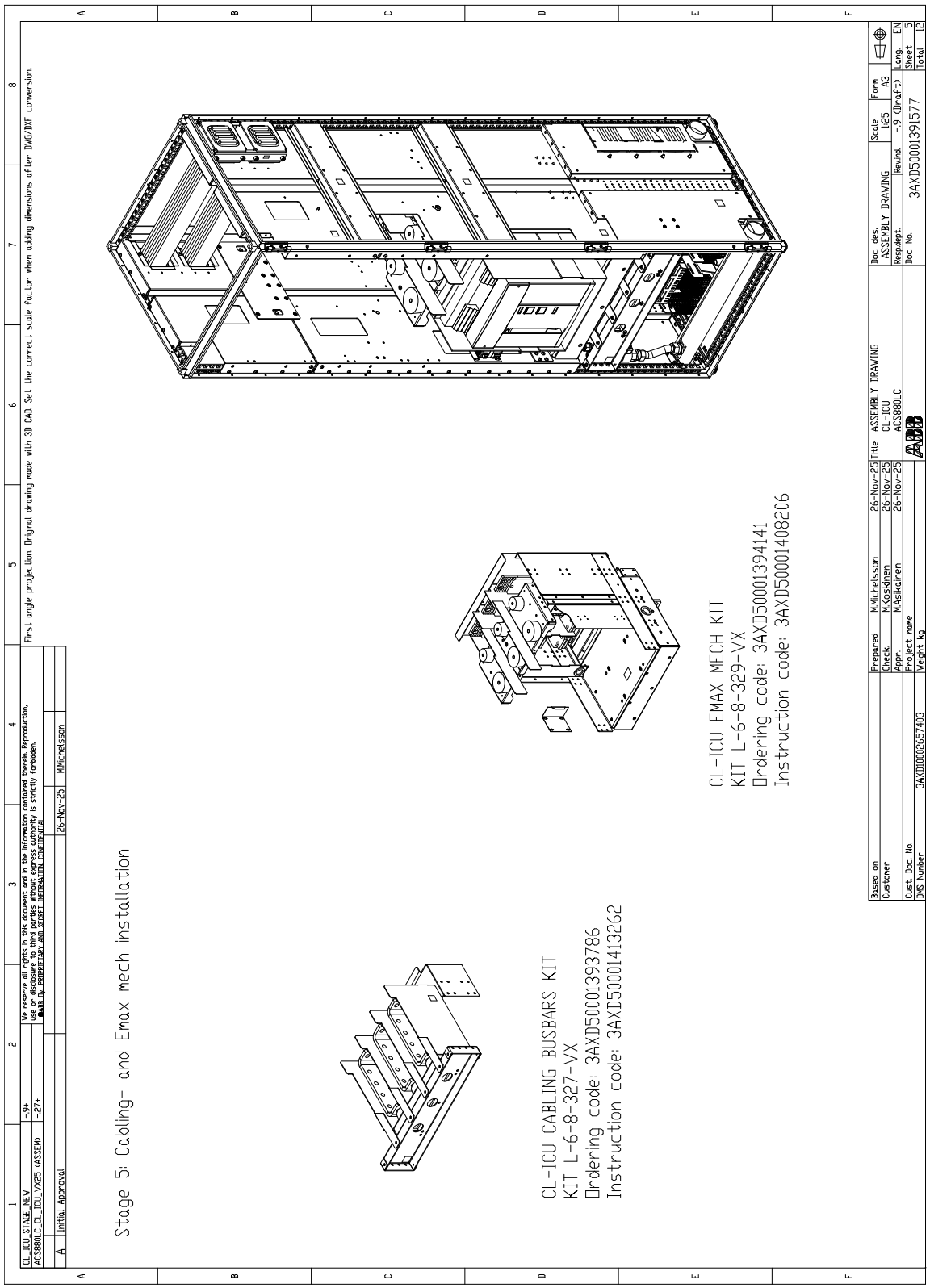


COOLING COMPONENTS KIT 1
FOR 24/25LC-7
KIT L-468-8-441
Ordering code: 3AXD50000044084
Instruction code: 3AXD50000048217

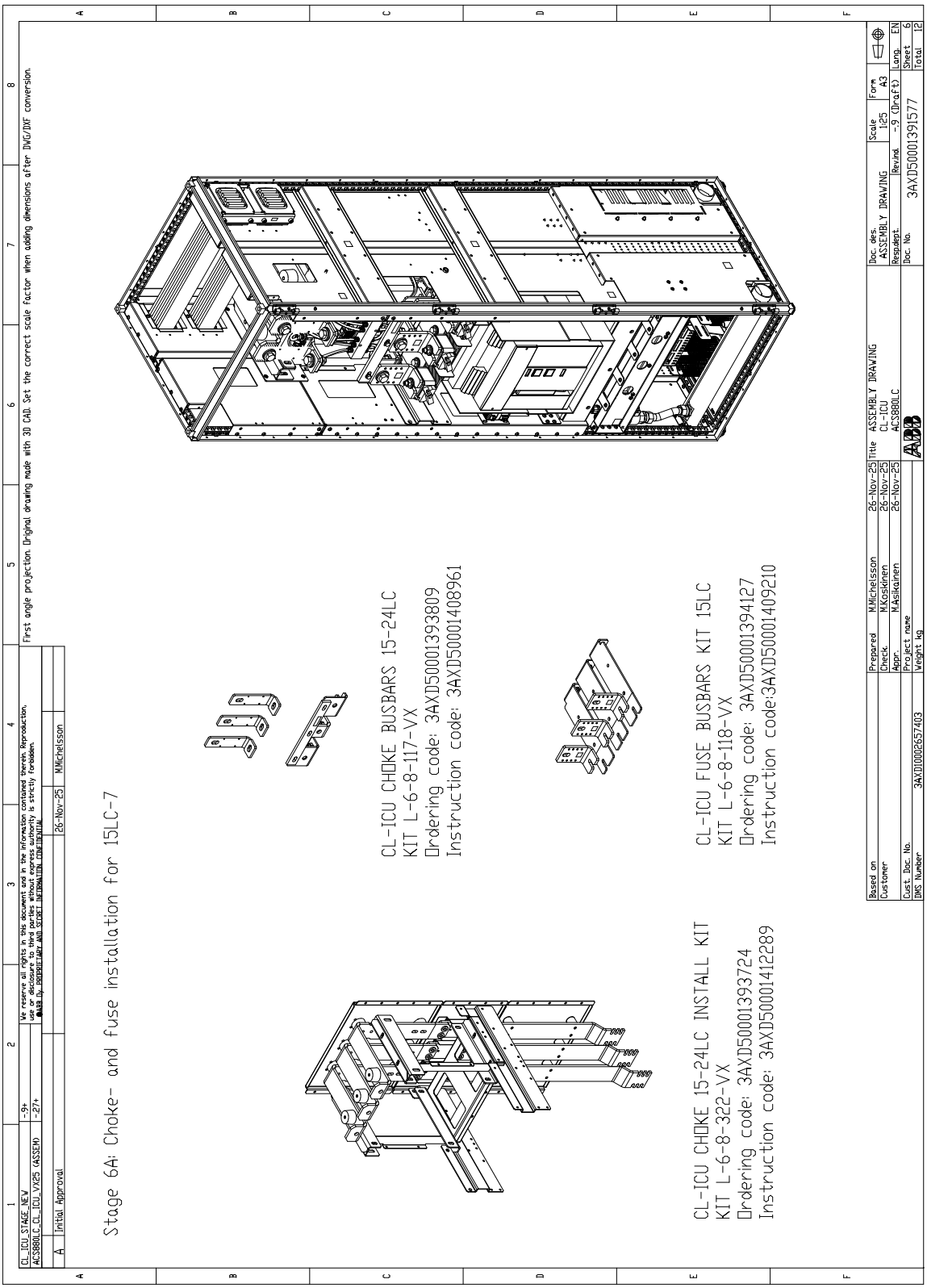
LCL COOLING KIT 1
FOR 15LC-7
KIT L-468-8-444
Ordering code: 3AXD50000479771
Instruction code: 3AXD50000479498

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Based on | | Prepared | M.Michelsson | 26-Nov-25 | Title | ASSEMBLY DRAWING | Doc. des. ASSEMBLY DRAWING |
| Customer | | Check. | M.Koskinen | 26-Nov-25 | | CL-ICU | Scale 1:25 |
| | | Appr. | M.Asikainen | 26-Nov-25 | | ACS880LC | Form A3 |
| Cust. Doc. No. | | Project name | | | | | Resp.dept. Rev.ind. -.9 (Draft) |
| DMS Number | 3AXD10002657403 | Weight kg | | | | | Doc. No. 3AXD50001391577 |
| | | | | | | | Lang. EN |
| | | | | | | | Sheet 4 |
| | | | | | | | Total 12 |

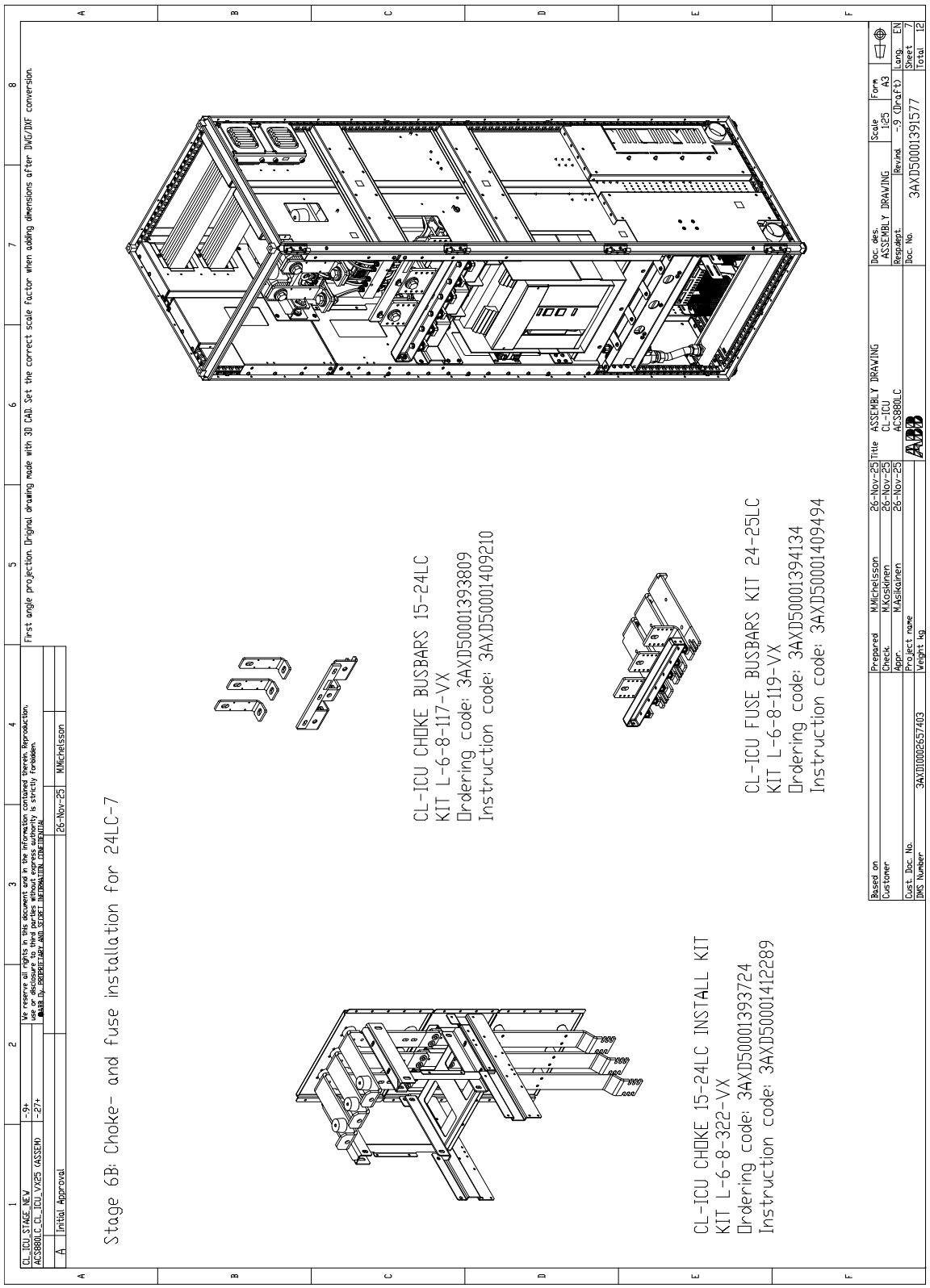
## Stage 5: Cabling and main circuit breaker mechanical installation



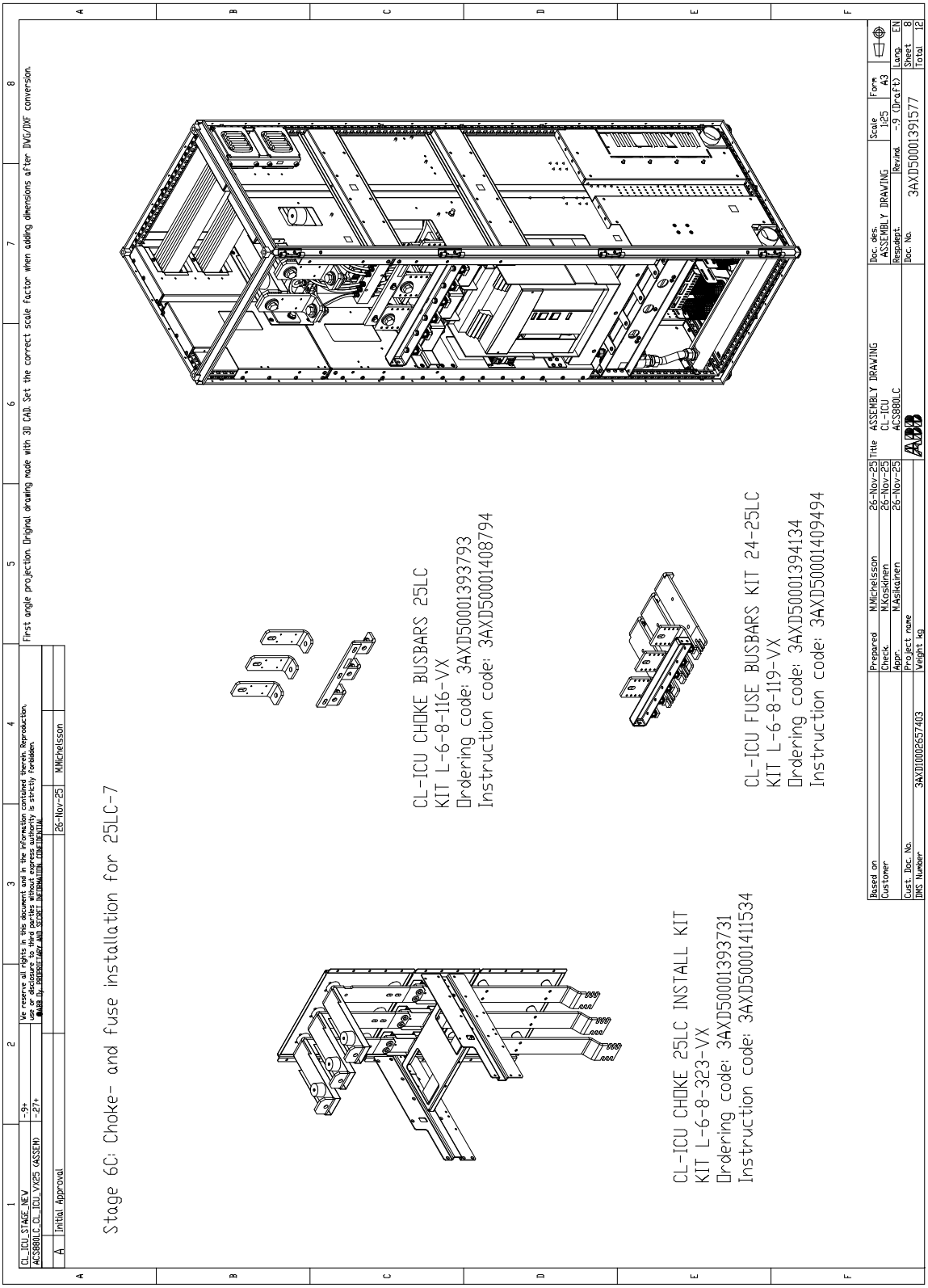
## Stage 6A: Choke and fuse installation for BCL-15LC-7



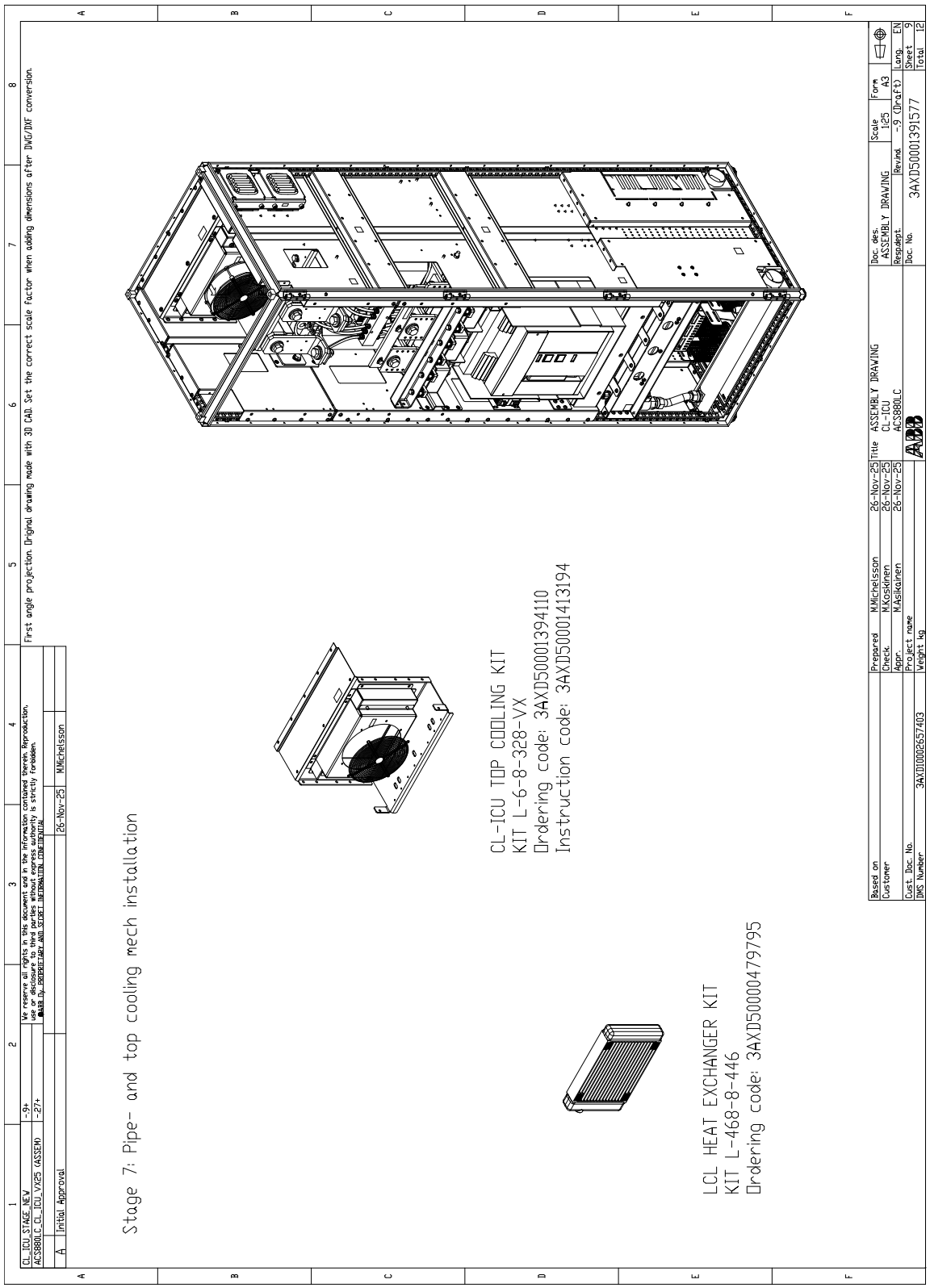
## Stage 6B: Choke and fuse installation for BCL-24LC-7



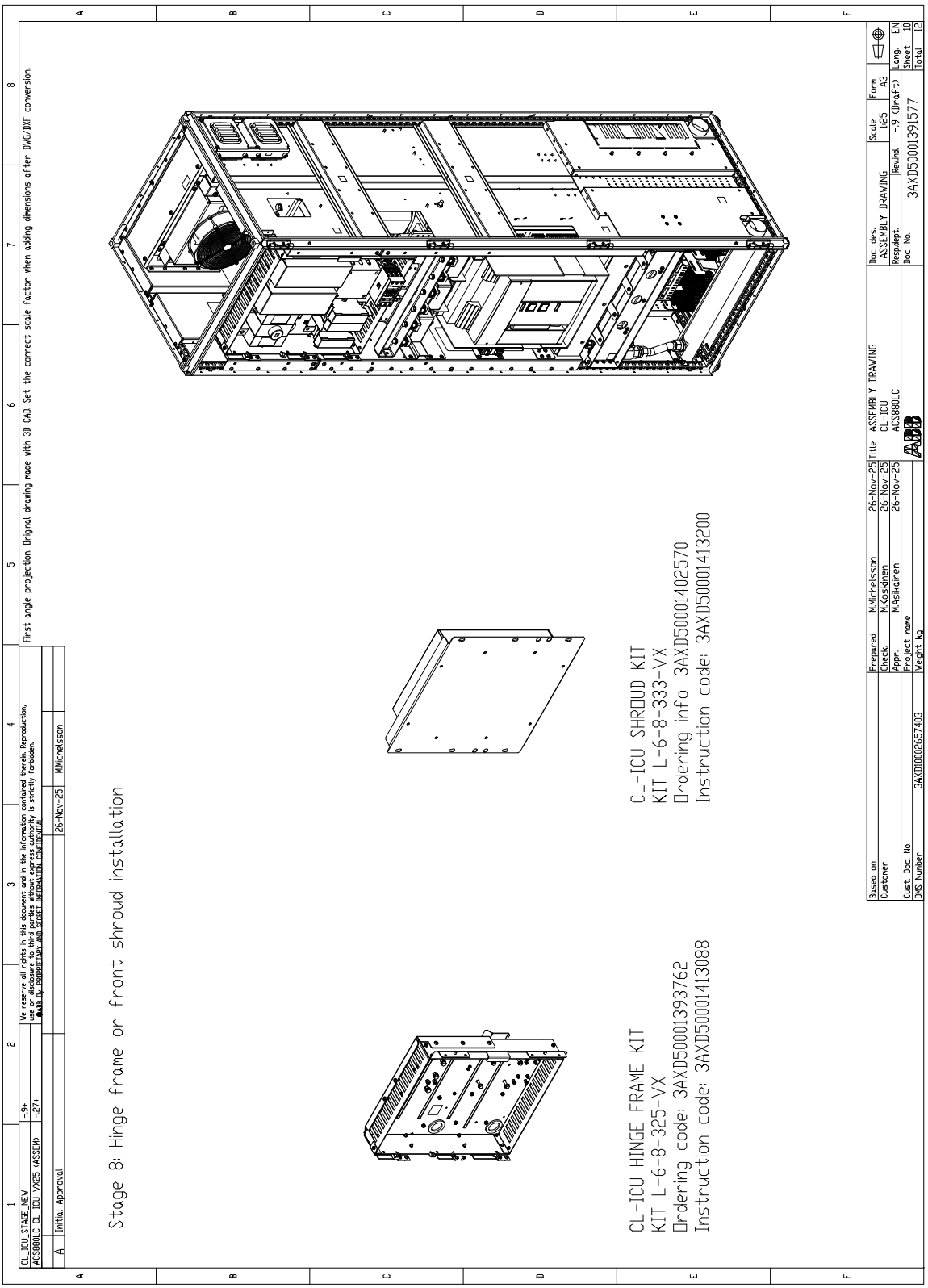
## Stage 6C: Choke and fuse installation for BCL-25LC-7



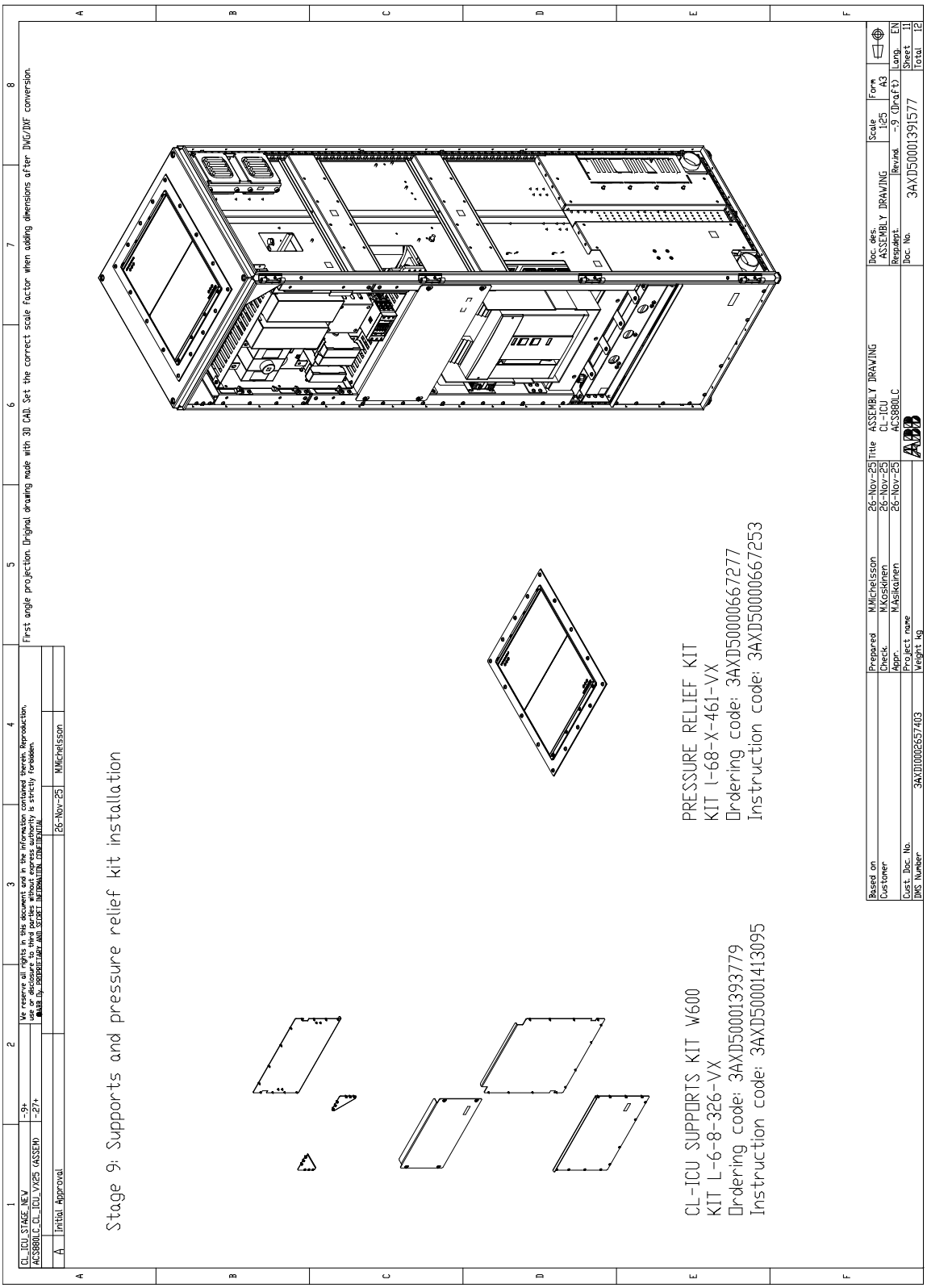
## Stage 7: Pipe and top cooling mechanics installation



## Stage 8: Hinge frame or front shroud installation

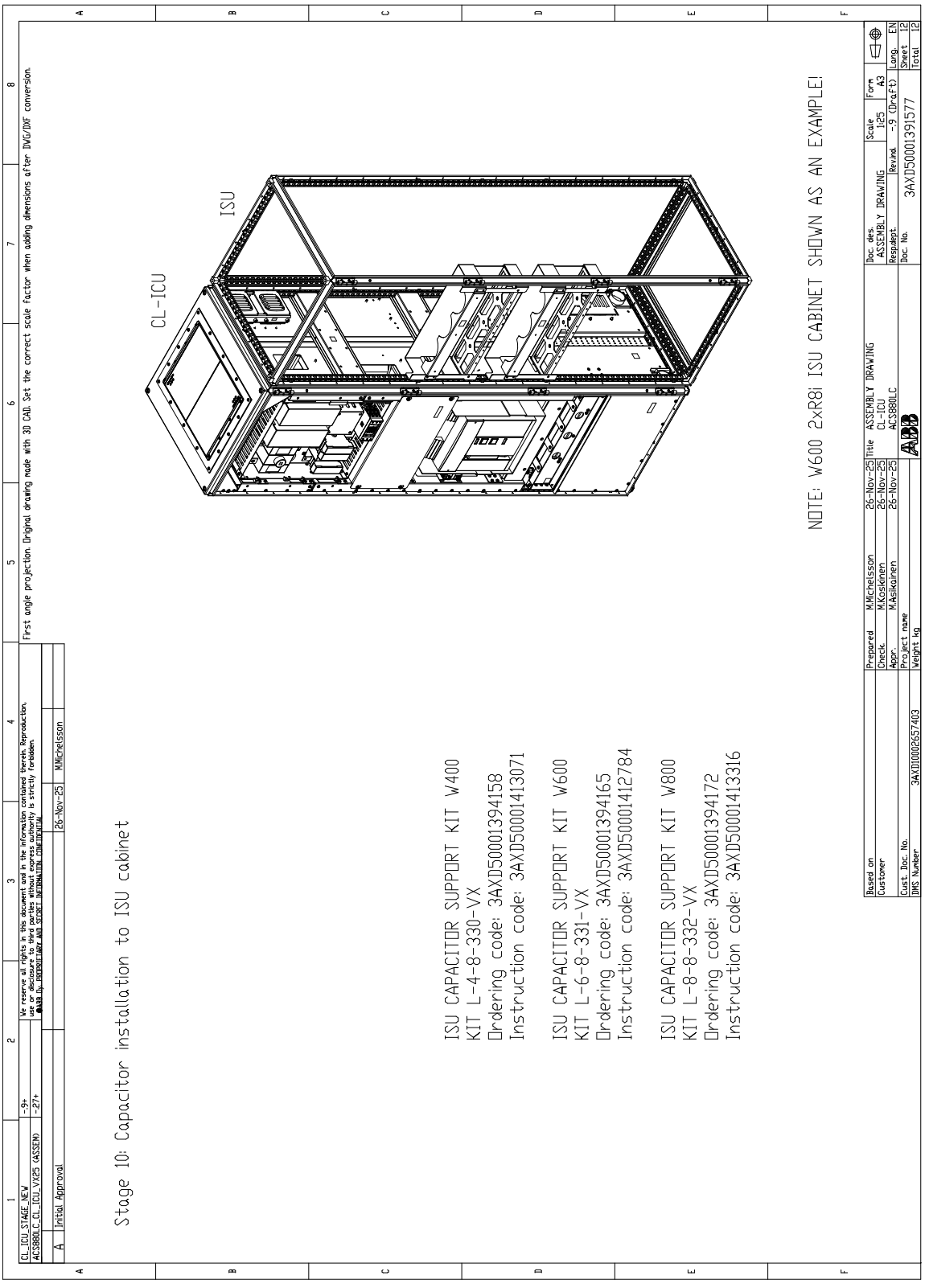


## Stage 9: Supports and pressure relief kit installation



### Stage 10: Capacitor installation to module cubicle

When using the CL filter design where the capacitors are installed in front of the supply module(s), the supply module cubicle must be constructed according to the R8i installation examples. The only difference is that the capacitors are installed in front of the supply module(s), as shown in the figure below.



## Incoming and CL filter cubicle in a 600 mm wide generic enclosure

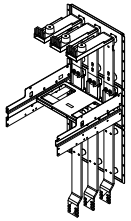
| Parts to be installed | Instruction code | Kit code | Kit ordering code |
|---|---|---|---|
| Cooling components | 3AXD50000048217 | L-468-8-441 | 3AXD50000044084 |
| | 3AXD50000479498 | BCL-15LC-7: L-468-8-444 | 3AXD50000479771 |
| Lead-through for bottom plate | 3AXD50000004817 | A-468-8-441 | 3AXD50000004385 |
| Cabling and main circuit breaker kits | 3AXD50001413262 | L-6-8-327-VX | 3AXD50001393786 |
| | 3AXD50001408206 | L-6-8-329-VX | 3AXD50001394141 |
| Choke and fuse kits for BCL-15LC-7 | 3AXD50001412289 | L-6-8-322-VX | 3AXD50001393724 |
| | 3AXD50001408961 | L-6-8-117-VX | 3AXD50001393809 |
| | 3AXD50001409210 | L-6-8-118-VX | 3AXD50001394127 |
| Choke and fuse kits for BCL-24LC-7 | 3AXD50001412289 | L-6-8-322-VX | 3AXD50001393724 |
| | 3AXD50001408961 | L-6-8-117-VX | 3AXD50001393809 |
| | 3AXD50001409494 | L-6-8-119-VX | 3AXD50001394134 |
| Choke and fuse kits for BCL-25LC-7 | 3AXD50001411534 | L-6-8-323-VX | 3AXD50001393731 |
| | 3AXD50001408794 | L-6-8-116-VX | 3AXD50001393793 |
| | 3AXD50001409494 | L-6-8-119-VX | 3AXD50001394134 |
| Cooling mechanics | 3AXD50000431588 | L-468-8-446 | 3AXD50000479795 |
| | 3AXD50001413194 | L-6-8-328-VX | 3AXD50001394110 |
| Hinge frame and shroud installation | 3AXD50001413088 | L-6-8-325-VX | 3AXD50001393762 |
| | 3AXD50001413200 | L-6-8-333-VX | 3AXD50001402570 |
| Pressure relief | 3AXD50000667253 | L-68-X-461-VX | 3AXD50000667277 |
| Capacitor kits to module cubicle | 3AXD50001413071 | L-4-8-330-VX | 3AXD50001394158 |
| | 3AXD50001412784 | L-6-8-331-VX | 3AXD50001394165 |
| | 3AXD50001413316 | L-8-8-332-VX | 3AXD50001394172 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

| | | | | |
|---|---|---|---|---|
| CL_ICU_STAGE_GEN | A.1+ | We reserve all rights in this document and in the information contained therein. Reproduction, use or disclosure to third parties without express authority is strictly forbidden. ©ABB Oy. PROPRIETARY AND SECRET INFORMATION. CONFIDENTIAL | First angle projection. Original drawing made with 3D CAD. Set the correct scale factor when adding dimensions after DWG/DXF conversion. | |
| ACS880LC_CL_ICU_GEN (ASSEM) | A.1+ | | | |
| A | Initial Approval | 07-Nov-25 | M.Michelsson | |

# KITS FOR CL-ICU IN GENERIC 2000x600x600 CABINET

Note! Only parts included in ABB kits are shown.
See kit assembly drawings for required Rittal and/or other manufacturer parts.



CL-ICU CHOKE 15-24LC INSTALL KIT
KIT L-6-8-322-VX
Ordering code: 3AXD50001393724

CL-ICU CHOKE 25LC INSTALL KIT
KIT L-6-8-323-VX
Ordering code: 3AXD50001393731

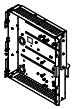


LCL HEAT EXCHANGER KIT
KIT L-468-8-446
Ordering code: 3AXD50000479795



COOLING COMPONENTS KIT 1
KIT L-468-8-441
Ordering code: 3AXD50000044084

LCL COOLING KIT 1
KIT L-468-8-444
Ordering code: 3AXD50000479771



CL-ICU HINGE FRAME KIT
KIT L-6-8-325-VX
Ordering code: 3AXD50001393762

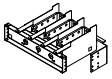
CL-ICU SHROUD KIT
KIT L-6-8-333-VX
Ordering info: 3AXD50001402570



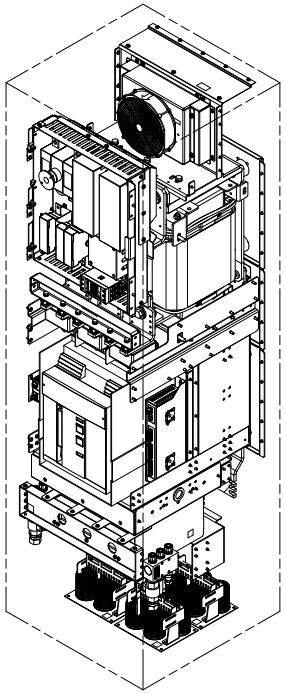
CL-ICU CHOKE BUSBARS 15-24LC
KIT L-6-8-117-VX
Ordering code: 3AXD50001393809

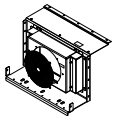


CL-ICU CHOKE BUSBARS 25LC
KIT L-6-8-116-VX
Ordering code: 3AXD50001393793

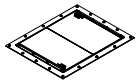


CL-ICU CABLING BUSBARS KIT
KIT L-6-8-327-VX
Ordering code: 3AXD50001393786

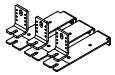




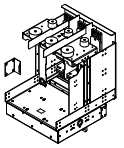
CL-ICU TOP COOLING KIT
KIT L-6-8-328-VX
Ordering code: 3AXD50001394110



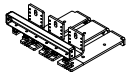
PRESSURE RELIEF KIT
KIT 1-68-X-461-VX
Ordering code: 3AXD50000667277



CL-ICU FUSE BUSBARS KIT 15LC
KIT L-6-8-118-VX
Ordering code: 3AXD50001394127



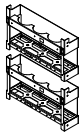
CL-ICU EMAX MECH KIT
KIT L-6-8-329-VX
Ordering code: 3AXD50001394141



CL-ICU FUSE BUSBARS KIT 24-25LC
KIT L-6-8-119-VX
Ordering code: 3AXD50001394134



LEAD-THROUGH FOR BOTTOM PLATE
KIT A-468-8-441
Ordering code: 3AXD50000004385
1-4 kits needed



ISU CAPACITOR SUPPORT KIT W400
KIT L-4-8-330-VX
Ordering code: 3AXD50001394158

ISU CAPACITOR SUPPORT KIT W600
KIT L-6-8-331-VX
Ordering code: 3AXD50001394165

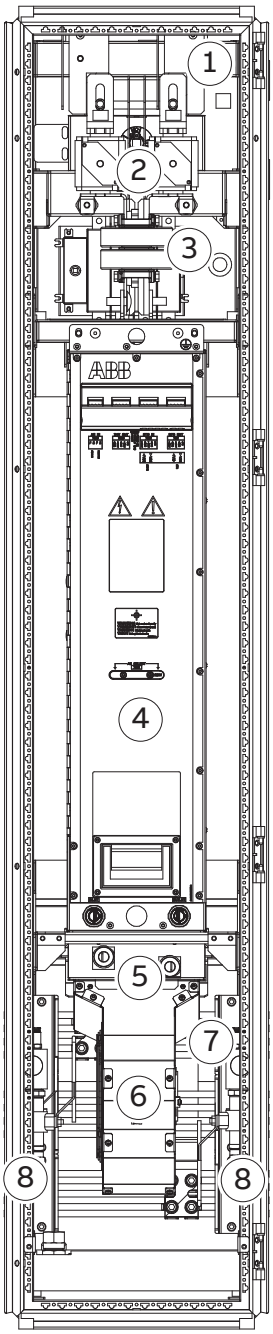
ISU CAPACITOR SUPPORT KIT W800
KIT L-8-8-332-VX
Ordering code: 3AXD50001394172

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Based on | | Prepared | M.Michelsson | 07-Nov-25 | Title | Doc. des. ASSEMBLY DRAWING | Scale 1:25 / Form A3 |
| Customer | | Check. | M.Koskinen | 07-Nov-25 | | Respdept. | Rev.ind. A.1 (Draft) / Lang. EN |
| | | Appr. | M.Asikainen | 07-Nov-25 | | Doc. No. 3AXD50001413811 | Sheet 1 / Total 1 |
| Cust. Doc. No. | | Project name | | | ABB | | |
| DMS Number | 3AXD10002695501 | Weight kg | | | | | |

## One R8i module in a 400 mm wide Rittal VX25 enclosure

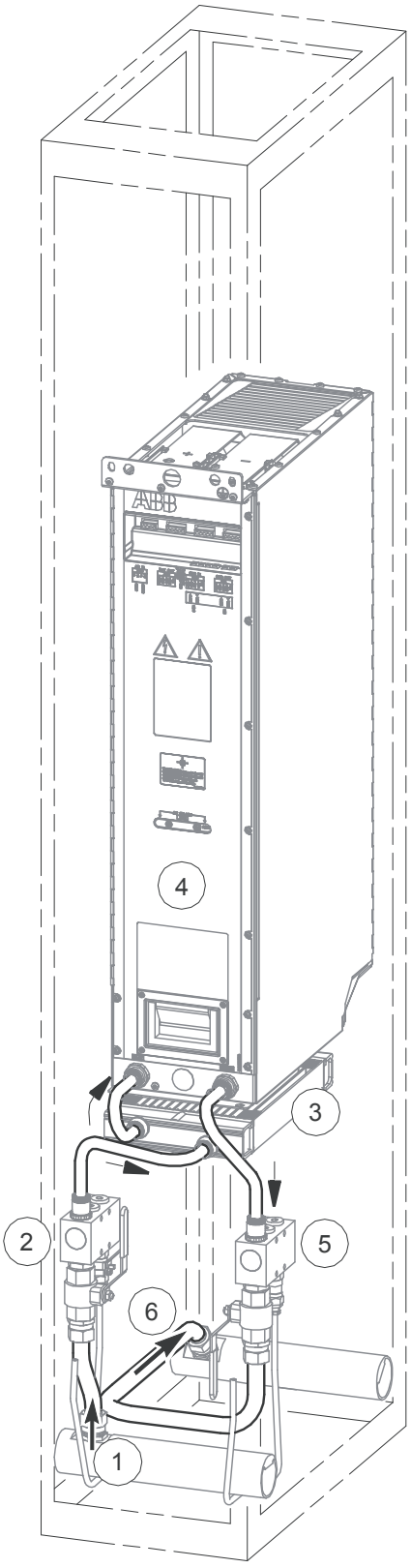
This section is applicable to a supply unit with the LCL filter.

### Layout drawing




| No. | Description |
|---|---|
| 1 | Common DC busbars (Rittal Flat-PLS) |
| 2 | DC fuses and optional DC switch |
| 3 | Common mode filter |
| 4 | IGBT supply module |
| 5 | Heat exchanger |
| 6 | Cooling fan |
| 7 | AC connection to LCL filter (Rittal Flat-PLS) |
| 8 | Inlet and outlet manifold with valves |

## Pipe routing example

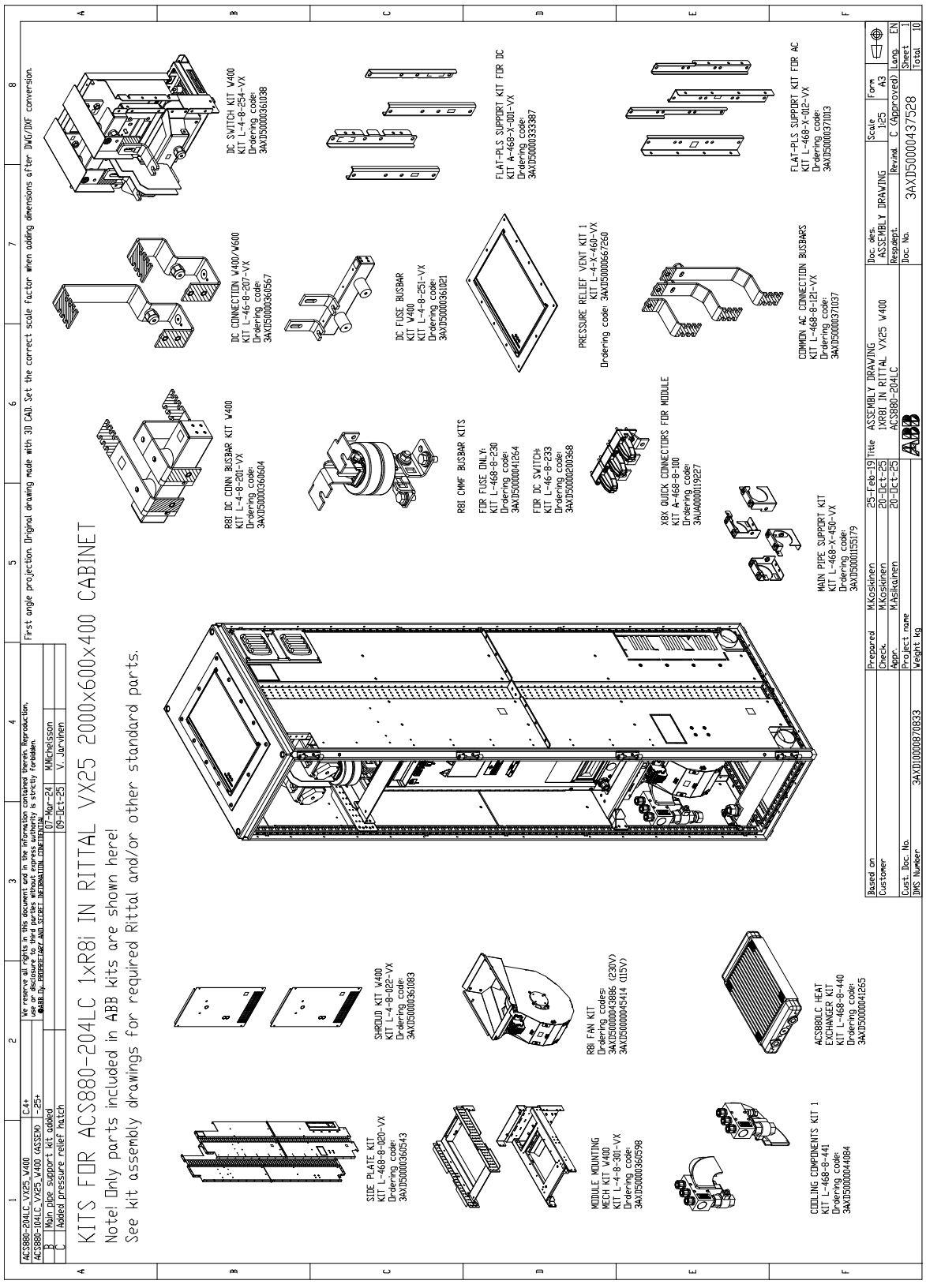



| No. | Description |
|---|---|
| 1 | Coolant in |
| 2 | Inlet manifold with stop and drain valves |
| 3 | Heat exchanger |
| 4 | IGBT supply module |
| 5 | Outlet manifold with stop and drain valves |
| 6 | Coolant out |

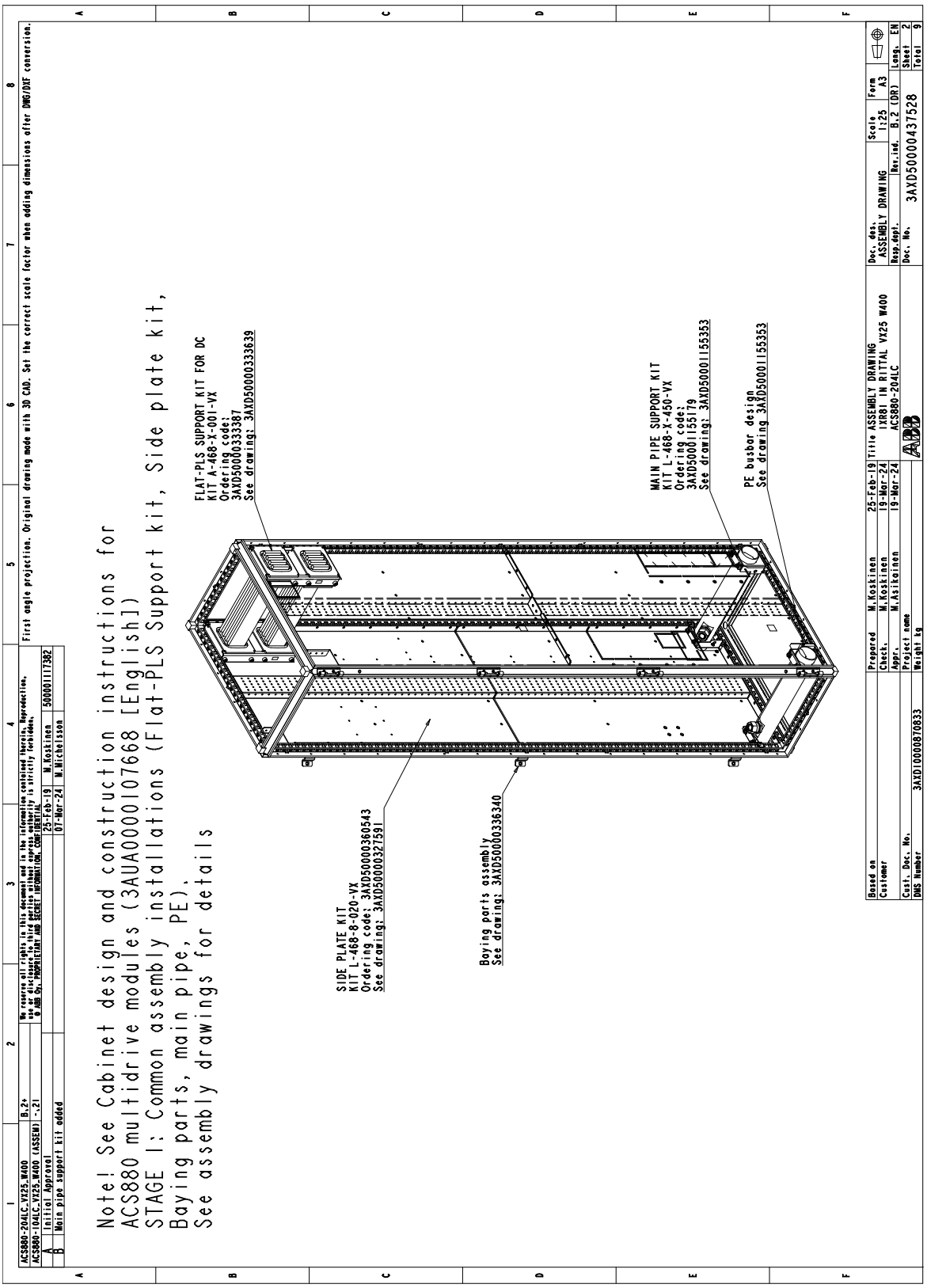
## Installation stages

| No. | Installation stage | Instruction code | Kit code | Kit ordering code |
|---|---|---|---|---|
| 1 | DC bus | 3AXD50000333639 | A-468-X-001-VX | 3AXD50000333387 |
| | Side plate kit | 3AXD50000327591 | L-468-8-020-VX | 3AXD50000360543 |
| | Baying parts | 3AXD50000336340 | - | - |
| | Main pipe support kit | 3AXD50001155353 | L-468-X-450-VX | 3AXD50001155179 |
| | PE busbar | 3AXD50001155353 | - | - |
| 2 | Module mounting mechanics and quick connectors | 3AXD50000330461 | L-4-8-301-VX | 3AXD50000360598 |
| | | 3AUA0000118667 | A-468-8-100 | 3AUA0000119227 |
| 3 | Flat-PLS support kit for AC and common AC connection busbars | 3AXD50000370870 | L-468-X-012-VX | 3AXD50000371013 |
| | | 3AXD50000352791 | L-468-8-121-VX | 3AXD50000371037 |
| 4 | Fan, heat exchanger and cooling components | - | - | 3AXD50000043886 / 3AXD50000045414 |
| | | - | L-468-8-440 | 3AXD50000041265 |
| | | 3AXD50000048217 | L-468-8-441 | 3AXD50000044084 |
| 5A | DC busbars | 3AXD50000332861 | L-4-8-201-VX | 3AXD50000360604 |
| | | 3AXD50000332885 | L-4-8-251-VX | 3AXD50000361021 |
| | | 3AXD50000041311 | L-468-8-230 | 3AXD50000041264 |
| 5B | DC switch, DC connection and common mode filter busbar kits | 3AXD50000342600 | L-4-8-254-VX | 3AXD50000361038 |
| | | 3AXD50000343614 | L-46-8-207-VX | 3AXD50000360567 |
| | | 3AXD50000205042 | L-46-8-233 | 3AXD50000200368 |
| 6 | Module installation | - | - | - |
| 7 | Shrouding | 3AXD50000353354 | L-4-8-022-VX | 3AXD50000361083 |
| 8 | Pressure relief kit | 3AXD50000666430 | L-4-X-460-VX | 3AXD50000667260 |

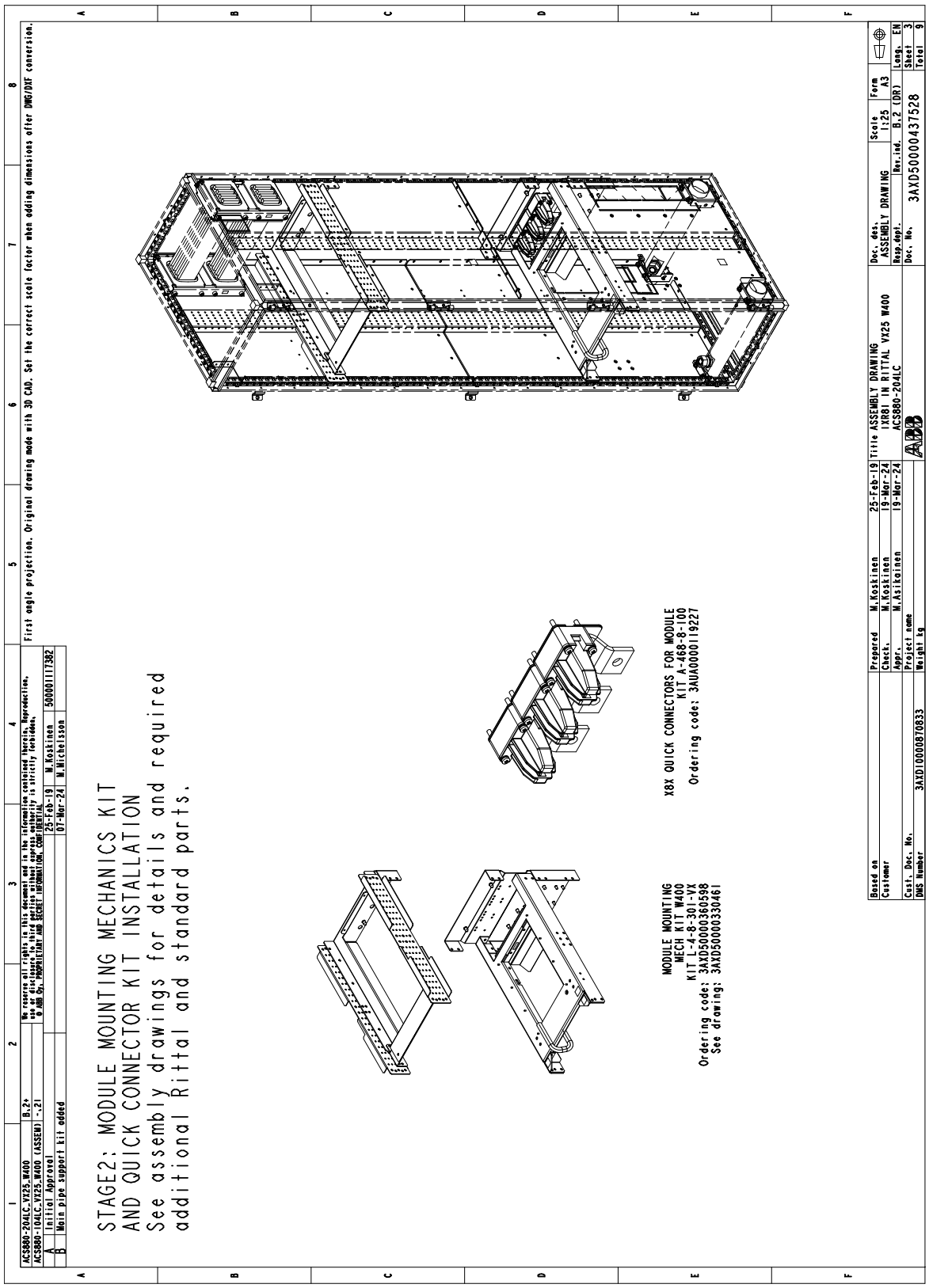
## Overview of kits



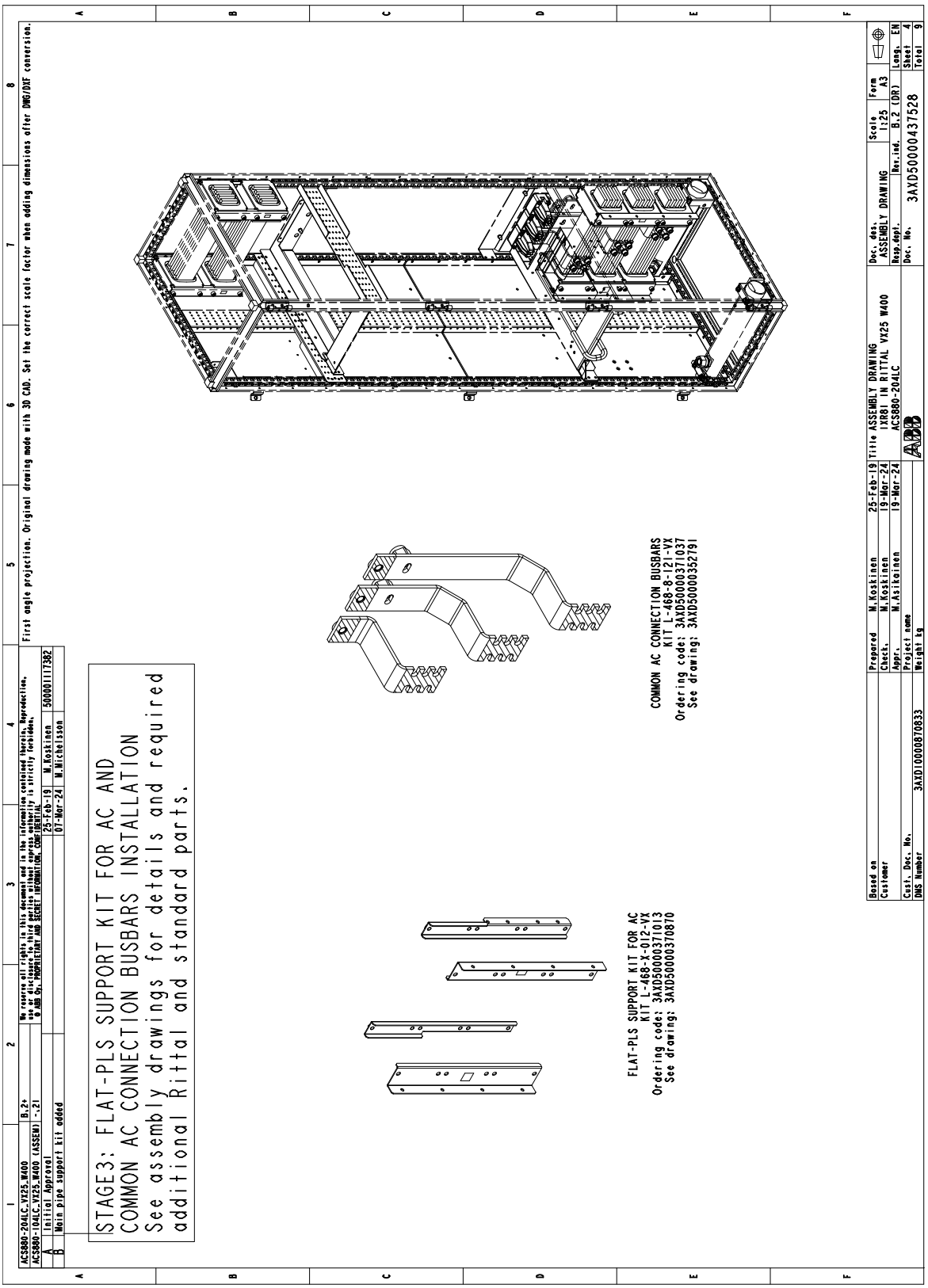
## Stage 1: Installation of common parts



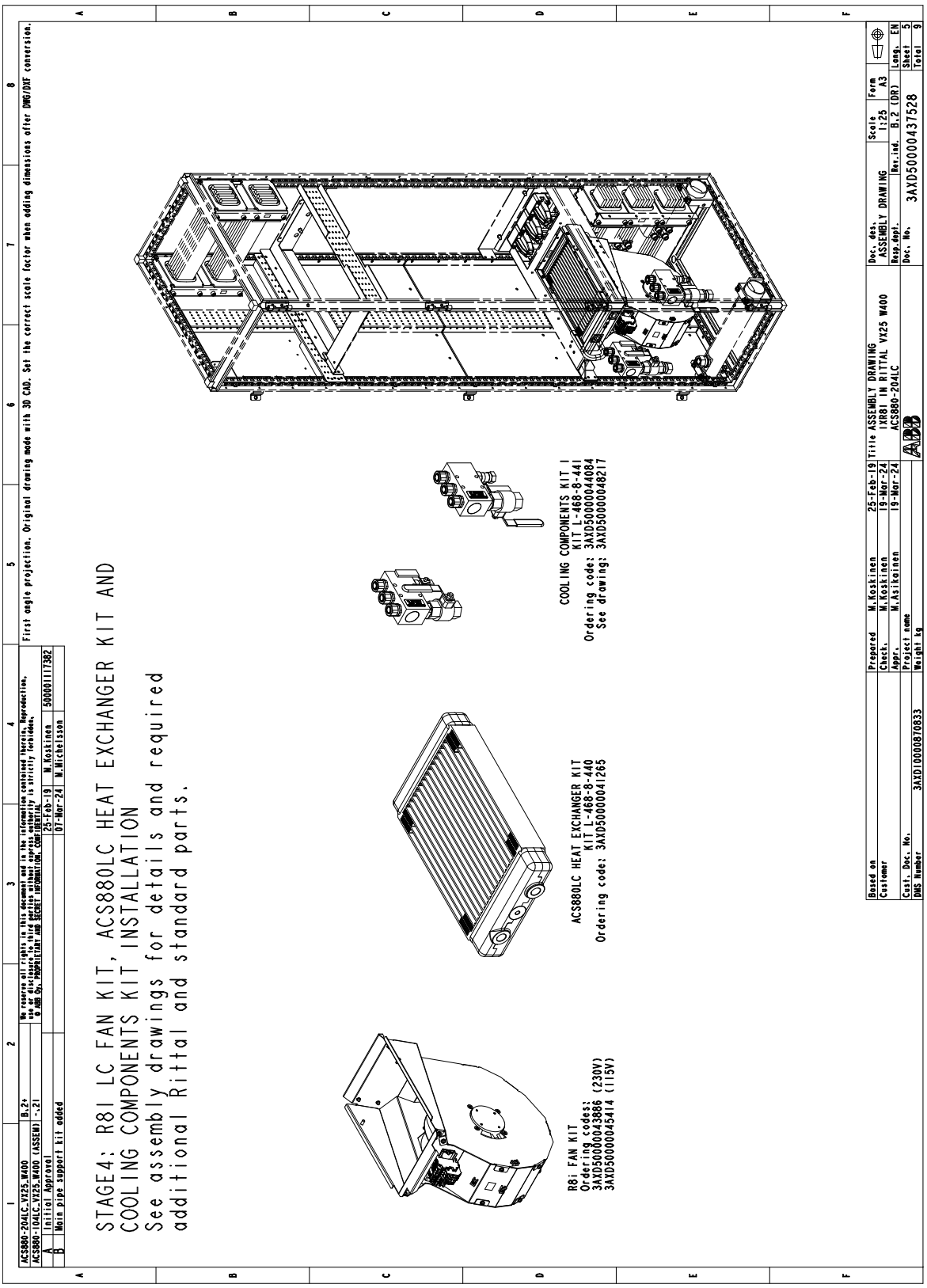
## Stage 2: Module mounting mechanics and quick connectors



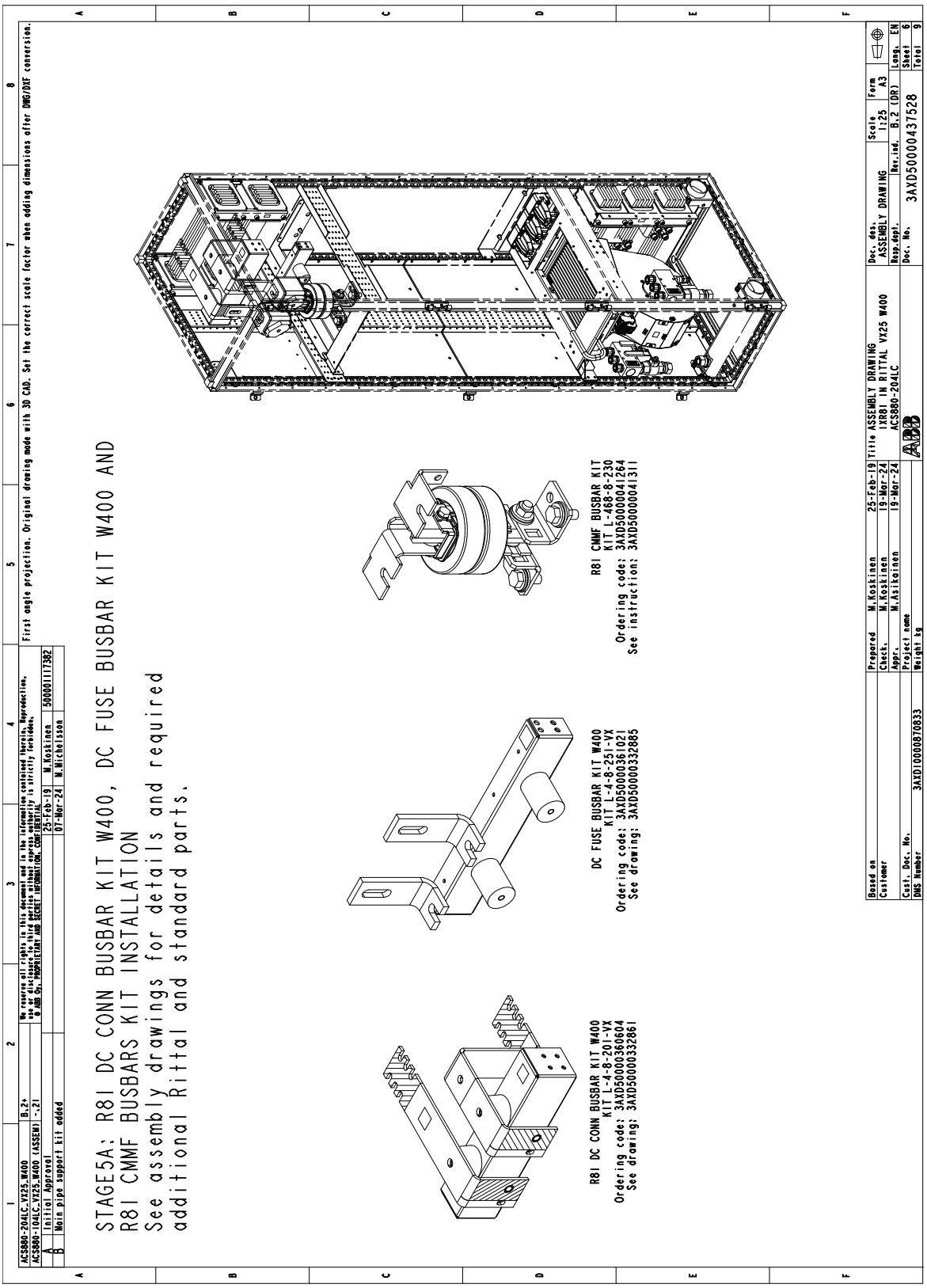
## Stage 3: Flat-PLS support kit for AC and common AC connection busbars



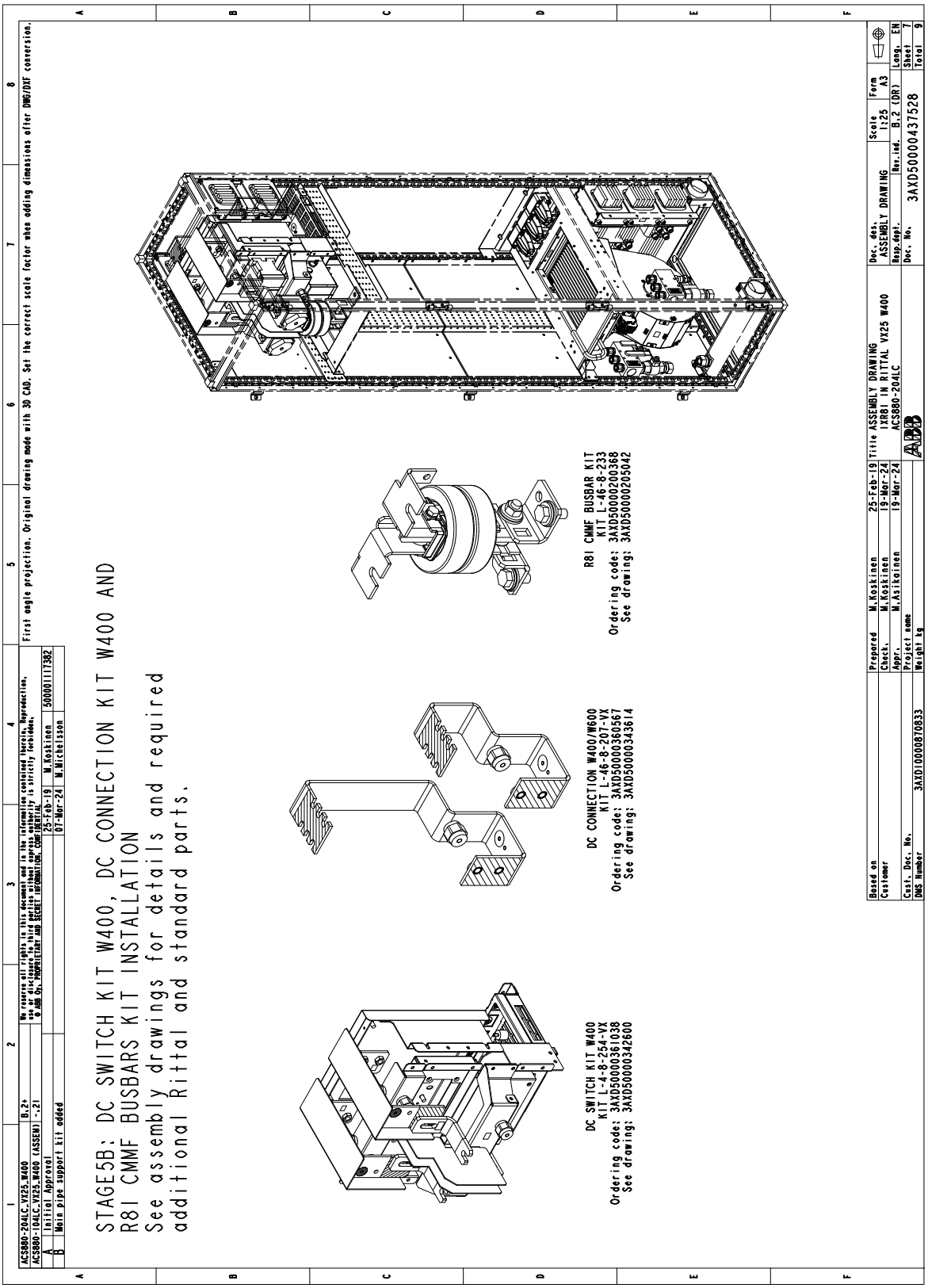
## Stage 4: Fan, heat exchanger and cooling components



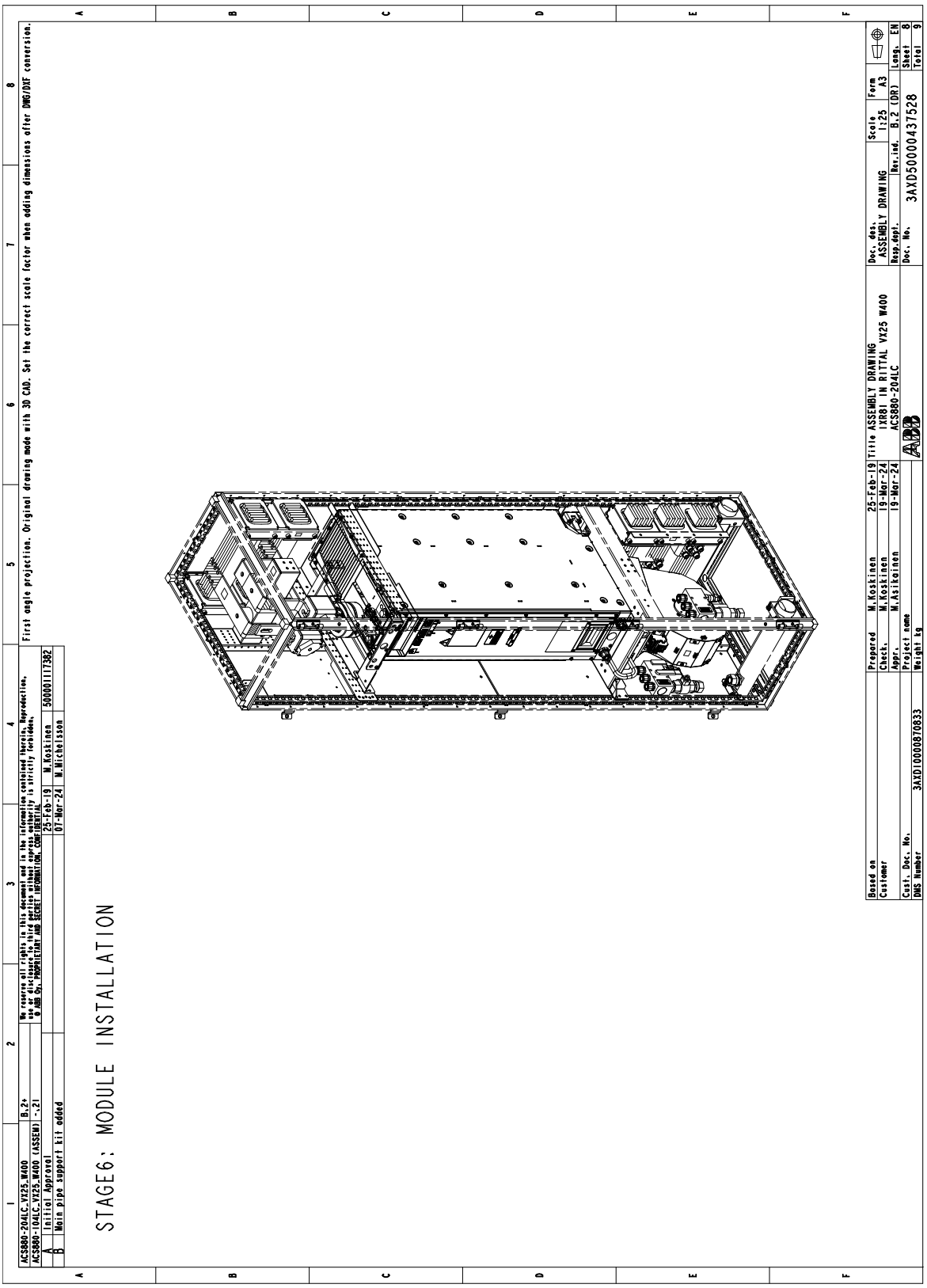
## Stage 5A: Installation of DC busbars



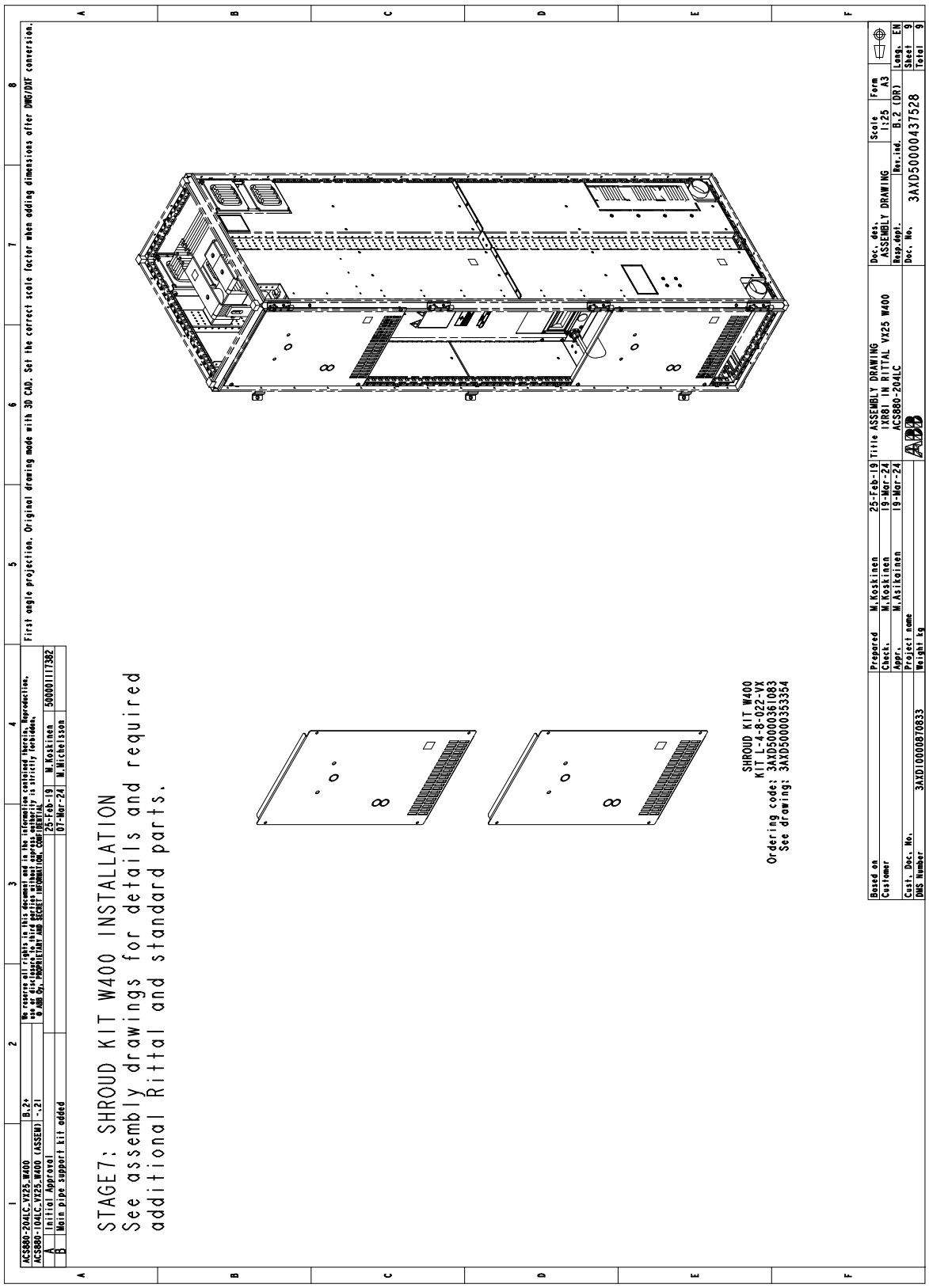
## Stage 5B: Installation of DC switch, DC connection and common mode filter busbar kits



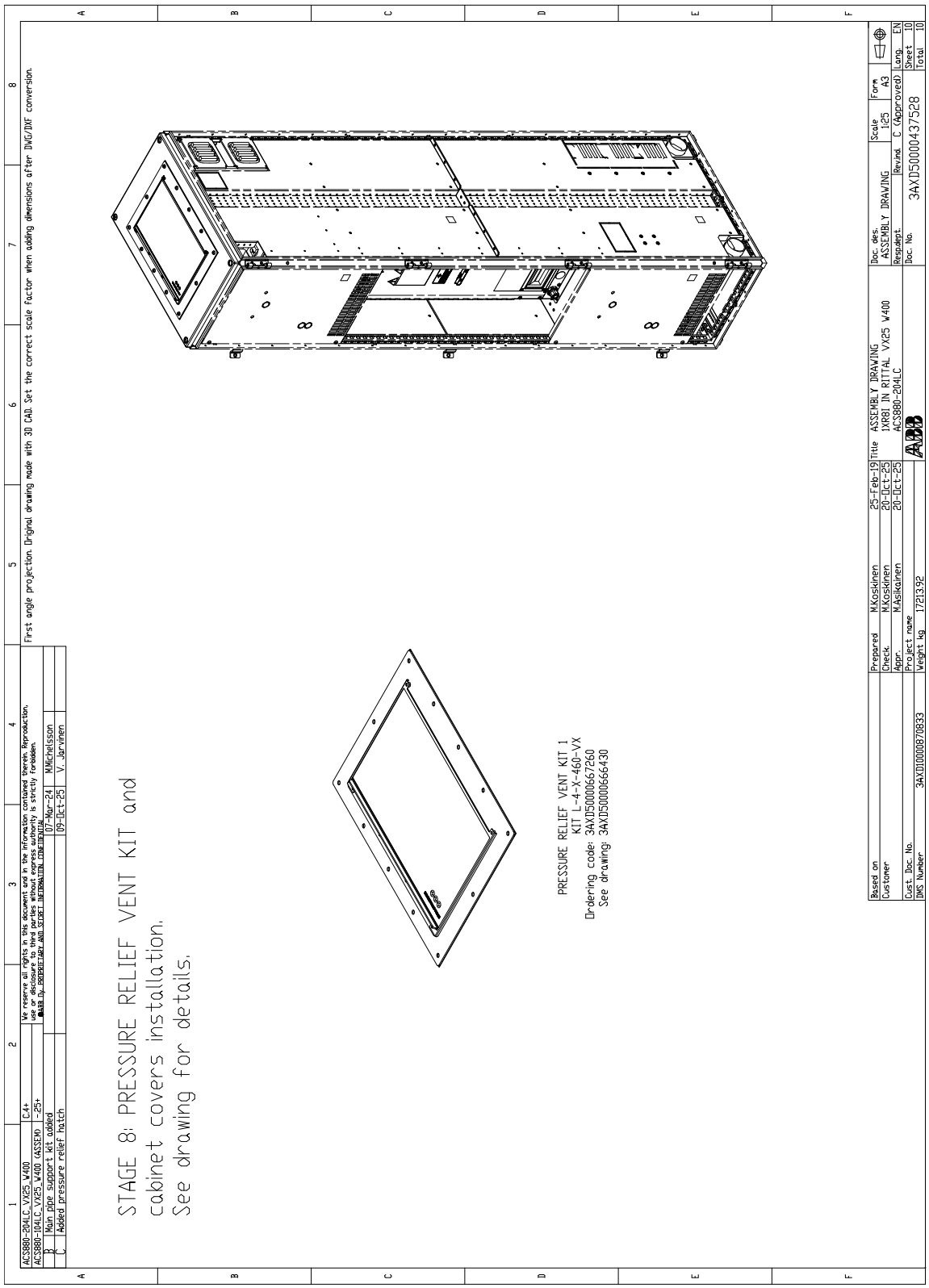
## Stage 6: Module installation



## Stage 7: Installation of shrouding



## Stage 8: Installation of pressure relief kit and cabinet covers

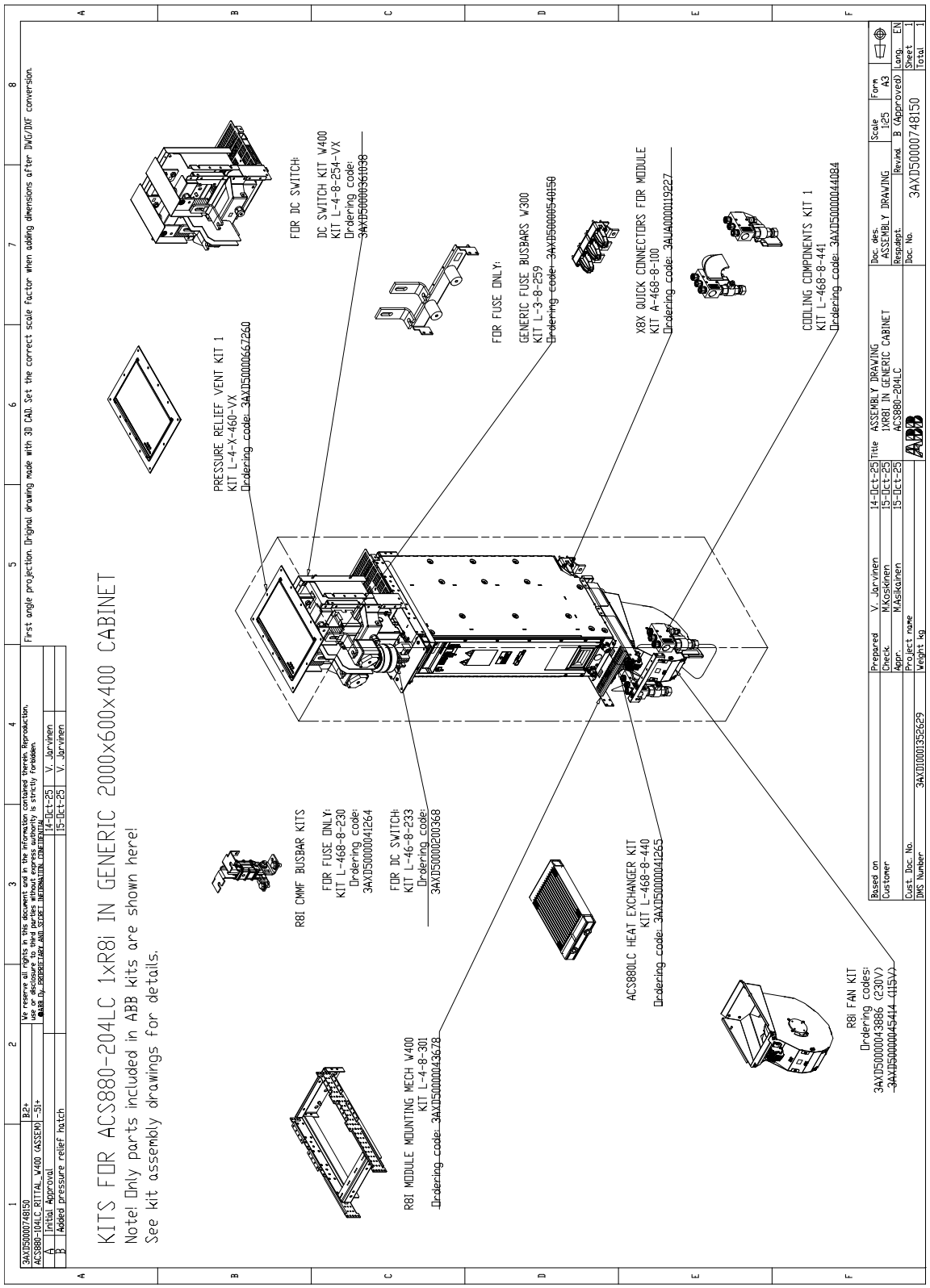


## One R8i module in a 400 mm wide generic enclosure

This section is applicable to a supply unit with the LCL filter.

| Parts to be installed | Instruction code | Kit code | Kit ordering code |
|---|---|---|---|
| Cooling component kit | 3AXD50000048217 | L-468-8-441 | 3AXD50000044084 |
| Quick connectors | 3AUA0000118667 | A-468-8-100 | 3AUA0000119227 |
| Module mounting mechanics and cooling components | - | - | 3AXD50000043886 / 3AXD50000045414 |
| | - | L-4-8-301 | 3AXD50000043678 |
| | - | L-468-8-440 | 3AXD50000041265 |
| DC busbars (for configuration without DC switch) [1)] | 3AXD50000540655 | L-3-8-259 | 3AXD50000540150 |
| | 3AXD50000041311 | L-468-8-230 | 3AXD50000041264 |
| DC switch and busbars | 3AXD50000342600 | L-4-8-254-VX | 3AXD50000361038 |
| | 3AXD50000205042 | L-46-8-233 | 3AXD50000200368 |
| Supply module | - | - | - |
| Shrouding | - | - | - |
| Pressure relief kit | 3AXD50000666430 | L-4-X-460-VX | 3AXD50000667260 |

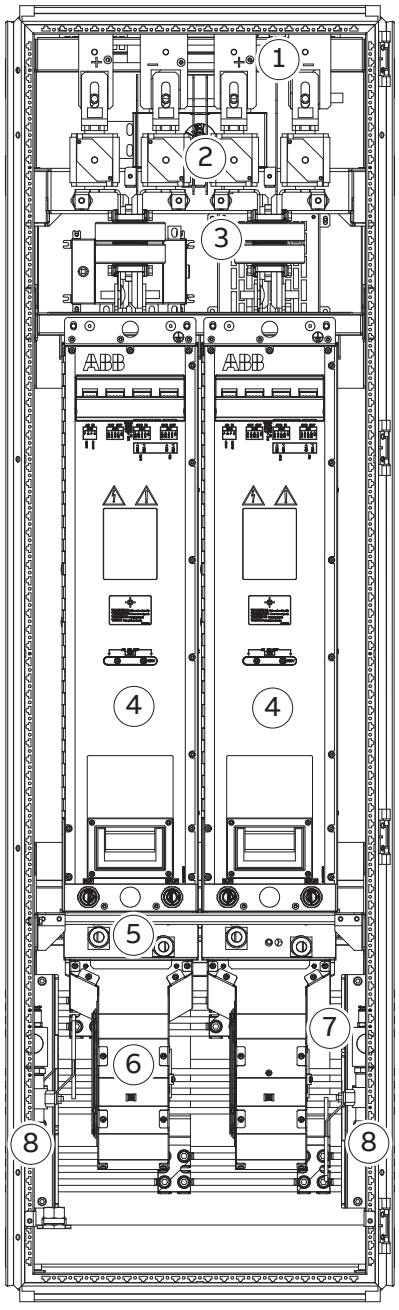
1) With this configuration, it is possible to install the kits to a 300 mm wide enclosure.


KITS FOR ACS880-204LC 1xR8i IN GENERIC 2000x600x400 CABINET
Note! Only parts included in ABB kits are shown here!
See kit assembly drawings for details.
PRESSURE RELIEF VENT KIT 1
KIT L-4-X-460-VX
Ordering code: 3AXD50000667260
FOR DC SWITCH:
DC SWITCH KIT W400
KIT L-4-8-254-VX
Ordering code:
3AXD50000361038
FOR FUSE ONLY:
GENERIC FUSE BUSBARS W300
KIT L-3-8-259
Ordering code: 3AXD50000540150
X8X QUICK CONNECTORS FOR MODULE
KIT A-468-8-100
Ordering code: 3AUA0000119227
COOLING COMPONENTS KIT 1
KIT L-468-8-441
Ordering code: 3AXD50000044084
R8i CMMF BUSBAR KITS
FOR FUSE ONLY:
KIT L-468-8-230
Ordering code:
3AXD50000041264
FOR DC SWITCH:
KIT L-46-8-233
Ordering code:
3AXD50000200368
R8i MODULE MOUNTING MECH W400
KIT L-4-8-301
Ordering code: 3AXD50000043678
ACS880LC HEAT EXCHANGER KIT
KIT L-468-8-440
Ordering code: 3AXD50000041265
R8i FAN KIT
Ordering codes:
3AXD50000043886 (230V)
3AXD50000045414 (115V)
3AXD50000748150
ACS880-104LC_RITTAL_W400 (ASSEMBLY)-Si+
Initial Approval
Added pressure relief hatch
V. Jarvinen
14-Oct-25
15-Oct-25
Prepared
Check.
Appr.
Project name
Weight kg
ASSEMBLY DRAWING
IXR8I IN GENERIC CABINET
ACS880-204LC
Doc. No.
3AXD50000748150
Scale 1:25
Form A3
Lang. EN
Sheet 1
Total 1

## Two R8i modules in a 600 mm wide Rittal VX25 enclosure

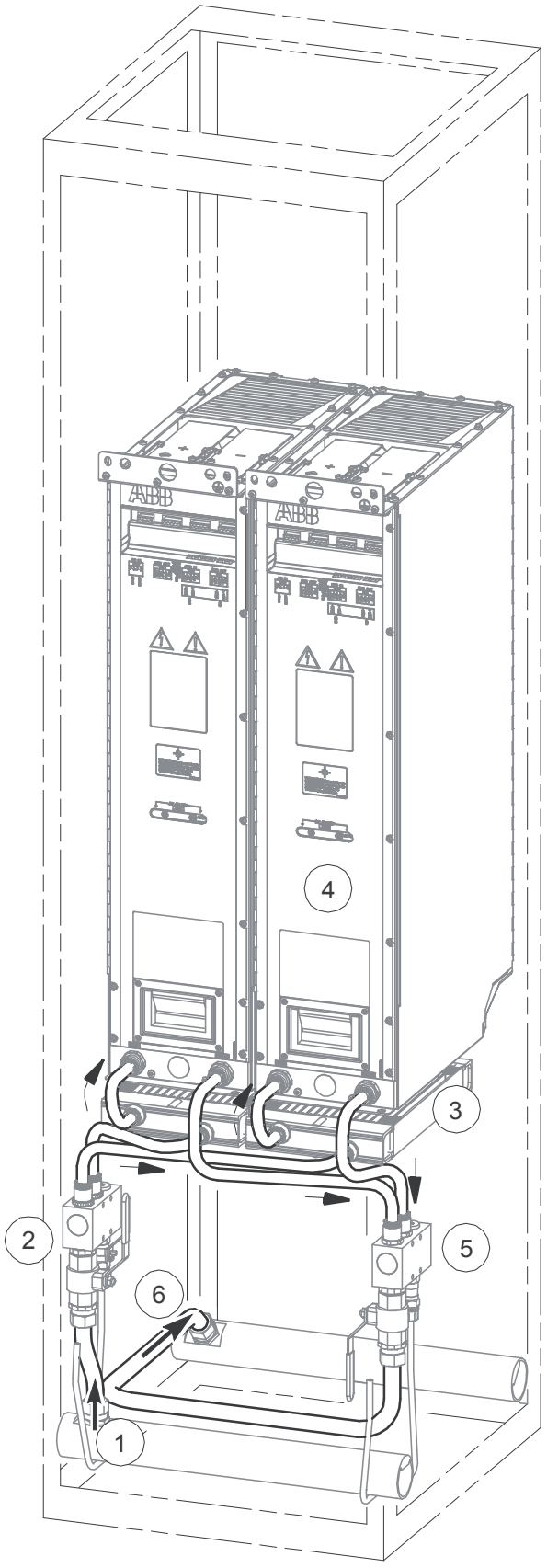
This section is applicable to a supply unit with the LCL filter.

### Layout drawing




| No. | Description |
|---|---|
| 1 | Common DC busbars (Rittal Flat-PLS) |
| 2 | DC fuses and optional DC switch |
| 3 | Common mode filter |
| 4 | IGBT supply module |
| 5 | Heat exchanger |
| 6 | Cooling fan |
| 7 | AC connection to LCL filter (Rittal Flat-PLS) |
| 8 | Inlet and outlet manifold with valves |

## Pipe routing example

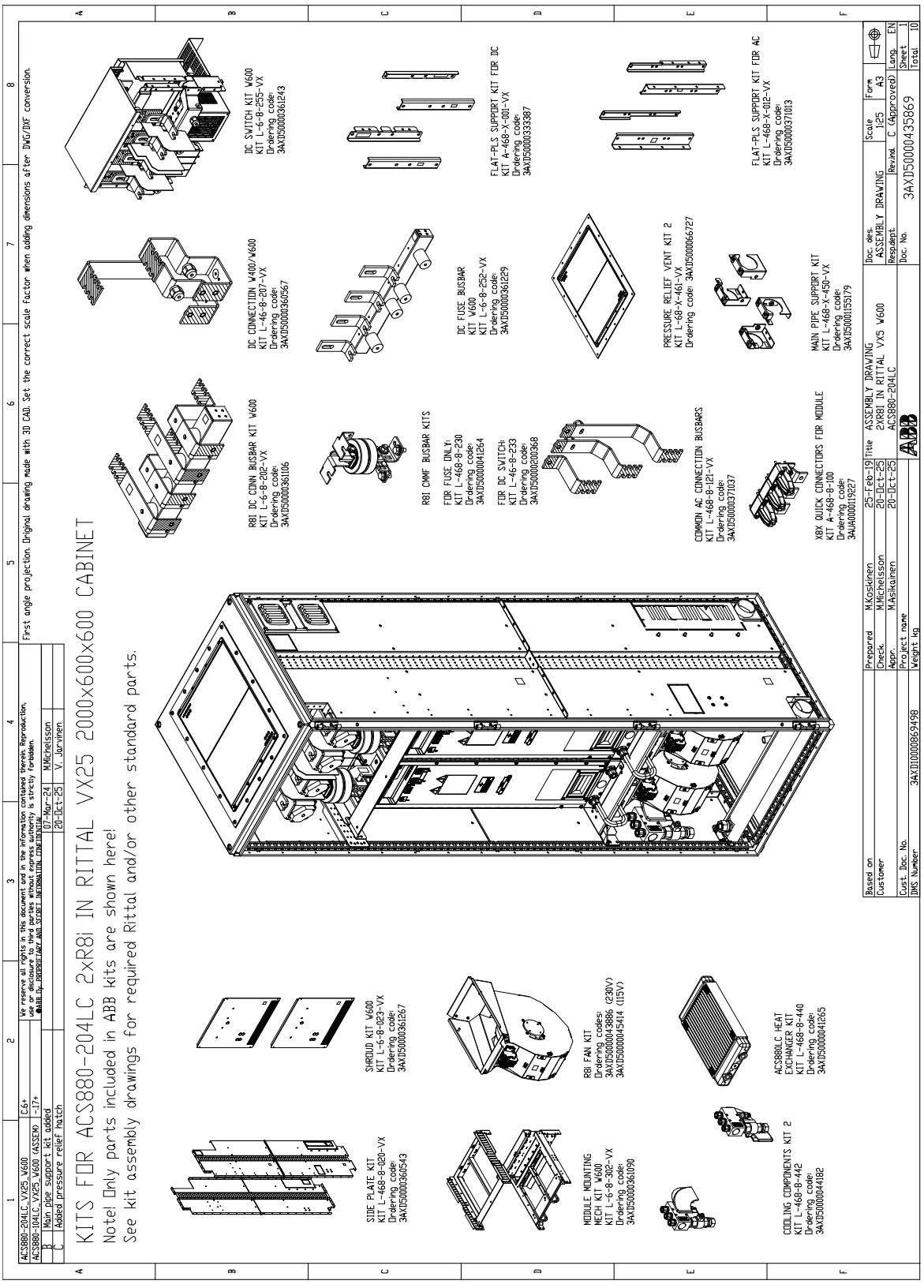



| No. | Description |
|---|---|
| 1 | Coolant in |
| 2 | Inlet manifold with stop and drain valves |
| 3 | Heat exchanger |
| 4 | IGBT supply module |
| 5 | Outlet manifold with stop and drain valves |
| 6 | Coolant out |

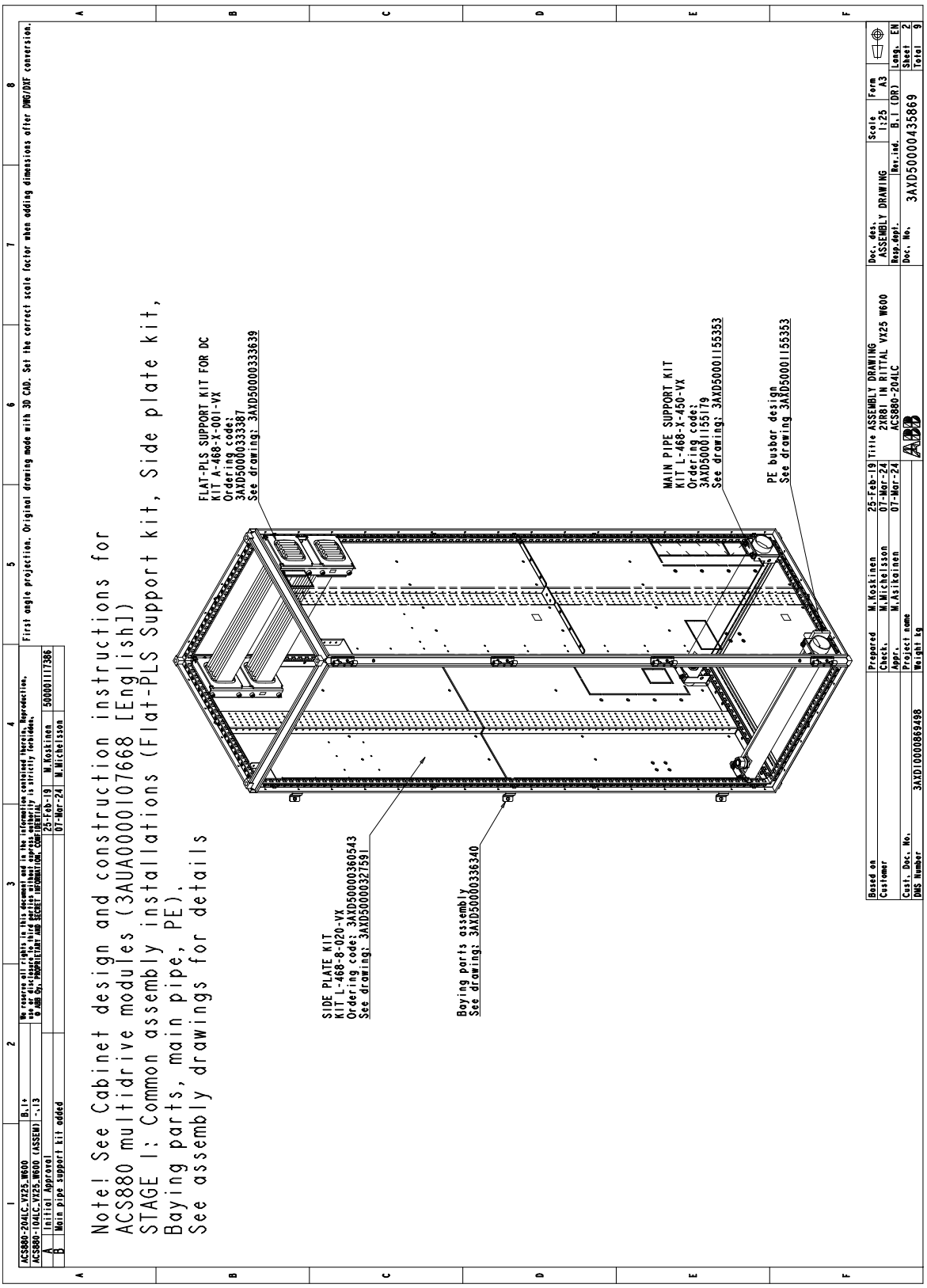
## Installation stages

| No. | Installation stage | Instruction code | Kit code | Kit ordering code |
|---|---|---|---|---|
| 1 | DC bus | 3AXD50000333639 | A-468-X-001-VX | 3AXD50000333387 |
| | Side plate kit | 3AXD50000327591 | L-468-8-020-VX | 3AXD50000360543 |
| | Baying parts | 3AXD50000336340 | - | - |
| | Main pipe support kit | 3AXD50001155353 | L-468-X-450-VX | 3AXD50001155179 |
| | PE busbar | 3AXD50001155353 | - | - |
| 2 | Module mounting mechanics and quick connectors | 3AXD50000330201 | L-6-8-302-VX | 3AXD50000361090 |
| | | 3AUA0000118667 | A-468-8-100 | 3AUA0000119227 |
| 3 | Flat-PLS support kit for AC and common AC connection busbars | 3AXD50000370870 | L-468-X-012-VX | 3AXD50000371013 |
| | | 3AXD50000352791 | L-468-8-121-VX | 3AXD50000371037 |
| 4 | Fan, heat exchanger and cooling components | - | - | 3AXD50000043886 / 3AXD50000045414 |
| | | - | L-468-8-440 | 3AXD50000041265 |
| | | 3AXD50000048258 | L-468-8-442 | 3AXD50000044182 |
| 5A | DC busbars | 3AXD50000332229 | L-6-8-202-VX | 3AXD50000361106 |
| | | 3AXD50000332106 | L-6-8-252-VX | 3AXD50000361229 |
| | | 3AXD50000041311 | L-468-8-230 | 3AXD50000041264 |
| 5B | DC switch, DC connection and common mode filter busbar kits | 3AXD50000338740 | L-6-8-255-VX | 3AXD50000361243 |
| | | 3AXD50000343614 | L-46-8-207-VX | 3AXD50000360567 |
| | | 3AXD50000205042 | L-46-8-233 | 3AXD50000200368 |
| 6 | Module installation | - | - | - |
| 7 | Shrouding | 3AXD50000353521 | L-6-8-023-VX | 3AXD50000361267 |
| 8 | Pressure relief kit | 3AXD50000667253 | L-68-X-461-VX | 3AXD50000667277 |

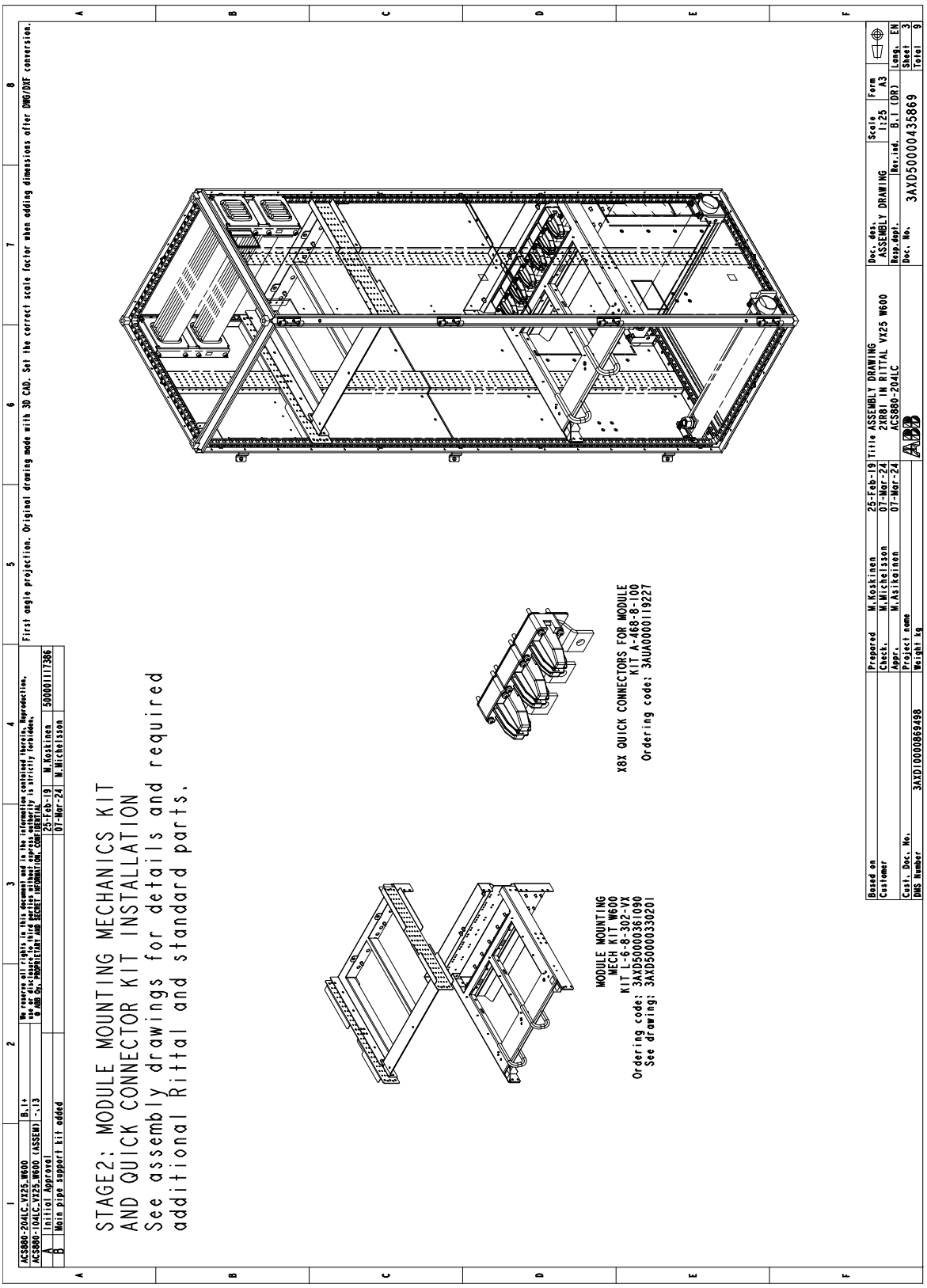
## Overview of kits



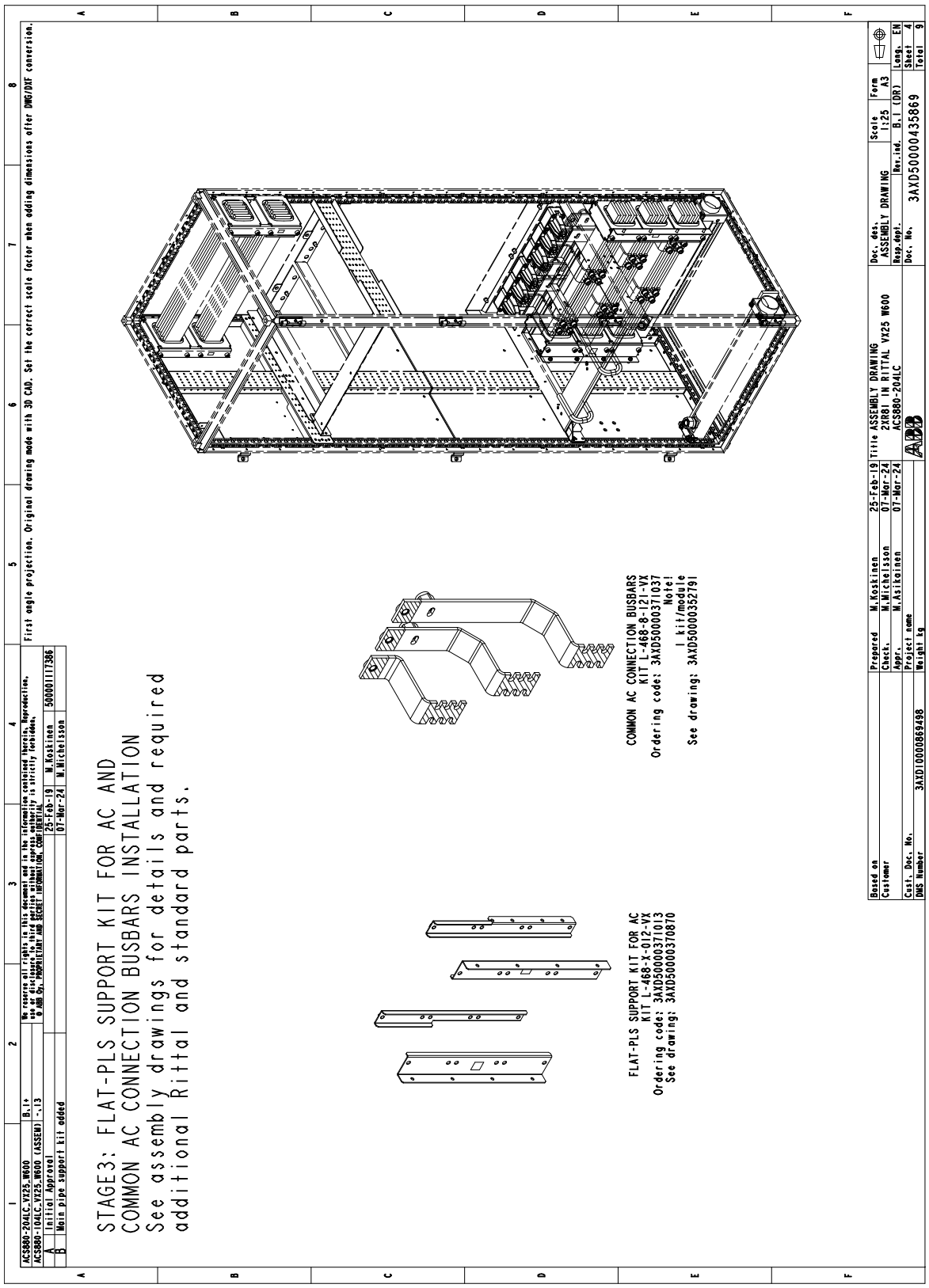
## Stage 1: Installation of common parts



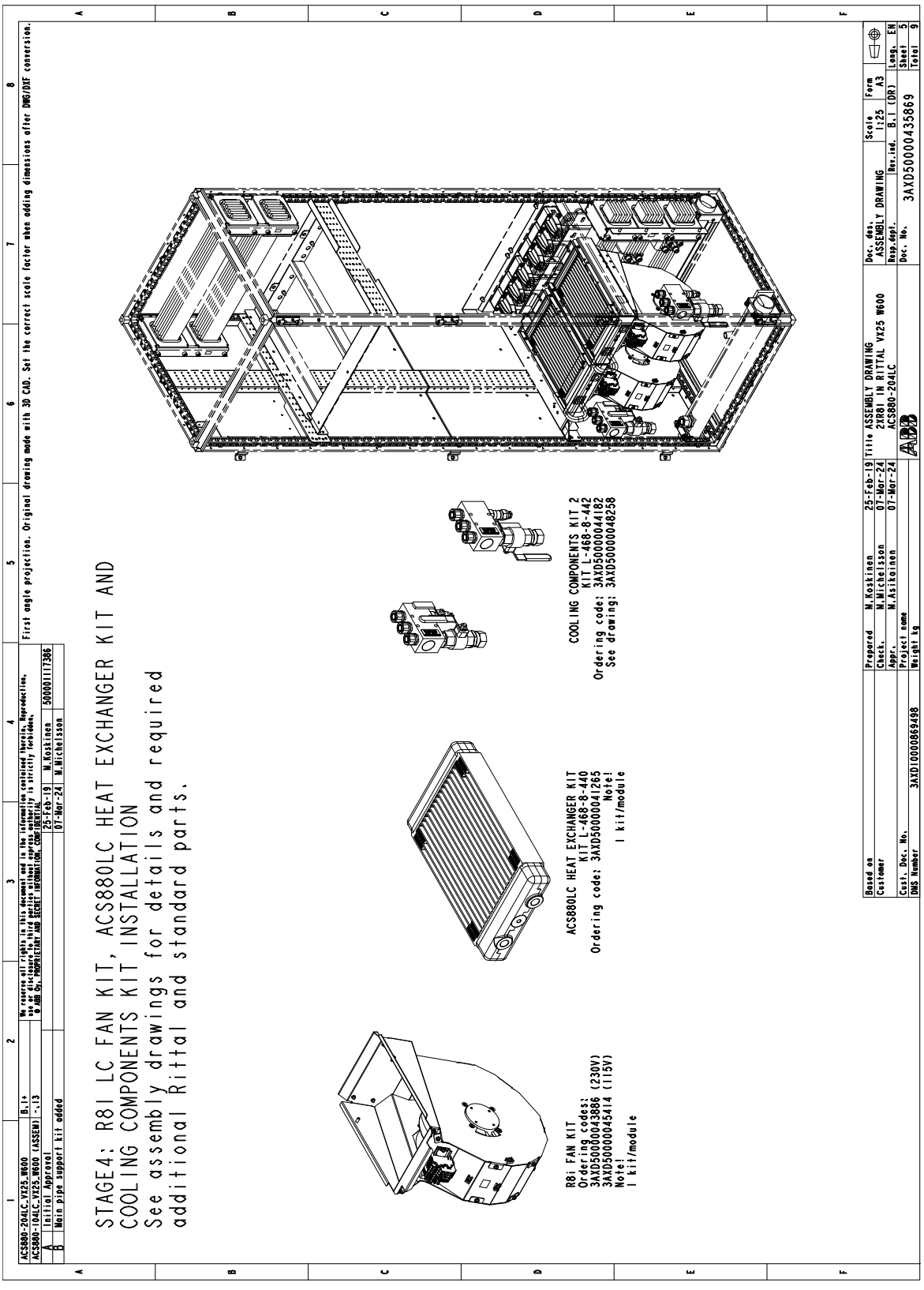
## Stage 2: Module mounting mechanics and quick connectors



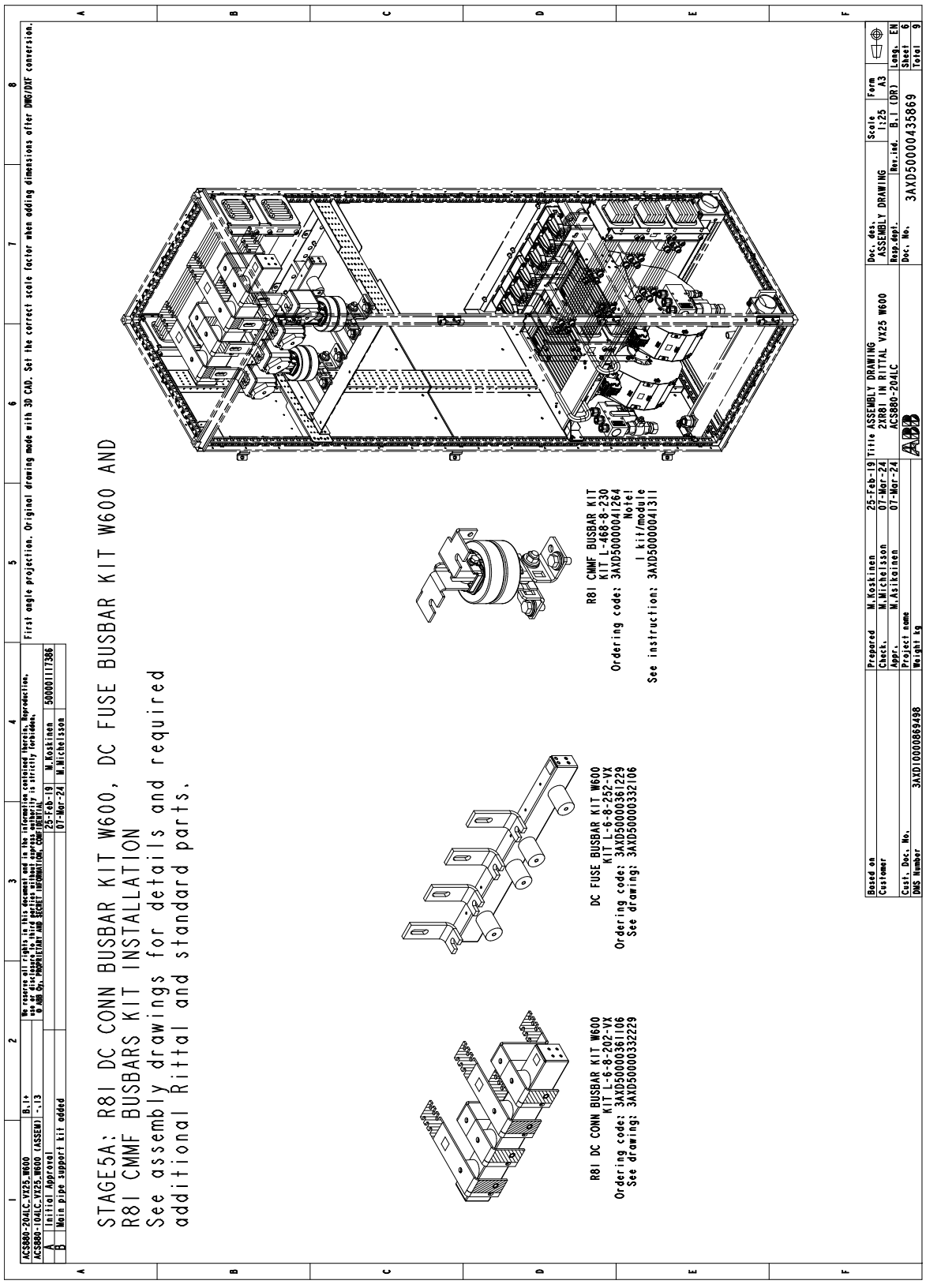
## Stage 3: Flat-PLS support kit for AC and common AC connection busbars



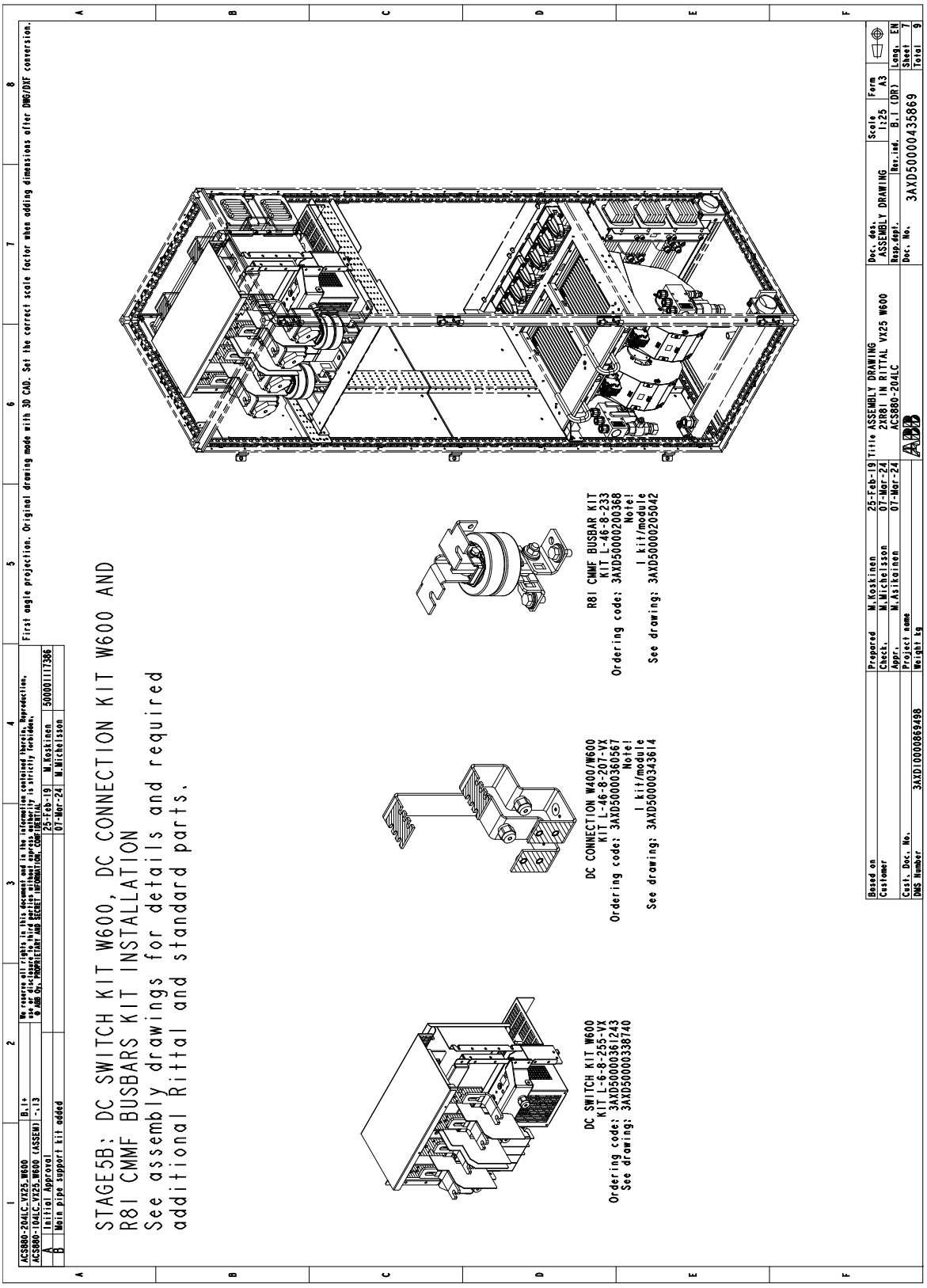
## Stage 4: Fan, heat exchanger and cooling components



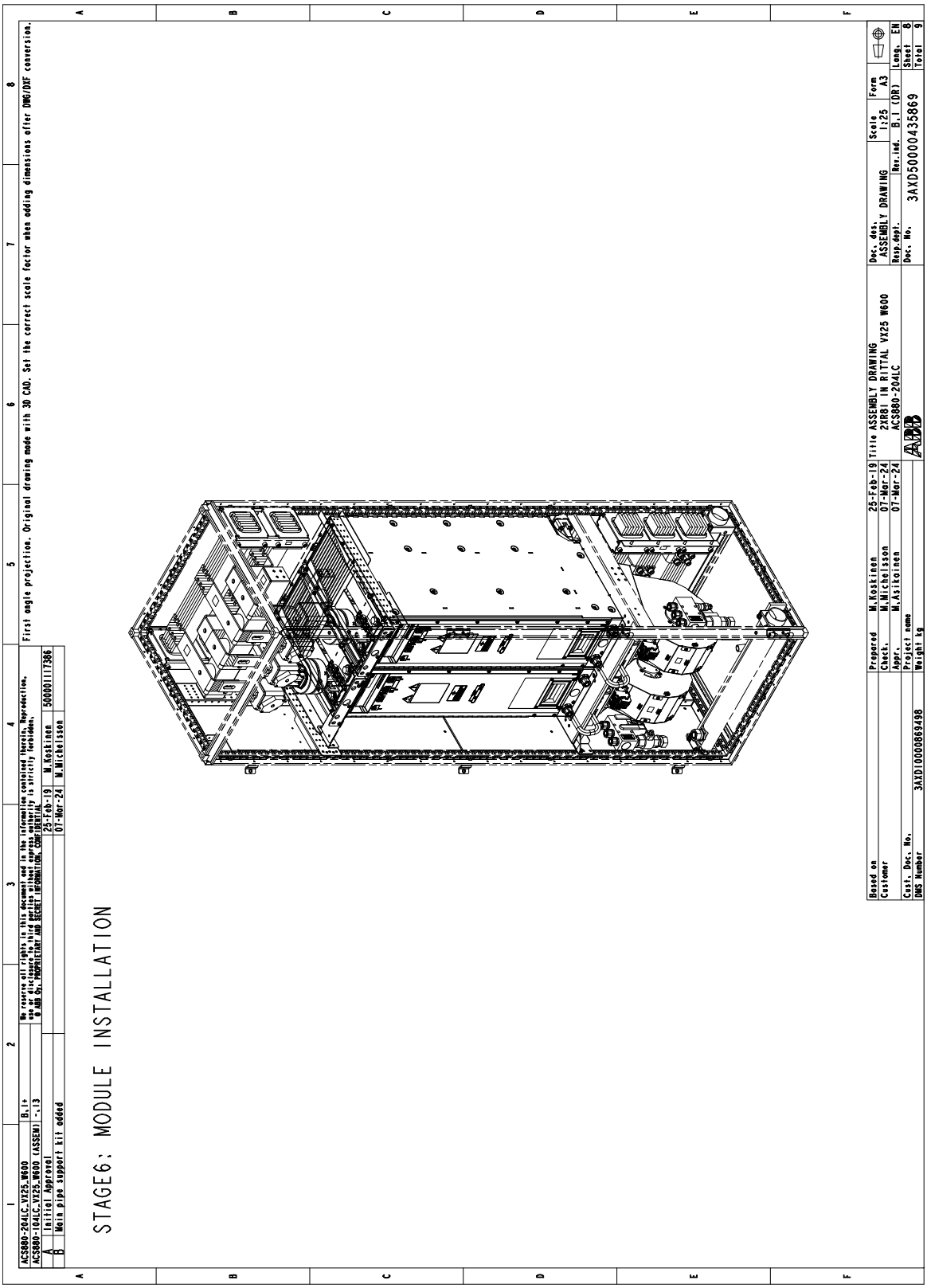
## Stage 5A: Installation of DC busbars



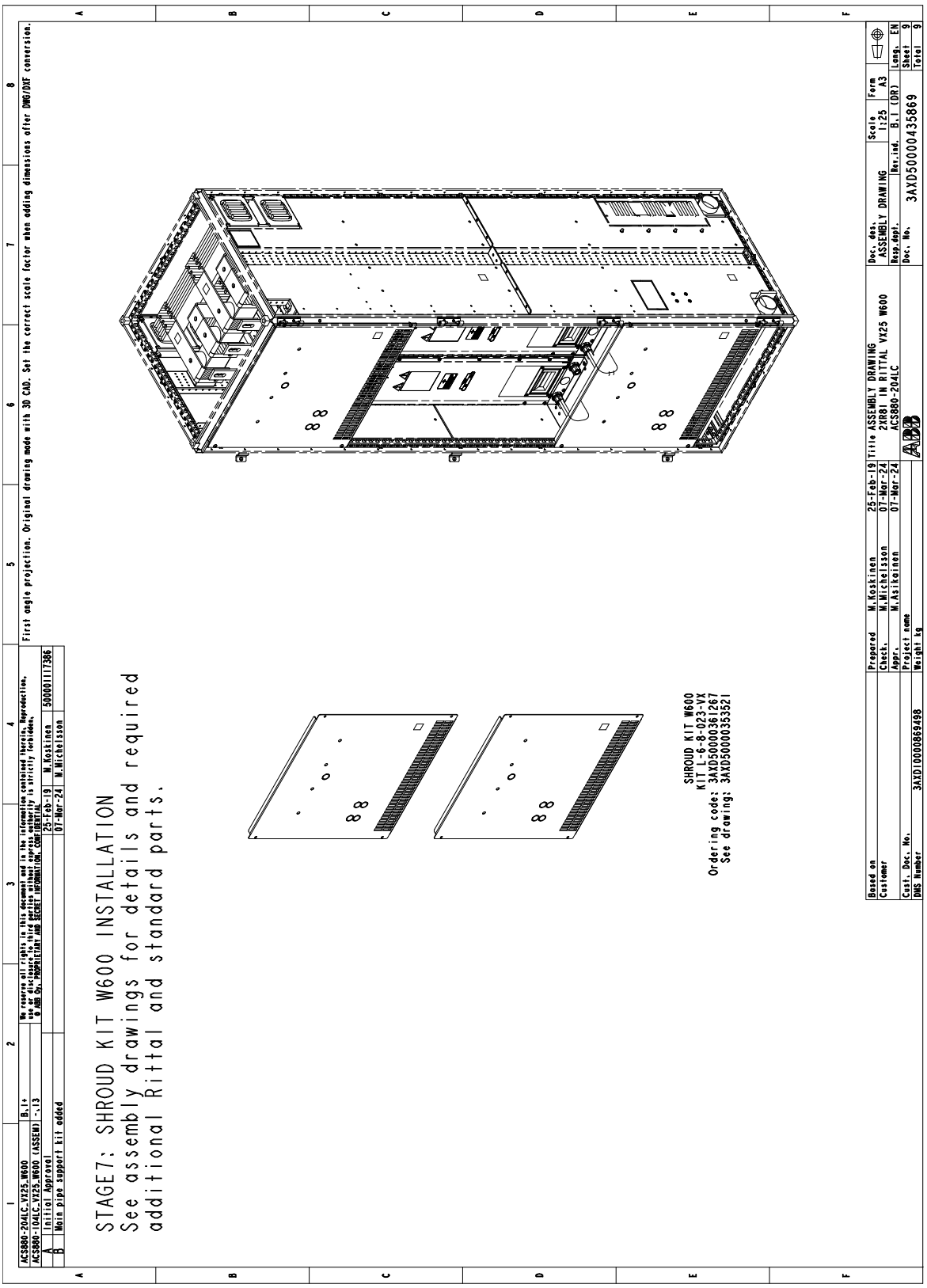
## Stage 5B: Installation of DC switch, DC connection and common mode filter busbar kits



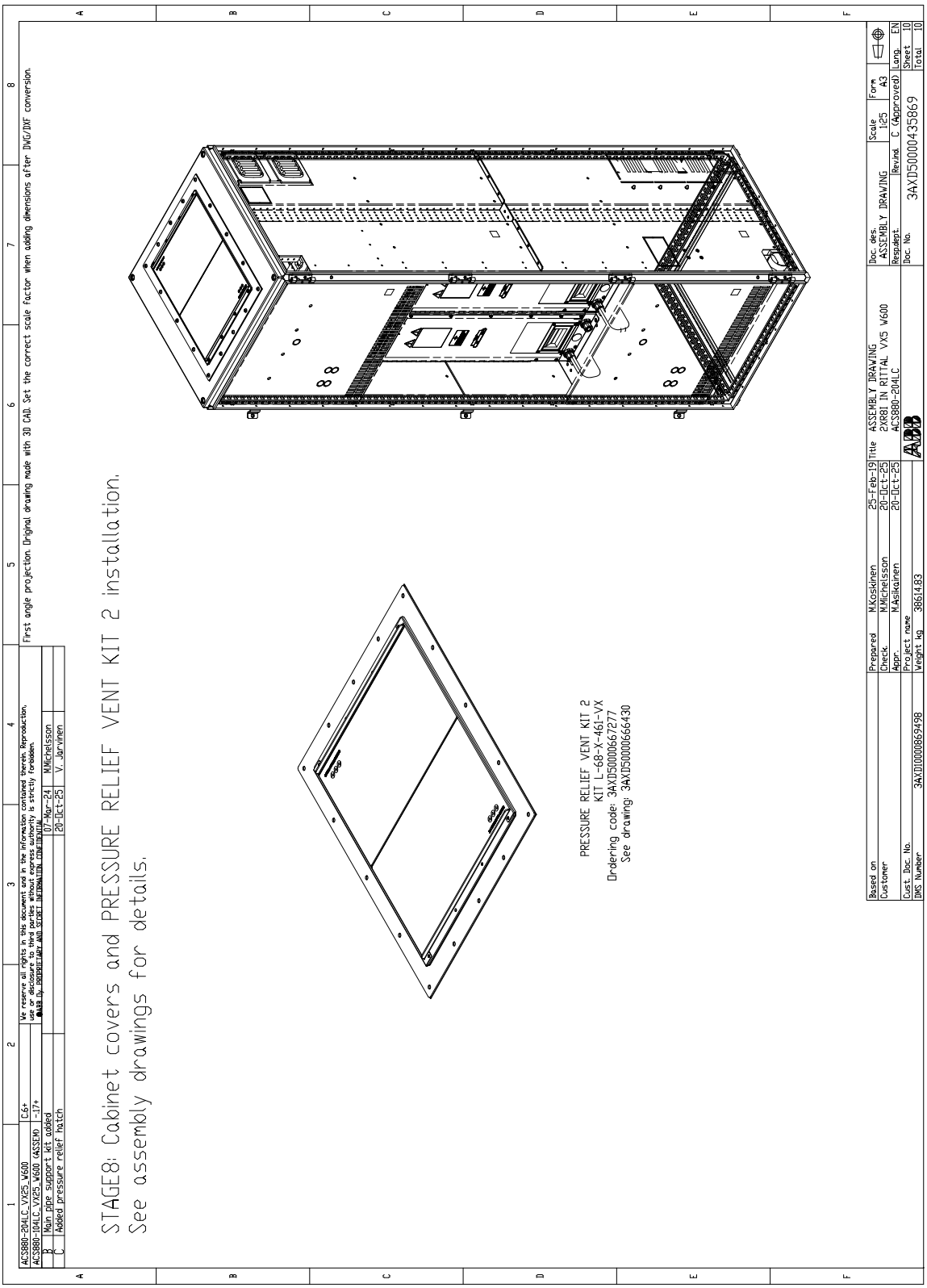
## Stage 6: Module installation



## Stage 7: Installation of shrouding



## Stage 8: Installation of pressure relief kit and cabinet covers



## Two R8i modules in a 600 mm wide generic enclosure

This section is applicable to a supply unit with the LCL filter.

| Parts to be installed | Instruction code | Kit code | Kit ordering code |
|---|---|---|---|
| Cooling component kit | 3AXD50000048258 | L-468-8-442 | 3AXD50000044182 |
| Quick connectors | 3AUA0000118667 | A-468-8-100 | 3AUA0000119227 |
| Module mounting mechanics and cooling components | 3AXD50000041836 | L-6-8-302 | 3AXD50000041710 |
| | - | - | 3AXD50000043886 / 3AXD50000045414 |
| | | L-468-8-440 | 3AXD50000041265 |
| DC busbars (for configuration without DC switch) [1)] | 3AXD50000540723 | L-5-8-260 | 3AXD50000540167 |
| | 3AXD50000041311 | L-468-8-230 | 3AXD50000041264 |
| DC switch and busbars | 3AXD50000338740 | L-6-8-255-VX | 3AXD50000361243 |
| | 3AXD50000205042 | L-46-8-233 | 3AXD50000200368 |
| Supply modules | - | - | - |
| Shrouding | - | - | - |
| Pressure relief kit | 3AXD50000667253 | L-68-X-461-VX | 3AXD50000667277 |

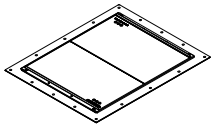
1) With this configuration, it is possible to install the kits to a 500 mm wide enclosure.

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©ABB Oy. PROPRIETARY AND SECRET INFORMATION. CONFIDENTIAL!

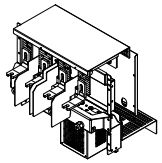
| | | | |
|---|---|---|---|
| 3AXD50000748174 | A.1+ | First angle projection. Original drawing made with 3D CAD. Set the correct scale factor when adding dimensions after DWG/DXF conversion. | |
| ACS880-104LC_RITTAL_W600_V2 (ASSEMB | B+ | | |
| A | Initial Approval | 15-Oct-25 | V. Jarvinen |

# KITS FOR ACS880-204LC 2xR8i IN GENERIC 2000x600x600 CABINET

Note! Only parts included in ABB kits are shown here!
See kit assembly drawings for details.



PRESSURE RELIEF VENT KIT 2
KIT L-68-X-461-VX
Ordering code: 3AXD50000667277



FOR DC SWITCH:

DC SWITCH KIT W600
KIT L-6-8-255-VX
Ordering code:
3AXD50000361243

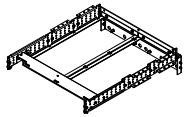


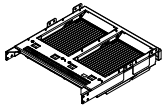
R8I CMMF BUSBAR KITS

FOR FUSE ONLY:
KIT L-468-8-230
Ordering code:
3AXD50000041264

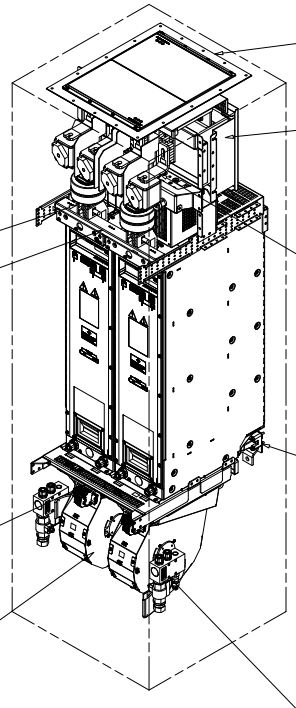
FOR DC SWITCH:
KIT L-46-8-233
Ordering code:
3AXD50000200368

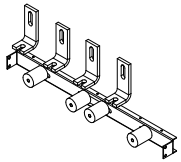
1 kit/module





R8I MODULE MOUNTING MECH W600
KIT L-6-8-302
Ordering code: 3AXD50000041710





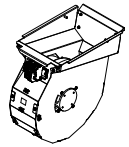
FOR FUSE ONLY:

GENERIC FUSE BUSBARS W500
KIT L-5-8-260
Ordering code: 3AXD50000540167



X8X QUICK CONNECTORS FOR MODULE
KIT A-468-8-100
Ordering code: 3AUA0000119227
1 kit/module

ACS880LC HEAT EXCHANGER KIT
KIT L-468-8-440
Ordering code: 3AXD50000041265
1 kit/module



R8i FAN KIT
Ordering codes:
3AXD50000043886 (230V)
3AXD50000045414 (115V)
1 kit/module





COOLING COMPONENTS KIT 2
KIT L-468-8-442
Ordering code: 3AXD50000044182

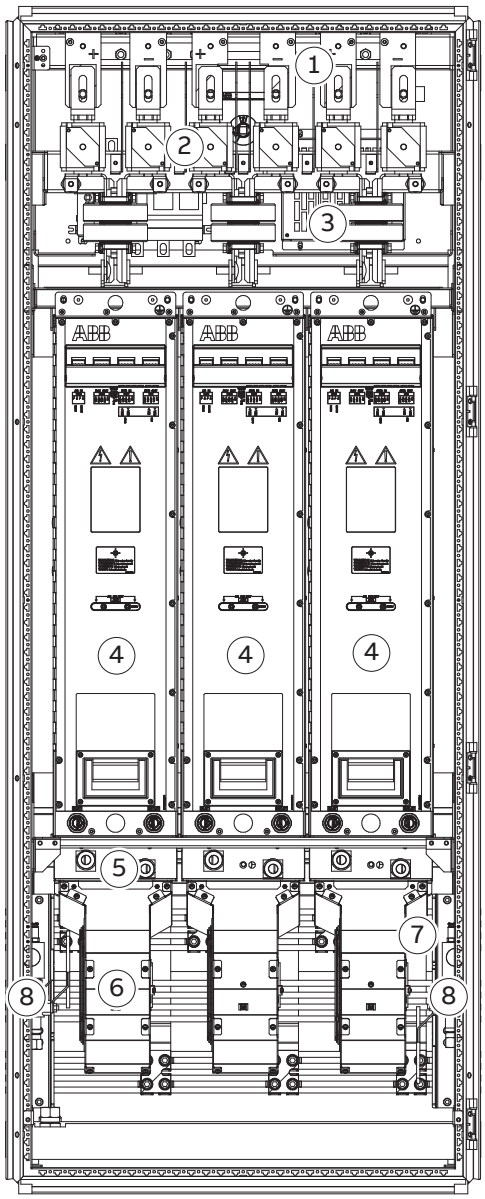
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Based on | Prepared | V. Jarvinen | 15-Oct-25 | Title | ASSEMBLY DRAWING | Doc. des. | Scale / Form |
| Customer | Check. | M.Koskinen | 15-Oct-25 | | 2XR8I IN GENERIC CABINET | ASSEMBLY DRAWING | 1:25 / A3 |
| | Appr. | M.Asikainen | 15-Oct-25 | | ACS880-204LC | Respdept. | Rev.Ind. A (Approved) / Lang. EN |
| Cust. Doc. No. | Project name | | | | | Doc. No. | Sheet 1 |
| DMS Number 3AXD10001352873 | Weight kg | 14879005.53 | | | | 3AXD50000748174 | Total 1 |

## Three R8i modules in an 800 mm wide Rittal VX25 enclosure

This section is applicable to a supply unit with the LCL filter.

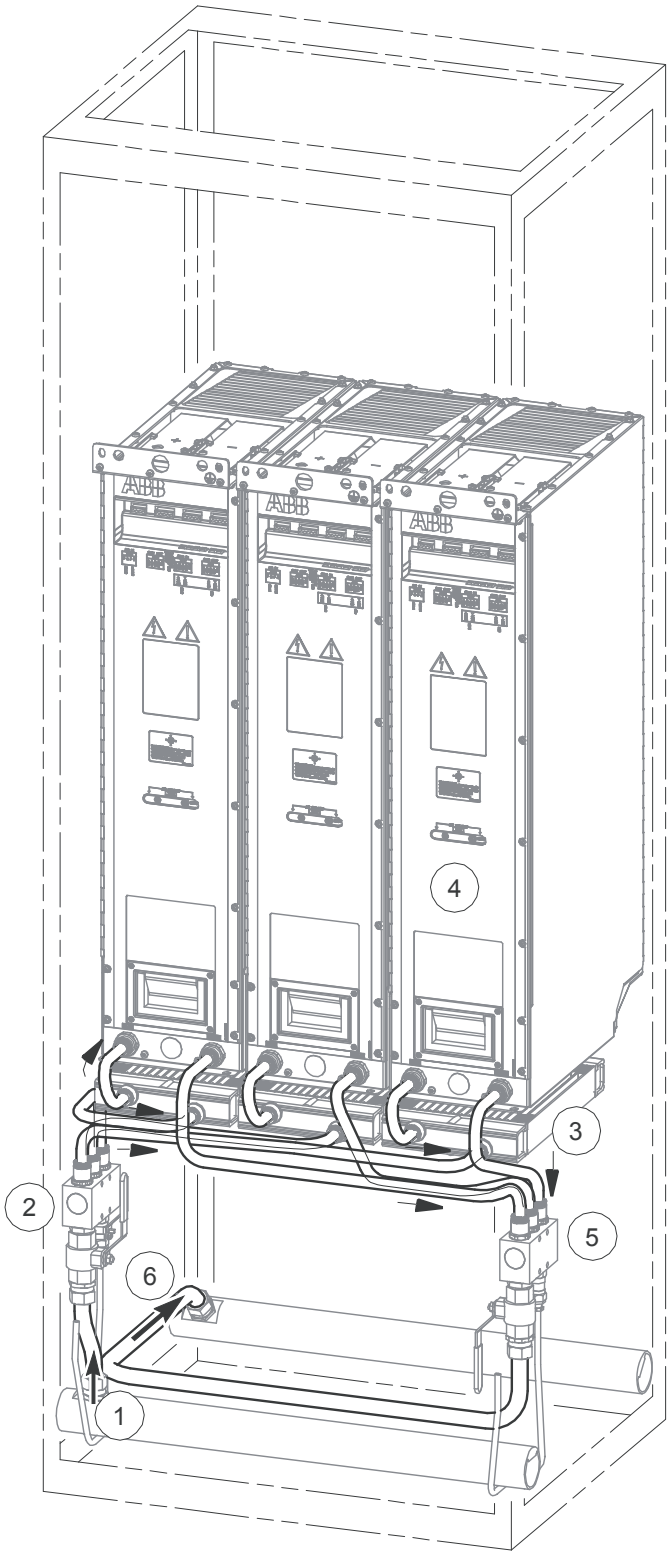
**Note:** 3×R8i design with DC switches is not suitable for UL installations.

### Layout drawing




| No. | Description |
|---|---|
| 1 | Common DC busbars (Rittal Flat-PLS) |
| 2 | DC fuses and optional DC switch |
| 3 | Common mode filter |
| 4 | IGBT supply module |
| 5 | Heat exchanger |
| 6 | Cooling fan |
| 7 | AC connection to LCL filter (Rittal Flat-PLS) |
| 8 | Inlet and outlet manifold with valves |

## Pipe routing example

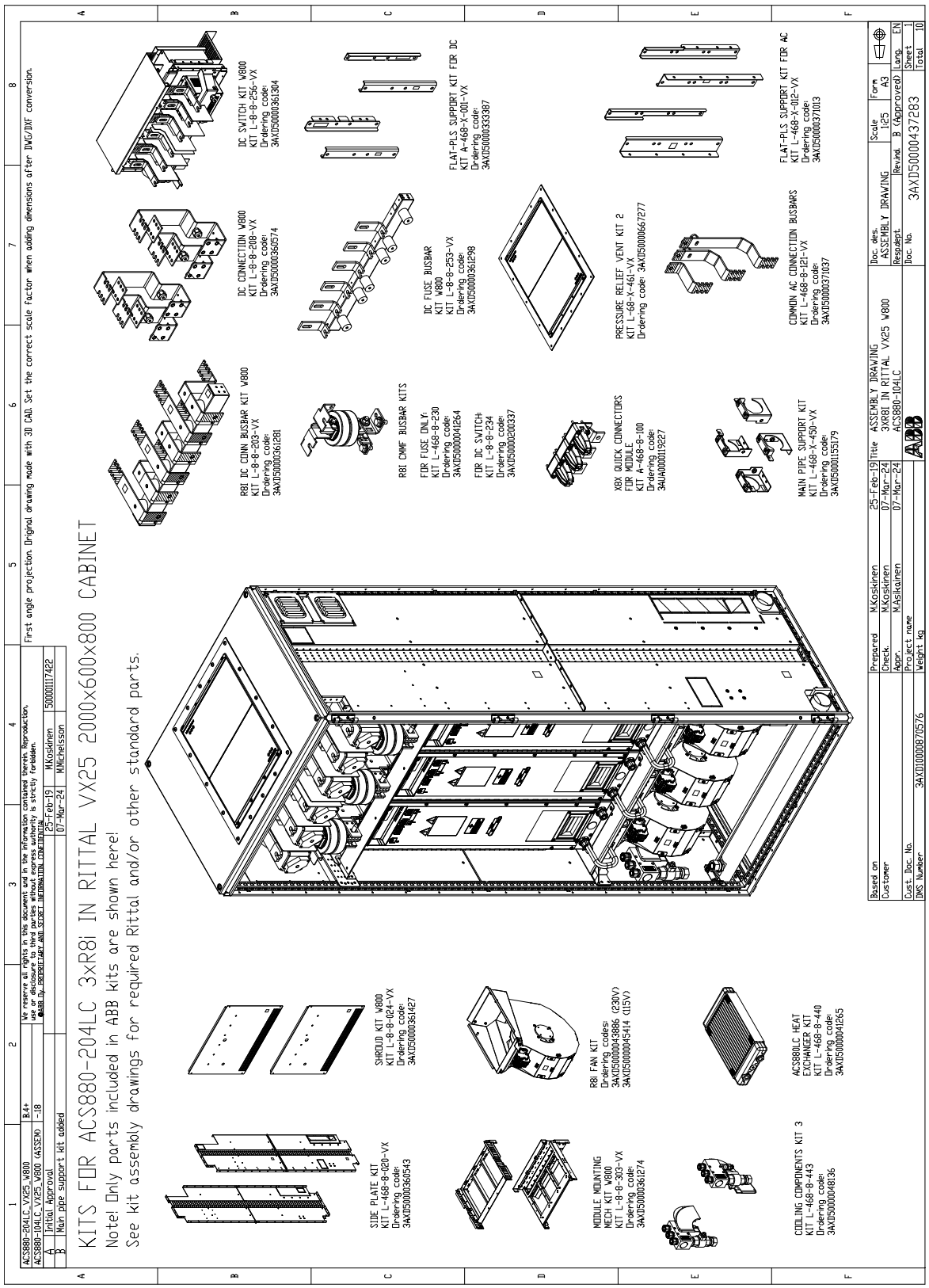



| No. | Description |
|---|---|
| 1 | Coolant in |
| 2 | Inlet manifold with stop and drain valves |
| 3 | Heat exchanger |
| 4 | IGBT supply module |
| 5 | Outlet manifold with stop and drain valves |
| 6 | Coolant out |

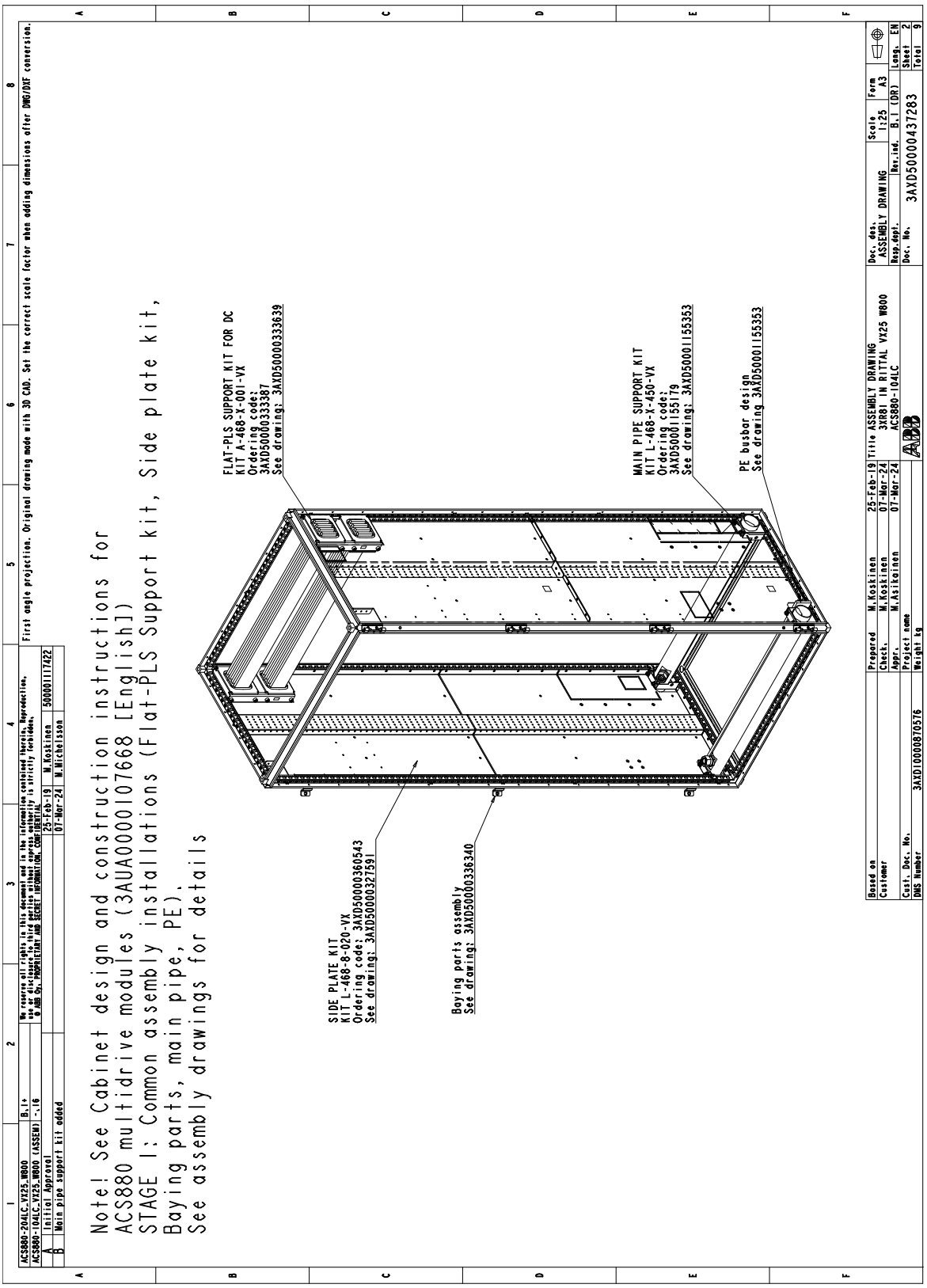
## Installation stages

| No. | Installation stage | Instruction code | Kit code | Kit ordering code |
|---|---|---|---|---|
| 1 | DC bus | 3AXD50000333639 | A-468-X-001-VX | 3AXD50000333387 |
| | Side plate kit | 3AXD50000327591 | L-468-8-020-VX | 3AXD50000360543 |
| | Baying parts | 3AXD50000336340 | - | - |
| | Main pipe support kit | 3AXD50001155353 | L-468-X-450-VX | 3AXD50001155179 |
| | PE busbar | 3AXD50001155353 | - | - |
| 2 | Module mounting mechanics and quick connectors | 3AXD50000329502 | L-8-8-303-VX | 3AXD50000361274 |
| | | 3AUA0000118667 | A-468-8-100 | 3AUA0000119227 |
| 3 | Flat-PLS support kit for AC and common AC connection busbars | 3AXD50000370870 | L-468-X-012-VX | 3AXD50000371013 |
| | | 3AXD50000352791 | L-468-8-121-VX | 3AXD50000371037 |
| 4 | Fan, heat exchanger and cooling components | - | - | 3AXD50000043886 / 3AXD50000045414 |
| | | - | L-468-8-440 | 3AXD50000041265 |
| | | 3AXD50000048283 | L-468-8-443 | 3AXD50000048136 |
| 5A | DC busbars | 3AXD50000331567 | L-8-8-203-VX | 3AXD50000361281 |
| | | 3AXD50000331765 | L-8-8-253-VX | 3AXD50000361298 |
| | | 3AXD50000041311 | L-468-8-230 | 3AXD50000041264 |
| 5B | DC switch, DC connection and common mode filter busbar kits | 3AXD50000336999 | L-8-8-256-VX | 3AXD50000361304 |
| | | 3AXD50000344185 | L-8-8-208-VX | 3AXD50000360574 |
| | | 3AXD50000205226 | L-8-8-234 | 3AXD50000200337 |
| 6 | Module installation | - | - | - |
| 7 | Shrouding | 3AXD50000353125 | L-8-8-024-VX | 3AXD50000361427 |
| 8 | Pressure relief kit | 3AXD50000667253 | L-68-X-461-VX | 3AXD50000667277 |

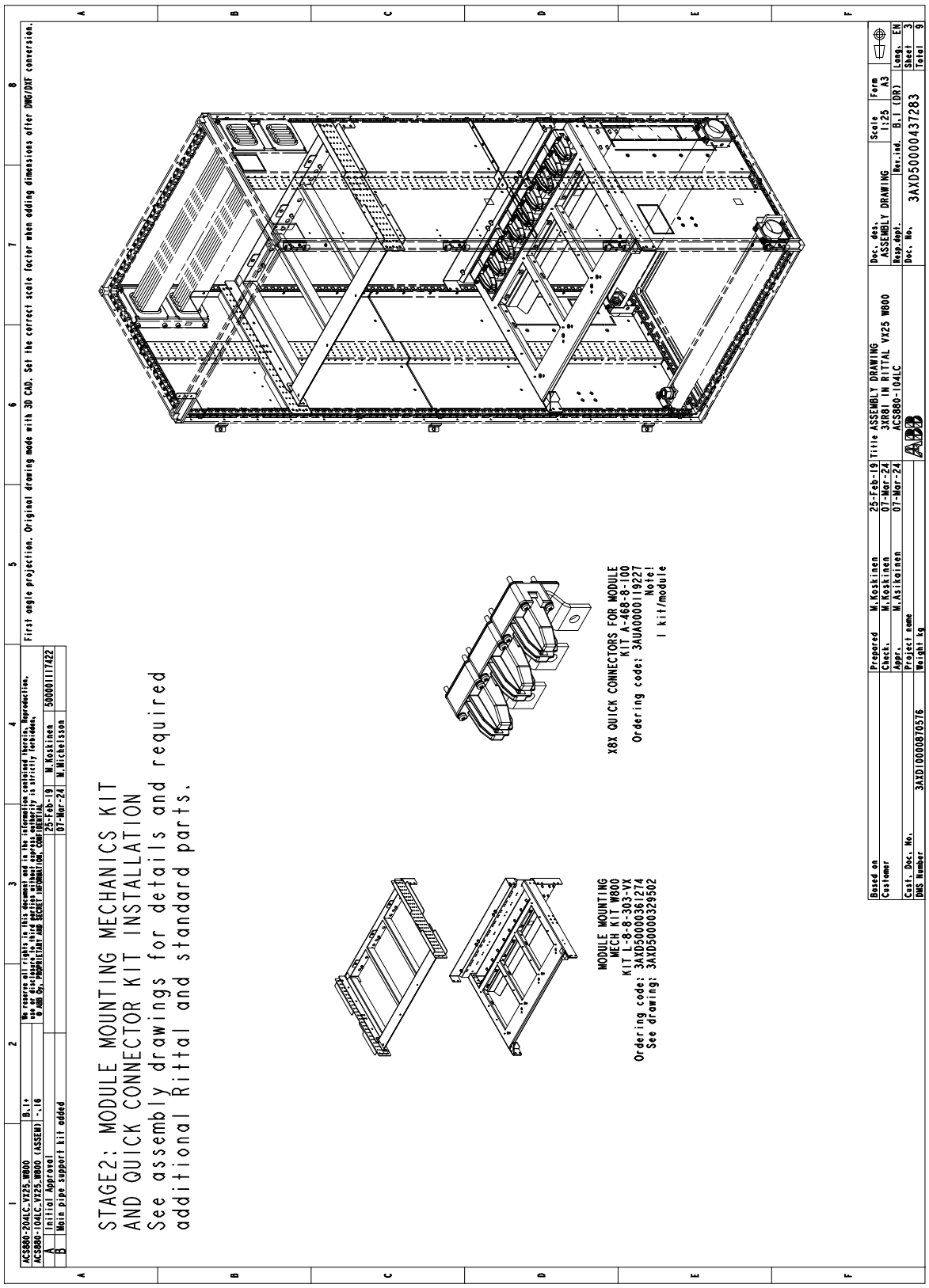
## Overview of kits



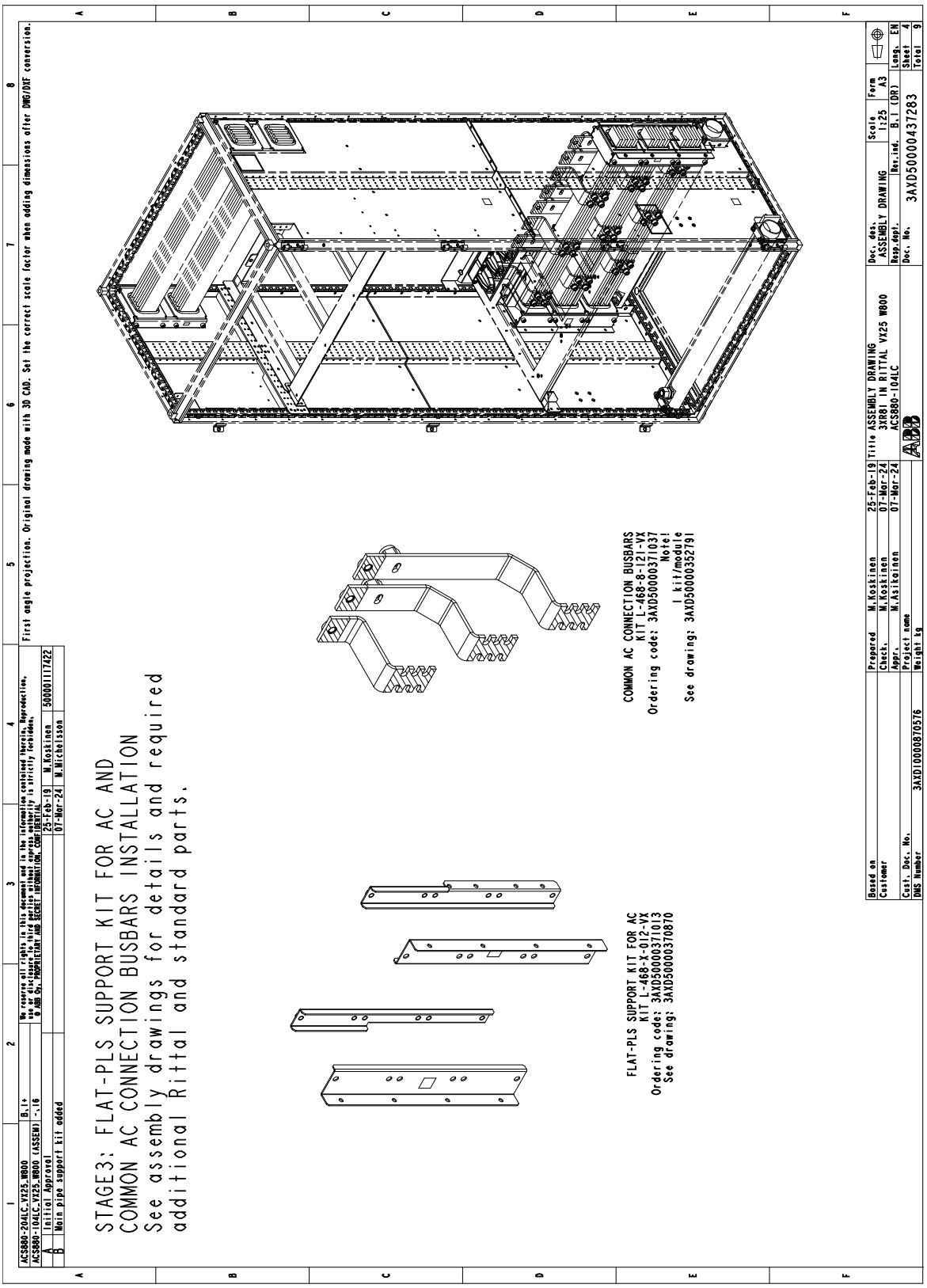
## Stage 1: Installation of common parts



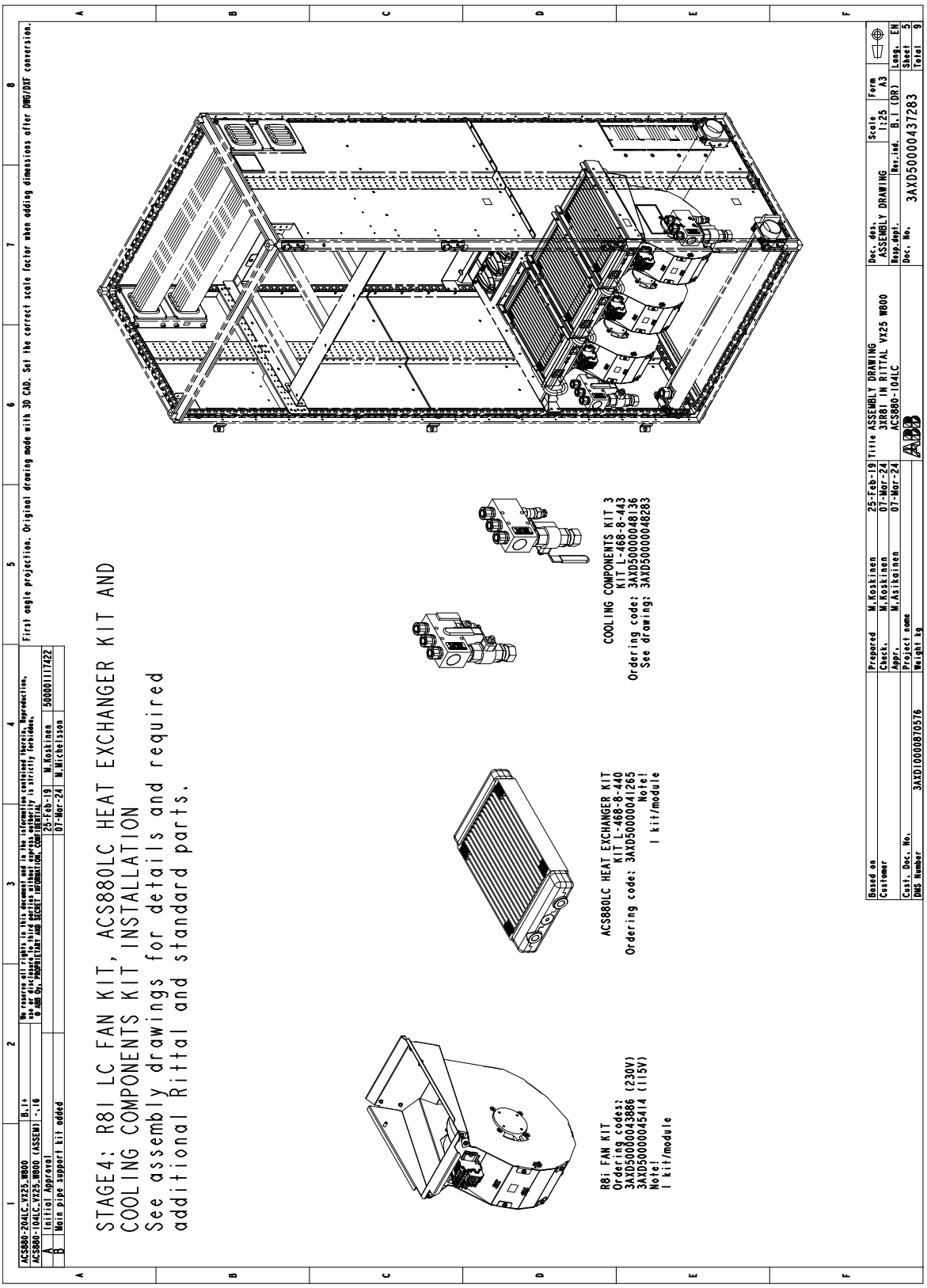
## Stage 2: Module mounting mechanics and quick connectors



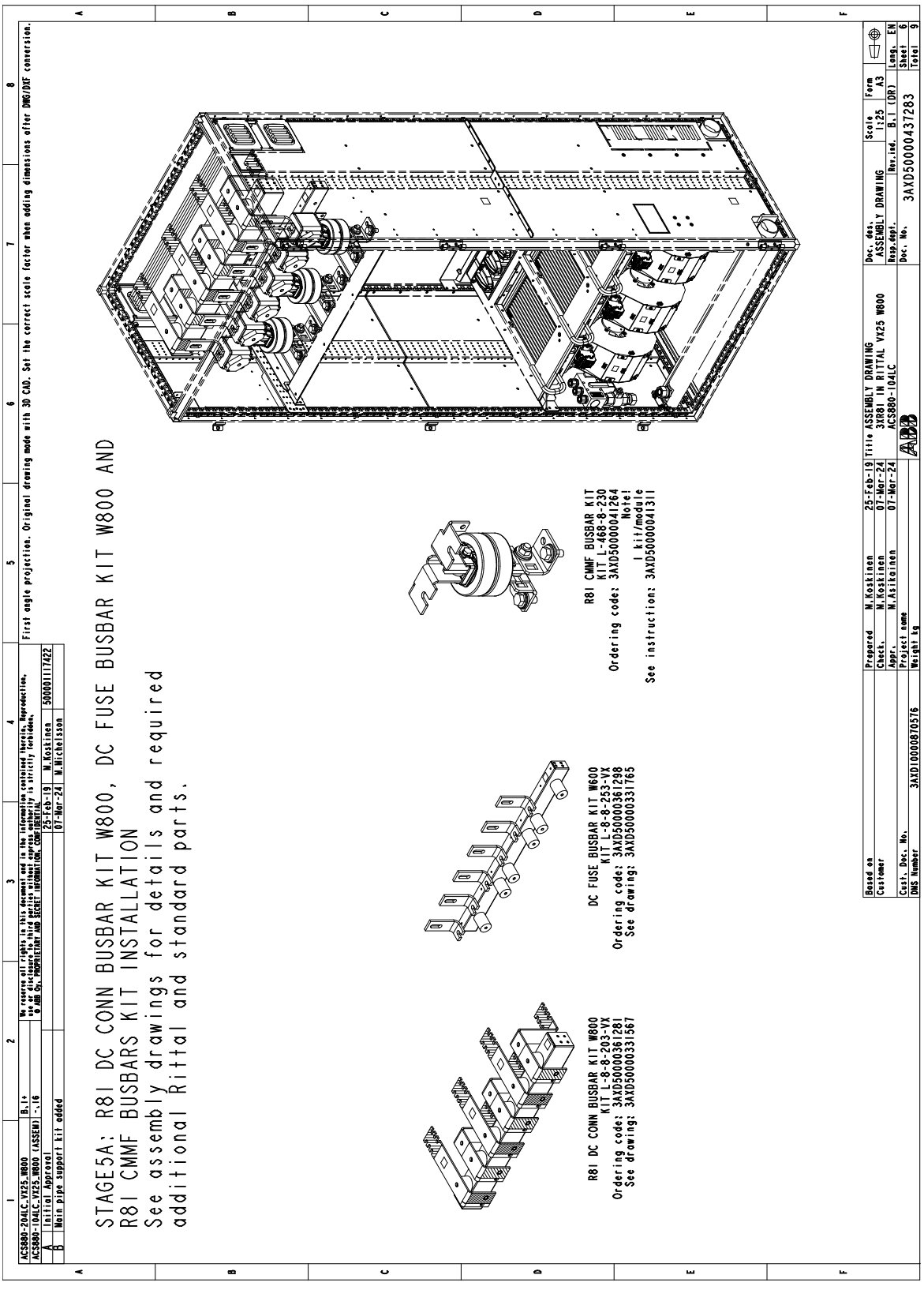
## Stage 3: Flat-PLS support kit for AC and common AC connection busbars



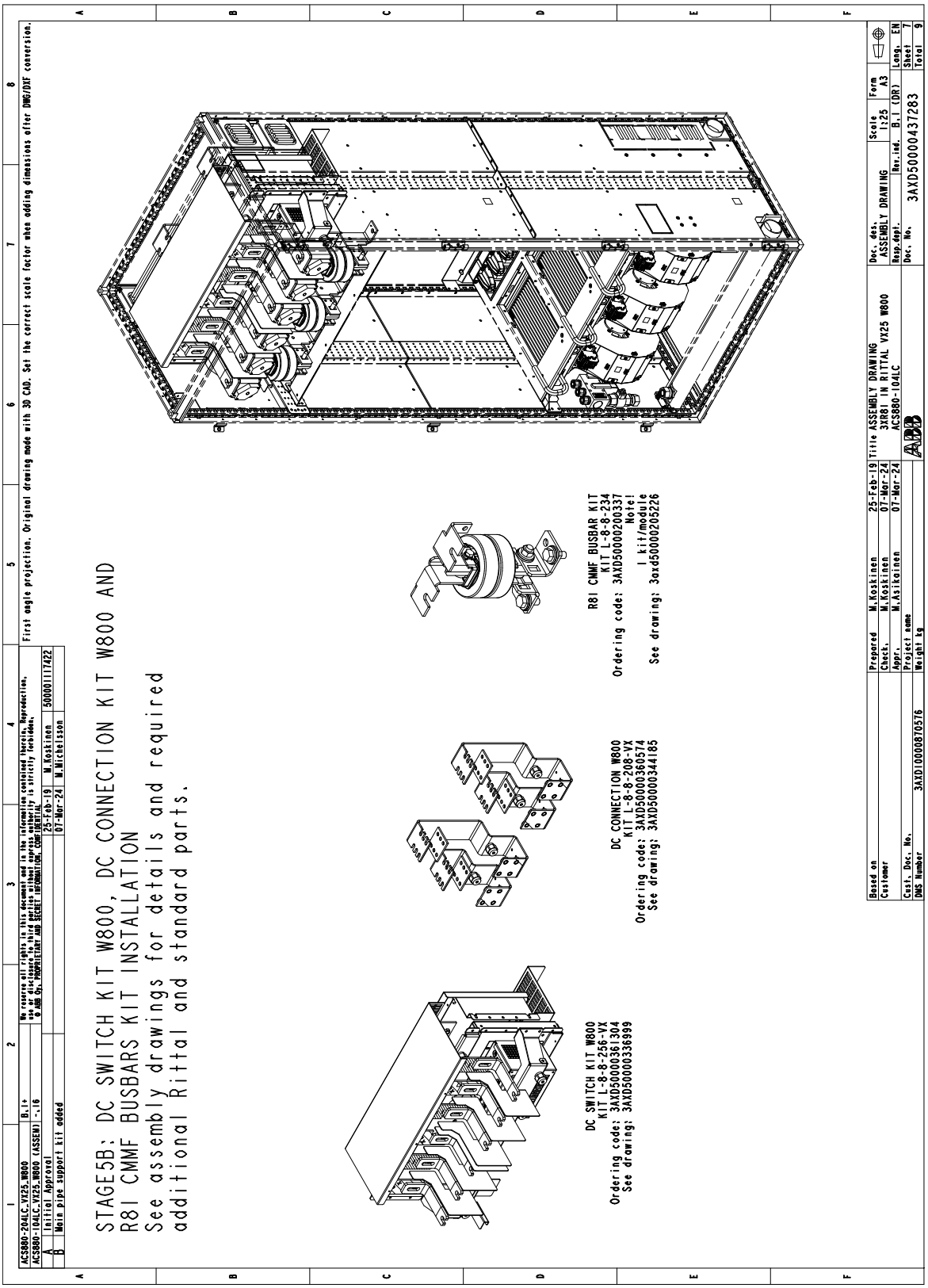
## Stage 4: Fan, heat exchanger and cooling components



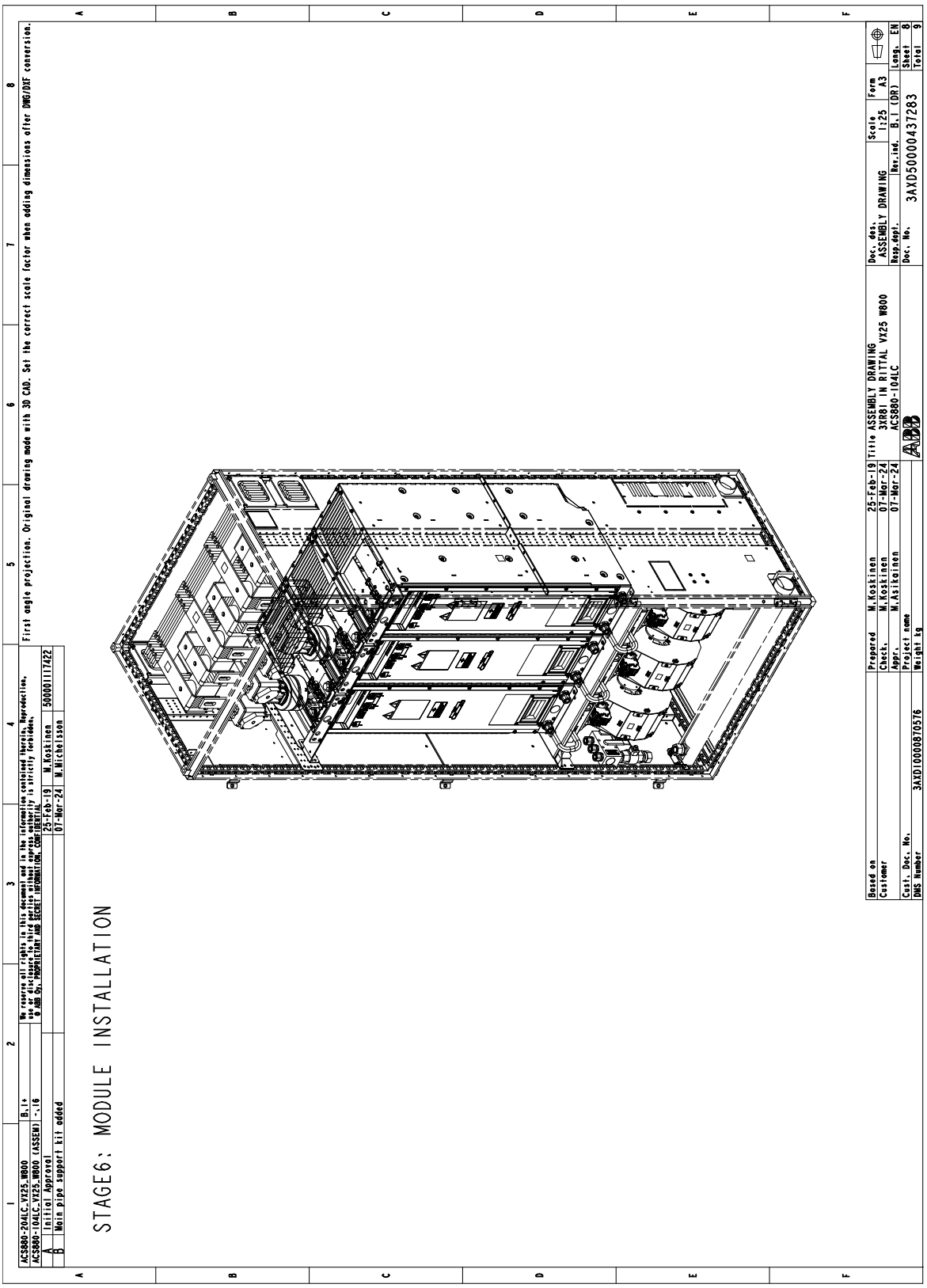
## Stage 5A: Installation of DC busbars



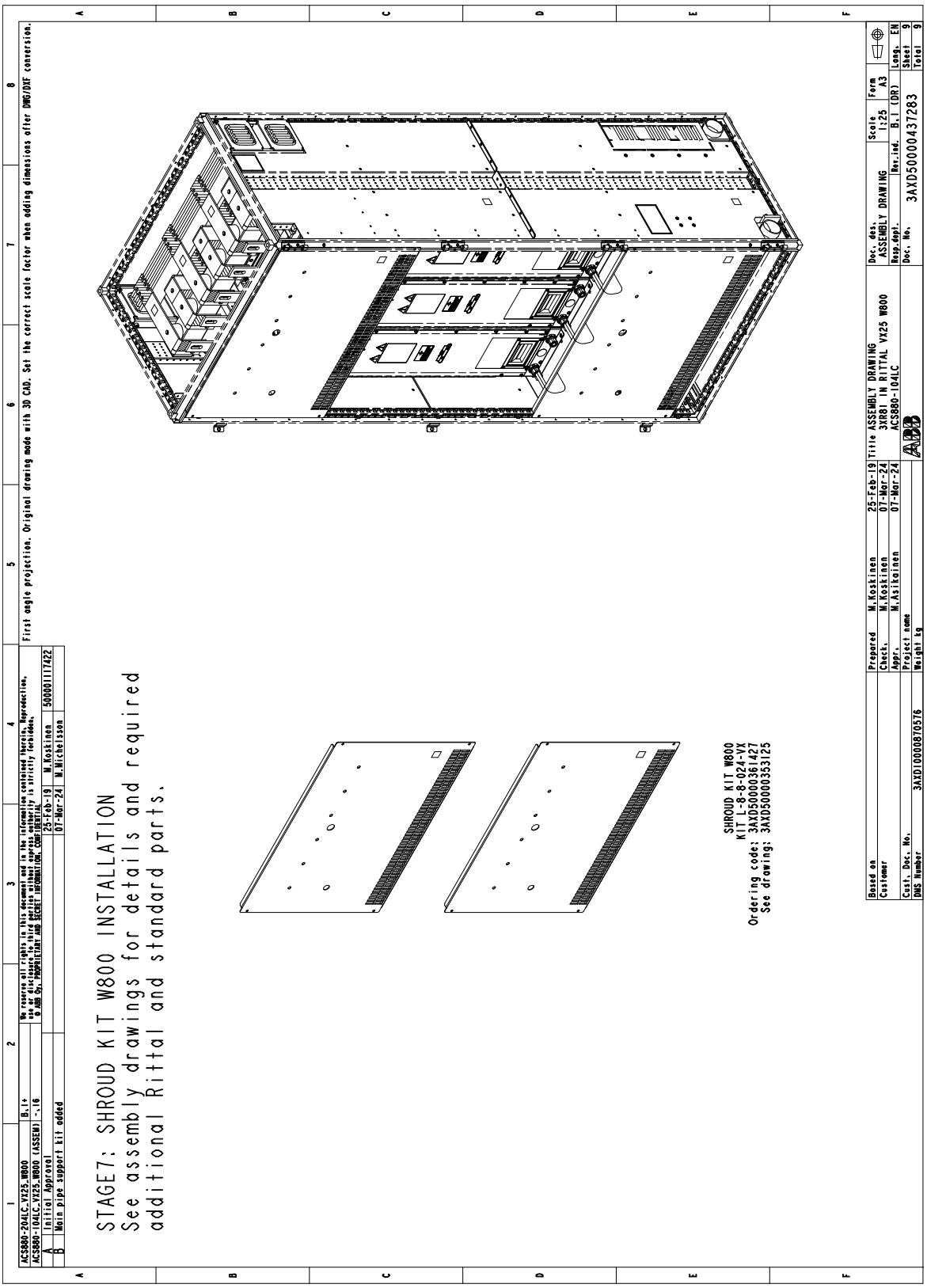
## Stage 5B: Installation of DC switch, DC connection and common mode filter busbar kits



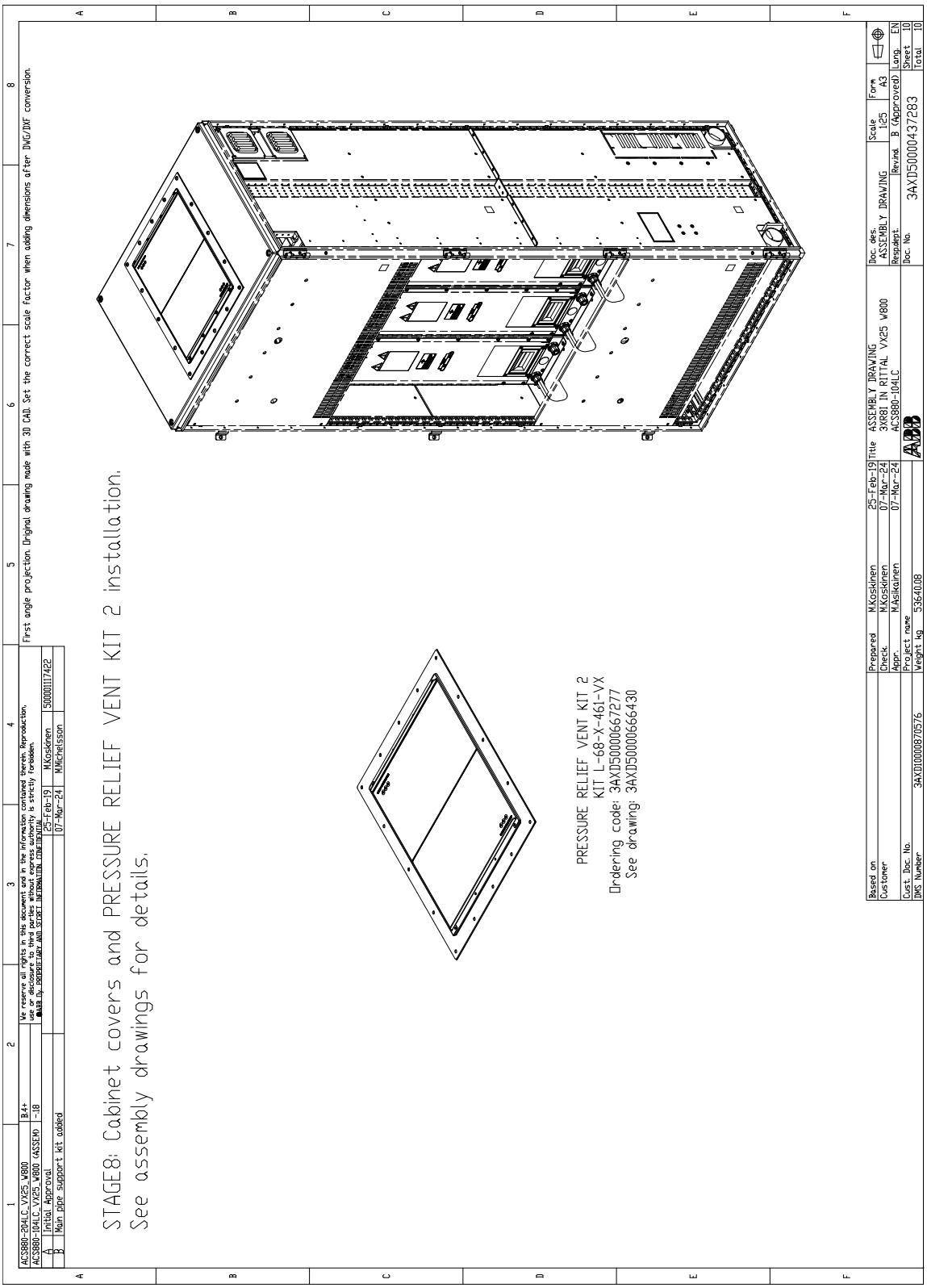
## Stage 6: Module installation



## Stage 7: Installation of shrouding



## Stage 8: Installation of pressure relief kit and cabinet covers

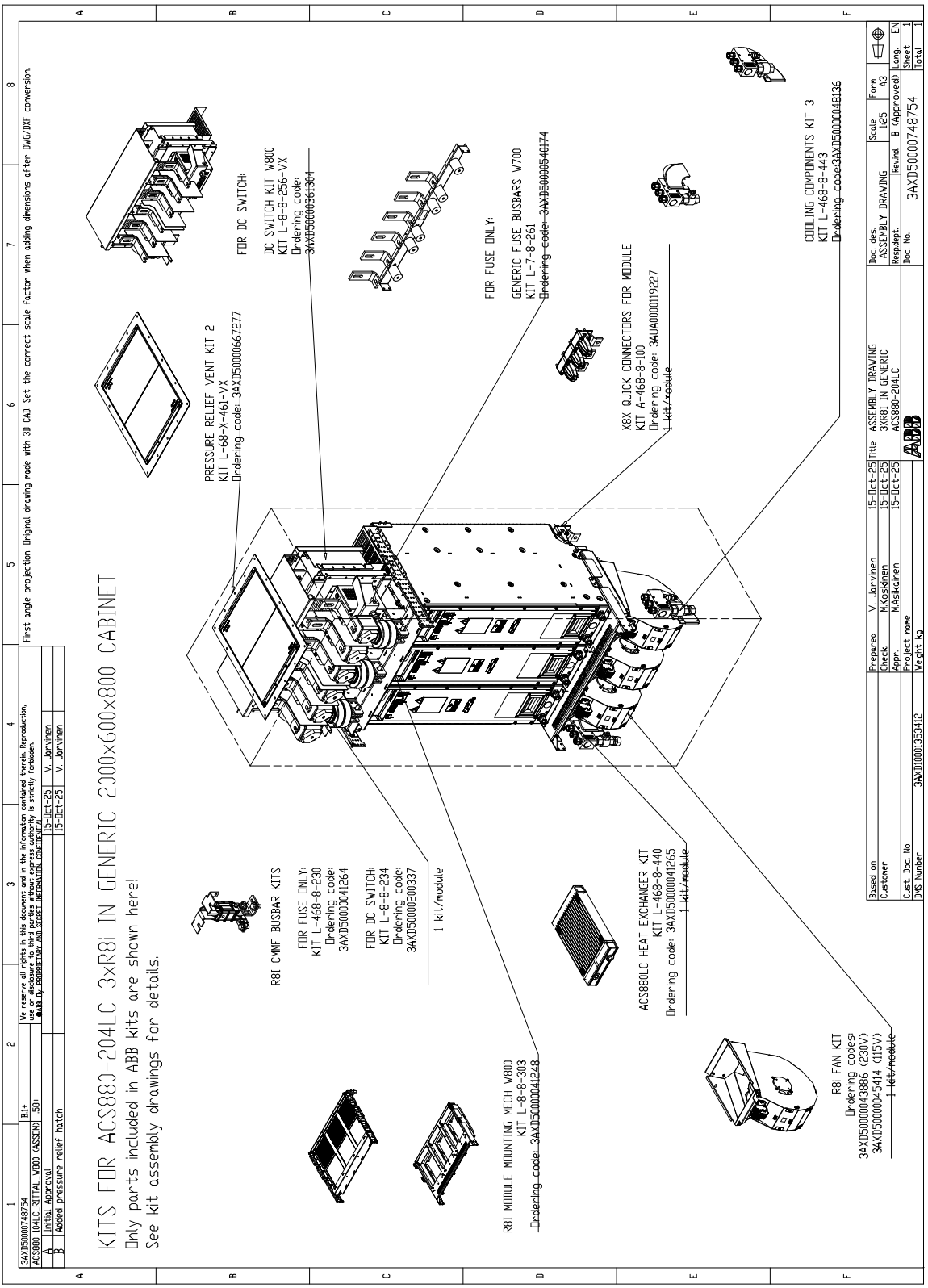


## Three R8i modules in an 800 mm wide generic enclosure

This section is applicable to a supply unit with the LCL filter.

| Parts to be installed | Instruction code | Kit code | Kit ordering code |
|---|---|---|---|
| Cooling component kit | 3AXD50000048283 | L-468-8-443 | 3AXD50000048136 |
| Quick connectors | 3AUA0000118667 | A-468-8-100 | 3AUA0000119227 |
| Module mounting mechanics and cooling components | 3AXD50000041461 | L-8-8-303 | 3AXD50000041248 |
| | - | - | 3AXD50000043886 / 3AXD50000045414 |
| | | L-468-8-440 | 3AXD50000041265 |
| DC busbars (for configuration without DC switch) [1)] | 3AXD50000540693 | L-7-8-261 | 3AXD50000540174 |
| | 3AXD50000041311 | L-468-8-230 | 3AXD50000041264 |
| DC switch and busbars | 3AXD50000336999 | L-8-8-256-VX | 3AXD50000361304 |
| | 3AXD50000205226 | L-8-8-234 | 3AXD50000200337 |
| Supply modules | - | - | - |
| Shrouding | - | - | - |
| Pressure relief kit | 3AXD50000667253 | L-68-X-461-VX | 3AXD50000667277 |

1) With this configuration, it is possible to install the kits to a 700 mm wide enclosure.

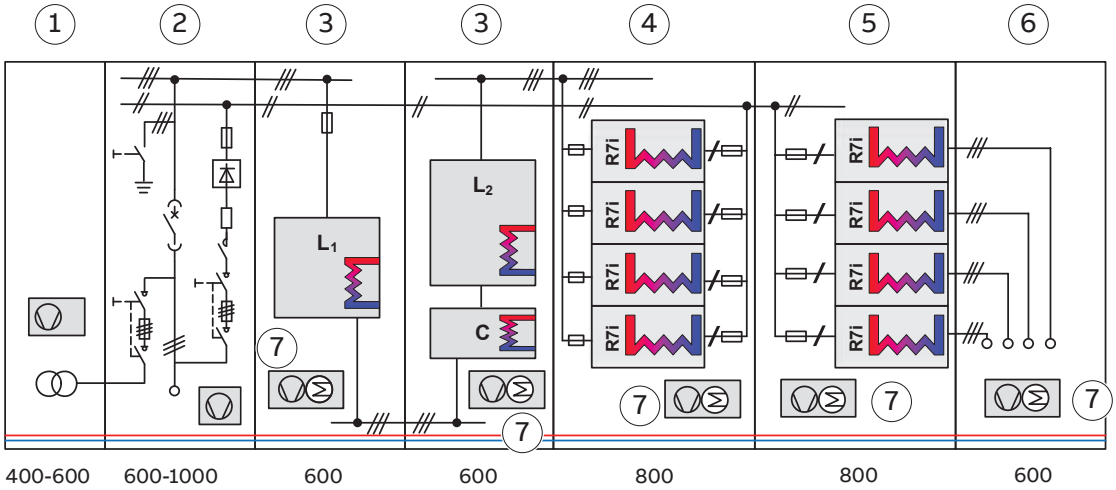

KITS FOR ACS880-204LC 3xR8i IN GENERIC 2000x600x800 CABINET
Only parts included in ABB kits are shown here!
See kit assembly drawings for details.
PRESSURE RELIEF VENT KIT 2
KIT L-68-X-461-VX
Ordering code: 3AXD50000667277
FOR DC SWITCH:
DC SWITCH KIT W800
KIT L-8-8-256-VX
Ordering code:
3AXD50000361304
FOR FUSE ONLY:
GENERIC FUSE BUSBARS W700
KIT L-7-8-261
Ordering code: 3AXD50000540174
X8X QUICK CONNECTORS FOR MODULE
KIT A-468-8-100
Ordering code: 3AUA0000019227
1 kit/module
COOLING COMPONENTS KIT 3
KIT L-468-8-443
Ordering code:3AXD50000048136
R8i CMMF BUSBAR KITS
FOR FUSE ONLY:
KIT L-468-8-230
Ordering code:
3AXD50000041264
FOR DC SWITCH:
KIT L-8-8-234
Ordering code:
3AXD50000200337
1 kit/module
R8i MODULE MOUNTING MECH W800
KIT L-8-8-303
Ordering code: 3AXD50000041248
ACS880LC HEAT EXCHANGER KIT
KIT L-468-8-440
Ordering code: 3AXD50000041265
1 kit/module
R8i FAN KIT
Ordering codes:
3AXD50000043886 (230V)
3AXD50000045414 (115V)
1 kit/module
3AXD50000748754
ACS880-104LC_RITTAL_W800 (ASSEMB)-58+
Initial Approval
Added pressure relief hatch
V. Jarvinen
15-Oct-25
Prepared
Check.
Appr.
Project name
Weight kg
ASSEMBLY DRAWING
3XR8I IN GENERIC
ACS880-204LC
ABB
Based on
Customer
Cust. Doc. No.
DMS Number
3AXD10001353412
Doc. des.
ASSEMBLY DRAWING
Respdept.
Doc. No.
Scale 1:25
Form A3
Revind B (Approved)
Lang. EN
Sheet 1
Total 1

## Drive with 4×R7i + 4×R7i modules in a low-height enclosure

This section shows a simplified cabinet construction example for a high-power drive that is installed in a low-height enclosure. The supply unit and the inverter unit both have four parallel R7i supply modules. The drawing below shows the cubicle widths, and the main components in each cubicle. This example design is also applicable to other low-height cabinets with parallel R7i supply and inverter modules, such as 2×R7i+2×R7i, etc.

The pre-selected cooling circuit components with their order codes are listed in Cooling system parts (example drive with 4×R7i + 4×R7i) (page 310) for the supply unit and in ACS880-104LC hardware manual for the inverter unit. These pre-selections are suitable for the cubicle widths in the example.

This drawing and the pre-selected cooling circuit component listings serve as the starting point for the design. The customer must do the rest, such as design the layout and connection details and select the remaining components.




| | |
|---|---|
| 1 | Auxiliary control cubicle |
| 2 | Incoming cubicle |
| 3 | LCL filter cubicle |
| 4 | IGBT supply module cubicle |
| 5 | Inverter module cubicle |
| 6 | Common output terminals cubicle |
| 7 | Air-to-liquid heat exchanger and cooling fan |

5

# Guidelines for planning electrical installation

## Contents of this chapter

This chapter contains electrical planning instructions.

## 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 that 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.

### North America

Installations must be compliant with NFPA 70 (NEC)[1)] and/or Canadian Electrical Code (CE code), along with state and local codes for your location and application.

[1)] National Fire Protection Association 70 (National Electric Code).

## Generic guidelines

Refer to ACS880 liquid-cooled multidrives cabinets and modules electrical planning instructions (3AXD50000048634 [English]) for the generic guidelines for planning the electrical installation (selecting cables, routing cables, etc.) of multidrives cabinets and modules.

# Selecting a supply transformer for an IGBT supply unit with a CL filter

Obey the basic rules for the supply transformer selection. Refer to ACS880 liquid-cooled multidrives cabinets and modules electrical planning (3AXD50000048634 [English]). Make also sure that the transformer and the supply network comply with these additional requirements:

- The transformer insulation system must withstand 3 kV voltage spikes.
- The transformer must not saturate at current that is equal to or lower than the maximum input current of the supply unit $I_{max,peak}$. Refer to Equation 1.
- The transformer inductance must be equal to or bigger than the minimum limit $L_{min,tr}$. Refer to Table 1.
  **Alternative:** If the network that supplies the supply unit is mostly inductive, you can also use Equation 2. If the transformer short circuit power is equal to or smaller than the maximum limit $S_{k,net,max}$, the transformer inductance meets the requirement, i.e., it is equal to or bigger than the minimum limit $L_{min,tr}$. Equation 3 shows the relation between $S_{k,net,max}$ and $L_{min,tr}$.
  **Note:** If the transformer does not comply with the requirement, it is possible to connect a 3-phase AC choke to the supply network. Consult ABB.
- Recommendation for the optimal EMC performance: Make sure that the supply transformer has an earthed screen between primary and secondary windings of the transformer.
- There must be no devices that are sensitive to common mode voltage connected to the network that supplies the supply unit.

**Equation 1.** Maximum input current of the supply unit

$$I_{\mathrm{max,peak}} = 1.5 \times \sqrt{2}\, I_n$$

| | |
|---|---|
| $I_{max,peak}$ | Maximum (peak) input current of the supply unit [A] |
| $I_n$ | Nominal input current of the supply unit [A] |

**Equation 2.** Maximum limit for the supply transformer short circuit power (IEC 61000-3-4:1998)

$S_{k,net,max} = SCR_{net,max} \times S_n$

| | |
|---|---|
| $S_{k,net,max}$ | Maximum limit for the short circuit apparent power of the supply transformer [kVA] |
| $SCR_{net,max}$ | Maximum limit for the short-circuit ratio of the supply network |
| $S_n$ | Nominal apparent power of the supply unit [kVA] |

**Equation 3.** Relation between $SCR_{net}$ and $L_{min,tr}$ in a mostly inductive network

$$\mathrm{SCR}_{\mathrm{net,max}} = \frac{S_{k,\mathrm{net,max}}}{S_n} = \frac{\frac{U^2}{Z_{\mathrm{min}}}}{S_n} = \frac{U^2}{L_{\mathrm{min,tr}} \times 10^{-6} \times 2\pi f_n \times S_n \times 10^3}$$

| | |
|---|---|
| $SCR_{net,max}$ | Maximum limit for the short-circuit ratio of the supply network |
| $S_{k,net,max}$ | Maximum limit for the short circuit apparent power of the supply transformer [kVA] |
| $S_n$ | Nominal apparent power of the supply unit [kVA] |
| $U$ | Phase-to-phase voltage of the supply network of the supply unit [V] |
| $SCR_{net,max}$ | Maximum limit for the short-circuit ratio of the supply network |
| $L_{min,tr}$ | Minimum limit for the supply transformer inductance [µH]. Refer to Table 1. |

**Calculation example:**

ACS880-204LC-0770A-7: $S_n$ = 920 KVA, $U_n$ = 690 V, $f_n$ = 50 Hz, minimum transformer inductance according to hardware manual $L_{min,tr}$ = 85 µH

$$\mathrm{SCR}_{\mathrm{net,Max}} \leq \frac{(690\ \mathrm{V})^2}{85\ \mu\mathrm{H} \times 10^{-6} \times 2\pi \times 50\ \mathrm{Hz} \times 920\ \mathrm{kVA} \times 10^3} \approx 19.38$$

$$S_{k,\mathrm{net,max}} \leq 19.38 \times 920\,\mathrm{KVA} \approx 17830\,\mathrm{KVA}$$

**Table 1.** Minimum limit for the supply transformer inductance

| ACS880-204LC IGBT supply module type | Frame size | $L_{min,tr}$ [µH] |
|---|---|---|
| ACS880-204LC-0360A-7 | 1×R8i | 85 |
| ACS880-204LC-0400A-7 | 1×R8i | 85 |
| ACS880-204LC-0450A-7 | 1×R8i | 85 |
| ACS880-204LC-0480A-7 | 1×R8i | 85 |
| ACS880-204LC-0560A-7 | 1×R8i | 85 |
| ACS880-204LC-0620A-7 | 1×R8i | 85 |
| ACS880-204LC-0700A-7 | 1×R8i | 85 |
| ACS880-204LC-0770A-7 | 1×R8i | 85 |
| ACS880-204LC-0930A-7 | 2×R8i | 42 |
| ACS880-204LC-1090A-7 | 2×R8i | 42 |
| ACS880-204LC-1180A-7 | 2×R8i | 42 |
| ACS880-204LC-1360A-7 | 2×R8i | 34 |
| ACS880-204LC-1500A-7 | 2×R8i | 34 |
| ACS880-204LC-1800A-7 | 3×R8i | 21 |
| ACS880-204LC-2020A-7 | 3×R8i | 21 |
| ACS880-204LC-2220A-7 | 3×R8i | 21 |
| ACS880-204LC-2670A-7 | 4×R8i | 17 |
| ACS880-204LC-2930A-7 | 4×R8i | 17 |
| ACS880-204LC-3840A-7 | 6×R8i | 10.5 |
| ACS880-204LC-4360A-7 | 6×R8i | 10.5 |
| ACS880-204LC-5240A-7 | 8×R8i | 8.5 |
| ACS880-204LC-5810A-7 | 8×R8i | 8.5 |

**Note:** Since frame size 5×R8i cannot be equipped with CL filter, this instruction is not applicable for that.

When multiple CL filter cubicles are connected to the same transformer, use symmetrical supply cabling to ensure equal current sharing between parallel units, especially when incoming and CL filter cubicles (CL-ICU cubicles) are not next to each other.

Additional requirements for IGBT supply units with plus code +N8053 (optimal grid control) are presented in ACS880 multidrives, Optimal grid control (option +N8053) supplement (3AXD50000220717 [English]).

## Selecting power cables

Refer to ACS880 liquid-cooled multidrives cabinets and modules electrical planning (3AXD50000048634 [English]) for the generic cable selection guidelines.

Remark for the supply unit with CL filter that have more than one incoming cubicle and input power cable connection points: Make sure that the input power cable that you connect to each incoming cubicle is identical with the parallel cable(s) that you connect to other incoming cubicles. That is:

- The cable types and cable lengths are the same.
- If you use parallel cables, the number of parallel cables is identical in each incoming cubicle.

## Main breaker / contactor

In the power up, you must keep the supply modules de-energized with the contactor/breaker until you have charged the drive DC link capacitors via the charging circuit. A main breaker or contactor is needed for the following reasons:

- If the LCL filter (or CL filter) is connected to the AC input power supply while the IGBT supply 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 IGBT supply module, LCL filter (or CL filter) and equipment connected to the DC bus. If the IGBT supply module is stopped, faulty or otherwise inactive, it cannot counteract the resonance of the filter.
- The IGBT supply module cannot prevent power flow from the AC input to the DC bus and further to the ACS880-104LC inverter module(s). Even if the modulation of the IGBT supply 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 IGBT supply module does not de-energize the system.
- The IGBT supply 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 IGBT supply module, it trips. If the current demand remains or increases, the IGBT supply module is damaged.

6

# Electrical installation

## Contents of this chapter

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

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

## Safety and 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 system may experience problems that the warranty does not cover.

## Electrical safety precautions

These electrical safety precautions are for all persons who do work on the drive, motor cable or motor.

This procedure gives information on how to de-energize the drive and make it safe to do work on it. The procedure does not include all possible drive configurations.



**⚠WARNING** Obey these instructions. If you ignore them, injury or death, or damage to the equipment can occur. If you are not a qualified electrical professional, do not do electrical installation or maintenance work. Do these steps before you do installation or maintenance work.

1. Prepare for the work.
   - Make sure that you have a work order.
   - Do an on-site risk assessment or job hazard analysis.
   - Make sure that you have the correct tools available.
   - Make sure that the workers are qualified.
   - Select the correct personal protective equipment (PPE).
   - Stop the drive and motor(s).
2. Clearly identify the work location and equipment.
3. Disconnect all possible voltage sources. Make sure that connection is not possible. Lock out and tag out.
   - If the drive is equipped with a DC/DC converter unit or a DC feeder unit: Open the disconnecting device of the energy storage connected to the unit. The disconnecting device is outside the drive cabinet. Then open the DC switch-disconnector [Q11] of the unit.
   - Open the main disconnecting device of the drive
   - Open the DC switch-disconnectors [Q11] in the multidrives units if they are present.
   - Open the line-up charging switch [Q3] if it is present. Open also the unit charging switches [Q10] in the multidrives units if they are 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.)
   - Open the auxiliary voltage switch-disconnector (if it is present), and all other possible disconnecting devices that isolate the drive from dangerous voltage sources.
   - In the liquid cooling unit (if present), open the switch-disconnector of the cooling pumps.
   - If there is a permanent magnet motor connected to the drive, disconnect the motor from the drive with a safety switch or by other means.
   - Open the main isolating device of the drive.
   - Disconnect all dangerous external voltages from the control circuits.
   - After you disconnect power from the drive, wait 5 minutes to let the intermediate circuit capacitors discharge before you continue.
4. Protect other energized parts in the work location against contact and take special precautions when close to bare conductors.
5. Measure that the installation is de-energized. Use a high-quality voltage tester. If the measurement requires that you remove shrouding or other cabinet structures,

obey the local laws and regulations applicable to live electrical work. This includes, but is not limited to, electric shock and arc protection.

- Before and after you measure the installation, verify the operation of the voltage tester on a known voltage source.
- Make sure that the voltage between the input power terminals of the drive (L1, L2, L3) and the grounding (PE) busbar is zero.
- Make sure that the voltage between the output power terminals of the drive (U, V, W) and the grounding (PE) busbar is zero.
  Important! Repeat the measurement with the DC voltage setting of the voltage tester. Measure between each phase and ground. There is a risk of dangerous DC voltage charging due to leakage capacitances of the motor circuit. This voltage can remain charged for a long time after the drive power-off. The measurement discharges the voltage.
- Make sure that the voltage between the drive DC busbars and the grounding (PE) busbar is zero.
- If the drive is equipped with a DC/DC converter unit or a DC feeder unit: Make sure that the voltage between the energy storage terminals of the unit (ES+ and ES-) and the grounding (PE) busbar is zero.

6. Install temporary grounding as required by the local regulations.
7. Ask for a permit to work from the person that is responsible for the electrical installation work.



**⚠WARNING** In case of DC bus remaining energized, Personal Protective Equipment (PPE) of Level 2 is required for doing maintenance. Note that this is valid for work on every cabinet of the device.

## Isolating the supply modules from the DC bus with the DC switch-disconnector (optional)

1. Stop the supply unit with the operating switch [S21].
2. Open the DC switch-disconnector [Q11] and charging switch [Q10] in every supply module cubicle of the supply unit.
3. Open the switch-disconnector of the AC-DC line charging circuit [Q40].

# General notes

## Printed circuit boards

**NOTICE** Use an antistatic wrist strap when you handle printed circuit boards. Do not touch the boards unnecessarily. The boards are sensitive to electrostatic discharge.

## Handling fiber-optic cables

**NOTICE** Obey these instructions. If you ignore them, equipment malfunction and damage to the fiber-optic cables can occur.

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

# Checking the insulation of the assembly

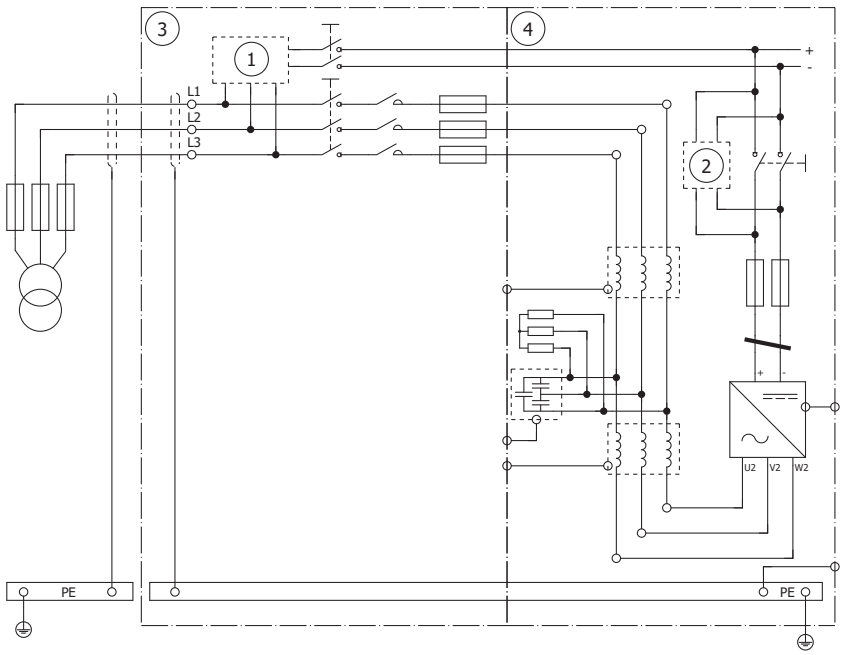
**NOTICE** Do not do voltage withstand or insulation resistance tests on the drive. The tests can cause damage to the drive. Every drive is tested for insulation between the main circuit and the chassis at the factory. Also, there are voltage-limiting circuits inside the drive which cut down the testing voltage automatically.

## Measuring the insulation resistance of the input power cable

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

# Connecting the main circuit and charging circuit cabling

## Connection diagram (frame 1×R7i)




| | |
|---|---|
| 1 | Components for main charging circuit. For details, see chapter Example circuit diagrams. |
| 2 | Components for DC charging circuit. For details, see chapter Example circuit diagrams. |
| 3 | Incoming cubicle |
| 4 | IGBT supply module cubicle |

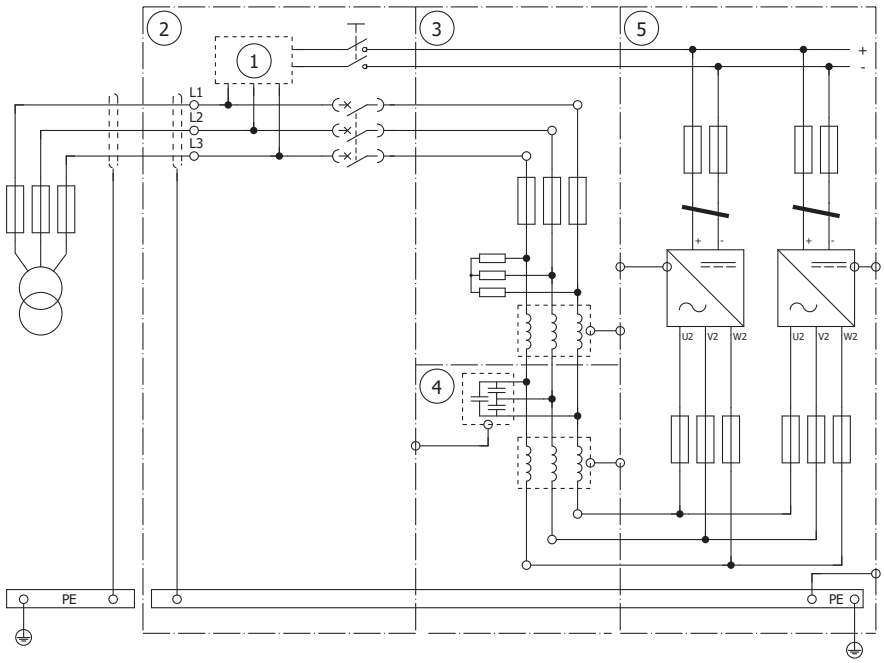
**Notes:**

For the conductivity requirements for the shield and the PE conductor, see ACS880 liquid-cooled multidrives cabinets and modules electrical planning (3AXD50000048634 [English]).

For the cable selection instructions, see ACS880 liquid-cooled multidrives cabinets and modules electrical planning (3AXD50000048634 [English]).

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

## Connection diagram (frame R7i multiples)




| | |
|---|---|
| 1 | Components for main charging circuit. For details, see chapter Example circuit diagrams. |
| 2 | Incoming cubicle |
| 3 | The first LCL filter cubicle |
| 4 | The second LCL filter cubicle |
| 5 | IGBT supply module cubicle |

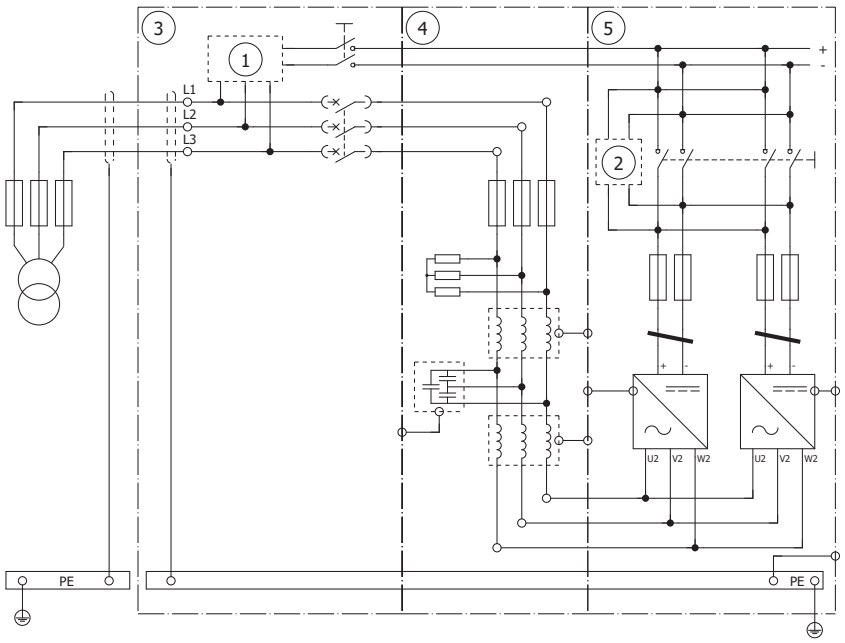
**Notes:**

For the conductivity requirements for the shield and the PE conductor, see ACS880 liquid-cooled multidrives cabinets and modules electrical planning (3AXD50000048634 [English]).

For the cable selection instructions, see ACS880 liquid-cooled multidrives cabinets and modules electrical planning (3AXD50000048634 [English]).

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

## Connection diagram (frame R8i and multiples with LCL filter)




| | |
|---|---|
| 1 | Components for main charging circuit. For details, see chapter Example circuit diagrams. |
| 2 | Components for DC charging circuit. For details, see chapter Example circuit diagrams. |
| 3 | Incoming cubicle |
| 4 | LCL filter cubicle |
| 5 | IGBT supply module cubicle |

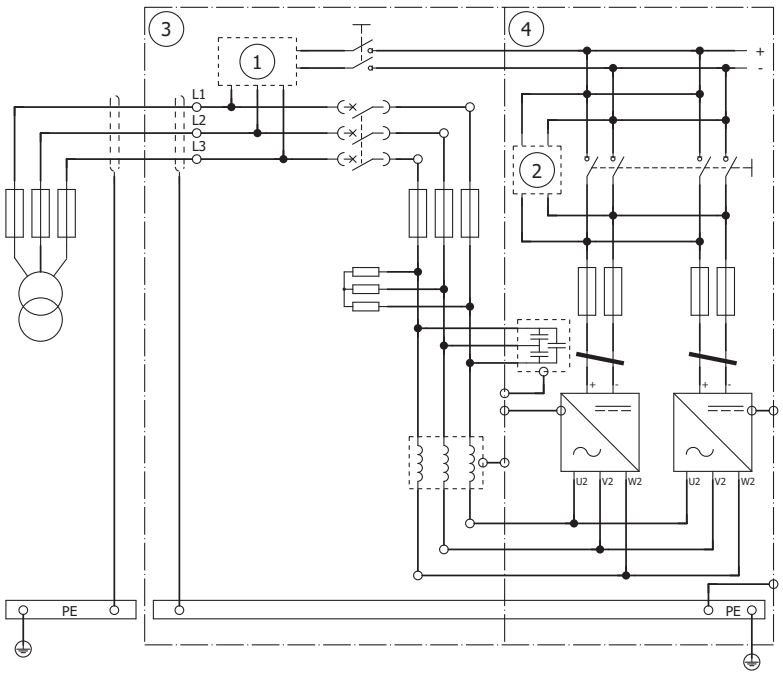
**Notes:**

For the conductivity requirements for the shield and the PE conductor, see ACS880 liquid-cooled multidrives cabinets and modules electrical planning (3AXD50000048634 [English]).

For the cable selection instructions, see ACS880 liquid-cooled multidrives cabinets and modules electrical planning (3AXD50000048634 [English]).

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

## Connection diagram (frame R8i and multiples with CL filter)




| | |
|---|---|
| 1 | Components for lineup charging circuit. For details, see chapter Example circuit diagrams. |
| 2 | Components for unit charging circuit. For details, see chapter Example circuit diagrams. |
| 3 | Incoming and CL filter cubicle |
| 4 | IGBT supply module cubicle |

**Notes:**

For the conductivity requirements for the shield and the PE conductor, see ACS880 liquid-cooled multidrives cabinets and modules electrical planning (3AXD50000048634 [English]).

For the cable selection instructions, see ACS880 liquid-cooled multidrives cabinets and modules electrical planning (3AXD50000048634 [English]).

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

## Connection procedure



**⚠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 electrical installation, commissioning or maintenance work.

***NOTICE*** Apply grease to stripped aluminum conductors before you attach them to non-coated aluminum cable lugs. Obey the grease manufacturer's instructions. Aluminum-aluminum contact can cause oxidation in the contact surfaces.

Remark for the supply unit with CL filter that have more than one incoming cubicle and input power cable connection points: Make sure that the input power cable that you connect to each incoming cubicle is identical with the parallel cable(s) that you connect to other incoming cubicles. That is:

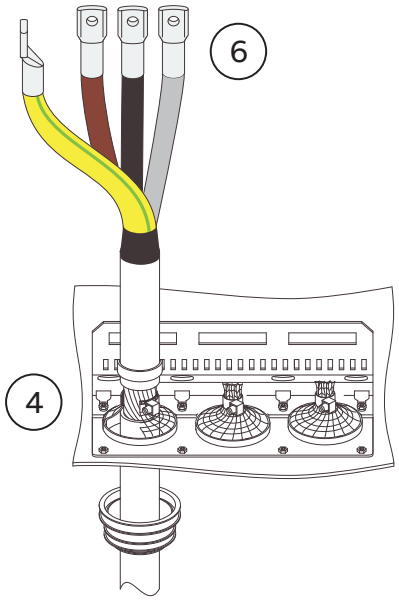
- The cable types and cable lengths are the same.
- If you use parallel cables, the number of parallel cables is identical in each incoming cubicle.

1. Stop the drive and do the steps in section Electrical safety precautions (page 192) before you start the work.
2. Open the door of the incoming cubicle and remove the shrouding.
3. Make sure that you have the necessary main circuit components and charging circuit components mechanically installed in the cabinet. Refer to the applicable information in this manual and the documentation by the system integrator or panel builder.
4. Ground the module (if not made yet). If the grounding via the module fixing screws is not good enough, connect a separate cable between the module grounding point and the cabinet PE busbar. The grounding point is marked on the module.

   **Note:** If the cabinet frame is painted (such as with Rittal VX25 enclosures), it is important to make sure that a 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 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 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).
5. Make the interconnections of the components in the main circuit and in the charging circuits. For the filter component wirings, refer to sections Connecting the LCL filter (page 200) or Connecting the CL filter (page 205).
6. Lead the input power cables into the cabinet. 360° grounding of the cable shield at the entry is recommended to suppress interference.

7. Twist the input power cable shields to bundles and connect to cabinet PE (ground) busbar. Connect the separate ground conductors/cables to cabinet PE (ground) busbar.
8. Connect the phase conductors to the input power cable busbars. See the tightening torques in technical data.




Note that this figure is an example of a cable entry that the cabinet installer has to acquire and install in the cabinet.

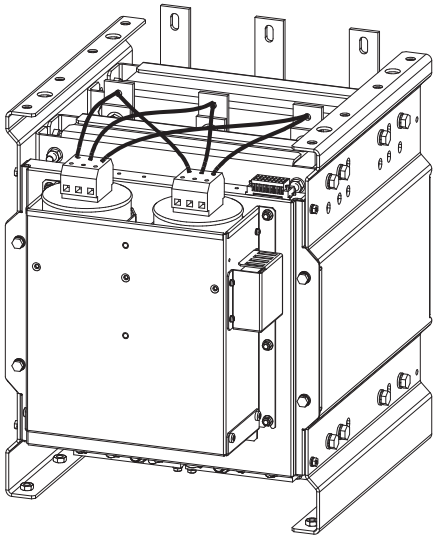
## Connecting the LCL filter

**NOTICE** Do not disable the overheating protection with parameter settings. The filter may be damaged permanently or cause a fire.

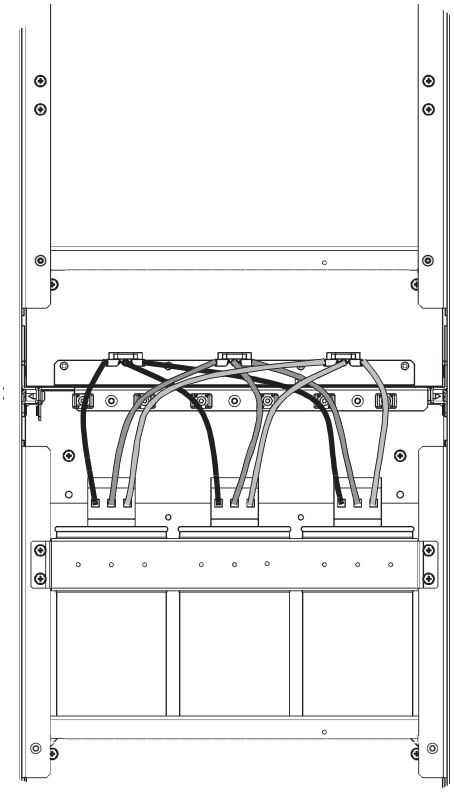
**⚠WARNING** Use the filter only with an IGBT supply module of an appropriate frame size.

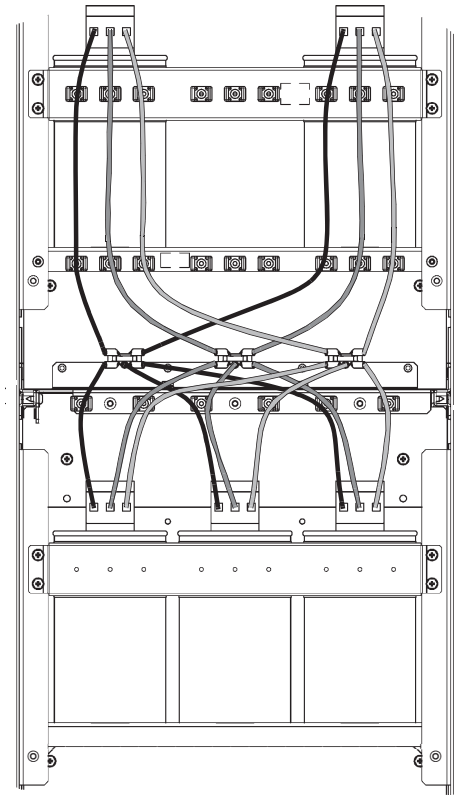
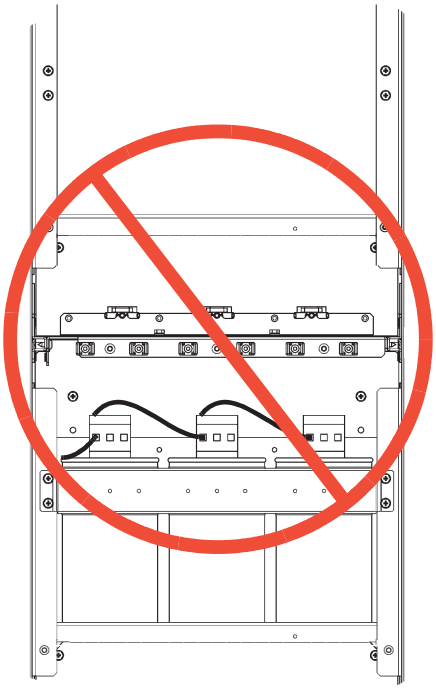
Cable every capacitor to every phase busbar. Do not wire capacitors to each other. For the cable routing, refer to the examples that follow. For the terminal designations, refer to the applicable circuit diagrams in chapter Example circuit diagrams.

Cabling example for BLCL-14LC-5 and BLCL-13LC-7

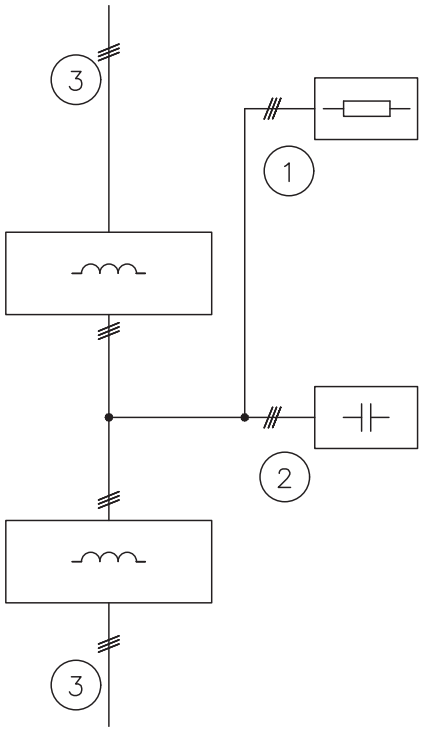


Cabling example for BLCL-15LC-7



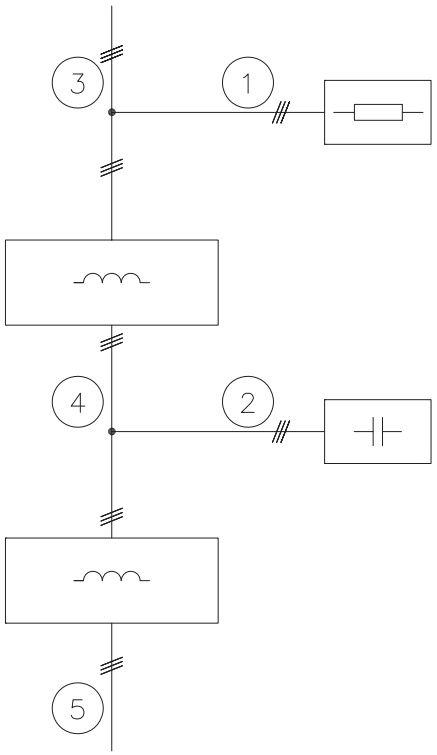
| Cabling example for BLCL-24LC-7 |
| --- |
|  |
| Example of not allowed cabling |
|  |

## Cabling specification (frame 1×R7i with LCL filter)




| | |
|---|---|
| 1 | Resistor cabling: copper 2.5 mm² / 14 AWG<br>Reinforced insulation<br>3 pcs of cables per resistor<br>Cable lug bolt size: M5 (resistor) |
| 2 | Capacitor cabling: copper 16 mm² / 6 AWG<br>Reinforced insulation<br>3 pcs of cables per capacitor<br>Cable lug bolt size: M8 (LCL filter choke busbars) |
| 3 | Grid-side and converter-side busbars: ABB accessories kits |

## Cabling specification (frame R8i and R7i multiples with LCL filter)

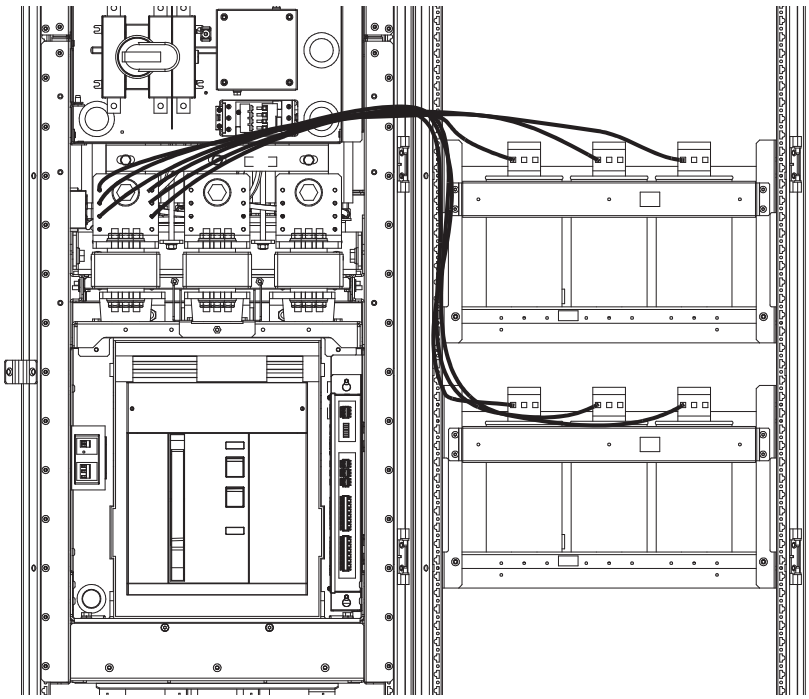



| | |
|---|---|
| 1 | Resistor cabling: copper 2.5 mm² / 14 AWG<br>Reinforced insulation<br>3 pcs of cables per resistor<br>Cable lug bolt size: M5 (resistor), M6 or M5 (LCL filter choke busbars (see page 342) or LCL fuse busbars (see page 341)) |
| 2 | Capacitor cabling: copper 16 mm² / 6 AWG<br>Reinforced insulation<br>3 pcs of cables per capacitor<br>Cable lug bolt size: M6 (LCL filter choke busbars (see page 342)) |
| 3 | Grid-side busbars: ABB accessories kits |
| 4 | Busbars between chokes: ABB accessories kits |
| 5 | Converter-side busbars: ABB accessories kits |

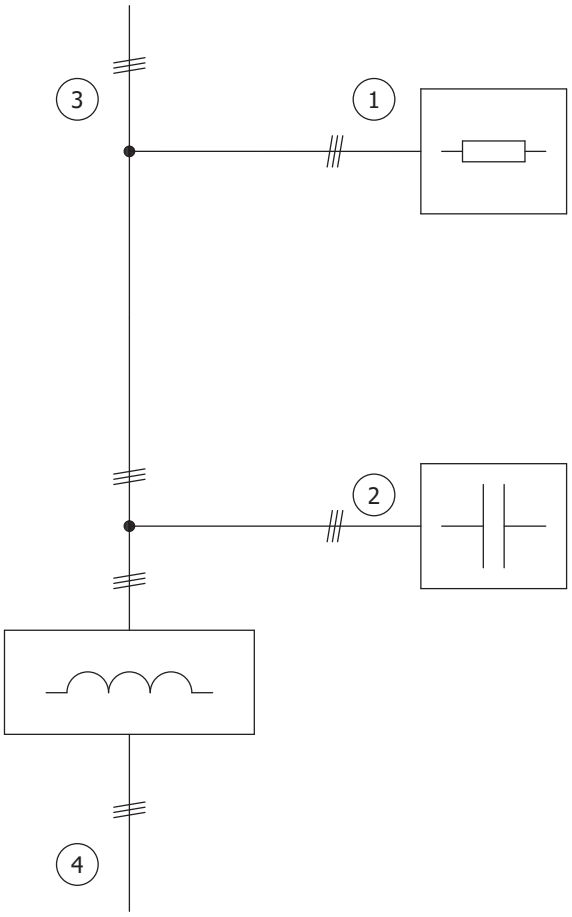
# Connecting the CL filter

Cable every capacitor to every phase busbar. Do not wire capacitors to each other. For the cable routing, refer to the examples that follow. For the terminal designations, refer to the applicable circuit diagrams in chapter Example circuit diagrams.

Cabling example for CL filter - Cabling of **phase L1** is shown as an example



### Cabling specification (frame R8i with CL filter)




| | |
|---|---|
| 1 | Filter resistor cabling: copper 2.5 mm² / 14 AWG<br>Reinforced insulation<br>3 pcs of cables per resistor<br>Cable lug bolt size: M5 (resistor) |
| 2 | Filter capacitor cabling: copper 16 mm² / 6 AWG<br>Reinforced insulation<br>3 pcs of cables per capacitor<br>Cable lug bolt size: M6 (CL choke busbars) |
| 3 | Grid-side busbars: ABB accessories kits |
| 4 | Converter-side busbars: ABB accessories kits |

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

Refer to the example circuit diagrams, or the diagrams prepared by the system integrator or panel builder.

# Connecting the control cables

## Connection diagram

Refer to the circuit diagrams by the system integrator or panel builder. For the default connections by ABB, refer to the example circuit diagrams and the default control connection diagram by ABB.

## Connection procedure

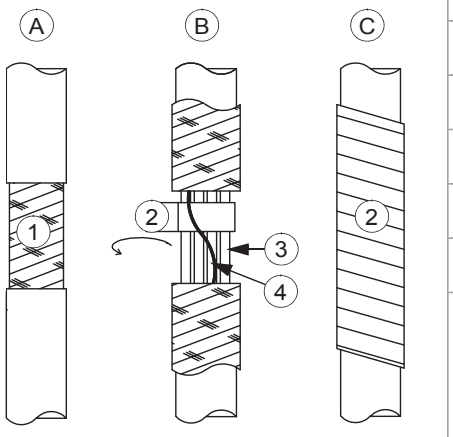
**Note:** The instructions below are based on an example cabinet construction. They are not applicable to all possible solutions but only clarify the principles.

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

For the default control connections, refer to the default control connections diagram of the applicable control unit.

**⚠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, commissioning, or maintenance work.

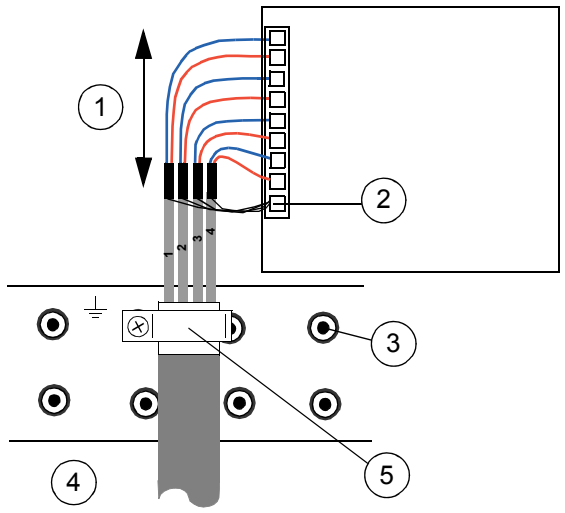
1. Stop the drive and do the steps in Electrical safety precautions (page 192) before you start the work.
2. Remove shrouding to access the cable entries and trunking inside the cubicle.
3. Run the control cables into the cubicle. If possible, arrange for a 360° grounding of the cable shield at the cable entry.
   If the outer surface of the shield is non-conductive, turn the shield inside out as shown below and wrap copper foil around the cable to keep the shielding continuous. Do not cut the grounding wire (if present).




| | |
|---|---|
| A | Stripped cable |
| B | Conductive surface of the shield exposed |
| C | Stripped part covered with copper foil |
| 1 | Cable shield |
| 2 | Copper foil |
| 3 | Shielded twisted pair |
| 4 | Grounding wire |

4. Run the cables to the control unit (or other connection point). Use the existing trunking wherever possible.
5. Cut the cables to suitable length.

6. Strip the cable ends and conductors. When connecting to the drive I/O, also remove the shield along with the outer sheathing, and use electrical tape or shrink tubing to contain the strands. Elsewhere, twist the outer shield strands into a bundle, crimp a lug onto it and connect it to the nearest chassis grounding point.




| | |
|---|---|
| 1 | Keep as short as possible |
| 2 | SHIELD* |
| 3 | If no dedicated “shield” connector is provided, ground the inner cable shields to the chassis. |
| 4 | At the other end of the cable, leave the shield unconnected, or connect it to ground via a capacitor with a value of a few nanofarads. |
| 5 | Where grounding clamps are not available, twist the shield strands into a bundle, crimp a lug terminal onto it and fasten the lug to the chassis. Secure the cable into place with eg. cable ties. |

7. Connect the conductors to appropriate terminals.
8. Install any shrouds removed earlier.

### Connectors X50…X59 and fiber optic connectors in the supply module

Connectors X50…X59 and fiber optic connectors are described in chapter Operation principle and hardware description.

## Connecting the temperature monitoring circuit of the cabinet

Protect the filter and the other components in the cabinet against overtemperature as follows:

1. Wire the cabinet temperature monitoring circuit: Connect the thermistors of the filter choke(s) and the temperature sensitive switches in the cabinet to series and to digital input XDI:1 on the control unit. For the terminal designations, refer to the applicable circuit diagrams in chapter Example circuit diagrams.
2. Later at the start-up phase, make sure that the Cabinet temperature monitoring function (131.33) is active in the control program, and it monitors digital input DI1. (This is the case as default.)

# Installing option modules

## Installing an I/O extension, fieldbus adapter or pulse encoder option module

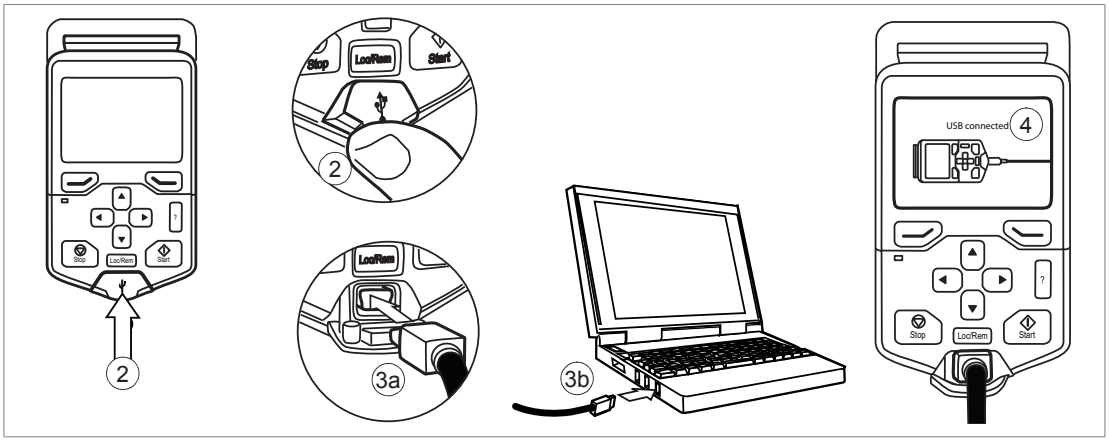
Refer to the option module manual. For installation onto the UCU-22, UCU-23 or UCU-24 control unit, refer to UCU-22, -23 and -24 control units hardware manual (3AXD50000817726 [English]). For installation onto the BCU-02, BCU-12 or BCU-22 control unit, refer to BCU-02, -12 and -22 control units Hardware manual (3AUA0000113605 [English]).

# Connecting a PC

**NOTICE** Do not connect a PC directly to the control panel connector of the control unit. It can cause damage.

To connect a control panel to a PC (with, for example, Drive Composer PC tool):

1. Put the control panel into the panel holder or platform.
2. Remove the USB connector cover on the front of the control panel.
3. Connect a 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 shows when the connection is active.
5. Refer to the documentation of the PC tool for setup instructions.




Alternatively, you can connect an Ethernet cable (for example, Cat 5e) to the Ethernet port behind the control panel. Make sure that the control panel is on a platform or a DIN rail.

# Installing and using CIO-01 I/O module

See CIO-01 I/O module and distributed I/O bus user's manual (3AXD50000126880 [English]).

7

# Control unit (UCU-22, -23 and -24)

## Contents of this chapter

This chapter

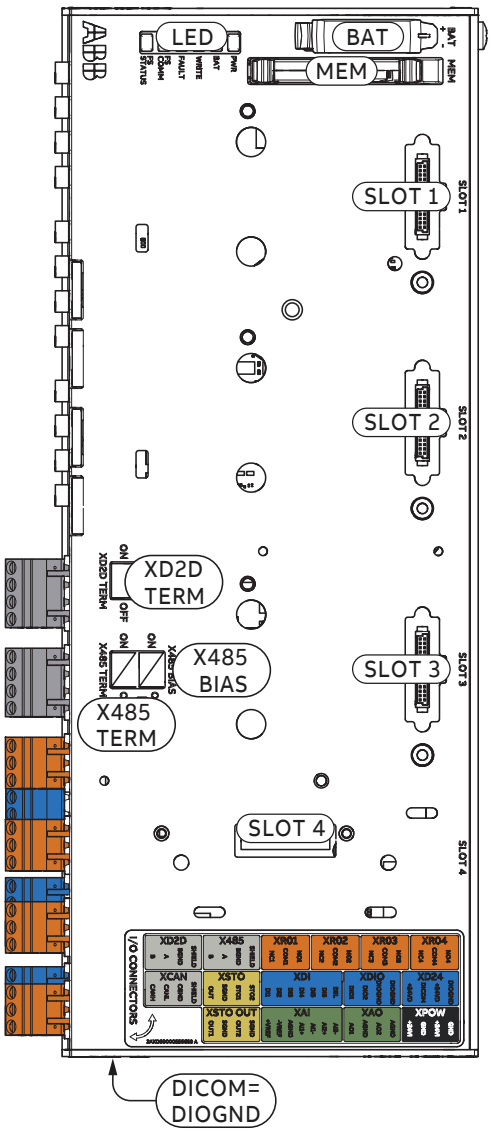
- gives information on the connections of the control unit, and
- has the specifications of the inputs and outputs of the control unit.

## General

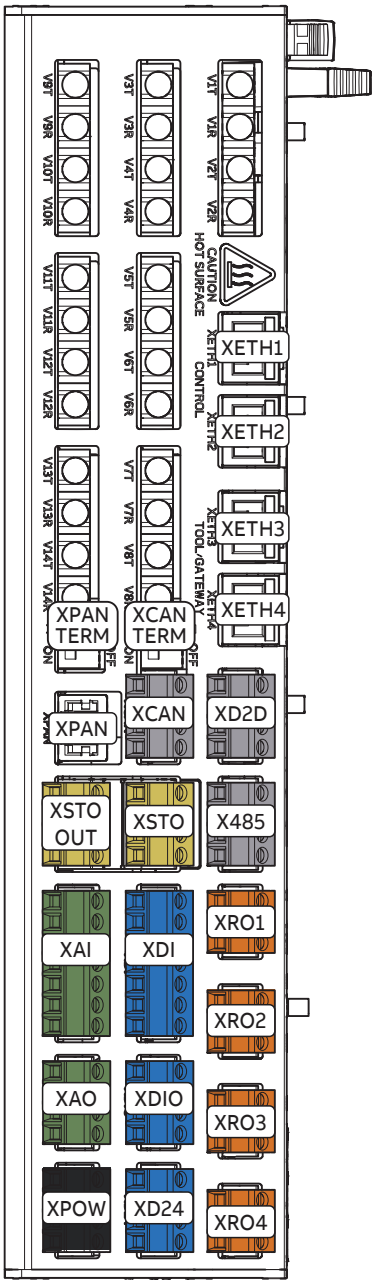
The UCU-22...24 control units are used for controlling power modules (drive, inverter, supply, converter, etc) via fiber optic links. UCU-22 has two, UCU-23 has eight and UCU-24 has 14 power module connections. The UCU-22...24 control units have integrated branching unit functionality for collecting and storing real-time data from the power modules to help fault tracing and analysis. The data is stored on a memory card which can be analyzed by ABB service personnel.

# Layout

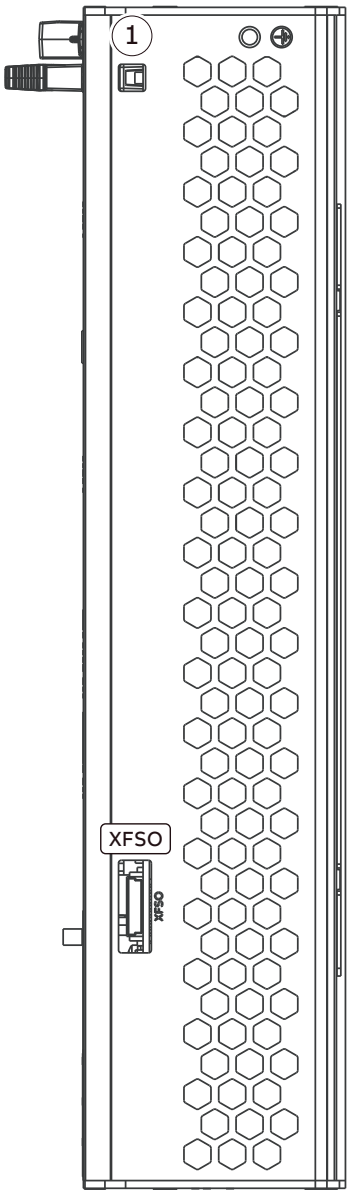
The figures below show the layout of the UCU-24 control unit.




| Item | Description |
|---|---|
| SLOT 1 | I/O extension, encoder interface or fieldbus adapter module connection. For F-type modules with USCA-02 adapter. |
| SLOT 2 | |
| SLOT 3 | |
| SLOT 4 | RDCO DDCS communication option module connection |
| MEM | UMU-01 memory unit connection. A data logger microSDHC memory card is inside the memory unit. |
| BAT | Holder for real-time clock battery (BR2032) |
| XD2D TERM | Termination switches for drive-to-drive link (XD2D) |
| X485 TERM | RS-485 link termination switch |
| X485 BIAS | RS-485 link bias switch. |
| DICOM= DIOGND | Ground selection. Determines whether DICOM is separated from DIOGND (ie. the common reference for the digital inputs floats). Refer to the ground isolation diagram. |
| PWR LED | When the PWR LED is on, the voltage supply is sufficient. |
| BAT LED | When the BAT LED is on, the real-time clock battery voltage is higher than 2.5 V. If the LED is off when the control unit is energized, the battery must be replaced. |
| WRITE LED | When the WRITE LED is on, writing to the microSDHC memory card is in progress. Do not remove the microSDHC memory card. |
| FAULT LED | If the FAULT LED is on, the control program has generated a fault. Refer to the firmware manual. |
| FS COMM LED | Reserved |
| FS STATUS LED | Reserved |




| Item | Description |
|---|---|
| XAI | Analog input |
| XAO | Analog output |
| XCAN | Not in use |
| XCAN TERM | CAN bus termination switch |
| XDI | Digital input |
| XDIO | Digital input/output |
| XD2D | Drive-to-drive link or Modbus/RTU |
| XD24 | +24 V output (for digital input) |
| XETH1 | Ethernet ports for fieldbus, internal switch |
| XETH2 | |
| XETH3 | Ethernet ports for tool communication, internal switch |
| XETH4 | |
| XPAN | Control panel connection |
| XPAN TERM | Panel bus termination switch |
| XPOW | External power input |
| XRO1 | Relay output RO1 |
| XRO2 | Relay output RO2 |
| XRO3 | Relay output RO3 |
| XRO4 | Relay output RO4, reserved |
| XSTO | Safe torque off connection (input signals) |
| XSTO OUT | Safe torque off connection (to inverter modules) |
| X485 | RS-485 link |
| V1T/V1R … V14T/V14R | Fiber optic connections (VxT = transmitter, VxR = receiver)<br>UCU-22: V1T/V1R … V2T/V2R<br>UCU-23: V1T/V1R … V8T/V8R<br>UCU-24: V1T/V1R … V14T/V14R |




| Item | Description |
|---|---|
| XFSO | Optional connection for FSO safety functions module (supported only in inverter units) |
| 1 | Humidity and temperature measurements |

# Default control connection diagram of the supply control unit

This table describes the use of the default connections in the IGBT supply unit.

| Terminal | | Description | |
|---|---|---|---|
| XD2D | | Drive-to-drive link | |
| 1 | B | Not supported | |
| 2 | A | | |
| 3 | BGND | | |
| 4 | SHIELD | | |
|  | XD2D.TERM | Drive-to-drive link termination switch | |
| X485 | | RS485 connection | |
| 5 | B | Not in use by default. Can be used for CIO-01 module connection.<br>**Note:** This connection is available in UCU-22…24 control units only. | |
| 6 | A | | |
| 7 | BGND | | |
| 8 | SHIELD | | |
|  | X485 BIAS | X485 bias selection switch | |
|  | X485 TERM | X485 termination switch | |
| XCAN | | CAN bus | |
| 9 | CANH | Not supported<br>**Note:** This connection is available in UCU-22…24 control units only. | |
| 10 | CANL | | |
| 11 | CGND | | |
| 12 | SHIELD | Control cable shield | |
|  | XCAN TERM | CANopen termination switch<br>**Note:** This connection is available in UCU-22…24 control units only. | |
| XRO1 | | Relay output 1 | |
| 11 | NC1 | Norm. closed | XRO1: Charging [1] (Energized = Closes charging contactor.)<br>250 V AC / 30 V DC, 2 A |
| 12 | COM1 | Common | |
| 13 | NO1 | Norm. open | |
| XRO2 | | Relay output 2 | |
| 21 | NC2 | Norm. closed | XRO2: Fault (-1) [2]<br>250 V AC / 30 V DC, 2 A |
| 22 | COM2 | Common | |
| 23 | NO2 | Norm. open | |
| XRO3 | | Relay output 3 | |

| Terminal | | Description | |
|---|---|---|---|
| 31 | NC3 | Norm. closed | XRO3: MCB ctrl[1] (Energized = Closes main contactor/breaker.)<br>250 V AC / 30 V DC, 2 A<br>**Note:** This connection is available in UCU-22…24 control units only. |
| 32 | COM3 | Common | |
| 33 | NO3 | Norm. open | |
| XRO4 | | Relay output 4 | |
| 41 | NC4 | Norm. closed | XRO4: Not supported<br>250 V AC / 30 V DC, 2 A<br>**Note:** This connection is available in UCU-22…24 control units only. |
| 42 | COM4 | Common | |
| 43 | NO4 | Norm. open | |
| XSTO | | Safe torque off input connection | |
| 1 | OUT | XSTO: STO1 and STO2 are connected to OUT at the factory. To enable start and operation, STO1 and STO2 must be connected to OUT.<br>STO circuit is not in use in IGBT supply units. | |
| 2 | SGND | | |
| 3 | STO1 | | |
| 4 | STO2 | | |
| XSTO OUT | | Safe torque off output connection (to inverter modules) | |
| 5 | OUT1 | XSTO OUT: Not in use | |
| 6 | SGND | | |
| 7 | OUT2 | | |
| 8 | SGND | | |
| XDI | | Digital inputs | |
| 1 | DI1 | Temp fault[3] (0 = overtemperature) | |
| 2 | DI2 | Run / enable[3] (1 = run / enable) | |
| 3 | DI3 | MCB feedback[1] (0 = main contactor/breaker open) | |
| 4 | DI4 | Not in use by default. Can be used for eg, auxiliary circuit breaker fault. | |
| 5 | DI5 | Not in use by default. Can be used for eg, earth fault monitoring. | |
| 6 | DI6 | Reset[3] (0 -> = fault reset) | |
| 7 | DIIL | Not in use by default. DIIL is connected to XD24:5 at the factory.<br>**Note:** This connection is available in UCU-22…24 control units only. | |
| XDIO | | Digital input/outputs | |
| 1 | DIO1 | Not in use by default | |
| 2 | DIO2 | Not in use by default | |
| 3 | DIOGND | Digital input/output ground | |
| 4 | DIOGND | Digital input/output ground | |
| XD24 | | Auxiliary voltage output | |
| 5 | +24VD | +24 V DC 200 mA[4] | |
| 6 | DICOM | Digital input ground | |
| 7 | +24VD | +24 V DC 200 mA[4] | |
| 8 | DIOGND | Digital input/output ground | |
|  | DICOM=DIOGND | Ground selection switch. Determines whether DICOM is separated from DIOGND (ie, common reference for digital inputs floats). ON: DICOM connected to DIOGND. OFF: DICOM and DIOGND separate. | |
| XAI | | Analog inputs, reference voltage output | |

| Terminal | | Description |
|---|---|---|
| 1 | +VREF | 10 V DC, $R_L$ 1…10 kohm |
| 2 | -VREF | -10 V DC, $R_L$ 1…10 kohm |
| 3 | AGND | Ground |
| 4 | AI1+ | Not in use by default. 0(2)…10 V, $R_{in}$ > 200 kohm [5] |
| 5 | AI1- | |
| 6 | AI2+ | Not in use by default. 0(4)…20 mA, $R_{in}$ = 100 ohm [6] |
| 7 | AI2- | |
| XAO | | Analog outputs |
| 1 | AO1 | Zero (no signal indicated)[3] 0…20 mA, $R_L$ < 500 ohm |
| 2 | AGND | |
| 3 | AO2 | Zero (not signal indicated)[3] 0…20 mA, $R_L$ < 500 ohm |
| 4 | AGND | |
| XPOW | | External power input |
| 1 | +24VI | 19…32 V DC, 1.5…2.9 A (depends on the load and supply voltage)<br>External power input<br>Two supplies can be connected to the control unit for redundancy.<br>**Note:** Pins 3 and 4 are available in UCU-22…24 control units only. |
| 2 | GND | |
| 3 | +24VI | |
| 4 | GND | |
| XFSO | | Safety functions module connection. Not supported in supply unit. |
| XETH1 | | Embedded control Ethernet |
| XETH2 | | |
| XETH3 | | Embedded tool Ethernet |
| XETH4 | | |
| XPAN | | Control panel connection |
|  | XPAN TERM | Control panel connection termination switch. Used for panel bus configuration. |
| MEM | | Memory unit connection<br>**Note:** This connection is available in UCU-22…24 control units only. |

1) 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.
2) Default use of the signal in the control program. See also the delivery-specific circuit diagrams.
3) Use of the signal in the control program (fixed). See also the delivery-specific circuit diagrams.
4) Total load capacity of these outputs is 4.8 W (200 mA at 24 V) minus the power taken by DIO1 and DIO2.
5) Current [0(4)…20 mA, $R_{in}$ = 100 ohm] or voltage [0(2)…10 V, $R_{in}$ > 200 kohm]. Change of setting requires reboot of control unit.
6) Current [0(4)…20 mA, $R_{in}$ = 100 ohm] or voltage [0(2)…10 V, $R_{in}$ > 200 kohm]. Change of setting requires reboot of control unit.

# Additional information on the connections

## Power supply for the control unit (XPOW)

Connect a power supply to the control unit through terminal block XPOW. Refer to the control unit connector data for the current and voltage ratings of the power supply.

Connect an additional external power supply to the free +24 V and GND terminals of the XPOW terminal block if:

- the control unit must be kept operational during input power breaks, for example, because of continuous fieldbus communication
- immediate restart is necessary after a power break (that is, no control unit power-up delay is permitted).

## Digital interlock (DIIL)

Digital interlock input (DIIL) terminal is originally intended for interlock signals that stop the drive/unit when necessary. ABB connects this teminal to +24V DC as default at the factory.

In the ACS880 primary control program, DIIL terminal is the source for the run enable signal by default. The inverter unit or drive cannot start, or it stops when there is no DIIL signal. In other control programs (and units), the default use of the DIIL terminal varies. Refer to the firmware manual for more information.

**Note:** This input is **not** SIL or PL classified.

## Control panel connection (XPAN)

The XPAN connector is the interface for an assistant control panel or FDPI-02 diagnostics and panel interface unit. With FDPI-02, it is possible to connect one control panel to two or more control units in a chain topology, also known as a panel bus. For more information, refer to FDPI-02 diagnostics and panel interface user's manual (3AUA0000113618 [English]).

The XPAN TERM switch sets the termination for the panel bus. Must be set to ON if there is no panel bus, or if the control unit is the last one in a panel bus. On intermediate units in a panel bus, set termination to OFF (1).

## Safe torque off (XSTO, XSTO OUT)

The XSTO input only acts as a true Safe torque off input on the inverter control unit. De-energizing the STO input terminals of other control units (supply, DC/DC converter, or brake unit) stops the unit but does not constitute a SIL/PL classified safety function.

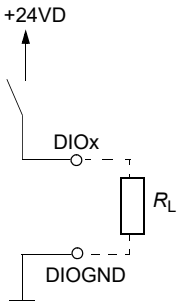
## MicroSDHC memory card slot

The control unit 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 microSDHC memory card inserted into the UMU-01 memory unit and can be analyzed by ABB service personnel.

# Connector data

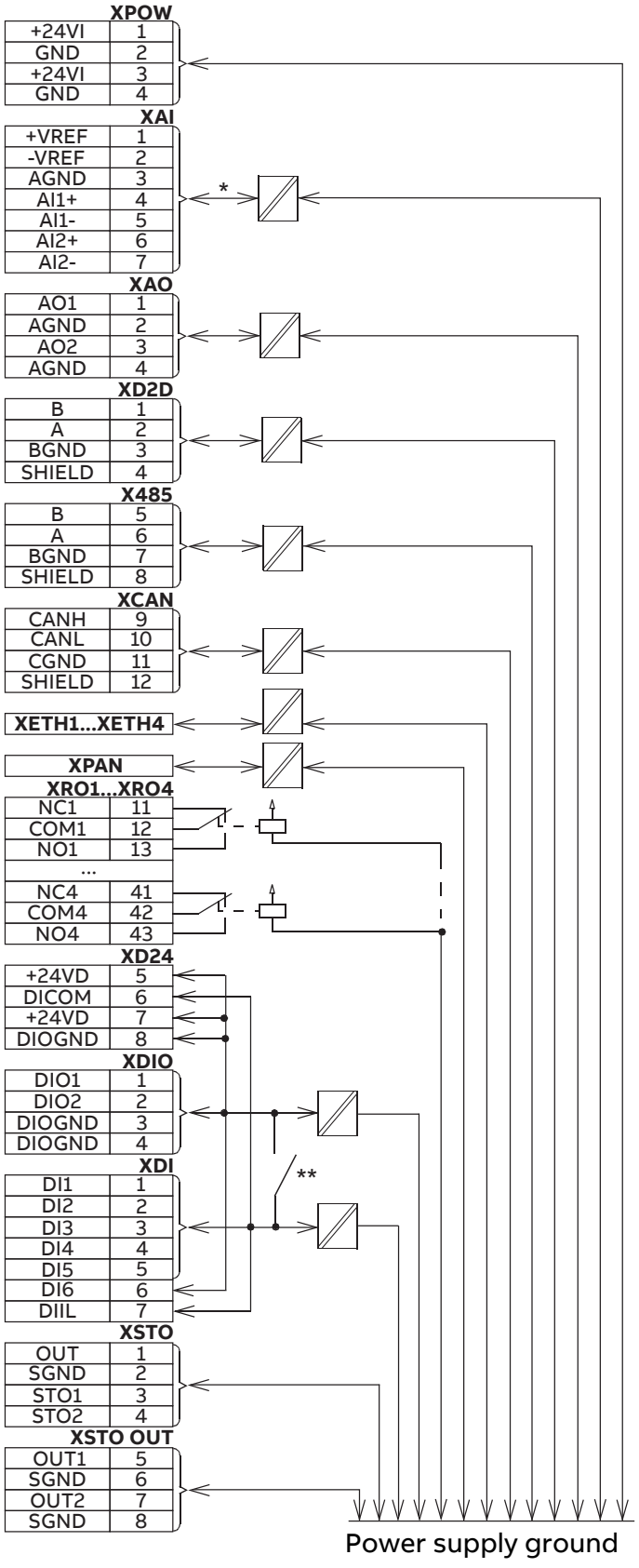
The wire size accepted by all screw terminals (for both stranded and solid wire) is 0.5 … 2.5 mm$^2$ (22…12 AWG). Connector pitch is 5 mm.

Maximum tightening torque of the screw terminals is 0.45 N·m (4 lbf·in).

| | |
|---|---|
| Power supply (XPOW) | 19…32 V DC, 1.5 … 2.9 A (depends on the load and supply voltage)<br>External power input.<br>Two supplies can be connected to the control unit for redundancy. |
| Relay outputs XRO1…XRO4 | 250 V AC / 30 V DC, 2 A<br>Protected by varistors |
| +24 V output (XD24:5 and XD24:7) | Total load capacity of these outputs is 4.8 W (200 mA / 24 V) minus the power taken by DIO1 and DIO2. |
| Digital inputs DI1…DI6 (XDI:1…XDI:6) | 24 V logic levels: “0” < 5 V, “1” > 15 V<br>$R_{in}$: 2.0 kohm<br>Input type: NPN/PNP (DI1…DI5), PNP (DI6)<br>Hardware filtering: 0.04 ms, digital filtering up to 8 ms<br>$I_{max}$: 15 mA (DI1…DI5), 5 mA (DI6) |
| Start interlock input DIIL (XDI:7) | 24 V logic levels: "0" < 5 V, "1" > 15 V<br>$R_{in}$: 2.0 kohm<br>Input type: NPN/PNP<br>Hardware filtering: 0.04 ms, digital filtering up to 8 ms |
| Digital inputs/outputs DIO1 and DIO2 (XDIO:1 and XDIO:2)<br>Input/output mode selection by parameters.<br>DIO1 can be configured as a frequency input (0…100 kHz with hardware filtering of 4 microseconds) for 24 V level square wave signal (sinusoidal or other wave form cannot be used).<br>In some control programs, DIO2 can be configured as a 24 V level square wave frequency output. Refer to the firmware manual, parameter group 11. | As inputs: 24 V logic levels: "0" < 5 V, "1" > 15 V. $R_{in}$: 2.0 kohm. Filtering: 1 ms.<br>As outputs: Total output current from +24VD is limited to 200 mA<br>  |
| Reference voltage for analog inputs +VREF and -VREF (XAI:1 and XAI:2) | 10 V ±1% and -10 V ±1%, $R_{load}$ 1…10 kohm<br>Maximum output current: 10 mA |
| Analog inputs AI1 and AI2 (XAI:4 … XAI:7).<br>Current/voltage input mode selection by parameters 12.15 AI1 unit selection and 12.25 AI2 unit selection | Current input: -20…20 mA, $R_{in}$ = 100 ohm<br>Voltage input: -10…10 V, $R_{in}$ > 200 kohm<br>Differential inputs, common mode range ±30 V<br>Sampling interval per channel: 0.25 ms<br>Hardware filtering: 0.25 ms<br>Resolution: 11 bit + sign bit<br>Inaccuracy: 1% of full scale range |
| Analog outputs AO1 and AO2 (XAO) | 0…20 mA, $R_{load}$ < 500 ohm<br>Frequency range: 0…500 Hz<br>Resolution: 11 bit + sign bit<br>Inaccuracy: 2% of full scale range |

| | |
|---|---|
| XD2D connector | Physical layer: RS-485<br>Transmission rate: 8 Mbit/s<br>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)<br>Maximum length of link: 50 m (164 ft)<br>Termination by switch |
| RS-485 connection (X485) | Physical layer: RS-485<br>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)<br>Maximum length of link: 50 m (164 ft)<br>Termination and bias by switch (X485 TERM and X485 BIAS) |
| CAN connection (XCAN) | Termination by switch (XCAN TERM)<br>This connection is not supported by the ACS880 control programs. |
| Safe torque off connection (XSTO) | Input voltage range: -3…30 V DC<br>Logic levels: "0" < 5 V, "1" > 17 V.<br>**Note:** Both circuits must be closed to enable start and operation (STO1 and STO2 must be connected to OUT). This applies to all control units (including drive, inverter, supply, brake, DC/DC converter etc. control units), but SIL/PL classified Safe torque off functionality is only achieved through the XSTO connector of the drive/inverter control unit.<br>Current consumption (continuous) per STO channel: 15 mA. The number of parallel inverter modules does not have an effect on the current consumption.<br>EMC (immunity) according to IEC 61326-3-1 and IEC 61800-5-2 |
| Safe torque off output (XSTO OUT) | To STO connector of inverter module. |
| Control panel connection (XPAN) | Connector: RJ-45<br>Cable length < 50 m (164 ft)<br>Termination by switch (XPAN TERM) |
| Control Ethernet connection with internal switch (XETH1 and XETH2) | Connector: RJ-45<br>Cable type: minimum requirement CAT5e |
| Tool Ethernet connection with internal switch (XETH3 and XETH4) | Connector: RJ-45<br>Cable type: minimum requirement CAT5e |
| microSDHC memory card slot (microSDHC CARD) | Memory card type: microSDHC (minimum of class 4 speed grade)<br>Supported memory size: 4 GB…32 GB |
| Battery | Real-time clock battery type: BR2032 |
| 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 isolation diagram




*The maximum common mode voltage between each AI input and AGND is ±30 V.

****Ground selector (DICOM=DIOGND) settings**

| |
|---|
| DICOM=DIOGND: ON<br>All digital inputs share a common ground (DICOM connected to DIOGND). This is the default setting. |
| DICOM=DIOGND: OFF<br>Ground of digital inputs DI1…DI5 and DIIL (DICOM) is isolated from DIO signal ground (DIOGND). Isolation voltage 50 V. |

# Other information

Refer to UCU-22, UCU-23 and UCU-24 control units hardware manual (3AXD50000817726 [English]).

8

# Control unit (BCU)

## Contents of this chapter

This chapter

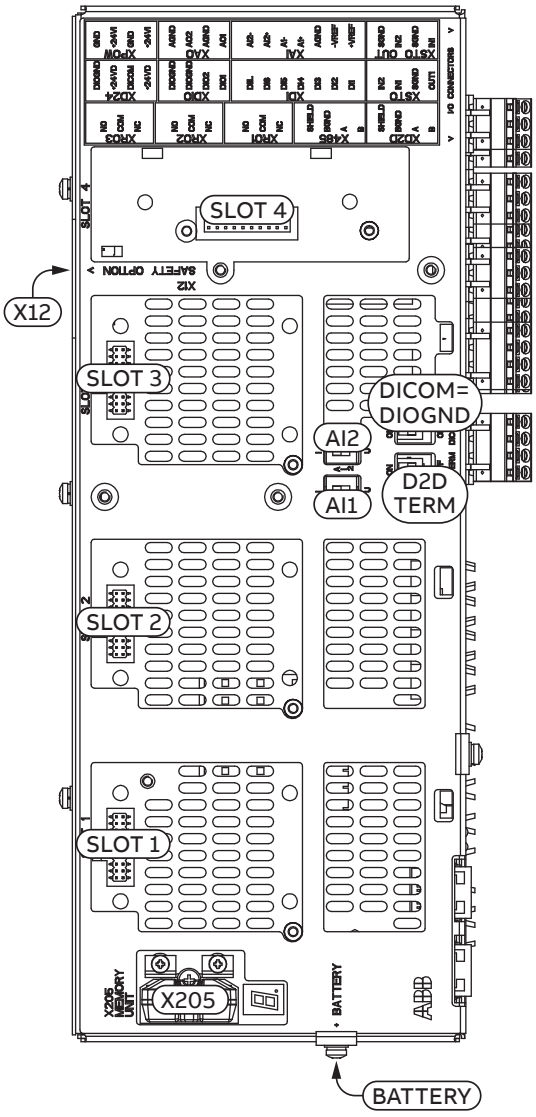
- gives information on the connections of the control unit, and
- has the specifications of the inputs and outputs of the control unit.

## General

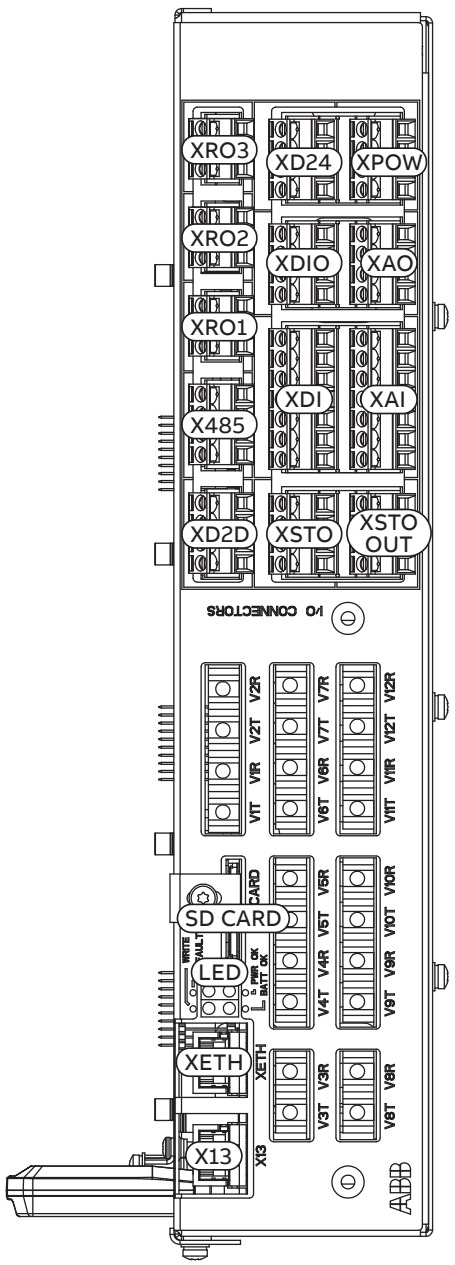
The BCU control units are used for controlling power modules (drive, inverter, supply, converter, etc) via fiber optic links. BCU-02 has two, BCU-12 has seven, and BCU-22 has 12 power module connections. The BCU control units have integrated branching unit functionality for collecting and storing real-time data from the power modules to help fault tracing and analysis. The data is stored on a memory card which can be analyzed by ABB service personnel.

# Layout

The figures below show an example layout of the BCU control unit.




| Item | Description |
|---|---|
| SLOT 1 | I/O extension, encoder interface or fieldbus adapter module connection. (This is the only location for an FDPI-02 diagnostics and panel interface module.) |
| SLOT 2 | I/O extension, encoder interface or fieldbus adapter module connection |
| SLOT 3 | I/O extension, encoder interface, fieldbus adapter or FSO safety functions module connection |
| SLOT 4 | RDCO DDCS communication option module connection |
| X12 | Optional connection for FSO safety functions module (supported only in inverter units) |
| 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 (ie. the common reference for the digital inputs floats). Refer to the ground isolation diagram. |
| **7-segment display**<br>Multicharacter indications are displayed as repeated sequences of characters. | |
| o | (“U” is indicated briefly before “o”.)<br>Control program running |
| U | Control program startup in progress |
| L | (Flashing) Firmware cannot be started. Memory unit is missing or corrupted. |
| 1 | Firmware download from PC to control unit in progress |
| 2 | At power-up, the display can 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. |




| Item | Description |
|---|---|
| XAI | Analog input |
| XAO | Analog output |
| XDI | Digital input |
| XDIO | Digital input/output |
| XD2D | Drive-to-drive link or Modbus/RTU |
| XD24 | +24 V output (for digital input) |
| XETH | Ethernet port (not in use) |
| XPOW | External power input |
| XRO1 | Relay output RO1 |
| XRO2 | Relay output RO2 |
| XRO3 | Relay output RO3 |
| XSTO | Safe torque off connection (input signals) |
| XSTO OUT | Safe torque off connection (to inverter modules) |
| X13 | Control panel connection (PC connection through control panel) |
| X485 | Not in use by default |
| V1T/V1R … V12T/V12R | Fiber optic connections (VxT = transmitter, VxR = receiver)<br>BCU-02: V1T/V1R … V2T/V2R<br>BCU-12: V1T/V1R … V7T/V7R<br>BCU-22: V1T/V1R … V12T/V12R |
| SD CARD | Data logger memory card |
| BATT OK LED | When the BATT OK LED is on, the real-time clock battery voltage is higher than 2.8 V. If the LED is off when the control unit is energized, the battery must be replaced. |
| PWR OK LED | When the PWR OK LED is on, the voltage supply is sufficient. |
| FAULT LED | If the FAULT LED is on, the control program has generated a fault. Refer to the firmware manual. |
| WRITE LED | When the WRITE LED is on, writing to the memory card is in progress. Do not remove the memory card. |

# Default control connection diagram of the supply control unit

This table describes the use of default connections in the IGBT supply unit.

| Terminal | | Description | |
|---|---|---|---|
| XD2D | | Drive-to-drive link | |
| 1 | B | Not supported | |
| 2 | A | | |
| 3 | BGND | | |
| 4 | Shield | | |
| ON OFF | D2D.TERM | Drive-to-drive link termination switch | |
| X485 | | RS485 connection | |
| 5 | B | Not in use by default. Can be used for CIO-01 module connection. | |
| 6 | A | | |
| 7 | BGND | | |
| 8 | Shield | | |
| XRO1, XRO2, XRO3 | | Relay outputs | |
| 11 | NC | Norm. closed | XRO1: Charging[1] (Energized = Closes charging contactor.) 250 V AC / 30 V DC, 2 A |
| 12 | COM | Common | |
| 13 | NO | Norm. open | |
| 21 | NC | Norm. closed | XRO2: Fault (-1)[2] (Energized = Indicates no fault.) 250 V AC / 30 V DC, 2 A |
| 22 | COM | Common | |
| 23 | NO | Norm. open | |
| 31 | NC | Norm. closed | XRO3: MCB ctrl[1] (Energized = Closes main contactor/breaker.) 250 V AC / 30 V DC, 2 A |
| 32 | COM | Common | |
| 33 | NO | Norm. open | |
| XSTO | | Safe torque off input connection | |
| 1 | OUT | XSTO: IN1 and IN2 are connected to OUT at the factory. To enable start and operation, IN1 and IN2 must be connected to OUT. | |
| 2 | SGND | | |
| 3 | IN1 | | |
| 4 | IN2 | | |
| XSTO OUT | | Safe torque off output connection (to inverter modules) | |
| 5 | IN1 | XSTO OUT: Not in use | |
| 6 | SGND | | |
| 7 | IN2 | | |
| 8 | SGND | | |
| XDI | | Digital inputs | |
| 1 | DI1 | Temp fault[2] (0 = overtemperature) | |
| 2 | DI2 | Run / enable[2] (1 = run / enable) | |
| 3 | DI3 | MCB feedback[1] (0 = main contactor/breaker open) | |
| 4 | DI4 | Not in use by default. Can be used for eg, auxiliary circuit breaker fault. | |
| 5 | DI5 | Not in use by default. Can be used for eg, earth fault monitoring. | |

| Terminal | | Description |
|---|---|---|
| 6 | DI6 | Reset[2] (0 -> 1 = fault reset) |
| 7 | DIIL | Not in use by default. DIIL is connected to XD24:5 at the factory. |
| XDIO | | Digital input/outputs |
| 1 | DIO1 | Not in use by default |
| 2 | DIO2 | Not in use by default |
| 3 | DIOGND | Digital input/output ground |
| 4 | DIOGND | Digital input/output ground |
| XD24 | | Auxiliary voltage output |
| 1 | +24VD | +24 V DC 200 mA[3] |
| 2 | DICOM | Digital input ground |
| 3 | +24VD | +24 V DC 200 mA[3] |
| 4 | DIOGND | Digital input/output ground |
| ON OFF | DICOM=DIOGND | Ground selection switch. Determines whether DICOM is separated from DIOGND (ie, common reference for digital inputs floats). ON: DICOM connected to DIOGND. OFF: DICOM and DIOGND separate. |
| XAI | | Analog inputs, reference voltage output |
| 1 | +VREF | 10 V DC, $R_L$ 1…10 kohm |
| 2 | -VREF | -10 V DC, $R_L$ 1…10 kohm |
| 3 | AGND | Ground |
| 4 | AI1+ | Not in use by default. 0(2)…10 V, $R_{in}$ > 200 kohm[4] |
| 5 | AI1- | |
| 6 | AI2+ | Not in use by default. 0(4)…20 mA, $R_{in}$ = 100 ohm[5] |
| 7 | AI2- | |
| – ⊃ | AI1 | AI1 current/voltage selection switch |
| – ⊃ | AI2 | AI2 current/voltage selection switch |
| XAO | | Analog outputs |
| 1 | AO1 | Zero (no signal indicated)[2] 0…20 mA, $R_L$ < 500 ohm |
| 2 | AGND | |
| 3 | AO2 | Zero (not signal indicated)[2] 0…20 mA, $R_L$ < 500 ohm |
| 4 | AGND | |
| XPOW | | External power input |
| 1 | +24VI | 24 V DC (±10%), 2 A<br>External power input<br>Two supplies can be connected to the control unit for redundancy. |
| 2 | GND | |
| 3 | +24VI | |
| 4 | GND | |
| X12 | | Safety functions module connection. Not in use by default in IGBT supply unit. |
| X13 | | Control panel connection |
| X205 | | Memory unit connection |

1) 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.

2) Use of the signal in the control program (fixed). See also the delivery-specific circuit diagrams.
3) Total load capacity of these outputs is 4.8 W (200 mA at 24 V) minus the power taken by DIO1 and DIO2.
4) Current [0(4)…20 mA, $R_{in}$ = 100 ohm] or voltage [0(2)…10 V, $R_{in}$ > 200 kohm] input selected by switch AI1. Change of setting requires reboot of control unit.
5) Current [0(4)…20 mA, $R_{in}$ = 100 ohm] or voltage [0(2)…10 V, $R_{in}$ > 200 kohm] input selected by switch AI2. Change of setting requires reboot of control unit.

# Additional information on the connections

## Power supply for the control unit (XPOW)

Connect a power supply to the control unit through terminal block XPOW. Refer to the control unit connector data for the current and voltage ratings of the power supply.

Connect an additional external power supply to the free +24 V and GND terminals of the XPOW terminal block if:

- the control unit must be kept operational during input power breaks, for example, because of continuous fieldbus communication
- immediate restart is necessary after a power break (that is, no control unit power-up delay is permitted).

## Digital interlock (DIIL)

Digital interlock input (DIIL) terminal is originally intended for interlock signals that stop the drive/unit when necessary. ABB connects this teminal to +24V DC as default at the factory.

In the ACS880 primary control program, DIIL terminal is the source for the run enable signal by default. The inverter unit or drive cannot start, or it stops when there is no DIIL signal. In other control programs (and units), the default use of the DIIL terminal varies. Refer to the firmware manual for more information.

**Note:** This input is **not** SIL or PL classified.

## Safe torque off (XSTO, XSTO OUT)

The XSTO input only acts as a true Safe torque off input on the inverter control unit. De-energizing the STO input terminals of other control units (supply, DC/DC converter, or brake unit) stops the unit but does not constitute a SIL/PL classified safety function.

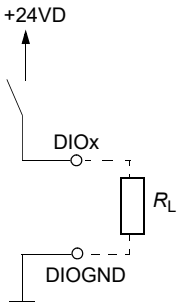
## SDHC memory card slot

The control unit 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

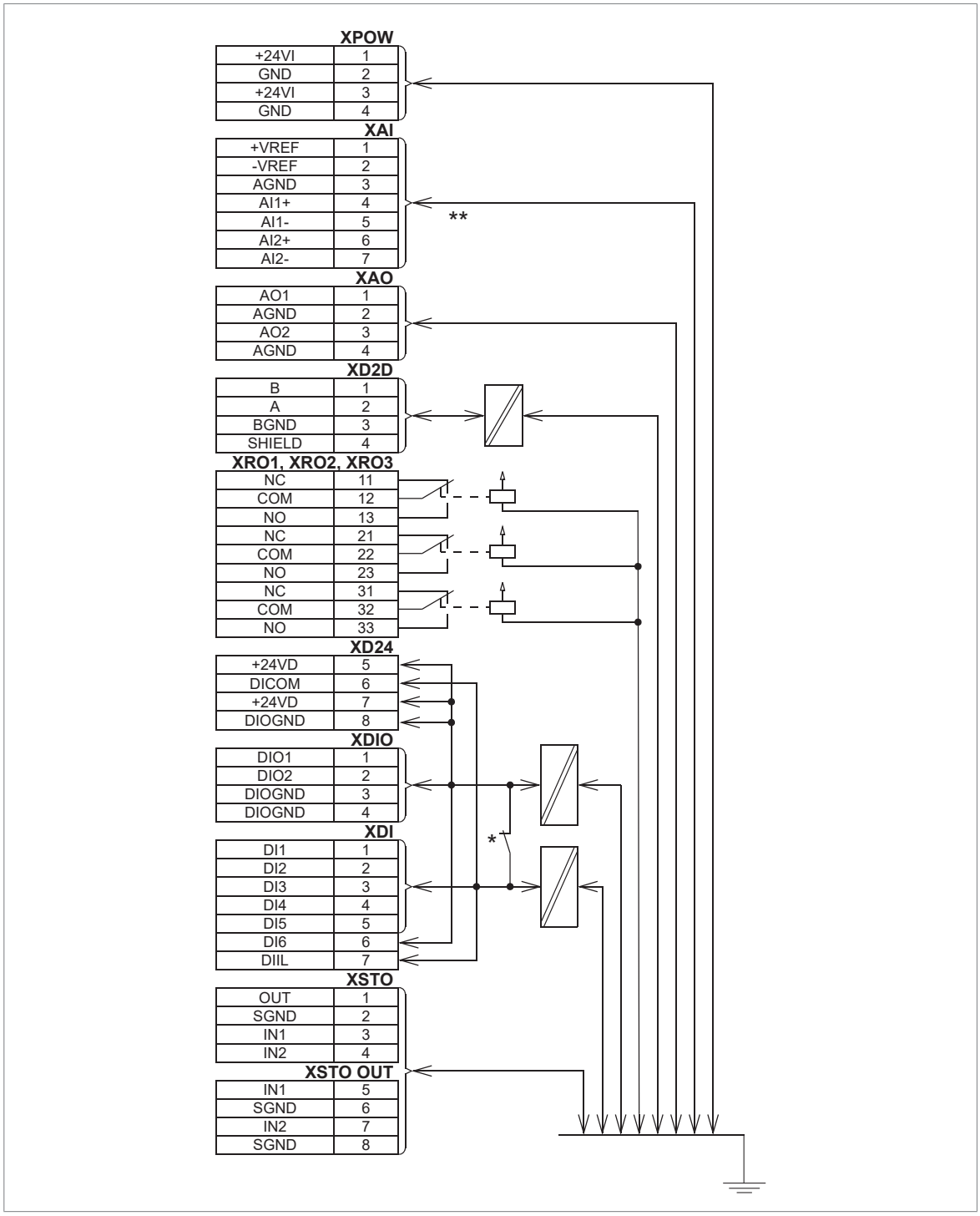
The wire size accepted by all screw terminals (for both stranded and solid wire) is 0.5 … 2.5 $mm^2$ (22…12 AWG). Connector pitch is 5 mm.

The maximum tightening torque for screw terminals is 0.45 N·m (4 lbf·in).

| | |
|---|---|
| Power supply (XPOW) | 24 V DC (±10%), 2 A<br>External power input.<br>Two supplies can be connected to the BCU control unit for redundancy. |
| Relay outputs RO1…RO3 (XRO1…XRO3) | 250 V AC / 30 V DC, 2 A<br>Protected by varistors |
| +24 V output (XD24:5 and XD24:7) | Total load capacity of these outputs is 4.8 W (200 mA / 24 V) minus the power taken by DIO1 and DIO2. |
| Digital inputs DI1…DI6 (XDI:1…XDI:6) | 24 V logic levels: “0” < 5 V, “1” > 15 V<br>$R_{in}$: 2.0 kohm (DI1…DI5)<br>Input type: NPN/PNP (DI1…DI5), PNP (DI6)<br>Hardware filtering: 0.04 ms, digital filtering up to 8 ms<br>$I_{max}$: 15 mA (DI1…DI5), 5 mA (DI6) |
| Start interlock input DIIL (XDI:7) | 24 V logic levels: "0" < 5 V, "1" > 15 V<br>$R_{in}$: 2.0 kohm<br>Input type: NPN/PNP<br>Hardware filtering: 0.04 ms, digital filtering up to 8 ms |
| Digital inputs/outputs DIO1 and DIO2 (XDIO:1 and XDIO:2)<br>Input/output mode selection by parameters.<br>DIO1 can be configured as a frequency input (0…16 kHz with hardware filtering of 4 microseconds) for 24 V level square wave signal (sinusoidal or other wave form cannot be used).<br>In some control programs, DIO2 can be configured as a 24 V level square wave frequency output. Refer to the firmware manual, parameter group 11. | As inputs: 24 V logic levels: "0" < 5 V, "1" > 15 V. $R_{in}$: 2.0 kohm. Filtering: 1 ms.<br>As outputs: Total output current from +24VD is limited to 200 mA<br>  |
| Reference voltage for analog inputs +VREF and -VREF (XAI:1 and XAI:2) | 10 V ±1% and -10 V ±1%, $R_{load}$ 1…10 kohm<br>Maximum output current: 10 mA |
| Analog inputs AI1 and AI2 (XAI:4 … XAI:7).<br>Current/voltage input mode selection by switches | Current input: -20…20 mA, $R_{in}$ = 100 ohm<br>Voltage input: -10…10 V, $R_{in}$ > 200 kohm<br>Differential inputs, common mode range ±30 V<br>Sampling interval per channel: 0.25 ms<br>Hardware filtering: 0.25 ms<br>Resolution: 11 bit + sign bit<br>Inaccuracy: 1% of full scale range |
| Analog outputs AO1 and AO2 (XAO) | 0…20 mA, $R_{load}$ < 500 ohm<br>Frequency range: 0…500 Hz<br>Resolution: 11 bit + sign bit<br>Inaccuracy: 2% of full scale range |

| | |
|---|---|
| XD2D connector | Physical layer: RS-485<br>Transmission rate: 8 Mbit/s<br>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)<br>Maximum length of link: 50 m (164 ft)<br>Termination by switch |
| RS-485 connection (X485) | Physical layer: RS-485<br>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)<br>Maximum length of link: 50 m (164 ft) |
| Safe torque off connection (XSTO) | Input voltage range: -3…30 V DC<br>Logic levels: "0" < 5 V, "1" > 17 V.<br>**Note:** Both circuits must be closed to enable start and operation (IN1 and IN2 must be connected to OUT). This applies to all control units (including drive, inverter, supply, brake, DC/DC converter etc. control units), but SIL/PL classified Safe torque off functionality is only achieved through the XSTO connector of the drive/inverter control unit.<br>Current consumption: 66 mA (continuous) per STO channel per drive/inverter module<br>EMC (immunity) according to IEC 61326-3-1 and IEC 61800-5-2 |
| Safe torque off output (XSTO OUT) | To STO connector of inverter module. |
| Control panel connection (X13) | Connector: RJ-45<br>Cable length < 100 m (328 ft) |
| Ethernet connection (XETH) | Connector: RJ-45<br>This connection is not supported by the firmware |
| SDHC memory card slot (SD CARD) | Memory card type: SDHC<br>Maximum memory size: 4 GB |
| Battery | Real-time clock battery type: BR2032 |
| 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. | |

## BCU ground isolation diagram




### *Ground selector (DICOM=DIOGND) settings

| |
|---|
| DICOM=DIOGND: ON<br>All digital inputs share a common ground (DICOM connected to DIOGND). This is the default setting. |
| DICOM=DIOGND: OFF<br>Ground of digital inputs DI1…DI5 and DIIL (DICOM) is isolated from DIO signal ground (DIOGND). Isolation voltage 50 V. |

**The maximum common mode voltage between each AI input and AGND is +30 V

## Other information

Refer to BCU-02, BCU-12 and BCU-22 control units hardware manual (3AUA0000113605 [English]).

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# Installation checklist

## Contents of this chapter

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

## Checklist



**⚠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 electrical installation, commissioning or maintenance work.



**⚠WARNING** Do the steps in Electrical safety precautions (page 192) before you start the work.

Examine the mechanical and electrical installation of the drive before start-up. Do the tasks in the checklist together with a second person.

| **Make sure that ...** | ☑ |
|---|---|
| The ambient operating conditions meet the drive ambient conditions specification and enclosure rating (IP code). | ☐ |
| The supply voltage matches the nominal input voltage of the drive. Refer to the type designation label. | ☐ |
| The insulation resistance of the input power cable, motor cable, and motor is measured according to local regulations and the manuals of the drive. | ☐ |
| The drive cabinet is attached to the floor, and if it is necessary due to vibration etc., also by its top to the wall or roof. | ☐ |
| The drive module is fastened properly to the enclosure. | ☐ |

| **Make sure that ...** | ☑ |
|---|---|
| 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). Refer to the electrical installation instructions in the supply unit manual. | ☐ |
| 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 (un-painted) and the connections are tight, or separate grounding conductors are installed. | ☐ |
| The main circuit connections inside the drive cabinet correspond to the circuit diagrams. | ☐ |
| The control unit is connected. Refer to the circuit diagrams. | ☐ |
| Appropriate AC fuses and main disconnecting device are installed. | ☐ |
| 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.<br>Grounding is measured according to the regulations. | ☐ |
| 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 is connected to the correct terminal, and the terminal is tightened to the correct torque. Proper grounding is measured according to the regulations. | ☐ |
| If the drive is equipped with a DC/DC-converter unit: The energy storage cable is connected to the correct terminals of the DC/DC-converter and energy storage, and the terminals are tightened to the correct torque. | ☐ |
| If the drive is equipped with a DC/DC-converter unit: The energy storage is equipped with fuses for protecting the energy storage cable in a cable short-circuit situation. | ☐ |
| If the drive is equipped with a DC/DC-converter unit: The energy storage is equipped with a disconnecting device. | ☐ |
| The input power cable is connected to the correct terminals, the phase order is correct, and the terminals are tightened to the correct torque. | ☐ |
| There is an adequately sized protective earth (ground) conductor between the motor and the drive. The conductor is connected to the correct terminal, and the terminal is tightened to the correct torque.<br>Grounding has also been measured according to the regulations. | ☐ |
| The motor cable is connected to the correct terminals, the phase order is correct, and the terminals are tightened to the correct torque. | ☐ |
| The motor cable is routed away from other cables. | ☐ |
| No power factor compensation capacitors are connected to the motor cable. | ☐ |
| 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. Grounding has also been measured according to the regulations. | ☐ |
| If an external brake resistor is connected to the drive: The brake resistor cable is connected to the correct terminals, and the terminals are tightened to the correct torque. | ☐ |
| If an external brake resistor is connected to the drive: The brake resistor cable is routed away from other cables. | ☐ |
| The control cables are connected to the correct terminals, and the terminals are tightened to the correct torque. | ☐ |
| 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. | ☐ |
| There are no tools, foreign objects, or dust from drilling inside the drive. | ☐ |
| The terminal box cover of the motor is in place. Cabinet shrouds are in place and doors are closed. | ☐ |

| **Make sure that ...** | ☑ |
|---|---|
| The motor and the driven equipment are ready for power-up. | ☐ |
| The coolant connections between cubicles (if any) and to the cooling circuit are tight. | ☐ |
| If the drive is equipped with a cooling unit: Make sure that the mechanical and electrical installation of the cooling unit is completed. Refer to the cooling unit documentation. | ☐ |

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# 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 ACS880-204LC IGBT supply modules. The default device designations (if any) are given in square brackets, for example, main circuit breaker [Q1]. 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:** These instructions do not cover all possible cabinet constructions. Always refer to the delivery-specific circuit diagrams when proceeding with the start-up.



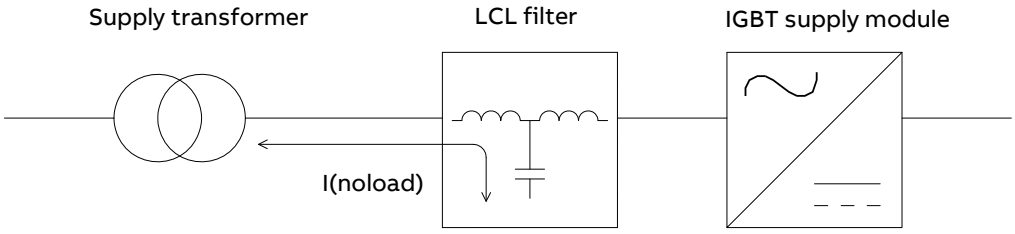
**⚠WARNING** Only qualified electricians are allowed to do the work described in this chapter. Read the complete safety instructions and repeat the steps described in section Electrical safety precautions (page 192). The complete safety instructions are given in ACS880 liquid-cooled multidrives cabinets and modules safety instructions (3AXD50000048633 [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 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 | ☑ |
|---|---|
| **Safety** | |
| **WARNING** Obey the safety instructions during the start-up procedure. See ACS880 liquid-cooled multidrives cabinets and modules safety instructions (3AXD50000048633 [English]). Only qualified electricians are allowed to start-up the drive. | ☐ |
| **Checks/Settings with no voltage connected** | |
| **WARNING** Ensure 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.<br>The no-load current of the IGBT supply unit must be taken into account if pretests (eg, 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 (or CL 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.<br>In case a generator is used as a supply, generator nominal power $P_{gen} > 0.3 \times P_{N,ISU}$.<br>  | ☐ |
| Check that the main disconnecting device (main switch-disconnector or main circuit breaker) [Q1] is in open position, locked out and tagged out. | ☐ |
| Check the mechanical and electrical installation. See chapter Installation checklist. | ☐ |
| Check the settings of breakers/switches in the auxiliary circuits. | ☐ |
| Energize the auxiliary power circuits, i.e. close the auxiliary circuit switch disconnector and circuit breaker ([Q20], [F20]). | ☐ |
| Drives with a charging switch [Q3] and a DC switch-disconnector for lineup charging [Q40]: Open the charging circuit switch [Q3] and the DC switch-disconnector for lineup charging [Q40]. Open DC switch and unit charging switches [Q11] and [Q10] only when the DC-side is de-energized. | ☐ |
| Adjust the main breaker fault current limits to appropriate values. Refer to breaker manufacturer's instructions. | ☐ |
| 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). | ☐ |
| 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 is either circuit is open. Refer to the wiring diagrams delivered with the drive and chapters Control unit (UCU-22, -23 and -24) and Control unit (BCU). | ☐ |

| Tasks | ☑ |
|---|---|
| Check that both channels of STO IN (X52) connector on IGBT supply module are connected to 24 V DC. The supply unit cannot start is either circuit is open. | ☐ |
| **Starting and checking the cooling system** | |
| Fill up and bleed the internal cooling circuit. Start the cooling unit up. See section Filling up and bleeding the internal cooling circuit (page 554). | ☐ |
| Check the cooling system for leaks. Make sure that cooling circuit joints at the shipping split joining cubicles are tight and that all drain valves have been closed. | ☐ |
| Make sure that the coolant can flow freely in all cubicles. Make sure that the drive system cools down. | ☐ |
| **Powering up the auxiliary circuit of the drive** | |
| Make sure that it is safe to connect voltage. Ensure that:<br>• nobody is working on the unit or circuits that have been wired from outside into the cabinets<br>• covers of the motor terminal boxes are on. | ☐ |
| Close the circuit breakers supplying the auxiliary circuits. | ☐ |
| Close the cabinet doors. | ☐ |
| Close the main breaker of the supply transformer. | ☐ |
| Switch the auxiliary voltage switch on. | ☐ |
| **Setting up the supply unit parameters** | |
| Check the correct voltage range, parameter 195.01 Supply voltage. | ☐ |
| If your supply unit consists of more than one module, set parameters 195.30 Parallel type filter and 195.31 Parallel connection rating id accordingly. 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.<br>If you need more information on the use of the control panel, see ACS-AP-I, -S, -W and ACH-AP-H, -W Assistant control panels user's manual (3AUA0000085685 [English]). | ☐ |
| IGBT supply unit with CL filter: Set parameter 120.28 MCB relay timing to value +0.10 s. | ☐ |
| To enable CIO-01 I/O module operation, set bit 15 of parameter 195.20 HW options word 1. | ☐ |
| Check that bit 7 (Low harmonic mode) of parameter 195.20 HW options word 1 is set correctly. If needed, change the setting. | ☐ |
| Switch the control panel to the remote mode (Loc/Rem key) to enable control of the supply unit with the external control signals and operating switch [S21]. | ☐ |
| **Powering up the main circuit of the drive** | |
| Units with a DC switch-disconnector [Q11]: Make sure that all DC switch-disconnectors [Q11] are closed and charging switches [Q10] are open in all IGBT supply module cubicles. See also How to close DC switch-disconnector of the supply module cubicle [Q11] if the DC link is discharged (page 240). | ☐ |
| Close the main disconnecting device (main switch-disconnector or main circuit breaker) [Q1]. | ☐ |
| Close the charging switch [Q3] and the DC switch-disconnector for lineup charging [Q40]. | ☐ |

| Tasks | ☑ |
|---|---|
| Turn the operating switch [S21] to on (1) position to activate the Run enable signal, and start the power up:<br>• The control unit closes the charging contactor [Q4] and the charging circuit charges the capacitors connected to the drive DC bus.<br>• After the DC bus voltage reaches high enough level, the control unit opens the charging contactor [Q4] and closes the main breaker [Q1].<br>The supply unit is now ready for normal operation.<br>Open the DC switch-disconnector for lineup charging [Q40]. | ☐ |
| **Validating the safety functions** | |
| Validate the operation of safety functions (for example, emergency stop).<br>**⚠WARNING** The safety functions are not safe before they are validated according to the instructions. Refer to the function-specific manual for the validation tasks.<br>Safety functions are optional. See the function-specific manual for the validation tasks. | ☐ |
| **On-load checks** | |
| Make sure that the supply unit cooling is operating properly. That is, there are no overtemperature alarms or faults. | ☐ |
| Validate the operation of safety functions (for example, emergency stop).<br>**⚠WARNING** The safety functions are not safe before they are validated according to the instructions. Safety functions are optional. Refer to the function-specific manual for the validation tasks. | ☐ |

## Stopping and de-energizing the supply unit

1. Stop the motors connected to inverter units.
2. Deactivate the Run enable signal to open the main circuit breaker [Q1], that is, turn the operating switch [S21] to off (0) position. The control program opens the main breaker [Q1] or the main contactor [Q2].

## How to close DC switch-disconnector of the supply module cubicle [Q11] if the DC link is discharged

***NOTICE*** Do not use excessive force when you try to close the DC switch-disconnector of the supply module cubicle [Q11]. If you cannot turn the handle, it means that an interlocking circuit prevents it. If you use excessive force, you will break the handle.

If the DC bus is not energized and the main DC switch-disconnector [Q11] is in OFF position, the main DC switch-disconnector [Q11] is mechanically locked to OFF position by interlock [K11]. You cannot start the normal operation of supply unit if the supply modules are not connected to the drive common DC link. On the other hand, if the common DC link is discharged, you cannot close the DC switch-disconnector of the supply module cubicle [K11]. In order to close the switch-disconnector, and start the normal operation of the supply unit, proceed as follows.

1. Make sure that the auxiliary circuit is energized, ie, the auxiliary circuit switch disconnector [Q20] and circuit breaker [F20] are closed.
2. Make sure that the main switch-disconnector [Q1] is closed, or the main breaker [Q2] is racked in, and the supply unit is also otherwise ready for the drive DC link power up.
3. Close the switch-disconnector of the lineup charging circuit [Q40] and the lineup charging switch [Q3].
4. Turn the local charging control switch [S4] to position “1”. This bypasses the normal control circuit of the charging contactor and closes it. The lineup charging circuit energizes the drive DC link in a few seconds.
5. After the DC link is charged and the voltage level is high enough:
   - Close the charging switch of the supply module cubicle [Q10].
   - After the charging ready light [P11] illuminates, close the DC switch-disconnector of the supply module cubicle [Q11] and open the charging switch [Q10].
6. Turn the local charging control switch [S4] back to normal position “0”. The charging contactor opens and disconnects it from the DC link. The drive DC link starts discharging.

The DC switch-disconnector of the supply module cubicle [Q11] is now closed, and supply modules are connected to the drive DC link. The supply unit is ready for the normal start-up and use.

With OTZT4A-137 interlock, it is possible to bypass locking manually.

**⚠WARNING** To bypass locking manually, the lineup must be de-energized.

## Charging sequence

Lineup charging: For details on charging sequence, refer to Powering up the main circuit of the drive in the start-up procedure above.

Unit charging: If the DC link is energized and the DC switch-disconnector of the supply module cubicle [Q11] is open, charge the cubicles as follows:

1. Close the charging switch of the supply module cubicle [Q10].
2. After the charging ready light [P11] illuminates, close the DC switch-disconnector of the supply module cubicle [Q11] and open the charging switch [Q10].

If the DC link is not energized, obey the instructions in section How to close DC switch-disconnector of the supply module cubicle [Q11] if the DC link is discharged (page 240).

For further details on the unit charging sequence, refer to BSFC-02C and BSFC-12C charging controllers hardware manual (3AXD50000027498 [English]).

11

# Maintenance

## Contents of this chapter

This chapter instructs how to maintain the IGBT supply module and how to interpret its fault conditions. The information is valid for ACS880-204LC IGBT supply modules and the cabinet construction examples presented in this manual.

**⚠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 ACS880 liquid-cooled multidrives cabinets and modules safety instructions (3AXD50000048633 [English]).

## Maintenance intervals

The tables show the maintenance tasks that can be done by the end user. For the ABB Service offering, contact your local ABB Service representative (new.abb.com/contact-centers).

### Description of symbols

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

## Recommended maintenance intervals after start-up

| Maintenance task/object | Years from start-up | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | ... |
| **Coolant** | | | | | | | | | | | | | | |
| Checking coolant antifreeze concentration | | P | P | P | P | P | P | P | P | P | P | P | P | |
| Coolant draining and replacement | | | | | | | R | | | | | | R | |
| **Cooling fan and fan control** | | | | | | | | | | | | | | |
| Cooling fans 230 V AC 50/60 Hz and 24 V DC | | | | | | | | | | R | | | | |
| Cooling fans 115 V AC 50/60 Hz | | | | | | | R | | | | | | R | |
| Cooling fans 24 V DC for CL filter | | | | | | | R | | | | | | R | |
| Frame R7i: Internal cooling fan for circuit boards | | | | | | | | | | R | | | | |
| CIO module for fan control (230 V AC and 24 V DC) [1] | | | | | | | | | | R | | | | |
| CIO module for fan control (115 V AC) [1] | | | | | | | I/R | | | | | | R | |
| **Aging** | | | | | | | | | | | | | | |
| UCU-22…24 control unit battery (Real-time clock) | | | | | | | | | | R | | | | |
| BCU control unit battery (Real-time clock) | | | | | | | R | | | | | | R | |
| Control panel battery | | | | | | | | | | R | | | | |
| Capacitors of CL or LCL filter | | | | | | | | | | R | | | | |
| **Connections and environment** | | | | | | | | | | | | | | |
| Quality of supply voltage | | P | P | P | P | P | P | P | P | P | P | P | P | |
| **Spare parts** | | | | | | | | | | | | | | |
| Spare parts | | I | I | I | I | I | I | I | I | I | I | I | I | I |
| DC circuit capacitor reforming (spare modules and spare capacitors) | | P | P | P | P | P | P | P | P | P | P | P | P | |
| **Inspections by user** | | | | | | | | | | | | | | |
| Checking tightness of cable and busbar terminals. Tightening if needed. | | I | I | I | I | I | I | I | I | I | I | I | I | I |
| Checking ambient conditions (dustiness, corrosion, temperature) | | I | I | I | I | I | I | I | I | I | I | I | I | I |
| Checking coolant pipe connections | | I | I | I | I | I | I | I | I | I | I | I | I | I |
| **Other** | | | | | | | | | | | | | | |
| ABB SACE main circuit breaker maintenance | | I | I | I | I | I | I | I | I | I | I | I | I | I |
| ABB contactors maintenance | | I | I | I | I | I | I | I | I | I | I | I | I | I |
| **Functional safety** | | | | | | | | | | | | | | |
| Safety function test | I<br>See the maintenance information of the safety function. | | | | | | | | | | | | | |
| Safety component expiry (Mission time, $T_M$) | 20 years | | | | | | | | | | | | | |

[1] To replace CIO module or reset fan counters, see CIO-01 I/O module and distributed I/O bus user's manual (3AXD50000126880 [English]).

**Note:**

- The maintenance and component replacement intervals are valid when the equipment operates within the specified ratings and ambient conditions. ABB recommends annual drive inspections.
- Long-term operation near the specified maximum ratings or ambient conditions may require shorter maintenance intervals for certain components. Contact 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, refer to the firmware manual.

## Cooling system

For instructions on coolant replacement and checking the cooling system, see chapter Internal cooling circuit (page 551).

## Cabinet

### Cleaning the interior of the cabinet



**⚠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 electrical installation, commissioning or maintenance work.

***NOTICE*** Use an antistatic wrist strap and a vacuum cleaner with an antistatic hose and nozzle. A normal vacuum cleaner creates static discharges which can cause damage to circuit boards.

1. Stop the drive and do the steps in Electrical safety precautions (page 192) 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.

# Cooling fans

The lifespan of the cooling fans of the drive depends on running time, ambient temperature and dust concentration. Refer to the firmware manual for the actual signal which indicates the running time of the cooling fan. Reset the running time signal after fan replacement. If the maintenance interval requires it, change the CIO-01 module. Refer also to CIO-01 I/O module and distributed I/O bus user's manual (3AXD50000126880 [English]).

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

## Frame R7i – internal module fan replacement



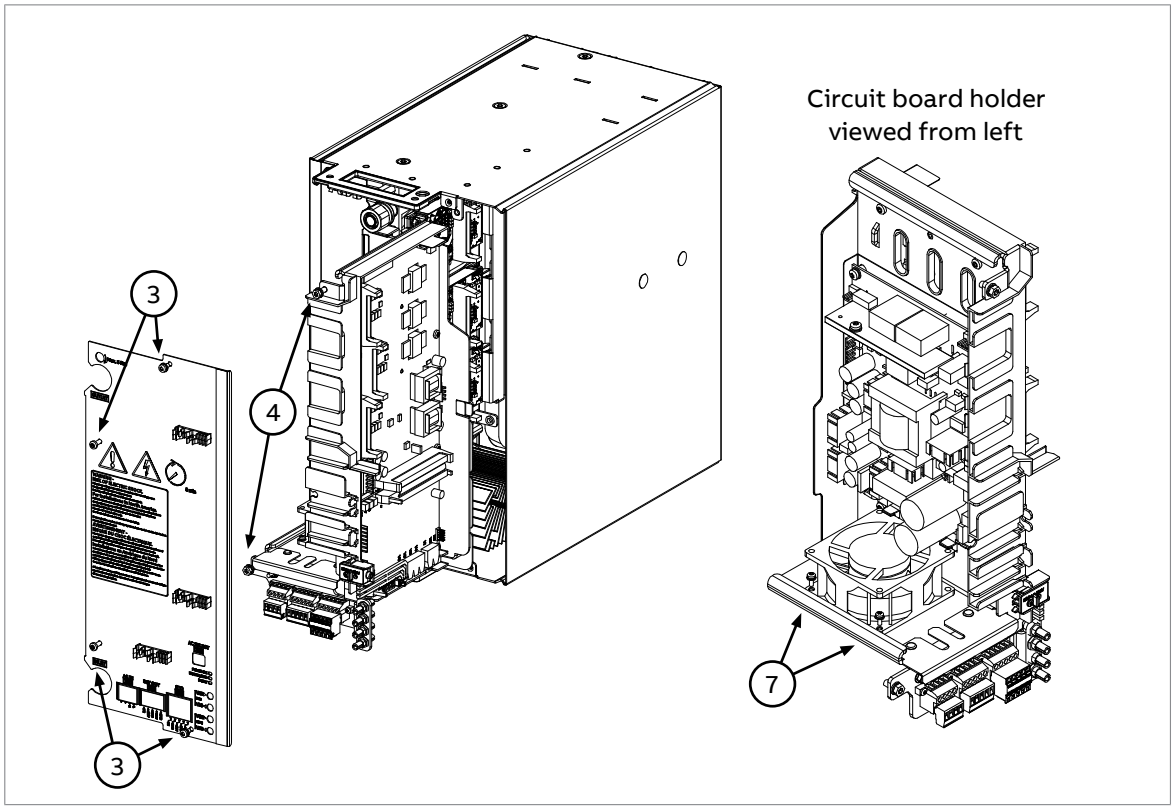
**WARNING** Obey the safety instructions of the drive. If you ignore them, injury or death, or damage to the equipment can occur. If you are not a qualified electrical professional, do not do electrical installation, commissioning or maintenance work.



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

***NOTICE*** Use an antistatic wrist strap when you handle printed circuit boards. Do not touch the boards unnecessarily. The boards are sensitive to electrostatic discharge.

1. Stop the drive and do the steps in Electrical safety precautions (page 192) before you start the work.
2. Detach and move aside the wiring in front of the module.
3. Remove the four screws that hold the faceplate of the module. Remove the faceplate.
4. Remove the two screws that attach the circuit board holder to the module frame.
5. Carefully pull the circuit board holder outward until you have access to the cooling fan at the bottom of the holder. Detach the wiring coming to the circuit boards if necessary.
6. Disconnect the wiring of the fan.
7. Remove the two screws that hold the fan. Remove the fan.
8. Install a new fan in reverse order to the above. Note that the direction of airflow is up.

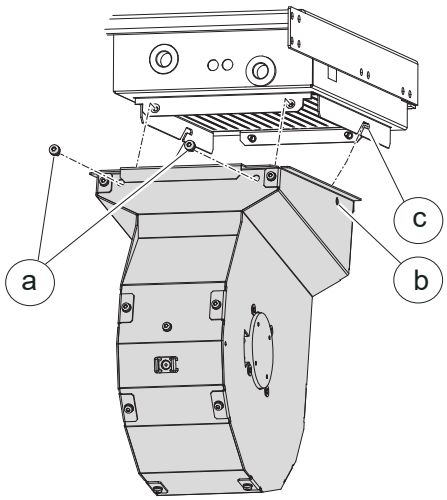

Circuit board holder
viewed from left
3
4
3
7

## Replacing the cooling fan of the IGBT supply module (frame R8i)

**⚠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 electrical installation, commissioning or maintenance work.

**⚠CAUTION** 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 Electrical safety precautions (page 192) before you start the work.
2. Open the door.
3. Remove any shrouding in front of the cooling fan .
4. Disconnect the fan wiring. .
5. Remove the two retaining screws (a).
6. Pull the fan outwards to separate it from the heat exchanger housing.
7. Install new fan in reverse order. Align the guide pins (b) at the rear of the fan cowling with the slots (c) in the module bottom guide, then install the retaining screws (a).

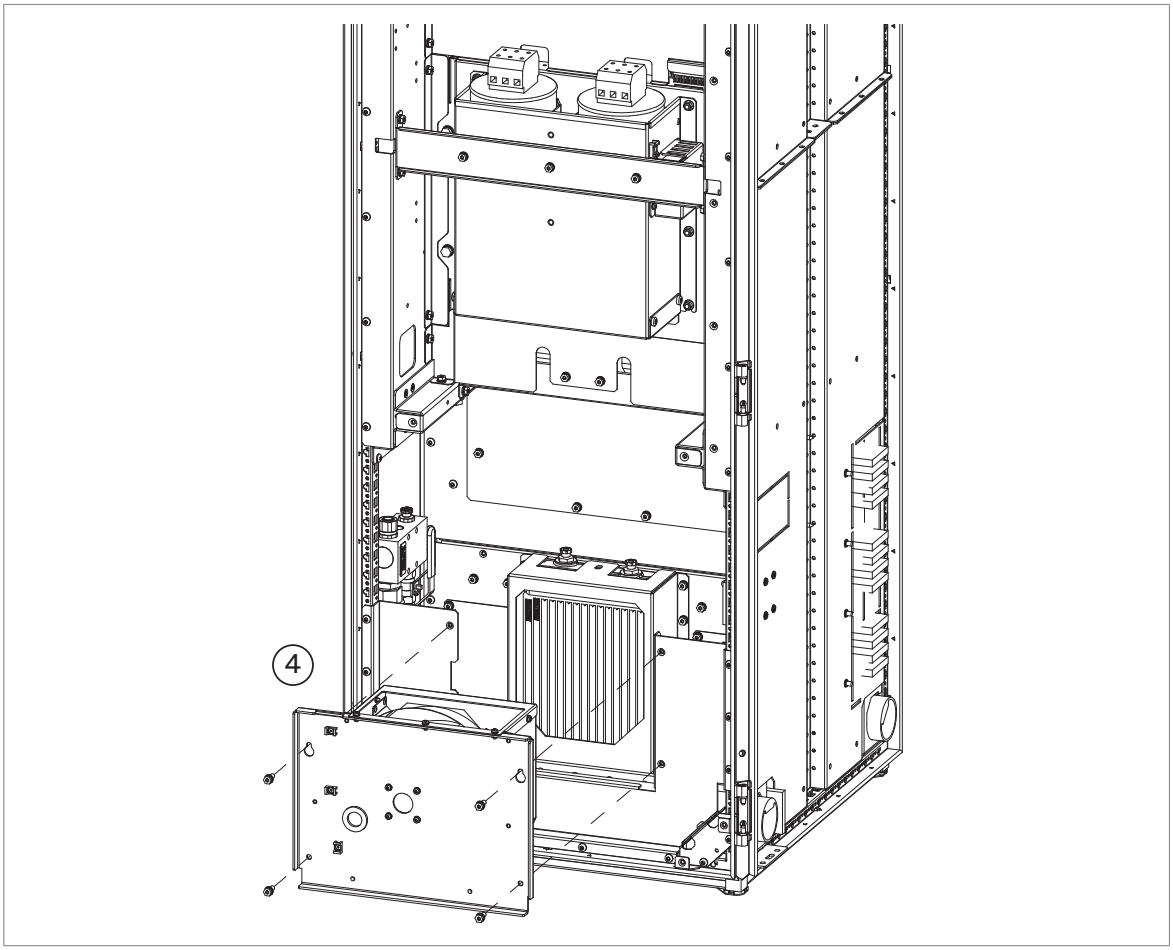


## Replacing the cabinet cooling fan (frame R7i)



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

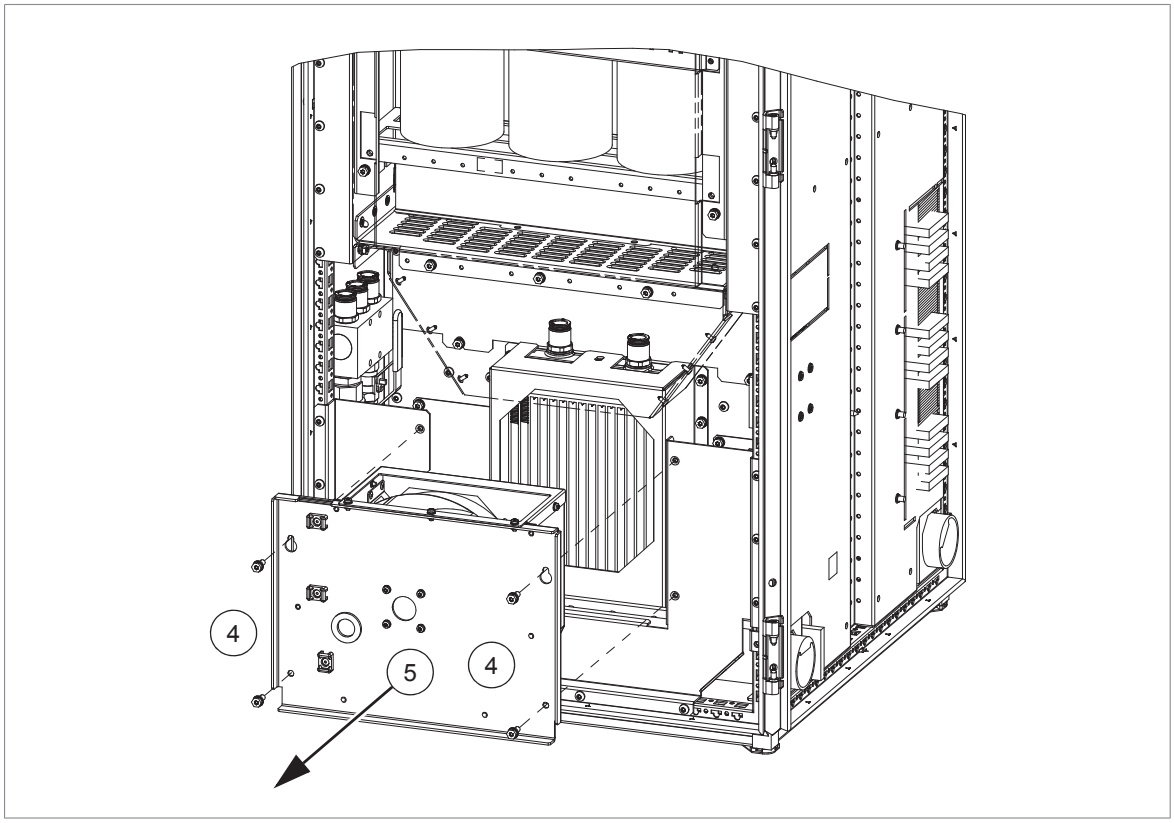
1. Repeat the steps described in section Electrical safety precautions (page 192).
2. Remove any shrouding in front of the cooling fan.
3. Remove the four fastening screws.
4. Pull the fan housing outwards.
5. Disconnect the fan wiring.
6. Install a new fan in reverse order.



## Replacing the cooling fan of the LCL filter (frame R8i)

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

1. Repeat the steps described in section Electrical safety precautions (page 192).
2. Remove any shrouding in front of the cooling fan.
3. Disconnect the fan wiring.
4. Remove the four fastening screws.
5. Pull the fan housing outwards.
6. Install a new fan in reverse order.

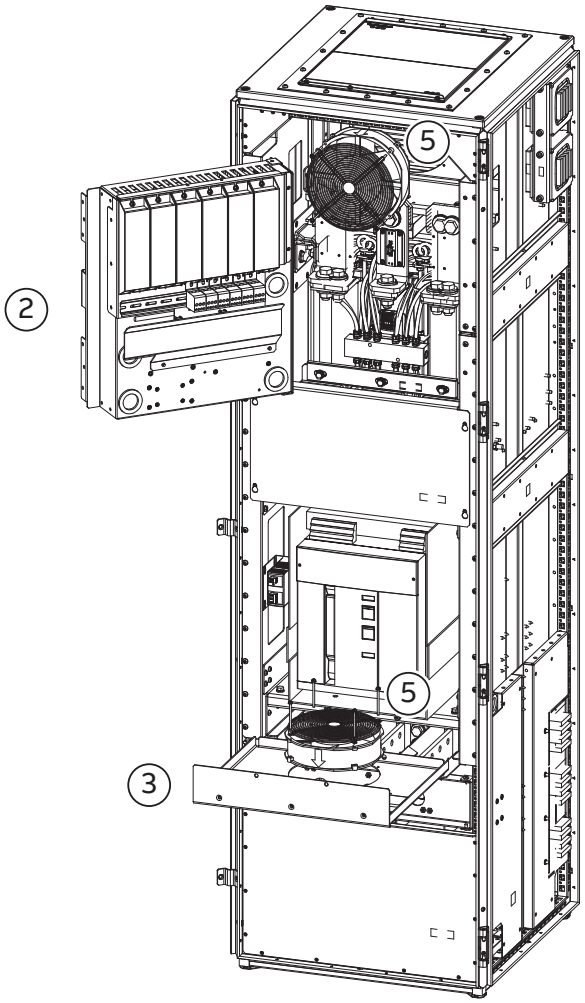


## Replacing the cooling fans of the incoming and CL filter cubicle (frame R8i)

Incoming and CL filter cubicle has two fans: one in the upper part of the cubicle and one in the lower part of the cubicle.

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

1. Repeat the steps described in section Electrical safety precautions (page 192).
2. Open the door of the incoming and CL filter cubicle. Turn the swing-out frame aside.
3. Open the bottom cooling fan shelf.
4. Disconnect the fan wiring.
5. Remove the four fastening screws per fan.
6. Pull the fan housing out.
7. Install a new fan in reverse order.



# IGBT supply module

## Replacing the IGBT supply module (frame R7i)



**⚠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 electrical installation, commissioning or maintenance work.

***NOTICE*** Make sure that the replacement module has exactly the same type code as the old module.



**⚠CAUTION** Stop the pumps and drain the coolant before you do work on the liquid cooling system. There is high-pressure hot coolant (6 bar, max. 50 °C) in the cooling circuit when it is in operation.

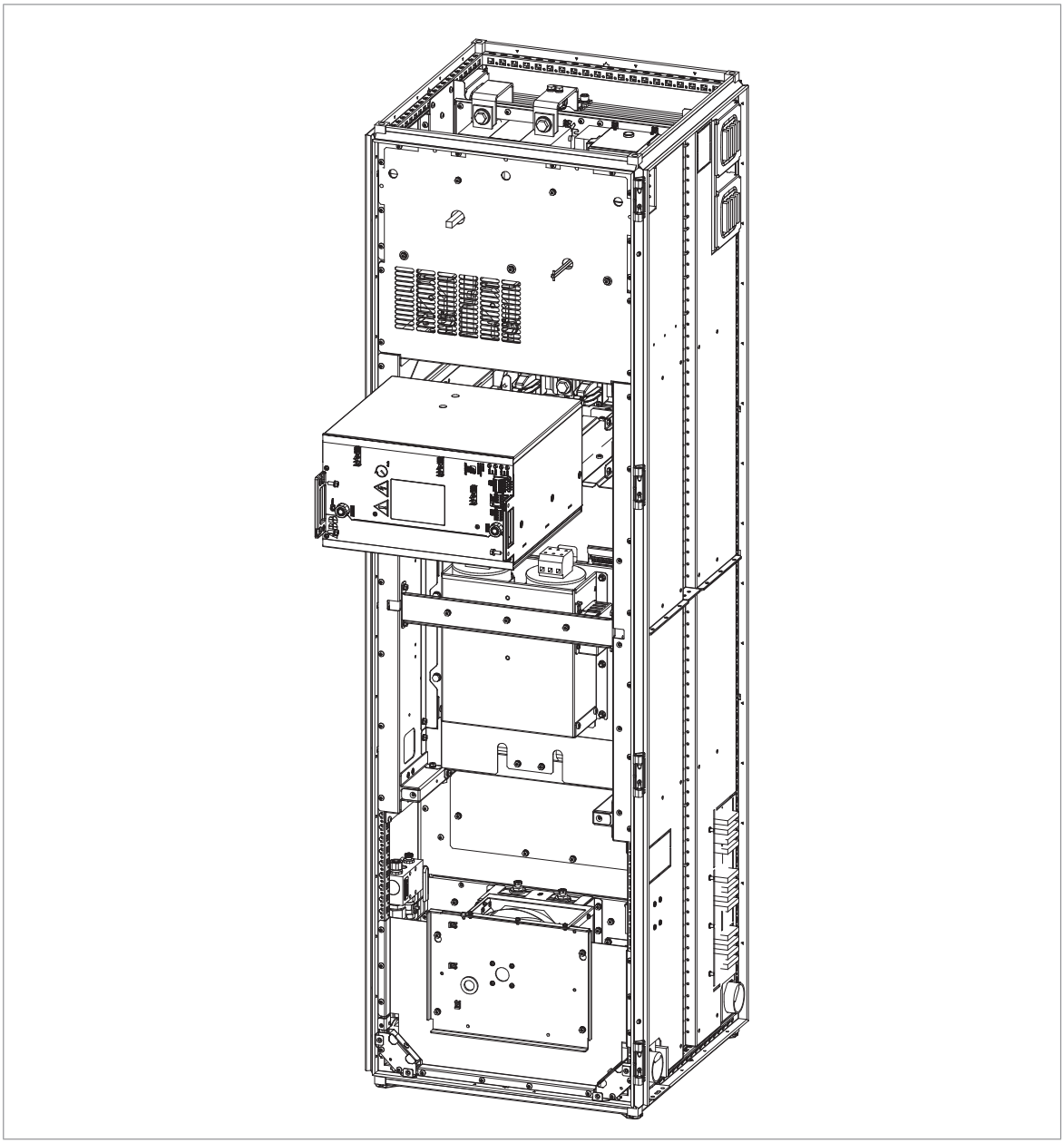


**⚠CAUTION** Use the required personal protective equipment. Wear protective gloves and long sleeves. Some parts have sharp edges.

**Note:** You can replace a module that does not have option +E205 with a module that has option +E205 (for example, if you have a spare part module with option +E205). For units with parallel-connected modules, all modules must have option +E205.

### Removing the module

1. Do the steps in section Electrical safety precautions (page 192).
2. Remove the shrouding in front of the module (if any).
3. Mark the terminal designations for each cable that is connected to the module. Disconnect the wiring from the module and move it aside. Use cable ties to keep the wiring out of the way.
4. Close the inlet valve and outlet valve (located on the right-hand side of the cubicle). Lead the drain hoses (on both sides of the cubicle) into a suitable container. Open the drain valves (on both sides of the cubicle).
5. After the module has drained, disconnect the piping from the module.
6. Pull the module carefully out onto a suitable platform. Keep the module secured to a hoist or equivalent to prevent the module from falling. For information on using the lifting device, see Converter module lifting device for drive cabinets hardware manual (3AXD50000210268 [English]).



**Reinstalling the module**

1. Push the module carefully into its bay.
2. Tighten the locking screw (6 mm hex key) at the top of the module to 5 N·m [3.6 lbf·ft] maximum.
3. Fasten the module retaining screws at the top and the bottom of the module (two screws each).
4. Reconnect the coolant pipes to the module. Tighten to 20 N·m (14.75 lbf·ft).
5. Reconnect the control wiring to the module.
6. Fill up the cooling system. For instructions, see section Filling up and bleeding the internal cooling circuit.

## Replacing the IGBT supply module (frame R8i)

Units with CL filter: Before replacing the supply module, remove the capacitors of the CL filter. Refer to section Replacing the capacitors of the CL filter (frame R8i) (page 262).



**⚠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 electrical installation, commissioning or maintenance work.



**⚠WARNING** If screws or other items fall inside the drive or module, find and remove them. Unwanted items inside the drive can cause a short-circuit or arc blast when the drive is energized.



**⚠WARNING** The module is heavy. Reserve two persons, hoist and a suitable platform for the replacement procedure. Keep the module fastened to the hoist to prevent the module from falling. For information on a lifting device available from ABB, refer to Converter module lifting device for drive cabinets hardware manual (3AXD50000210268 [English]).



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



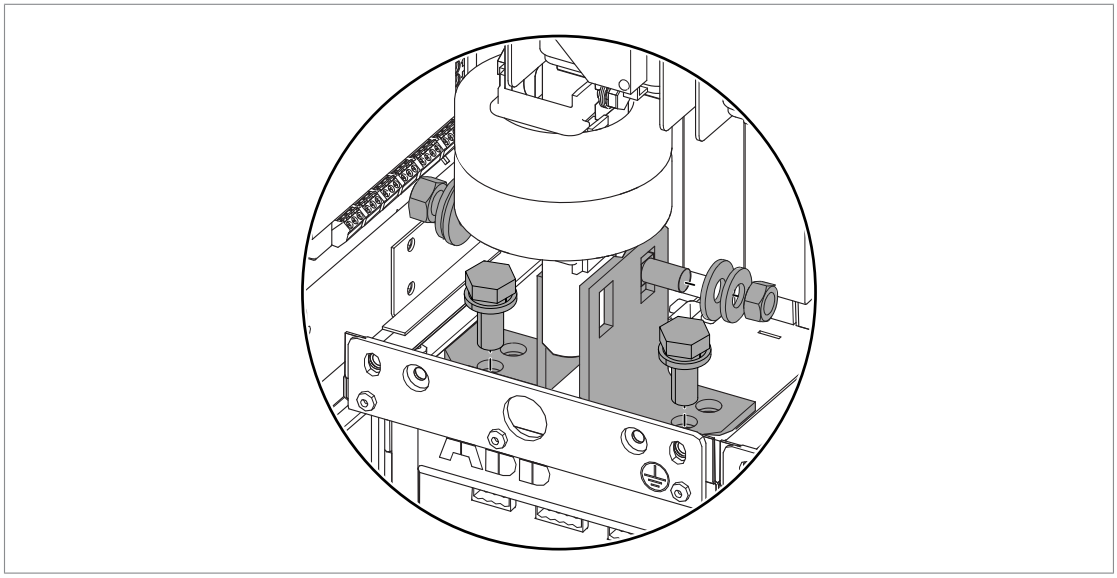
**⚠CAUTION** Stop the pumps and drain the coolant before you do work on the liquid cooling system. There is high-pressure hot coolant (6 bar, max. 50 °C) in the cooling circuit when it is in operation.

***NOTICE*** Make sure that the replacement module has exactly the same type code as the old module.

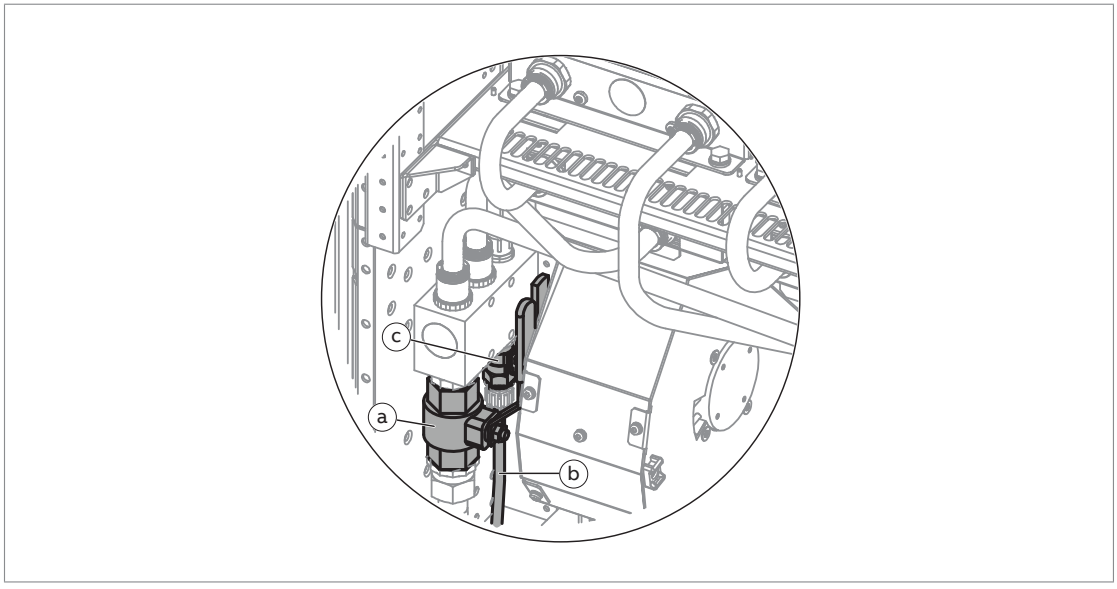
### Removing the module

1. Stop the drive and do the steps in Electrical safety precautions (page 192) before you start the work.
2. Install the converter module lifting device by ABB, or make sure that you have another winch in use. For information on a lifting device available from ABB, refer to Converter module lifting device for drive cabinets hardware manual (3AXD50000210268 [English]).
3. Remove the shrouding in front of the module.
4. Remove the fastening screws (a) of the swing-out frame and open it (b).
5. Disconnect the wires from the module and move them aside. Use cable ties to keep the wires out of the way.

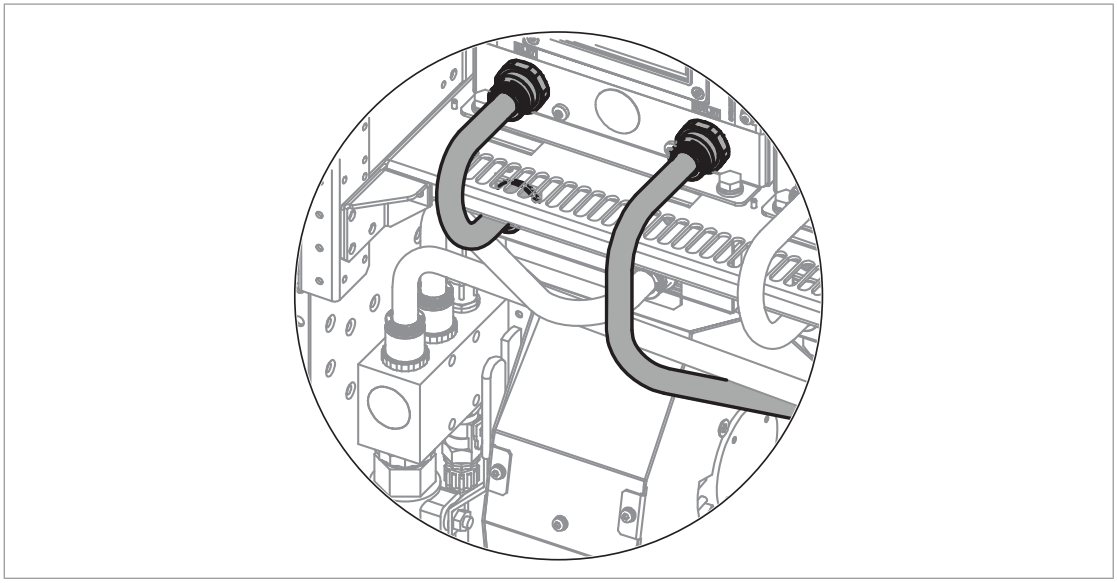
6. Remove the L-shaped DC busbars at the top of the module. Make note of the orientation of the screws as well as the order of the washers.



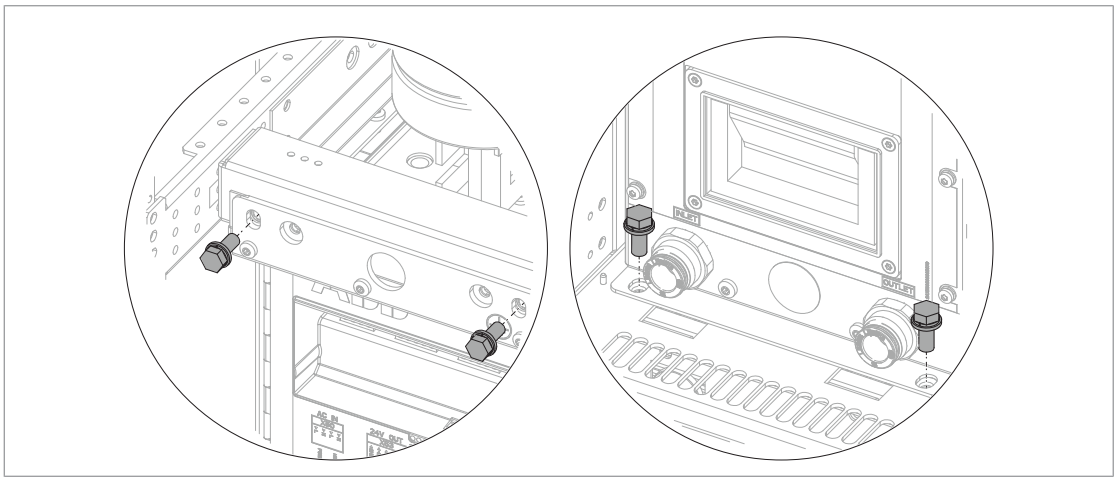
7. Close the inlet valve (a) (located on the left-hand side of the cubicle) and outlet valve (located on the right-hand side of the cubicle). Lead the drain hoses (b, on both sides of the cubicle) into a suitable container. Open the drain valves (c, on both sides of the cubicle). This will drain all modules in the cubicle.



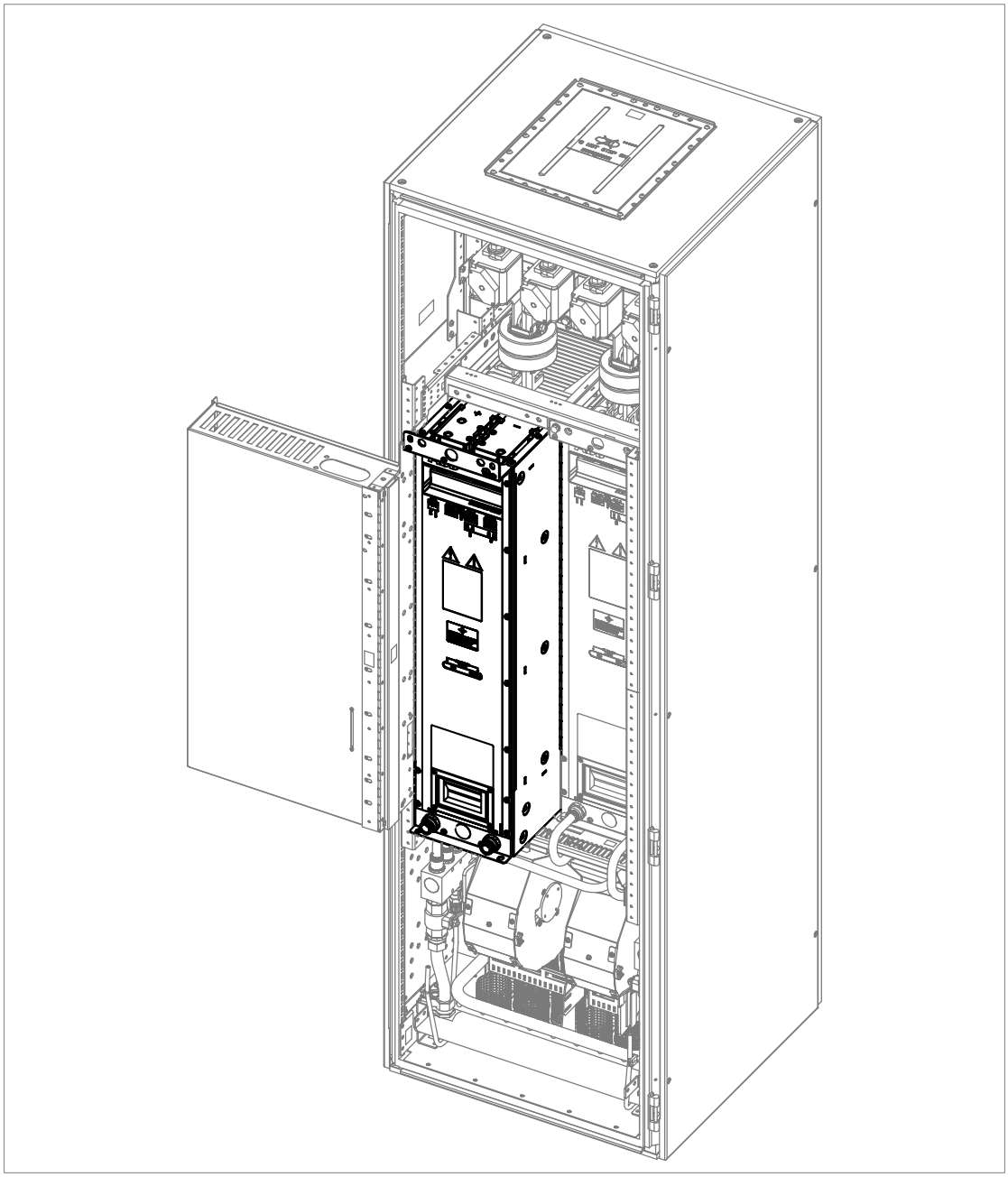
8. After the module has drained, disconnect the piping from the module.



9. Remove the module retaining screws at the top and the bottom of the module.



10. Pull the module carefully out onto a suitable platform. Attach the module secured to a hoist or equivalent to prevent the module from falling. For information on using the lifting device, refer to Converter module lifting device for drive cabinets hardware manual (3AXD50000210268 [English]).



**Installing the module**

1. Install the converter module lifting device by ABB, or make sure that you have another winch in use. For information on a lifting device available from ABB, refer to Converter module lifting device for drive cabinets hardware manual (3AXD50000210268 [English]).
2. Attach the lifting device to the spare module to be installed, and lift it .
3. Push the module carefully into its bay.
4. Fasten the retaining screws at the top and the bottom of the module.

5. Install the DC busbars at the top of the module. Tighten the fastening bolts to 70 N·m (51.6 lbf·ft).
6. Connect the coolant pipes to the module. Tighten to the specified torque. R8i module coolant connections: 15 N·m (11.1 lbf·ft). Other connections: 20 N·m (14.75 lbf·ft).
7. Connect the control wiring to the module.
8. Fill up the cooling system. For instructions, see section Filling up and bleeding the internal cooling circuit.
9. Remove the lifting device, if assembled earlier.
10. Close the swing-out frame (if present). Install all shrouds removed earlier.

# LCL and CL filters

## Replacing the capacitors of the LCL filter (frame R7i)

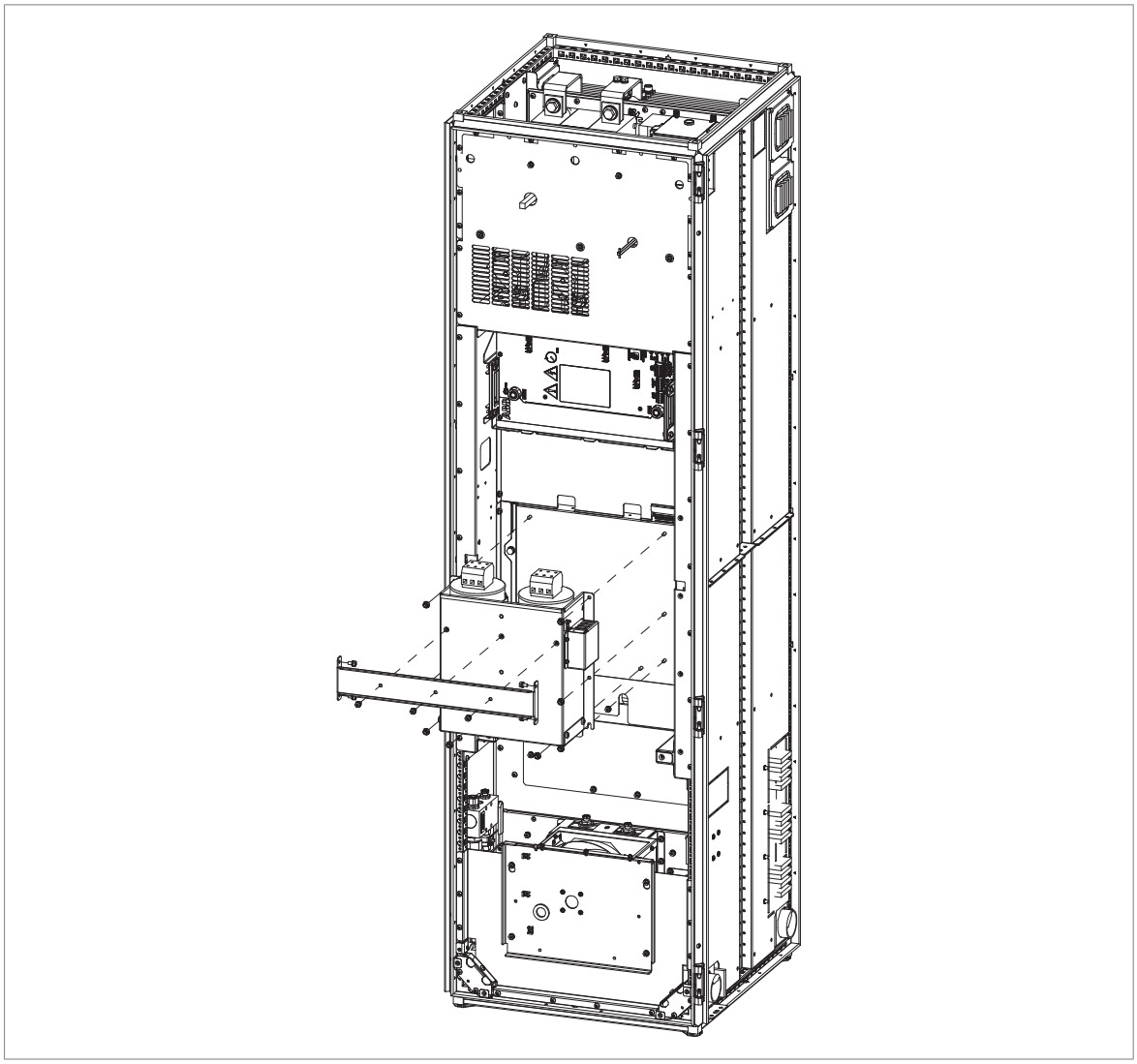


**⚠WARNING** Obey the safety instructions of the drive. If you ignore them, injury or death, or damage to the equipment can occur. If you are not a qualified electrical professional, do not do electrical installation, commissioning or maintenance work.



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

1. Repeat the steps described in section Electrical safety precautions (page 192) before you start the work.
2. Remove the shrouding (if any).
3. Remove the busbar in front of the capacitor unit.
4. Disconnect the wiring of the capacitors.
5. Remove the fastening screws of the capacitor unit and slide the capacitor unit out.
6. Install a new capacitor unit in reverse order.
7. Close the door.

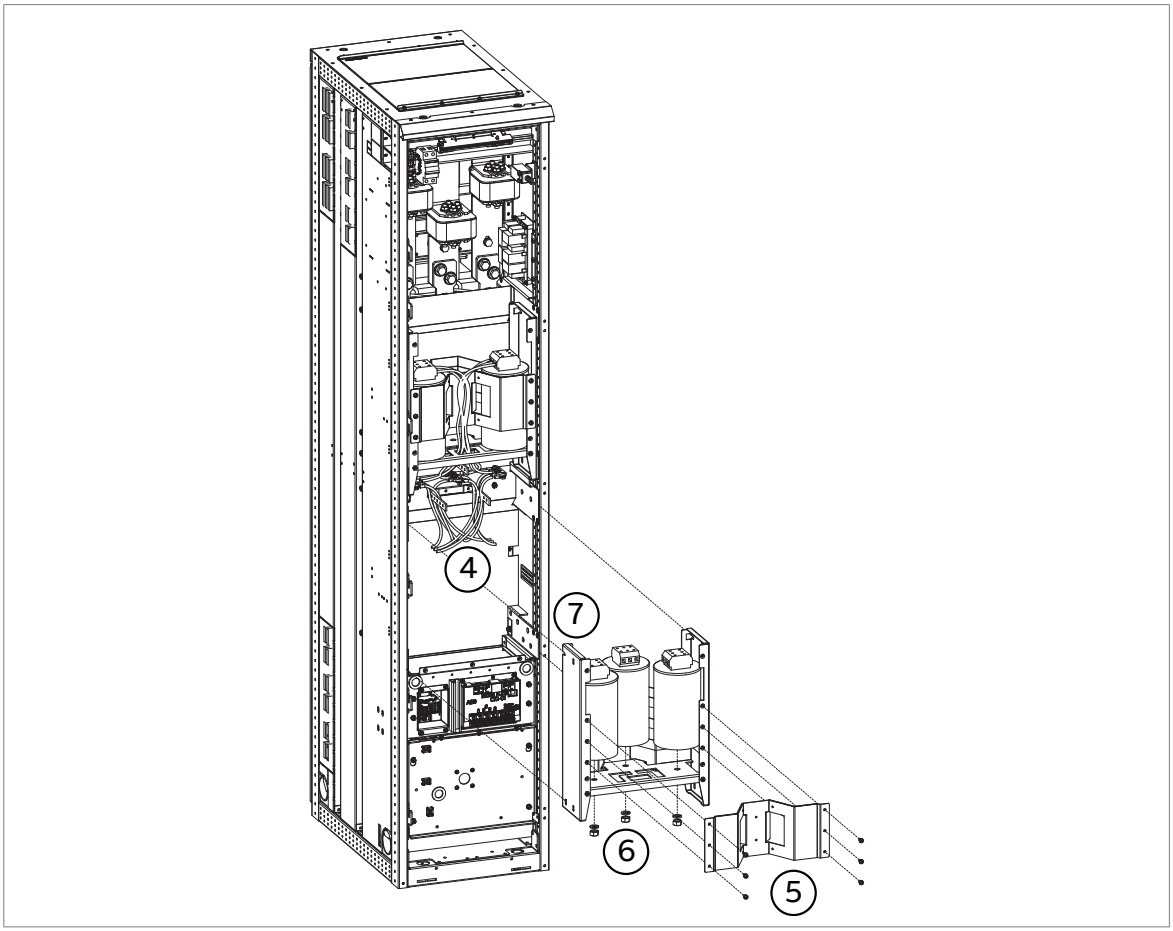


## Replacing the capacitors of the LCL filter (frame R8i)

**⚠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 electrical installation, commissioning or maintenance work.

**⚠CAUTION** 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 Electrical safety precautions (page 192) before you start the work.
2. Open the door of the LCL filter cubicle.
3. Remove the shrouding in front of the capacitors (if any).
4. Disconnect the wiring of the capacitors.
5. Remove the six fastening screws in front of the capacitor unit.
6. Remove the three bolts below each capacitor.
7. Remove the four screws of the capacitor unit and slide the capacitor unit out.
8. Install the new capacitor unit in reverse order.
9. Attach the shrouding (if any) and close the door.



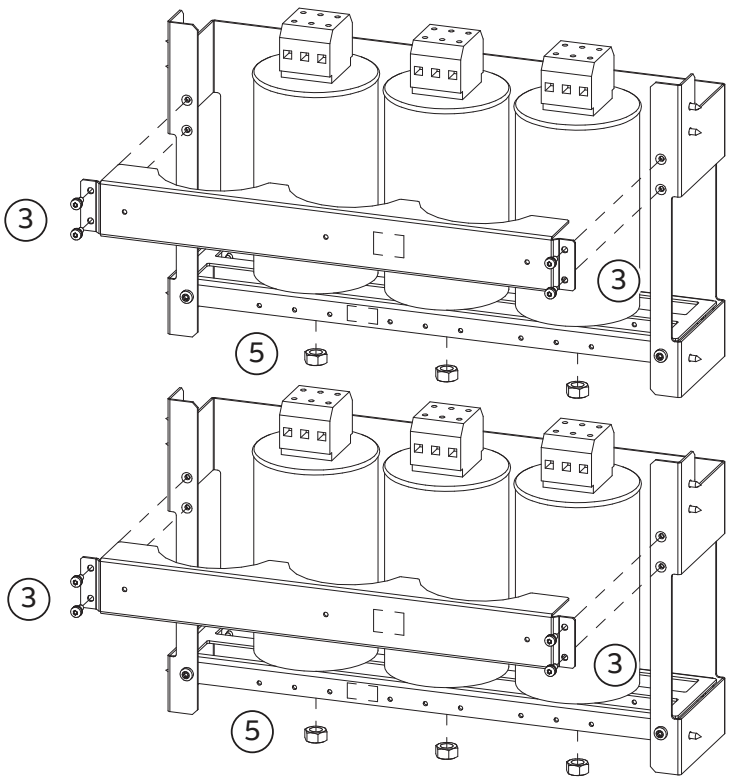
## Replacing the capacitors of the CL filter (frame R8i)

Capacitors of the CL filter are located in the IGBT supply module cubicle.

**⚠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 electrical installation, commissioning or maintenance work.

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

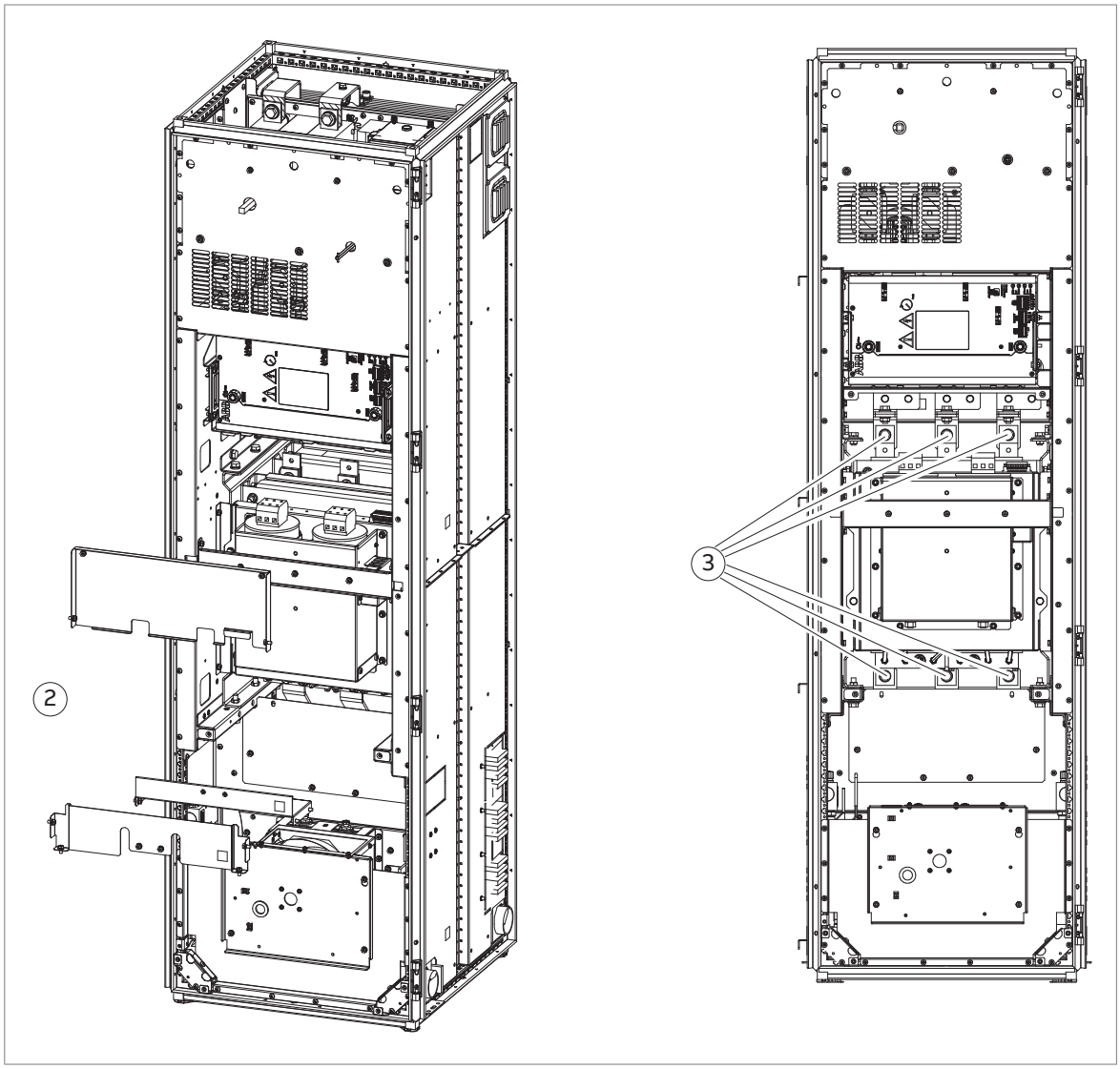
1. Repeat the steps described in section Electrical safety precautions (page 192) before you start the work.
2. Remove the shrouding (if any).
3. Remove the horizontal supports in front of the capacitors.
4. Mark the terminal designations for each cable that is connected to the capacitors. Disconnect the wiring of the capacitors.
5. Remove the fastening bolts of the capacitors. Lift the capacitors out.
6. Install new capacitors in reverse order.
7. Close the door.



## Retightening of the connections of the LCL filter (frame R7i)

**⚠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 electrical installation, commissioning or maintenance work.

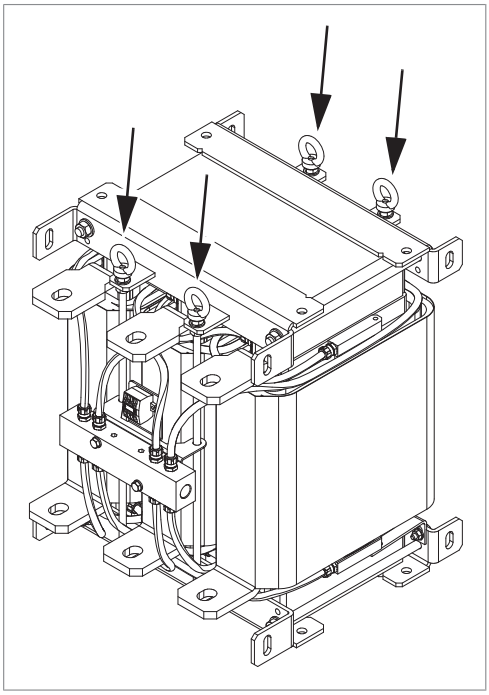
1. Stop the drive and do the steps in Electrical safety precautions (page 192) before you start the work.
2. Open the door of the module cubicle. Remove the shrouding and air guides below and on top of the LCL filter.
3. Examine the tightness of the LCL filter busbar connections. Tighten if needed. Tightening torque for Al-Cu connections with M10 screws is 20 N·m (14.75 lbf·ft).



### Lifting the inductor of the LCL or CL filter

**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, commissioning, or maintenance work.

Lift the inductor steadily by its all four lifting eyes. Make sure that lifting device is suitable for lifting by four lifting points.



## Capacitors

The intermediate DC circuit of the drive contains several electrolytic capacitors. The operating time, load, and surrounding air temperature have an effect on the operating life of these capacitors. A lower ambient temperature can increase the operating life of capacitors.

Capacitor failure can cause damage to the unit, 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

Reform the capacitors if the drive was not powered for a year or more (is in storage or is unused). Read the manufacturing date from the type designation label. For the instructions, refer to Capacitor reforming instructions (3BFE64059629 [English]).

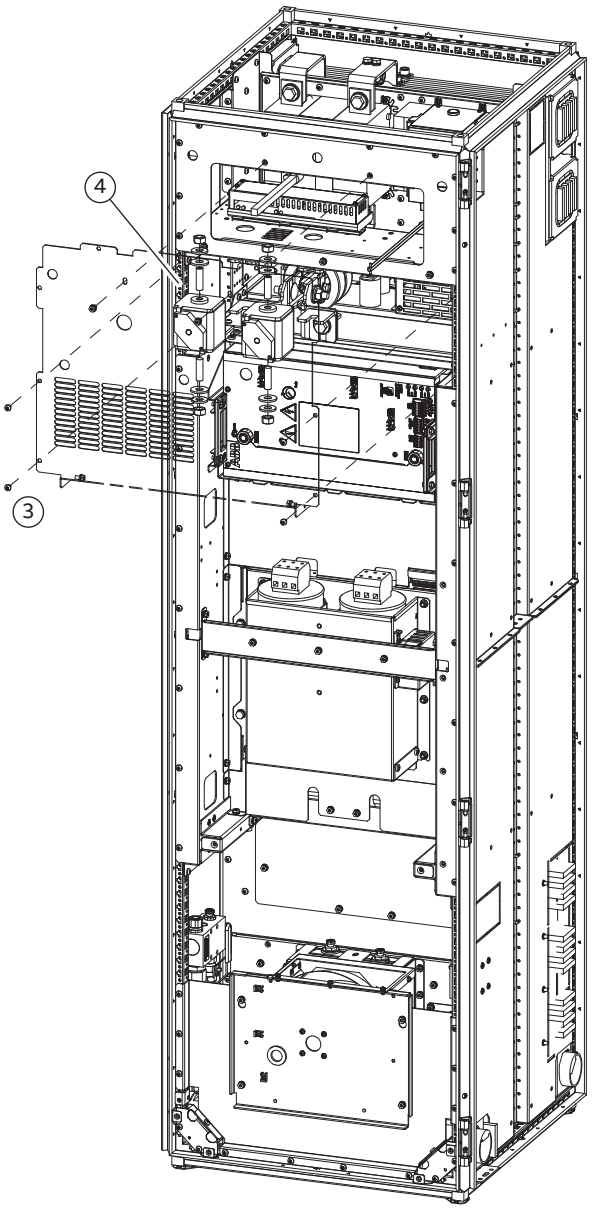
# Fuses

## Replacing the supply unit DC fuses (frame R7i)

**⚠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 electrical installation, commissioning or maintenance work.

**⚠CAUTION** 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 Electrical safety precautions (page 192) before you start the work.
2. Open the door of the module cubicle.
3. Remove the shrouding in front of the fuses (upper part of the cabinet).
4. Check the condition of the fuses. In case of a blown fuse, replace all fuses with similar fuses: slacken the nuts of the screws of the fuses, and slide out the fuse blocks. Do not unscrew the nuts completely, not to drop them inside the cubicle.
5. Make note of the order of the washers on the screws.
6. Remove the screws, nuts and washers from the old fuses and attach them to the new fuses. Make sure to keep the washers in the original order.
7. Insert the new fuses into their slots in the cubicle. Pre-tighten the nuts first by hand or by applying a torque of no more than 5 N·m (3.7 lbf·ft).
8. Tighten the nuts to torque as follows:
   - Cooper-Bussmann fuses: 50 N·m (37 lbf·ft)
   - Mersen (Ferraz-Shawmut) fuses: 46 N·m (34 lbf·ft)
   - Other: Refer to the fuse manufacturer's instructions.
9. Attach the shrouding and close the door.



## Replacing the supply unit AC fuses (frame R8i with CL filter)

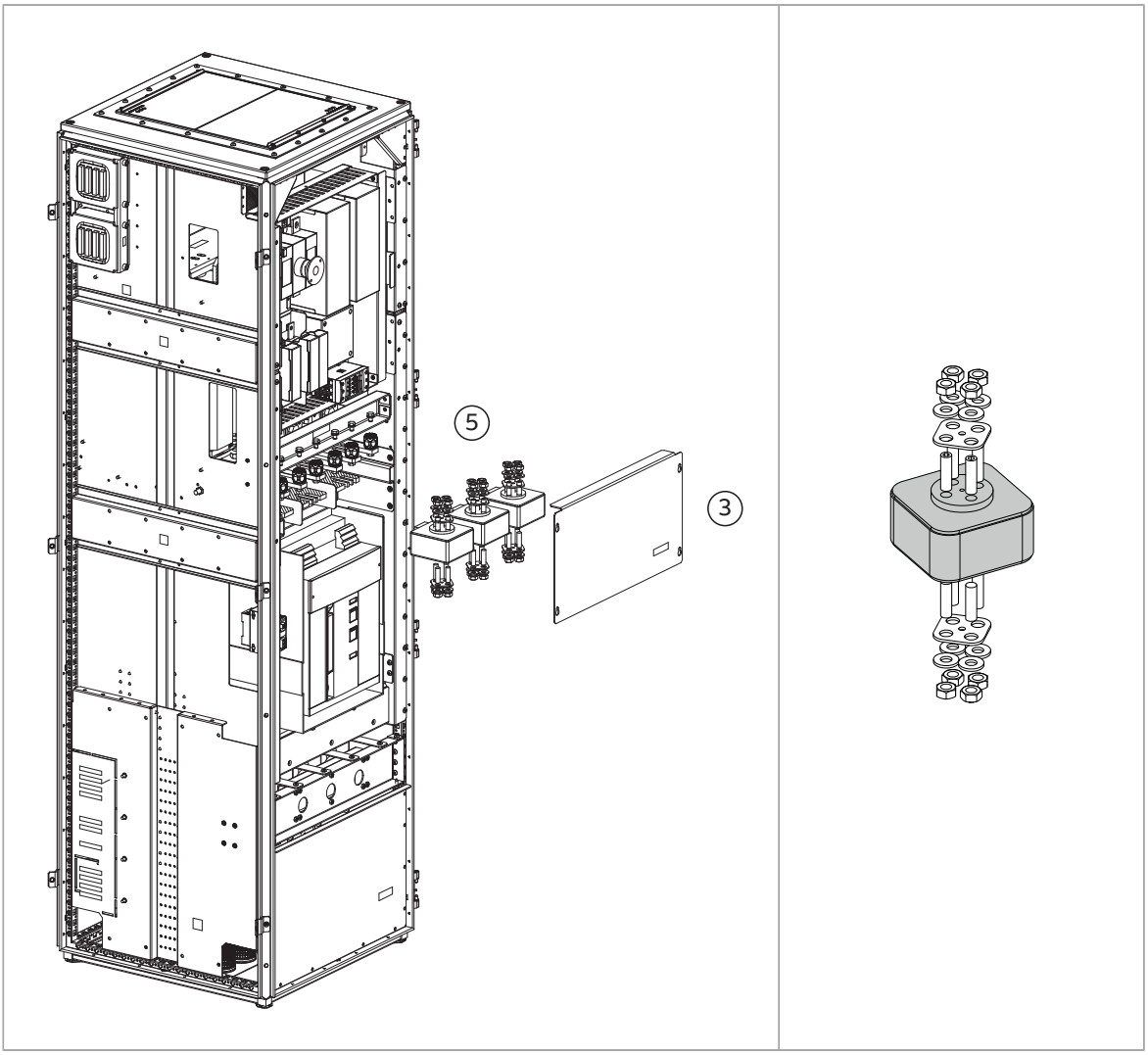


**⚠WARNING** Obey the safety instructions of the drive. If you ignore them, injury or death, or damage to the equipment can occur. If you are not a qualified electrical professional, do not do electrical installation, commissioning or maintenance work.



**⚠CAUTION** 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 Electrical safety precautions (page 192) before you start the work.
2. Open the door of the incoming and CL filter cubicle.
3. Remove the shroud in front of the fuses.
4. Remove the horizontal fuse support and insulator supports (if used).
5. Check the condition of the fuses. In case of a blown fuse, replace all fuses with similar fuses: slacken the nuts of the screws of the fuses and pull the fuses out. Do not unscrew the nuts completely, not to drop them inside the cubicle.
6. Make note of the order of the washers on the screws.
7. Remove the screws, nuts and washers from the old fuses and attach them to the new fuses. Make sure to keep the washers in the original order.
8. Insert the new fuses into their slots in the cubicle. Pre-tighten the nuts first by hand or by applying a torque of no more than 5 N·m (3.7 lbf·ft).
9. Tighten the M12 nuts to torque as follows:
   - Cooper-Bussmann fuses: 50 N·m (37 lbf·ft)
   - Mersen (Ferraz-Shawmut) fuses: 46 N·m (34 lbf·ft)
   - M10 nuts: 40 N·m (29.5 lbf·ft).
10. Attach the shroud and close the door.




## Control panel

Refer to:

- ACS-AP-I, -S, -W Assistant control panels user’s manual (3AUA0000085685 [English])
- ACS-BP-S basic control panels user’s manual (3AXD50000032527 [English]).

# UCU control unit

Refer to UCU-22, UCU-23 and UCU-24 control units hardware manual (3AXD50000817726 [English]) for replacement of

- real-time clock battery
- memory unit
- microSDHC memory card
- control unit.

# BCU control unit

Refer to BCU-02, BCU-12 and BCU-22 control units hardware manual (3AUA0000113605 [English]) for replacement of

- real-time clock battery
- memory unit
- SD/SDHC memory card
- control unit.

# 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 IGBT 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 status LED indications, refer to the following table.

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

### R7i and R8i module LEDs

See chapter Operation principle and hardware description.

## 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, refer to the firmware manual of the supply unit.

### Starting reduced run operation



**⚠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 electrical installation, commissioning or maintenance work.



**⚠CAUTION** 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 192) 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 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, commissioning, or maintenance work.

1. Stop the drive and do the steps in section Electrical safety precautions (page 192) 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 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. To certify the components, these options exist:

- Renew the whole drive and all optional functional safety modules and components.
- Renew the components in the safety function circuit. In practice, this is economical only with large drives that have replaceable circuit boards and other components such as relays.

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

For more information, contact ABB.

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# 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.

# Frame R7i and multiples

## IGBT supply modules

IGBT supply units consisting of frame R7i IGBT supply module are to be ordered as separate modules.

Units which consist of multiple R7i modules connected in parallel are intended to be used when vertical space is limited, for example in low-height enclosures (see example on page 185). Only limited support is available from ABB for mechanical installation of 2×R7i...4×R7i units. Contact ABB for further information.

| IGBT supply unit | | Modules used | |
|---|---|---|---|
| Type | Frame size | Qty | Ordering code (for options see below) |
| **$U_N$ = 400 V** | | | |
| ACS880-204LC-0150A-3 | 1×R7i | 1 | ACS880-104LC-0170A-3 |
| ACS880-204LC-0190A-3 | 1×R7i | 1 | ACS880-104LC-0210A-3 |
| ACS880-204LC-0220A-3 | 1×R7i | 1 | ACS880-104LC-0250A-3 |
| ACS880-204LC-0270A-3 | 1×R7i | 1 | ACS880-104LC-0300A-3 |
| ACS880-204LC-0340A-3 | 1×R7i | 1 | ACS880-104LC-0380A-3 |
| ACS880-204LC-0420A-3 | 1×R7i | 1 | ACS880-104LC-0470A-3 |
| ACS880-204LC-0530A-3 | 2×R7i | 2 | ACS880-104LC-0300A-3+E205 |
| ACS880-204LC-0670A-3 | 2×R7i | 2 | ACS880-104LC-0380A-3+E205 |
| ACS880-204LC-0770A-3 | 2×R7i | 2 | ACS880-104LC-0470A-3+E205 |
| ACS880-204LC-1000A-3 | 3×R7i | 3 | ACS880-104LC-0380A-3+E205 |
| ACS880-204LC-1180A-3 | 3×R7i | 3 | ACS880-104LC-0470A-3+E205 |
| ACS880-204LC-1310A-3 | 4×R7i | 4 | ACS880-104LC-0380A-3+E205 |
| ACS880-204LC-1500A-3 | 4×R7i | 4 | ACS880-104LC-0470A-3+E205 |
| **$U_N$ = 500 V** | | | |
| ACS880-204LC-0150A-5 | 1×R7i | 1 | ACS880-104LC-0170A-5 |
| ACS880-204LC-0180A-5 | 1×R7i | 1 | ACS880-104LC-0200A-5 |
| ACS880-204LC-0220A-5 | 1×R7i | 1 | ACS880-104LC-0240A-5 |
| ACS880-204LC-0270A-5 | 1×R7i | 1 | ACS880-104LC-0300A-5 |
| ACS880-204LC-0340A-5 | 1×R7i | 1 | ACS880-104LC-0380A-5 |
| ACS880-204LC-0410A-5 | 1×R7i | 1 | ACS880-104LC-0460A-5 |
| ACS880-204LC-0530A-5 | 2×R7i | 2 | ACS880-104LC-0300A-5+E205 |
| ACS880-204LC-0670A-5 | 2×R7i | 2 | ACS880-104LC-0380A-5+E205 |
| ACS880-204LC-0770A-5 | 2×R7i | 2 | ACS880-104LC-0460A-5+E205 |
| ACS880-204LC-1000A-5 | 3×R7i | 3 | ACS880-104LC-0380A-5+E205 |
| ACS880-204LC-1180A-5 | 3×R7i | 3 | ACS880-104LC-0460A-5+E205 |
| ACS880-204LC-1310A-5 | 4×R7i | 4 | ACS880-104LC-0380A-5+E205 |
| ACS880-204LC-1500A-5 | 4×R7i | 4 | ACS880-104LC-0460A-5+E205 |
| **$U_N$ = 690 V** | | | |
| ACS880-204LC-0260A-7 | R7i | 1 | ACS880-104LC-0290A-7 |
| ACS880-204LC-0310A-7 | R7i | 1 | ACS880-104LC-0340A-7 |

| IGBT supply unit | | Modules used | |
|---|---|---|---|
| **Type** | **Frame size** | **Qty** | **Ordering code (for options see below)** |
| ACS880-204LC-0350A-7 | R7i | 1 | ACS880-104LC-0389A-7 |
| The units below consist of multiple R7i modules connected in parallel. The power ratings of these units overlap the ratings of units built out of frame R8i modules. R8i modules are likely to be suitable for most applications, but these units can be considered instead if vertical space is limited, for example. | | | |
| ACS880-204LC-0500A-7 | 2×R7i | 2 | ACS880-104LC-0290A-7+E205 |
| ACS880-204LC-0590A-7 | 2×R7i | 2 | ACS880-104LC-0340A-7+E205 |
| ACS880-204LC-0680A-7 | 2×R7i | 2 | ACS880-104LC-0389A-7+E205 |
| ACS880-204LC-0760A-7 | 3×R7i | 3 | ACS880-104LC-0290A-7+E205 |
| ACS880-204LC-0880A-7 | 3×R7i | 3 | ACS880-104LC-0340A-7+E205 |
| ACS880-204LC-1020A-7 | 3×R7i | 3 | ACS880-104LC-0389A-7+E205 |
| ACS880-204LC-1170A-7 | 4×R7i | 4 | ACS880-104LC-0340A-7+E205 |
| ACS880-204LC-1340A-7 | 4×R7i | 4 | ACS880-104LC-0389A-7+E205 |

| Ordering code format | Option codes |
|---|---|
| [Module type] +code [+code] …<br>For example,<br>**ACS880-104LC-0340A-7** | 2×R7i…4×R7i: **+E205**: Internal du/dt filtering |

**Note:** You can replace a module that does not have option +E205 with a module that has option +E205 (for example, if you have a spare part module with option +E205). For units with parallel-connected modules, all modules must have option +E205.

**Note:** These components are required to construct a working supply unit and must be ordered separately:

- LCL filter
- ACS-AP-W or ACS-AP-I control panel (required for commissioning)
- Control unit
- Common mode filters
- Quick connector
- Fiber optic cables (from control unit to each IGBT supply module).

Other parts given in this chapter can be required by the application or make the installation of the module easier.

## LCL filters

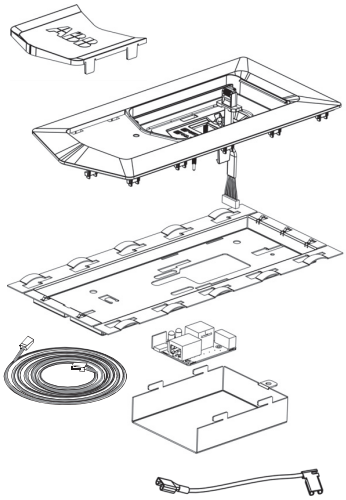
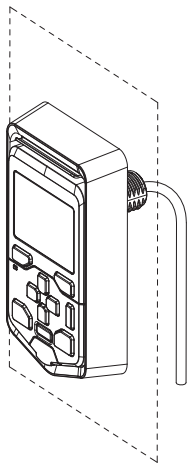
LCL filter delivery contains LCL filter components as loose parts. LCL filter contains the grid-side choke, converter-side choke, capacitors and resistor. For contents, see Kit contents of the LCL filters.

| ACS880-204LC-... | LCL filter | | |
|---|---|---|---|
| | LCL filter type | Qty | Ordering code |
| **$U_N$ = 400 V** | | | |
| 0150A-3 | BLCL-13LC-7 | 1 | 3AXD50000896431 |
| 0190A-3 | | | |
| 0220A-3 | | | |
| 0270A-3 | BLCL-14LC-5 | 1 | 3AXD50000896332 |
| 0340A-3 | | | |
| 0420A-3 | | | |
| 0530A-3 | BLCL-15LC-7 | 1 | 3AXD50000234417 |
| 0670A-3 | | | |
| 0770A-3 | | | |
| 1000A-3 | BLCL-24LC-7 | 1 | 3AXD50000234431 |
| 1180A-3 | | | |
| 1310A-3 | BLCL-25LC-7 | 1 | 3AXD50000234448 |
| 1500A-3 | | | |
| **$U_N$ = 500 V** | | | |
| 0150A-5 | BLCL-13LC-7 | 1 | 3AXD50000896431 |
| 0180A-5 | | | |
| 0220A-5 | | | |
| 0270A-5 | BLCL-14LC-5 | 1 | 3AXD50000896332 |
| 0340A-5 | | | |
| 0410A-5 | | | |
| 0530A-5 | BLCL-15LC-7 | 1 | 3AXD50000234417 |
| 0670A-5 | | | |
| 0770A-5 | | | |
| 1000A-5 | BLCL-24LC-7 | 1 | 3AXD50000234431 |
| 1180A-5 | | | |
| 1310A-5 | BLCL-25LC-7 | 1 | 3AXD50000234448 |
| 1500A-5 | | | |
| **$U_N$ = 690 V** | | | |
| 0260A-7 | BLCL-13LC-7 | 1 | 3AXD50000896431 |
| 0310A-7 | | | |
| 0350A-7 | | | |
| 0500A-7 | BLCL-15LC-7 | 1 | 3AXD50000234417 |
| 0590A-7 | | | |
| 0680A-7 | | | |
| 0760A-7 | | | |
| 0880A-7 | BLCL-24LC-7 | 1 | 3AXD50000234431 |
| 1020A-7 | | | |
| 1170A-7 | | | |
| 1340A-7 | BLCL-25LC-7 | 1 | 3AXD50000234448 |

## 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, refer to ACS-AP-I, -S, -W and ACH-AP-H, -W Assistant control panels user's manual (3AUA0000085685 [English]).

| Type | Description | Ordering code | Illustration |
|---|---|---|---|
| ACS-AP-W | Control panel with Bluetooth | 3AXD50000025965 |   |
| DPMP-01 | Door mounting kit (IP55) | 3AUA0000108878 |  |
| DPMP-02 | Door mounting kit (IP65) | 3AXD50000009374 |  |

For more information on the door mounting kits, such as the contents of the kit, refer to the installation manuals:

- DPMP-01 mounting platform for control panels installation guide (3AUA0000100140 [English])
- DPMP-02/03 mounting platform for control panels installations guide (3AUA0000136205 [English]).

## Control electronics

### Control unit (UCU)

One UCU control unit is required per IGBT supply unit. The type of the control unit depends on the number of supply modules as shown below. The control unit is delivered with a memory unit containing the ACS880 IGBT supply control program.

| IGBT supply module type | Control unit type | Ordering code |
|---|---|---|
| **$U_N$ = 400 V** | | |
| ACS880-204LC-0150A-3 | UCU-22 | ACS880UCU-204-22-0 |
| ACS880-204LC-0190A-3 | | |
| ACS880-204LC-0220A-3 | | |
| ACS880-204LC-0270A-3 | | |
| ACS880-204LC-0340A-3 | | |
| ACS880-204LC-0420A-3 | | |
| ACS880-204LC-0530A-3 | UCU-22, if BAMU auxiliary measurement unit is not used<br>UCU-23, if BAMU auxiliary measurement unit is used | ACS880UCU-204-22-0<br>ACS880UCU-204-23-0 |
| ACS880-204LC-0670A-3 | | |
| ACS880-204LC-0770A-3 | | |
| ACS880-204LC-1000A-3 | UCU-23 | ACS880UCU-204-23-0 |
| ACS880-204LC-1180A-3 | | |
| ACS880-204LC-1310A-3 | | |
| ACS880-204LC-1500A-3 | | |
| **$U_N$ = 500 V** | | |
| ACS880-204LC-0150A-5 | UCU-22 | ACS880UCU-204-22-0 |
| ACS880-204LC-0180A-5 | | |
| ACS880-204LC-0220A-5 | | |
| ACS880-204LC-0270A-5 | | |
| ACS880-204LC-0340A-5 | | |
| ACS880-204LC-0410A-5 | | |
| ACS880-204LC-0530A-5 | UCU-22, if BAMU auxiliary measurement unit is not used<br>UCU-23, if BAMU auxiliary measurement unit is used | ACS880UCU-204-22-0<br>ACS880UCU-204-23-0 |
| ACS880-204LC-0670A-5 | | |
| ACS880-204LC-0770A-5 | | |
| ACS880-204LC-1000A-5 | UCU-23 | ACS880UCU-204-23-0 |
| ACS880-204LC-1180A-5 | | |
| ACS880-204LC-1310A-5 | | |
| ACS880-204LC-1500A-5 | | |
| **$U_N$ = 690 V** | | |

| IGBT supply module type | Control unit type | Ordering code |
|---|---|---|
| ACS880-204LC-0260A-7 | UCU-22 | ACS880UCU-204-22-0 |
| ACS880-204LC-0310A-7 | | |
| ACS880-204LC-0350A-7 | | |
| ACS880-204LC-0500A-7 | UCU-22, if BAMU auxiliary measurement unit is not used<br>UCU-23, if BAMU auxiliary measurement unit is used | ACS880UCU-204-22-0<br>ACS880UCU-204-23-0 |
| ACS880-204LC-0590A-7 | | |
| ACS880-204LC-0680A-7 | | |
| ACS880-204LC-0760A-7 | UCU-23 | ACS880UCU-204-23-0 |
| ACS880-204LC-0880A-7 | | |
| ACS880-204LC-1020A-7 | | |
| ACS880-204LC-1170A-7 | | |
| ACS880-204LC-1340A-7 | | |

| Ordering code format | Option codes |
|---|---|
| [Control unit type] + code [+code]…<br>For example, ACS880UCU-204-22-0+N8010 | **+N8010:** Application programming<br>**+N8053:** Optimal grid control |

The UCU control unit kit contains:

- UCU control unit with USCA-02 adapters.
- UMU-01 memory unit with the control program.

The following option module is to be installed on the control unit and must be ordered separately if communication between supply and drive units is needed:

- RDCO-04C DDCS communication option module (ordering code: 3AXD50000868056).

### Control unit (BCU)

One BCU control unit is required per IGBT supply unit. The type of the control unit depends on the number of supply modules as shown below. The control unit is delivered with a memory unit containing the ACS880 IGBT supply control program.

| IGBT supply module type | Control unit type | Ordering code |
|---|---|---|
| **$U_N$ = 690 V** | | |
| ACS880-204LC-0260A-7 | BCU-02 | 3AXD50000002937 |
| ACS880-204LC-0310A-7 | | |
| ACS880-204LC-0350A-7 | | |
| ACS880-204LC-0500A-7 | BCU-02, if BAMU auxiliary measurement unit is not used<br>BCU-12, if BAMU auxiliary measurement unit is used | 3AXD50000002937<br>3AXD50000015806 |
| ACS880-204LC-0590A-7 | | |
| ACS880-204LC-0680A-7 | | |
| ACS880-204LC-0760A-7 | BCU-12 | 3AXD50000015806 |
| ACS880-204LC-0880A-7 | | |
| ACS880-204LC-1020A-7 | | |
| ACS880-204LC-1170A-7 | | |
| ACS880-204LC-1340A-7 | | |

| IGBT supply module type | Control unit kit for optimal grid control (option +N8053) | Ordering code |
|---|---|---|
| **$U_N$ = 690 V** | | |
| ACS880-204LC-0260A-7 | BCU N8053 kit 1×R7i OGC ISU | 3AXD50000821310 |
| ACS880-204LC-0310A-7 | | |
| ACS880-204LC-0350A-7 | | |
| ACS880-204LC-0500A-7 | BCU N8053 kit 2×R7i OGC ISU | 3AXD50000823253 |
| ACS880-204LC-0590A-7 | | |
| ACS880-204LC-0680A-7 | | |
| ACS880-204LC-0760A-7 | BCU N8053 kit 3×R7i OGC ISU | 3AXD50000959969 |
| ACS880-204LC-0880A-7 | | |
| ACS880-204LC-1020A-7 | | |
| ACS880-204LC-1170A-7 | BCU N8053 kit 4×R7i OGC ISU | 3AXD50000959976 |
| ACS880-204LC-1340A-7 | | |

**Note:** Fiber optic communication with another control unit (such as that of the inverter unit) requires an RDCO-0x DDCS communication module. For more information, see RDCO-0x DDCS communication option modules user's manual (3AFE64492209 [English]).

For more information on optional modules, see appropriate option module manual.

### Fiber optic cables

Each frame R7i module is connected to the control unit with a pair of fiber optic cables.

Each of the kits in the table below contain a pair of plastic fiber-optic cables that are needed in communication between the control unit and the power (inverter/supply/brake/converter) module.

| Length | Kit type designation | Ordering code |
|---|---|---|
| 2 m (6.6 ft) | NLWC-02 | 58988821 |
| 3 m (9.8 ft) | NLWC-03 | 58948233 |
| 5 m (16.4 ft) | NLWC-05 | 58948250 |
| 7 m (23 ft) | NLWC-07 | 58948268 |
| 10 m (32.8 ft) | NLWC-10 | 58948276 |

### Auxiliary measurement unit (BAMU)

The BAMU is a measurement unit for precise voltage and current measurements. It is mandatory when used in a grid converter (i.e. when the optional optimal grid control functionality is used).

| Frame size | Unit type | Ordering code |
|---|---|---|
| All | BAMU-12C | 3AXD50000045879 |

For more information, see

- Optimal grid control (option +N8053) for ACS880 multidrives (3AXD50000220717 [English])
- BAMU-12C auxiliary measurement unit hardware manual (3AXD50000117840 [English]).

**Note:** You must have adequate amount of fiber optic connections in the control unit if you use a BAMU auxiliary measurement unit with parallel-connected IGBT supply modules.

### CIO-01 I/O module

The control program (on the control unit) can control the speed of the cooling fans and monitor them via CIO I/O modules. Each CIO module can control and monitor 1 to 4 fans. The control unit connects to the CIO module(s) via a distributed I/O bus.

The fan control and monitoring is an optional feature. If the user wants to implement it, he/she must order the CIO modules, make the connections, and enable the operation in the control program.

For more information, see CIO-01 I/O module and distributed I/O bus user's manual (3AXD50000126880 [English]).

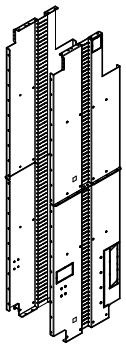
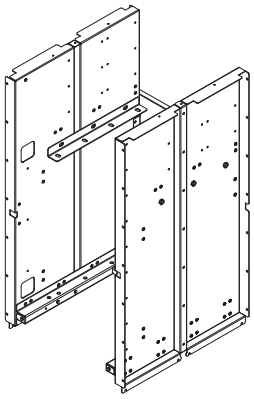
| Type | Data | Qty | Ordering code |
|---|---|---|---|
| CIO-01 | CIO-01 I/O module for distributed I/O bus control | 1 | 3AXD50000041983 |

## Mechanical installation accessories

These kits include parts that are used for installing the module and the LCL filter in the enclosure.

### Module, LCL filter, and electronics mounting parts

These parts attach to the VX25 enclosure frame and act as a mounting base for the module installation frame, the control unit, and other components.

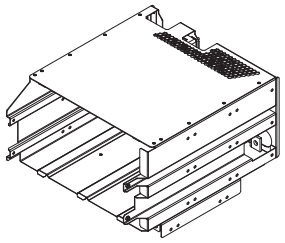
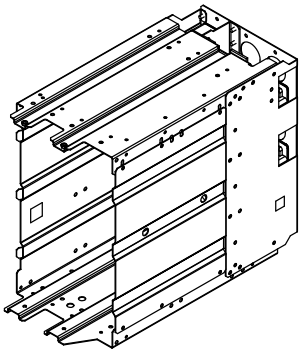
| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 400/600/800 mm VX25 enclosure | 1 | 3AXD50000360543 | L-468-8-020-VX |  Instruction code: 3AXD50000327591 |
| BLCL-14LC-5 (600 mm Rittal VX25 enclosure)<br>BLCL-13LC-7 (600 mm Rittal VX25 enclosure) | 1 | 3AXD50001013523 | L-6-7-037-VX |  Instruction code: 3AXD50001012816 |

### Module installation frame

The module can easily be inserted into (and extracted from) the installation frame. The frame has quick connectors at the back for the AC and DC power connections.

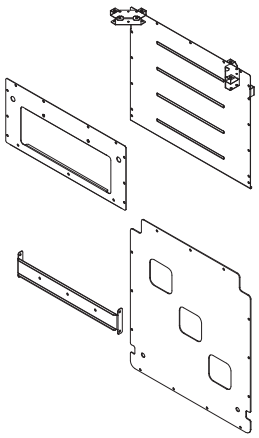
You can install the module in upright position (kit L-468-7-320) or on its side (kit L-6-7-038-VX). The latter can especially be used with LCL filter of type BLCL-13LC-7. AC power connection is on bottom part of the frame, and DC power connection is on top part of the frame.

For details of the module installation frames, see the dimension drawings.

| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 1×R7i | 1 per module | 3AXD50001013547 | L-6-7-038-VX |  Instruction code: |
| 2×R7i...4×R7i | 1 per module | 3AXD50000836444 | L-468-7-320 |  Instruction code: 3AXD50000837915 |

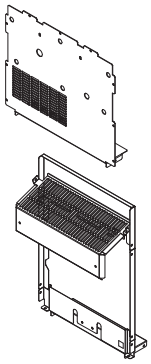
### Marine support kit

This kit contains parts that can be used for reinforcing the cabinet structure for installation sites with vibration, for example in marine applications.

| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 600 mm VX25 enclosure with 1 module | 1 | 3AXD50001013646 | L-6-7-504-VX |  Instruction code: 3AXD50001062552 |

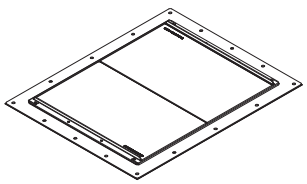
### Shrouding and air guide

This kit contains the shrouds and the air guide, as well as the necessary brackets and screws, to cover the top and bottom parts of the cubicle.

| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 600 mm Rittal VX25 enclosure | 1 | 3AXD50001013653 | L-6-7-353-VX |  Instruction code: 3AXD50001062668 |

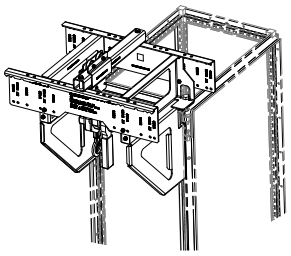
### Pressure relief kit

The explosion exhaust plate acts as a pressure relief vent in case of arcing inside the cubicle. This part is installed on the roof of the cabinet.

| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| VX25 enclosure | 1 per cubicle | 3AXD50000667277 | L-68-X-461-VX |  |

### Lifting device

Use the lifting device when replacing a module in the Rittal VX25 enclosure.

| Frame | Enclosure | Qty | Ordering code | Illustration |
|---|---|---|---|---|
| R7i, R8i | Rittal VX25 | 1 | 3AXD50000439997 |  Instruction code: 3AXD50000210268, 3AXD50000439409 |

## AC-side components

### Main switch kit

You must equip the drive with a main disconnecting device (IEC/EN60204-1). The table below lists suitable switch-disconnectors for those supply units that also have main contactors as default.

| IGBT supply unit | Main switches (230 V / 115 V, IEC) | | |
|---|---|---|---|
| Type | Type | Ordering code | Qty |
| **$U_N$ = 400 V** | | | |
| ACS880-204LC-0150A-3 | OT1000E12 | 3AXD50001056292 | 1 |
| ACS880-204LC-0190A-3 | OT1000E12 | 3AXD50001056292 | 1 |
| ACS880-204LC-0220A-3 | OT1000E12 | 3AXD50001056292 | 1 |
| ACS880-204LC-0270A-3 | OT1000E12 | 3AXD50001056292 | 1 |
| ACS880-204LC-0340A-3 | OT1000E12 | 3AXD50001056292 | 1 |
| ACS880-204LC-0420A-3 | OT1000E12 | 3AXD50001056292 | 1 |
| **$U_N$ = 500 V** | | | |
| ACS880-204LC-0150A-5 | OT1000E12 | 3AXD50001056292 | 1 |
| ACS880-204LC-0180A-5 | OT1000E12 | 3AXD50001056292 | 1 |
| ACS880-204LC-0220A-5 | OT1000E12 | 3AXD50001056292 | 1 |
| ACS880-204LC-0270A-5 | OT1000E12 | 3AXD50001056292 | 1 |
| ACS880-204LC-0310A-5 | OT1000E12 | 3AXD50001056292 | 1 |
| ACS880-204LC-0410A-5 | OT1000E12 | 3AXD50001056292 | 1 |
| **$U_N$ = 690 V** | | | |
| ACS880-204LC-0260A-7 | OT1000E12 | 3AXD50001056292 | 1 |
| ACS880-204LC-0310A-7 | OT1000E12 | 3AXD50001056292 | 1 |
| ACS880-204LC-0350A-7 | OT1000E12 | 3AXD50001056292 | 1 |

| IGBT supply unit | Main switches (230 V / 115 V, UL) | | |
|---|---|---|---|
| Type | Type | Ordering code | Qty |
| **$U_N$ = 400 V** | | | |
| ACS880-204LC-0150A-3 | OT800U12 | 3AXD50001082031 | 1 |
| ACS880-204LC-0190A-3 | OT800U12 | 3AXD50001082031 | 1 |
| ACS880-204LC-0220A-3 | OT800U12 | 3AXD50001082031 | 1 |
| ACS880-204LC-0270A-3 | OT800U12 | 3AXD50001082031 | 1 |
| ACS880-204LC-0340A-3 | OT800U12 | 3AXD50001082031 | 1 |
| ACS880-204LC-0420A-3 | OT800U12 | 3AXD50001082031 | 1 |
| **$U_N$ = 500 V** | | | |
| ACS880-204LC-0150A-5 | OT800U12 | 3AXD50001082031 | 1 |
| ACS880-204LC-0180A-5 | OT800U12 | 3AXD50001082031 | 1 |
| ACS880-204LC-0220A-5 | OT800U12 | 3AXD50001082031 | 1 |
| ACS880-204LC-0270A-5 | OT800U12 | 3AXD50001082031 | 1 |
| ACS880-204LC-0310A-5 | OT800U12 | 3AXD50001082031 | 1 |
| ACS880-204LC-0410A-5 | OT800U12 | 3AXD50001082031 | 1 |
| **$U_N$ = 690 V** | | | |
| ACS880-204LC-0260A-7 | OT800U12 | 3AXD50001082031 | 1 |
| ACS880-204LC-0310A-7 | OT800U12 | 3AXD50001082031 | 1 |
| ACS880-204LC-0350A-7 | OT800U12 | 3AXD50001082031 | 1 |

## Main contactor

| IGBT supply unit | Main contactor (230 V / 115 V, IEC, UL) | | |
|---|---|---|---|
| Type | Type | Ordering code | Qty |
| **$U_N$ = 400 V** | | | |
| ACS880-204LC-0150A-3 | AF460 | 64430742 | 1 |
| ACS880-204LC-0190A-3 | AF460 | 64430742 | 1 |
| ACS880-204LC-0220A-3 | AF460 | 64430742 | 1 |
| ACS880-204LC-0270A-3 | AF460 | 64430742 | 1 |
| ACS880-204LC-0340A-3 | AF460 | 64430742 | 1 |
| ACS880-204LC-0420A-3 | AF460 | 64430742 | 1 |
| **$U_N$ = 500 V** | | | |
| ACS880-204LC-0150A-5 | AF460 | 64430742 | 1 |
| ACS880-204LC-0180A-5 | AF460 | 64430742 | 1 |
| ACS880-204LC-0220A-5 | AF460 | 64430742 | 1 |
| ACS880-204LC-0270A-5 | AF460 | 64430742 | 1 |
| ACS880-204LC-0310A-5 | AF460 | 64430742 | 1 |
| ACS880-204LC-0410A-5 | AF460 | 64430742 | 1 |
| **$U_N$ = 690 V** | | | |
| ACS880-204LC-0260A-7 | AF400 | 64399730 | 1 |
| ACS880-204LC-0310A-7 | AF400 | 64399730 | 1 |
| ACS880-204LC-0350A-7 | AF400 | 64399730 | 1 |

### Main circuit breakers and wagons

You must equip the drive with a main disconnecting device (IEC/EN60204-1). Frames 2×R7i…4×R7i have withdrawable main circuit breakers as default.

| IGBT supply unit | Main circuit breakers (230 V, IEC) | | |
|---|---|---|---|
| Type | Type | Ordering code | Qty |
| **$U_N$ = 400 V** | | | |
| ACS880-204LC-0530A-3 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0670A-3 | E2.2S-1250 | 3AXD50000902941 | 1 |
| ACS880-204LC-0770A-3 | E2.2S-1250 | 3AXD50000902941 | 1 |
| ACS880-204LC-1000A-3 | E2.2S-1600 | 3AXD50000902965 | 1 |
| ACS880-204LC-1180A-3 | E2.2S-1600 | 3AXD50000902965 | 1 |
| ACS880-204LC-1310A-3 | E2.2S-2000 | 3AXD50000903375 | 1 |
| ACS880-204LC-1500A-3 | E2.2S-2000 | 3AXD50000903375 | 1 |
| **$U_N$ = 500 V** | | | |
| ACS880-204LC-0530A-5 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0670A-5 | E2.2S-1250 | 3AXD50000902941 | 1 |
| ACS880-204LC-0770A-5 | E2.2S-1250 | 3AXD50000902941 | 1 |
| ACS880-204LC-0990A-5 | E2.2S-1600 | 3AXD50000902965 | 1 |
| ACS880-204LC-1180A-5 | E2.2S-1600 | 3AXD50000902965 | 1 |
| ACS880-204LC-1310A-5 | E2.2S-2000 | 3AXD50000903375 | 1 |
| ACS880-204LC-1500A-5 | E2.2S-2000 | 3AXD50000903375 | 1 |
| **$U_N$ = 690 V** | | | |
| ACS880-204LC-0500A-7 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0590A-7 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0680A-7 | E2.2S-1250 | 3AXD50000902941 | 1 |
| ACS880-204LC-0760A-7 | E2.2S-1250 | 3AXD50000902941 | 1 |
| ACS880-204LC-0880A-7 | E2.2S-1250 | 3AXD50000902941 | 1 |
| ACS880-204LC-1020A-7 | E2.2S-1600 | 3AXD50000902965 | 1 |
| ACS880-204LC-1170A-7 | E2.2S-1600 | 3AXD50000902965 | 1 |
| ACS880-204LC-1340A-7 | E2.2S-2000 | 3AXD50000903375 | 1 |

| IGBT supply unit | Main circuit breakers (230 V, UL) | | |
|---|---|---|---|
| **Type** | **Type** | **Ordering code** | **Qty** |
| **$U_N$ = 400 V** | | | |
| ACS880-204LC-0530A-3 | E4.2V-A 800 | 3AXD50000826018 | 1 |
| ACS880-204LC-0670A-3 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-0770A-3 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-1000A-3 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-1180A-3 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-1310A-3 | E4.2V-A 2000 | 3AXD50000828128 | 1 |
| ACS880-204LC-1500A-3 | E4.2V-A 2000 | 3AXD50000828128 | 1 |
| **$U_N$ = 500 V** | | | |
| ACS880-204LC-0530A-5 | E4.2V-A 800 | 3AXD50000826018 | 1 |
| ACS880-204LC-0670A-5 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-0770A-5 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-0990A-5 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-1180A-5 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-1310A-5 | E4.2V-A 2000 | 3AXD50000828128 | 1 |
| ACS880-204LC-1500A-5 | E4.2V-A 2000 | 3AXD50000828128 | 1 |
| **$U_N$ = 690 V** | | | |
| ACS880-204LC-0500A-7 | E4.2V-A 800 | 3AXD50000826018 | 1 |
| ACS880-204LC-0590A-7 | E4.2V-A 800 | 3AXD50000826018 | 1 |
| ACS880-204LC-0680A-7 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-0760A-7 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-0880A-7 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-1020A-7 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-1170A-7 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-1340A-7 | E4.2V-A 2000 | 3AXD50000828128 | 1 |

Content of the 230 V air circuit breakers:

| | |
|---|---|
| • Ekip Dip LI 3p WMP | E2.2S-800<br>E2.2S-1250<br>E2.2S-1600<br>E2.2S-2000<br>E4.2V-A 800<br>E4.2V-A 1600<br>E4.2V-A 2000 |
| • RTC 250V E2.2...E6.2 | 1SDA073773R1 |
| • 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)<br>1SDA083025R1 (E4.2S),<br>1SDA083028R1 (E6.2V) |

| IGBT supply unit | Main circuit breakers (115 V, IEC) | | |
|---|---|---|---|
| **Type** | **Type** | **Ordering code** | **Qty** |
| **$U_N$ = 400 V** | | | |
| ACS880-204LC-0530A-3 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0670A-3 | E2.2S-1250 | 3AXD50000902958 | 1 |
| ACS880-204LC-0770A-3 | E2.2S-1250 | 3AXD50000902958 | 1 |
| ACS880-204LC-1000A-3 | E2.2S-1600 | 3AXD50000904259 | 1 |
| ACS880-204LC-1180A-3 | E2.2S-1600 | 3AXD50000904259 | 1 |
| ACS880-204LC-1310A-3 | E2.2S-2000 | 3AXD50000903382 | 1 |
| ACS880-204LC-1500A-3 | E2.2S-2000 | 3AXD50000903382 | 1 |
| **$U_N$ = 500 V** | | | |
| ACS880-204LC-0530A-5 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0670A-5 | E2.2S-1250 | 3AXD50000902958 | 1 |
| ACS880-204LC-0770A-5 | E2.2S-1250 | 3AXD50000902958 | 1 |
| ACS880-204LC-0990A-5 | E2.2S-1600 | 3AXD50000904259 | 1 |
| ACS880-204LC-1180A-5 | E2.2S-1600 | 3AXD50000904259 | 1 |
| ACS880-204LC-1310A-5 | E2.2S-2000 | 3AXD50000903382 | 1 |
| ACS880-204LC-1500A-5 | E2.2S-2000 | 3AXD50000903382 | 1 |
| **$U_N$ = 690 V** | | | |
| ACS880-204LC-0500A-7 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0590A-7 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0680A-7 | E2.2S-1250 | 3AXD50000902958 | 1 |
| ACS880-204LC-0760A-7 | E2.2S-1250 | 3AXD50000902958 | 1 |
| ACS880-204LC-0880A-7 | E2.2S-1250 | 3AXD50000902958 | 1 |
| ACS880-204LC-1020A-7 | E2.2S-1600 | 3AXD50000904259 | 1 |
| ACS880-204LC-1170A-7 | E2.2S-1600 | 3AXD50000904259 | 1 |
| ACS880-204LC-1340A-7 | E2.2S-2000 | 3AXD50000903382 | 1 |

| IGBT supply unit | Main circuit breakers (115 V, UL) | | |
|---|---|---|---|
| **Type** | **Type** | **Ordering code** | **Qty** |
| **$U_N$ = 400 V** | | | |
| ACS880-204LC-0530A-3 | E4.2V-A 800 | 3AXD50000826148 | 1 |
| ACS880-204LC-0670A-3 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-0770A-3 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-1000A-3 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-1180A-3 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-1310A-3 | E4.2V-A 2000 | 3AXD50000826162 | 1 |
| ACS880-204LC-1500A-3 | E4.2V-A 2000 | 3AXD50000826162 | 1 |
| **$U_N$ = 500 V** | | | |
| ACS880-204LC-0530A-5 | E4.2V-A 800 | 3AXD50000826148 | 1 |
| ACS880-204LC-0670A-5 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-0770A-5 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-0990A-5 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-1180A-5 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-1310A-5 | E4.2V-A 2000 | 3AXD50000826162 | 1 |
| ACS880-204LC-1500A-5 | E4.2V-A 2000 | 3AXD50000826162 | 1 |
| **$U_N$ = 690 V** | | | |
| ACS880-204LC-0500A-7 | E4.2V-A 800 | 3AXD50000826148 | 1 |
| ACS880-204LC-0590A-7 | E4.2V-A 800 | 3AXD50000826148 | 1 |
| ACS880-204LC-0680A-7 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-0760A-7 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-0880A-7 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-1020A-7 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-1170A-7 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-1340A-7 | E4.2V-A 2000 | 3AXD50000826162 | 1 |

## Content of the 115 V air circuit breakers:

| | |
|---|---|
| • Ekip Dip LI 3p WMP | E2.2S-800<br>E2.2S-1250<br>E2.2S-1600<br>E2.2S-2000<br>E4.2V-A 800<br>E4.2V-A 1600<br>E4.2V-A 2000 |
| • RTC 250V E2.2...E6.2 | 1SDA073773R1 |
| • 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)<br>1SDA083025R1 (E4.2S),<br>1SDA083028R1 (E6.2V) |

| IGBT supply unit | Wagons (IEC) | | |
|---|---|---|---|
| **Type** | **Type** | **Ordering code** | **Qty** |
| **$U_N$ = 400 V** | | | |
| ACS880-204LC-0530A-3 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-0670A-3 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-0770A-3 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-1000A-3 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-1180A-3 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-1310A-3 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-1500A-3 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| **$U_N$ = 500 V** | | | |
| ACS880-204LC-0530A-5 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-0670A-5 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-0770A-5 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-0990A-5 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-1180A-5 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-1310A-5 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-1500A-5 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| **$U_N$ = 690 V** | | | |
| ACS880-204LC-0500A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-0590A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-0680A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-0760A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-0880A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-1020A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-1170A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-1340A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |

| IGBT supply unit | Wagons (UL) | | |
|---|---|---|---|
| **Type** | **Type** | **Ordering code** | **Qty** |
| **$U_N$ = 400 V** | | | |
| ACS880-204LC-0530A-3 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-0670A-3 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-0770A-3 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-1000A-3 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-1180A-3 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-1310A-3 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-1500A-3 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| **$U_N$ = 500 V** | | | |
| ACS880-204LC-0530A-5 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-0670A-5 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-0770A-5 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-0990A-5 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-1180A-5 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-1310A-5 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-1500A-5 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| **$U_N$ = 690 V** | | | |
| ACS880-204LC-0500A-7 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-0590A-7 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-0680A-7 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-0760A-7 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-0880A-7 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-1020A-7 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-1170A-7 | E4.2-A W 2500 | 3AXD50000039281 | 1 |
| ACS880-204LC-1340A-7 | E4.2-A W 2500 | 3AXD50000039281 | 1 |

## Content of the 115 V and 230 V IEC wagons:

| | |
|---|---|
| • E2.2 W 2000<br>• E2.2 W 2500<br>• E4.2 W 3200<br>• E4.2 W 4000 | E2.2 W FP Iu=2000 HR HR, IEC<br>E2.2 W FP Iu=2500 HR HR, IEC<br>E4.2 W FP Iu=3200 HR HR, IEC<br>E4.2 W FP Iu=4000 HR HR, IEC |
| • AUP 5 contacts 400Vac SX E2.2...E6.2 | 1SDA073764R1 |

## Content of the 115 V and 230 V UL wagons:

| | |
|---|---|
| • E4.2-A W 2500 | E4.2-A W FP Iu=2500 HR HR, UL |
| • AUP 5 contacts 400V E2.2...E6.2 - left set | 1SDA080373R1 |

### Main circuit breaker and wagon cover

One cover is needed for each main circuit breaker/wagon pair. See Drive 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 fuses

| IGBT supply unit | Main fuses | | | |
|---|---|---|---|---|
| Type | Type | Size | Ordering code | Qty |
| **$U_N$ = 400 V** | | | | |
| ACS880-204LC-0150A-3 | 170M4409 | 250 | 3AUA0000066038 | 3 |
| ACS880-204LC-0190A-3 | 170M4410 | 315 | 3AXD50000000234 | 3 |
| ACS880-204LC-0220A-3 | 170M4411 | 350 | 68731615 | 3 |
| ACS880-204LC-0270A-3 | 170M4413 | 450 | 68731623 | 3 |
| ACS880-204LC-0340A-3 | 170M4415 | 550 | 68731631 | 3 |
| ACS880-204LC-0420A-3 | 170M4417 | 700 | 64607383 | 3 |
| ACS880-204LC-0530A-3 | 170M6413 | 900 | 3AXD50000000148 | 3 |
| ACS880-204LC-0670A-3 | 170M6415 | 1100 | 68731658 | 3 |
| ACS880-204LC-0770A-3 | 170M6416 | 1250 | 68244463 | 3 |
| ACS880-204LC-1000A-3 | 170M7061 | 1600 | 3AUA0000220709 | 3 |
| ACS880-204LC-1180A-3 | 170M7062 | 2000 | 68689589 | 3 |
| ACS880-204LC-1310A-3 | 170M7063 | 2500 | 68752591 | 3 |
| ACS880-204LC-1500A-3 | 170M7063 | 2500 | 68752591 | 3 |
| **$U_N$ = 500 V** | | | | |
| ACS880-204LC-0150A-5 | 170M4409 | 250 | 3AUA0000066038 | 3 |
| ACS880-204LC-0180A-5 | 170M4410 | 315 | 3AXD50000000234 | 3 |
| ACS880-204LC-0220A-5 | 170M4411 | 350 | 68731615 | 3 |
| ACS880-204LC-0270A-5 | 170M4413 | 450 | 68731623 | 3 |
| ACS880-204LC-0340A-5 | 170M4415 | 550 | 68731631 | 3 |
| ACS880-204LC-0410A-5 | 170M4417 | 700 | 64607383 | 3 |
| ACS880-204LC-0530A-5 | 170M6413 | 900 | 3AXD50000000148 | 3 |
| ACS880-204LC-0670A-5 | 170M6415 | 1100 | 68731658 | 3 |
| ACS880-204LC-0770A-5 | 170M6416 | 1250 | 68244463 | 3 |
| ACS880-204LC-1000A-5 | 170M7061 | 1600 | 3AUA0000220709 | 3 |
| ACS880-204LC-1180A-5 | 170M7062 | 2000 | 68689589 | 3 |
| ACS880-204LC-1310A-5 | 170M7063 | 2500 | 68752591 | 3 |
| ACS880-204LC-1500A-5 | 170M7063 | 2500 | 68752591 | 3 |
| **$U_N$ = 690 V** | | | | |
| ACS880-204LC-0260A-7 | 170M4413 | 450 | 68731623 | 3 |
| ACS880-204LC-0310A-7 | 170M4414 | 500 | 3AXD50000000242 | 3 |
| ACS880-204LC-0350A-7 | 170M4416 | 630 | 3AXD50000000246 | 3 |

| IGBT supply unit | Main fuses | | | |
|---|---|---|---|---|
| Type | Type | Size | Ordering code | Qty |
| ACS880-204LC-0500A-7 | 170M6413 | 900 | 3AXD50000000148 | 3 |
| ACS880-204LC-0590A-7 | 170M6414 | 1000 | 68333296 | 3 |
| ACS880-204LC-0680A-7 | 170M6415 | 1100 | 68731658 | 3 |
| ACS880-204LC-0760A-7 | 170M6416 | 1250 | 68244463 | 3 |
| ACS880-204LC-0880A-7 | 170M7061 | 1600 | 3AUA0000220709 | 3 |
| ACS880-204LC-1020A-7 | 170M7062 | 2000 | 68689589 | 3 |
| ACS880-204LC-1170A-7 | 170M7062 | 2000 | 68689589 | 3 |
| ACS880-204LC-1340A-7 | 170M7063 | 2500 | 68752591 | 3 |

## AC fuses

The AC fuses protect the supply module in short circuits.

| IGBT supply unit | AC fuses | | | |
|---|---|---|---|---|
| Type | Type | Size | Ordering code | Qty |
| **$U_N$ = 400 V** | | | | |
| ACS880-204LC-0530A-3 | 170M4413 | 450 | 68731623 | 6 |
| ACS880-204LC-0670A-3 | 170M4415 | 550 | 68731631 | 6 |
| ACS880-204LC-0770A-3 | 170M4417 | 700 | 64607383 | 6 |
| ACS880-204LC-1000A-3 | 170M4415 | 550 | 68731631 | 9 |
| ACS880-204LC-1180A-3 | 170M4417 | 700 | 64607383 | 9 |
| ACS880-204LC-1310A-3 | 170M4415 | 550 | 68731631 | 12 |
| ACS880-204LC-1500A-3 | 170M4417 | 700 | 64607383 | 12 |
| **$U_N$ = 500 V** | | | | |
| ACS880-204LC-0530A-5 | 170M4413 | 450 | 68731623 | 6 |
| ACS880-204LC-0670A-5 | 170M4415 | 550 | 68731631 | 6 |
| ACS880-204LC-0770A-5 | 170M4417 | 700 | 64607383 | 6 |
| ACS880-204LC-1000A-5 | 170M4415 | 550 | 68731631 | 9 |
| ACS880-204LC-1180A-5 | 170M4417 | 700 | 64607383 | 9 |
| ACS880-204LC-1310A-5 | 170M4415 | 550 | 68731631 | 12 |
| ACS880-204LC-1500A-5 | 170M4417 | 700 | 64607383 | 12 |
| **$U_N$ = 690 V** | | | | |
| ACS880-204LC-0500A-7 | 170M4413 | 450 | 68731623 | 6 |
| ACS880-204LC-0590A-7 | 170M4414 | 500 | 3AXD50000000242 | 6 |
| ACS880-204LC-0680A-7 | 170M4416 | 630 | 3AXD50000000246 | 6 |
| ACS880-204LC-0760A-7 | 170M4413 | 450 | 68731623 | 9 |
| ACS880-204LC-0880A-7 | 170M4414 | 500 | 3AXD50000000242 | 9 |
| ACS880-204LC-1020A-7 | 170M4416 | 630 | 3AXD50000000246 | 9 |
| ACS880-204LC-1170A-7 | 170M4414 | 500 | 3AXD50000000242 | 12 |
| ACS880-204LC-1340A-7 | 170M4416 | 630 | 3AXD50000000246 | 12 |

### AC-DC charging kits for lineup charging

The capacitors in the drive DC link need to be charged during the start-up before connecting the module to a three-phase power line. The charging kit contains the main parts of the charging circuit.

**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). For example, 1×ISU + 2×INU means that there is one ISU with two INUs with the same capacitance. There can be more INUs as long as the capacitance limit is not exceeded. 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.

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

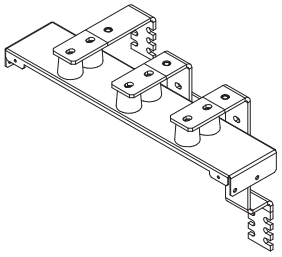
| ACS880-204LC-... | 2×INU | | 4×INU | | 6×INU | |
|---|---|---|---|---|---|---|
| | Ordering code (IEC) | Max. capa-citance (mF) | Ordering code (IEC) | Max. capa-citance (mF) | Ordering code (IEC) | Max. capa-citance (mF) |
| **$U_N$ = 400 V** | | | | | | |
| 0150A-3 | 3AXD50000250776 | 19.2 | 3AXD50000250776 | 32.0 | 3AXD50000250776 | 44.8 |
| 0190A-3 | 3AXD50000250776 | 19.2 | 3AXD50000250776 | 32.0 | 3AXD50000250776 | 44.8 |
| 0220A-3 | 3AXD50000250776 | 19.2 | 3AXD50000250776 | 32.0 | 3AXD50000250776 | 44.8 |
| 0270A-3 | 3AXD50000250776 | 28.8 | 3AXD50000250776 | 48.0 | 3AXD50000250776 | 67.2 |
| 0340A-3 | 3AXD50000250776 | 28.8 | 3AXD50000250776 | 48.0 | 3AXD50000250776 | 67.2 |
| 0420A-3 | 3AXD50000250776 | 28.8 | 3AXD50000250776 | 48.0 | 3AXD50000250776 | 67.2 |
| 0530A-3 | 3AXD50000250776 | 57.6 | 3AXD50000250776 | 96.0 | 3AXD50000250776 | 134.4 |
| 0670A-3 | 3AXD50000250776 | 57.6 | 3AXD50000250776 | 96.0 | 3AXD50000250776 | 134.4 |
| 0770A-3 | 3AXD50000250776 | 57.6 | 3AXD50000250776 | 96.0 | 3AXD50000250776 | 134.4 |
| 1000A-3 | 3AXD50000250776 | 86.4 | 3AXD50000250776 | 144.0 | 3AXD50000250776 | 201.6 |
| 1180A-3 | 3AXD50000250776 | 86.4 | 3AXD50000250776 | 144.0 | 3AXD50000250776 | 201.6 |
| 1310A-3 | 3AXD50000250776 | 115.2 | 3AXD50000250776 | 192.0 | 3AXD50000250776 | 268.8 |
| 1500A-3 | 3AXD50000250776 | 115.2 | 3AXD50000250776 | 192.0 | 3AXD50000250776 | 268.8 |
| **$U_N$ = 500 V** | | | | | | |
| 0150A-5 | 3AXD50000250776 | 19.2 | 3AXD50000250776 | 32.0 | 3AXD50000250776 | 44.8 |
| 0180A-5 | 3AXD50000250776 | 19.2 | 3AXD50000250776 | 32.0 | 3AXD50000250776 | 44.8 |
| 0220A-5 | 3AXD50000250776 | 19.2 | 3AXD50000250776 | 32.0 | 3AXD50000250776 | 44.8 |
| 0270A-5 | 3AXD50000250776 | 28.8 | 3AXD50000250776 | 48.0 | 3AXD50000250776 | 67.2 |
| 0340A-5 | 3AXD50000250776 | 28.8 | 3AXD50000250776 | 48.0 | 3AXD50000250776 | 67.2 |
| 0410A-5 | 3AXD50000250776 | 28.8 | 3AXD50000250776 | 48.0 | 3AXD50000250776 | 67.2 |
| 0530A-5 | 3AXD50000250776 | 57.6 | 3AXD50000250776 | 96.0 | 3AXD50000250776 | 134.4 |
| 0670A-5 | 3AXD50000250776 | 57.6 | 3AXD50000250776 | 96.0 | 3AXD50000250776 | 134.4 |
| 0770A-5 | 3AXD50000250776 | 57.6 | 3AXD50000250776 | 96.0 | 3AXD50000250776 | 134.4 |
| 1000A-5 | 3AXD50000250776 | 86.4 | 3AXD50000250776 | 144.0 | 3AXD50000250776 | 201.6 |
| 1180A-5 | 3AXD50000250776 | 86.4 | 3AXD50000250776 | 144.0 | 3AXD50000250776 | 201.6 |
| 1310A-5 | 3AXD50000250776 | 115.2 | 3AXD50000250776 | 192.0 | 3AXD50000250776 | 268.8 |
| 1500A-5 | 3AXD50000250776 | 115.2 | 3AXD50000250776 | 192.0 | 3AXD50000250776 | 268.8 |
| **$U_N$ = 690 V** | | | | | | |
| 0260A-7 | 3AXD50000250776 | 15.9 | 3AXD50000250776 | 26.5 | 3AXD50000250776 | 37.1 |
| 0310A-7 | 3AXD50000250776 | 15.9 | 3AXD50000250776 | 26.5 | 3AXD50000250776 | 37.1 |
| 0350A-7 | 3AXD50000250776 | 15.9 | 3AXD50000250776 | 26.5 | 3AXD50000250776 | 37.1 |
| 0500A-7 | 3AXD50000250776 | 32.1 | 3AXD50000250776 | 53.5 | 3AXD50000250776 | 74.9 |
| 0590A-7 | 3AXD50000250776 | 32.1 | 3AXD50000250776 | 53.5 | 3AXD50000250776 | 74.9 |
| 0680A-7 | 3AXD50000250776 | 32.1 | 3AXD50000250776 | 53.5 | 3AXD50000250776 | 74.9 |
| 0760A-7 | 3AXD50000250776 | 48.0 | 3AXD50000250776 | 80.0 | 3AXD50000250790 | 112.0 |
| 0880A-7 | 3AXD50000250776 | 48.0 | 3AXD50000250776 | 80.0 | 3AXD50000250790 | 112.0 |
| 1020A-7 | 3AXD50000250776 | 48.0 | 3AXD50000250776 | 80.0 | 3AXD50000250790 | 112.0 |
| 1170A-7 | 3AXD50000250776 | 63.9 | 3AXD50000250790 | 106.5 | 3AXD50000250790 | 149.1 |

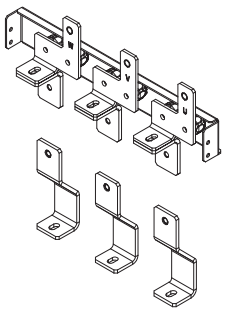
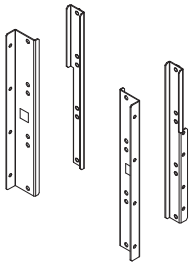
| ACS880-204LC-... | 2×INU | | 4×INU | | 6×INU | |
|---|---|---|---|---|---|---|
| | Ordering code (IEC) | Max. capa-citance (mF) | Ordering code (IEC) | Max. capa-citance (mF) | Ordering code (IEC) | Max. capa-citance (mF) |
| 1340A-7 | 3AXD50000250776 | 63.9 | 3AXD50000250790 | 106.5 | 3AXD50000250790 | 149.1 |

| ACS880-204LC-... | 2×INU | | 4×INU | | 6×INU | |
|---|---|---|---|---|---|---|
| | Ordering code (UL) | Max. capa-citance (mF) | Ordering code ((UL) | Max. capa-citance (mF) | Ordering code ((UL) | Max. capa-citance (mF) |
| **$U_N$ = 400 V** | | | | | | |
| 0150A-3 | 3AXD50000686308 | 19.2 | 3AXD50000686308 | 32.0 | 3AXD50000686308 | 44.8 |
| 0190A-3 | 3AXD50000686308 | 19.2 | 3AXD50000686308 | 32.0 | 3AXD50000686308 | 44.8 |
| 0220A-3 | 3AXD50000686308 | 19.2 | 3AXD50000686308 | 32.0 | 3AXD50000686308 | 44.8 |
| 0270A-3 | 3AXD50000686308 | 28.8 | 3AXD50000686308 | 48.0 | 3AXD50000686308 | 67.2 |
| 0340A-3 | 3AXD50000686308 | 28.8 | 3AXD50000686308 | 48.0 | 3AXD50000686308 | 67.2 |
| 0420A-3 | 3AXD50000686308 | 28.8 | 3AXD50000686308 | 48.0 | 3AXD50000686308 | 67.2 |
| **$U_N$ = 500 V** | | | | | | |
| 0150A-5 | 3AXD50000686308 | 19.2 | 3AXD50000686308 | 32.0 | 3AXD50000686308 | 44.8 |
| 0180A-5 | 3AXD50000686308 | 19.2 | 3AXD50000686308 | 32.0 | 3AXD50000686308 | 44.8 |
| 0220A-5 | 3AXD50000686308 | 19.2 | 3AXD50000686308 | 32.0 | 3AXD50000686308 | 44.8 |
| 0270A-5 | 3AXD50000686308 | 28.8 | 3AXD50000686308 | 48.0 | 3AXD50000686308 | 67.2 |
| 0340A-5 | 3AXD50000686308 | 28.8 | 3AXD50000686308 | 48.0 | 3AXD50000686308 | 67.2 |
| 0410A-5 | 3AXD50000686308 | 28.8 | 3AXD50000686308 | 48.0 | 3AXD50000686308 | 67.2 |
| **$U_N$ = 690 V** | | | | | | |
| 0260A-7 | 3AXD50000686308 | 15.9 | 3AXD50000686308 | 26.5 | 3AXD50000686308 | 37.1 |
| 0310A-7 | 3AXD50000686308 | 15.9 | 3AXD50000686308 | 26.5 | 3AXD50000686308 | 37.1 |
| 0350A-7 | 3AXD50000686308 | 15.9 | 3AXD50000686308 | 26.5 | 3AXD50000686308 | 37.1 |

Note that the charging kits (UL) are not available for frames 2×R7i…4×R7i. Contact your local ABB representative. For charging kit contents, see the technical data.

### AC busbars

| Used with | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 600 mm VX25 enclosure | 1 | 3AXD50001013516 | L-6-7-114-VX |  Instruction code: 3AXD50001012540 |

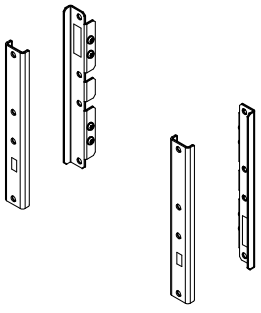
| Used with | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 600 mm VX25 enclosure | 1 | 3AXD50001013530 | L-6-7-115-VX |  Instruction code: 3AXD50001013387 |
| 600 mm VX25 enclosure | 1 | 3AXD50000371013 | L-6-X-012-VX |  Instruction code: 3AXD50000370870 |

## DC-side components

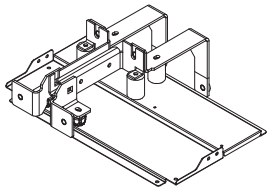
### DC bus installation parts (for Rittal VX25 enclosures)

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

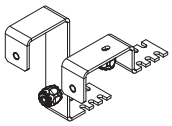
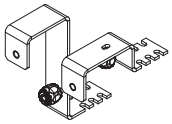
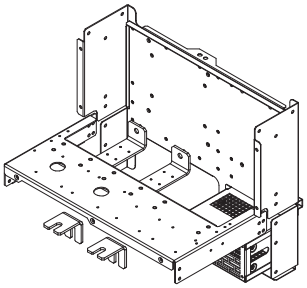
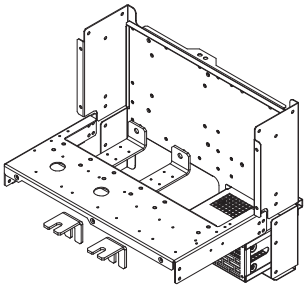
The designs shown in this manual for Rittal VX25 enclosures use the Rittal Flat-PLS busbar system. Make sure that the current in the drive system does not exceed the current-carrying capacity of the busbars.

| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| VX25 enclosure | 1 kit per cubicle | 3AXD50000333387 | A-468-X-001-VX |  Instruction code: 3AXD50000333639 |

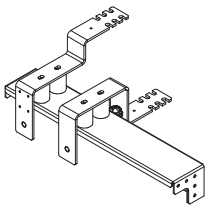
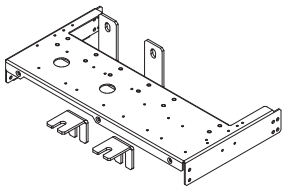
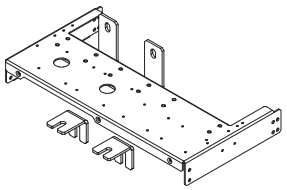
### DC connection parts (for Rittal VX25 enclosures)

| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 600 mm VX25 enclosure | 1 | 3AXD50001013554 | L-6-7-275-VX |  Instruction code: 3AXD50001048426 |

Units with DC switch

| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 600 mm VX25 enclosure and OT400 | 1 | 3AXD50001013592 | L-6-7-218-VX |  Instruction code: 3AXD50001061142 |
| 600 mm VX25 enclosure and OT600 | 1 | 3AXD50001013608 | L-6-7-219-VX |  Instruction code: 3AXD50001060497 |
| 600 mm VX25 enclosure and OT400 | 1 | 3AXD50001013561 | L-6-7-276-VX |  Instruction code: 3AXD50001050245 |
| 600 mm VX25 enclosure and OT600 | 1 | 3AXD50001013578 | L-6-7-277-VX |  Instruction code: 3AXD50001050757 |

Units without DC switch (fuses only)

| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 600 mm VX25 enclosure | 1 | 3AXD50001013615 | L-6-7-220-VX |  Instruction code: 3AXD50001059330 |
| 600 mm VX25 enclosure | 1 | 3AXD50001013585 | L-6-7-278-VX |  Instruction code: 3AXD50001059767 |
| 600 mm VX25 enclosure | 1 | 3AXD50001058944 | L-6-7-279-VX |  Instruction code: 3AXD50001059750 |

## DC fuses

| IGBT supply unit | DC fuses | | | |
|---|---|---|---|---|
| Type | Type | Size | Ordering code | Qty |
| **$U_N$ = 400 V** | | | | |
| ACS880-204LC-0150A-3 | 170M4391 | 315 | 3AXD50000010196 | 2 |
| ACS880-204LC-0190A-3 | 170M4393 | 400 | 3AUA0000076327 | 2 |
| ACS880-204LC-0220A-3 | 170M6541 | 450 | 68735971 | 2 |
| ACS880-204LC-0270A-3 | 170M6543 | 550 | 3AXD50000698752 | 2 |
| ACS880-204LC-0340A-3 | 170M6545 | 700 | 68735980 | 2 |
| ACS880-204LC-0420A-3 | 170M6547 | 900 | 63919381 | 2 |
| ACS880-204LC-0530A-3 | 170M6543 | 550 | 3AXD50000698752 | 4 |
| ACS880-204LC-0670A-3 | 170M6545 | 700 | 68735980 | 4 |
| ACS880-204LC-0770A-3 | 170M6547 | 900 | 63919381 | 4 |
| ACS880-204LC-1000A-3 | 170M6545 | 700 | 68735980 | 6 |
| ACS880-204LC-1180A-3 | 170M6547 | 900 | 63919381 | 6 |
| ACS880-204LC-1310A-3 | 170M6545 | 700 | 68735980 | 8 |
| ACS880-204LC-1500A-3 | 170M6547 | 900 | 63919381 | 8 |
| **$U_N$ = 500 V** | | | | |

| IGBT supply unit | DC fuses | | | |
|---|---|---|---|---|
| **Type** | **Type** | **Size** | **Ordering code** | **Qty** |
| ACS880-204LC-0150A-5 | 170M4391 | 315 | 3AXD50000010196 | 2 |
| ACS880-204LC-0180A-5 | 170M4393 | 400 | 3AUA0000076327 | 2 |
| ACS880-204LC-0220A-5 | 170M6541 | 450 | 68735971 | 2 |
| ACS880-204LC-0270A-5 | 170M6543 | 550 | 3AXD50000698752 | 2 |
| ACS880-204LC-0340A-5 | 170M6545 | 700 | 68735980 | 2 |
| ACS880-204LC-0410A-5 | 170M6547 | 900 | 63919381 | 2 |
| ACS880-204LC-0530A-5 | 170M6543 | 550 | 3AXD50000698752 | 4 |
| ACS880-204LC-0670A-5 | 170M6545 | 700 | 68735980 | 4 |
| ACS880-204LC-0770A-5 | 170M6547 | 900 | 63919381 | 4 |
| ACS880-204LC-1000A-5 | 170M6545 | 700 | 68735980 | 6 |
| ACS880-204LC-1180A-5 | 170M6547 | 900 | 63919381 | 6 |
| ACS880-204LC-1310A-5 | 170M6545 | 700 | 68735980 | 8 |
| ACS880-204LC-1500A-5 | 170M6547 | 900 | 63919381 | 8 |
| **$U_N$ = 690 V** | | | | |
| ACS880-204LC-0260A-7 | 170M6543 | 550 | 3AXD50000698752 | 2 |
| ACS880-204LC-0310A-7 | 170M6544 | 630 | 63903167 | 2 |
| ACS880-204LC-0350A-7 | 170M6545 | 700 | 68735980 | 2 |
| ACS880-204LC-0500A-7 | 170M6543 | 550 | 3AXD50000698752 | 4 |
| ACS880-204LC-0590A-7 | 170M6544 | 630 | 63903167 | 4 |
| ACS880-204LC-0680A-7 | 170M6545 | 700 | 68735980 | 4 |
| ACS880-204LC-0760A-7 | 170M6543 | 550 | 3AXD50000698752 | 6 |
| ACS880-204LC-0880A-7 | 170M6544 | 630 | 63903167 | 6 |
| ACS880-204LC-1020A-7 | 170M6545 | 700 | 68735980 | 6 |
| ACS880-204LC-1170A-7 | 170M6544 | 630 | 63903167 | 8 |
| ACS880-204LC-1340A-7 | 170M6545 | 700 | 68735980 | 8 |

### DC switch-disconnector kits for unit charging

For further information on using the kits, see section Supply unit control devices (page 41).

| Used with... ACS880-204LC-... | IEC/UL | Switch type Handle type Shaft type | Qty | Ordering code | Instruction code |
|---|---|---|---|---|---|
| 0150A-3<br>0190A-3<br>0150A-5<br>0180A-5 | IEC | OT400E11<br>OHB95J12<br>OXP12X395 | 1 | 3AXD50000823369 | 3AXD50000823352 |
| | UL | OT400U11<br>OHB95J12<br>OXP12X395 | 1 | 3AXD50000823383 | 3AXD50000823352 |
| 0220A-3<br>0270A-3<br>0340A-3<br>0420A-3<br>0220A-5<br>0270A-5<br>0310A-5<br>0410A-5<br>0260A-7<br>0310A-7<br>0350A-7 | IEC | OT630E11<br>OHB145J12<br>OXP12X465 | 1 | 3AXD50000823376 | 3AXD50000823352 |
| | UL | OT600U11<br>OHB145J12<br>OXP12X465 | 1 | 3AXD50000823390 | 3AXD50000823352 |

The kit contains the following components:

- DC switch-disconnector (type indicated in table)
- Operating handle (type indicated in table)
- Operating shaft (type indicated in table)
- Two OA1G10 and two OA3G01 auxiliary contacts
- OTZT2A (OT4…) or OTZT3A (OT6…) interlock
- PDAL2/24DC interlock
- OHZX10 alignment ring.

Note that the kits are not available for frames 2×R7i…4×R7i. Contact your local ABB representative.

### Unit charging components (for units with DC switch-disconnector)

A unit charging circuit is required if the supply unit is equipped with a DC switch/disconnector.

Unit charging kit for frame 1×R7i

| IEC/UL | Switch type | Qty | Ordering code | Instruction code |
|---|---|---|---|---|
| IEC | OS160GD04F | 1 | 3AXD50000826933 | 3AXD50000827046 |

| IEC/UL | Switch type | Qty | Ordering code | Instruction code |
|---|---|---|---|---|
| UL | OS100GJ04F | 1 | 3AXD50000826940 | 3AXD50000827046 |

The kit contains the following components:

- Charging switch (type indicated in table) with terminal shrouds
- OHB65J6 operating handle
- OXP6X430 operating shaft
- 2 pcs of OA3G01 auxiliary contacts
- BSFC-12C charging controller
- 4 pcs 170M2676 fuses and fuse holders (kit 3AXD50000826940 contains FWJ-30A fuses and conversion parts)
- OHZX10 alignment ring.

Charging resistors for frame 1×R7i

| Used with... | Qty | Ordering code | Data |
|---|---|---|---|
| Frame R7i with DC switch (IEC, UL) | 4 | 10028531 | 33 ohm |

Fiber optic cables

A pair of optical cables is needed to connect the charging controller to the supply module.

Each of the kits in the table below contain a pair of plastic fiber-optic cables that are needed in communication between the control unit and the power (inverter/supply/brake/converter) module.

| Length | Kit type designation | Ordering code |
|---|---|---|
| 2 m (6.6 ft) | NLWC-02 | 58988821 |
| 3 m (9.8 ft) | NLWC-03 | 58948233 |
| 5 m (16.4 ft) | NLWC-05 | 58948250 |
| 7 m (23 ft) | NLWC-07 | 58948268 |
| 10 m (32.8 ft) | NLWC-10 | 58948276 |

### Switch-disconnector for lineup charging

Switch-disconnector for lineup charging is needed when the delivery contains both lineup charging and unit charging. For further information on using the kits, see section Supply unit control devices (page 41).

| Used with... | Switch-disconnector for lineup charging (IEC) | | | | |
|---|---|---|---|---|---|
| | Type | Rating | Qty | Ordering code | Instruction code |
| Frame 1×R7i | OT630E11 kit | 630 A, 1000 V | 1 | 3AXD50000507078 | 3AXD50000660582 |

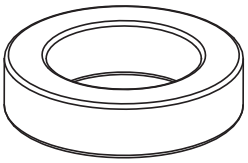
| Used with... | Switch-disconnector for lineup charging (UL) | | | |
|---|---|---|---|---|
| | Type | Qty | Ordering code | Instruction code |
| Frame 1×R7i | OT600U11 | 1 | 3AXD50000686674 | 3AXD50000660582 |

The kit contains the following components:

- OXP12X250 operating shaft
- OHB150J12P operating handle
- OA1G10 auxiliary contact
- OHZX10 alignment ring.

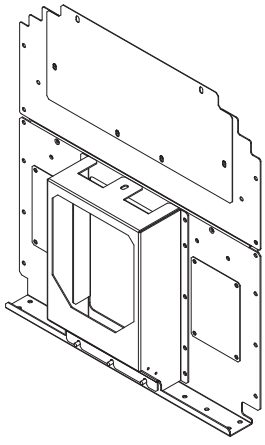
### Common mode filters

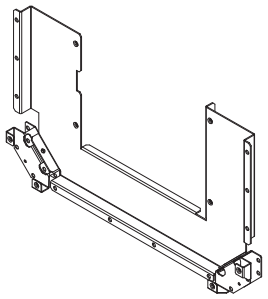
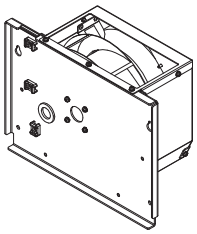
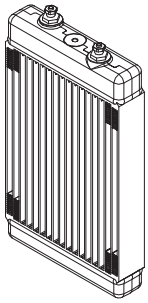
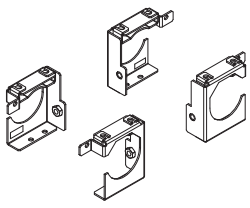
Common mode filtering reduces bearing currents and is required for electromagnetic compatibility (EMC). The filtering is implemented by installing two toroidal cores onto the DC busbars.

| Used with | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| All enclosure types | 2 per module | 3AXD50000566785 | - |  |

## Cooling system parts (1×R7i)

### Cooling system parts (600 mm VX25 enclosure)

| Component | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| Heat exchanger assembly | 1 | 3AXD50001013622 | L-6-7-446-VX |  Instruction code: 3AXD50001061906 |

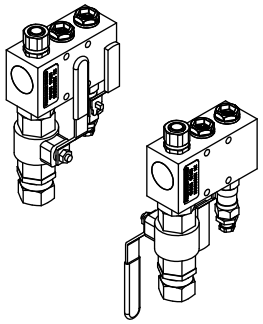
| Component | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| Fan mechanics | 1 | 3AXD50001013639 | L-6-7-447-VX |  Instruction code: 3AXD50001062439 |
| BLCL-13LC-7 (600 mm Rittal VX25 enclosure) | 1 / filter cubicle | 3AXD50000344970 | L-6-8-405 |  **Note:** Fan to be ordered separately. |
| BLCL-13LC-7 (600 mm Rittal VX25 enclosure) | 1 | 3AXD50000479795 | L-468-8-446 |  Instruction code: 3AXD50000431588 |
| Main pipe support kit | 1 | 3AXD50001155179 | L-468-X-450-VX |  Instruction code: 3AXD50001155353 |

### Cabinet fans (600 mm VX25 enclosure)

The fan is selected according to the auxiliary voltage.

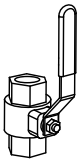
| Auxiliary voltage | Qty | Ordering code |
|---|---|---|
| 230 V AC (50/60 Hz) | 1 | 3AXD50000050763 |
| 115 V AC (50/60 Hz) | 1 | 3AXD50000050767 |

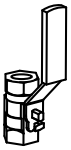
### Coolant distribution manifold kits

| Enclosure | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 400 mm VX25 enclosure | 1 | 3AXD50000044084 | L-468-8-441 |  Instruction code: 3AXD50000048217 |

The manifold kits contain:

 Inlet and outlet manifolds

 Inlet and outlet valves

 Drain valves

 Nipples for connecting the valves to manifolds

 Connectors for PA piping

 Plugs for unused piping connectors

 Chokes for flow limitation – not used with the ACS880-204LC.

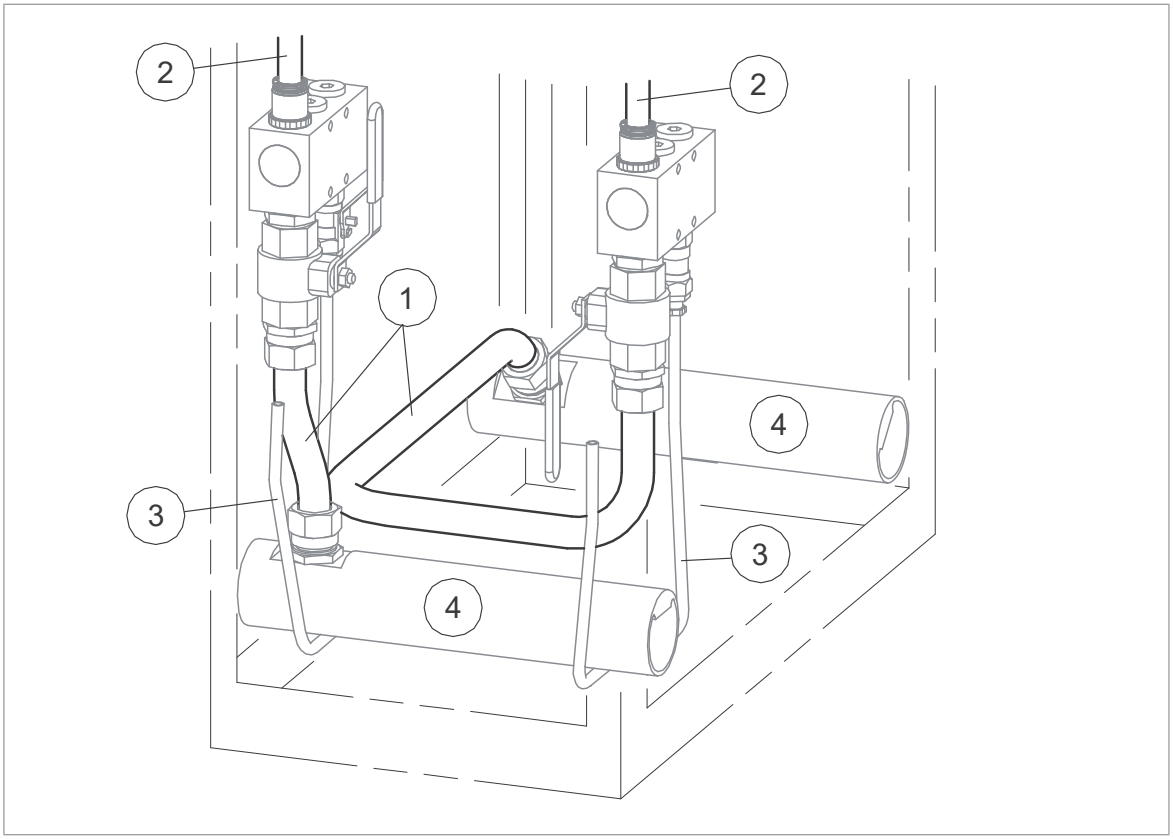
You must order the following parts separately as they are not included in the manifold kits:

- Connectors to attach to inlet, outlet and drain valves
- Connectors to attach to main pipes
- Pipes between main pipe and inlet/outlet valves
- Main pipes
- Drain pipes.

**Note:** The inlet and outlet valves have an R3/4" internal thread. The drain valves have an R3/8" internal thread.

## Piping

PA (polyamide) pipe is available in various diameters on 50-meter reels. Refer to the image for application.




| Item | Data | Ordering code |
|---|---|---|
| 1 | PA12P40, 22/18 mm, 50 m | 3AXD50000441419 |
| 2[1)] | PA12P40, 16/13 mm, 50 m<br>PA12P40, 6/4 mm, 100 m | 3AXD50000047488<br>3AXD50001075316 |
| 3 | PA11P40, 8/6 mm, 50 m | 3AXD50000419302 |
| 4 | Available on request | |

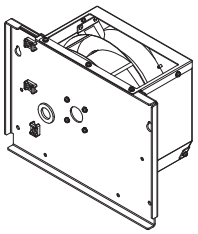
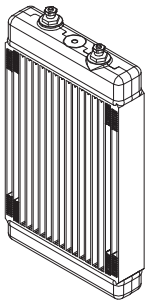
1) Use 16/13 mm pipe for the R7i module and LCL filter, which are connected in series between the manifolds. Use 8/6 mm pipe for the heat exchanger, which is connected in parallel with the module and LCL filter between the manifolds.

## Cooling system parts (example drive with 4×R7i + 4×R7i)

This section lists the cooling system parts for a supply unit with LCL filter of an example drive. Refer to Drive with 4×R7i + 4×R7i modules in a low-height enclosure (page 185). For the inverter unit cooling system components, refer to ACS880-104LC hardware manual.

### Fan mechanics and heat exchanger

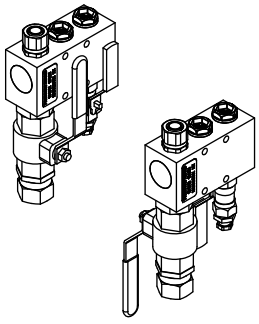
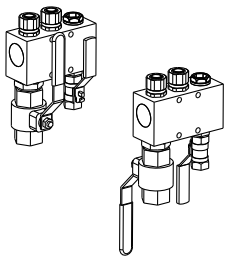
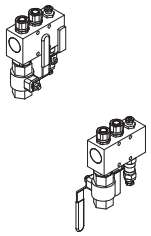
This section shows the order codes for the cooling fan mechanics and heat exchanger for the LCL filter cubicles. Use the same components in inverter module cubicle and the output terminals cubicle of the example drive. You need to install one air-to-liquid heat exchanger and cooling fan per cubicle.

| Component | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| LCL fan mechanics (600 mm Rittal VX25 or generic enclosure) | 3 | 3AXD50000344970 | L-6-8-405 |  **Note:** Fan to be ordered separately. |
| LCL fan mechanics (600 mm Rittal VX25 or generic enclosure) | 3 | 3AXD50000479795 | L-468-8-446 |  Instruction code: 3AXD50000431588 |

### Cabinet fans

| Component | Qty | Ordering code |
|---|---|---|
| Centrifugal fan, 115 V AC, or<br>Centrifugal fan, 230 V AC | 3 | 3AXD50000050767<br>3AXD50000050763 |

## Coolant distribution manifold kits

| Frame size | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 2×R7i<br>4×R7i | 2 | 3AXD50000044084 | L-468-8-441 |  <br>Instruction code:<br>3AXD50000048217 |
| 3×R7i | 3 | | | |
| 3×R7i<br>4×R7i | 1 | 3AXD50000044182 | L-468-8-442 |  <br>Instruction code:<br>3AXD50000048258 |
| 2×R7i<br>4×R7i | 1 | 3AXD50000479788 | L-468-8-445 |  <br>Instruction code:<br>3AXD50000479634 |

# Frame R8i and multiples

## IGBT supply modules

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

| IGBT supply unit | | Modules used | |
|---|---|---|---|
| **Type** | **Frame size** | **Qty** | **Ordering code (for options see below)** |
| **$U_N$ = 690 V** | | | |
| ACS880-204LC-0360A-7 | R8i | 1 | ACS880-104LC-0390A-7+E205 |
| ACS880-204LC-0400A-7 | R8i | 1 | ACS880-104LC-0430A-7+E205 |
| ACS880-204LC-0450A-7 | R8i | 1 | ACS880-104LC-0480A-7+E205 |
| ACS880-204LC-0480A-7 | R8i | 1 | ACS880-104LC-0530A-7+E205 |
| ACS880-204LC-0560A-7 | R8i | 1 | ACS880-104LC-0600A-7+E205 |
| ACS880-204LC-0620A-7 | R8i | 1 | ACS880-104LC-0670A-7+E205 |
| ACS880-204LC-0700A-7 | R8i | 1 | ACS880-104LC-0750A-7+E205 |
| ACS880-204LC-0770A-7 | R8i | 1 | ACS880-104LC-0850A-7+E205 |
| ACS880-204LC-0930A-7 | 2×R8i | 2 | ACS880-104LC-0530A-7+E205 |
| ACS880-204LC-1090A-7 | 2×R8i | 2 | ACS880-104LC-0600A-7+E205 |
| ACS880-204LC-1180A-7 | 2×R8i | 2 | ACS880-104LC-0670A-7+E205 |
| ACS880-204LC-1360A-7 | 2×R8i | 2 | ACS880-104LC-0750A-7+E205 |
| ACS880-204LC-1500A-7 | 2×R8i | 2 | ACS880-104LC-0850A-7+E205 |
| ACS880-204LC-1800A-7 | 3×R8i | 3 | ACS880-104LC-0670A-7+E205 |
| ACS880-204LC-2020A-7 | 3×R8i | 3 | ACS880-104LC-0750A-7+E205 |
| ACS880-204LC-2220A-7 | 3×R8i | 3 | ACS880-104LC-0850A-7+E205 |
| ACS880-204LC-2670A-7 | 4×R8i | 4 | ACS880-104LC-0750A-7+E205 |
| ACS880-204LC-2930A-7 | 4×R8i | 4 | ACS880-104LC-0850A-7+E205 |
| ACS880-204LC-3320A-7 | 5×R8i | 5 | ACS880-104LC-0750A-7+E205 |
| ACS880-204LC-3840A-7 | 6×R8i | 6 | ACS880-104LC-0750A-7+E205 |
| ACS880-204LC-4360A-7 | 6×R8i | 6 | ACS880-104LC-0850A-7+E205 |
| ACS880-204LC-5240A-7 | 8×R8i | 8 | ACS880-104LC-0750A-7+E205 |
| ACS880-204LC-5810A-7 | 8×R8i | 8 | ACS880-104LC-0850A-7+E205 |

| Ordering code format | Option codes |
|---|---|
| [Module type] +code [+code] …<br>For example,<br>**ACS880-104LC-0480A-7 +E205** | **+E205**: Internal du/dt filtering. Standard with 690 V modules. |

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

- LCL filter or CL filter
- ACS-AP-W or ACS-AP-I control panel (required for commissioning)
- Control unit
- Common mode filters
- Quick connector
- Fiber optic cables (from control unit to each IGBT supply module).

Other parts given in this chapter can be required by the application or make the installation of the module easier.

## LCL filters

LCL filter delivery contains LCL filter components as loose parts. LCL filter contains the grid-side choke, converter-side choke, capacitors and resistor. For contents, see Kit contents of the LCL filters.

| ACS880-204LC-... | LCL filter | | |
|---|---|---|---|
| | LCL filter type | Qty | Ordering code |
| **$U_N$ = 690 V** | | | |
| 0360A-7 | BLCL-15LC-7 | 1 | 3AXD50000234417 |
| 0400A-7 | BLCL-15LC-7 | 1 | 3AXD50000234417 |
| 0450A-7 | BLCL-15LC-7 | 1 | 3AXD50000234417 |
| 0480A-7 | BLCL-15LC-7 | 1 | 3AXD50000234417 |
| 0560A-7 | BLCL-15LC-7 | 1 | 3AXD50000234417 |
| 0620A-7 | BLCL-15LC-7 | 1 | 3AXD50000234417 |
| 0700A-7 | BLCL-15LC-7 | 1 | 3AXD50000234417 |
| 0770A-7 | BLCL-15LC-7 | 1 | 3AXD50000234417 |
| 0930A-7 | BLCL-24LC-7 | 1 | 3AXD50000234431 |
| 1090A-7 | BLCL-24LC-7 | 1 | 3AXD50000234431 |
| 1180A-7 | BLCL-24LC-7 | 1 | 3AXD50000234431 |
| 1360A-7 | BLCL-25LC-7 | 1 | 3AXD50000234448 |
| 1500A-7 | BLCL-25LC-7 | 1 | 3AXD50000234448 |
| 1800A-7 | BLCL-24LC-7 | 2 | 3AXD50000234431 |
| 2020A-7 | BLCL-24LC-7 | 2 | 3AXD50000234431 |
| 2220A-7 | BLCL-24LC-7 | 2 | 3AXD50000234431 |
| 2670A-7 | BLCL-25LC-7 | 2 | 3AXD50000234448 |
| 2930A-7 | BLCL-25LC-7 | 2 | 3AXD50000234448 |
| 3320A-7 | BLCL-24LC-7 | 3 | 3AXD50000234431 |
| 3840A-7 | BLCL-24LC-7 *) | 4 | 3AXD50000234431 |
| 4360A-7 | BLCL-24LC-7 *) | 4 | 3AXD50000234431 |
| 5240A-7 | BLCL-25LC-7 | 4 | 3AXD50000234448 |
| 5810A-7 | BLCL-25LC-7 | 4 | 3AXD50000234448 |

*) 3×BLCL-25LC-7 for UL

## CL filters

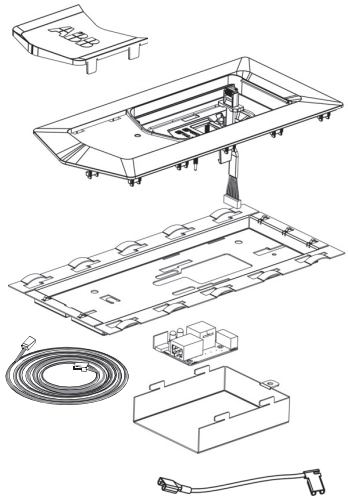
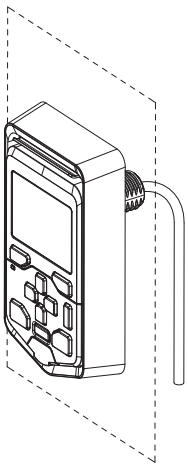
CL filter delivery contains CL filter components as loose parts. CL filter contains the converter-side choke, capacitors and resistor. For contents, see CL filters (page 378).

| ACS880-204LC-... | CL filter | | |
|---|---|---|---|
| | CL filter type | Qty | Ordering code |
| **$U_N$ = 690 V** | | | |
| 0360A-7 | BCL-15LC-7 | 1 | 3AXD50001373979 |
| 0400A-7 | BCL-15LC-7 | 1 | 3AXD50001373979 |
| 0450A-7 | BCL-15LC-7 | 1 | 3AXD50001373979 |
| 0480A-7 | BCL-15LC-7 | 1 | 3AXD50001373979 |
| 0560A-7 | BCL-15LC-7 | 1 | 3AXD50001373979 |
| 0620A-7 | BCL-15LC-7 | 1 | 3AXD50001373979 |
| 0700A-7 | BCL-15LC-7 | 1 | 3AXD50001373979 |
| 0770A-7 | BCL-15LC-7 | 1 | 3AXD50001373979 |
| 0930A-7 | BCL-24LC-7 | 1 | 3AXD50001373986 |
| 1090A-7 | BCL-24LC-7 | 1 | 3AXD50001373986 |
| 1180A-7 | BCL-24LC-7 | 1 | 3AXD50001373986 |
| 1360A-7 | BCL-25LC-7 | 1 | 3AXD50001373993 |
| 1500A-7 | BCL-25LC-7 | 1 | 3AXD50001373993 |
| 1800A-7 | BCL-24LC-7 | 2 | 3AXD50001373986 |
| 2020A-7 | BCL-24LC-7 | 2 | 3AXD50001373986 |
| 2220A-7 | BCL-24LC-7 | 2 | 3AXD50001373986 |
| 2670A-7 | BCL-25LC-7 | 2 | 3AXD50001373993 |
| 2930A-7 | BCL-25LC-7 | 2 | 3AXD50001373993 |
| 3320A-7 | - | - | - |
| 3840A-7 | BCL-24LC-7 | 4 | 3AXD50001373986 |
| 4360A-7 | BCL-24LC-7 | 4 | 3AXD50001373986 |
| 5240A-7 | BCL-25LC-7 | 4 | 3AXD50001373993 |
| 5810A-7 | BCL-25LC-7 | 4 | 3AXD50001373993 |

## 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, refer to ACS-AP-I, -S, -W and ACH-AP-H, -W Assistant control panels user's manual (3AUA0000085685 [English]).

| Type | Description | Ordering code | Illustration |
|---|---|---|---|
| ACS-AP-W | Control panel with Bluetooth | 3AXD50000025965 |   |
| DPMP-01 | Door mounting kit (IP55) | 3AUA0000108878 |  |
| DPMP-02 | Door mounting kit (IP65) | 3AXD50000009374 |  |

For more information on the door mounting kits, such as the contents of the kit, refer to the installation manuals:

- DPMP-01 mounting platform for control panels installation guide (3AUA0000100140 [English])
- DPMP-02/03 mounting platform for control panels installations guide (3AUA0000136205 [English]).

## Control electronics

### Control unit (UCU)

One UCU control unit is required per IGBT supply unit. The type of the control unit depends on the number of supply modules as shown below. The control unit is delivered with a memory unit containing the ACS880 IGBT supply control program.

| IGBT supply module type | Control unit type | Ordering code |
|---|---|---|
| **$U_N$ = 690 V** | | |
| ACS880-204LC-0360A-7 | UCU-22 | ACS880UCU-204-22-0 |
| ACS880-204LC-0400A-7 | | |
| ACS880-204LC-0450A-7 | | |
| ACS880-204LC-0480A-7 | | |
| ACS880-204LC-0560A-7 | | |
| ACS880-204LC-0620A-7 | | |
| ACS880-204LC-0700A-7 | | |
| ACS880-204LC-0770A-7 | | |
| ACS880-204LC-0930A-7 | UCU-22, if BAMU auxiliary measurement unit is not used<br>UCU-23, if BAMU auxiliary measurement unit is used | ACS880UCU-204-22-0<br>ACS880UCU-204-23-0 |
| ACS880-204LC-1090A-7 | | |
| ACS880-204LC-1180A-7 | | |
| ACS880-204LC-1360A-7 | | |
| ACS880-204LC-1500A-7 | | |
| ACS880-204LC-1800A-7 | UCU-23 | ACS880UCU-204-23-0 |
| ACS880-204LC-2020A-7 | | |
| ACS880-204LC-2220A-7 | | |
| ACS880-204LC-2670A-7 | | |
| ACS880-204LC-2930A-7 | | |
| ACS880-204LC-3320A-7 | UCU-23 | ACS880UCU-204-23-0 |
| ACS880-204LC-3840A-7 | | |
| ACS880-204LC-4360A-7 | | |
| ACS880-204LC-5240A-7 | UCU-23, if BAMU auxiliary measurement unit is not used<br>UCU-24, if BAMU auxiliary measurement unit is used | ACS880UCU-204-23-0<br>ACS880UCU-204-24-0 |
| ACS880-204LC-5810A-7 | | |

| Ordering code format | Option codes |
|---|---|
| [Control unit type] + code [+code]…<br>For example, ACS880UCU-204-22-0+N8010 | **+N8010:** Application programming<br>**+N8053:** Optimal grid control |

The UCU control unit kit contains:

- UCU control unit with USCA-02 adapters.
- UMU-01 memory unit with the control program.

The following option module is to be installed on the control unit and must be ordered separately if communication between supply and drive units is needed:

- RDCO-04C DDCS communication option module (ordering code: 3AXD50000868056).

**Control unit (BCU)**

One BCU control unit is required per IGBT supply unit. The type of the control unit depends on the number of supply modules as shown below. The control unit is delivered with a memory unit containing the ACS880 IGBT supply control program.

| Frame size | Control unit type | Ordering code |
|---|---|---|
| R8i | BCU-02 | 3AXD50000002937 |
| 2×R8i…4×R8i | BCU-12 | 3AXD50000015806 |
| 5×R8i | | |
| 6×R8i | | |
| 8×R8i | BCU-22 | 3AXD50000015808 |

| Frame size | Control unit kit for optimal grid control (option +N8053) | Ordering code |
|---|---|---|
| R8i | BCU N8053 kit 1×R8i OGC ISU | 3AXD50000821129 |
| 2×R8i | BCU N8053 kit 2×R8i OGC ISU | 3AXD50000821136 |
| 3×R8i | BCU N8053 kit 3×R8i OGC ISU | 3AXD50000821150 |
| 4×R8i | BCU N8053 kit 4×R8i OGC ISU | 3AXD50000821167 |
| 5×R8i | BCU N8053 kit 5×R8i OGC ISU | 3AXD50000821174 |
| 6×R8i | BCU N8053 kit 6×R8i OGC ISU | 3AXD50000821181 |
| 8×R8i | BCU N8053 kit 8×R8i OGC ISU | 3AXD50000821143 |

**Note:** Fiber optic communication with another control unit (such as that of the inverter unit) requires an RDCO-0x DDCS communication module. For more information, see RDCO-0x DDCS communication option modules user's manual (3AFE64492209 [English]).

For more information on optional modules, see appropriate option module manual.

### Fiber optic cables

Each frame R8i module is connected to the control unit with a pair of fiber optic cables.

Each of the kits in the table below contain a pair of plastic fiber-optic cables that are needed in communication between the control unit and the power (inverter/supply/brake/converter) module.

| Length | Kit type designation | Ordering code |
|---|---|---|
| 2 m (6.6 ft) | NLWC-02 | 58988821 |
| 3 m (9.8 ft) | NLWC-03 | 58948233 |
| 5 m (16.4 ft) | NLWC-05 | 58948250 |
| 7 m (23 ft) | NLWC-07 | 58948268 |
| 10 m (32.8 ft) | NLWC-10 | 58948276 |

### Auxiliary measurement unit (BAMU)

The BAMU is a measurement unit for precise voltage and current measurements. It is mandatory when used in a grid converter (i.e. when the optional optimal grid control functionality is used).

| Frame size | Unit type | Ordering code |
|---|---|---|
| All | BAMU-12C | 3AXD50000045879 |

For more information, see

- Optimal grid control (option +N8053) for ACS880 multidrives (3AXD50000220717 [English])
- BAMU-12C auxiliary measurement unit hardware manual (3AXD50000117840 [English]).

**Note:** You must have adequate amount of fiber optic connections in the control unit if you use a BAMU auxiliary measurement unit with parallel-connected IGBT supply modules.

### CIO-01 I/O module

The control program (on the control unit) can control the speed of the cooling fans and monitor them via CIO I/O modules. Each CIO module can control and monitor 1 to 4 fans. The control unit connects to the CIO module(s) via a distributed I/O bus.

The fan control and monitoring is an optional feature. If the user wants to implement it, he/she must order the CIO modules, make the connections, and enable the operation in the control program.

For more information, see CIO-01 I/O module and distributed I/O bus user's manual (3AXD50000126880 [English]).

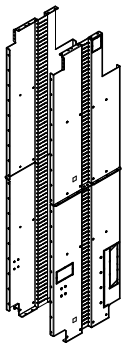
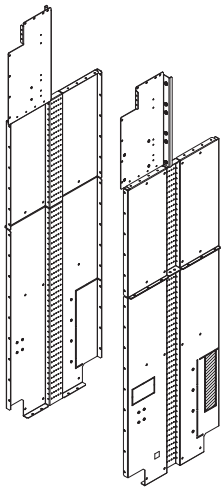
| Type | Data | Qty | Ordering code |
|---|---|---|---|
| CIO-01 | CIO-01 I/O module for distributed I/O bus control | 1 | 3AXD50000041983 |

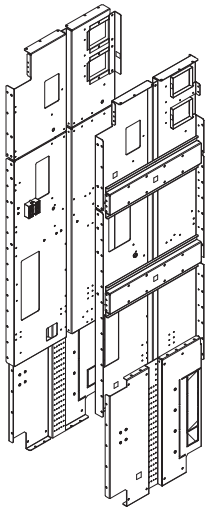
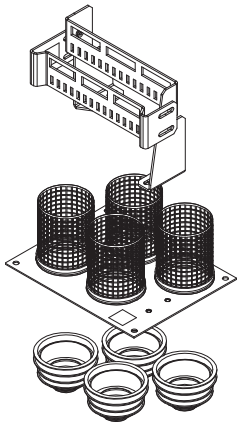
## Mechanical installation accessories

These kits include parts that are used for installing the module and filter in the enclosure.

### Adapter and cable entry kits (for Rittal VX25 enclosures)

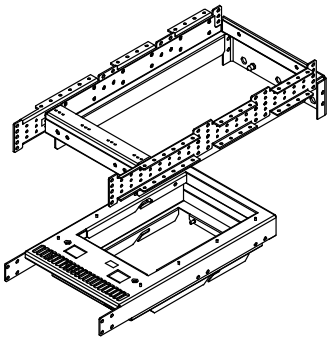
These parts attach to the left-hand and right-hand sides of the VX25 enclosure frame and act as a mounting base for the module guides.

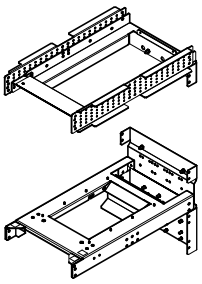
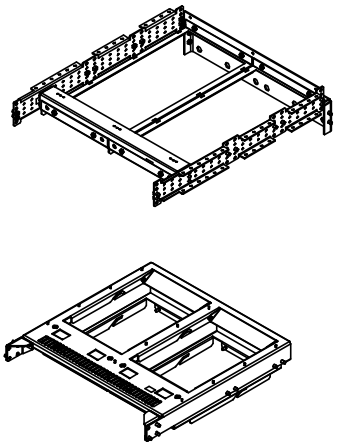
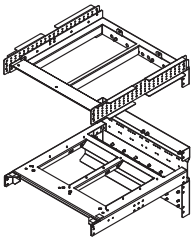
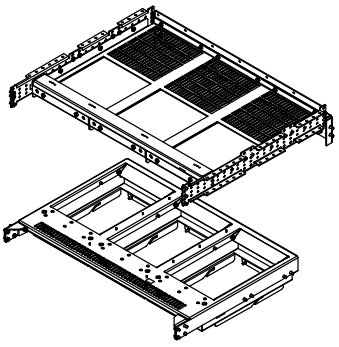
| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 400/600/800 mm VX25 enclosure | 1 | 3AXD50000360543 | L-468-8-020-VX |  Instruction code: 3AXD50000327591 |
| BLCL-15LC-7, BLCL-24LC-7 and BLCL-25LC-7 (600 mm Rittal VX25 enclosure) | 1 | 3AXD50000426652 | L-468-8-314-VX |  Instruction code: 3AXD50000429653 |

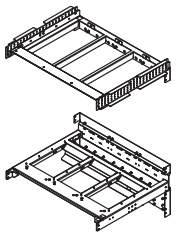
| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| Incoming and CL filter cubicle (600 mm Rittal VX25 enclosure) | 1 | 3AXD50001393755 | L-6-8-324-VX |  Instruction code: 3AXD50001410322 |
| Incoming and CL filter cubicle (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50000004385 | A-468-8-441 |  Instruction code: 3AXD50000004817 |

### Supply module top/bottom guides

This kit contains the frames that support the module at the top and the bottom.

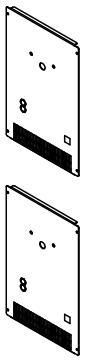
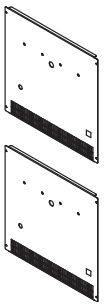
| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 400 mm generic enclosure | 1 | 3AXD50000043678 | L-4-8-301 |  Instruction code: 3AXD50000043726 |

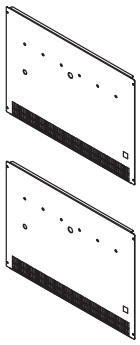
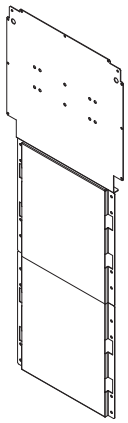
| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 400 mm Rittal VX25 enclosure | 1 | 3AXD50000360598 | L-4-8-301-VX |  Instruction code: 3AXD50000330461 |
| 600 mm generic enclosure | 1 | 3AXD50000041710 | L-6-8-302 |  Instruction code: 3AXD50000041836 |
| 600 mm Rittal VX25 enclosure | 1 | 3AXD50000361090 | L-6-8-302-VX |  Instruction code: 3AXD50000330201 |
| 800 mm generic enclosure | 1 | 3AXD50000041248 | L-8-8-303 |  Instruction code: 3AXD50000041461 |

| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 800 mm Rittal VX25 enclosure | 1 | 3AXD50000361274 | L-8-8-303-VX |  Instruction code: 3AXD50000329502 |

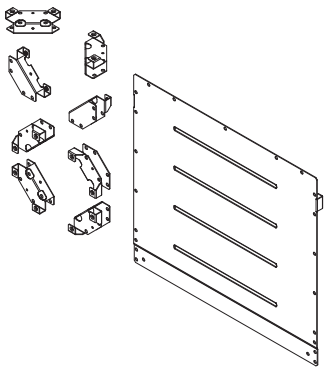
## Shrouding

This kit contains the shroud to cover the top part of the cubicle with the necessary brackets and screws.

| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 400 mm Rittal VX25 enclosure | 1 | 3AXD50000361083 | L-4-8-022-VX |  Instruction code: 3AXD50000353354 |
| 600 mm Rittal VX25 enclosure | 1 | 3AXD50000361267 | L-6-8-023-VX |  Instruction code: 3AXD50000353521 |

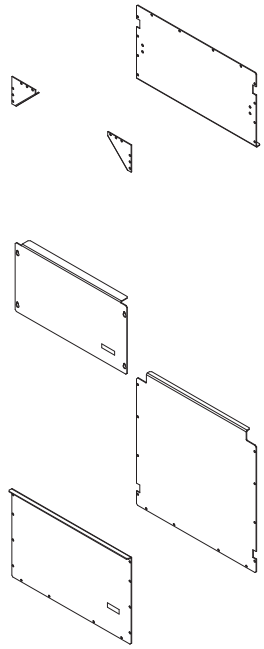
| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 800 mm Rittal VX25 enclosure | 1 | 3AXD50000361427 | L-8-8-024-VX |  Instruction code: 3AXD50000353125 |
| BLCL-15LC-7, BLCL-24LC-7 and BLCL-25LC-7 (600 mm Rittal VX25 enclosure) | 1 | 3AXD50000426638 | A-6-8-027-VX |  Instruction code: 3AXD50000431632 |

## Marine support kit for LCL filters

| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| BLCL-15LC-7, BLCL-24LC-7 and BLCL-25LC-7 (600 mm Rittal VX25 enclosure) | 1 | 3AXD50000457885 | L-6-8-500-VX |  |

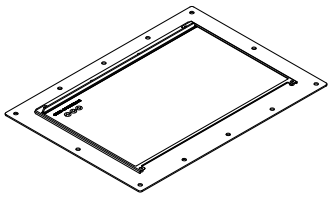
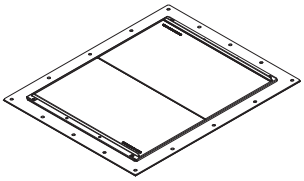
### Support kit for incoming and CL filter cubicle

This kit contains the support plates for the front part of the cubicle.

| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| Incoming and CL filter cubicle (600 mm Rittal VX25 enclosure) | 1 | 3AXD50001393779 | L-6-8-326-VX |  Instruction code: 3AXD50001413095 |

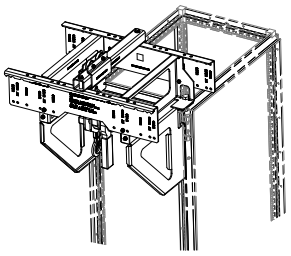
### Pressure relief kit

The explosion exhaust plate acts as a pressure relief vent in case of arcing inside the cubicle. This part is installed on the roof of the cabinet.

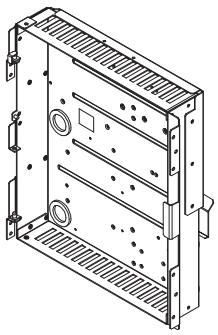
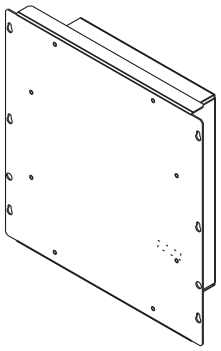
| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 400 mm Rittal VX25 or generic enclosure | 1 per cubicle | 3AXD50000667260 | L-4-X-460-VX |  Instruction code: 3AXD50000666430 |
| 600 and 800 mm Rittal VX25 or generic enclosure | 1 per cubicle | 3AXD50000667277 | L-68-X-461-VX |  Instruction code: 3AXD50000667253 |

### Lifting device

Use the lifting device when replacing a module in the Rittal VX25 enclosure.

| Frame | Enclosure | Qty | Ordering code | Illustration |
|---|---|---|---|---|
| R7i, R8i | Rittal VX25 | 1 | 3AXD50000439997 |  Instruction code: 3AXD50000210268, 3AXD50000439409 |

### Swing-out frame and shroud for incoming and CL filter cubicle

| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| Incoming and CL filter cubicle (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50001393762 | L-6-8-325-VX |  Instruction code: 3AXD50001413088 |
| Incoming and CL filter cubicle (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50001402570 | L-6-8-333-VX |  Instruction code: 3AXD50001413200 |

## AC-side components

### Main circuit breakers and wagons

You must equip the drive with a main disconnecting device (IEC/EN60204-1). The main power line can be equipped with a withdrawable main circuit breaker [Q1]. This section lists suitable main circuit breakers.

| IGBT supply unit | Main circuit breakers (230 V, IEC), units with LCL filter | | |
|---|---|---|---|
| Type | Type | Ordering code | Qty |
| $U_N$ = 690 V | | | |
| ACS880-204LC-0360A-7 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0400A-7 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0450A-7 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0480A-7 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0560A-7 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0620A-7 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0700A-7 | E2.2S-1250 | 3AXD50000902941 | 1 |
| ACS880-204LC-0770A-7 | E2.2S-1250 | 3AXD50000902941 | 1 |
| ACS880-204LC-0930A-7 | E2.2S-1250 | 3AXD50000902941 | 1 |
| ACS880-204LC-1090A-7 | E2.2S-1600 | 3AXD50000902965 | 1 |
| ACS880-204LC-1180A-7 | E2.2S-1600 | 3AXD50000902965 | 1 |
| ACS880-204LC-1360A-7 | E2.2S-2000 | 3AXD50000903375 | 1 |
| ACS880-204LC-1500A-7 | E2.2S-2000 | 3AXD50000903375 | 1 |
| ACS880-204LC-1800A-7 | E2.2S-2500 | 3AXD50000903399 | 1 |
| ACS880-204LC-2020A-7 | E2.2S-2500 | 3AXD50000903399 | 1 |
| ACS880-204LC-2220A-7 | E4.2S 3200 | 3AXD50000048346 | 1 |
| ACS880-204LC-2670A-7 | E4.2V 4000 | 3AXD50000189571 | 1 |
| ACS880-204LC-2930A-7 | E4.2V 4000 | 3AXD50000189571 | 1 |
| ACS880-204LC-3320A-7 | E4.2V 4000 | 3AXD50000189571 | 1 |
| ACS880-204LC-3840A-7 | E4.2S 3200 | 3AXD50000048346 | 2 |
| ACS880-204LC-4360A-7 | E4.2S 3200 | 3AXD50000048346 | 2 |
| ACS880-204LC-5240A-7 | E4.2V 4000 | 3AXD50000189571 | 2 |
| ACS880-204LC-5810A-7 | E4.2V 4000 | 3AXD50000189571 | 2 |

| IGBT supply unit | Main circuit breakers (230 V, UL, CSA), units with LCL filter | | |
|---|---|---|---|
| **Type** | **Type** | **Ordering code** | **Qty** |
| **$U_N$ = 690 V** | | | |
| ACS880-204LC-0360A-7 | E4.2V-A 800 | 3AXD50000826018 | 1 |
| ACS880-204LC-0400A-7 | E4.2V-A 800 | 3AXD50000826018 | 1 |
| ACS880-204LC-0450A-7 | E4.2V-A 800 | 3AXD50000826018 | 1 |
| ACS880-204LC-0480A-7 | E4.2V-A 800 | 3AXD50000826018 | 1 |
| ACS880-204LC-0560A-7 | E4.2V-A 800 | 3AXD50000826018 | 1 |
| ACS880-204LC-0620A-7 | E4.2V-A 800 | 3AXD50000826018 | 1 |
| ACS880-204LC-0700A-7 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-0770A-7 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-0930A-7 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-1090A-7 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-1180A-7 | E4.2V-A 1600 | 3AXD50000826025 | 1 |
| ACS880-204LC-1360A-7 | E4.2V-A 2000 | 3AXD50000828128 | 1 |
| ACS880-204LC-1500A-7 | E4.2V-A 2000 | 3AXD50000828128 | 1 |
| ACS880-204LC-1800A-7 | E4.2V-A 2500 | 3AXD50000826049 | 1 |
| ACS880-204LC-2020A-7 | E4.2V-A 2500 | 3AXD50000826049 | 1 |
| ACS880-204LC-2220A-7 | E4.2V-A 2500 | 3AXD50000826049 | 1 |
| ACS880-204LC-2670A-7 | E4.2V-A 2000 | 3AXD50000828128 | 2 |
| ACS880-204LC-2930A-7 | E4.2V-A 2000 | 3AXD50000828128 | 2 |
| ACS880-204LC-3320A-7 | - | - | - |
| ACS880-204LC-3840A-7 | E4.2V-A 2000 | 3AXD50000828128 | 3 |
| ACS880-204LC-4360A-7 | E4.2V-A 2000 | 3AXD50000828128 | 3 |
| ACS880-204LC-5240A-7 | E4.2V-A 2000 | 3AXD50000828128 | 4 |
| ACS880-204LC-5810A-7 | E4.2V-A 2000 | 3AXD50000828128 | 4 |

| IGBT supply unit | Main circuit breakers (230 V, IEC), units with CL filter | | |
|---|---|---|---|
| **Type** | **Type** | **Ordering code** | **Qty** |
| **$U_N$ = 690 V** | | | |
| ACS880-204LC-0360A-7 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0400A-7 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0450A-7 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0480A-7 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0560A-7 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0620A-7 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0700A-7 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0770A-7 | E2.2S-800 | 3AXD50001234034 | 1 |
| ACS880-204LC-0930A-7 | E2.2S-1250 | 3AXD50000902941 | 1 |
| ACS880-204LC-1090A-7 | E2.2S-1250 | 3AXD50000902941 | 1 |
| ACS880-204LC-1180A-7 | E2.2S-1250 | 3AXD50000902941 | 1 |
| ACS880-204LC-1360A-7 | E2.2S-1600 | 3AXD50000902965 | 1 |
| ACS880-204LC-1500A-7 | E2.2S-1600 | 3AXD50000902965 | 1 |
| ACS880-204LC-1800A-7 | E2.2S-1250 | 3AXD50000902941 | 2 |
| ACS880-204LC-2020A-7 | E2.2S-1250 | 3AXD50000902941 | 2 |
| ACS880-204LC-2220A-7 | E2.2S-1250 | 3AXD50000902941 | 2 |
| ACS880-204LC-2670A-7 | E2.2S-1600 | 3AXD50000902965 | 2 |
| ACS880-204LC-2930A-7 | E2.2S-1600 | 3AXD50000902965 | 2 |
| ACS880-204LC-3320A-7 | - | - | - |
| ACS880-204LC-3840A-7 | E2.2S-1250 | 3AXD50000902941 | 4 |
| ACS880-204LC-4360A-7 | E2.2S-1250 | 3AXD50000902941 | 4 |
| ACS880-204LC-5240A-7 | E2.2S-1600 | 3AXD50000902965 | 4 |
| ACS880-204LC-5810A-7 | E2.2S-1600 | 3AXD50000902965 | 4 |

## Content of the 230 V air circuit breakers:

| | |
|---|---|
| • Ekip Dip LI 3p WMP | E2.2S-800<br>E4.2V 4000<br>E4.2V-A 800<br>E4.2V-A 1600<br>E4.2V-A 2000<br>E4.2V-A 2500<br>E2.2S-1250<br>E2.2S-1600<br>E2.2S-2000<br>E2.2S-2500<br>E4.2S 3200<br>E6.2V-A 5000 |
| • RTC 250V E2.2...E6.2 | 1SDA073773R1 |
| • 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 * for UL only | 1SDA083022R1 (E2.2S),<br>1SDA083025R1 (E4.2S),<br>1SDA083028R1 (E6.2V) |

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

| IGBT supply unit | Main circuit breakers (115 V, IEC), units with LCL filter | | |
|---|---|---|---|
| Type | Type | Ordering code | Qty |
| **$U_N$ = 690 V** | | | |
| ACS880-204LC-0360A-7 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0400A-7 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0450A-7 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0480A-7 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0560A-7 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0620A-7 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0700A-7 | E2.2S-1250 | 3AXD50000902958 | 1 |
| ACS880-204LC-0770A-7 | E2.2S-1250 | 3AXD50000902958 | 1 |
| ACS880-204LC-0930A-7 | E2.2S-1250 | 3AXD50000902958 | 1 |
| ACS880-204LC-1090A-7 | E2.2S-1600 | 3AXD50000904259 | 1 |
| ACS880-204LC-1180A-7 | E2.2S-1600 | 3AXD50000904259 | 1 |
| ACS880-204LC-1360A-7 | E2.2S-2000 | 3AXD50000903382 | 1 |
| ACS880-204LC-1500A-7 | E2.2S-2000 | 3AXD50000903382 | 1 |
| ACS880-204LC-1800A-7 | E2.2S-2500 | 3AXD50000903405 | 1 |
| ACS880-204LC-2020A-7 | E2.2S-2500 | 3AXD50000903405 | 1 |
| ACS880-204LC-2220A-7 | E4.2S 3200 | 3AXD50000048341 | 1 |
| ACS880-204LC-2670A-7 | E4.2V 4000 | 3AXD50000231980 | 1 |
| ACS880-204LC-2930A-7 | E4.2V 4000 | 3AXD50000231980 | 1 |
| ACS880-204LC-3320A-7 | E4.2V 4000 | 3AXD50000231980 | 1 |
| ACS880-204LC-3840A-7 | E4.2S 3200 | 3AXD50000048341 | 2 |
| ACS880-204LC-4360A-7 | E4.2S 3200 | 3AXD50000048341 | 2 |
| ACS880-204LC-5240A-7 | E4.2V 4000 | 3AXD50000231980 | 2 |
| ACS880-204LC-5810A-7 | E4.2V 4000 | 3AXD50000231980 | 2 |

| IGBT supply unit | Main circuit breakers (115 V, UL, CSA), units with LCL filter | | |
|---|---|---|---|
| **Type** | **Type** | **Ordering code** | **Qty** |
| **$U_N$ = 690 V** | | | |
| ACS880-204LC-0360A-7 | E4.2V-A 800 | 3AXD50000826148 | 1 |
| ACS880-204LC-0400A-7 | E4.2V-A 800 | 3AXD50000826148 | 1 |
| ACS880-204LC-0450A-7 | E4.2V-A 800 | 3AXD50000826148 | 1 |
| ACS880-204LC-0480A-7 | E4.2V-A 800 | 3AXD50000826148 | 1 |
| ACS880-204LC-0560A-7 | E4.2V-A 800 | 3AXD50000826148 | 1 |
| ACS880-204LC-0620A-7 | E4.2V-A 800 | 3AXD50000826148 | 1 |
| ACS880-204LC-0700A-7 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-0770A-7 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-0930A-7 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-1090A-7 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-1180A-7 | E4.2V-A 1600 | 3AXD50000826155 | 1 |
| ACS880-204LC-1360A-7 | E4.2V-A 2000 | 3AXD50000826162 | 1 |
| ACS880-204LC-1500A-7 | E4.2V-A 2000 | 3AXD50000826162 | 1 |
| ACS880-204LC-1800A-7 | E4.2V-A 2500 | 3AXD50000826179 | 1 |
| ACS880-204LC-2020A-7 | E4.2V-A 2500 | 3AXD50000826179 | 1 |
| ACS880-204LC-2220A-7 | E4.2V-A 2500 | 3AXD50000826179 | 1 |
| ACS880-204LC-2670A-7 | E4.2V-A 2000 | 3AXD50000826162 | 2 |
| ACS880-204LC-2930A-7 | E4.2V-A 2000 | 3AXD50000826162 | 2 |
| ACS880-204LC-3320A-7 | - | - | - |
| ACS880-204LC-3840A-7 | E4.2V-A 2000 | 3AXD50000826162 | 3 |
| ACS880-204LC-4360A-7 | E4.2V-A 2000 | 3AXD50000826162 | 3 |
| ACS880-204LC-5240A-7 | E4.2V-A 2000 | 3AXD50000826162 | 4 |
| ACS880-204LC-5810A-7 | E4.2V-A 2000 | 3AXD50000826162 | 4 |

| IGBT supply unit | Main circuit breakers (115 V, IEC), units with CL filter | | |
|---|---|---|---|
| **Type** | **Type** | **Ordering code** | **Qty** |
| **$U_N$ = 690 V** | | | |
| ACS880-204LC-0360A-7 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0400A-7 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0450A-7 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0480A-7 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0560A-7 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0620A-7 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0700A-7 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0770A-7 | E2.2S-800 | 3AXD50001234041 | 1 |
| ACS880-204LC-0930A-7 | E2.2S-1250 | 3AXD50000902958 | 1 |
| ACS880-204LC-1090A-7 | E2.2S-1250 | 3AXD50000902958 | 1 |
| ACS880-204LC-1180A-7 | E2.2S-1250 | 3AXD50000902958 | 1 |
| ACS880-204LC-1360A-7 | E2.2S-1600 | 3AXD50000904259 | 1 |
| ACS880-204LC-1500A-7 | E2.2S-1600 | 3AXD50000904259 | 1 |
| ACS880-204LC-1800A-7 | E2.2S-1250 | 3AXD50000902958 | 2 |
| ACS880-204LC-2020A-7 | E2.2S-1250 | 3AXD50000902958 | 2 |
| ACS880-204LC-2220A-7 | E2.2S-1250 | 3AXD50000902958 | 2 |
| ACS880-204LC-2670A-7 | E2.2S-1600 | 3AXD50000904259 | 2 |
| ACS880-204LC-2930A-7 | E2.2S-1600 | 3AXD50000904259 | 2 |
| ACS880-204LC-3320A-7 | - | - | - |
| ACS880-204LC-3840A-7 | E2.2S-1250 | 3AXD50000902958 | 4 |
| ACS880-204LC-4360A-7 | E2.2S-1250 | 3AXD50000902958 | 4 |
| ACS880-204LC-5240A-7 | E2.2S-1600 | 3AXD50000904259 | 4 |
| ACS880-204LC-5810A-7 | E2.2S-1600 | 3AXD50000904259 | 4 |

## Content of the 115 V air circuit breakers:

| | |
|---|---|
| • Ekip Dip LI 3p WMP | E2.2S-800<br>E4.2V 4000<br>E4.2V-A 800<br>E4.2V-A 1600<br>E4.2V-A 2000<br>E4.2V-A 2500<br>E2.2S-1250<br>E2.2S-1600<br>E2.2S-2000<br>E2.2S-2500<br>E4.2S 3200<br>E6.2V-A 5000 |
| • RTC 250V E2.2...E6.2 | 1SDA073773R1 |
| • 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),<br>1SDA083025R1 (E4.2S),<br>1SDA083028R1 (E6.2V) |

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

| IGBT supply unit | Wagons (IEC), units with LCL filter | | |
|---|---|---|---|
| Type | Type | Ordering code | Qty |
| **$U_N$ = 690 V** | | | |
| ACS880-204LC-0360A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-0400A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-0450A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-0480A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-0560A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-0620A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-0700A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-0770A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-0930A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-1090A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-1180A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-1360A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-1500A-7 | E2.2 W 2000 | 3AXD50000893485 | 1 |
| ACS880-204LC-1800A-7 | E2.2 W 2500 | 3AXD50000903610 | 1 |
| ACS880-204LC-2020A-7 | E2.2 W 2500 | 3AXD50000903610 | 1 |
| ACS880-204LC-2220A-7 | E4.2 W FP 3200 | 3AXD50000048356 | 1 |
| ACS880-204LC-2670A-7 | E4.2 W FP 4000 | 3AXD50000189588 | 1 |
| ACS880-204LC-2930A-7 | E4.2 W FP 4000 | 3AXD50000189588 | 1 |
| ACS880-204LC-3320A-7 | E4.2 W FP 4000 | 3AXD50000189588 | 1 |
| ACS880-204LC-3840A-7 | E4.2 W FP 3200 | 3AXD50000048356 | 2 |
| ACS880-204LC-4360A-7 | E4.2 W FP 3200 | 3AXD50000048356 | 2 |
| ACS880-204LC-5240A-7 | E4.2 W FP 4000 | 3AXD50000189588 | 2 |
| ACS880-204LC-5810A-7 | E4.2 W FP 4000 | 3AXD50000189588 | 2 |

| Frame size | Wagons (UL, CSA), units with LCL filter | | |
|---|---|---|---|
| | Type | Ordering code | Qty |
| 1×R8i … 3×R8i | E4.2-A W FP 2500 | 3AXD50000039281 | 1 |
| 4×R8i | E4.2-A W FP 2500 | 3AXD50000039281 | 2 |
| 5×R8i | - | - | - |
| 6×R8i | E4.2-A W FP 2500 | 3AXD50000039281 | 3 |
| 8×R8i | E4.2-A W FP 2500 | 3AXD50000039281 | 4 |

| Frame size | Wagons (IEC), units with CL filter | | |
|---|---|---|---|
| | Type | Ordering code | Qty |
| **$U_N$ = 690 V** | | | |
| 1×R8i…4×R8i | E2.2 W 2000 | 3AXD50000893485 | 1 |
| 5×R8i | - | - | - |
| 6×R8i | E2.2 W 2000 | 3AXD50000893485 | 4 |
| 8×R8i | E2.2 W 2000 | 3AXD50000893485 | 4 |

Content of the 115 V and 230 V IEC wagons:

| | |
|---|---|
| • E2.2 W 2000<br>• E2.2 W 2500<br>• E4.2 W 3200<br>• E4.2 W 4000 | E2.2 W FP Iu=2000 HR HR, IEC<br>E2.2 W FP Iu=2500 HR HR, IEC<br>E4.2 W FP Iu=3200 HR HR, IEC<br>E4.2 W FP Iu=4000 HR HR, IEC |
| • AUP 5 contacts 400Vac SX E2.2...E6.2 | 1SDA073764R1 |

Content of the 115 V and 230 V UL wagons:

| | |
|---|---|
| • E4.2-A W 2500 | E4.2-A W FP Iu=2500 HR HR, UL |
| • AUP 5 contacts 400V E2.2...E6.2 - left set | 1SDA080373R1 |

The exception is E4.2_W_FP_3200_HR-HR_IEC:

| | |
|---|---|
| • W FP Iu=3200 HR HR, IEC | • E4.2 W FP 3200 |
| • AUP 5 contacts 400V E2.2...E6.2, IEC | • 1SDA073764R1 |

**Main circuit breaker and wagon cover**

One cover is needed for each main circuit breaker/wagon pair. See Drive 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, CSA: Hinged Window, APWK2016H, ordering code 3AUA0000222786

**Lifting plates**

Lifting plates are needed for safe handling and lifting the EMAX2 circuit breakers into a switchboard enclosure.

1SDA081454R1, ordering code: 3AXD50001090722

### AC fuses

The AC fuses protect the input cables and the module against short circuits.

| IGBT supply unit | AC fuses | | | | |
|---|---|---|---|---|---|
| **Type** | **Type** | **A** | **V** | **Ordering code** | **Qty** |
| **$U_N$ = 690 V** | | | | | |
| ACS880-204LC-0360A-7 | 170M6410 | 630 | 690 | 68335418 | 3 |
| ACS880-204LC-0400A-7 | 170M6411 | 700 | 690 | 3AXD50000000175 | 3 |
| ACS880-204LC-0450A-7 | 170M6412 | 800 | 690 | 68731640 | 3 |
| ACS880-204LC-0480A-7 | 170M6412 | 800 | 690 | 68731640 | 3 |
| ACS880-204LC-0560A-7 | 170M6413 | 900 | 690 | 3AXD50000000148 | 3 |
| ACS880-204LC-0620A-7 | 170M6414 | 1000 | 690 | 68333296 | 3 |
| ACS880-204LC-0700A-7 | 170M6416 | 1250 | 690 | 68244463 | 3 |
| ACS880-204LC-0770A-7 | 170M6417 | 1400 | 690 | 3AXD50000000150 | 3 |
| ACS880-204LC-0930A-7 | 170M7061 | 1600 | 690 | 3AUA0000220709 | 3 |
| ACS880-204LC-1090A-7 | 170M7062 | 2000 | 690 | 68689589 | 3 |
| ACS880-204LC-1180A-7 | 170M7062 | 2000 | 690 | 68689589 | 3 |
| ACS880-204LC-1360A-7 | 170M7063 | 2500 | 690 | 68752591 | 3 |
| ACS880-204LC-1500A-7 | 170M7063 | 2500 | 690 | 68752591 | 3 |
| ACS880-204LC-1800A-7 | 170M7061 | 1600 | 690 | 3AUA0000220709 | 6 |
| ACS880-204LC-2020A-7 | 170M7062 | 2000 | 690 | 68689589 | 6 |
| ACS880-204LC-2220A-7 | 170M7062 | 2000 | 690 | 68689589 | 6 |
| ACS880-204LC-2670A-7 | 170M7063 | 2500 | 690 | 68752591 | 6 |
| ACS880-204LC-2930A-7 | 170M7063 | 2500 | 690 | 68752591 | 6 |
| ACS880-204LC-3320A-7 | 170M7062 | 2000 | 690 | 68689589 | 9 |
| ACS880-204LC-3840A-7 (IEC) | 170M7061 | 1600 | 690 | 3AUA0000220709 | 12 |
| ACS880-204LC-3840A-7 (UL) | 170M7063 | 2500 | 690 | 68752591 | 9 |
| ACS880-204LC-4360A-7 (IEC) | 170M7062 | 2000 | 690 | 68689589 | 12 |
| ACS880-204LC-4360A-7 (UL) | 170M7063 | 2500 | 690 | 68752591 | 9 |
| ACS880-204LC-5240A-7 | 170M7063 | 2500 | 690 | 68752591 | 12 |
| ACS880-204LC-5810A-7 | 170M7063 | 2500 | 690 | 68752591 | 12 |

### AC-DC charging kits for lineup charging

The DC link capacitors of the drive DC link must be charged during the start-up before connecting the supply modules to a three-phase power line. The charging kit contains the main parts of the lineup charging circuit.

**Note:** The charging components are dimensioned for DC link capacitances equal to 3 × R8i supply module DC capacitance (1×ISU + 2×INU), 5 × R8i supply module DC capacitance (1×ISU + 4×INU) and 7 × R8i supply module DC capacitance (1×ISU + 6×INU). For example, 1×ISU + 2×INU means that there is one R8i IGBT supply module and two R8i inverter modules with the same capacitance. There can be more inverter modules as long as the capacitance limit is not exceeded. 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.

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

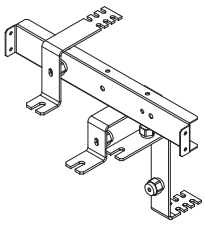
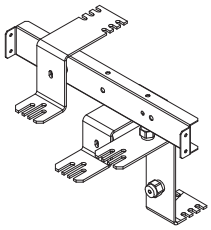
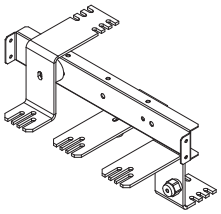
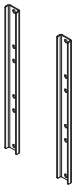
| ACS880-204LC-... | 2×INU | | 4×INU | | 6×INU | |
|---|---|---|---|---|---|---|
| | Ordering code (IEC) | Max. capa-citance (mF) | Ordering code (IEC) | Max. capa-citance (mF) | Ordering code (IEC) | Max. capa-citance (mF) |
| **$U_N$ = 690 V** | | | | | | |
| 0360A-7 | 3AXD50000250776 | 18 | 3AXD50000250776 | 30 | 3AXD50000250783 | 42 |
| 0400A-7 | 3AXD50000250776 | 18 | 3AXD50000250776 | 30 | 3AXD50000250783 | 42 |
| 0450A-7 | 3AXD50000250776 | 18 | 3AXD50000250776 | 30 | 3AXD50000250783 | 42 |
| 0480A-7 | 3AXD50000250776 | 18 | 3AXD50000250776 | 30 | 3AXD50000250783 | 42 |
| 0560A-7 | 3AXD50000250776 | 27 | 3AXD50000250783 | 45 | 3AXD50000250783 | 63 |
| 0620A-7 | 3AXD50000250776 | 27 | 3AXD50000250783 | 45 | 3AXD50000250783 | 63 |
| 0700A-7 | 3AXD50000250776 | 27 | 3AXD50000250783 | 45 | 3AXD50000250783 | 63 |
| 0770A-7 | 3AXD50000250776 | 27 | 3AXD50000250783 | 45 | 3AXD50000250783 | 63 |
| 0930A-7 | 3AXD50000250776 | 36 | 3AXD50000250783 | 60 | 3AXD50000250783 | 84 |
| 1090A-7 | 3AXD50000250783 | 54 | 3AXD50000250783 | 90 | 3AXD50000250790 | 126 |
| 1180A-7 | 3AXD50000250783 | 54 | 3AXD50000250783 | 90 | 3AXD50000250790 | 126 |
| 1360A-7 | 3AXD50000250783 | 54 | 3AXD50000250783 | 90 | 3AXD50000250790 | 126 |
| 1500A-7 | 3AXD50000250783 | 54 | 3AXD50000250783 | 90 | 3AXD50000250790 | 126 |
| 1800A-7 | 3AXD50000250783 | 81 | 3AXD50000250790 | 135 | 3AXD50000250806 | 189 |
| 2020A-7 | 3AXD50000250783 | 81 | 3AXD50000250790 | 135 | 3AXD50000250806 | 189 |
| 2220A-7 | 3AXD50000250783 | 81 | 3AXD50000250790 | 135 | 3AXD50000250806 | 189 |
| 2670A-7 | 3AXD50000250790 | 108 | 3AXD50000250806 | 180 | 3AXD50000251216 | 252 |
| 2930A-7 | 3AXD50000250790 | 108 | 3AXD50000250806 | 180 | 3AXD50000251216 | 252 |
| 3320A-7 | 3AXD50000250790 | 135 | - | - | - | - |
| 3840A-7 | 3AXD50000250790 | 162 | - | - | - | - |
| 4360A-7 | 3AXD50000250790 | 162 | - | - | - | - |
| 5240A-7 | 3AXD50000250806 | 216 | - | - | - | - |

| ACS880-204LC-... | 2×INU | | 4×INU | | 6×INU | |
|---|---|---|---|---|---|---|
| | Ordering code (IEC) | Max. capa-citance (mF) | Ordering code (IEC) | Max. capa-citance (mF) | Ordering code (IEC) | Max. capa-citance (mF) |
| 5810A-7 | 3AXD50000250806 | 216 | - | - | - | - |

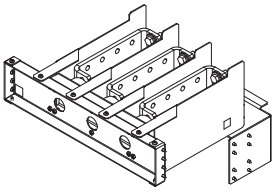
| ACS880-204LC-... | 2×INU | | 4×INU | | 6×INU | |
|---|---|---|---|---|---|---|
| | Ordering code (UL) | Max. capa-citance (mF) | Ordering code (UL) | Max. capa-citance (mF) | Ordering code (UL) | Max. capa-citance (mF) |
| **$U_N$ = 690 V** | | | | | | |
| 0360A-7 | 3AXD50000686308 | 18 | 3AXD50000686308 | 30 | 3AXD50000686612 | 42 |
| 0400A-7 | 3AXD50000686308 | 18 | 3AXD50000686308 | 30 | 3AXD50000686612 | 42 |
| 0450A-7 | 3AXD50000686308 | 18 | 3AXD50000686308 | 30 | 3AXD50000686612 | 42 |
| 0480A-7 | 3AXD50000686308 | 18 | 3AXD50000686308 | 30 | 3AXD50000686612 | 42 |
| 0560A-7 | 3AXD50000686308 | 27 | 3AXD50000686612 | 45 | 3AXD50000686612 | 63 |
| 0620A-7 | 3AXD50000686308 | 27 | 3AXD50000686612 | 45 | 3AXD50000686612 | 63 |
| 0700A-7 | 3AXD50000686308 | 27 | 3AXD50000686612 | 45 | 3AXD50000686612 | 63 |
| 0770A-7 | 3AXD50000686308 | 27 | 3AXD50000686612 | 45 | 3AXD50000686612 | 63 |
| 0930A-7 | 3AXD50000686308 | 36 | 3AXD50000686612 | 60 | 3AXD50000686612 | 84 |
| 1090A-7 | 3AXD50000686612 | 54 | 3AXD50000686612 | 90 | 3AXD50000686629 | 126 |
| 1180A-7 | 3AXD50000686612 | 54 | 3AXD50000686612 | 90 | 3AXD50000686629 | 126 |
| 1360A-7 | 3AXD50000686612 | 54 | 3AXD50000686612 | 90 | 3AXD50000686629 | 126 |
| 1500A-7 | 3AXD50000686612 | 54 | 3AXD50000686612 | 90 | 3AXD50000686629 | 126 |
| 1800A-7 | 3AXD50000686612 | 81 | 3AXD50000686629 | 135 | 3AXD50000686636 | 189 |
| 2020A-7 | 3AXD50000686612 | 81 | 3AXD50000686629 | 135 | 3AXD50000686636 | 189 |
| 2220A-7 | 3AXD50000686612 | 81 | 3AXD50000686629 | 135 | 3AXD50000686636 | 189 |
| 2670A-7 | 3AXD50000686629 | 108 | 3AXD50000686636 | 180 | 3AXD50000686643 | 252 |
| 2930A-7 | 3AXD50000686629 | 108 | 3AXD50000686636 | 180 | 3AXD50000686643 | 252 |
| 3320A-7 | 3AXD50000686629 | 135 | - | - | - | - |
| 3840A-7 | 3AXD50000686629 | 162 | - | - | - | - |
| 4360A-7 | 3AXD50000686629 | 162 | - | - | - | - |
| 5240A-7 | 3AXD50000686629 | 216 | - | - | - | - |
| 5810A-7 | 3AXD50000686636 | 216 | - | - | - | - |

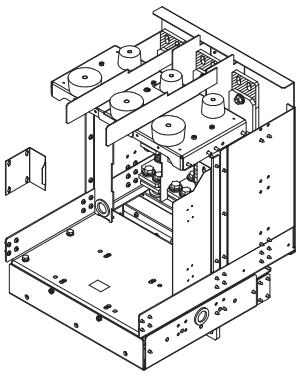
For charging kit contents, see the technical data.

## AC busbars for LCL filters

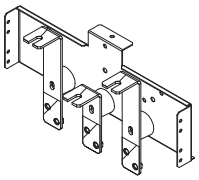
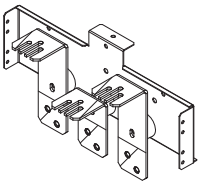
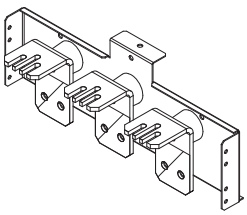
| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| BLCL-15LC-7 (600 mm Rittal VX25 enclosure) | 1 | 3AXD50000237470 | L-6-8-108 |  Instruction code: 3AXD50000248476 |
| BLCL-24LC-7 (600 mm Rittal VX25 enclosure) | 1 | 3AXD50000237487 | L-6-8-109 |  Instruction code: 3AXD50000249206 |
| BLCL-25LC-7 (600 mm Rittal VX25 enclosure) | 1 | 3AXD50000237494 | L-6-8-110 |  Instruction code: 3AXD50000249534 |
| BLCL-15LC-7, BLCL-24LC-7and BLCL-25LC-7 (600 mm Rittal VX25 enclosure) | 1 | 3AXD50000237371 | L-6-X-012 |  Instruction code: 3AXD50000245987 |

## Main circuit breaker installation in incoming and CL filter cubicle

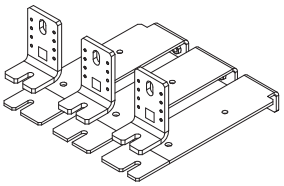
| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| Incoming and CL filter cubicle (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50001393786 | L-6-8-327-VX |  Instruction code: 3AXD50001413262 |

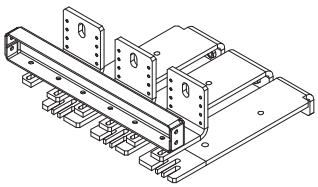
| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| Incoming and CL filter cubicle (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50001394141 | L-6-8-329-VX |  Instruction code: 3AXD50001408206 |

## LCL filter fuse busbars

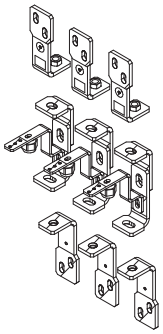
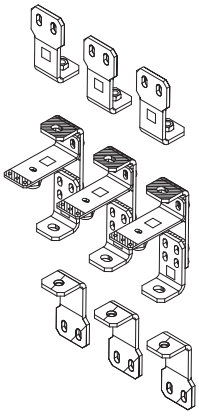
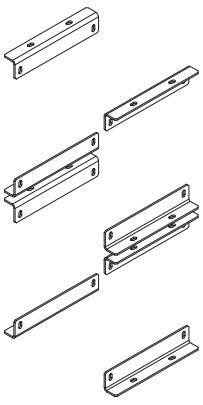
| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| BLCL-15LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50000426669 | L-6-8-103-VX |  Instruction code: 3AXD50000431601 |
| BLCL-24LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50000426676 | L-6-8-104-VX |  Instruction code: 3AXD50000431403 |
| BLCL-25LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50000426683 | L-6-8-105-VX |  Instruction code: 3AXD50000431724 |

## CL filter fuse busbars in incoming and CL filter cubicle

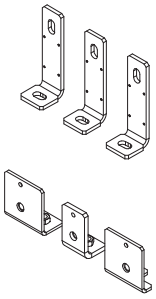
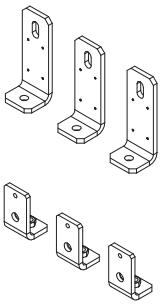
| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| BCL-15LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50001394127 | L-6-8-118-VX |  Instruction code: 3AXD50001409210 |

| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| BCL-24LC-7 and BCL-25LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50001394134 | L-6-8-119-VX |  Instruction code: 3AXD50001409494 |

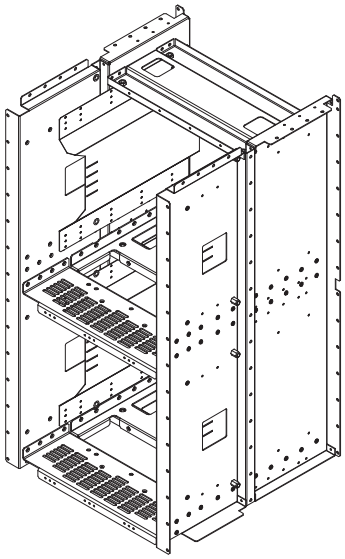
## LCL filter choke busbars

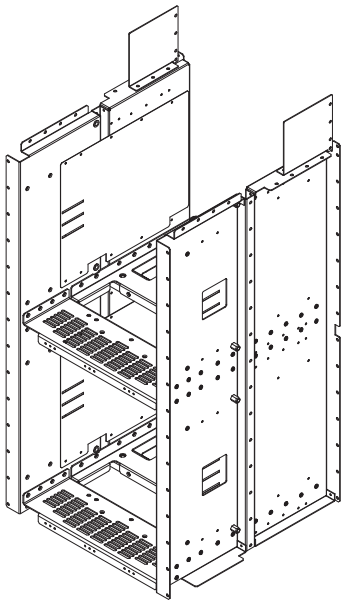
| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| BLCL-15LC-7 and BLCL-24LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50000237418 | L-6-8-106 |  Instruction code: 3AXD50000247097 |
| BLCL-25LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50000237425 | L-6-8-107 |  Instruction code: 3AXD50000247080 |
| BLCL-15LC-7 and BLCL-24LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50000237517 | L-6-8-311 |  Instruction code: 3AXD50000249893 |

## CL filter choke busbars

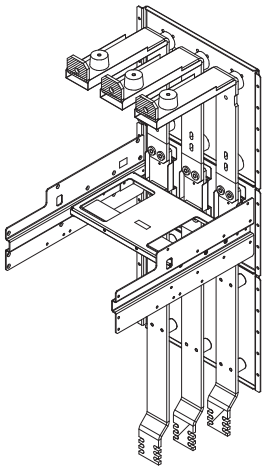
| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| BCL-15LC-7 and BCL-24LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50001393809 | L-6-8-117-VX |  Instruction code: 3AXD50001408961 |
| BCL-25LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50001393793 | L-6-8-116-VX |  Instruction code: 3AXD50001408794 |

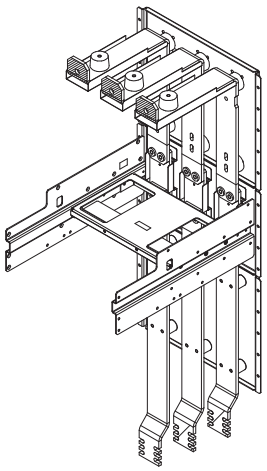
## LCL filter choke installation kits

| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| BLCL-15LC-7 and BLCL-24LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50000426195 | L-6-8-306-VX |  Instruction code: 3AXD50000431915 |

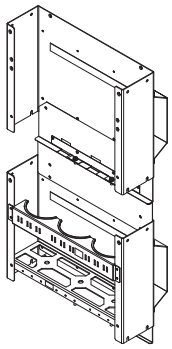
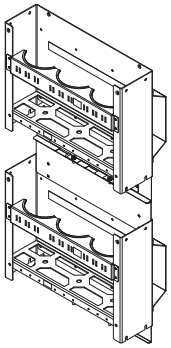
| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| BLCL-25LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50000426201 | L-6-8-307-VX |  Instruction code: 3AXD50000431816 |

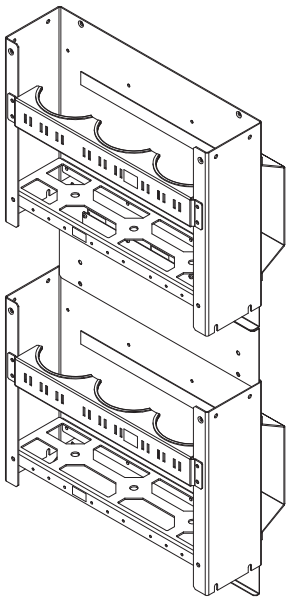
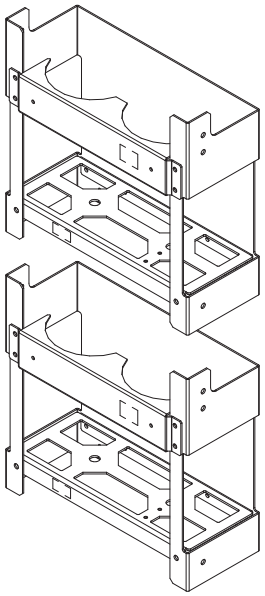
## CL filter choke installation kits

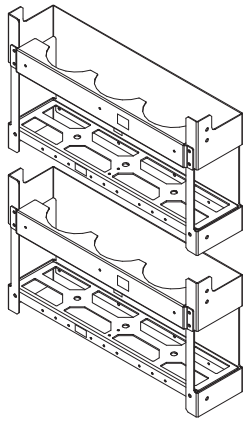
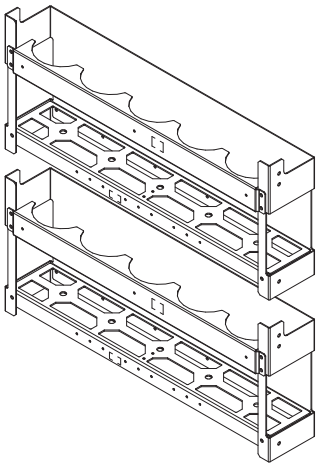
| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| BCL-15LC-7 and BCL-24LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50001393724 | L-6-8-322-VX |  Instruction code: 3AXD50001412289 |

| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| BCL-25LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50001393731 | L-6-8-323-VX |  Instruction code: 3AXD50001411534 |

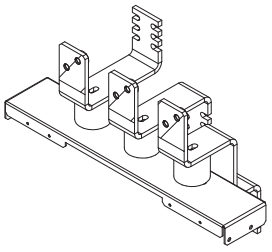
## LCL and CL filter capacitor installation kits

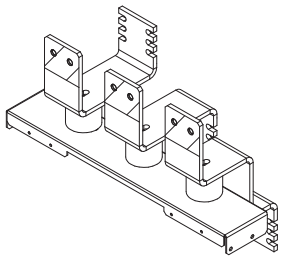
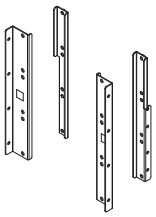
| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| BLCL-15LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50000237319 | L-6-8-308 |  Instruction code: 3AXD50000244065 |
| BLCL-24LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50000237333 | L-6-8-309 |  Instruction code: 3AXD50000244065 |

| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| BLCL-25LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50000237340 | L-6-8-310 |  Instruction code: 3AXD50000244065 |
| CL filter capacitors (400 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50001394158 | L-4-8-330-VX |  Instruction code: 3AXD50001413071 |

| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| CL filter capacitors (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50001394165 | L-6-8-331-VX |  Instruction code: 3AXD50001412784 |
| CL filter capacitors (800 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50001394172 | L-8-8-332-VX |  Instruction code: 3AXD50001413316 |

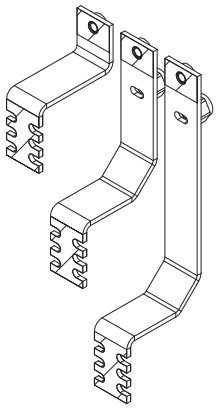
## LCL and CL filter - ISU connection kits

| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| BLCL-15LC-7 and BLCL-24LC-7 (600 mm Rittal VX25 enclosure) | 1 | 3AXD50000426690 | L-6-8-101-VX |  Instruction code: 3AXD50000431717 |

| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| BLCL-25LC-7 (600 mm Rittal VX25 enclosure) | 1 | 3AXD50000426706 | L-6-8-102-VX |  Instruction code: 3AXD50000431502 |
| BLCL-15LC-7, BLCL-24LC-7, BLCL-25LC-7 and incoming and CL filter cubicle (600 mm Rittal VX25 enclosure) | 1 | 3AXD50000371013 | L-6-X-012-VX |  Instruction code: 3AXD50000370870 |

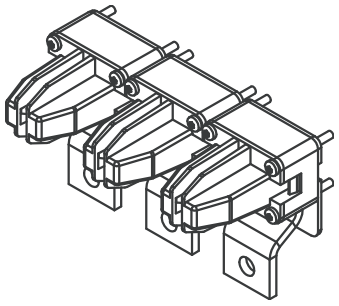
### AC busbars

The power input of the supply module is connected to the module through a quick connector.

| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 400/600/800 mm Rittal VX25 enclosure | 1 / module | 3AXD50000371037 | L-468-8-121-VX |  Instruction code: 3AXD50000352791 |

### Quick connector

The three-phase power connection to the inverter/supply/brake/converter module through a quick connector.

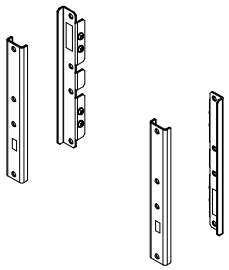
| Used with | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| All enclosure types | 1 per module | 3AUA0000119227 | A-468-8-100 |  Instruction code: 3AUA0000118667 |

## DC-side components

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

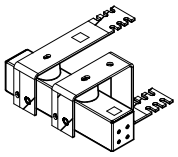
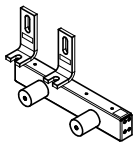
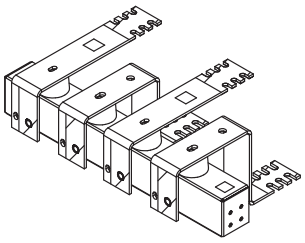
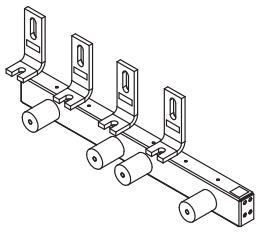
The brackets in this kit act as a mounting base for the busbar supports of the Rittal Flat-PLS DC bus and ensure its correct placement and alignment inside the cabinet lineup.

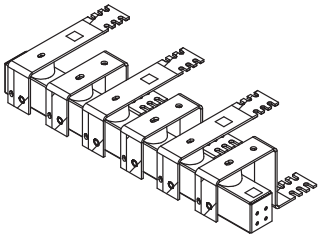
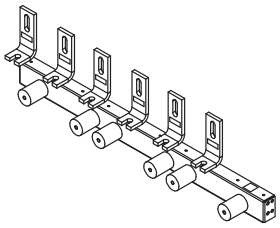
**Note:** The designs presented in this manual for Rittal VX25 enclosures employ the Rittal Flat-PLS busbar system. Make sure that the current carrying capability of the busbars is not exceeded at any point of the drive system.

| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 400/600/800 mm Rittal VX25 enclosure | 1 kit per cubicle | 3AXD50000333387 | A-468-X-001-VX |  Instruction code: 3AXD50000333639 |

### DC connection parts 1 of 2 (for Rittal VX25 enclosures)

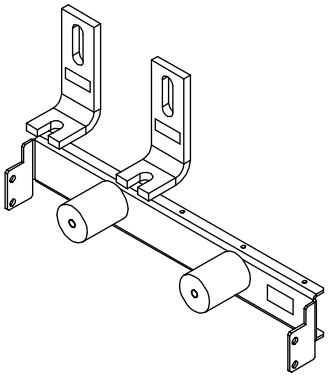
These parts connect the Flat-PLS busbars to the DC fuses.

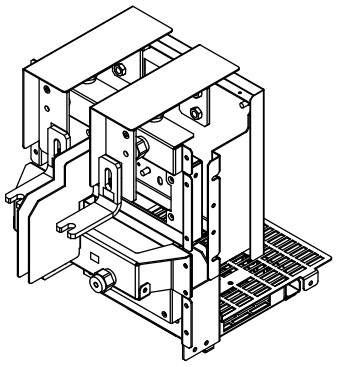
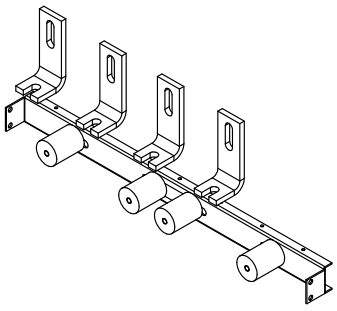
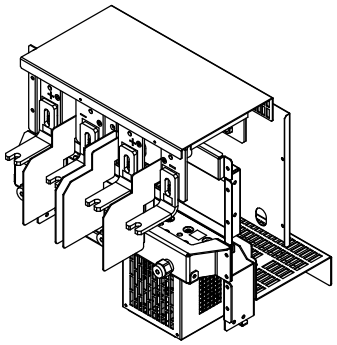
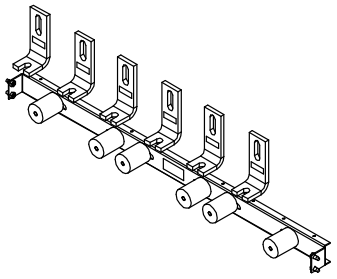
| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 400 mm Rittal VX25 enclosure | 1 | 3AXD50000360604 | L-4-8-201-VX |  Instruction code: 3AXD50000332861 |
| | 1 | 3AXD50000361021 | L-4-8-251-VX |  Instruction code: 3AXD50000332885 |
| 600 mm Rittal VX25 enclosure | 1 | 3AXD50000361106 | L-6-8-202-VX |  Instruction code: 3AXD50000332229 |
| | 1 | 3AXD50000361229 | L-6-8-252-VX |  Instruction code: 3AXD50000332106 |

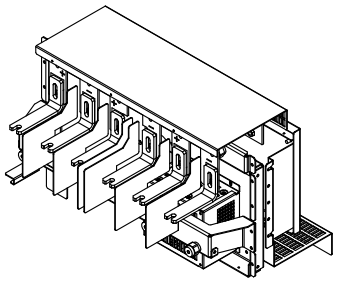
| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 800 mm Rittal VX25 enclosure | 1 | 3AXD50000361281 | L-8-8-203-VX |  Instruction code: 3AXD50000331567 |
| | 1 | 3AXD50000361298 | L-8-8-253-VX |  Instruction code: 3AXD50000331765 |

### DC connection parts 1 of 2 (for generic enclosures)

These parts provide the DC connection between the DC output (busbars or otherwise) and the DC fuses.

| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 400 mm generic enclosure without DC switch | 1 | 3AXD50000540150 | L-3-8-259 |  Instruction code: 3AXD50000540655 |

| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 400 mm generic enclosure with DC switch | 1 | 3AXD50000361038 | L-4-8-254-VX |  Instruction code: 3AXD50000342600 |
| 600 mm generic enclosure without DC switch | 1 | 3AXD50000540167 | L-5-8-260 |  Instruction code: 3AXD50000540723 |
| 600 mm generic enclosure with DC switch | 1 | 3AXD50000361243 | L-6-8-255-VX |  Instruction code: 3AXD50000338740 |
| 800 mm generic enclosure without DC switch | 1 | 3AXD50000540174 | L-7-8-261 |  Instruction code: 3AXD50000540693 |

| Used with... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 800 mm generic enclosure<br>with DC switch<br>**Note:** 3×R8i design with DC switches is not suitable for UL installations. | 1 | 3AXD50000361304 | L-8-8-256-VX |  <br>Instruction code:<br>3AXD50000336999 |

## DC fuses

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

| IGBT supply unit | DC fuses | | | |
|---|---|---|---|---|
| **Type** | **Type** | **Rating [A]** | **Ordering code** | **Qty** |
| **$U_N$ = 690 V** | | | | |
| ACS880-204LC-0360A-7 | 170M6546 | 800 | 63919128 | 2 |
| ACS880-204LC-0400A-7 | 170M6546 | 800 | 63919128 | 2 |
| ACS880-204LC-0450A-7 | 170M6547 | 900 | 63919381 | 2 |
| ACS880-204LC-0480A-7 | 170M6548 | 1000 | 63916749 | 2 |
| ACS880-204LC-0560A-7 | 170M6549 | 1100 | 68736021 | 2 |
| ACS880-204LC-0620A-7 | 170M6500 | 1250 | 63919462 | 2 |
| ACS880-204LC-0700A-7 | 170M6501 | 1400 | 3AUA0000086673 | 2 |
| ACS880-204LC-0770A-7 | 170M6501 | 1400 | 3AUA0000086673 | 2 |
| ACS880-204LC-0930A-7 | 170M6548 | 1000 | 63916749 | 4 |
| ACS880-204LC-1090A-7 | 170M6549 | 1100 | 68736021 | 4 |
| ACS880-204LC-1180A-7 | 170M6500 | 1250 | 63919462 | 4 |
| ACS880-204LC-1360A-7 | 170M6501 | 1400 | 3AUA0000086673 | 4 |
| ACS880-204LC-1500A-7 | 170M6501 | 1400 | 3AUA0000086673 | 4 |
| ACS880-204LC-1800A-7 | 170M6500 | 1250 | 63919462 | 6 |
| ACS880-204LC-2020A-7 | 170M6501 | 1400 | 3AUA0000086673 | 6 |
| ACS880-204LC-2220A-7 | 170M6501 | 1400 | 3AUA0000086673 | 6 |
| ACS880-204LC-2670A-7 | 170M6501 | 1400 | 3AUA0000086673 | 8 |
| ACS880-204LC-2930A-7 | 170M6501 | 1400 | 3AUA0000086673 | 8 |
| ACS880-204LC-3320A-7 | 170M6501 | 1400 | 3AUA0000086673 | 10 |
| ACS880-204LC-3840A-7 | 170M6501 | 1400 | 3AUA0000086673 | 12 |
| ACS880-204LC-4360A-7 | 170M6501 | 1400 | 3AUA0000086673 | 12 |
| ACS880-204LC-5240A-7 | 170M6501 | 1400 | 3AUA0000086673 | 16 |
| ACS880-204LC-5810A-7 | 170M6501 | 1400 | 3AUA0000086673 | 16 |

### DC switch-disconnector kits for unit charging

For further information on using the kits, see section Supply unit control devices (page 41).

| Used with... | DC switch-disconnector kits for unit charging (IEC) | | | |
|---|---|---|---|---|
| | Switch type<br>Handle type | Qty | Ordering code | Instruction code |
| Frame R8i with DC switch-disconnector | OT1600E11<br>OHB150J12P | 1 | 3AXD50000227037 | 3AXD50000330720 |
| Frame 2×R8i with DC switch-disconnector | OT1600E22<br>OHB274J12 | 1 | 3AXD50000227044 | |
| Frame 3×R8i with DC switch-disconnector | OT2500E22<br>OHB274J12 | 1 | 3AXD50000227051 | |
| Frame 4×R8i with DC switch-disconnector | OT1600E22<br>OHB274J12 | 2 | 3AXD50000227044 | |
| Frame 5×R8i with DC switch-disconnector | 2×R8i:<br>OT1600E22<br>OHB274J12 | 1 | 3AXD50000227044 | |
| | 3×R8i:<br>OT2500E22<br>OHB274J12 | 1 | 3AXD50000227051 | |
| Frame 6×R8i with DC switch-disconnector | OT2500E22<br>OHB274J12 | 2 | 3AXD50000227051 | |
| Frame 8×R8i with DC switch-disconnector | OT1600E22<br>OHB274J12 | 4 | 3AXD50000227044 | |

The kit contains the following components:

- DC switch-disconnector (type indicated in table)
- Operating handle (type indicated in table)
- OXP12X395 operating shaft
- OA1G10 and OA3G01 auxiliary contacts
- OTZT4A-137 and PDAL2/24DC interlocks
- OHZX10 alignment ring.

| Used with... | DC switch-disconnector kits for unit charging (UL, CSA) | | | |
|---|---|---|---|---|
| | Switch type<br>Handle type | Qty | Ordering code | Instruction code |
| Frame R8i<br>with DC switch-disconnector | OT1200U11<br>OHB150J12P | 1 | 3AXD50000227068 | 3AXD50000330720 |
| Frame 2×R8i<br>with DC switch-disconnector | OT1200U22<br>OHB274J12 | 1 | 3AXD50000227075 | |
| Frame 3×R8i<br>with DC switch-disconnector | 1×R8i:<br>OT1200U22<br>OHB274J12 | 1 | 3AXD50000227068 | |
| | 2×R8i:<br>OT1200U22<br>OHB274J12 | 1 | 3AXD50000227075 | |
| Frame 4×R8i<br>with DC switch-disconnector | OT1200U22<br>OHB274J12 | 2 | 3AXD50000227075 | |
| Frame 5×R8i<br>with DC switch-disconnector | 1×R8i:<br>OT1200U22<br>OHB274J12 | 1 | 3AXD50000227068 | |
| | 2×R8i:<br>OT1200U22<br>OHB274J12 | 2 | 3AXD50000227075 | |
| Frame 6×R8i<br>with DC switch-disconnector | OT1200U22<br>OHB274J12 | 3 | 3AXD50000227075 | |
| Frame 8×R8i<br>with DC switch-disconnector | OT1200U22<br>OHB274J12 | 4 | 3AXD50000227075 | |

### DC charging kits for unit charging (for units with DC switch-disconnector)

| Used with... | DC charging kits for unit charging (IEC) | | | |
|---|---|---|---|---|
| | Switch type | Qty | Ordering code | Instruction code |
| Frames R8i and 2×R8i with DC switch-disconnector | OS160GD04F | 1 | 3AXD50000226801 | 3AXD50000450978 |
| Frame 3×R8i with DC switch-disconnector | OS200DZ04F | 1 | 3AXD50000227020 | |
| Frame 4×R8i with DC switch-disconnector | OS160GD04F | 2 | 3AXD50000226801 | |
| Frame 5×R8i with DC switch-disconnector | 1×R8i, 2×R8i: OS160GD04F | 1 | 3AXD50000226801 | |
| | 3×R8i: OS200DZ04F | 1 | 3AXD50000227020 | |
| Frame 6×R8i with DC switch-disconnector | OS200DZ04F | 2 | 3AXD50000227020 | |
| Frame 8×R8i with DC switch-disconnector | OS160GD04F | 4 | 3AXD50000226801 | |

The kit contains the following components:

- Charging switch (type indicated in table) with terminal shrouds
- OHB65J6 operating handle
- OXP6X290 operating shaft
- 2 pcs of OA3G01 auxiliary contacts
- BSFC-12C charging controller
- 170M2676 fuses
- OHZX10 alignment ring.

| Used with... | DC charging kits for unit charging (UL, CSA) | | | |
|---|---|---|---|---|
| | Switch type | Qty | Ordering code | Instruction code |
| Frames R8i and 2×R8i with DC switch-disconnector | OS100GJ04F | 1 | 3AXD50000227013 | 3AXD50000450978 |
| Frame 3×R8i with DC switch-disconnector | OS100GJ04F | 2 | 3AXD50000227013 | |
| Frame 4×R8i with DC switch-disconnector | OS100GJ04F | 2 | 3AXD50000227013 | |
| Frame 5×R8i with DC switch-disconnector | OS100GJ04F | 3 | 3AXD50000227013 | |
| Frame 6×R8i with DC switch-disconnector | OS100GJ04F | 3 | 3AXD50000227013 | |
| Frame 8×R8i with DC switch-disconnector | OS100GJ04F | 4 | 3AXD50000227013 | |

The kit contains the following components:

- Charging switch (type indicated in table) with terminal shrouds and support
- OXP6X290 operating shaft
- OHB65J6 operating handle
- Combi screws M4×8
- 2 pcs of OA3G01 auxiliary contacts
- BSFC-12C charging controller
- FWJ 30A fuses and fuse clips
- OHZX10 alignment ring.

**Note:** Charging resistors are not included in the kit and must be ordered separately.

## Charging resistors for unit charging (for units with DC switch-disconnector)

| Used with... | Qty (IEC) | Qty (UL/CSA) | Ordering code (IEC/UL/CSA) | Data |
|---|---|---|---|---|
| Frame R8i with DC switch-disconnector | 4 | 4 | 10028531 | 33 ohm |
| Frame 2×R8i with DC switch-disconnector | 6 | 6 | | |
| Frame 3×R8i with DC switch-disconnector | 8 | 10 | | |
| Frame 4×R8i with DC switch-disconnector | 12 | 12 | | |
| Frame 5×R8i with DC switch-disconnector | 14 | 16 | | |
| Frame 6×R8i with DC switch-disconnector | 16 | 18 | | |
| Frame 8×R8i with DC switch-disconnector | 24 | 24 | | |

### DC switch-disconnector for lineup charging

Switch-disconnector for lineup charging is needed when the delivery contains both lineup charging and unit charging. For further information on using the kits, see section Supply unit control devices (page 41).

| Used with... | DC switch-disconnector for lineup charging (IEC), units with LCL filter | | | | |
|---|---|---|---|---|---|
| | Type | Rating | Qty | Ordering code | Instruction code |
| Frame R8i | OT630E11 kit | 630 A, 1000 V | 1 | 3AXD50000507078 | 3AXD50000660582 |
| Frame 2×R8i | | | | | |
| Frame 3×R8i | | | | | |
| Frame 4×R8i | | | | | |
| Frame 5×R8i | | | | | |
| Frame 6×R8i | | | | | |
| Frame 8×R8i | | | | | |

| Used with... | DC switch-disconnector for lineup charging (UL, CSA), units with LCL filter | | | |
|---|---|---|---|---|
| | Type | Qty | Ordering code | Instruction code |
| Frame R8i | OT600U11 | 1 | 3AXD50000686674 | 3AXD50000660582 |
| Frame 2×R8i | | | | |
| Frame 3×R8i | | | | |
| Frame 4×R8i | | | | |
| Frame 5×R8i | | | | |
| Frame 6×R8i | | | | |
| Frame 8×R8i | | | | |

| Used with... | DC switch-disconnector for lineup charging (IEC), units with CL filter | | | | |
|---|---|---|---|---|---|
| | Type | Rating | Qty | Ordering code | Instruction code |
| Frame R8i | OT400E11 kit | 400 A, 1000 V | 1 | 3AXD50001383534 | 3AXD50000660582 |
| Frame 2×R8i | | | | | |
| Frame 3×R8i | | | | | |
| Frame 4×R8i | | | | | |
| Frame 6×R8i | OT400E11 kit | 400 A, 1000 V | 1 | 3AXD50001383534 | 3AXD50000660582 |
| Frame 8×R8i | | | | | |

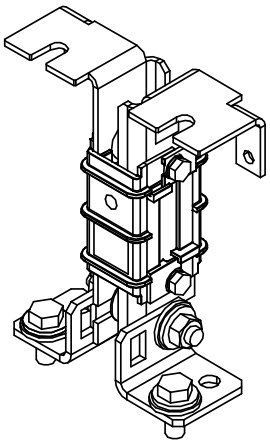
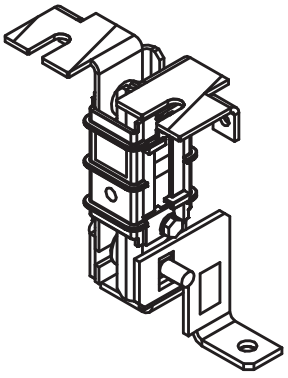
The kits above contain the following components:

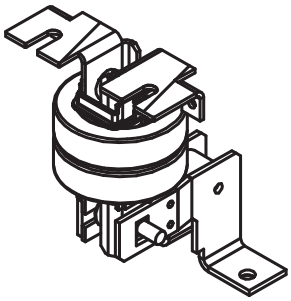
- DC switch-disconnector
- OXP12X250 operating shaft

- OHB150J12P operating handle
- OA1G10 auxiliary contact
- OHZX10 alignment ring.

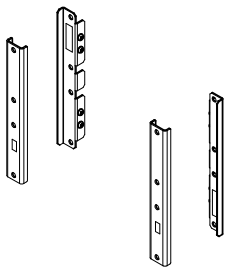
**DC connection parts 2 of 2**

These parts connect the DC fuses to the module.

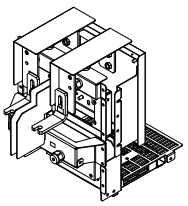
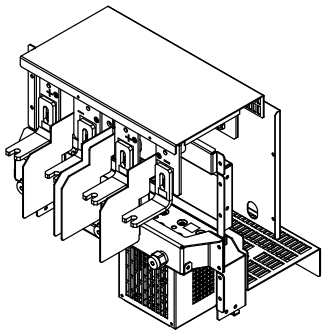
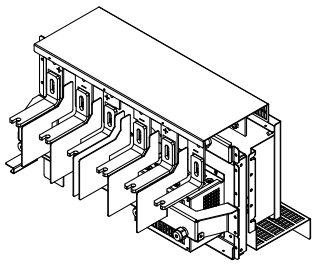
| Used with | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| All VX25 and generic enclosures (without DC switch) | 1 per module | 3AXD50000041264 | L-468-8-230 |  Instruction code: 3AXD50000041311 **Note:** Filters to be ordered separately |
| 400 mm and 600 mm VX25 enclosures (with DC switch) | 1 per module | 3AXD50000200368 | L-46-8-233 |  Instruction code: 3AXD50000205042 **Note:** Filters to be ordered separately |

| Used with | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 800 mm VX25 enclosures (with DC switch) | 3 | 3AXD50000200337 | L-8-8-234 |  Instruction code: 3AXD50000205226 **Note:** Filters to be ordered separately |

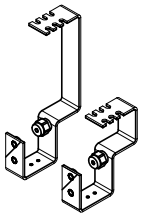
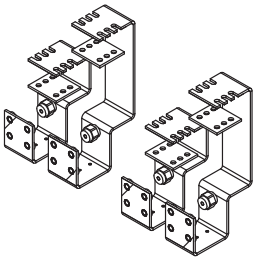
## Flat-PLS busbar support kits (common DC) for CL filters and LCL filters

| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 600 mm Rittal VX25 enclosure | 1 | 3AXD50000333387 | A-468-X-001-VX |  Instruction code: 3AXD50000333639 |

## Charging mechanics

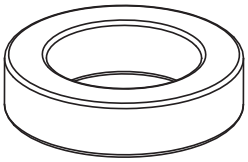
| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 400 mm Rittal VX25 enclosure | 1 | 3AXD50000361038 | L-4-8-254-VX |  Instruction code: 3AXD50000342600 |
| 600 mm Rittal VX25 enclosure | 1 | 3AXD50000361243 | L-6-8-255-VX |  Instruction code: 3AXD50000338740 |
| 800 mm Rittal VX25 enclosure | 1 | 3AXD50000361304 | L-8-8-256-VX |  Instruction code: 3AXD50000336999 |

## DC connection charging mechanics

| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 400 mm and 600 mm Rittal VX25 enclosures | 1 / module | 3AXD50000360567 | L-46-8-207-VX |  Instruction code: 3AXD50000343614 |
| 800 mm Rittal VX25 enclosure | 1 | 3AXD50000360574 | L-8-8-208-VX |  Instruction code: 3AXD50000344185 |

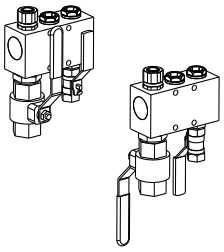
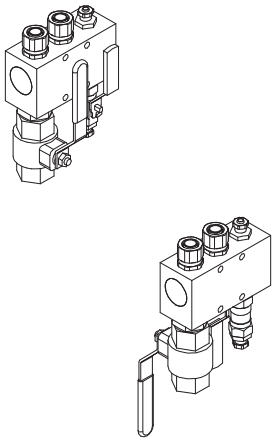
### Common mode filters

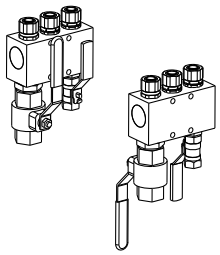
Common mode filtering reduces bearing currents and is required for electromagnetic compatibility (EMC). The filtering is implemented by installing two toroidal cores onto the DC busbars.

| Used with | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| All enclosure types | 2 per module | 3AXD50000566785 | - |  |

## Cooling system parts for supply modules

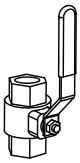
### Coolant distribution manifold kits

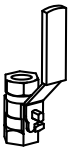
| Enclosure | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 400/600/800mm VX25 and generic enclosure (1 module) | 1 | 3AXD50000044084 | L-468-8-441 |  Instruction code: 3AXD50000048217 |
| 400/600/800mm VX25 and generic enclosure (2 modules) | 1 | 3AXD50000479788 | L-468-8-445 |  Instruction code: 3AXD50000479634 |

| Enclosure | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 400/600/800mm VX25 and generic enclosure (3 modules) | 1 | 3AXD50000048136 | L-468-8-443 |  Instruction code: 3AXD50000048283 |

The manifold kits contain:

 Inlet and outlet manifolds

 Inlet and outlet valves

 Drain valves

 Nipples for connecting the valves to manifolds

 Connectors for PA piping

 Plugs for unused piping connectors

 Chokes for flow limitation – not used with the ACS880-204LC.

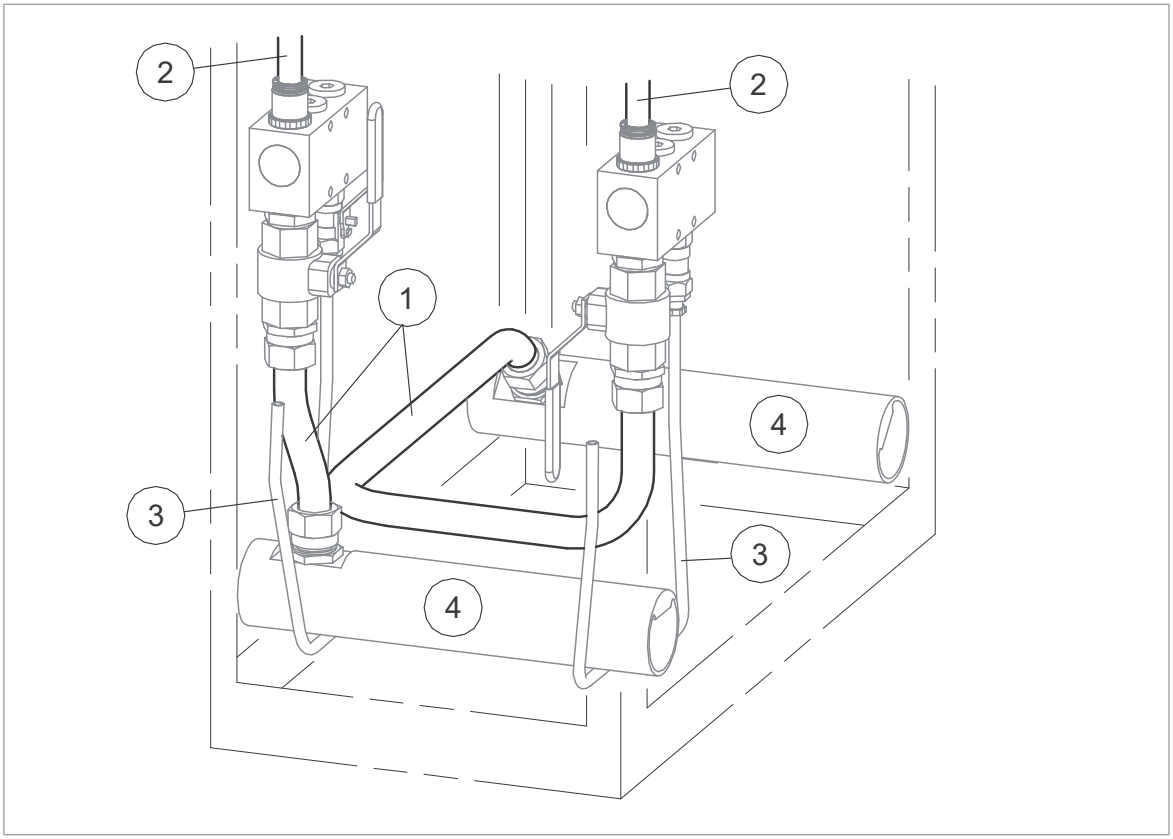
You must order the following parts separately as they are not included in the manifold kits:

- Connectors to attach to inlet, outlet and drain valves
- Connectors to attach to main pipes
- Pipes between main pipe and inlet/outlet valves
- Main pipes
- Drain pipes.

**Note:** The inlet and outlet valves have an R3/4" internal thread. The drain valves have an R3/8" internal thread.

## Piping

PA (polyamide) pipe is available in various diameters on reels. Refer to the figure for application.

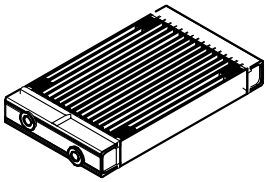



| Item | Data | Ordering code |
|---|---|---|
| 1 | PA12P40, 22/18 mm, 50 m | 3AXD50000441419 |
| 2[1)] | PA12P40, 16/13 mm, 50 m<br>PA12P40, 6/4 mm, 100 m | 3AXD50000047488<br>3AXD50001075316 |
| 3 | PA11P40, 8/6 mm, 50 m | 3AXD50000419302 |
| 4 | Available on request | |

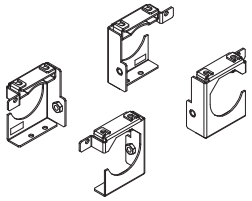
1) Use 16/13 mm pipe between the modules and the manifolds. If the heat exchanger is connected in parallel with the module(s), use 8/6 mm or 6/4 mm pipe between the heat exchanger and the manifolds. If the heat exchanger is connected in series with the module(s), use 16/13 mm pipe.

### Heat exchanger

The kit includes the heat exchanger and the connectors for piping.

| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| All enclosure types | 1 per module | 3AXD50000041265 | L-468-8-440 |  |

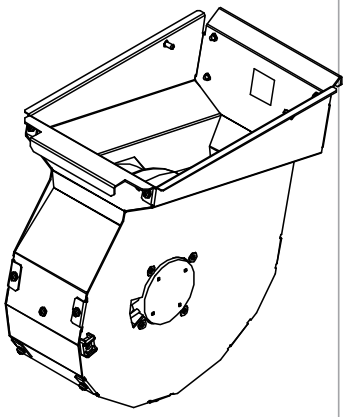
### Main pipe support kit

| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| 400/600/800 mm VX25 enclosure | 1 per cubicle | 3AXD50001155179 | L-468-X-450-VX |  Instruction code: 3AXD50001155353 |

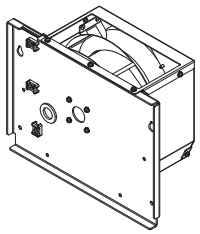
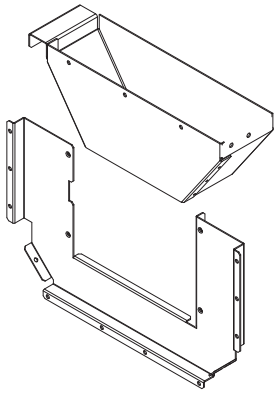
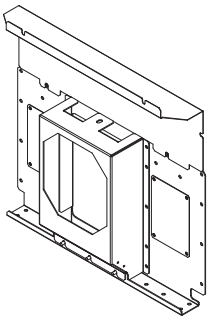
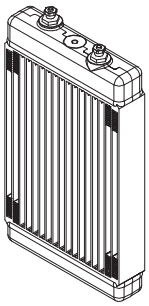
### Cooling fans for IGBT supply modules

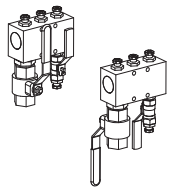
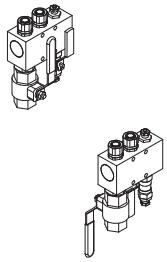
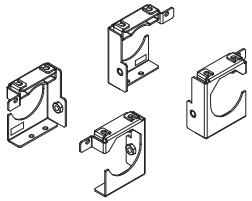
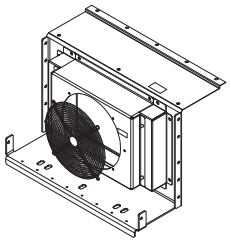
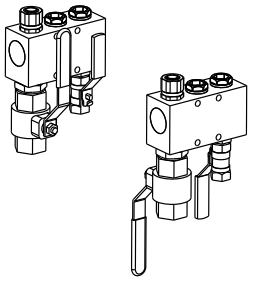
The fan blows air through the heat exchanger and through the module, circulating the air inside the cabinet. The kit contains the fan installed into its cowling which mounts to the module bottom guide.

The fan is selected according to the auxiliary voltage.

| Auxiliary voltage | Qty | Ordering code | Illustration |
|---|---|---|---|
| 230 V AC (50/60 Hz) | 1 / module | 3AXD50000043886 |  |
| 115 V AC (50/60 Hz) | 1 / module | 3AXD50000045414 | |

## Cooling system parts for filters

| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| BLCL-15LC-7, BLCL-24LC-7 and BLCL-25LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 / filter cubicle | 3AXD50000344970 | L-6-8-405 |  **Note:** Fan to be ordered separately. |
| BLCL-15LC-7, BLCL-24LC-7 and BLCL-25LC-7 (600 mm Rittal VX25 enclosure) | 1 | 3AXD50000426614 | L-6-8-028-VX |  Instruction code: 3AXD50000431397 |
| BLCL-15LC-7, BLCL-24LC-7 and BLCL-25LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50000426621 | L-6-8-029-VX |  Instruction code: 3AXD50000431588 |
| BLCL-15LC-7, BLCL-24LC-7, BLCL-25LC-7, incoming and CL filter cubicle (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50000479795 | L-468-8-446 |  Instruction code: 3AXD50000431588 |

| Used with ... | Qty | Ordering code | Kit code | Illustration |
|---|---|---|---|---|
| BLCL-15LC-7, BCL-15LC-7, incoming and CL filter cubicle (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50000479771 | L-468-8-444 |  Instruction code: 3AXD50000479498 |
| BLCL-24LC-7 and BLCL-25LC-7 (600 mm Rittal VX25 or generic enclosure) | 1 | 3AXD50000479788 | L-468-8-445 |  Instruction code: 3AXD50000479634 |
| BLCL-15LC-7, BLCL-24LC-7, BLCL-25LC-7, incoming and CL filter cubicle (600 mm Rittal VX25 enclosure) | 1 / filter cubicle | 3AXD50001155179 | L-468-X-450-VX |  Instruction code: 3AXD50001155353 |
| Incoming and CL filter cubicle (600 mm Rittal VX25 or generic enclosure) | 1 / filter cubicle | 3AXD50001394110 | L-6-8-328-VX |  Instruction code: 3AXD50001413194 |
| BCL-24LC-7, BCL-25LC-7, incoming and CL filter cubicle (600 mm Rittal VX25 or generic enclosure) | 1 / filter cubicle | 3AXD50000044084 | L-468-8-441 |  Instruction code: 3AXD50000048217 |

### Cooling fans for LCL filters

The fan blows air through the heat exchanger, circulating the air inside the cabinet. The fan is selected according to the auxiliary voltage.

| Auxiliary voltage | Qty | Ordering code |
|---|---|---|
| 230 V AC (50/60 Hz) | 1 / filter cubicle | 3AXD50000050763 |
| 115 V AC (50/60 Hz) | 1 / filter cubicle | 3AXD50000050767 |

### Cooling fans for CL filters

The fan blows air through the heat exchanger, circulating the air inside the cabinet.

| Auxiliary voltage | Qty | Ordering code |
|---|---|---|
| 24 V DC | 2 per cubicle (CL-ICU) | 3AXD50001325244 |

13

# Technical data

## Contents of this chapter

This chapter contains the technical data for ACS880-204LC IGBT supply modules.

# Ratings

The nominal ratings for are given below. The definitions are described below the table.

| ACS880-204LC- | Basic module type ACS880-104LC- | Frame size | No-overload use | | | | | | Light-overload use | | Heavy-duty use | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $I_1$ | $I_N$ | $I_{max}$ | $I_{max}$ | $P_N$ | $S_N$ | $I_{Ld}$ | $P_{Ld}$ | $I_{Hd}$ | $P_{Hd}$ |
| | | | A (AC) | A (DC) | A (AC) | A (DC) | kW (DC) | kVA | A (DC) | kW (DC) | A (DC) | kW (DC) |
| **$U_N$ = 400 V** | | | | | | | | | | | | |
| 0150A-3 | 0170A-3 | 1×R7i | 153 | 186 | 230 | 278 | 105 | 106 | 178 | 101 | 139 | 78 |
| 0190A-3 | 0210A-3 | 1×R7i | 185 | 224 | 280 | 336 | 127 | 128 | 215 | 122 | 168 | 95 |
| 0220A-3 | 0250A-3 | 1×R7i | 221 | 268 | 340 | 402 | 152 | 153 | 257 | 146 | 200 | 113 |
| 0270A-3 | 0300A-3 | 1×R7i | 272 | 330 | 410 | 495 | 187 | 188 | 317 | 179 | 247 | 140 |
| 0340A-3 | 0380A-3 | 1×R7i | 342 | 415 | 520 | 622 | 235 | 237 | 398 | 225 | 310 | 175 |
| 0420A-3 | 0470A-3 | 1×R7i | 419 | 508 | 630 | 762 | 287 | 290 | 488 | 276 | 380 | 215 |
| 0530A-3 | 0300A-3 | 2×R7i | 531 | 644 | 800 | 966 | 364 | 368 | 618 | 350 | 482 | 272 |
| 0670A-3 | 0380A-3 | 2×R7i | 666 | 808 | 1000 | 1211 | 457 | 461 | 775 | 439 | 604 | 342 |
| 0770A-3 | 0470A-3 | 2×R7i | 770 | 934 | 1160 | 1400 | 528 | 533 | 896 | 507 | 698 | 395 |
| 1000A-3 | 0380A-3 | 3×R7i | 999 | 1211 | 1500 | 1817 | 685 | 692 | 1163 | 658 | 906 | 513 |
| 1180A-3 | 0470A-3 | 3×R7i | 1180 | 1431 | 1770 | 2146 | 809 | 818 | 1374 | 777 | 1070 | 605 |
| 1310A-3 | 0380A-3 | 4×R7i | 1314 | 1593 | 1980 | 2390 | 901 | 910 | 1529 | 865 | 1192 | 674 |
| 1500A-3 | 0470A-3 | 4×R7i | 1500 | 1819 | 2250 | 2728 | 1029 | 1039 | 1746 | 988 | 1360 | 770 |
| **$U_N$ = 500 V** | | | | | | | | | | | | |
| 0150A-5 | 0170A-5 | 1×R7i | 153 | 186 | 230 | 278 | 131 | 133 | 178 | 126 | 139 | 98 |
| 0180A-5 | 0200A-5 | 1×R7i | 180 | 218 | 270 | 327 | 154 | 156 | 210 | 148 | 163 | 115 |
| 0220A-5 | 0240A-5 | 1×R7i | 216 | 262 | 330 | 393 | 185 | 187 | 251 | 178 | 196 | 139 |
| 0270A-5 | 0300A-5 | 1×R7i | 272 | 330 | 410 | 494 | 233 | 235 | 316 | 224 | 247 | 174 |
| 0340A-5 | 0380A-5 | 1×R7i | 342 | 415 | 520 | 622 | 293 | 296 | 398 | 281 | 310 | 219 |
| 0410A-5 | 0460A-5 | 1×R7i | 415 | 503 | 630 | 755 | 356 | 359 | 483 | 341 | 376 | 266 |
| 0530A-5 | 0300A-5 | 2×R7i | 531 | 644 | 800 | 966 | 455 | 460 | 618 | 437 | 482 | 341 |
| 0670A-5 | 0380A-5 | 2×R7i | 666 | 808 | 1000 | 1211 | 571 | 577 | 775 | 548 | 604 | 427 |
| 0770A-5 | 0460A-5 | 2×R7i | 770 | 934 | 1160 | 1400 | 660 | 667 | 896 | 634 | 698 | 494 |
| 1000A-5 | 0380A-5 | 3×R7i | 999 | 1211 | 1500 | 1817 | 857 | 865 | 1163 | 822 | 906 | 641 |
| 1180A-5 | 0460A-5 | 3×R7i | 1180 | 1431 | 1770 | 2146 | 1012 | 1022 | 1374 | 971 | 1070 | 757 |
| 1310A-5 | 0380A-5 | 4×R7i | 1314 | 1593 | 1980 | 2390 | 1127 | 1138 | 1529 | 1082 | 1192 | 843 |
| 1500A-5 | 0460A-5 | 4×R7i | 1500 | 1819 | 2250 | 2728 | 1286 | 1299 | 1746 | 1235 | 1360 | 962 |
| **$U_N$ = 690 V** | | | | | | | | | | | | |
| 0260A-7 | 0290A-7 | 1×R7i | 260 | 315 | 400 | 473 | 308 | 311 | 303 | 295 | 236 | 230 |
| 0310A-7 | 0340A-7 | 1×R7i | 306 | 371 | 460 | 557 | 362 | 366 | 356 | 348 | 278 | 271 |
| 0350A-7 | 0389A-7 | 1×R7i | 351 | 426 | 530 | 638 | 415 | 419 | 409 | 399 | 318 | 311 |
| 0500A-7 | 0290A-7 | 2×R7i | 504 | 611 | 760 | 917 | 596 | 602 | 587 | 572 | 457 | 446 |
| 0590A-7 | 0340A-7 | 2×R7i | 594 | 720 | 900 | 1080 | 703 | 710 | 691 | 675 | 539 | 526 |
| 0680A-7 | 0389A-7 | 2×R7i | 684 | 829 | 1030 | 1244 | 809 | 817 | 796 | 777 | 620 | 605 |

| ACS880-204LC- | Basic module type ACS880-104LC- | Frame size | No-overload use | | | | | | Light-overload use | | Heavy-duty use | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $I_1$ | $I_N$ | $I_{max}$ | $I_{max}$ | $P_N$ | $S_N$ | $I_{Ld}$ | $P_{Ld}$ | $I_{Hd}$ | $P_{Hd}$ |
| | | | A (AC) | A (DC) | A (AC) | A (DC) | kW (DC) | kVA | A (DC) | kW (DC) | A (DC) | kW (DC) |
| 0760A-7 | 0290A-7 | 3×R7i | 756 | 917 | 1140 | 1375 | 894 | 904 | 880 | 859 | 686 | 669 |
| 0880A-7 | 0340A-7 | 3×R7i | 882 | 1069 | 1330 | 1604 | 1044 | 1054 | 1027 | 1002 | 800 | 781 |
| 1020A-7 | 0389A-7 | 3×R7i | 1017 | 1233 | 1530 | 1850 | 1203 | 1215 | 1184 | 1155 | 922 | 900 |
| 1170A-7 | 0340A-7 | 4×R7i | 1170 | 1419 | 1760 | 2128 | 1384 | 1398 | 1362 | 1329 | 1061 | 1035 |
| 1340A-7 | 0389A-7 | 4×R7i | 1341 | 1626 | 2020 | 2439 | 1587 | 1603 | 1561 | 1523 | 1216 | 1187 |
| 0360A-7 | 0390A-7 | 1×R8i | 360 | 436 | 540 | 655 | 426 | 430 | 419 | 409 | 327 | 319 |
| 0400A-7 | 0430A-7 | 1×R8i | 400 | 485 | 600 | 727 | 473 | 478 | 466 | 454 | 363 | 354 |
| 0450A-7 | 0480A-7 | 1×R8i | 450 | 546 | 680 | 818 | 532 | 538 | 524 | 511 | 408 | 398 |
| 0480A-7 | 0530A-7 | 1×R8i | 480 | 582 | 720 | 873 | 568 | 574 | 559 | 545 | 435 | 425 |
| 0560A-7 | 0600A-7 | 1×R8i | 560 | 679 | 840 | 1018 | 663 | 669 | 652 | 636 | 508 | 496 |
| 0620A-7 | 0670A-7 | 1×R8i | 620 | 752 | 930 | 1128 | 734 | 741 | 722 | 704 | 562 | 549 |
| 0700A-7 | 0750A-7 | 1×R8i | 700 | 849 | 1050 | 1273 | 828 | 837 | 815 | 795 | 635 | 620 |
| 0770A-7 | 0850A-7 | 1×R8i | 770 | 934 | 1160 | 1400 | 911 | 920 | 896 | 875 | 698 | 681 |
| 0930A-7 | 0530A-7 | 2×R8i | 930 | 1128 | 1400 | 1691 | 1100 | 1111 | 1083 | 1056 | 843 | 823 |
| 1090A-7 | 0600A-7 | 2×R8i | 1090 | 1322 | 1640 | 1982 | 1290 | 1303 | 1269 | 1238 | 989 | 965 |
| 1180A-7 | 0670A-7 | 2×R8i | 1180 | 1431 | 1770 | 2146 | 1396 | 1410 | 1374 | 1340 | 1070 | 1044 |
| 1360A-7 | 0750A-7 | 2×R8i | 1360 | 1649 | 2040 | 2473 | 1609 | 1625 | 1583 | 1545 | 1233 | 1204 |
| 1500A-7 | 0850A-7 | 2×R8i | 1500 | 1819 | 2250 | 2728 | 1775 | 1793 | 1746 | 1704 | 1360 | 1328 |
| 1800A-7 | 0670A-7 | 3×R8i | 1800 | 2182 | 2700 | 3274 | 2130 | 2151 | 2095 | 2045 | 1633 | 1593 |
| 2020A-7 | 0750A-7 | 3×R8i | 2020 | 2449 | 3030 | 3674 | 2390 | 2414 | 2351 | 2294 | 1832 | 1788 |
| 2220A-7 | 0850A-7 | 3×R8i | 2220 | 2692 | 3330 | 4038 | 2627 | 2653 | 2584 | 2522 | 2013 | 1965 |
| 2670A-7 | 0750A-7 | 4×R8i | 2670 | 3237 | 4010 | 4856 | 3159 | 3191 | 3108 | 3033 | 2422 | 2363 |
| 2930A-7 | 0850A-7 | 4×R8i | 2930 | 3553 | 4400 | 5329 | 3467 | 3502 | 3411 | 3328 | 2657 | 2593 |
| 3320A-7[1)] | 0750A-7 | 5×R8i | 3320 | 4025 | 4980 | 6038 | 3928 | 3968 | 3864 | 3771 | 3011 | 2938 |
| 3840A-7 | 0750A-7 | 6×R8i | 3840 | 4656 | 5760 | 6984 | 4543 | 4589 | 4470 | 4362 | 3483 | 3398 |
| 4360A-7 | 0850A-7 | 6×R8i | 4360 | 5286 | 6540 | 7930 | 5159 | 5211 | 5075 | 4952 | 3954 | 3859 |
| 5240A-7 | 0750A-7 | 8×R8i | 5240 | 6353 | 7860 | 9530 | 6200 | 6262 | 6099 | 5952 | 4752 | 4637 |
| 5810A-7 | 0850A-7 | 8×R8i | 5810 | 7045 | 8720 | 10567 | 6874 | 6944 | 6763 | 6599 | 5269 | 5142 |

1) Frame 5×R8i is not available with CL filter. It is available with LCL filter only.

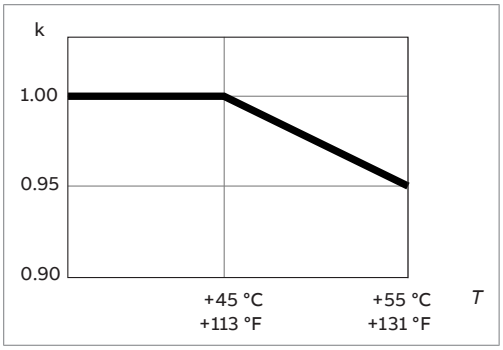
## Definitions

| | |
|---|---|
| $U_N$ | Supply voltage range |
| $I_1$ | Nominal rms current |
| $I_N$ | Nominal current (available continuously with no over-loading) |
| $I_{max}$ | Maximum current. Available for 10 seconds at start, then as long as allowed by drive temperature. |
| $P_N$ | Typical power in no-overload use |
| $S_N$ | Nominal apparent power |
| $I_{Ld}$ | Continuous rms current allowing 10% overload for 1 minute every 5 minutes |
| $P_{Ld}$ | Typical power in light-overload use |
| $I_{Hd}$ | Continuous rms current allowing 50% overload for 1 minute every 5 minutes |
| $P_{Hd}$ | Typical power in heavy-duty use |
| **Note 1:** The ratings apply at an ambient air temperature of 45 °C (113 °F) and a coolant temperature of 40 °C (104 °F).<br>**Note 2:** To achieve the rated power given in the table, the rated current must be higher than or equal to the rated current. For dimensioning, use DriveSize dimensioning tool available from ABB. | |

## Derating

### Surrounding air temperature derating

In the temperature range +45…55 °C (+113…131 °F), the rated output current is derated by 0.5 percentage points 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)*:




### Altitude derating

At altitudes more than 1000 m (3281 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. The maximum permitted installation altitude is given in the technical data.

For a more accurate derating, use the DriveSize PC tool.

# Type equivalence table

| ACS880-204LC-... | Modules used | | | LCL filter | | CL filter (frame R8i only) | |
|---|---|---|---|---|---|---|---|
| | ACS880-104LC-... | DC capacitance (mF) | Qty | Filter type | Qty | Filter type | Qty |
| **$U_N$ = 400 V** | | | | | | | |
| 0150A-3 | 0170A-3 | 6.4 | 1×R7i | BLCL-13LC-7 | 1 | - | - |
| 0190A-3 | 0210A-3 | 6.4 | 1×R7i | BLCL-13LC-7 | 1 | - | - |
| 0220A-3 | 0250A-3 | 6.4 | 1×R7i | BLCL-13LC-7 | 1 | - | - |
| 0270A-3 | 0300A-3 | 9.6 | 1×R7i | BLCL-14LC-5 | 1 | - | - |
| 0340A-3 | 0380A-3 | 9.6 | 1×R7i | BLCL-14LC-5 | 1 | - | - |
| 0420A-3 | 0470A-3 | 9.6 | 1×R7i | BLCL-14LC-5 | 1 | - | - |
| 0530A-3 | 0300A-3 | 19.2 | 2×R7i | BLCL-15LC-7 | 1 | - | - |
| 0670A-3 | 0380A-3 | 19.2 | 2×R7i | BLCL-15LC-7 | 1 | - | - |
| 0770A-3 | 0470A-3 | 19.2 | 2×R7i | BLCL-15LC-7 | 1 | - | - |
| 1000A-3 | 0380A-3 | 28.8 | 3×R7i | BLCL-24LC-7 | 1 | - | - |
| 1180A-3 | 0470A-3 | 28.8 | 3×R7i | BLCL-24LC-7 | 1 | - | - |
| 1310A-3 | 0380A-3 | 38.4 | 4×R7i | BLCL-25LC-7 | 1 | - | - |
| 1500A-3 | 0470A-3 | 38.4 | 4×R7i | BLCL-25LC-7 | 1 | - | - |
| **$U_N$ = 500 V** | | | | | | | |
| 0150A-5 | 0170A-5 | 6.4 | 1×R7i | BLCL-13LC-7 | 1 | - | - |
| 0180A-5 | 0200A-5 | 6.4 | 1×R7i | BLCL-13LC-7 | 1 | - | - |
| 0220A-5 | 0240A-5 | 6.4 | 1×R7i | BLCL-13LC-7 | 1 | - | - |
| 0270A-5 | 0300A-5 | 9.6 | 1×R7i | BLCL-14LC-5 | 1 | - | - |
| 0340A-5 | 0380A-5 | 9.6 | 1×R7i | BLCL-14LC-5 | 1 | - | - |
| 0410A-5 | 0460A-5 | 9.6 | 1×R7i | BLCL-14LC-5 | 1 | - | - |
| 0530A-5 | 0300A-5 | 19.2 | 2×R7i | BLCL-15LC-7 | 1 | - | - |
| 0670A-5 | 0380A-5 | 19.2 | 2×R7i | BLCL-15LC-7 | 1 | - | - |
| 0770A-5 | 0460A-5 | 19.2 | 2×R7i | BLCL-15LC-7 | 1 | - | - |
| 1000A-5 | 0380A-5 | 28.8 | 3×R7i | BLCL-24LC-7 | 1 | - | - |
| 1180A-5 | 0460A-5 | 28.8 | 3×R7i | BLCL-24LC-7 | 1 | - | - |
| 1310A-5 | 0380A-5 | 38.4 | 4×R7i | BLCL-25LC-7 | 1 | - | - |
| 1500A-5 | 0460A-5 | 38.4 | 4×R7i | BLCL-25LC-7 | 1 | - | - |
| **$U_N$ = 690 V** | | | | | | | |
| 0260A-7 | 0290A-7 | 5.3 | 1×R7i | BLCL-13LC-7 | 1 | - | - |
| 0310A-7 | 0340A-7 | 5.3 | 1×R7i | BLCL-13LC-7 | 1 | - | - |
| 0350A-7 | 0389A-7 | 5.3 | 1×R7i | BLCL-13LC-7 | 1 | - | - |
| 0500A-7 | 0290A-7 | 10.7 | 2×R7i | BLCL-15LC-7 | 1 | - | - |
| 0590A-7 | 0340A-7 | 10.7 | 2×R7i | BLCL-15LC-7 | 1 | - | - |
| 0680A-7 | 0389A-7 | 10.7 | 2×R7i | BLCL-15LC-7 | 1 | - | - |
| 0760A-7 | 0290A-7 | 16.0 | 3×R7i | BLCL-15LC-7 | 1 | - | - |
| 0880A-7 | 0340A-7 | 16.0 | 3×R7i | BLCL-24LC-7 | 1 | - | - |
| 1020A-7 | 0389A-7 | 16.0 | 3×R7i | BLCL-24LC-7 | 1 | - | - |

| ACS880-204LC-... | Modules used | | | LCL filter | | CL filter (frame R8i only) | |
|---|---|---|---|---|---|---|---|
| | ACS880-104LC-... | DC capacitance (mF) | Qty | Filter type | Qty | Filter type | Qty |
| 1170A-7 | 0340A-7 | 21.3 | 4×R7i | BLCL-24LC-7 | 1 | - | - |
| 1340A-7 | 0389A-7 | 21.3 | 4×R7i | BLCL-25LC-7 | 1 | - | - |
| 0360A-7 | 0390A-7 | 6 | 1×R8i | BLCL-15LC-7 | 1 | BCL-15LC-7 | 1 |
| 0400A-7 | 0430A-7 | 6 | 1×R8i | BLCL-15LC-7 | 1 | BCL-15LC-7 | 1 |
| 0450A-7 | 0480A-7 | 6 | 1×R8i | BLCL-15LC-7 | 1 | BCL-15LC-7 | 1 |
| 0480A-7 | 0530A-7 | 6 | 1×R8i | BLCL-15LC-7 | 1 | BCL-15LC-7 | 1 |
| 0560A-7 | 0600A-7 | 9 | 1×R8i | BLCL-15LC-7 | 1 | BCL-15LC-7 | 1 |
| 0620A-7 | 0670A-7 | 9 | 1×R8i | BLCL-15LC-7 | 1 | BCL-15LC-7 | 1 |
| 0700A-7 | 0750A-7 | 9 | 1×R8i | BLCL-15LC-7 | 1 | BCL-15LC-7 | 1 |
| 0770A-7 | 0850A-7 | 9 | 1×R8i | BLCL-15LC-7 | 1 | BCL-15LC-7 | 1 |
| 0930A-7 | 0530A-7 | 12 | 2×R8i | BLCL-24LC-7 | 1 | BCL-24LC-7 | 1 |
| 1090A-7 | 0600A-7 | 18 | 2×R8i | BLCL-24LC-7 | 1 | BCL-24LC-7 | 1 |
| 1180A-7 | 0670A-7 | 18 | 2×R8i | BLCL-24LC-7 | 1 | BCL-24LC-7 | 1 |
| 1360A-7 | 0750A-7 | 18 | 2×R8i | BLCL-25LC-7 | 1 | BCL-25LC-7 | 1 |
| 1500A-7 | 0850A-7 | 18 | 2×R8i | BLCL-25LC-7 | 1 | BCL-25LC-7 | 1 |
| 1800A-7 | 0670A-7 | 27 | 3×R8i | BLCL-24LC-7 | 2 | BCL-24LC-7 | 2 |
| 2020A-7 | 0750A-7 | 27 | 3×R8i | BLCL-24LC-7 | 2 | BCL-24LC-7 | 2 |
| 2220A-7 | 0850A-7 | 27 | 3×R8i | BLCL-24LC-7 | 2 | BCL-24LC-7 | 2 |
| 2670A-7 | 0750A-7 | 36 | 4×R8i | BLCL-25LC-7 | 2 | BCL-25LC-7 | 2 |
| 2930A-7 | 0850A-7 | 36 | 4×R8i | BLCL-25LC-7 | 2 | BCL-25LC-7 | 2 |
| 3320A-7 | 0750A-7 | 45 | 5×R8i | BLCL-24LC-7 | 3 | - | - |
| 3840A-7 | 0750A-7 | 54 | 6×R8i | BLCL-24LC-7 *) | 4 | BCL-24LC-7 | 4 |
| 4360A-7 | 0850A-7 | 54 | 6×R8i | BLCL-24LC-7 *) | 4 | BCL-24LC-7 | 4 |
| 5240A-7 | 0750A-7 | 72 | 8×R8i | BLCL-25LC-7 | 4 | BCL-25LC-7 | 4 |
| 5810A-7 | 0850A-7 | 72 | 8×R8i | BLCL-25LC-7 | 4 | BCL-25LC-7 | 4 |

*) 3×BLCL-25LC-7 for UL

# Fuses

Fuses are given in chapter Ordering information.

**Note:** The recommended fuses are for branch circuit protection per NEC as required for the UL approval.

# LCL filters

## Kit contents

| LCL filter type | Ordering code | Resistor | | Film capacitor | |
|---|---|---|---|---|---|
| | | Data | Qty | µF | Qty |
| BLCL-14LC-5 | 3AXD50000896332 | 3×120 W, 3×50 kohm | 1 | 3×42 | 2 |
| BLCL-13LC-7 | 3AXD50000896431 | 3×120 W, 3×50 kohm | 1 | 3×42 | 2 |
| BLCL-15LC-7 | 3AXD50000234417 | 3×120 W, 3×50 kohm | 1 | 3×40 | 3 |
| BLCL-24LC-7 | 3AXD50000234431 | 3×120 W, 3×50 kohm | 1 | 3×40 | 5 |
| BLCL-25LC-7 | 3AXD50000234448 | 3×120 W, 3×50 kohm | 1 | 3×40 | 6 |

| LCL filter type | $L_{grid}$ | $L_{converter}$ | Quick connector | | | Kit instruction |
|---|---|---|---|---|---|---|
| | Qty | Qty | Type | Qty | Qty (locking rings) | Qty |
| BLCL-14LC-5 | 1 | 1 | Part of the delivery | | | 1 |
| BLCL-13LC-7 | 1 | 1 | Part of the delivery | | | 1 |
| BLCL-15LC-7 | 1 | 1 | 3/8" for 16/13 mm | 4 | 4 | 1 |
| BLCL-24LC-7 | 1 | 1 | 3/8" for 16/13 mm | 4 | 4 | 1 |
| BLCL-25LC-7 | 1 | 1 | 3/8" for 16/13 mm | 4 | 4 | 1 |

## Technical data

The technical data and the weights of the LCL filter components are shown below. For the dimensions, see chapter Dimension drawings.

| LCL filter type | $L_{grid}$ | $L_{converter}$ | Capacitor | | Resistor | Weight [kg (lb)] |
|---|---|---|---|---|---|---|
| | L [mH] | L [mH] | Capacitor capacitance [µF] | Filter capacitance [µF] | W | |
| BLCL-14LC-5 | 0.100 | 0.126 | 3×42 | 3×84 | 3×120 | 220 (485) |
| BLCL-13LC-7 | 0.160 | 0.197 | 3×42 | 3×84 | 3×120 | 201 (443) |

| LCL filter type | $L_{grid}$ | | $L_{converter}$ | | Capacitor | | Resistor |
|---|---|---|---|---|---|---|---|
| | L [mH] | Weight [kg (lb)] | L [mH] | Weight [kg (lb)] | Capacitor capacitance [µF] | Filter capacitance [µF] | W |
| BLCL-15LC-7 | 0.085 | 144 (317) | 0.106 | 150 (331) | 3×40 | 3×120 | 3×120 |
| BLCL-24LC-7 | 0.042 | 146 (322) | 0.053 | 148 (326) | 3×40 | 3×200 | 3×120 |

| LCL filter type | $L_{grid}$ | | $L_{converter}$ | | Capacitor | | Resistor |
|---|---|---|---|---|---|---|---|
| | L [mH] | Weight [kg (lb)] | L [mH] | Weight [kg (lb)] | Capacitor capacitance [µF] | Filter capacitance [µF] | W |
| BLCL-25LC-7 | 0.034 | 212 (467) | 0.043 | 216 (476) | 3×40 | 3×240 | 3×120 |

# CL filters

## Kit contents

| CL filter type | Ordering code | Resistor | | Film capacitor | |
|---|---|---|---|---|---|
| | | Data | Qty | µF | Qty |
| BCL-15LC-7 | 3AXD50001373979 | 3×120 W, 3×50 kohm | 1 | 3×40 | 3 |
| BCL-24LC-7 | 3AXD50001373986 | 3×120 W, 3×50 kohm | 1 | 3×40 | 5 |
| BCL-25LC-7 | 3AXD50001373993 | 3×120 W, 3×50 kohm | 1 | 3×40 | 6 |

| CL filter type | $L_{converter}$ | Quick connector | | | Kit instruction |
|---|---|---|---|---|---|
| | Qty | Type | Qty | Qty (locking rings) | Qty |
| BCL-15LC-7 | 1 | 3/8" for 16/13 mm | 2 | 2 | 1 |
| BCL-24LC-7 | 1 | 3/8" for 16/13 mm | 2 | 2 | 1 |
| BCL-25LC-7 | 1 | 3/8" for 16/13 mm | 2 | 2 | 1 |

## Technical data

The technical data and the weights of the CL filter components are shown below. For the dimensions, see chapter Dimension drawings.

| CL filter type | $L_{converter}$ | | Capacitor | |
|---|---|---|---|---|
| | L [mH] | Weight [kg (lb)] | Capacitor capacitance [µF] | Filter capacitance [µF] |
| BCL-15LC-7 | 0.106 | 150 (331) | 3×40 | 3×120 |
| BCL-24LC-7 | 0.053 | 148 (326) | 3×40 | 3×200 |
| BCL-25LC-7 | 0.043 | 216 (476) | 3×40 | 3×240 |

# Lineup charging kit contents

| Charging kit code (IEC) | Charging resistors | | OS switch fuse rating | AC fuse rating | DC fuse rating | Contactor rating |
|---|---|---|---|---|---|---|
| | ohm | Qty | $I_e$ [A] | $I_n$ [A] | $I_n$ [A] | $I_e$ [A] |
| 3AXD50000250776 | 5 | 3 | 40 | 16 | 125 | 26 |
| 3AXD50000250783 | 5 | 3 | 40 | 20 | 125 | 26 |
| 3AXD50000250790 | 5 | 6 | 40 | 35 | 125 | 52 |
| 3AXD50000250806 | 5 | 9 | 63 | 50 | 125 | 65 |
| 3AXD50000251216 | 5 | 9 | 63 | 50 | 350 | 65 |

| Charging kit code (UL) | Charging resistors | | OS switch fuse rating | AC fuse rating | DC fuse rating | Contactor rating |
|---|---|---|---|---|---|---|
| | ohm | Qty | $I_e$ [A] | $I_n$ [A] | $I_n$ [A] | $I_e$ [A] |
| 3AXD50000686308 | 5 | 3 | 30 | 10 | 125 | 26 |
| 3AXD50000686612 | 5 | 3 | 30 | 15 | 125 | 26 |
| 3AXD50000686629 | 5 | 6 | 30 | 20 | 125 | 52 |
| 3AXD50000686636 | 5 | 9 | 30 | 25 | 125 | 65 |
| 3AXD50000686643 | 5 | 9 | 30 | 30 | 350 | 65 |

# Dimensions and weights

The weights of the supply modules are shown below. For the dimensions, see chapter Dimension drawings.

| Module type | Weight | |
|---|---|---|
| | kg | lb |
| ACS880-104LC-0170A-3 … -0250A-3<br>ACS880-104LC-0170A-5 … -0240A-5 | 38 | 84 |
| ACS880-104LC-0300A-3 … -0470A-3<br>ACS880-104LC-0300A-5 … -0460A-5 | 40 | 88 |
| ACS880-104LC-0290A-7 … -0389A-7 | 41 | 90 |
| ACS880-104LC-0390A-7 … -0530A-7 | 59 | 130 |
| ACS880-104LC-0600A-7 … -0850A-7 | 63 | 139 |

## Free space requirements

Frame R7i:

- Left and right sides, below, above, back: None, but the return flow of air must not be restricted.
- Front: Space needed by coolant piping.

Frame R8i:

- Left and right sides, back: None, but the return flow of air must not be restricted.
- Front: Space needed by coolant piping.
- Below: Space needed by heat exchanger and cooling fan.
- Above: The cooling air flow through the module should not be restricted.

## Allowable mounting positions

IGBT supply module:

- Upright
- On left-hand side (viewed from the front)

LCL filter (or CL filter) components:

- Upright

# Losses, cooling data and noise

## Losses (frame R7i)

| ACS880-204LC- | $P_{loss}$ (ISU) | $P_{loss}$ (LCL) | $P_{loss}$ (ISU+LCL) | Power loss, total | |
|---|---|---|---|---|---|
| | | | | into coolant | into air |
| | kW | kW | kW | kW | kW |
| **$U_N$ = 400 V** | | | | | |
| 0150A-3 | 1.3 | 0.9 | 2.2 | 2.21 | 0.06 |
| 0190A-3 | 1.6 | 1.1 | 2.7 | 2.70 | 0.07 |
| 0220A-3 | 2.1 | 1.4 | 3.5 | 3.35 | 0.09 |
| 0270A-3 | 2.7 | 1.3 | 4.0 | 3.9 | 0.10 |
| 0340A-3 | 3.7 | 1.6 | 5.3 | 5.2 | 0.13 |
| 0420A-3 | 5.0 | 2.0 | 7.0 | 6.9 | 0.18 |
| 0530A-3 | 5.2 | 3.2 | 8.4 | 8.2 | 0.21 |
| 0670A-3 | 7.2 | 4.7 | 11.9 | 11.6 | 0.3 |
| 0770A-3 | 9.3 | 5.8 | 15.1 | 14.7 | 0.4 |
| 1000A-3 | 10.8 | 5.0 | 15.8 | 15.4 | 0.4 |
| 1180A-3 | 14.2 | 6.3 | 20.5 | 20.0 | 0.5 |
| 1310A-3 | 14.2 | 5.6 | 19.8 | 19.3 | 0.5 |
| 1500A-3 | 18.1 | 6.9 | 25.0 | 24.3 | 0.6 |
| **$U_N$ = 500 V** | | | | | |
| 0150A-5 | 1.5 | 1.0 | 2.5 | 2.46 | 0.06 |
| 0180A-5 | 1.8 | 1.2 | 3.0 | 2.89 | 0.07 |
| 0220A-5 | 2.2 | 1.4 | 3.6 | 3.54 | 0.09 |
| 0270A-5 | 2.9 | 1.3 | 4.2 | 4.1 | 0.10 |
| 0340A-5 | 4.0 | 1.6 | 5.6 | 5.4 | 0.14 |
| 0410A-5 | 5.3 | 2.0 | 7.3 | 7.1 | 0.18 |
| 0530A-5 | 5.6 | 3.3 | 8.9 | 8.7 | 0.22 |
| 0670A-5 | 7.7 | 4.8 | 12.5 | 12.2 | 0.3 |
| 0770A-5 | 9.8 | 6.0 | 15.8 | 15.4 | 0.4 |
| 1000A-5 | 11.6 | 5.2 | 16.8 | 16.4 | 0.4 |
| 1180A-5 | 15.0 | 6.5 | 21.5 | 21.0 | 0.5 |
| 1310A-5 | 15.2 | 5.8 | 21.0 | 20.5 | 0.5 |
| 1500A-5 | 19.1 | 7.1 | 26.2 | 25.5 | 0.7 |
| **$U_N$ = 690 V** | | | | | |
| 0260A-7 | 4.4 | 1.8 | 6.2 | 6.0 | 0.15 |
| 0310A-7 | 5.4 | 2.2 | 7.6 | 7.4 | 0.19 |
| 0350A-7 | 6.4 | 2.8 | 9.2 | 9.0 | 0.23 |
| 0500A-7 | 8.5 | 3.2 | 11.7 | 11.4 | 0.3 |
| 0590A-7 | 10.4 | 4.1 | 14.5 | 14.2 | 0.4 |
| 0680A-7 | 12.5 | 5.1 | 17.6 | 17.1 | 0.4 |
| 0760A-7 | 12.8 | 6.2 | 19.0 | 18.5 | 0.5 |

| ACS880-204LC- | $P_{loss}$ (ISU) | $P_{loss}$ (LCL) | $P_{loss}$ (ISU+LCL) | Power loss, total | |
|---|---|---|---|---|---|
| | | | | into coolant | into air |
| | kW | kW | kW | kW | kW |
| 0880A-7 | 15.5 | 5.2 | 20.7 | 20.1 | 0.5 |
| 1020A-7 | 18.5 | 5.5 | 24.0 | 23.4 | 0.6 |
| 1170A-7 | 20.5 | 6.8 | 27.3 | 26.7 | 0.7 |
| 1340A-7 | 24.4 | 6.3 | 30.7 | 30.0 | 0.8 |

These losses are not calculated according to the ecodesign standard IEC 61800-9-2.

## Losses (frame R8i with LCL filter)

| ACS880-204LC- | $P_{loss}$ (ISU) | $P_{loss}$ (LCL) | $P_{loss}$ (LCL cabinet) | $P_{loss}$ (ISU+LCL+LCL cabinet) | Power loss, total | |
|---|---|---|---|---|---|---|
| | | | | | into coolant | into air |
| | kW | kW | kW | kW | kW | kW |
| **$U_N$ = 690 V** | | | | | | |
| 0360A-7 | 5.2 | 2.0 | 0.3 | 7.5 | 7.3 | 0.2 |
| 0400A-7 | 5.8 | 2.2 | 0.3 | 8.4 | 8.2 | 0.2 |
| 0450A-7 | 6.6 | 2.6 | 0.3 | 9.6 | 9.4 | 0.2 |
| 0480A-7 | 7.3 | 2.9 | 0.4 | 10.6 | 10.3 | 0.3 |
| 0560A-7 | 8.5 | 3.7 | 0.4 | 12.6 | 12.3 | 0.3 |
| 0620A-7 | 9.5 | 4.4 | 0.5 | 14.3 | 14.0 | 0.4 |
| 0700A-7 | 11.1 | 5.3 | 0.6 | 17.0 | 16.6 | 0.4 |
| 0770A-7 | 12.5 | 6.3 | 0.6 | 19.4 | 18.9 | 0.5 |
| 0930A-7 | 14.2 | 4.6 | 0.6 | 19.4 | 18.9 | 0.5 |
| 1090A-7 | 16.5 | 6.0 | 0.8 | 23.3 | 22.7 | 0.6 |
| 1180A-7 | 18.8 | 6.9 | 0.9 | 26.5 | 25.9 | 0.7 |
| 1360A-7 | 21.4 | 6.4 | 0.9 | 28.6 | 27.9 | 0.7 |
| 1500A-7 | 24.1 | 7.5 | 1.0 | 32.6 | 31.8 | 0.8 |
| 1800A-7 | 27.6 | 8.2 | 1.2 | 37.0 | 36.1 | 0.9 |
| 2020A-7 | 31.7 | 10.1 | 1.4 | 43.1 | 42.0 | 1.1 |
| 2220A-7 | 35.5 | 11.9 | 1.6 | 49.0 | 47.7 | 1.2 |
| 2670A-7 | 41.7 | 11.7 | 1.7 | 55.1 | 53.7 | 1.4 |
| 2930A-7 | 46.7 | 13.8 | 1.9 | 62.4 | 60.8 | 1.6 |
| 3320A-7 | 50.0 | 17.5 | 2.3 | 69.8 | 65.8 | 1.7 |
| 3840A-7 | 58.3 | 18.6 | 2.7 | 79.6 | 75.0 | 1.9 |
| 4360A-7 | 69.4 | 22.5 | 3.0 | 94.9 | 89.6 | 2.3 |
| 5240A-7 | 80.0 | 24.0 | 3.4 | 107.4 | 101.6 | 2.6 |
| 5810A-7 | 93.2 | 26.5 | 3.8 | 123.5 | 116.7 | 3.0 |

These losses are not calculated according to the ecodesign standard IEC 61800-9-2.

## Losses (frame R8i with CL filter)

| ACS880-204LC- | $P_{loss}$ (ISU) | $P_{loss}$ (CL-ICU cabinet) | $P_{loss}$ (CL-ICU) | $P_{loss}$ (ISU+CL-ICU cabinet+CL-ICU) | Power loss, total | |
|---|---|---|---|---|---|---|
| | | | | | into coolant | into air |
| | kW | kW | kW | kW | kW | kW |
| **$U_N$ = 690 V** | | | | | | |
| 0360A-7 | 5.2 | 0.2 | 1.4 | 6.8 | 6.4 | 0.2 |
| 0400A-7 | 5.8 | 0.2 | 1.5 | 7.5 | 7.1 | 0.2 |
| 0450A-7 | 6.6 | 0.2 | 1.7 | 8.5 | 8.1 | 0.2 |
| 0480A-7 | 7.3 | 0.2 | 1.9 | 9.4 | 8.9 | 0.2 |
| 0560A-7 | 8.5 | 0.3 | 2.3 | 11.1 | 10.5 | 0.3 |
| 0620A-7 | 9.5 | 0.3 | 2.6 | 12.4 | 11.8 | 0.3 |
| 0700A-7 | 11.1 | 0.3 | 3.1 | 14.5 | 13.9 | 0.4 |
| 0770A-7 | 12.5 | 0.3 | 3.6 | 16.4 | 15.7 | 0.4 |
| 0930A-7 | 14.2 | 0.4 | 3.1 | 17.7 | 16.8 | 0.4 |
| 1090A-7 | 16.5 | 0.4 | 3.8 | 20.7 | 19.8 | 0.5 |
| 1180A-7 | 18.8 | 0.5 | 4.4 | 23.7 | 22.6 | 0.6 |
| 1360A-7 | 21.4 | 0.5 | 4.2 | 26.1 | 25.0 | 0.6 |
| 1500A-7 | 24.1 | 0.6 | 4.9 | 29.6 | 28.3 | 0.7 |
| 1800A-7 | 27.6 | 0.8 | 5.3 | 33.7 | 32.1 | 0.8 |
| 2020A-7 | 31.7 | 0.8 | 6.3 | 38.8 | 37.1 | 1.0 |
| 2220A-7 | 35.5 | 0.9 | 7.4 | 43.8 | 41.8 | 1.1 |
| 2670A-7 | 41.7 | 1.1 | 7.5 | 50.3 | 48.0 | 1.2 |
| 2930A-7 | 46.7 | 1.2 | 8.8 | 56.7 | 54.1 | 1.4 |
| 3320A-7 | - | - | - | - | - | - |
| 3840A-7 | 58.3 | 1.6 | 12.5 | 72.4 | 69.0 | 1.8 |
| 4360A-7 | 69.4 | 1.6 | 13.7 | 84.7 | 81.0 | 2.1 |
| 5240A-7 | 80.0 | 1.9 | 16.0 | 97.9 | 93.7 | 2.4 |
| 5810A-7 | 93.2 | 2.3 | 16.5 | 112.0 | 106.9 | 2.7 |

These losses are not calculated according to the ecodesign standard IEC 61800-9-2.

## Cooling data and noise (frame R7i)

The noise level depends on the size and structure of the cabinet, actual load, installation method, and surrounding conditions.

Reported noise values are maximum measured values with a reference drive configuration in hemi-anechoic room in accordance with ISO 3746:2010 standard.

| ACS880-204LC- | Coolant volume | | Coolant flow rate | | | Pressure loss | Noise[1] | |
|---|---|---|---|---|---|---|---|---|
| | module(s) | LCL filter | module(s)[2] | LCL filter[2] | 1×R7i cabinet | | dB(A) | |
| | l (US qt) | l (US qt) | l/min (US gal/min) | l/min (US gal/min) | l/min (US gal/min) | kPa | $L_{WA}$[3] | $L_{pA}$[4] |
| **$U_N$ = 400 V** | | | | | | | | |
| 0150A-3 | 0.2 (0.2) | 2.7 (2.9) | 16 (4.2)[6] | | 22 (5.8) | 120 | 82 | 64 |
| 0190A-3 | 0.2 (0.2) | 2.7 (2.9) | 16 (4.2)[6] | | 22 (5.8) | 120 | 82 | 64 |
| 0220A-3 | 0.2 (0.2) | 2.7 (2.9) | 16 (4.2)[6] | | 22 (5.8) | 120 | 82 | 64 |
| 0270A-3 | 0.2 (0.2) | 2.7 (2.9) | 16 (4.2)[6] | | 22 (5.8) | 120 | 82 | 64 |
| 0340A-3 | 0.2 (0.2) | 2.7 (2.9) | 16 (4.2)[6] | | 22 (5.8) | 120 | 82 | 64 |
| 0420A-3 | 0.2 (0.2) | 2.7 (2.9) | 16 (4.2)[6] | | 22 (5.8) | 120 | 82 | 64 |
| 0530A-3 | 0.4 (0.4) | 4.1 (4.3) | 26 (6.9) | 20 (5.3) | - | 120 | 5) | 5) |
| 0670A-3 | 0.4 (0.4) | 4.1 (4.3) | 26 (6.9) | 20 (5.3) | - | 120 | 5) | 5) |
| 0770A-3 | 0.4 (0.4) | 4.1 (4.3) | 26 (6.9) | 20 (5.3) | - | 120 | 5) | 5) |
| 1000A-3 | 0.6 (0.6) | 4.6 (4.9) | 39 (10.3) | 40 (10.6) | - | 120 | 5) | 5) |
| 1180A-3 | 0.6 (0.6) | 4.6 (4.9) | 39 (10.3) | 40 (10.6) | - | 120 | 5) | 5) |
| 1310A-3 | 0.8 (0.8) | 4.6 (4.9) | 52 (13.7) | 40 (10.6) | - | 120 | 5) | 5) |
| 1500A-3 | 0.8 (0.8) | 4.6 (4.9) | 52 (13.7) | 40 (10.6) | - | 120 | 5) | 5) |
| **$U_N$ = 500 V** | | | | | | | | |
| 0150A-5 | 0.2 (0.2) | 2.7 (2.9) | 16 (4.2)[6] | | 22 (5.8) | 120 | 82 | 64 |
| 0180A-5 | 0.2 (0.2) | 2.7 (2.9) | 16 (4.2)[6] | | 22 (5.8) | 120 | 82 | 64 |
| 0220A-5 | 0.2 (0.2) | 2.7 (2.9) | 16 (4.2)[6] | | 22 (5.8) | 120 | 82 | 64 |
| 0270A-5 | 0.2 (0.2) | 2.7 (2.9) | 16 (4.2)[6] | | 22 (5.8) | 120 | 82 | 64 |
| 0340A-5 | 0.2 (0.2) | 2.7 (2.9) | 16 (4.2)[6] | | 22 (5.8) | 120 | 82 | 64 |
| 0410A-5 | 0.2 (0.2) | 2.7 (2.9) | 16 (4.2)[6] | | 22 (5.8) | 120 | 82 | 64 |
| 0530A-5 | 0.4 (0.4) | 4.1 (4.3) | 26 (6.9) | 20 (5.3) | - | 120 | 5) | 5) |
| 0670A-5 | 0.4 (0.4) | 4.1 (4.3) | 26 (6.9) | 20 (5.3) | - | 120 | 5) | 5) |
| 0770A-5 | 0.4 (0.4) | 4.1 (4.3) | 26 (6.9) | 20 (5.3) | - | 120 | 5) | 5) |
| 1000A-5 | 0.6 (0.6) | 4.6 (4.9) | 39 (10.3) | 40 (10.6) | - | 120 | 5) | 5) |
| 1180A-5 | 0.6 (0.6) | 4.6 (4.9) | 39 (10.3) | 40 (10.6) | - | 120 | 5) | 5) |

| ACS880-204LC- | Coolant volume | | Coolant flow rate | | | Pressure loss | Noise [1] | |
|---|---|---|---|---|---|---|---|---|
| | module(s) | LCL filter | module(s) [2] | LCL filter [2] | 1×R7i cabinet | | dB(A) | |
| | l (US qt) | l (US qt) | l/min (US gal/min) | l/min (US gal/min) | l/min (US gal/min) | kPa | $L_{WA}$ [3] | $L_{pA}$ [4] |
| 1310A-5 | 0.8 (0.8) | 4.6 (4.9) | 52 (13.7) | 40 (10.6) | - | 120 | 5) | 5) |
| 1500A-5 | 0.8 (0.8) | 4.6 (4.9) | 52 (13.7) | 40 (10.6) | - | 120 | 5) | 5) |
| **$U_N$ = 690 V** | | | | | | | | |
| 0260A-7 | 0.2 (0.2) | 2.7 (2.9) | 16 (4.2) [6] | | 22 (5.8) | 120 | 82 | 64 |
| 0310A-7 | 0.2 (0.2) | 2.7 (2.9) | 16 (4.2) [6] | | 22 (5.8) | 120 | 82 | 64 |
| 0350A-7 | 0.2 (0.2) | 2.7 (2.9) | 16 (4.2) [6] | | 22 (5.8) | 120 | 82 | 64 |
| 0500A-7 | 0.4 (0.4) | 4.1 (4.3) | 26 (6.9) | 20 (5.3) | - | 120 | 5) | 5) |
| 0590A-7 | 0.4 (0.4) | 4.1 (4.3) | 26 (6.9) | 20 (5.3) | - | 120 | 5) | 5) |
| 0680A-7 | 0.4 (0.4) | 4.1 (4.3) | 26 (6.9) | 20 (5.3) | - | 120 | 5) | 5) |
| 0760A-7 | 0.6 (0.6) | 4.1 (4.3) | 39 (10.3) | 20 (5.3) | - | 120 | 5) | 5) |
| 0880A-7 | 0.6 (0.6) | 4.6 (4.9) | 39 (10.3) | 40 (10.6) | - | 120 | 5) | 5) |
| 1020A-7 | 0.6 (0.6) | 4.6 (4.9) | 39 (10.3) | 40 (10.6) | - | 120 | 5) | 5) |
| 1170A-7 | 0.8 (0.8) | 4.6 (4.9) | 52 (13.7) | 40 (10.6) | - | 120 | 5) | 5) |
| 1340A-7 | 0.8 (0.8) | 4.6 (4.9) | 52 (13.7) | 40 (10.6) | - | 120 | 5) | 5) |

1) Measured in a typical ABB cabinet installation.
2) The mass flow values are for modules and LCL filters only. Additional heat exchangers, which might be needed for cooling of cabinet, are not included in these mass flow values.
3) $L_{WA}$ represents the calculated sound power level.
4) $L_{pA}$ represents the calculated surface time-averaged sound pressure level using right parallelepiped measurement surface with 1 m (3.3 ft) measurement distance.
5) Depends on the cabinet construction and selected fans.
6) The value is common for supply module and LCL filter, since they are in series in the same cubicle.

## Cooling data and noise (frame R8i)

Reported noise values are estimated values with a reference drive configuration measured in hemi-anechoic room in accordance with ISO 9614-2:1996 standard.

| ACS880-204LC- | Coolant volume | | | Coolant flow rate | | | Pressure loss | Noise [1] |
|---|---|---|---|---|---|---|---|---|
| | module(s) | LCL filter | CL filter (CL-ICU) | module(s) | LCL filter | CL filter (CL-ICU) | | dB(A) |
| | l (US qt) | l (US qt) | l (US qt) | l/min (US gal/min) | l/min (US gal/min) | l/min (US gal/min) | kPa | $L_{pA}$ [2] |
| **$U_N$ = 690 V** | | | | | | | | |
| 0360A-7 | 1.6 (1.7) | 4.1 (4.3) | 3.3 (3.5) | 16 (4.2) | 20 (5.3) | 30 (7.9) | 120 | 66 |
| 0400A-7 | 1.6 (1.7) | 4.1 (4.3) | 3.3 (3.5) | 16 (4.2) | 20 (5.3) | 30 (7.9) | 120 | 66 |
| 0450A-7 | 1.6 (1.7) | 4.1 (4.3) | 3.3 (3.5) | 16 (4.2) | 20 (5.3) | 30 (7.9) | 120 | 66 |
| 0480A-7 | 1.6 (1.7) | 4.1 (4.3) | 3.3 (3.5) | 16 (4.2) | 20 (5.3) | 30 (7.9) | 120 | 66 |
| 0560A-7 | 1.6 (1.7) | 4.1 (4.3) | 3.3 (3.5) | 16 (4.2) | 20 (5.3) | 30 (7.9) | 120 | 66 |
| 0620A-7 | 1.6 (1.7) | 4.1 (4.3) | 3.3 (3.5) | 16 (4.2) | 20 (5.3) | 30 (7.9) | 120 | 66 |
| 0700A-7 | 1.6 (1.7) | 4.1 (4.3) | 3.3 (3.5) | 16 (4.2) | 20 (5.3) | 30 (7.9) | 120 | 66 |
| 0770A-7 | 1.6 (1.7) | 4.1 (4.3) | 3.3 (3.5) | 16 (4.2) | 20 (5.3) | 30 (7.9) | 120 | 66 |
| 0930A-7 | 3.2 (3.4) | 4.1 (4.3) | 3.3 (3.5) | 32 (8.5) | 40 (10.6) | 30 (7.9) | 120 | 68 |
| 1090A-7 | 3.2 (3.4) | 4.1 (4.3) | 3.3 (3.5) | 32 (8.5) | 40 (10.6) | 30 (7.9) | 120 | 68 |
| 1180A-7 | 3.2 (3.4) | 4.6 (4.9) | 3.6 (3.8) | 32 (8.5) | 40 (10.6) | 30 (7.9) | 120 | 68 |
| 1360A-7 | 3.2 (3.4) | 4.6 (4.9) | 3.6 (3.8) | 32 (8.5) | 40 (10.6) | 30 (7.9) | 120 | 68 |
| 1500A-7 | 3.2 (3.4) | 4.6 (4.9) | 3.6 (3.8) | 32 (8.5) | 40 (10.6) | 30 (7.9) | 120 | 68 |
| 1800A-7 | 4.8 (5.1) | 8.2 (8.7) | 6.6 (7.0) | 48 (12.5) | 80 (21.1) | 60 (15.9) | 120 | 70 |
| 2020A-7 | 4.8 (5.1) | 8.2 (8.7) | 6.6 (7.0) | 48 (12.5) | 80 (21.1) | 60 (15.9) | 120 | 70 |
| 2220A-7 | 4.8 (5.1) | 8.2 (8.7) | 6.6 (7.0) | 48 (12.5) | 80 (21.1) | 60 (15.9) | 120 | 70 |
| 2670A-7 | 6.4 (6.8) | 9.2 (9.7) | 7.2 (7.6) | 64 (17) | 80 (21.1) | 60 (15.9) | 120 | 71 |
| 2930A-7 | 6.4 (6.8) | 9.2 (9.7) | 7.2 (7.6) | 64 (17) | 80 (21.1) | 60 (15.9) | 120 | 71 |
| 3320A-7 | 8.0 (8.5) | 12.3 (13.0) | - | 80 (21.1) | 120 (31.7) | - | 120 | 72 |
| 3840A-7 | 9.6 (10.1) | 16.4 (17.3) | 13.2 (13.9) | 96 (25.4) | 160 (42.3) | 160 (42.3) | 120 | 73 |
| 4360A-7 | 9.6 (10.1) | 16.4 (17.3) | 13.2 (13.9) | 96 (25.4) | 160 (42.3) | 160 (42.3) | 120 | 73 |
| 5240A-7 | 12.8 (13.5) | 18.4 (19.4) | 14.4 (15.2) | 128 (33.8) | 160 (42.3) | 120 (31.7) | 120 | 74 |
| 5810A-7 | 12.8 (13.5) | 18.4 (19.4) | 14.4 (15.2) | 128 (33.8) | 160 (42.3) | 120 (31.7) | 120 | 74 |

1) Measured in a typical ABB cabinet installation.
2) Estimated sound pressure level at 1 m (3.3 ft) distance from the cabinet.

# Tightening torques

Unless a tightening torque is specified in the text, these torques can be used.

For Rittal components, use the torques given in the Rittal assembly documentation.

## Electrical connections

| Size | Torque | Strength class |
|---|---|---|
| M3 | 0.5 N·m (4.4 lbf·in) | 4.6...8.8 |
| M4 | 1 N·m (9 lbf·in) | 4.6...8.8 |
| M5 | 4 N·m (35 lbf·in) | 8.8 |
| M6 | 9 N·m (6.6 lbf·ft) | 8.8 |
| M8 | 22 N·m (16 lbf·ft) | 8.8 |
| M10 | 42 N·m (31 lbf·ft) | 8.8 |
| M12 | 70 N·m (52 lbf·ft) | 8.8 |
| M16 | 120 N·m (90 lbf·ft) | 8.8 |

## Mechanical connections

| Size | Max. torque | Strength class |
|---|---|---|
| M5 | 6 N·m (53 lbf·in) | 8.8 |
| M6 | 10 N·m (7.4 lbf·ft) | 8.8 |
| M8 | 24 N·m (17.7 lbf·ft) | 8.8 |

## Insulation supports

| Size | Max. torque | Strength class |
|---|---|---|
| M6 | 5 N·m (44 lbf·in) | 8.8 |
| M8 | 9 N·m (6.6 lbf·ft) | 8.8 |
| M10 | 18 N·m (13.3 lbf·ft) | 8.8 |
| M12 | 31 N·m (23 lbf·ft) | 8.8 |

## Cable lugs

| Size | Max. torque | Strength class |
|---|---|---|
| M8 | 15 N·m (11 lbf·ft) | 8.8 (A2-70 or A4-70) |
| M10 | 32 N·m (23.5 lbf·ft) | 8.8 |
| M12 | 50 N·m (37 lbf·ft) | 8.8 |

# Typical power cable sizes

The tables below give the current carrying capacity ($I_{Lmax}$) and typical size for copper and aluminum cables with PVC or XLPE insulation. A correction factor K = 0.70 is used. Time const. is the temperature time constant of the cable.

The cable sizing is based on a maximum of 9 cables installed side by side on a ladder-type cable tray, with three trays on top of each other (with 30 cm of space between the trays), and an ambient temperature of 30 °C (IEC 60364-5-52).

The notation “3 × P + S” indicates a symmetrical, shielded cable that includes: three phase conductors, each with a cross-sectional area P (mm²), and one concentric PE conductor with a cross-sectional area S (mm²). If the notation includes a multiplier before the brackets, it indicates parallel cables.

| Conductor cross-section (copper) | | PVC insulation Conductor temperature 70° | | XLPE insulation Conductor temperature 90° | | Typical dimensions of copper cable | |
|---|---|---|---|---|---|---|---|
| mm² | AWG / kcmil | $I_{Lmax}$ (A) | Time const. (s) | $I_{Lmax}$ (A) | Time const. (s) | Size | ø [mm] |
| 1.5 | 16 | 13 | 85 | 16 | 67 | 3 × 1.5 + 1.5 | 13 |
| 2.5 | 12 | 18 | 121 | 23 | 88 | 3 × 2.5 + 2.5 | 14 |
| 4 | 12 | 24 | 175 | 30 | 133 | 3 × 4 + 4 | 16 |
| 6 | 10 | 30 | 251 | 38 | 186 | 3 × 6 + 6 | 18 |
| 10 | 8 | 42 | 359 | 53 | 268 | 3 × 10 + 10 | 21 |
| 16 | 6 | 56 | 514 | 70 | 391 | 3 × 16 + 16 | 23 |
| 25 | 4 | 71 | 791 | 89 | 598 | 3 × 25 + 16 | 24 |
| 35 | 1 | 88 | 1000 | 110 | 760 | 3 × 35 + 16 | 26 |
| 50 | 1/0 | 107 | 1308 | 134 | 990 | 3 × 50 + 25 | 29 |
| 70 | 2/0 | 137 | 1613 | 171 | 1230 | 3 × 70 + 35 | 32 |
| 95 | 4/0 | 167 | 2046 | 209 | 1551 | 3 × 95 + 50 | 38 |
| 120 | 250 | 193 | 2441 | 241 | 1859 | 3 × 120 + 70 | 41 |
| 150 | 300 | 223 | 2820 | 279 | 2139 | 3 × 150 + 70 | 44 |
| 185 | 400 | 255 | 3329 | 319 | 2525 | 3 × 185 + 95 | 50 |
| 240 | 500 | 301 | 4073 | 376 | 3099 | 3 × 240 + 120 | 55 |
| 300 | 600 | 348 | 4779 | 435 | 3636 | 3 × 300 + 150 | 58 |

| Conductor cross-section (aluminum) | | PVC insulation Conductor temperature 70° | | XLPE insulation Conductor temperature 90° | | Typical dimensions of aluminum cable | |
|---|---|---|---|---|---|---|---|
| mm² | AWG / kcmil | $I_{Lmax}$ (A) | Time const. (s) | $I_{Lmax}$ (A) | Time const. (s) | Size | ø [mm] |
| 35 | 1 | 67 | 736 | 84 | 669 | 3 × 35 + 10 Cu | 26 |
| 50 | 1/0 | 82 | 959 | 102 | 874 | 3 × 50 + 15 Cu | 29 |
| 70 | 2/0 | 105 | 1182 | 131 | 1079 | 3 × 70 + 21 Cu | 32 |
| 95 | 4/0 | 128 | 1492 | 159 | 1376 | 3 × 95 + 29 Cu | 38 |
| 120 | 250 | 148 | 1776 | 184 | 1637 | 3 × 120 + 41 Cu | 41 |
| 150 | 300 | 171 | 2042 | 213 | 1881 | 3 × 150 + 41 Cu | 44 |
| 185 | 400 | 196 | 2422 | 243 | 2237 | 3 × 185 + 57 Cu | 49 |

| Conductor cross-section (aluminum) | | PVC insulation Conductor temperature 70° | | XLPE insulation Conductor temperature 90° | | Typical dimensions of aluminum cable | |
|---|---|---|---|---|---|---|---|
| mm² | AWG / kcmil | $I_{Lmax}$ (A) | Time const. (s) | $I_{Lmax}$ (A) | Time const. (s) | Size | ø [mm] |
| 240 | 500 | 231 | 2967 | 286 | 2740 | 3 × 240 + 72 Cu | 54 |
| 300 | 600 | 267 | 3478 | 330 | 3229 | 3 × 300 + 88 Cu | 58 |

Units with CL filter: Maximum recommended cable size is 185 mm² (400 kcmil).

# Terminal and cable entry data for the power cables

The locations and sizes of the cable entries are shown in the dimension drawings delivered with the module, and the dimension drawing examples in this manual.

Busbar terminal material: Tin-plated copper.

# Electrical power network specification

Specifications in this section are valid for modules installed in Rittal VX25 or generic cabinets with kits and components defined in the manual or corresponding cabinet structure. Cabinet construction and busbars placement must be dimensioned according to the short-circuit requirements indicated in this manual.

| | |
|---|---|
| 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).<br>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).<br>690 V units:<br>IEC:<br>525…690 V AC 3-phase ± 10%<br>In corner-grounded TN systems: 525…600 V AC<br>UL/CSA:<br>525…600 V AC<br>The voltage range is indicated in the type designation label as typical input voltage levels for example, 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) | **Supply units with ABB-defined main breaker/contactor and fuses:**<br>Frame R7i module(s): Rated conditional short-circuit current ($I_{cc}$) is 50 kA.<br>Frame R8i module(s): Rated conditional short-circuit current ($I_{cc}$) is 65 kA. |
| 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 |

<table>
<tr><td>Harmonic distortion</td><td>Harmonics are below the limits defined in IEEE519.
<table>
<tr><th>$R_{sc}$</th><th>THD Voltage [%]</th><th>THD Current [%]</th></tr>
<tr><td>20</td><td>3</td><td>2.5 [1]</td></tr>
<tr><td>100</td><td>0.8</td><td>2.5 (4.0 with types -0390A…-0520A-7) [1]</td></tr>
<tr><td colspan="3">$THD = \sqrt{\sum_{2}^{50} \left(\frac{I_n}{I_N}\right)^2}$</td></tr>
</table>
[1] Other loads may influence the THD value.<br>
THD = Total Harmonic Distortion (THD). The voltage THD depends on the short-circuit ratio ($R_{sc}$). The spectrum of the distortion also contains interharmonics.<br>
$R_{sc} = I_{sc}/I_N$<br>
$I_{sc}$ = short-circuit current at point of common coupling (PCC)<br>
$I_N$ = supply unit nominal current<br>
$I_n$ = $n^{th}$ harmonic current component</td></tr>
</table>

## Control unit connection data

See chapters Control unit (UCU-22, -23 and -24) and Control unit (BCU).

## Coolant connections

Supply module: 16 mm, for polyamide (PA) pipe; heat exchanger: 8/6 mm pipe

## Efficiency

97.5…98.8% at nominal power level

The efficiency is not calculated according to the ecodesign standard IEC 61800-9-2.

## Energy efficiency data (ecodesign)

Energy efficiency data is not provided for the drive/unit. Multidrives and multidrive modules are not in the scope of the EU ecodesign requirements (Regulation EU/2019/1781) or the UK ecodesign requirements (Regulation SI 2021 No. 745).

## Protection classes of module

| | |
|---|---|
| Degrees of protection (IEC/EN 60529) | IP00 |
| Enclosure types (UL 50/50E) | UL Open Type |
| Overvoltage category (IEC/EN 60664-1) | III |
| Protective class (IEC/EN 61800-5-1) | I |

# Ambient conditions

This section gives the environmental requirements for the converter module. The converter module must be used in a heated indoor controlled environment.

| | **Operation installed for stationary use** | **Storage in protective package** | **Transportation in protective package** |
|---|---|---|---|
| **Altitude above sea level** | 0…4000 m (13123 ft)* for module<br>0…2000 m (6562 ft) for cabinet components<br>Output derated above 1000 m (3281 ft). See section Altitude derating.<br>*Neutral-grounded TN and TT network systems, non-corner-grounded IT network systems. Corner-grounded TN, TT and IT network systems up to 600 V. | - | - |
| **Air temperature** | 0 … +45 °C (+32 … +113 °F), no condensation allowed. Output derated in the range +45 … +55 °C (+113 … +131 °F). | -40 … +70 °C (-40 … +158 °F) | -40 … +70 °C (-40 … +158 °F) |
| **Relative humidity** | Maximum 95%, no condensation allowed | Maximum 95%, no condensation allowed | Maximum 95%, no condensation allowed |
| | No condensation allowed. Maximum allowed relative humidity is 60% in the presence of corrosive gases. | | |
| **Contamination** | IEC/EN 60721-3-3:2002: Classification of environmental conditions - Part 3-3: Classification of groups of environmental parameters and their severities - Stationary use of weather protected locations | IEC 60721-3-1:1997 | IEC 60721-3-2:1997 |
| Chemical gases | Class 3C2 | Class 1C2 | Class 2C2 |
| Solid particles | Class 3S1 | Class 1S3 (packing must support this, otherwise 1S2) | Class 2S2 |
| | No conductive dust allowed. | | |

| | Operation installed for stationary use | Storage in protective package | Transportation in protective package |
|---|---|---|---|
| **Vibration** | IEC 61800-5-1<br>IEC 60068-2-6:2007,<br>EN 60068-2-6:2008 Environmental testing Part 2: Tests -Test Fc: Vibration (sinusoidal)<br>10 … 57 Hz, max. 0.075 mm amplitude<br>57 … 150 Hz 1 *g*<br>Tested in a typical cabinet assembly according to:<br>Max. 1 mm (0.04 in.)<br>(peak value, 5 … 13.2 Hz),<br>max. 0.7 *g* (13.2 … 100 Hz) sinusoidal | IEC/EN 60721-3-1:1997 | IEC/EN 60721-3-1:1997 |
| **Shock**<br>IEC 60068-2-27:2008,<br>EN 60068-2-27:2009<br>Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock | Not allowed | With packing max. 100 m/s² (330 ft./s²) 11 ms | With packing max. 100 m/s² (330 ft./s²) 11 ms |

# Cooling

Cooling method: Liquid cooling

# Colors

PMS 1C Cool Gray, PMS Process Black

# Materials

## Module

Refer to ACS880 cabinet-installed drives and multidrive modules recycling instructions and environmental information (3AXD50000153909 [English]).

## Packaging of module

This is a complete list of the package materials. The materials vary depending on the frame size (packages do not contain all materials listed below).

- Cardboard (heavy duty quality with wet strength glue in large modules)
- Molded pulp
- Plywood
- Wood
- PP (strapping)
- EPP (foam)

- PE (plastic bag and/or VCI film)
- Metal (fixing clamps, screws).

### Packaging of options

- Cardboard
- Kraft paper
- PP (straps)
- PE (film, bubble wrap)
- Plywood, wood (only for heavy components)

The materials vary by item type, size, and shape. The typical package is a cardboard box with paper filling or bubble wrap. ESD-safe packaging is used for printed circuit boards and similar items.

### Manuals

Printed product manuals are made of recyclable paper.

## Disposal

The main parts of the product can be recycled to preserve natural resources and energy. Product parts and materials should be dismantled and separated.

In general, all metals, such as steel, aluminum, copper, and its alloys, and precious metals can be recycled. Plastics, rubber, cardboard, and other packaging materials can be used in energy recovery.

Printed circuit boards and DC capacitors require selective treatment according to IEC 62635 guidelines.

To aid recycling, most plastic parts are marked with an appropriate identification code. Components that contain Substances of Very High Concern (SVHCs) are listed in the European Chemicals Agency SCIP database. SCIP is the database for information on Substances of Concern in articles as such or in complex objects (products) established under the Waste Framework Directive (2008/98/EC). For more information, contact your local ABB distributor or consult the European Chemicals Agency SCIP database to determine which SVHCs are used in the product and where the components are located.

Contact your local ABB distributor for more information on environmental aspects. End-of-life treatment must obey international and national regulations.

For more information on ABB end-of-life services, refer to new.abb.com/service/end-of-life-services.

# Auxiliary circuit current consumption

## Control equipment

| Device | $U_N$ | $f$ Hz | $I_{cont}$ A | $I_{start}$ A | $P_{cont}$ W | $S_{cont}$ VA |
|---|---|---|---|---|---|---|
| UCU control unit | 24 V DC (+30%/-20%) | - | 2.5 [1] | - | 60 | - |
| BCU control unit | 24 V DC (±10%) | - | 2.0 | - | 48 | - |
| R7i module: internal electronics | 230 V AC (+15%/-20%) | 50 | 0.37 | - | 85 | - |
| | 115 V AC (+15%/-20%) | 60 | 0.74 | - | 85 | - |
| R8i module: internal electronics | 230 V AC (+15%/-20%) | 50 | 0.41 | - | 95 | - |
| | 115 V AC (+15%/-20%) | 60 | 0.83 | - | 95 | - |
| CIO-01 | 24 V (-15%/+20%) | - | 0.1 | - | - | - |
| BAMU-12C | 24 V (±10%) | - | 0.25 | - | - | - |
| BSFC-12C charging controller | 24 V DC (±10%) | - | 0.15 | - | - | - |
| PDAL2 switch/disconnector interlock coil | 24 V DC (+10%/-30%) | - | - | - | - | 9 |

[1] The value is applicable in these conditions: UCU-24 control unit, with 24 V DC power supply, with control panel, with 4 relay outputs in use, with all analog outputs at maximum current, with RDCO module and 3 option modules installed, and with 8 inverter modules in the STO circuit.

## Cooling fans

| Frame size | Qty per cubicle | $U_N$ V AC | $f$ Hz | $I_{cont}$ A |
|---|---|---|---|---|
| R7i | 1 [1] | 14.0 … 26.5 V DC | - | 1.35 |
| R8i, LCL or CL filter | 1 [2] | 200…240 V AC | 50/60 | 1.4 |
| | | 100…130 V AC | 50/60 | 2.4 |
| Incoming and CL filter cubicle | 2 | 24 V DC | - | 3.9 |

[1] For the cubicle containing the R7i module and the LCL filter.
[2] One cooling fan for the R8i module and one for the filter.

## Definitions

| | |
|---|---|
| $f$ | Supply frequency |
| $I_{cont}$ | Continuous current consumption |
| $I_{start}$ | Calculated load current at start |
| $P_{cont}$ | Continuous input power |
| $U_N$ | Voltage requirement |

# Standards and markings

See ACS880 liquid-cooled multidrives cabinets and modules electrical planning (3AXD50000048634 [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.

## Cyber security disclaimer

This product is designed to be connected to and to communicate information and data via a network interface. It is the Customer's sole responsibility to provide and continuously ensure a secure connection between the product and the Customer network or any other network (as the case may be). The 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.

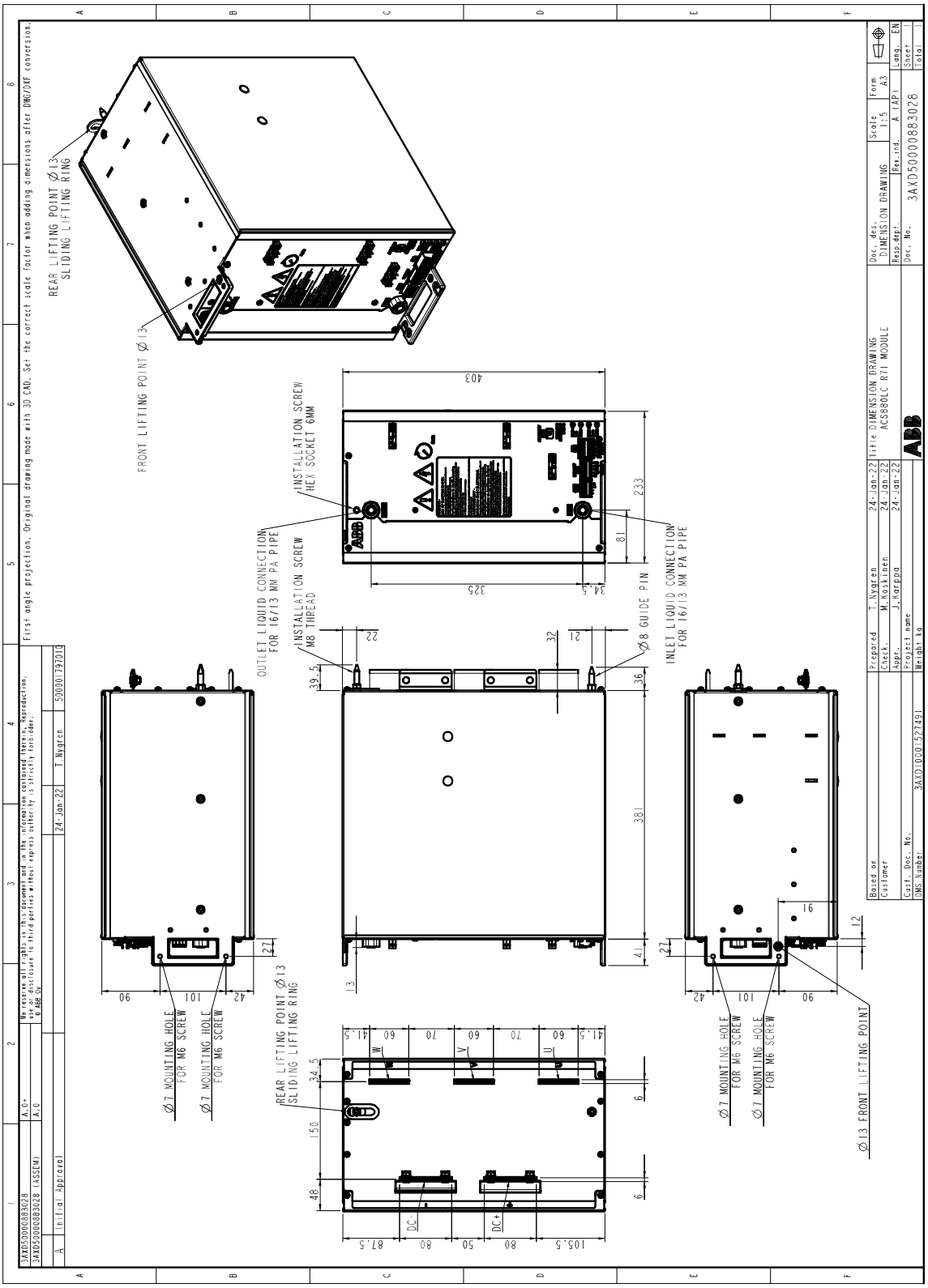
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# Dimension drawings

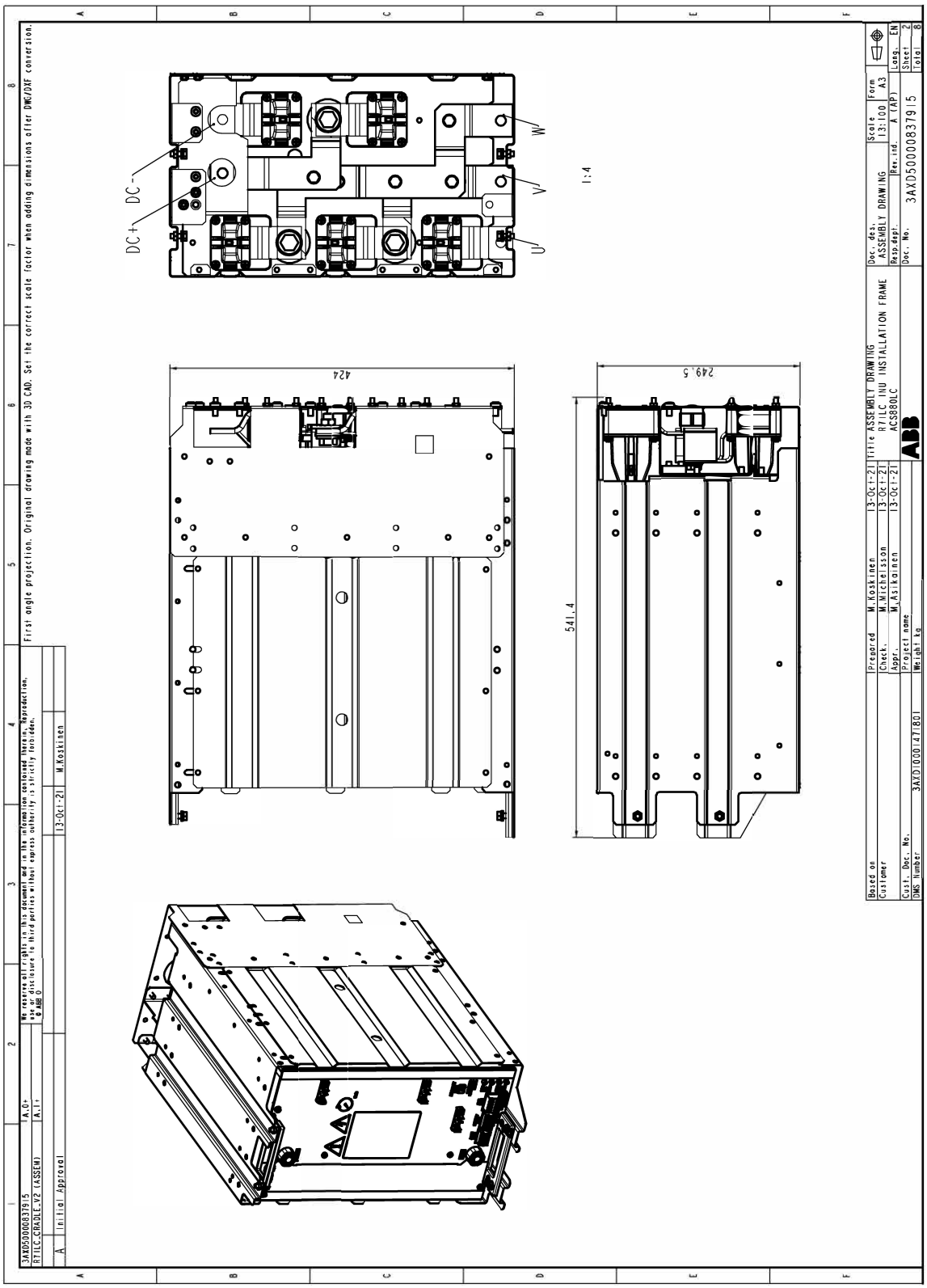
## Contents of this chapter

This chapter contains dimension drawings of the ACS880-204LC IGBT supply modules and accessories. Dimensional drawings of most installation accessories are available from ABB on request.

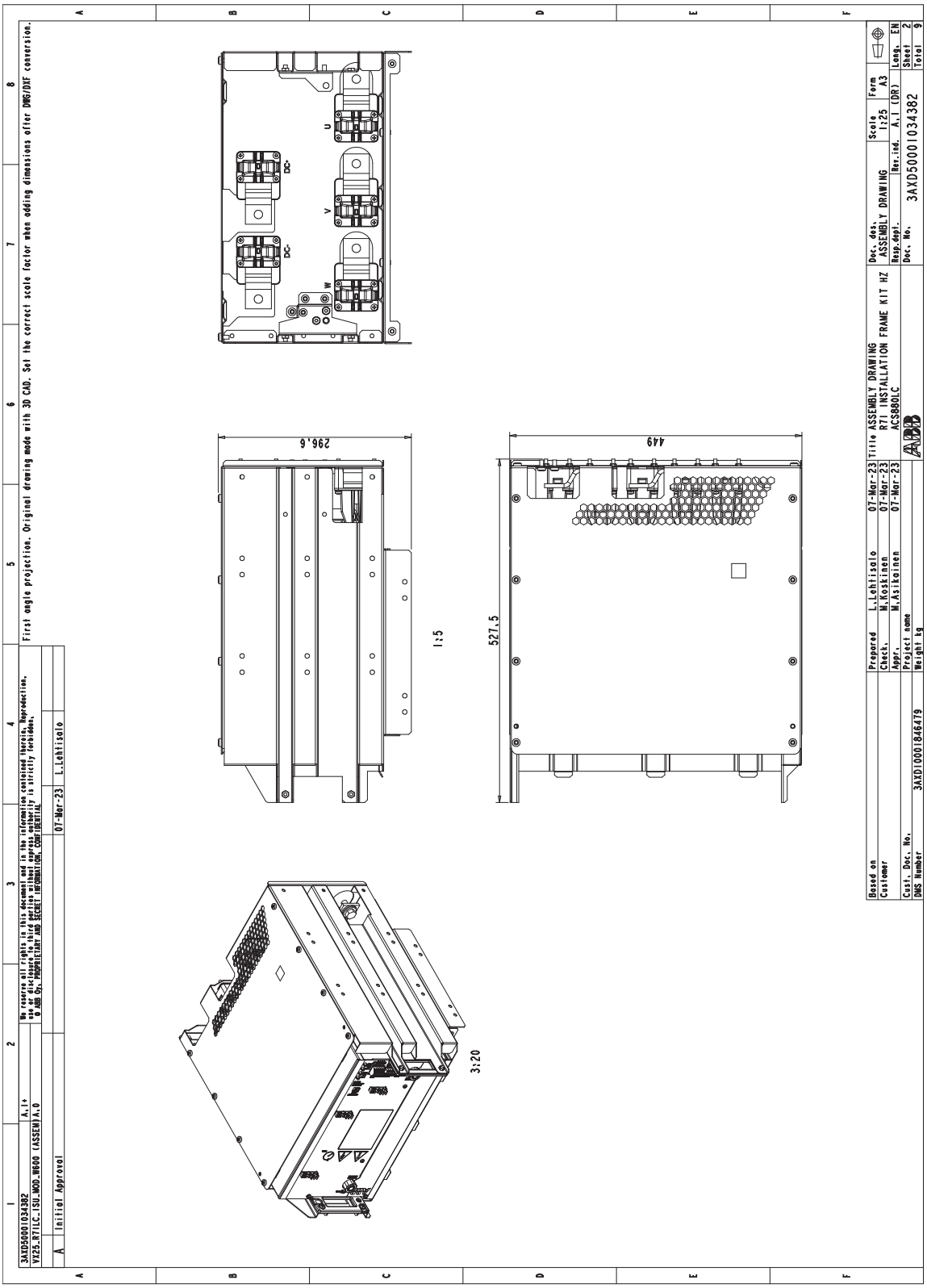
# Frame R7i module and installation frame



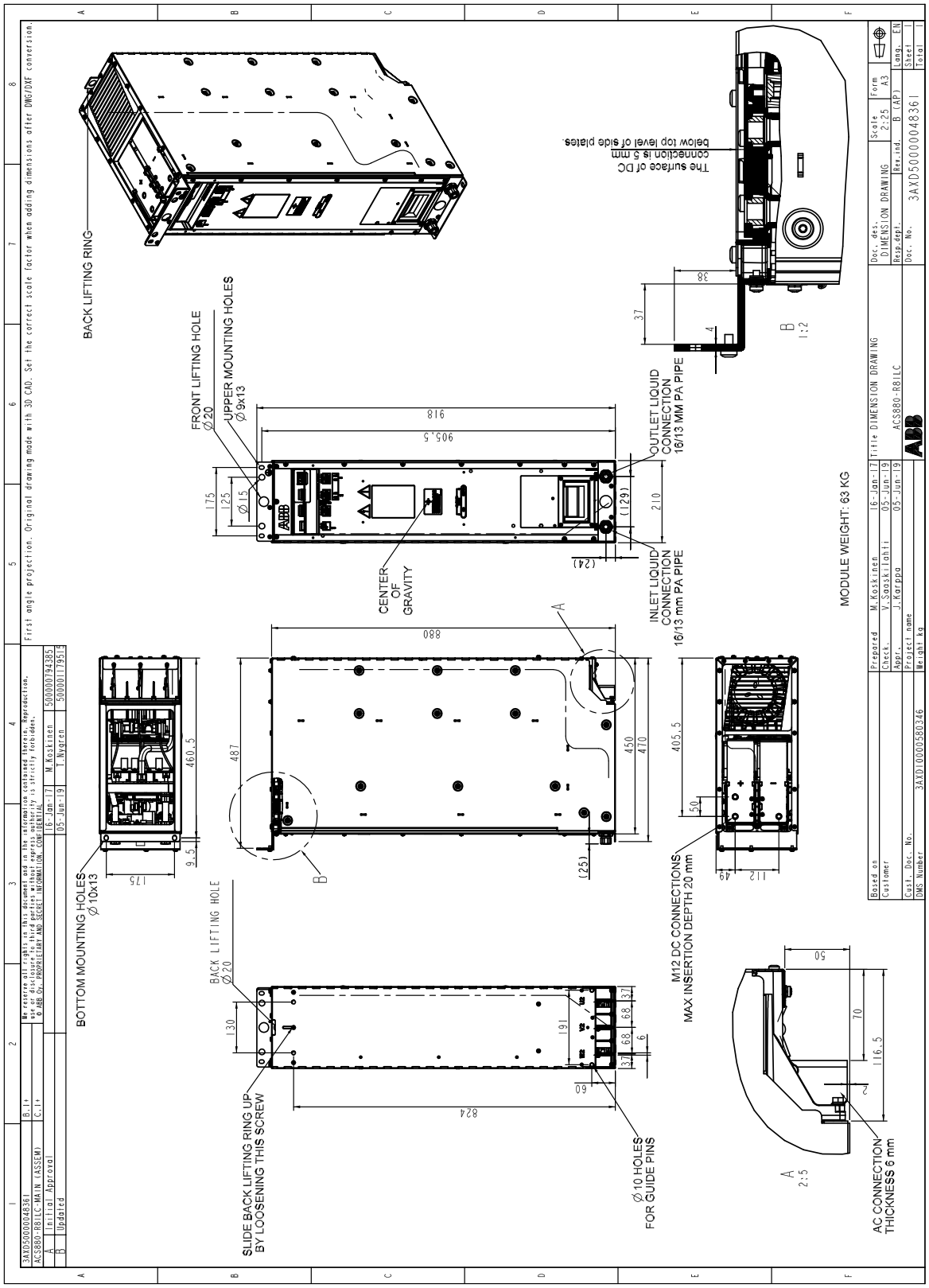
## Installation frame for a module in upright position



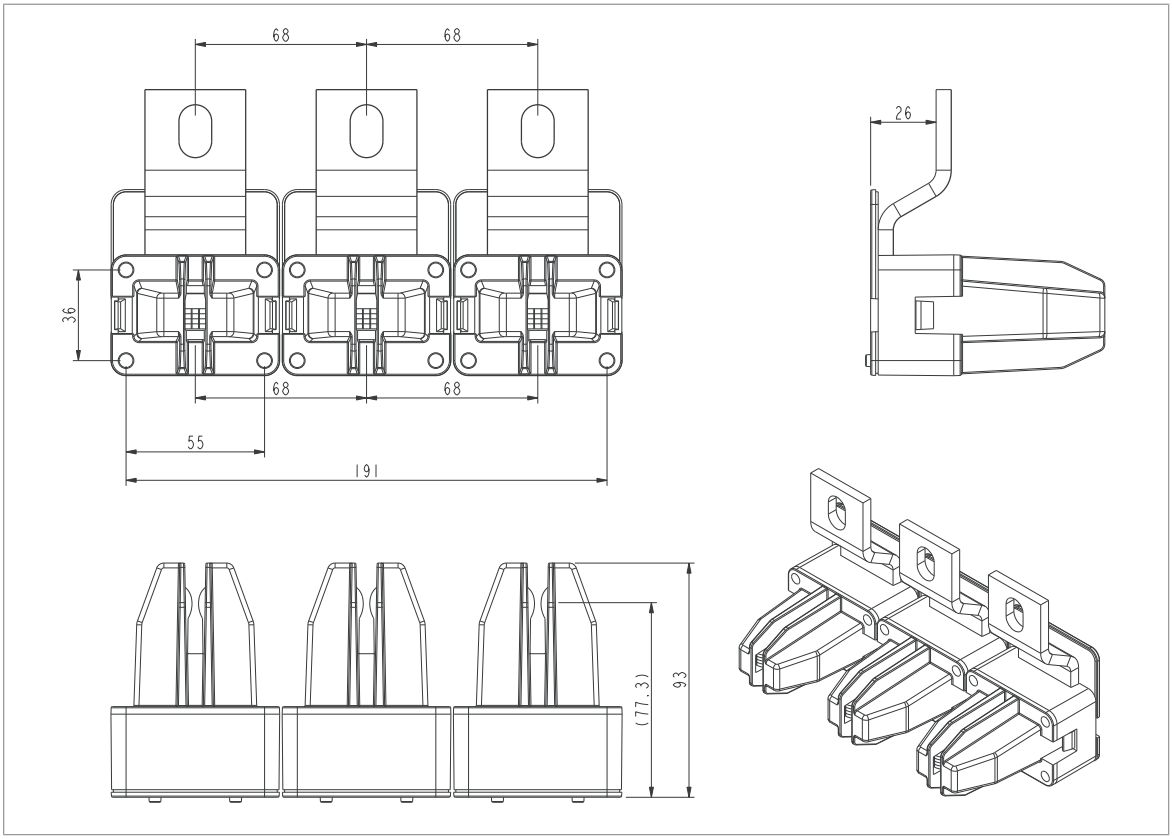
## Installation frame for a module on its side



# Frame R8i module

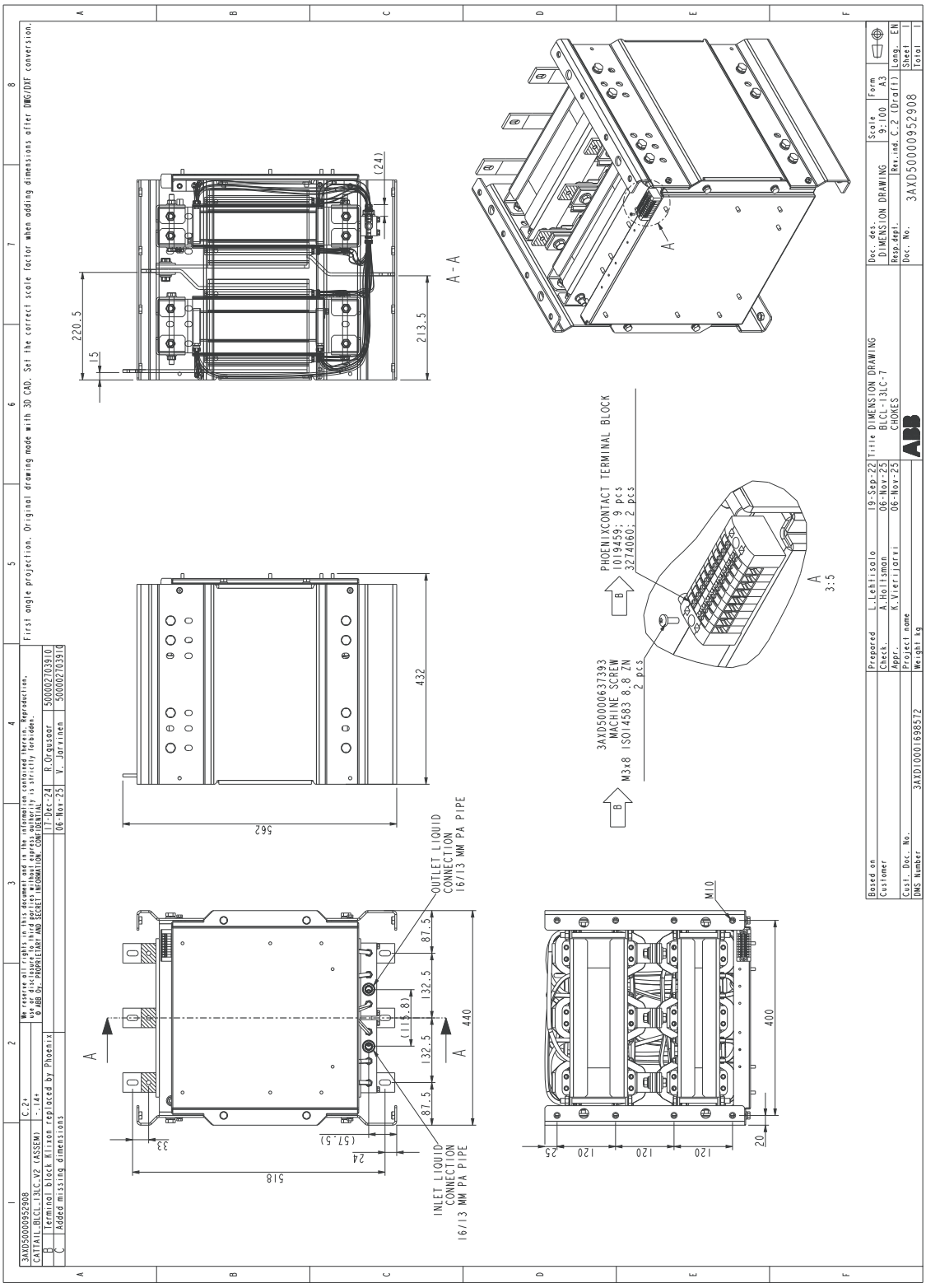


## Quick connector

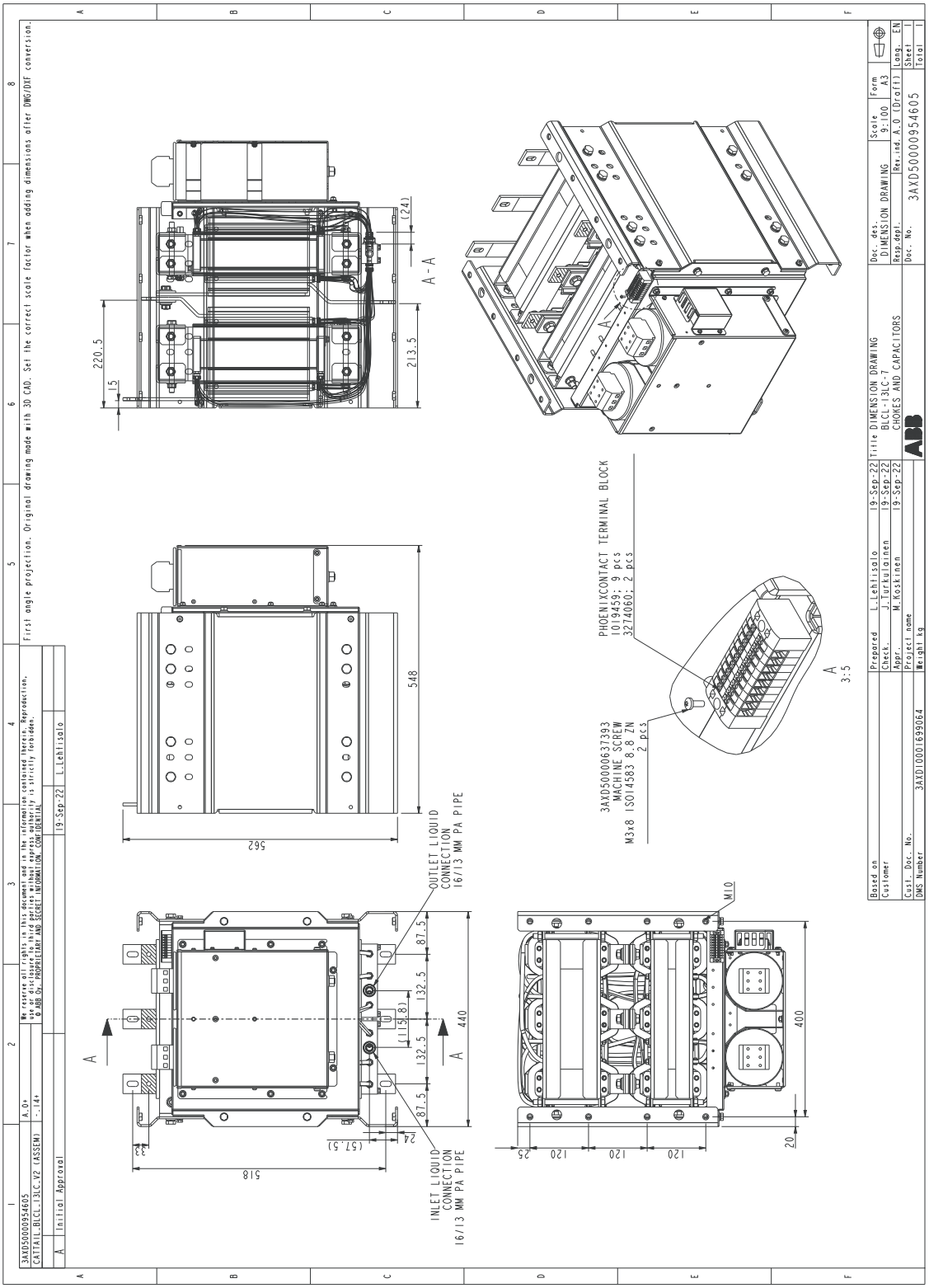


# LCL filter components

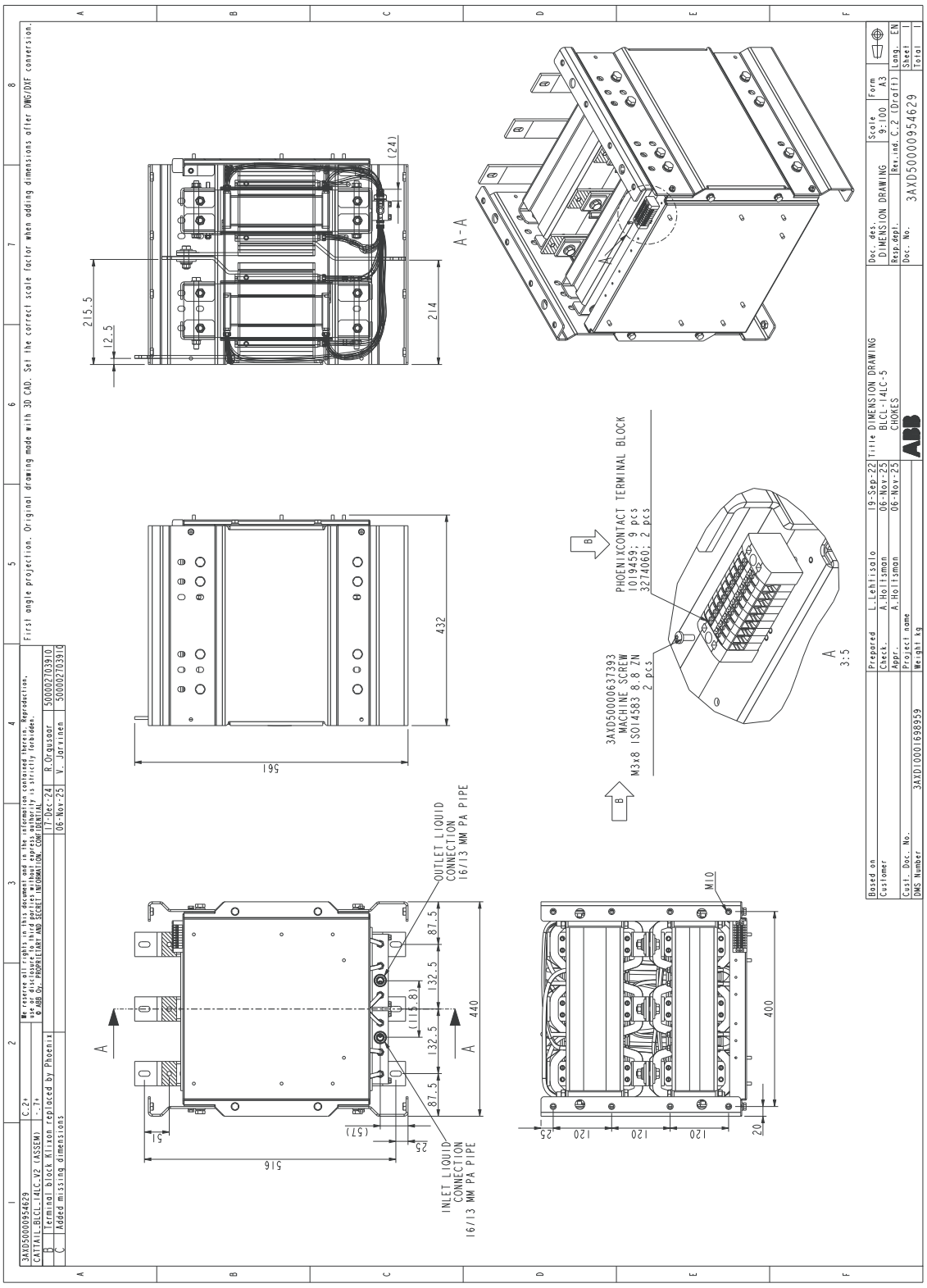
## BLCL-13LC-7, chokes



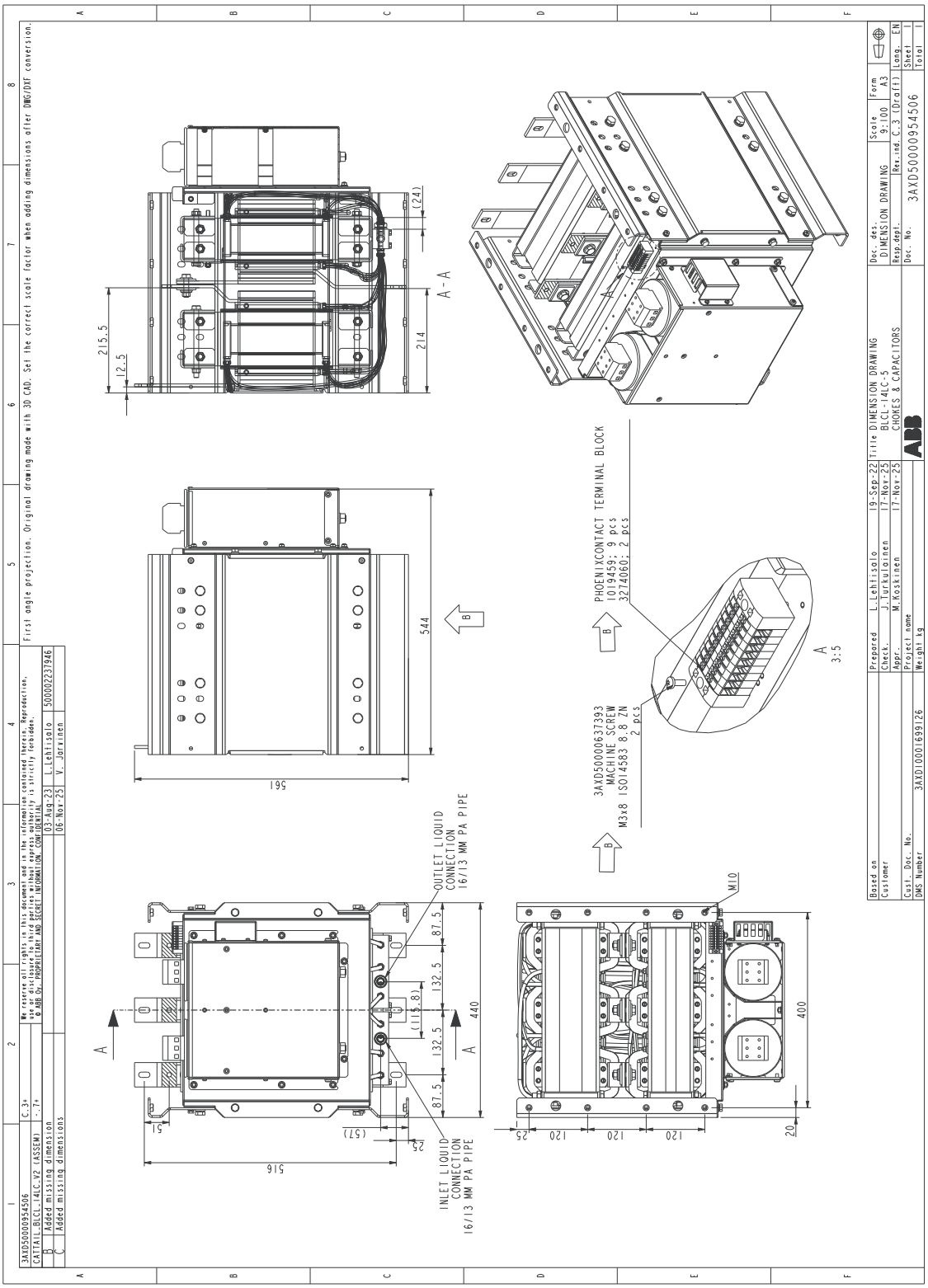
## BLCL-13LC-7, chokes and capacitors



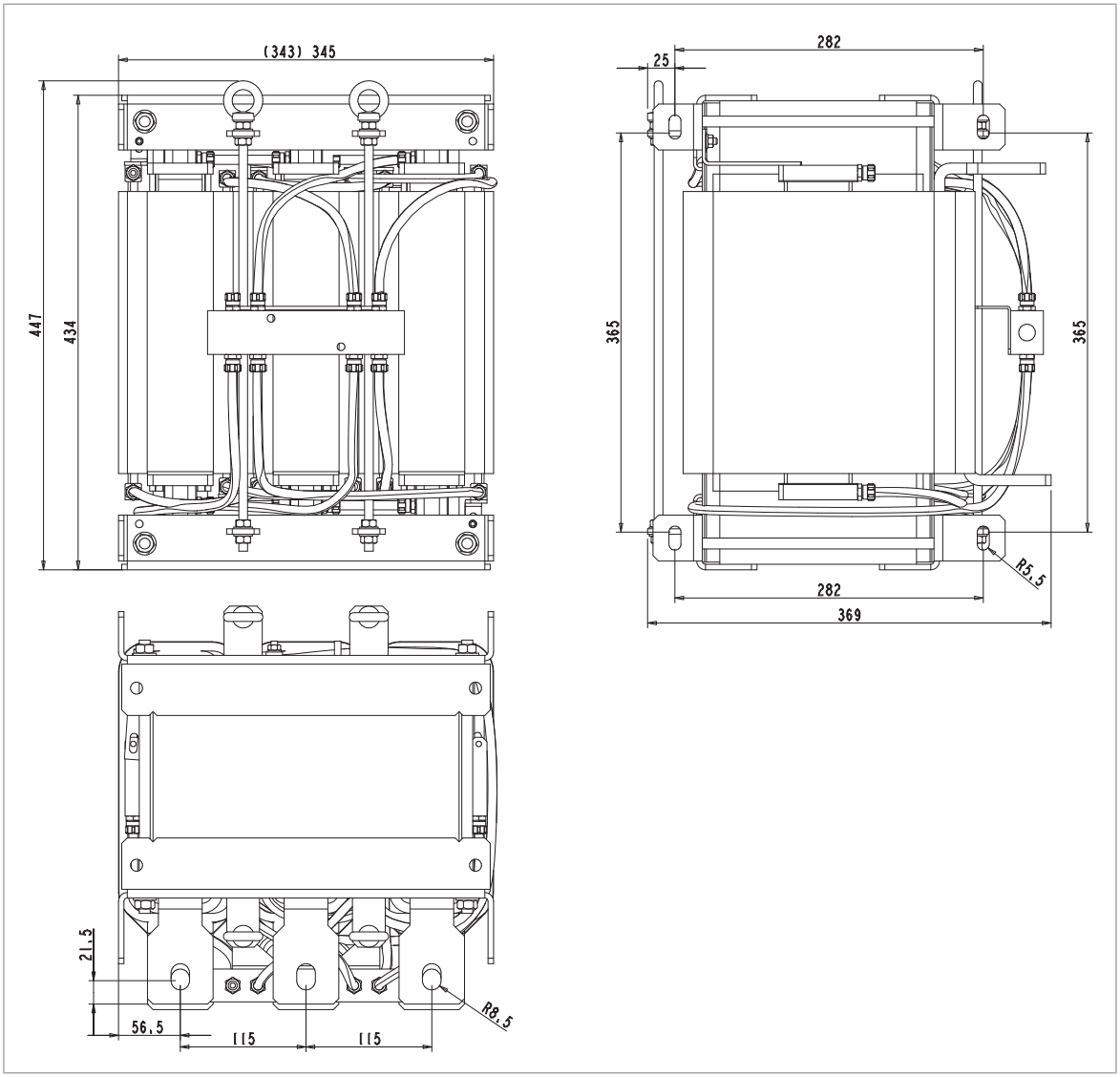
## BLCL-14LC-5, chokes



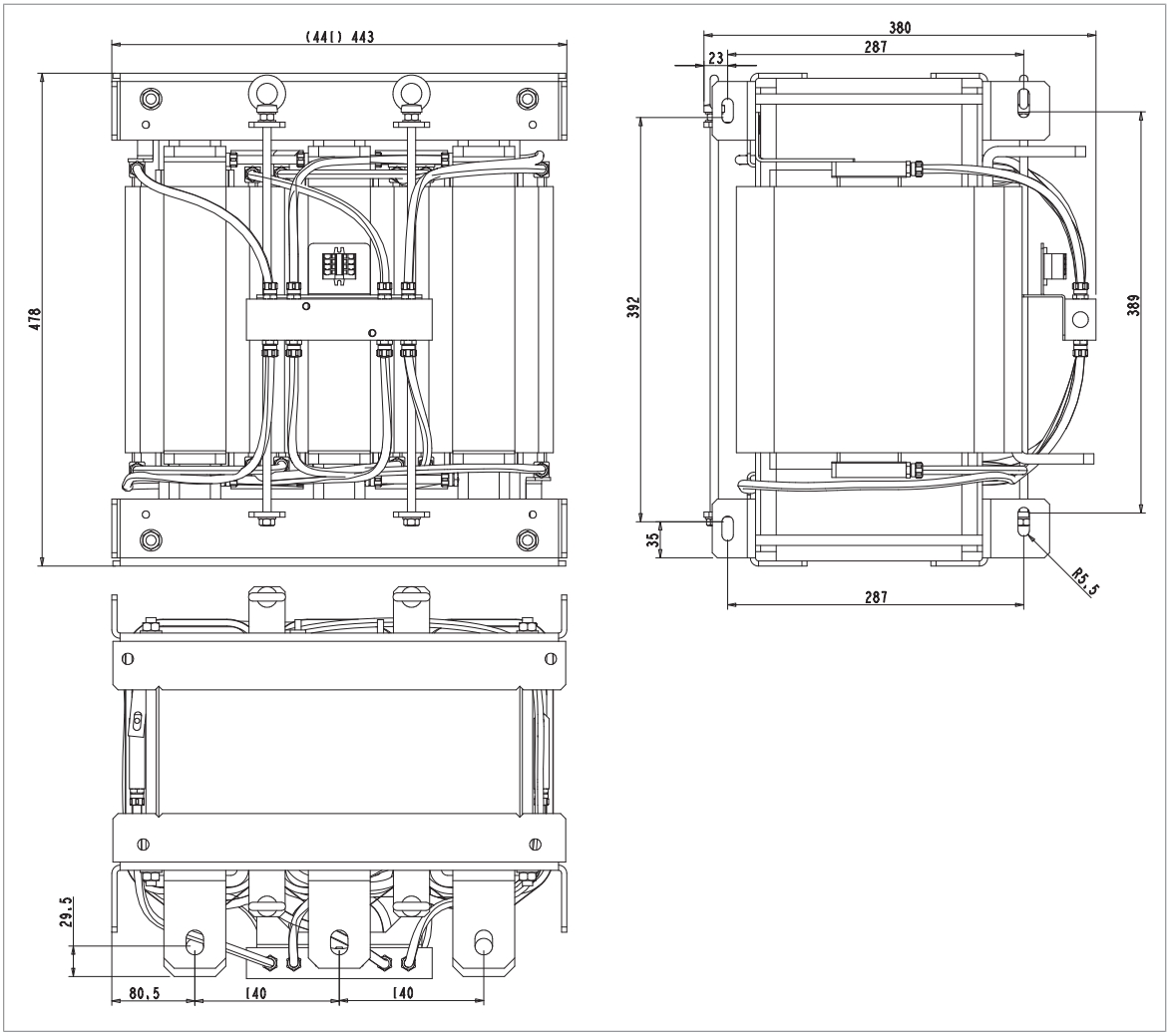
## BLCL-14LC-5, chokes and capacitors



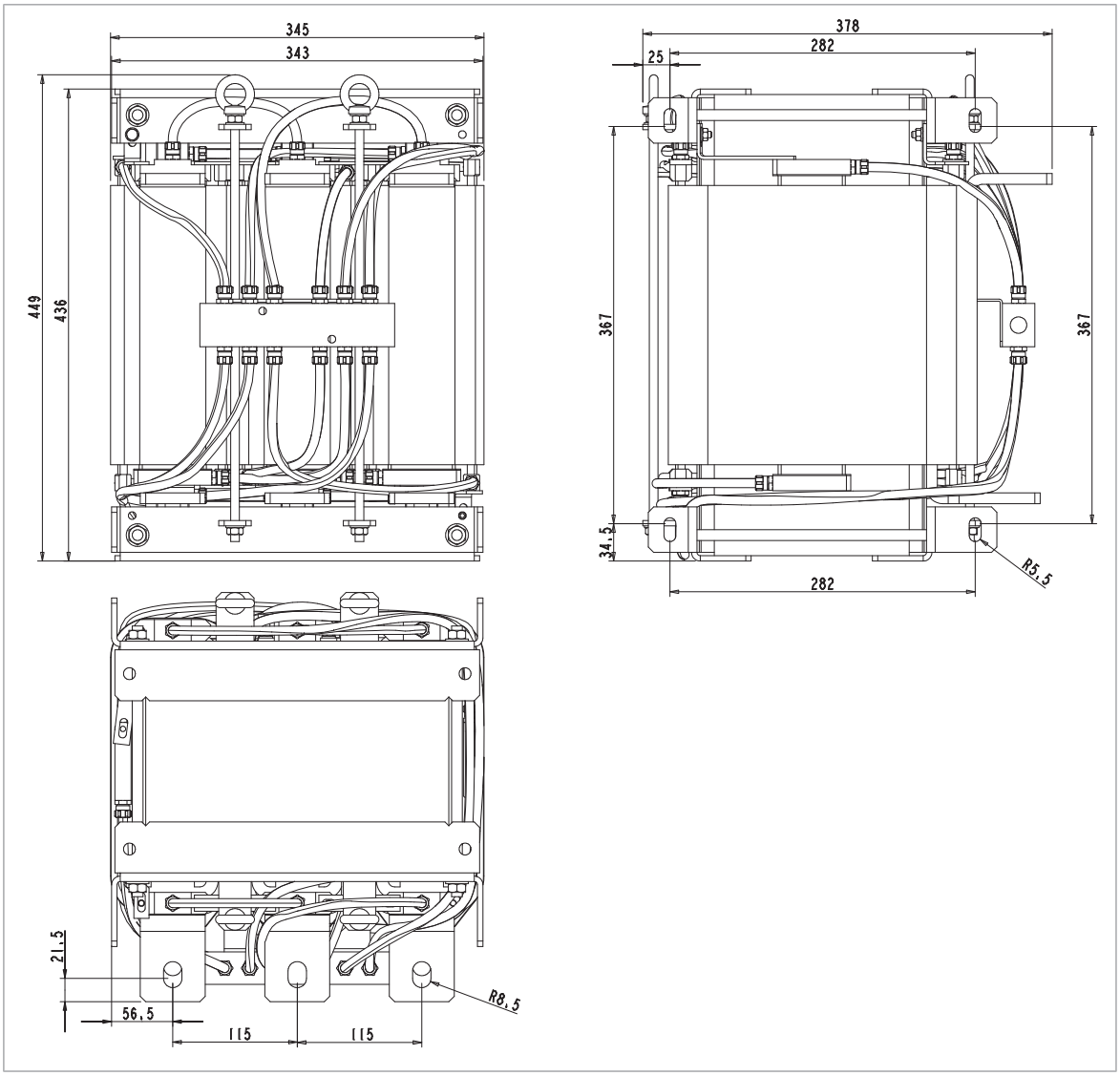
## Grid-side choke (BLCL-15LC-7 and BLCL-24LC-7)



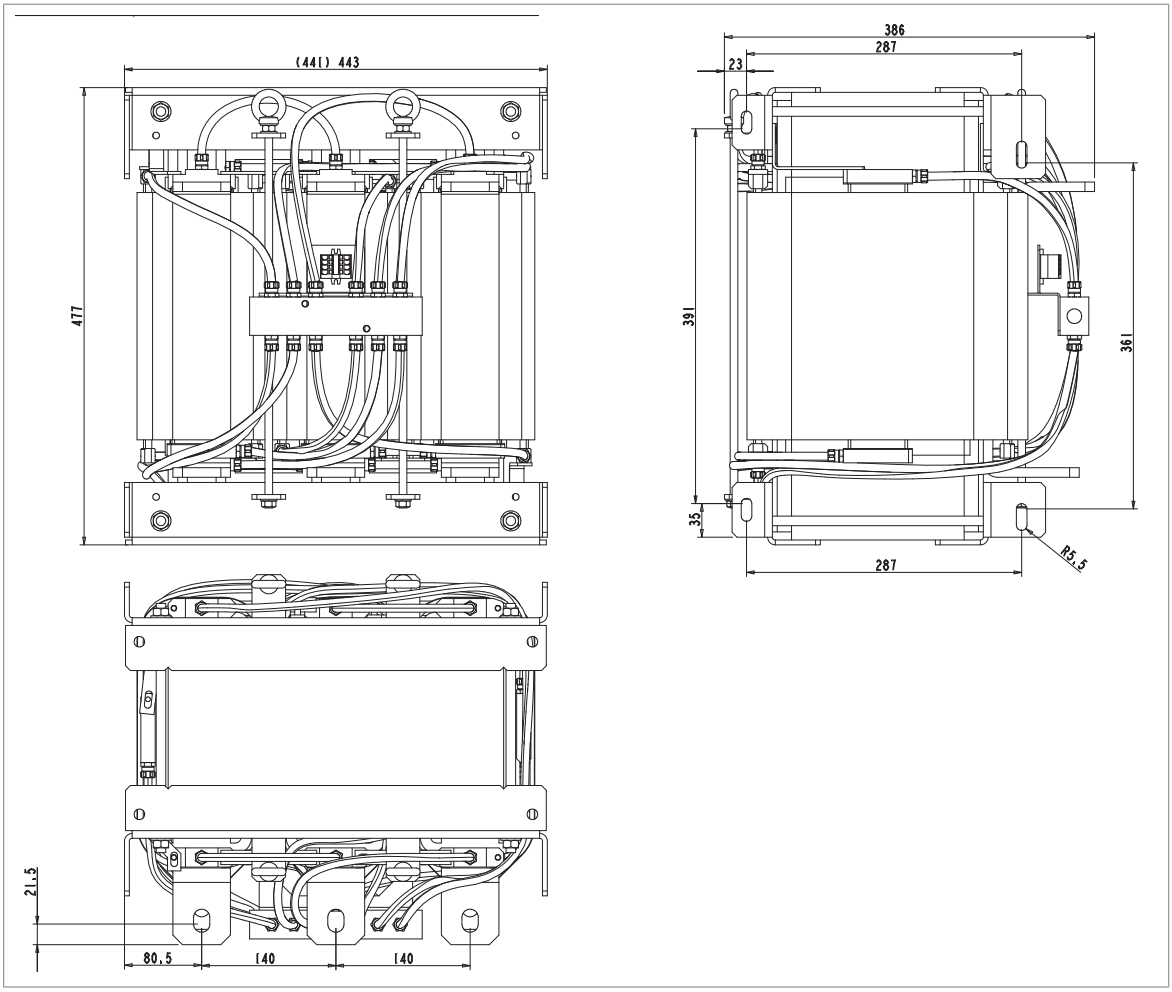
## Grid-side choke (BLCL-25LC-7)



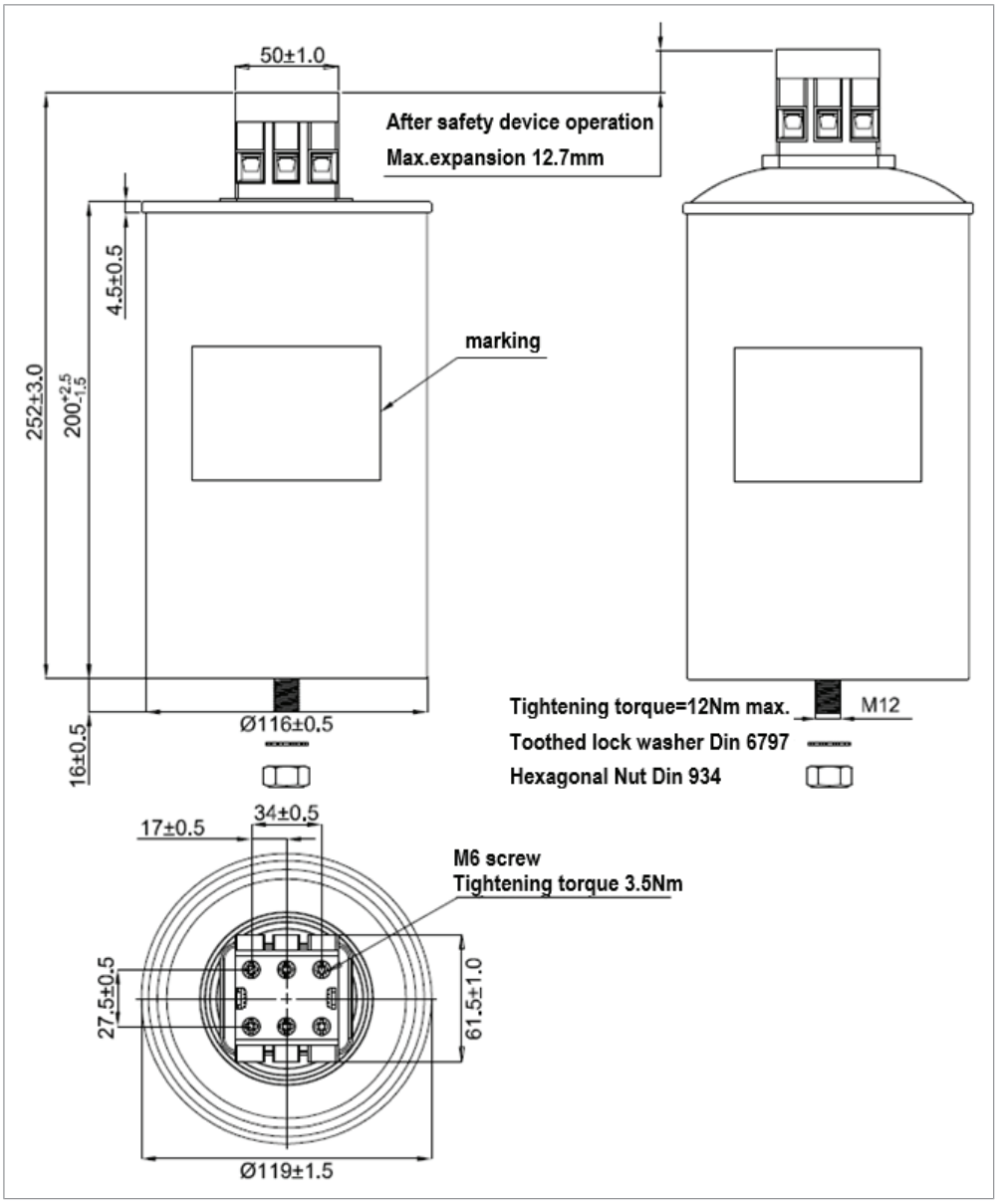
## Converter-side choke (BLCL-15LC-7, BLCL-24LC-7, BCL-15LC-7, BCL-24LC-7)



## Converter-side choke (BLCL-25LC-7 and BCL-25LC-7)

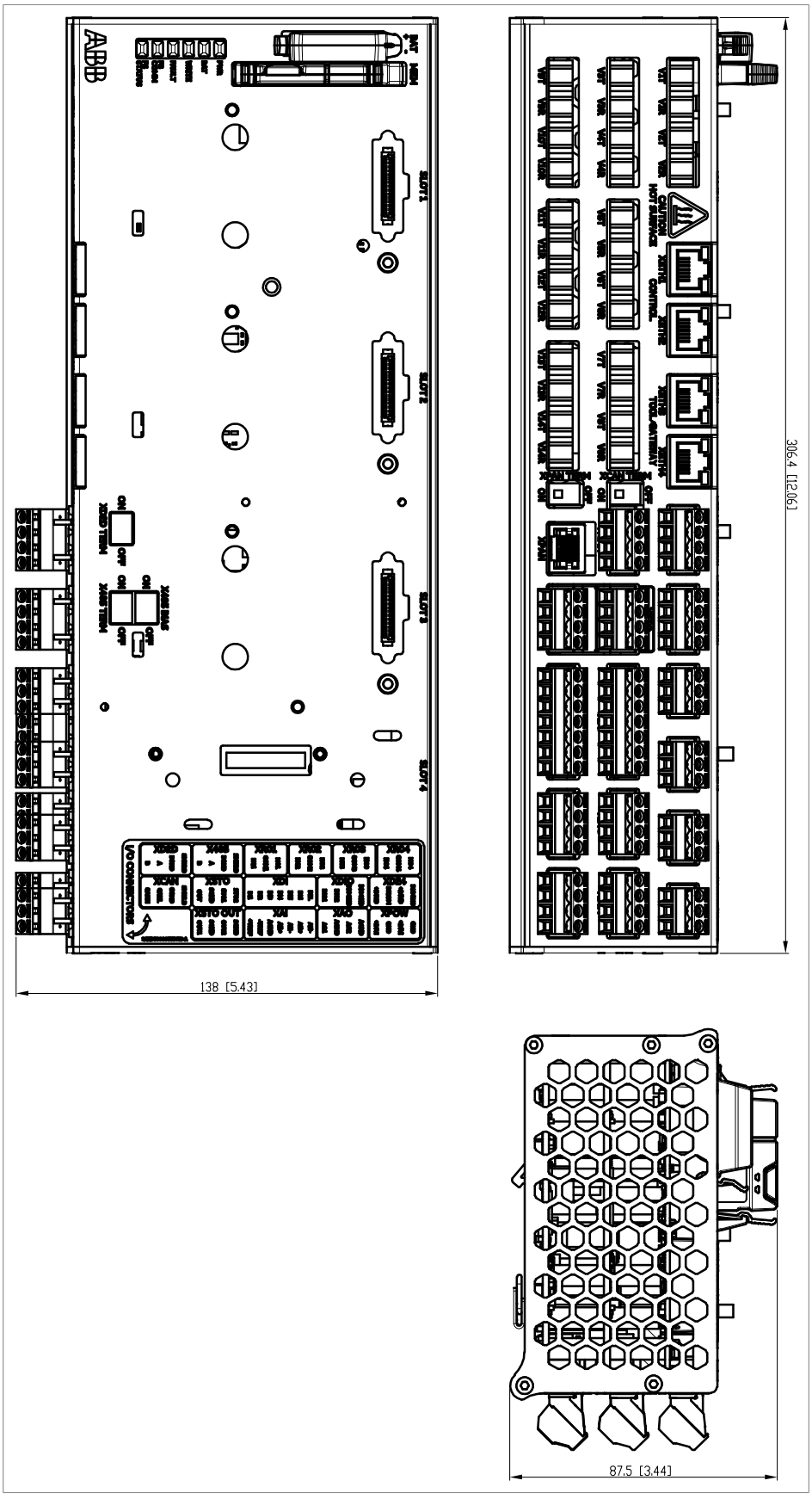


## Capacitor (BLCL-15LC-7, BLCL-24LC-7, BLCL-25LC-7, BCL-15LC-7, BCL-24LC-7, BCL-25LC-7)

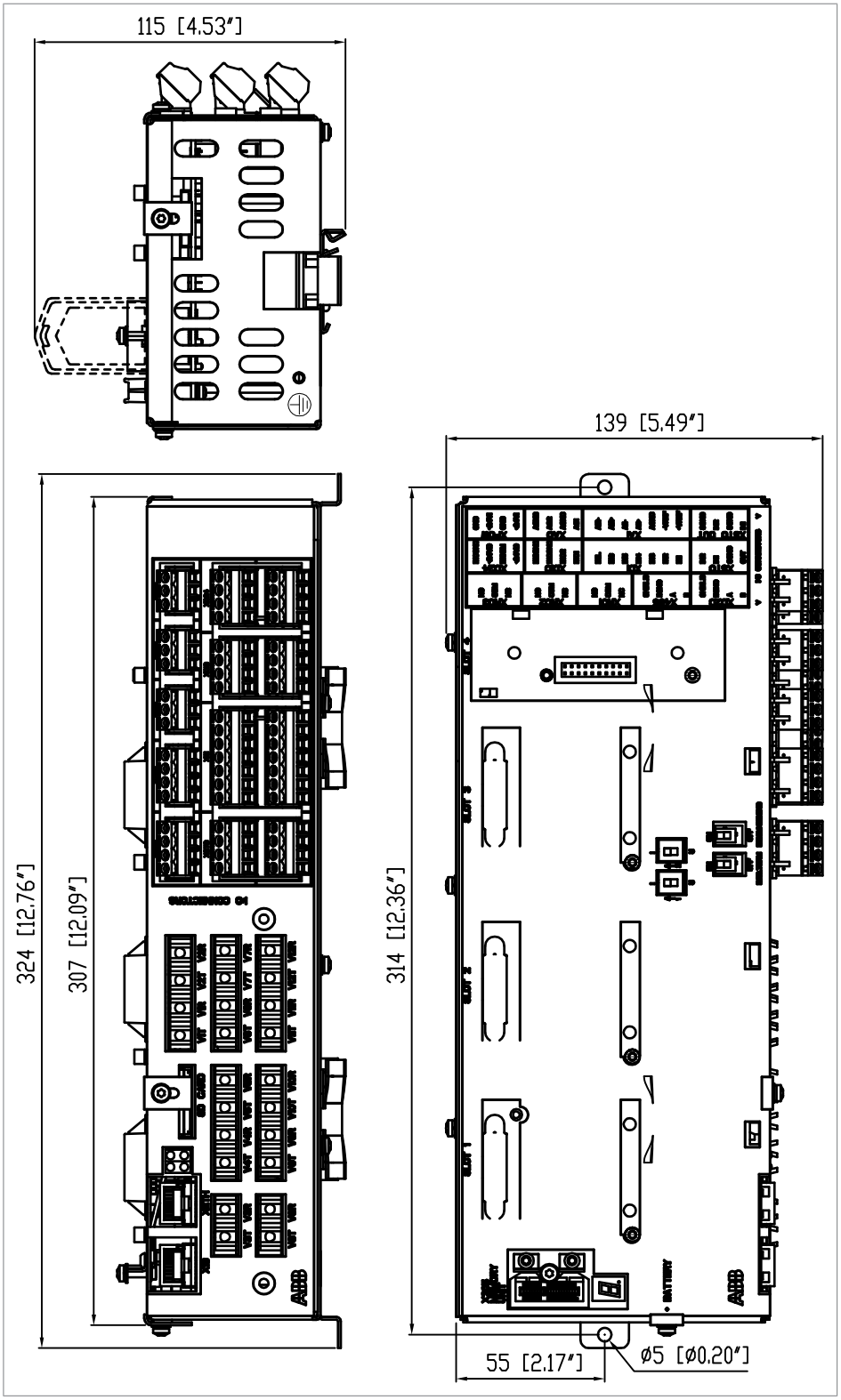


# Control electronics

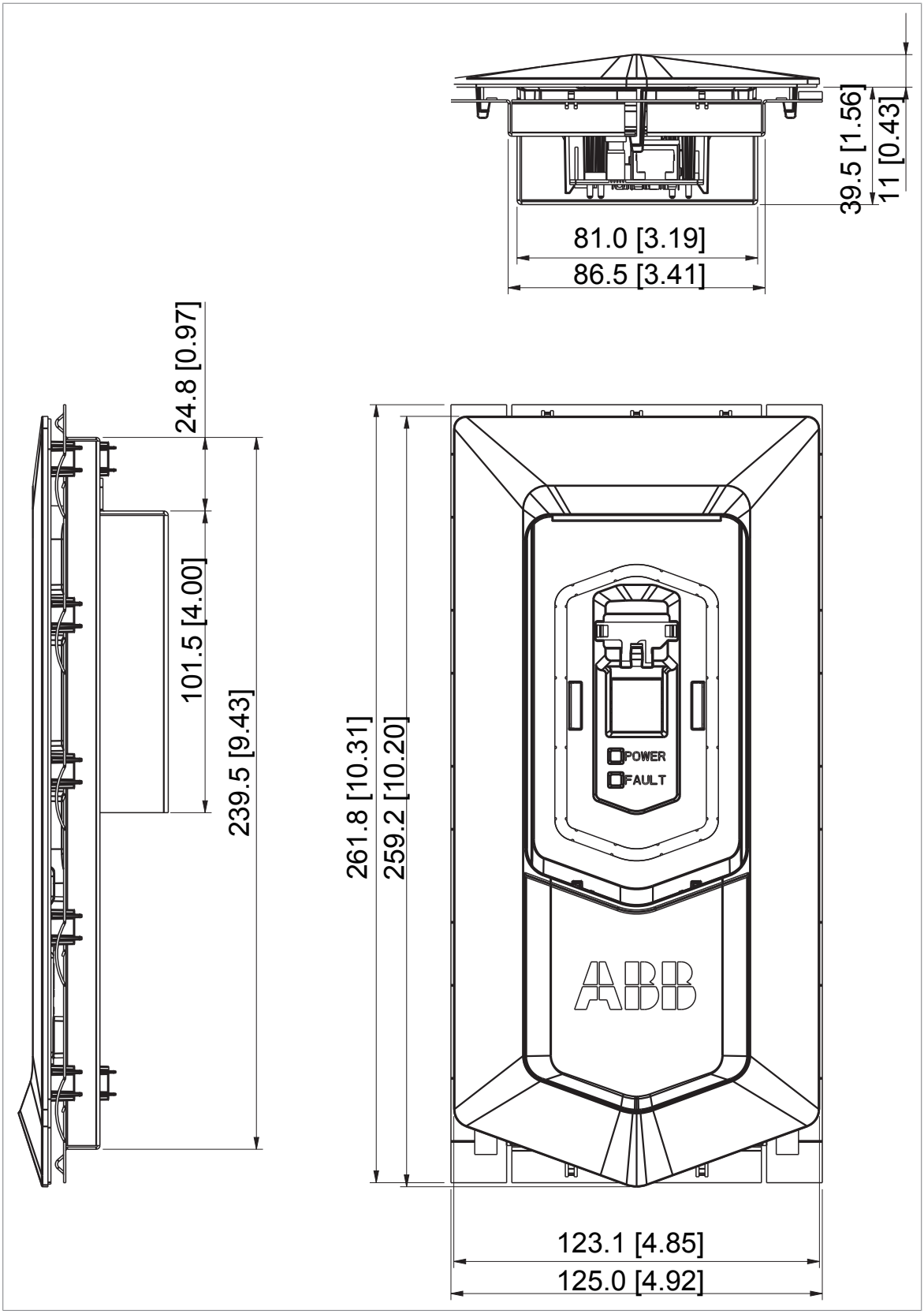
## UCU control unit



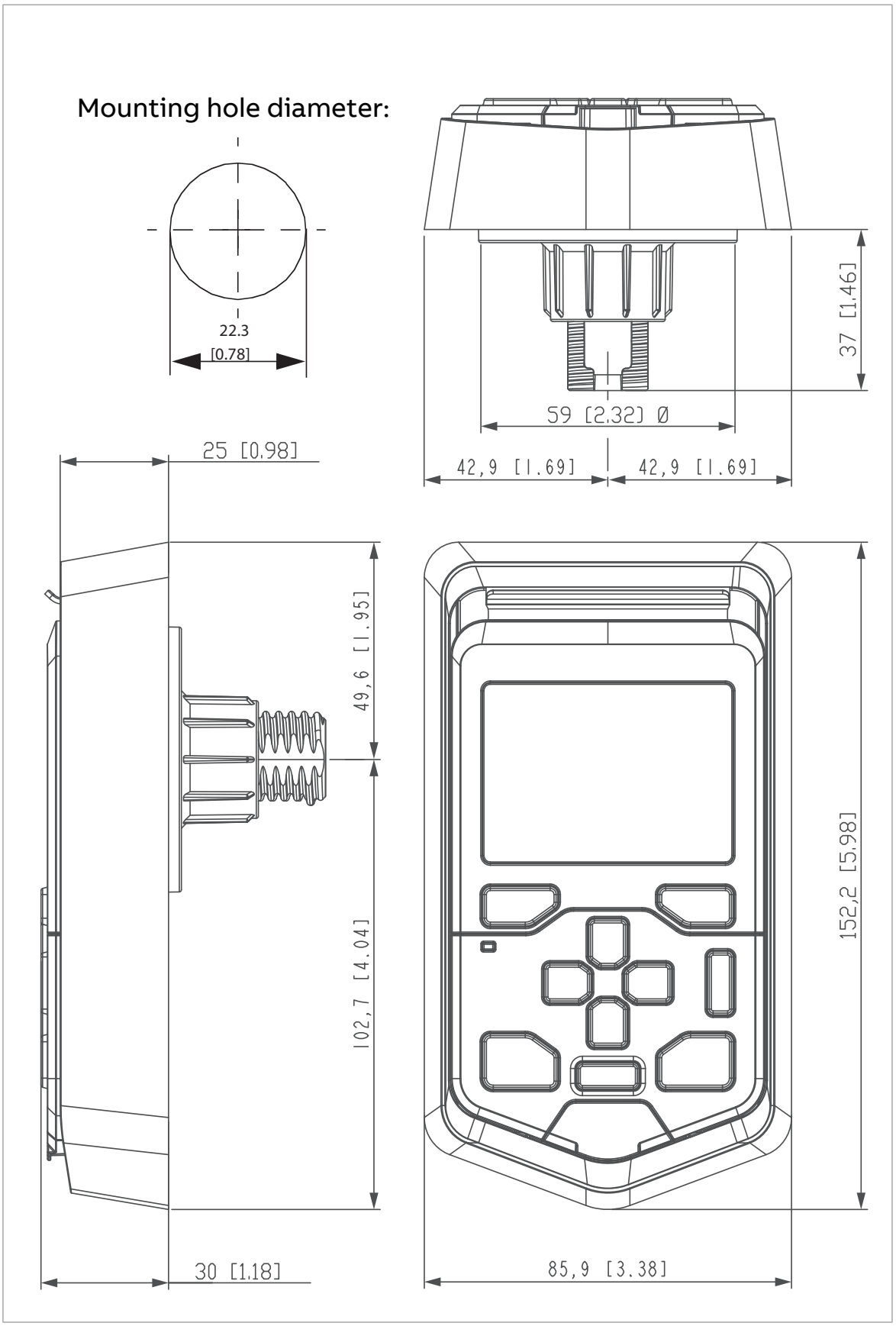
## BCU control unit



## DPMP-01 door mounting kit

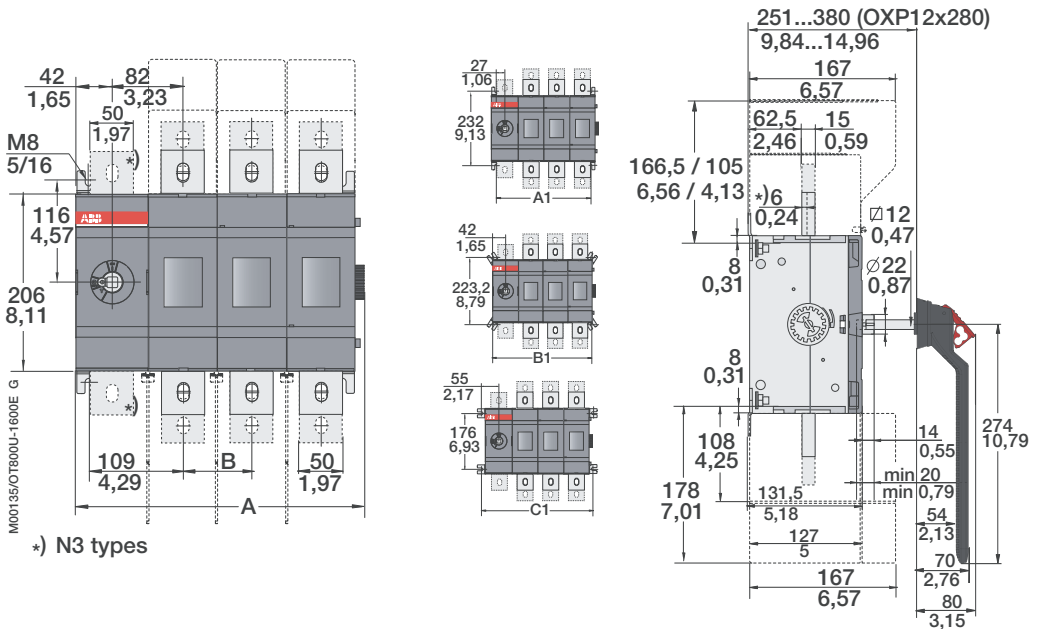


## DPMP-02 door mounting kit



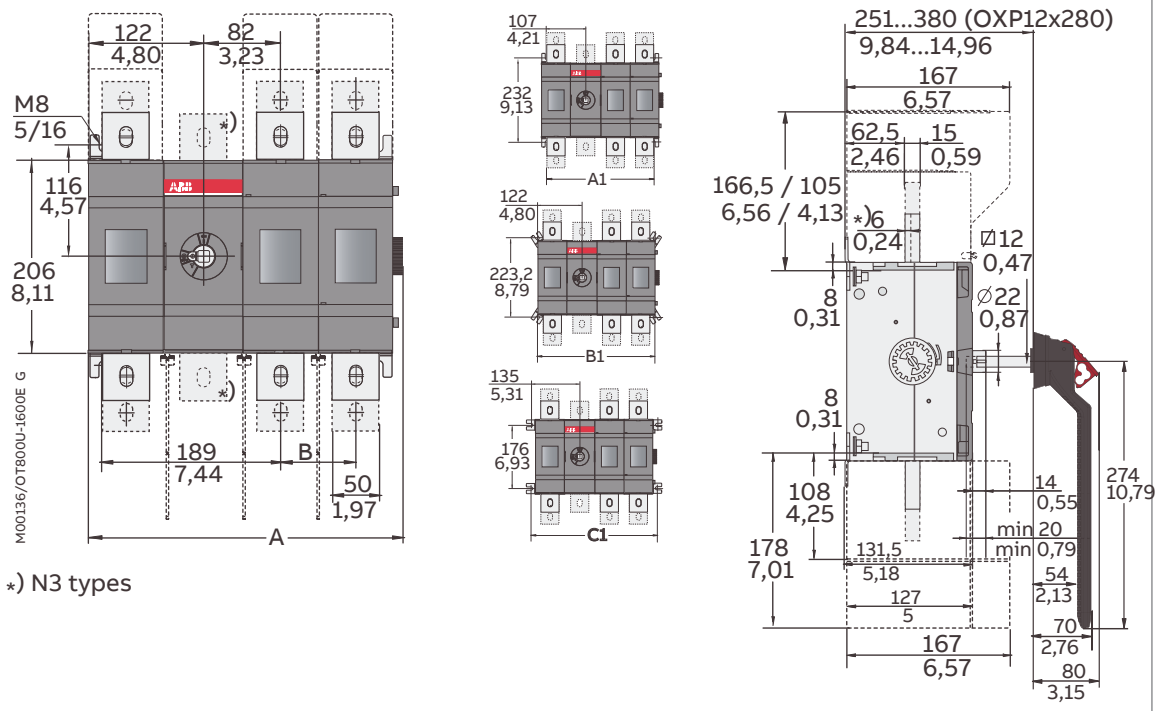
# Main switch-disconnectors

## OT1000E12




| A<br>mm (in) | B<br>mm (in) | A1<br>mm (in) | B1<br>mm (in) | C1<br>mm (in) |
|---|---|---|---|---|
| 334.50 (13.17) | 80 (3.15) | 294 (11.57) | 324 (12.76) | 350 (13.78) |

## OT800U12

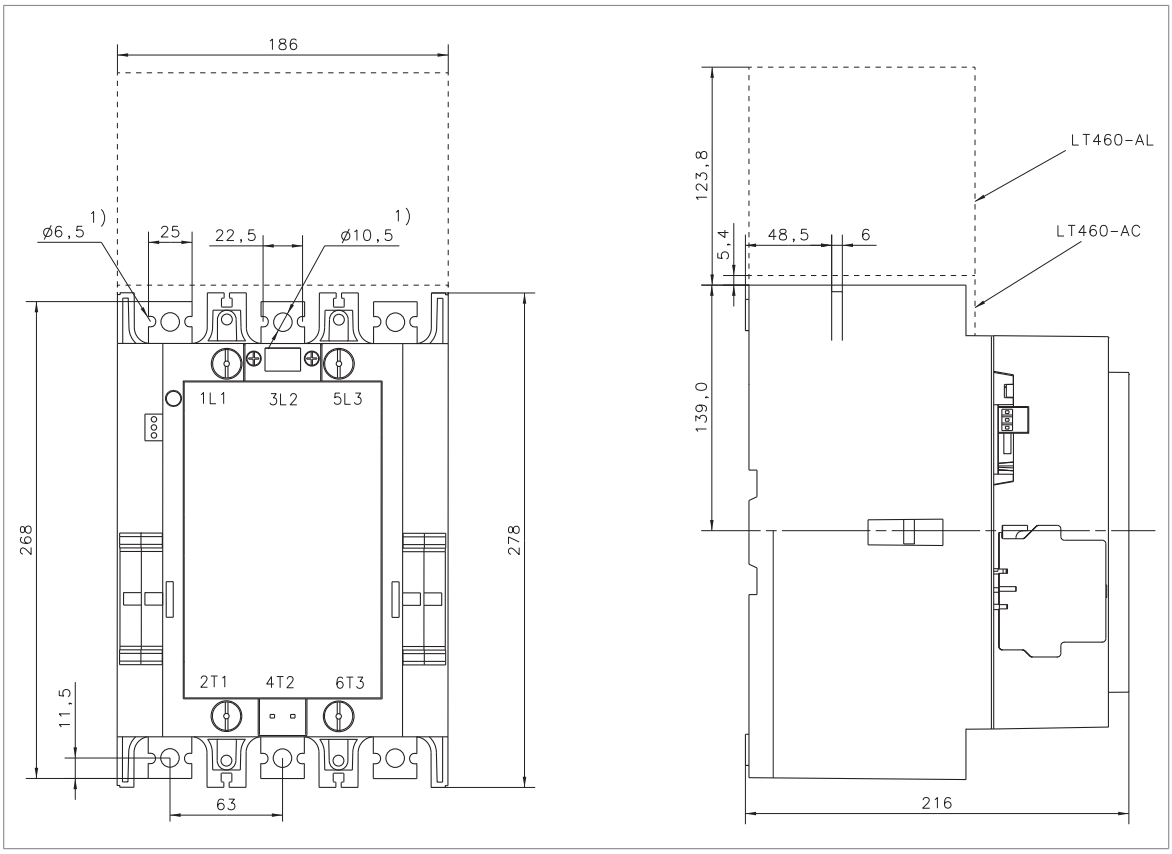



*) N3 types

| A<br>mm (in) | B<br>mm (in) | A1<br>mm (in) | B1<br>mm (in) | C1<br>mm (in) |
|---|---|---|---|---|
| 334.50 (13.17) | 80 (3.15) | 294 (11.57) | 324 (12.76) | 350 (13.78) |

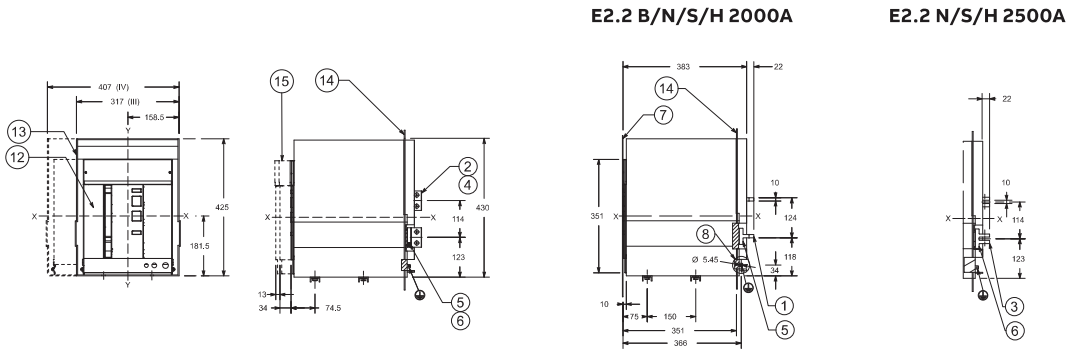
# Main contactors

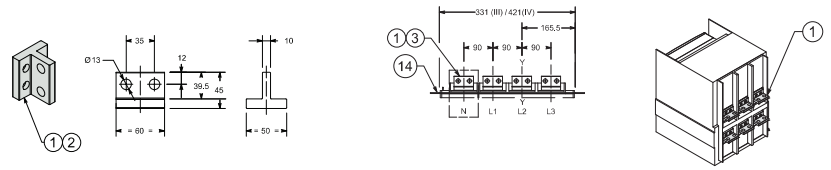
## AF400

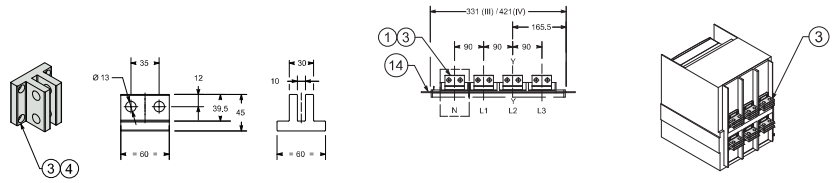


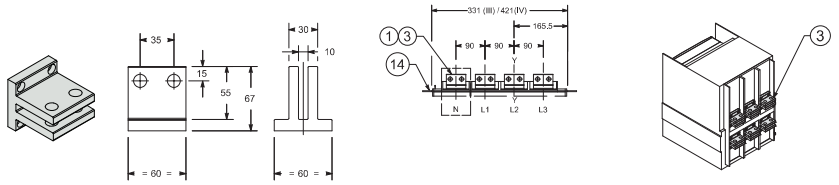
# Main circuit breakers

## E2.2S (IEC)



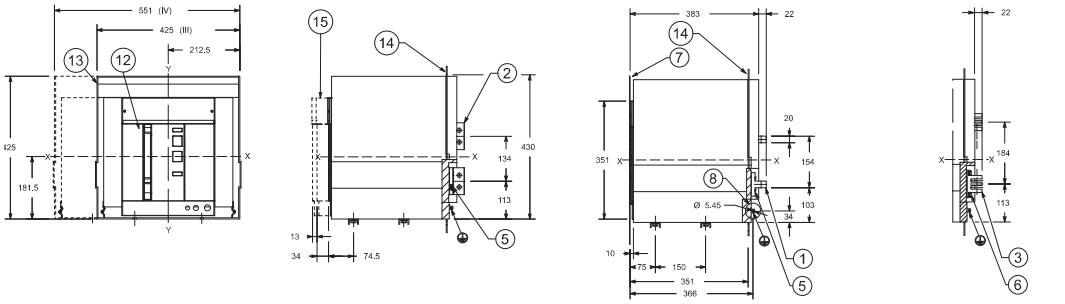




| | | | |
|---|---|---|---|
| 1 | Horizontal terminals 2000 A | 7 | Door position |
| 2 | Vertical terminals 2000 A (not in use in the design presented in this manual) | 8 | Earthing device |
| 3 | Horizontal terminals 2500 A | 12 | Mobile part |
| 4 | Vertical terminals 2500 A (not in use in the design presented in this manual) | 13 | Fixed part |
| 5 | Tightening torque (2000 A) 8.6 N·m (76 lbf·in) | 14 | Segregation (where envisaged) |
| 6 | Tightening torque (2500 A) 8.6 N·m (76 lbf·in) | 15 | Distance from connected for testing to isolated |

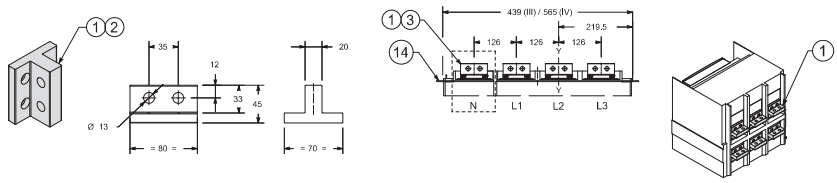
## E4.2S, E4.2V (IEC)

**E4.2 N/S/H 3200A**

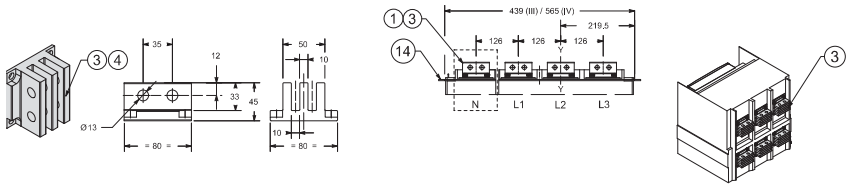
**E4.2 N/S/H 4000A**
**E4.2 V 2000...4000A**



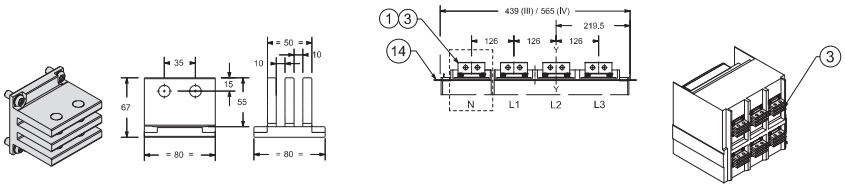

**E4.2 N/S/H 3200A**




**E4.2 N/S/H 4000A**
**E4.2 V 2000...4000A**



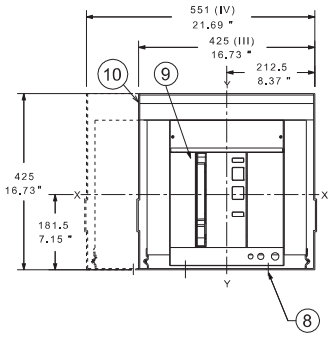

**E4.2 N/S/H 4000A LHR/LVR**



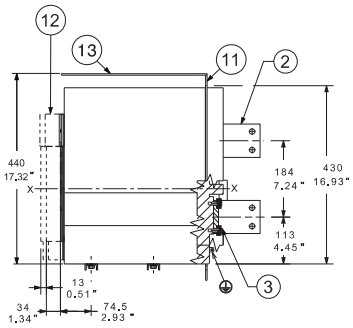

| | | | |
|---|---|---|---|
| 1 | Horizontal terminals 3200 A | 7 | Door position |
| 2 | Vertical terminals 3200 A (not in use in the design presented in this manual) | 8 | Earthing device |
| 3 | Horizontal terminals 4000 A | 12 | Mobile part |
| 4 | Vertical terminals 4000 A (not in use in the design presented in this manual) | 13 | Fixed part |
| 5 | Tightening torque (3200 A) 20 N·m (177 lbf·in) | 14 | Segregation (where envisaged) |
| 6 | Tightening torque (4000 A) 20 N·m (177 lbf·in) | 15 | Distance from connected for testing to isolated |

## E4.2V-A (UL/CSA)

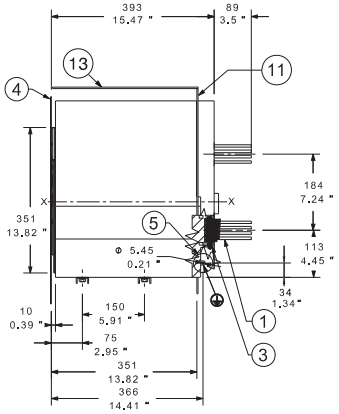
**E4.2 S-A, H-A, V-A 800A - 2500A**

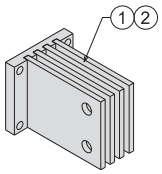


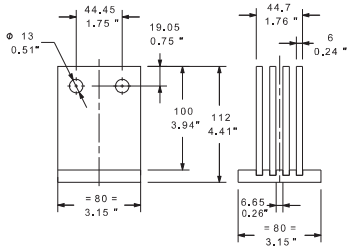

**VR adjustment ***



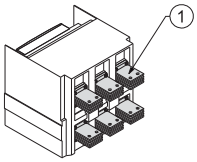

**HR adjustment**

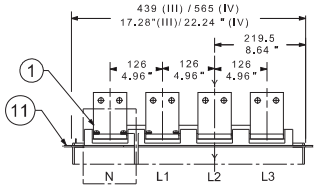




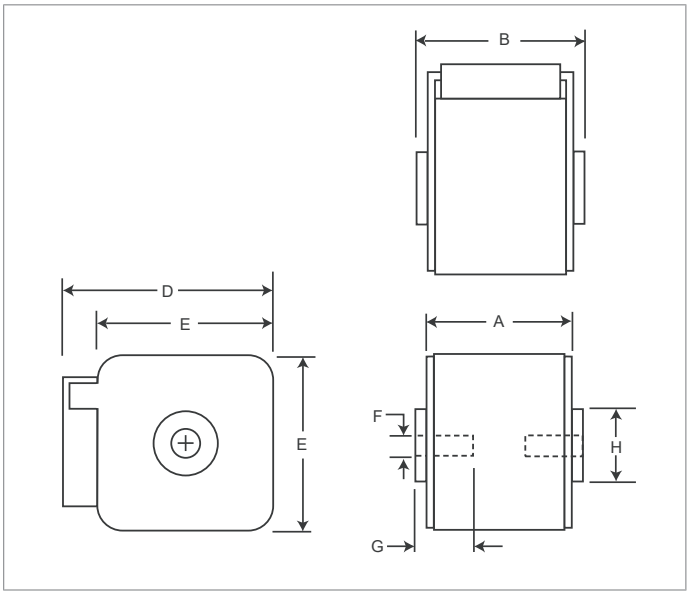

**HR adjustment**





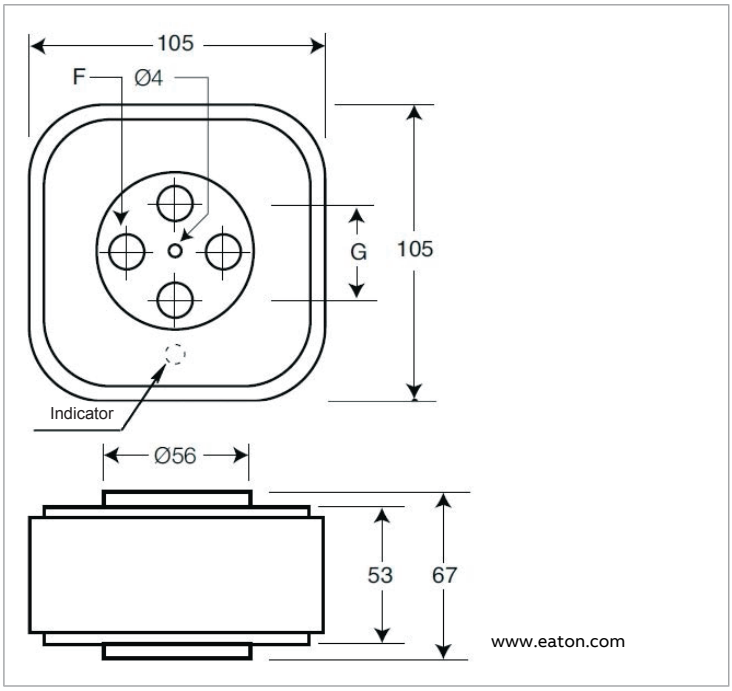

| | | | |
|---|---|---|---|
| 1 | Horizontal terminals 2500 A | 9 | Moving part |
| 2 | Vertical terminals 2500 A (not in use in the design presented in this manual) | 10 | Fixed part |
| 3 | Tightening torque 20 N·m (177 lbf·in) | 11 | Segregation |
| 4 | Door position | 12 | Connected, test, disconnected distances |
| 5 | Grounding | 13 | Roof insulation or insulated metal |
| 6 | Mounting fixed part screws | * | Not in use in the design presented in this manual |

# Fuse blocks (Bussmann)




| 1000…1250 V fuses (as used with 690 V units) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Size** | **A** mm (inch) | **B** mm (inch) | **D** mm (inch) | **E** mm (inch) | **F** | **G** mm (inch) | **H** mm (inch) |
| 1* | 74 (2.91) | 75 (2.95) | 59 (2.32) | 45 (1.77) | M8 | 5 (0.20) | 17 (0.67) |
| 1 | 74 (2.91) | 75 (2.95) | 69 (2.72) | 53 (2.09) | M8 | 8 (0.31) | 20 (0.79) |
| 3 | 81 (3.19) | 83 (3.27) | 92 (3.62) | 76 (2.99) | M12 | 10 (0.39) | 30 (1.18) |
| 3* | 81 (3.19) | 91 (3.58) | 92 (3.62) | 76 (2.99) | M12 | 10 (0.39) | 30 (1.18) |

# Fuses of type 170M70xx




| Size | F | G<br>mm (inch) |
|---|---|---|
| 4B | M10 | 33 (1.30) |

15

# Example circuit diagrams

## Contents of this chapter

This chapter contains example circuit diagrams of an 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 (ACS880-204LC) IGBT supply module when installed in a user-defined cabinet.

## Contents of example circuit diagrams

- **ACS880-204LC IGBT supply unit 1×R7i (3AXD10001871893)**

- IGBT supply module
- LCL filter
- main switch-disconnector
- main contactor
- main charging circuit
- DC switch-disconnector
- DC charging circuit
- internal auxiliary voltage supply
- control unit
- cabinet cooling fans

- control panel, panel mounting kit
- BAMU auxiliary measurement unit
- optimal grid control functionality (option +N8053).

### ACS880-204LC IGBT supply unit 4×R7i (3AXD10001968696)

- IGBT supply module
- LCL filter
- main circuit breaker
- main charging circuit
- internal auxiliary voltage supply
- control unit
- cabinet cooling fans
- control panel, panel mounting kit
- BAMU auxiliary measurement unit
- optimal grid control functionality (option +N8053).

### ACS880-204LC IGBT supply unit 2×R8i (with LCL filter, 3AXD10000695767)

- IGBT supply module
- LCL filter
- main circuit breaker
- main charging circuit
- DC switch
- DC charging circuit
- internal auxiliary voltage supply
- control unit
- cabinet cooling fans
- control panel, panel mounting kit.

### ACS880-204LC IGBT supply unit 4×R8i (with LCL filter, 3AXD10000695768)

- IGBT supply module
- LCL filter
- main circuit breaker
- main charging circuit
- DC switch
- DC charging circuit
- internal auxiliary voltage supply
- control unit
- cabinet cooling fans

- control panel, panel mounting kit
- CIO-01 module for distributed I/O bus control.

### ACS880-204LC IGBT supply unit 2×R8i (with CL filter, 3AXD10002635574)

- IGBT supply module
- CL filter
- main circuit breaker
- main charging circuit
- DC switch
- DC charging circuit
- internal auxiliary voltage supply
- control unit
- cabinet cooling fans
- control panel, panel mounting kit
- CIO-01 module for distributed I/O bus control.

# Frame 1×R7i


Example Circuit Diagrams
Project type
ACS880-204LC
IGBT Supply Unit
Converter type
R7i
Frame Size
ACS880-204LC-350A-7
Type Code
Revision F
Used EPLAN Version: 2025.0.3.23406
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep. Oleg Vanin 18.03.2026
App. Mika Asikainen 18.03.2026
Project ACS880-204LC R7i
Title Title page / cover sheet IGBT Supply Unit ACS880-204LC-350A-7
Circuit diagram EFS2
SAP Doc. No. DMS doc. nr. 3AXD10001871893
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
Rev. F Sheet 000A
Cont. 000B

| Higher-level function | Page | Page description | Revision |
|---|---|---|---|
| | 000A | Title page / cover sheet | F |
| | 000C | Structured identifier overview | F |
| | 000D | Summarized parts list | F |
| | 000E | Summarized parts list | F |
| | 000F | Summarized parts list | F |
| | 200A | Overview diagram | F |
| | 300A | Symbol Overview | F |
| 01 | 001a | MAIN CIRCUIT | F |
| | 001b | MAIN CIRCUIT | F |
| | 001c | LINE-UP CHARGING CIRCUIT | F |
| | 002a | LCL FILTER | F |
| | 003a | MAIN CIRCUIT | F |
| | 004a | UNIT CHARGING CIRCUIT | F |
| | 005a | MODULE CONTROL CONNECTIONS | F |
| | 007a | CURRENT AND VOLTAGE MEASUREMENT | F |
| | 020a | AUXILIARY VOLTAGE DISTRIBUTION | F |
| | 021a | AUXILIARY VOLTAGE DISTRIBUTION | F |
| | 022a | CONTROL VOLTAGE DISTRIBUTION | F |
| | 026a | CABINET FAN CONTROL | F |
| | 030a | MAIN BREAKER CONTROL | F |
| | 050a | CONTROL UNIT | F |
| | 050b | CONTROL UNIT | F |
| | 050c | CONTROL UNIT | F |
| | 050d | CONTROL UNIT | F |
| | 051a | OPTION CARDS | F |

| | | | |
|---|---|---|---|
| Cust. Doc. No. | Prep. Oleg Vanin 18.03.2026 | Title Table of contents<br>IGBT Supply Unit<br>ACS880-204LC-350A-7 | Circuit diagram EFS2 |
| Cust. Ref. No. | App. Mika Asikainen 18.03.2026 | | SAP Doc. No. DMS doc. nr. 3AXD10001871893 |
| Customer Example Circuit Diagrams | Project ACS880-204LC<br>R7i | ABB | EPLAN Doc. No. |
| | | | ABB Ref. No. |
| | | | Resp. Dept. |

Item Des. =
+
Rev. F Sheet 000B
Cont. 000C

## Function designations

| Designation | Structure description |
|---|---|
| =01 | IGBT Supply Unit |
| | |
| | |
| | |
| | |
| | |
| | |

## Location designations

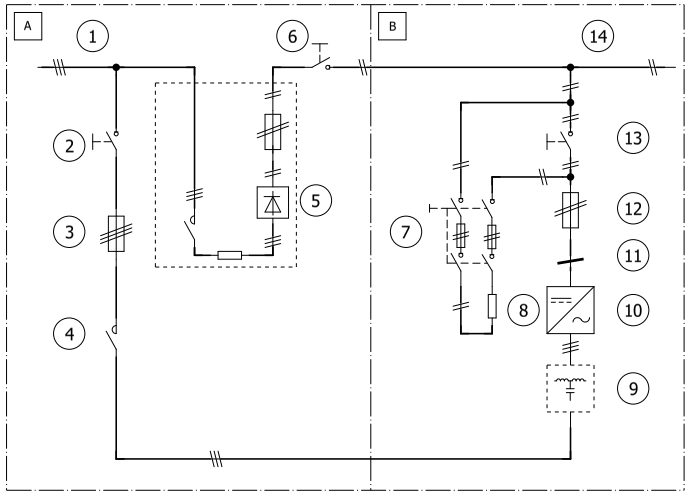
| Designation | Structure description |
|---|---|
| +01.1 | Auxiliary Control Cubicle (External) |
| +01.2 | Incoming Cubicle (External) |
| +01.3 | IGBT Supply Cubicle |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

## Electrical option designations

| Designation | Material Code | Quantity |
|---|---|---|
| #AC Fuse | 3AXD50000000246 | 3 |
| #BAMU | 3AXD50000045879 | 1 |
| #CIO I/O Module | 3AXD50000041983 | 1 |
| #CMF Filter | 3AXD50000566785 | 2 |
| #Cabinet Fan | 3AXD50000050763 | 1 |
| #Control Panel Kit | 3AXD50000025965 | 1 |
| #Control Unit Kit | ACS880UCU-204LC-22-0 | 1 |
| #DC Fuse | 68735980 | 2 |
| #DC Switch Kit | 3AXD50000823376 | 1 |
| #Fibre Optic | 58988821, 58948233, 58948250 | 3 |
| #LCL Filter Kit | 3AXD50000896431 | 1 |
| #Line-up Charging Kit | 3AXD50000250776 | 1 |
| #Line-up Charging Switch Kit | 3AXD50000507078 | 1 |
| #Main Contactor | 64399730 | 1 |
| #Main Switch Kit | 3AXD50001056292 | 1 |
| #Panel Interface Kit | 3AUA0000108650 | 1 |
| #Panel Mounting Kit | 3AUA0000108878 | 1 |
| #Resistor | 10028531 | 4 |
| #Supply Module | ACS880-104LC-0389A-7 | 1 |
| #Unit Charging Kit | 3AXD50000826933 | 1 |
| | | |
| | | |
| | | |

| | | | | | |
|---|---|---|---|---|---|
| Cust. Doc. No. | Prep. Oleg Vanin 18.03.2026 | Title Structured identifier overview<br>IGBT Supply Unit<br>ACS880-204LC-350A-7 | Circuit diagram EFS2 | Item Des. | |
| Cust. Ref. No. | App. Mika Asikainen 18.03.2026 | | SAP Doc. No. DMS doc. nr. 3AXD10001871893 | = | |
| Customer Example Circuit Diagrams | Project ACS880-204LC<br>R7i | ABB | EPLAN Doc. No. | + | |
| | | | ABB Ref. No. | Rev. F | Sheet 000C |
| | | | Resp. Dept. | Cont. | 000D |

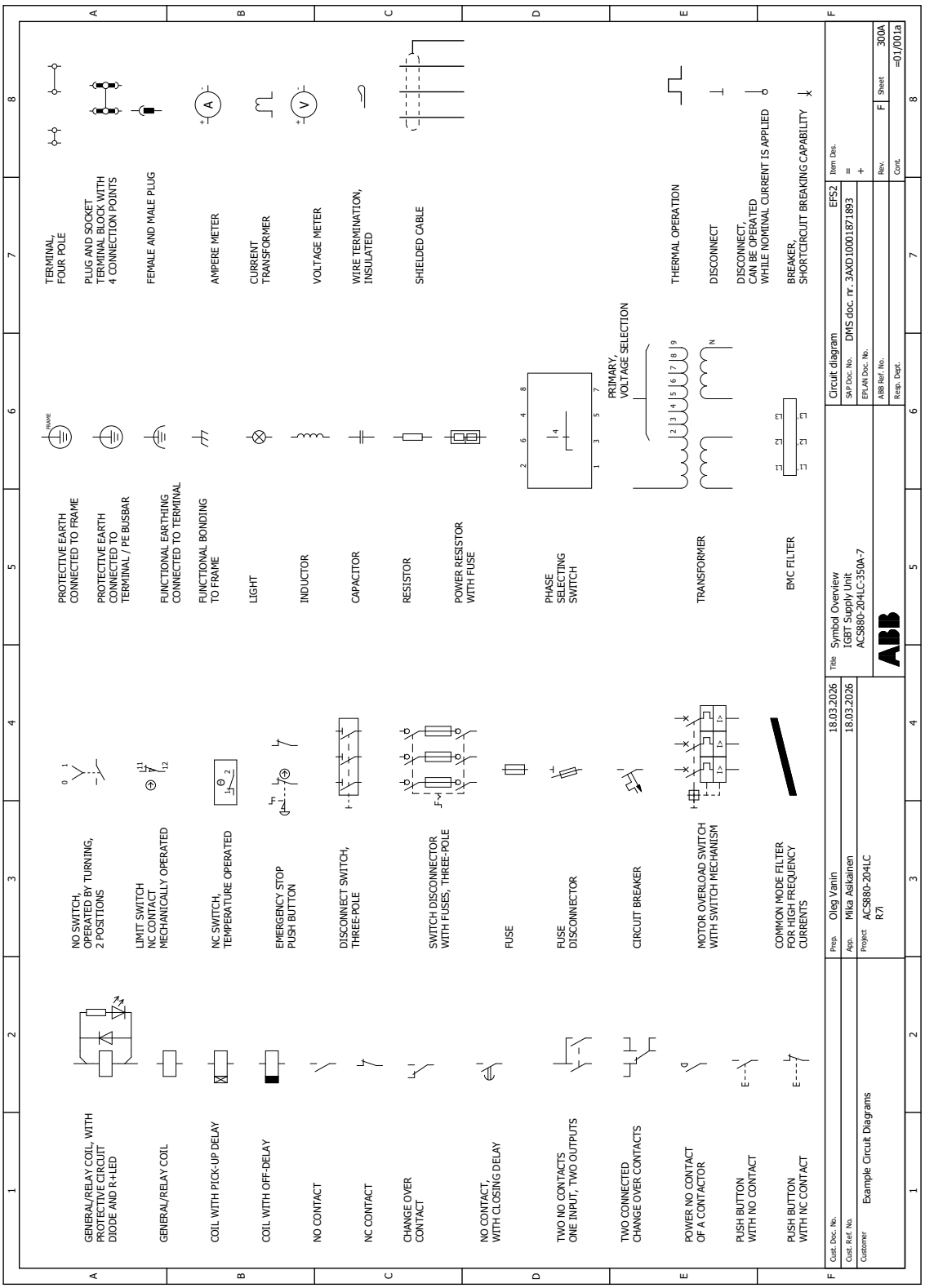
## Generic / Rittal enclosure

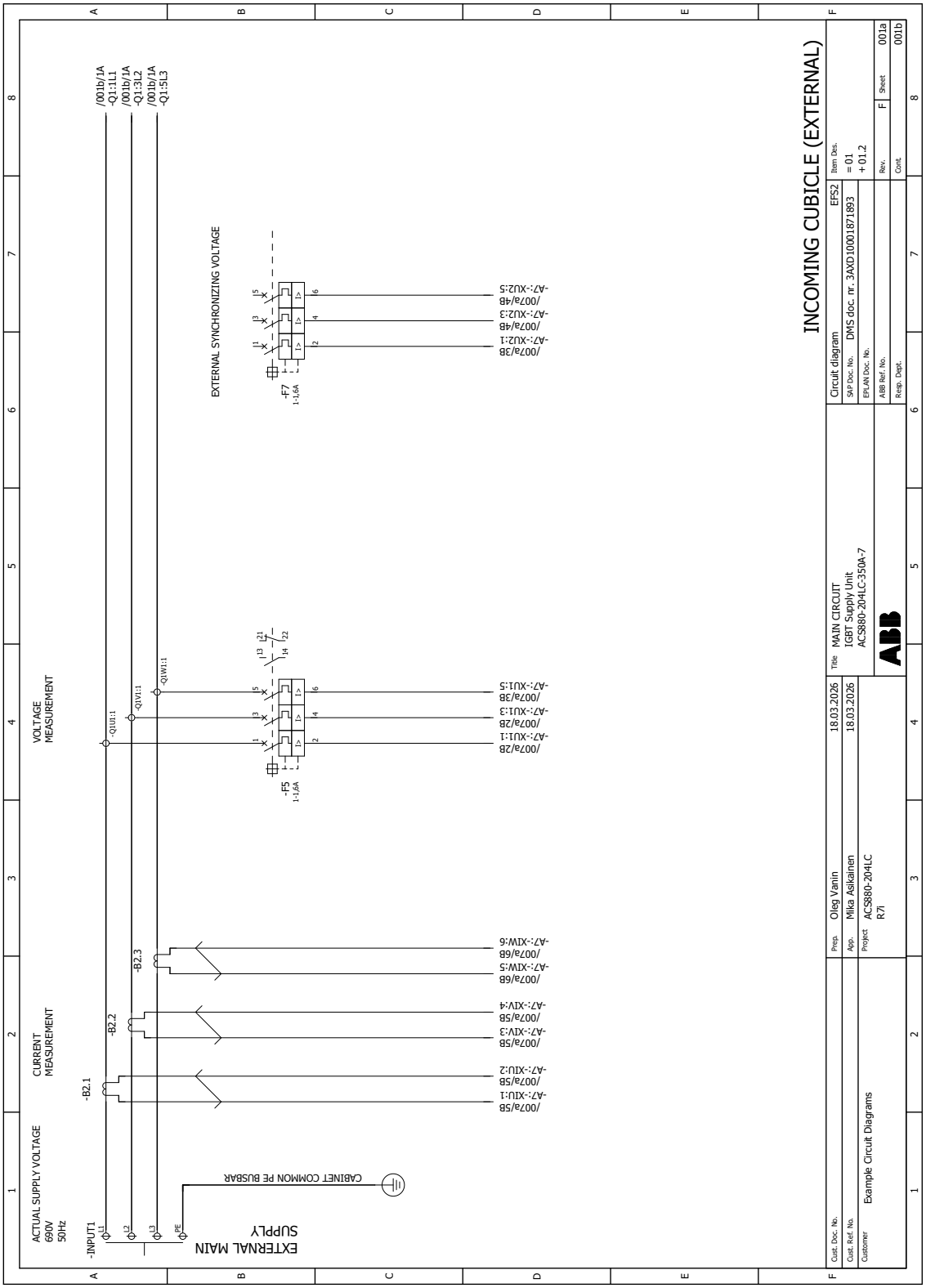


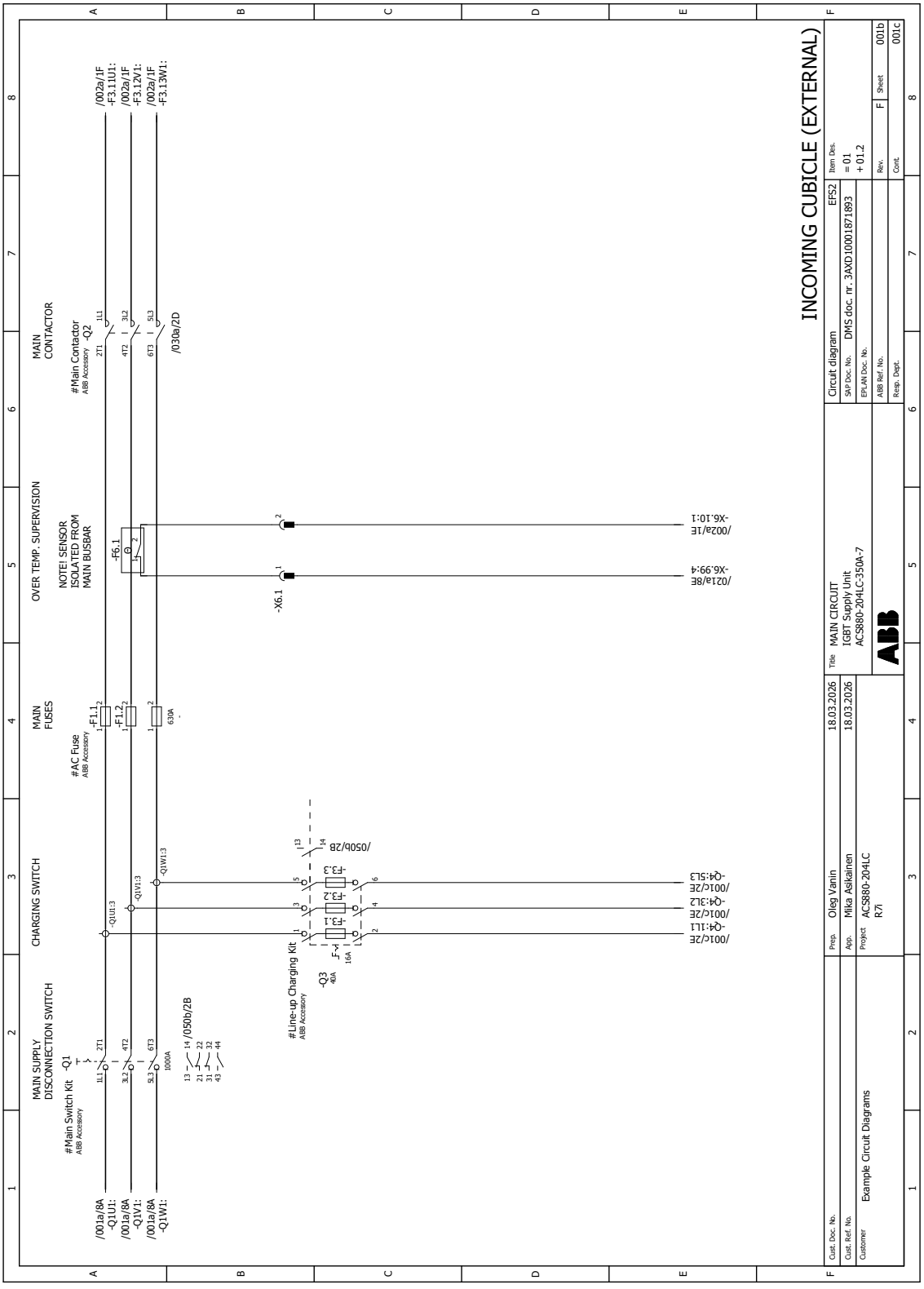

## Content

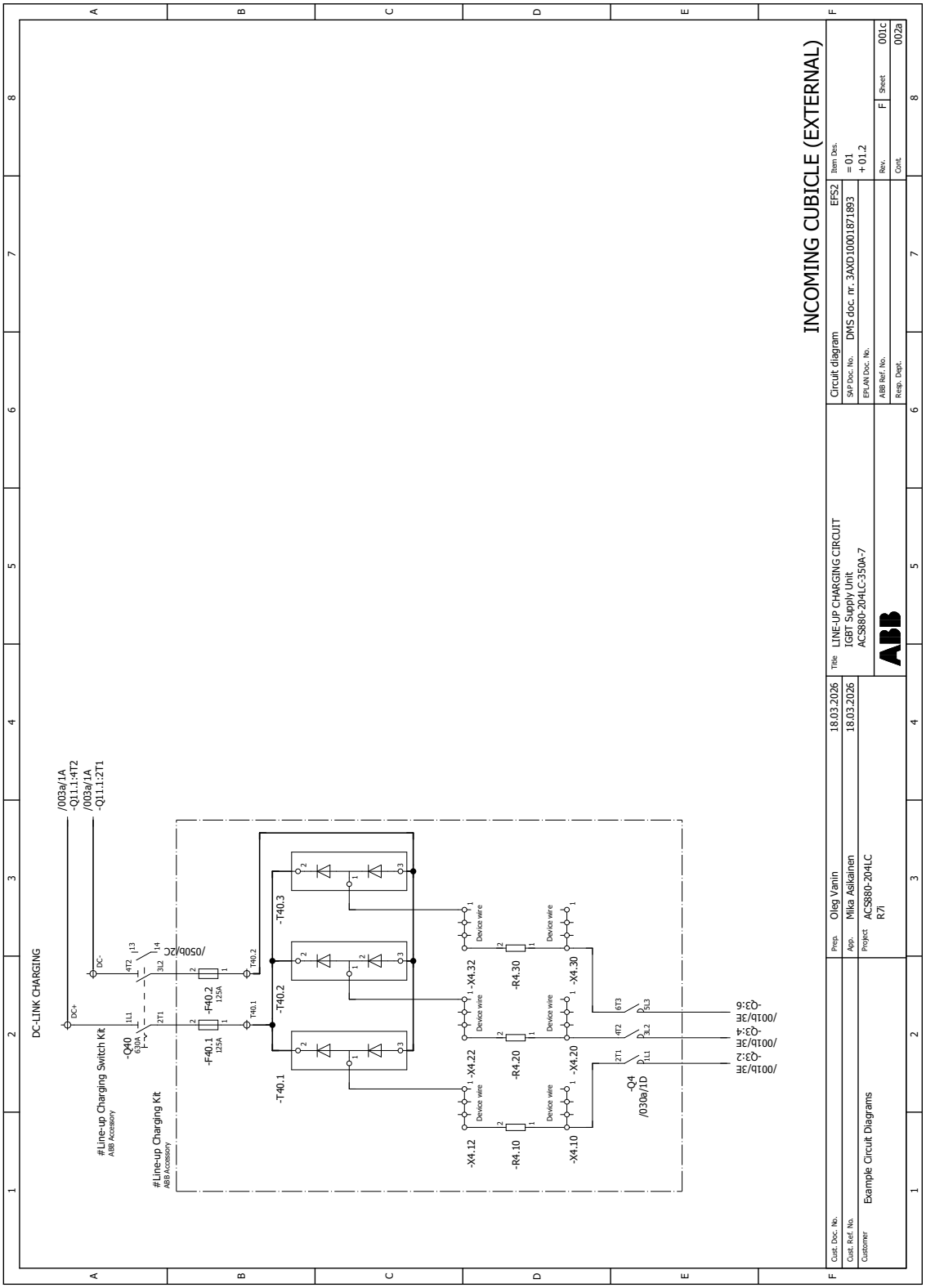
| Identifier | Location | Identifier | Component | Available through |
|---|---|---|---|---|
| A | Incoming cubicle | 1 | AC supply | - |
| A | Incoming cubicle | 2 | Main switch-disconnector | ABB or third party |
| A | Incoming cubicle | 3 | AC fuses | ABB or third party |
| A | Incoming cubicle | 4 | Main contactor | ABB or third party |
| A | Incoming cubicle | 5 | AC-DC charging kit (line-up charging) | ABB or third party |
| A | Incoming cubicle | 6 | DC switch-disconnector for line-up charging | ABB or third party |
| B | IGBT supply cubicle | 7 | DC-DC charging kit (unit charging) | ABB or third party |
| B | IGBT supply cubicle | 8 | Resistors for DC-DC charging | ABB or third party |
| B | IGBT supply cubicle | 9 | LCL filter kit | ABB |
| B | IGBT supply cubicle | 10 | IGBT supply module | ABB |
| B | IGBT supply cubicle | 11 | Common mode filter | ABB |
| B | IGBT supply cubicle | 12 | DC fuse | ABB or third party |
| B | IGBT supply cubicle | 13 | DC switch-disconnector | ABB or third party |
| B | IGBT supply cubicle | 14 | DC link | - |
| | | | | |
| | | | | |
| | | | | |

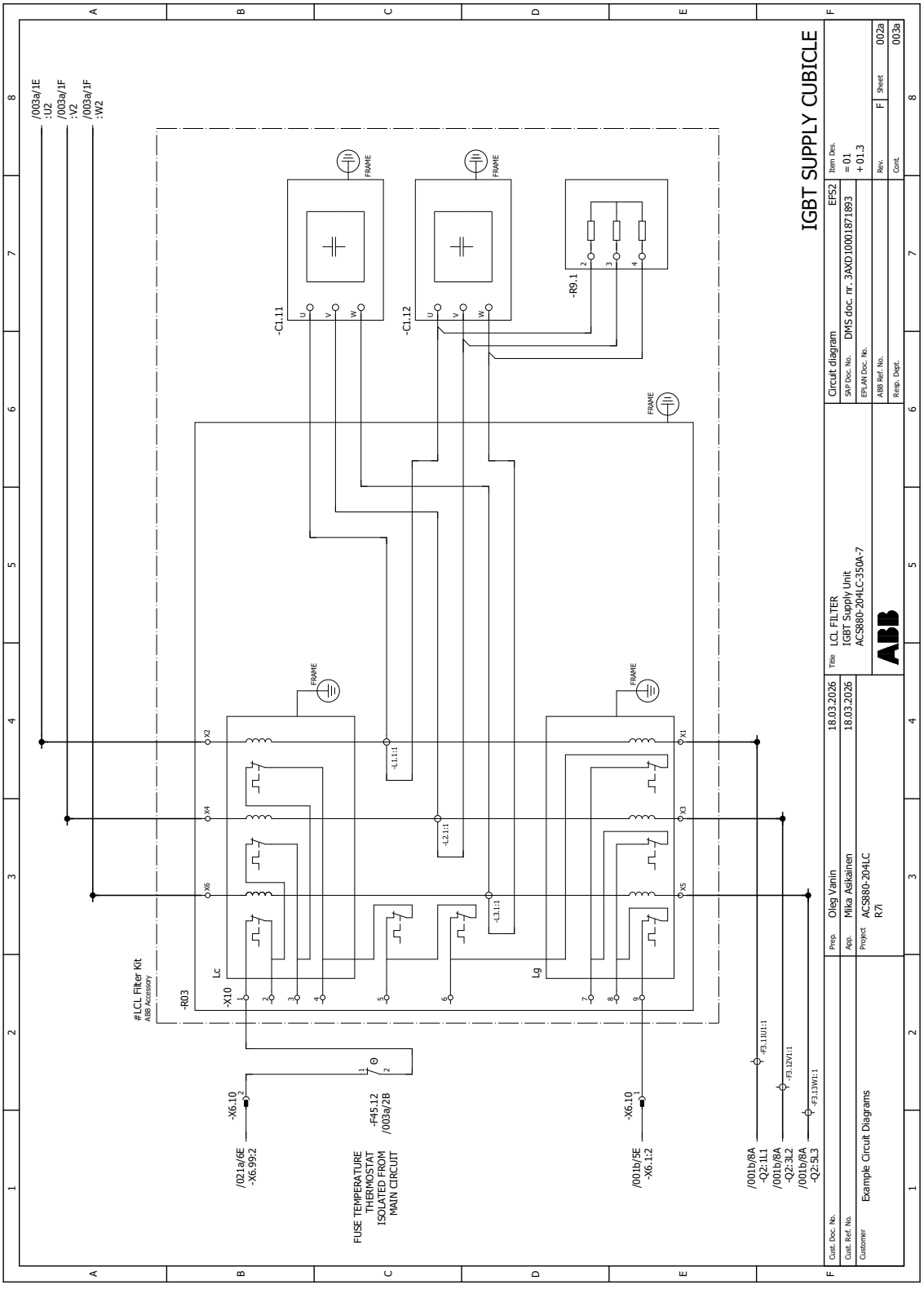
| | | | | | |
|---|---|---|---|---|---|
| Cust. Doc. No. | Prep. Oleg Vanin 18.03.2026 | Title Overview diagram IGBT Supply Unit ACS880-204LC-350A-7 | Circuit diagram EFS2 | Item Des. | |
| Cust. Ref. No. | App. Mika Asikainen 18.03.2026 | | SAP Doc. No. DMS doc. nr. 3AXD10001871893 | = | |
| Customer Example Circuit Diagrams | Project ACS880-204LC R7i | | EPLAN Doc. No. | + | |
| | | ABB | ABB Ref. No. | Rev. F | Sheet 200A |
| | | | Resp. Dept. | Cont. | 300A |

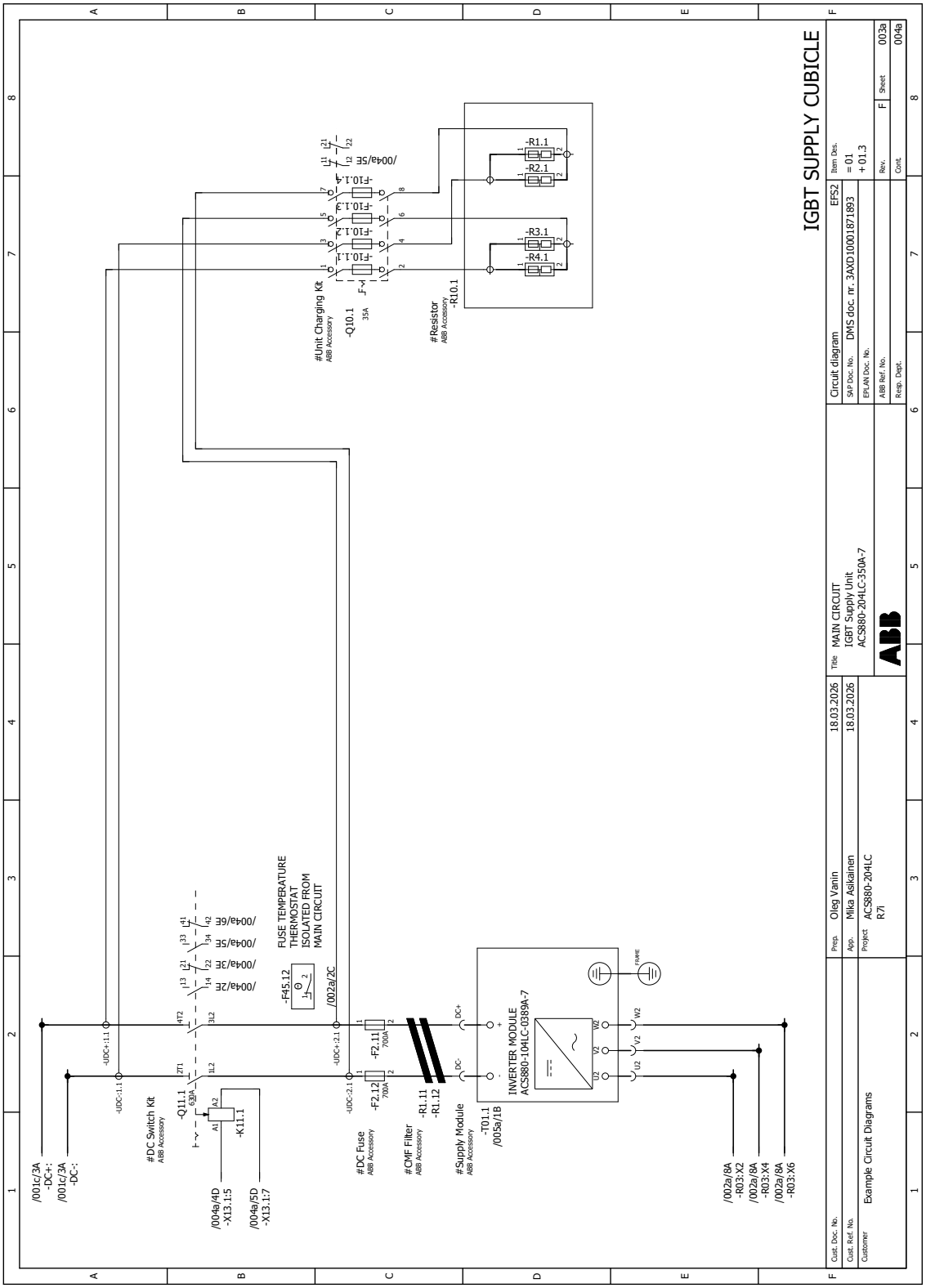

GENERAL/RELAY COIL, WITH PROTECTIVE CIRCUIT DIODE AND R+LED
GENERAL/RELAY COIL
COIL WITH PICK-UP DELAY
COIL WITH OFF-DELAY
NO CONTACT
NC CONTACT
CHANGE OVER CONTACT
NO CONTACT, WITH CLOSING DELAY
TWO NO CONTACTS ONE INPUT, TWO OUTPUTS
TWO CONNECTED CHANGE OVER CONTACTS
POWER NO CONTACT OF A CONTACTOR
PUSH BUTTON WITH NO CONTACT
PUSH BUTTON WITH NC CONTACT
NO SWITCH, OPERATED BY TURNING, 2 POSITIONS
LIMIT SWITCH NC CONTACT MECHANICALLY OPERATED
NC SWITCH, TEMPERATURE OPERATED
EMERGENCY STOP PUSH BUTTON
DISCONNECT SWITCH, THREE-POLE
SWITCH DISCONNECTOR WITH FUSES, THREE-POLE
FUSE
FUSE DISCONNECTOR
CIRCUIT BREAKER
MOTOR OVERLOAD SWITCH WITH SWITCH MECHANISM
COMMON MODE FILTER FOR HIGH FREQUENCY CURRENTS
PROTECTIVE EARTH CONNECTED TO FRAME
PROTECTIVE EARTH CONNECTED TO TERMINAL / PE BUSBAR
FUNCTIONAL EARTHING CONNECTED TO TERMINAL
FUNCTIONAL BONDING TO FRAME
LIGHT
INDUCTOR
CAPACITOR
RESISTOR
POWER RESISTOR WITH FUSE
PHASE SELECTING SWITCH
BMC FILTER
PRIMARY, VOLTAGE SELECTION
TRANSFORMER
TERMINAL, FOUR POLE
PLUG AND SOCKET TERMINAL BLOCK WITH 4 CONNECTION POINTS
FEMALE AND MALE PLUG
AMPERE METER
CURRENT TRANSFORMER
VOLTAGE METER
WIRE TERMINATION, INSULATED
SHIELDED CABLE
THERMAL OPERATION
DISCONNECT
DISCONNECT, CAN BE OPERATED WHILE NOMINAL CURRENT IS APPLIED
BREAKER, SHORTCIRCUIT BREAKING CAPABILITY
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep. Oleg Vanin 18.03.2026
Appr. Mika Aalkainen 18.03.2026
Project ACS880-204LC R7i
Title Symbol Overview IGBT Supply Unit ACS880-204LC-350A-7
ABB
Circuit diagram EFS2
SAP Doc. No. DMS doc. nr: 3AXD10001871893
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Dss.
Rev. F Sheet 300A
Cont. =01/001a

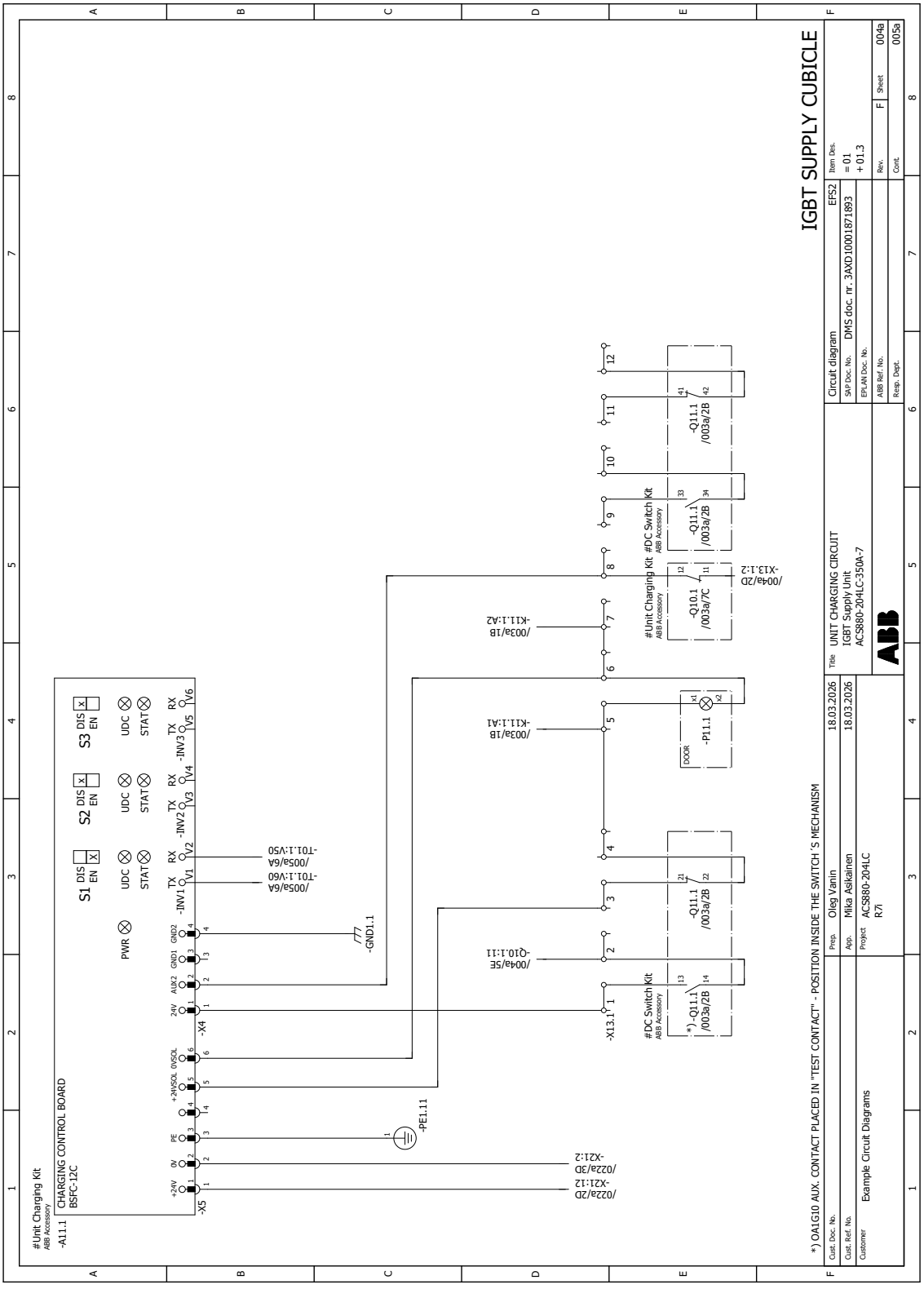

INCOMING CUBICLE (EXTERNAL)
EXTERNAL MAIN SUPPLY
ACTUAL SUPPLY VOLTAGE 690V 50Hz
-INPUT1
CURRENT MEASUREMENT
VOLTAGE MEASUREMENT
-B2.1
-B2.2
-B2.3
CABINET COMMON PE BUSBAR
EXTERNAL SYNCHRONIZING VOLTAGE
-F5 1-1,6A
-F7 1-1,6A
MAIN CIRCUIT
IGBT Supply Unit
ACS880-204LC-3504-7
Circuit diagram
EFS2
DMS doc. nr. 3AXD10001871893
Example Circuit Diagrams
ACS880-204LC
R7i
Oleg Vanin
Mika Asikainen
18.03.2026

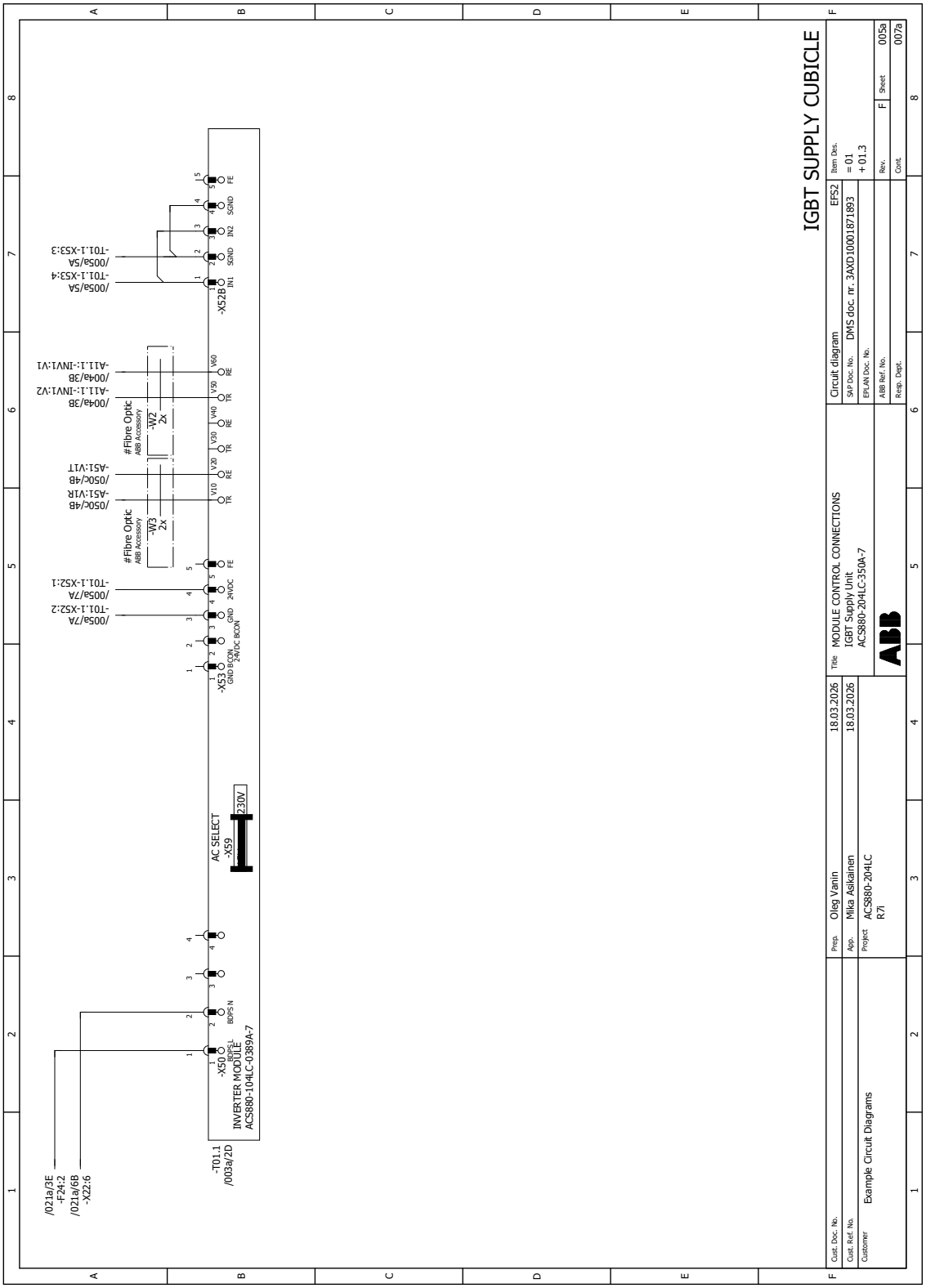

INCOMING CUBICLE (EXTERNAL)
MAIN SUPPLY DISCONNECTION SWITCH
CHARGING SWITCH
MAIN FUSES
OVER TEMP. SUPERVISION
MAIN CONTACTOR
#Main Switch Kit ABB Accessory -Q1
#AC Fuse ABB Accessory -F1.1 -F1.2
#Main Contactor ABB Accessory -Q2
NOTE! SENSOR ISOLATED FROM MAIN BUSBAR
-F6.1
-X6.1
#Line-up Charging Kit ABB Accessory
-Q3 40A
-F3.1 -F3.2 -F3.3 16A
1000A
630A
/001a/8A -Q1U1:
/001a/8A -Q1V1:
/001a/8A -Q1W1:
/002a/1F -F3.11U1:
/002a/1F -F3.12V1:
/002a/1F -F3.13W1:
/030a/2D
/050b/2B
/001c/2E -Q4:1L1
/001c/2E -Q4:3L2
/001c/2E -Q4:5L3
/002a/1E -X6.10:1
/021a/8E -X6.99:4
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep. Oleg Vanin 18.03.2026
Appr. Mika Aalkainen 18.03.2026
Project ACS880-204LC R.7i
Title MAIN CIRCUIT IGBT Supply Unit ACS880-204LC-350A-7
ABB
Circuit diagram EFS2
SAP Doc. No. DMS doc. nr. 3AXD10001871893
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Dis. = 01 + 01.2
Rev. F Sheet 001b
Cont. 001c

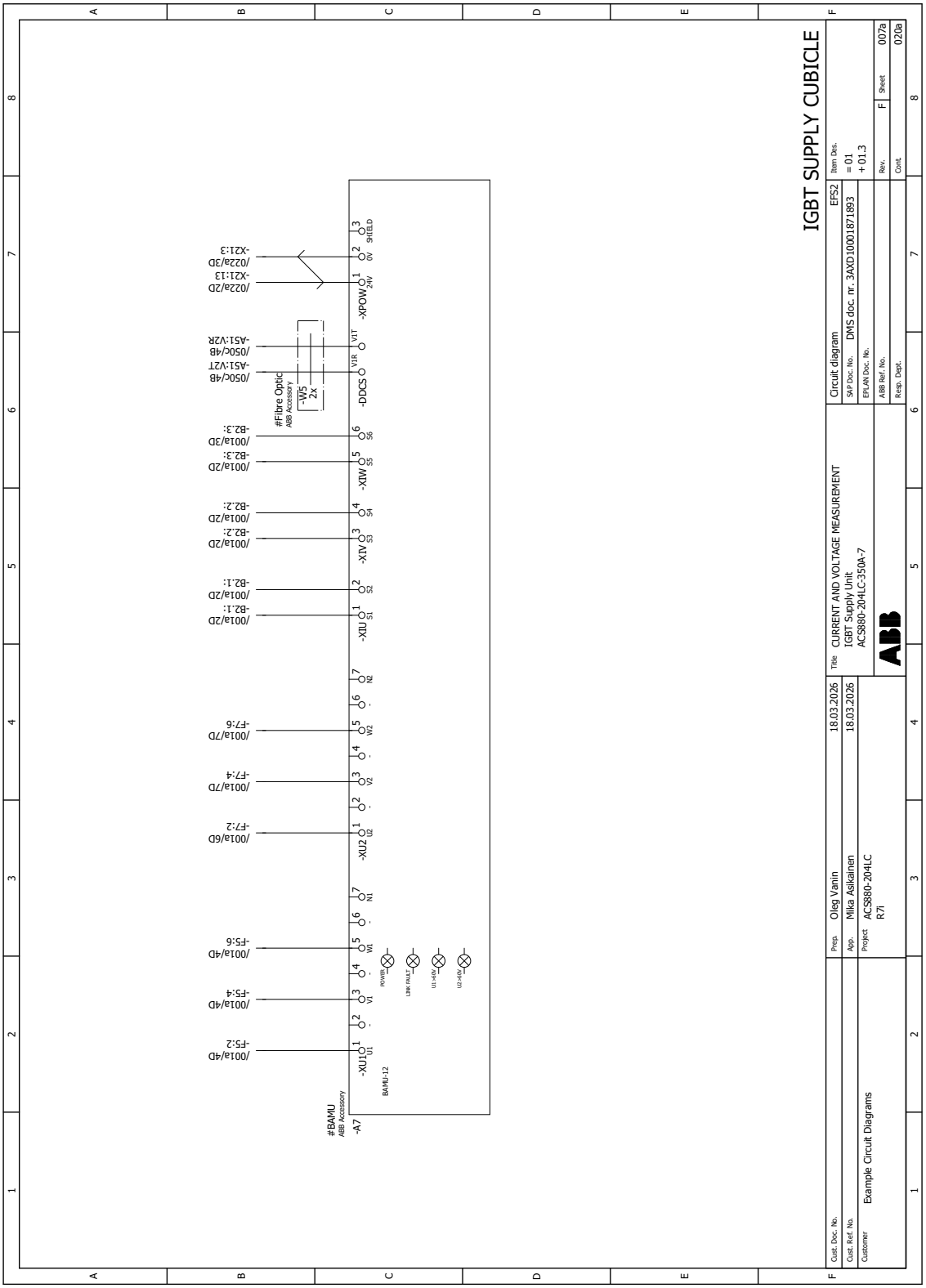

INCOMING CUBICLE (EXTERNAL)
DC-LINK CHARGING
/003a/1A
-Q11.1:4T2
/003a/1A
-Q11.1:2T1
DC+
DC-
#Line-up Charging Switch Kit
ABB Accessory
-Q40
630A
-F40.1
125A
-F40.2
125A
/050b/2C
-T40.1
-T40.2
-T40.3
#Line-up Charging Kit
ABB Accessory
-X4.12
-X4.22
-X4.32
-R4.10
-R4.20
-R4.30
-X4.10
-X4.20
-X4.30
-Q4
/030a/1D
/001b/3E
-Q3:2
/001b/3E
-Q3:4
/001b/3E
-Q3:6
Device wire
Prep. Oleg Vanin 18.03.2026
Appr. Mika Aslkainen 18.03.2026
Project ACS880-2041LC
R7i
Customer Example Circuit Diagrams
Cust. Doc. No.
Cust. Ref. No.
Title LINE-UP CHARGING CIRCUIT
IGBT Supply Unit
ACS880-2041LC-350A-7
Circuit diagram EFS2
SAP Doc. No. DMS doc. nr. 3AXD10001871893
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.2
Rev. F Sheet 001c
Cont. 002a

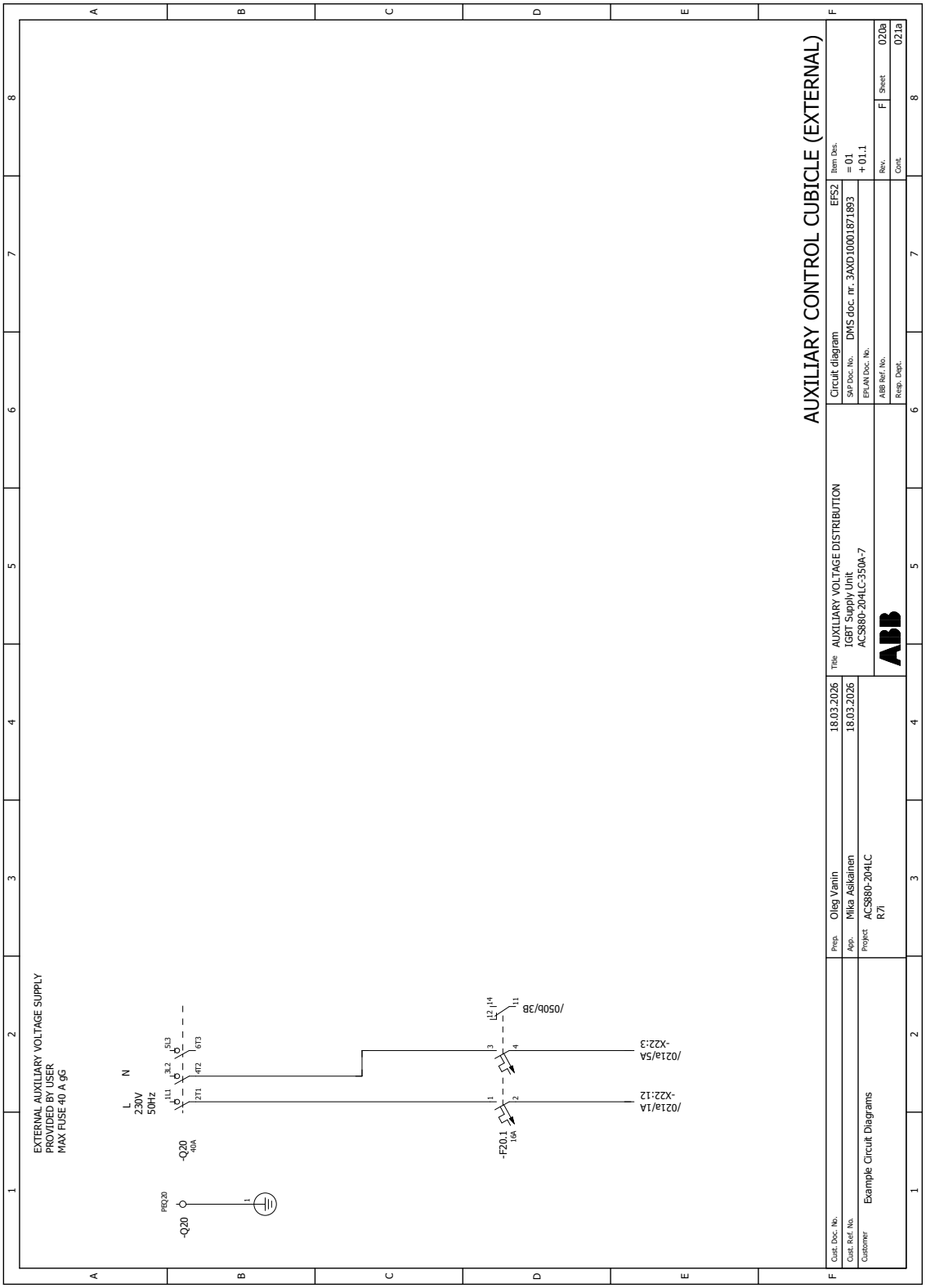

IGBT SUPPLY CUBICLE
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10001871893
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.3
Rev.
F
Sheet
002a
Cont.
003a
Title
LCL FILTER
IGBT Supply Unit
ACS880-204LC-350A-7
Prep.
Oleg Vanin
18.03.2026
Appr.
Mika Asikainen
18.03.2026
Project
ACS880-204LC
R.7i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
#LCL Filter Kit
ABB Accessory
-R03
Lc
Lg
-X10
-C1.11
-C1.12
-R9.1
-L1.1:1
-L2.1:1
-L3.1:1
FRAME
/003a/1E :U2
/003a/1F :V2
/003a/1F :W2
-X6.10
/021a/6E -X6.99:2
-F45.12 /003a/2B
FUSE TEMPERATURE THERMOSTAT ISOLATED FROM MAIN CIRCUIT
-X6.10
/001b/5E -X6.1:2
-F3.11U1:1
-F3.12V1:1
-F3.13W1:1
/001b/8A -Q2:1L1
/001b/8A -Q2:3L2
/001b/8A -Q2:5L3

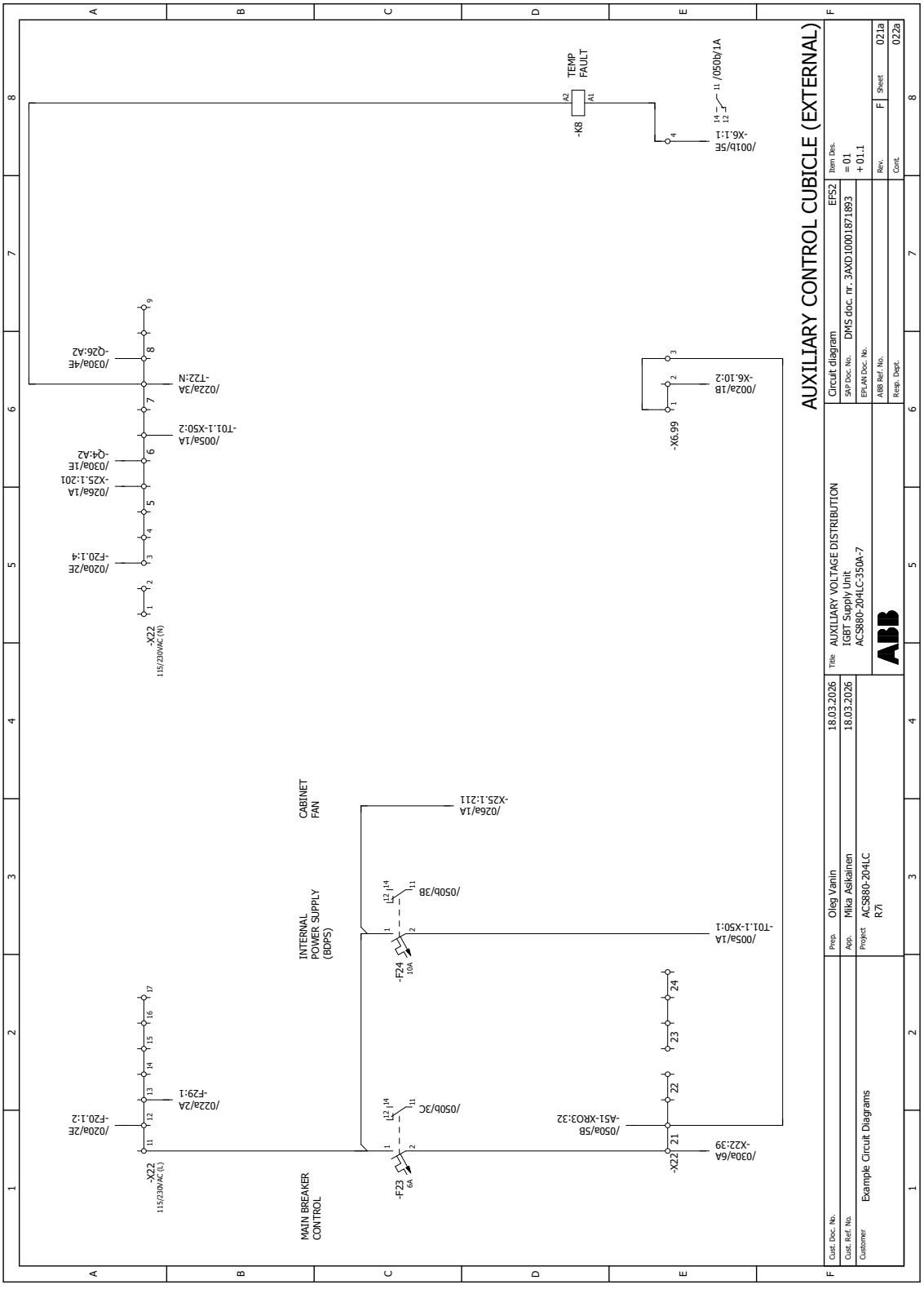

IGBT SUPPLY CUBICLE
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10001871893
EPLAN Doc. No.
+ 01.3
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
Rev.
F
Sheet
003a
Cont.
004a
Title
MAIN CIRCUIT
IGBT Supply Unit
ACS880-2041LC-3504-7
Prep.
Oleg Vanin
18.03.2026
Appr.
Mika Asikainen
18.03.2026
Project
ACS880-2041LC
R7i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
/001c/3A
-DC+:
/001c/3A
-DC-:
#DC Switch Kit
ABB Accessory
-Q11.1
630A
-K11.1
/004a/4D
-X13.1:5
/004a/5D
-X13.1:7
-UDC+:1.1
-UDC-:1.1
/004a/2E
/004a/3E
/004a/5E
/004a/6E
FUSE TEMPERATURE
THERMOSTAT
ISOLATED FROM
MAIN CIRCUIT
-F45.12
/002a/2C
-UDC+:2.1
-UDC-:2.1
-F2.11
700A
-F2.12
700A
#DC Fuse
ABB Accessory
#CMF Filter
ABB Accessory
-R1.11
-R1.12
#Supply Module
ABB Accessory
-T01.1
/005a/1B
DC+
DC-
INVERTER MODULE
ACS880-104LC-0389A-7
PHASE
W2
V2
U2
/002a/8A
-R03:X2
/002a/8A
-R03:X4
/002a/8A
-R03:X6
#Unit Charging Kit
ABB Accessory
-Q10.1
35A
-F10.1.1
-F10.1.2
-F10.1.3
-F10.1.4
/004a/5E
#Resistor
ABB Accessory
-R10.1
-R1.1
-R2.1
-R3.1
-R4.1

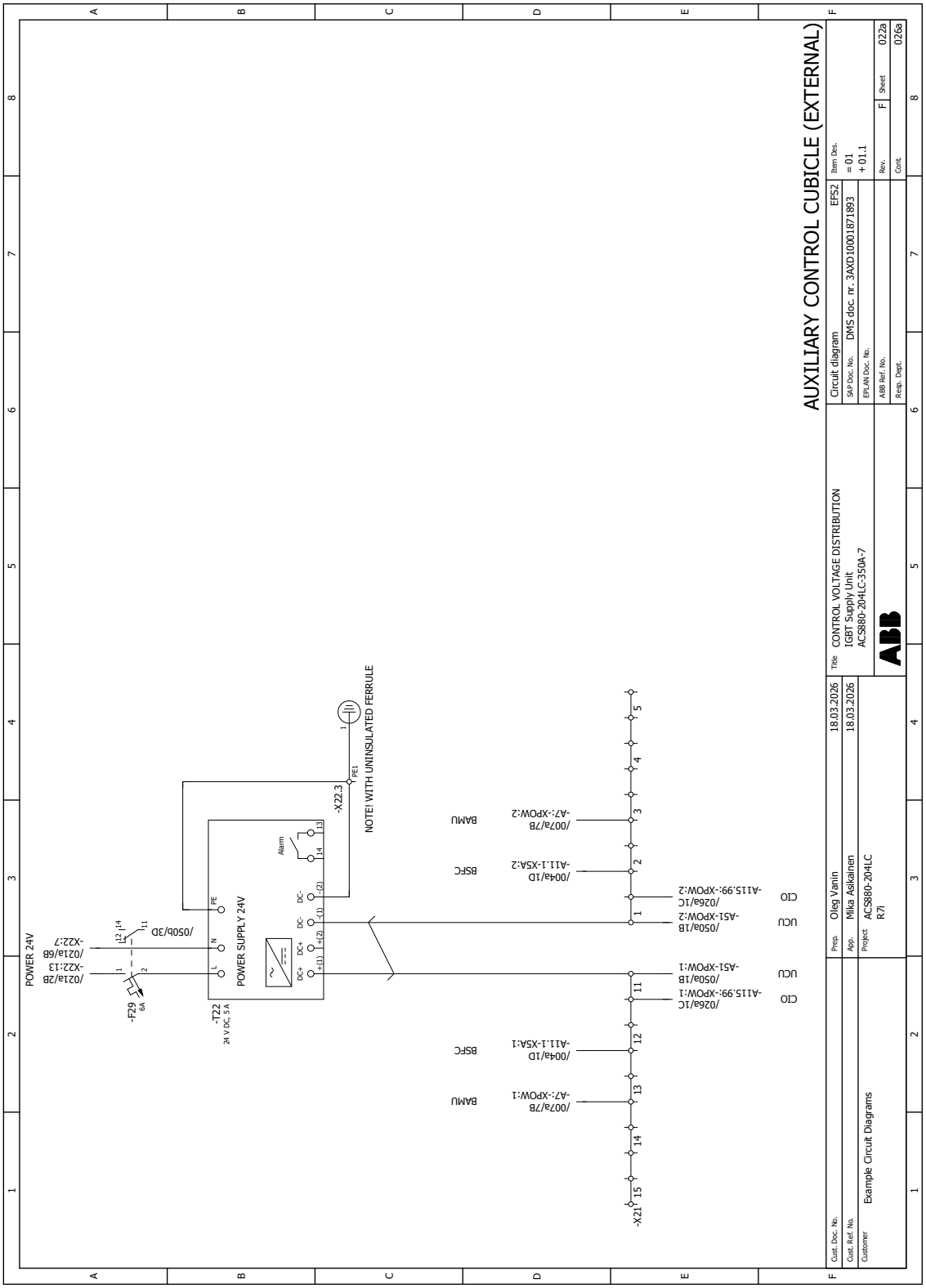

IGBT SUPPLY CUBICLE
#Unit Charging Kit
ABB Accessory
-A11.1
CHARGING CONTROL BOARD
BSFC-12C
-X5
-X4
-INV1
-INV2
-INV3
S1
S2
S3
PWR
UDC
STAT
-GND1.1
-PE1.11
-X13.1
-Q10.1
-Q11.1
-P11.1
#DC Switch Kit
ABB Accessory
#Unit Charging Kit
ABB Accessory
UNIT CHARGING CIRCUIT
IGBT Supply Unit
ACS880-204LC-350A-7
Circuit diagram
EFS2
DMS doc. nr. 3AXD10001871893
ABB
*) OA1G10 AUX. CONTACT PLACED IN "TEST CONTACT" - POSITION INSIDE THE SWITCH´S MECHANISM
Prep. Oleg Vanin 18.03.2026
Appr. Mika Aslkainen 18.03.2026
Project ACS880-204LC R.7i
Example Circuit Diagrams

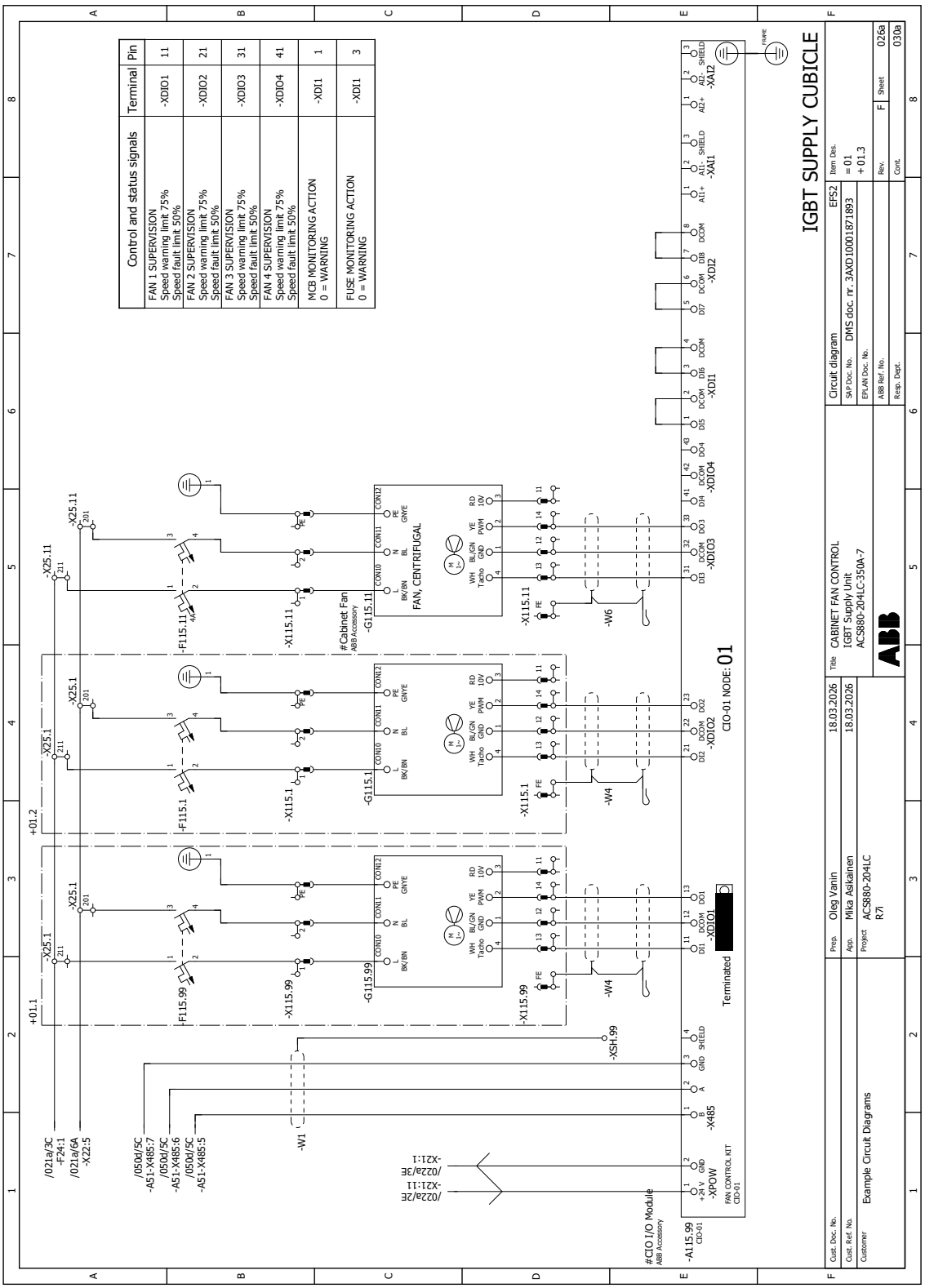

IGBT SUPPLY CUBICLE
MODULE CONTROL CONNECTIONS
IGBT Supply Unit
ACS880-204LC-350A-7
EFS2
Circuit diagram
DMS doc. nr. 3AXD10001871893
Item Des.
= 01
+ 01.3
Sheet
005a
007a
Prep. Oleg Vanin 18.03.2026
Appr. Mika Asikainen 18.03.2026
Project ACS880-204LC R7i
Example Circuit Diagrams
INVERTER MODULE
ACS880-104LC-0389A-7
-T01.1
/003a/2D
-X50
-X52B
-X53
-X59
AC SELECT
230V
#Fibre Optic
ABB Accessory
-W2
2x
-W3
2x
/021a/3E
-F24:2
/021a/6B
-X22:6
/005a/5A
-T01.1-XS3:4
/005a/5A
-T01.1-XS3:3
/004a/3B
-A11.1:-INV1:V1
/004a/3B
-A11.1:-INV1:V2
/050c/4B
-A51:V1T
/050c/4B
-A51:V1R
/005a/7A
-T01.1-XS2:2
/005a/7A
-T01.1-XS2:1

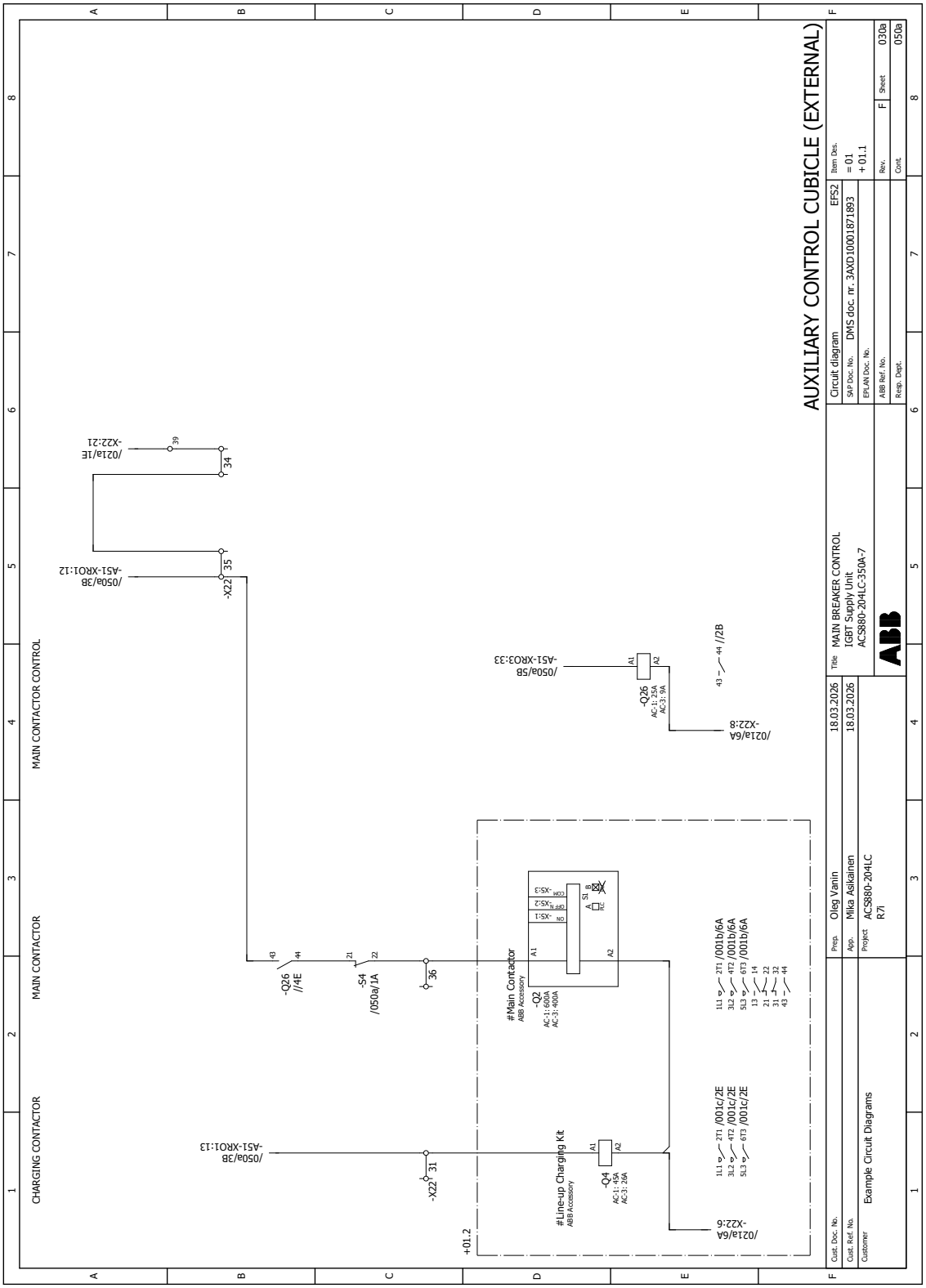

IGBT SUPPLY CUBICLE
EFS2
Item Dis.
= 01
+ 01.3
Circuit diagram
SAP Doc. No.
DMS doc. nr. 3AXD10001871893
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Rev.
F
Sheet
007a
Cont.
020a
Title
CURRENT AND VOLTAGE MEASUREMENT
IGBT Supply Unit
ACS880-204LC-350A-7
Prep.
Oleg Vanin
18.03.2026
App.
Mika Asikainen
18.03.2026
Project
ACS880-204LC
R.7i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
#BAMU
ABB Accessory
-A7
BAMU-12
-XU1
-FS:2
/001a/4D
-FS:4
/001a/4D
-FS:6
/001a/4D
-XU2
-F7:2
/001a/6D
-F7:4
/001a/7D
-F7:6
/001a/7D
-XIU
-B2.1:
/001a/ZD
-B2.1:
/001a/ZD
-XIV
-B2.2:
/001a/ZD
-B2.2:
/001a/ZD
-XIW
-B2.3:
/001a/ZD
-B2.3:
/001a/3D
#Fibre Optic
ABB Accessory
-W5
2x
-DDCS
/050c/4B
-AS1:V2T
/050c/4B
-AS1:V2R
-XPOW
/022a/ZD
-X21:13
/022a/3D
-X21:3
POWER
LINK FAULT
U1-485
U2-485

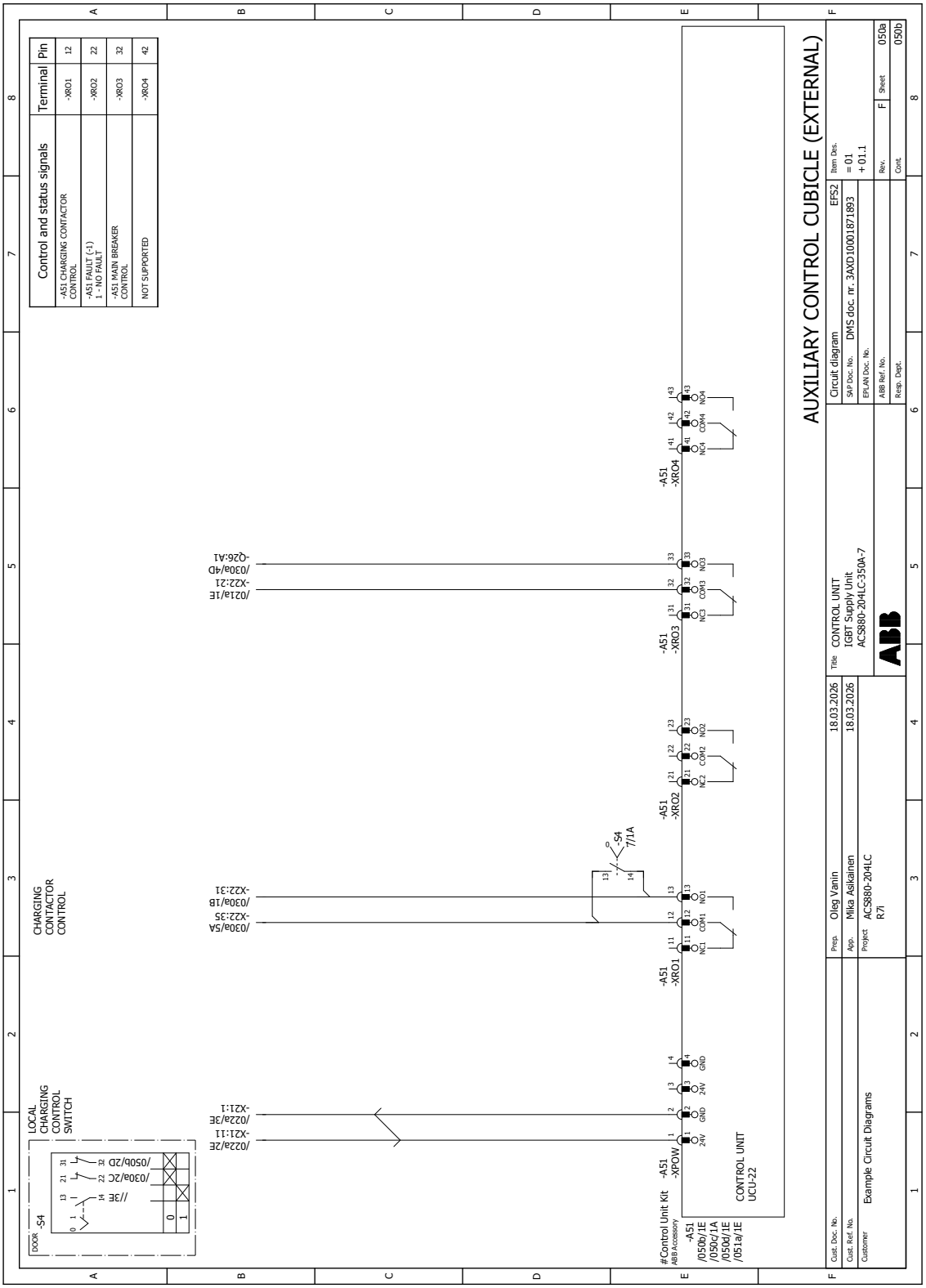

AUXILIARY CONTROL CUBICLE (EXTERNAL)
EXTERNAL AUXILIARY VOLTAGE SUPPLY
PROVIDED BY USER
MAX FUSE 40 A gG
L
230V
50Hz
N
-Q20
40A
-F20.1
16A
/050b/3B
/021a/5A
-XZ2:3
/021a/1A
-XZ2:12
PEQ20
-Q20
Circuit diagram
EFS2
AUXILIARY VOLTAGE DISTRIBUTION
IGBT Supply Unit
ACS880-2041C-3504-7
DMS doc. nr. 3AXD10001871893
Item Des.
= 01
+ 01.1
Sheet
020a
021a
Prep. Oleg Vanin 18.03.2026
Appr. Mika Asikainen 18.03.2026
Project ACS880-2041C
R7i
Customer
Example Circuit Diagrams
Cust. Doc. No.
Cust. Ref. No.

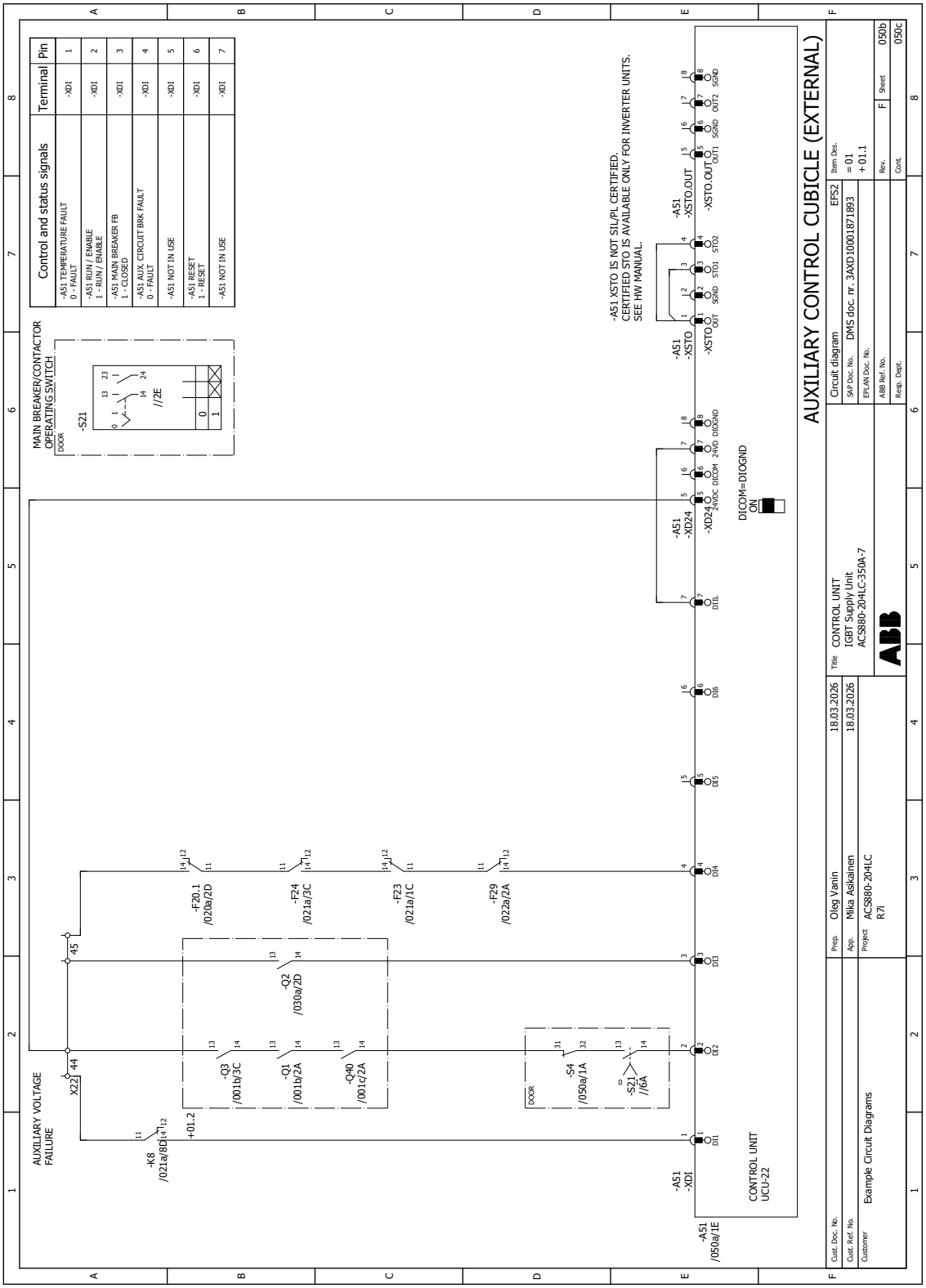

AUXILIARY CONTROL CUBICLE (EXTERNAL)
AUXILIARY VOLTAGE DISTRIBUTION
IGBT Supply Unit
ACS880-204LC-350A-7
Circuit diagram
EFS2
DMS doc. nr. 3AXD10001871893
Item Des.
= 01
+ 01.1
Sheet
021a
022a
Prep. Oleg Vanin 18.03.2026
Appr. Mika Asikainen 18.03.2026
Project ACS880-204LC R.7i
Example Circuit Diagrams
TEMP FAULT
-K8
/001b/5E
-X6.1:1
/050b/1A
-X6.99
/002a/1B
-X6.10:2
CABINET FAN
/026a/1A
-X25.1:211
INTERNAL POWER SUPPLY (BDPS)
/050b/3B
-F24
10A
/005a/1A
-T01.1-X50:1
MAIN BREAKER CONTROL
/050b/3C
-F23
6A
/050a/5B
-A51-XRO3:32
/030a/6A
-X22:39
-X22
115/230VAC (L)
/020a/2E
-F20.1:2
/022a/2A
-F29:1
-X22
115/230VAC (N)
/020a/2E
-F20.1:4
/026a/1A
-X25.1:201
/030a/1E
-Q4:A2
/005a/1A
-T01.1-X50:2
/022a/3A
-T22:N
/030a/4E
-Q26:A2

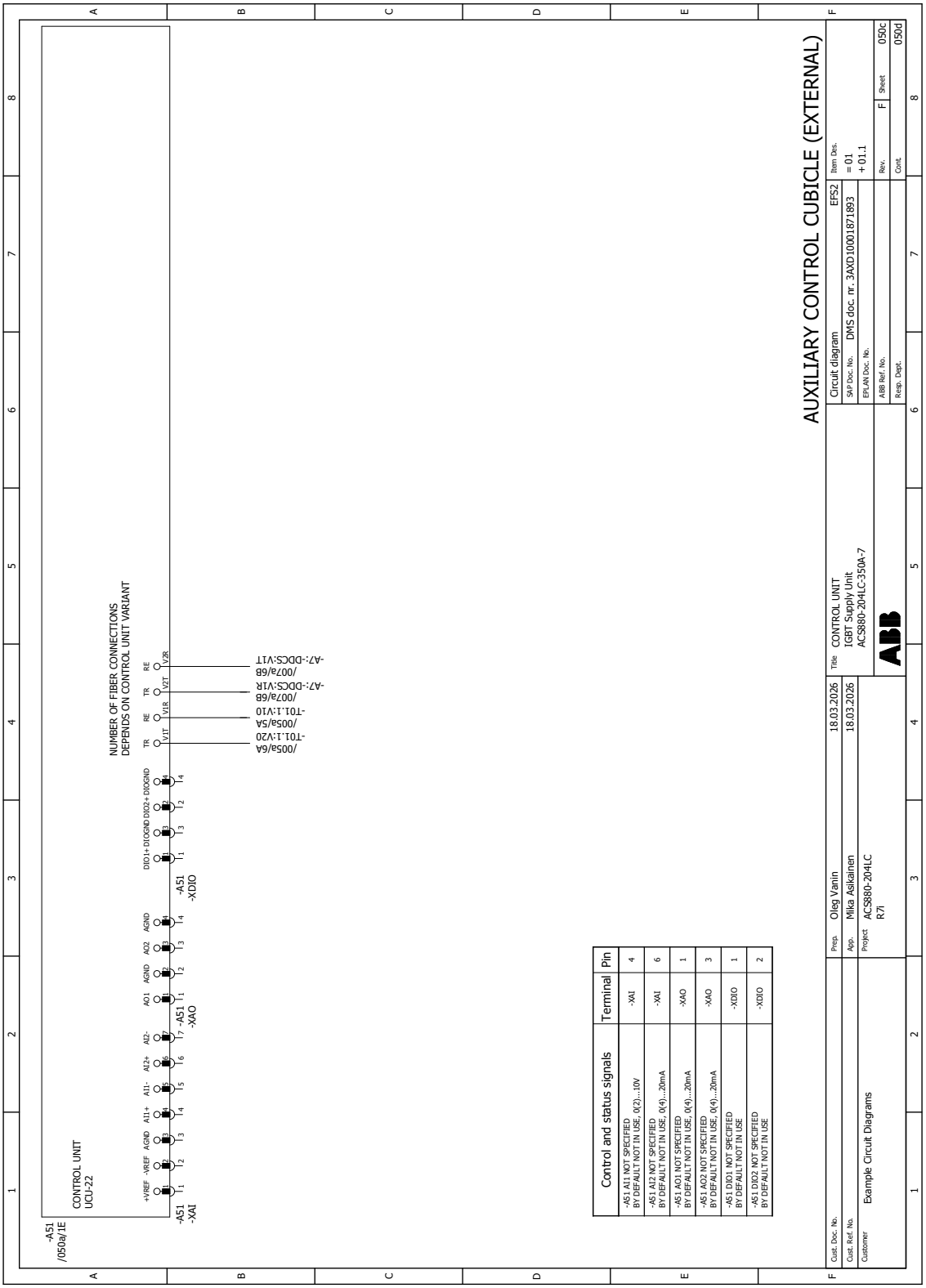

AUXILIARY CONTROL CUBICLE (EXTERNAL)
CONTROL VOLTAGE DISTRIBUTION
IGBT Supply Unit
ACS880-204LC-350A-7
EFS2
Circuit diagram
DMS doc. nr. 3AXD10001871893
= 01
+ 01.1
022a
026a
Oleg Vanin
Mika Aslkainen
ACS880-204LC
R7i
Example Circuit Diagrams
18.03.2026
POWER 24V
/021a/2B
-X22:13
/021a/6B
-X22:7
/050b/3D
-F29
6A
-T22
24 V DC, 5 A
POWER SUPPLY 24V
PE
L
N
DC-
DC+
+(1)
+(2)
Alarm
-X22.3
PE1
NOTE! WITH UNINSULATED FERRULE
-X21
/026a/1C
-A11.99:-XPOW:1
/050a/1B
-A51-XPOW:1
/050a/1B
-A51-XPOW:2
/026a/1C
-A11.99:-XPOW:2
CIO
UCU
/007a/7B
-A7:-XPOW:1
/004a/1D
-A11.1-XSA:1
/007a/7B
-A7:-XPOW:2
/004a/1D
-A11.1-XSA:2
BAMU
BSFC

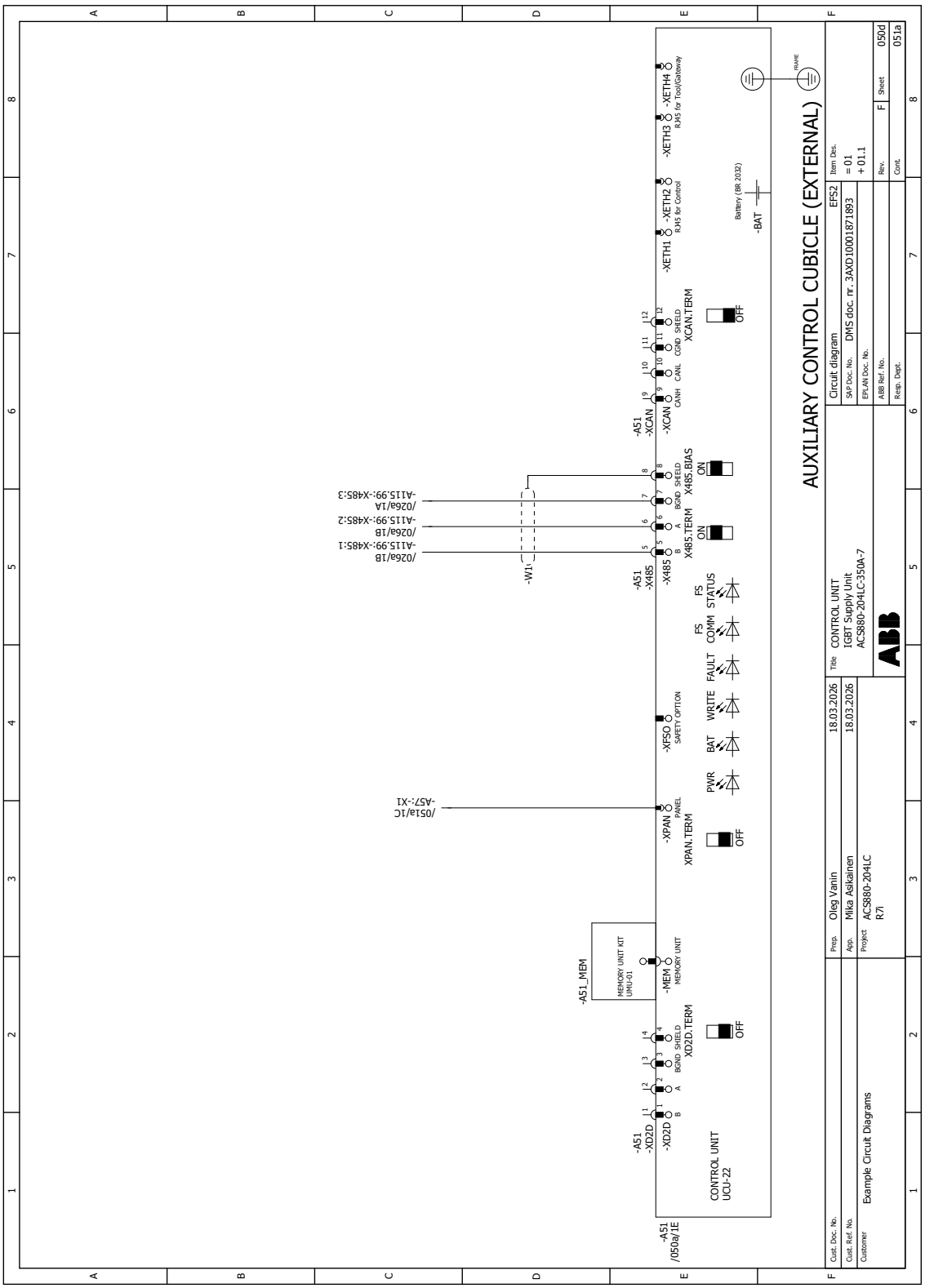

IGBT SUPPLY CUBICLE
CABINET FAN CONTROL
IGBT Supply Unit
ACS880-204LC-350A-7
Circuit diagram
EFS2
DMS doc. nr. 3AXD10001871893
ABB
Oleg Vanin
Mika Aslkainen
ACS880-204LC
R7i
Example Circuit Diagrams
18.03.2026
18.03.2026
Control and status signals
Terminal
Pin
FAN 1 SUPERVISION
Speed warning limit 75%
Speed fault limit 50%
-XDIO1
11
FAN 2 SUPERVISION
Speed warning limit 75%
Speed fault limit 50%
-XDIO2
21
FAN 3 SUPERVISION
Speed warning limit 75%
Speed fault limit 50%
-XDIO3
31
FAN 4 SUPERVISION
Speed warning limit 75%
Speed fault limit 50%
-XDIO4
41
MCB MONITORING ACTION
0 = WARNING
-XDI1
1
FUSE MONITORING ACTION
0 = WARNING
-XDI1
3
#Cabinet Fan
ABB Accessory
-G115.11
FAN, CENTRIFUGAL
-F115.11
-X115.11
-W6
-G115.1
-F115.1
-X115.1
-W4
-G115.99
-F115.99
-X115.99
-W4
CIO-01 NODE: 01
Terminated
-XDIO1
-XSH.99
-W1
-X485
-XPOW
-A115.99
CIO-01
#CIO I/O Module
ABB Accessory
FAN CONTROL KIT
CIO-01
/021a/3C
-F24:1
/021a/6A
-X22:5
/050d/5C
-A51-X485:7
/050d/5C
-A51-X485:6
/050d/5C
-A51-X485:5
/022a/2E
-X21:11
/022a/3E
-X21:1
-XDI1
-XDIO2
-XDIO3
-XDIO4
-XAI1
-XAI2
-XDI2
FRAME
+01.1
+01.2
+ 01.3
= 01
026a
030a

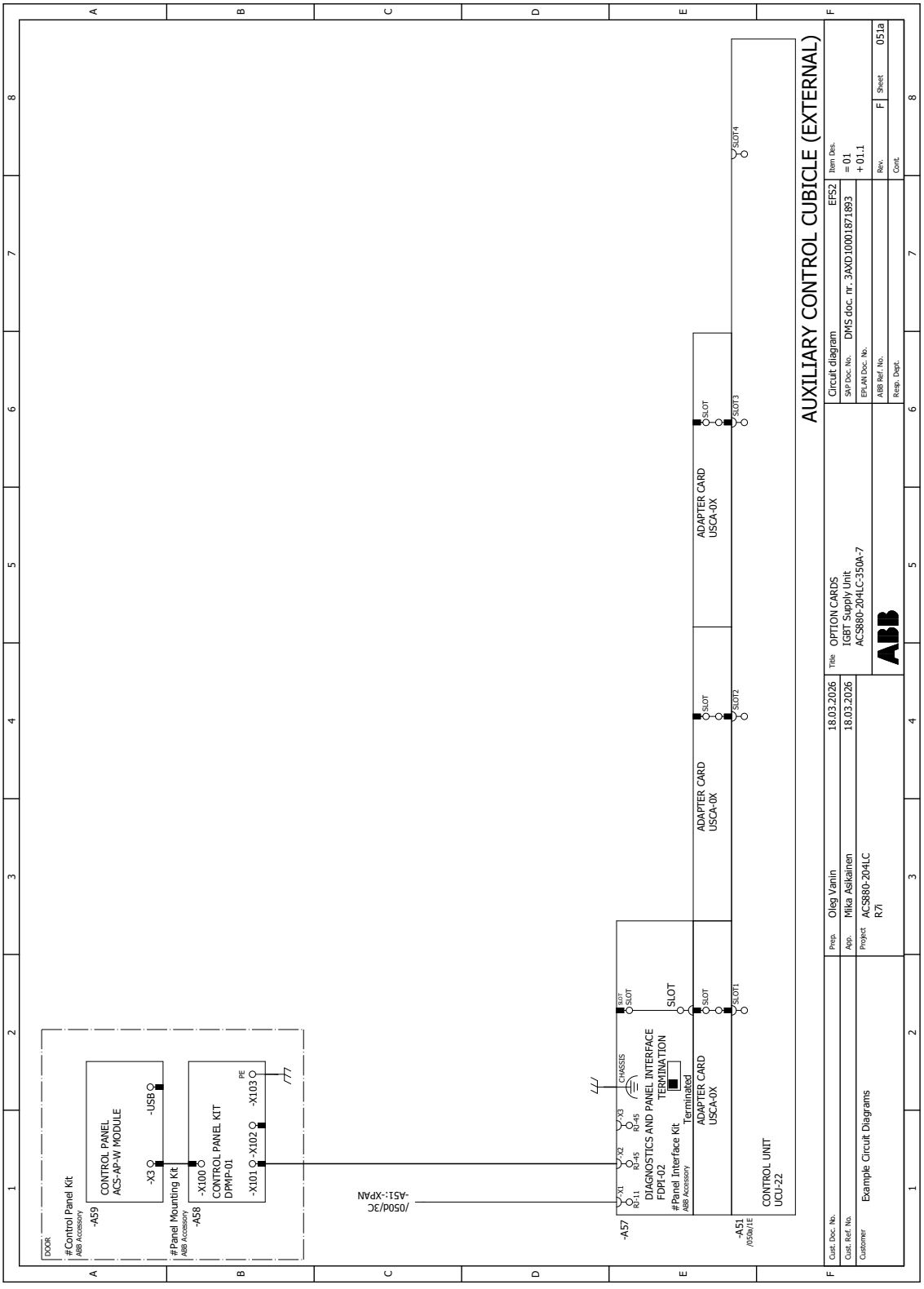

AUXILIARY CONTROL CUBICLE (EXTERNAL)
MAIN CONTACTOR CONTROL
CHARGING CONTACTOR
MAIN CONTACTOR
MAIN BREAKER CONTROL
IGBT Supply Unit
ACS880-204LC-3504-7
EFS2
Circuit diagram
DMS doc. nr. 3AXD10001871893
Oleg Vanin
Mika Asikainen
ACS880-204LC
R7i
Example Circuit Diagrams
18.03.2026
18.03.2026
+01.2
-Q26 //4E
-S4 /050a/1A
-X22 36
-X22 35
-X22 31
-X22:21
-X22:8
-X22:6
-A51-XRO1:12
-A51-XRO1:13
-A51-XRO3:33
/050a/38
/050a/5B
/021a/1E
/021a/6A
#Main Contactor
ABB Accessory
-Q2
AC-1: 600A
AC-3: 400A
#Line-up Charging Kit
ABB Accessory
-Q4
AC-1: 45A
AC-3: 26A
-Q26
AC-1: 25A
AC-3: 9A
/001b/6A
/001c/2E


AUXILIARY CONTROL CUBICLE (EXTERNAL)
CONTROL UNIT
IGBT Supply Unit
ACS880-204LC-350A-7
ABB
Control and status signals
-A51 CHARGING CONTACTOR CONTROL
-A51 FAULT (-1)
1 - NO FAULT
-A51 MAIN BREAKER CONTROL
NOT SUPPORTED
Terminal
Pin
-XRO1
12
-XRO2
22
-XRO3
32
-XRO4
42
LOCAL CHARGING CONTROL SWITCH
CHARGING CONTACTOR CONTROL
CONTROL UNIT UCU-22
-A51 -XPOW
-A51 -XRO1
-A51 -XRO2
-A51 -XRO3
-A51 -XRO4
-S4
/022a/2E
-X21:1
/022a/3E
-X21:11
/030a/5A
-X22:35
/030a/1B
-X22:31
/021a/1E
-X22:21
/030a/4D
-Q26:A1
/050b/2D
/030a/2C
//3E
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10001871893
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.1
Rev.
F
Sheet
050a
Cont.
050b
Prep.
Oleg Vanin
18.03.2026
Appr.
Mika Asikainen
18.03.2026
Project
ACS880-204LC
R.7i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams


AUXILIARY CONTROL CUBICLE (EXTERNAL)
Control and status signals
-A51 TEMPERATURE FAULT 0 - FAULT
-A51 RUN / ENABLE 1 - RUN / ENABLE
-A51 MAIN BREAKER FB 1 - CLOSED
-A51 AUX. CIRCUIT BRK FAULT 0 - FAULT
-A51 NOT IN USE
-A51 RESET 1 - RESET
-A51 NOT IN USE
Terminal
Pin
MAIN BREAKER/CONTACTOR OPERATING SWITCH
DOOR
-S21
//2E
-A51 XSTO IS NOT SIL/PL CERTIFIED.
CERTIFIED STO IS AVAILABLE ONLY FOR INVERTER UNITS.
SEE HW MANUAL.
DICOM=DIOGND
ON
AUXILIARY VOLTAGE FAILURE
X22
-K8 /021a/8D
+01.2
-F20.1 /020a/2D
-F24 /021a/3C
-F23 /021a/1C
-F29 /022a/2A
-Q2 /030a/2D
-Q3 /001b/3C
-Q1 /001b/2A
-Q40 /001c/2A
-S4 /050a/1A
-S21 /6A
-A51 -XD1
-A51 -XD24
-A51 -XSTO
-A51 -XSTO.OUT
-A51 /050a/1E
CONTROL UNIT UCU-22
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10001871893
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.1
Rev.
F
Sheet
050b
Cont.
050c
Prep.
Oleg Vanin
18.03.2026
Appr.
Mika Aslkainen
18.03.2026
Project
ACS880-204LC R7i
Title
CONTROL UNIT IGBT Supply Unit ACS880-204LC-3504-7
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams


AUXILIARY CONTROL CUBICLE (EXTERNAL)
CONTROL UNIT
UCU-22
-A51
/050a/1E
NUMBER OF FIBER CONNECTIONS
DEPENDS ON CONTROL UNIT VARIANT
+VREF -VREF AGND AI1+ AI1- AI2+ AI2- AO1 AGND AO2 AGND DIO1+ DIOGND DIO2+ DIOGND TR RE TR RE
V1T V1R V2T V2R
-A51
-XAI
-A51
-XAO
-A51
-XDIO
/050a/6A
-T01.1:V20
/050a/5A
-T01.1:V10
/007a/6B
-A7:-DDCS:V1R
/007a/6B
-A7:-DDCS:V1T
Control and status signals
Terminal
Pin
-A51 AI1 NOT SPECIFIED
BY DEFAULT NOT IN USE, (V2)...10V
-XAI
4
-A51 AI2 NOT SPECIFIED
BY DEFAULT NOT IN USE, (X4)...20mA
-XAI
6
-A51 AO1 NOT SPECIFIED
BY DEFAULT NOT IN USE, (X4)...20mA
-XAO
1
-A51 AO2 NOT SPECIFIED
BY DEFAULT NOT IN USE, (X4)...20mA
-XAO
3
-A51 DIO1 NOT SPECIFIED
BY DEFAULT NOT IN USE
-XDIO
1
-A51 DIO2 NOT SPECIFIED
BY DEFAULT NOT IN USE
-XDIO
2
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep.
Oleg Vanin
18.03.2026
Appr.
Mika Aslkainen
18.03.2026
Project
ACS880-204LC
R.7i
Title
CONTROL UNIT
IGBT Supply Unit
ACS880-204LC-350A-7
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr: 3AXD10001871893
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.1
Rev.
F
Sheet
050c
Cont.
050d


AUXILIARY CONTROL CUBICLE (EXTERNAL)
CONTROL UNIT
UCU-22
-A51
/050a/1E
-A51
-XD2D
-XD2D
XD2D.TERM
-A51_MEM
MEMORY UNIT KIT
UMU-01
-MEM
MEMORY UNIT
-XPAN
PANEL
XPAN.TERM
-XFSO
SAFETY OPTION
-A51
-X485
-X485
X485.TERM
X485.BIAS
-W1-
-XCAN
-XCAN
XCAN.TERM
-XETH1
-XETH2
-XETH3
-XETH4
RJ45 for Tool/Gateway
-BAT
Battery (BR 2032)
FRAME
PWR
BAT
WRITE
FAULT
FS COMM
FS STATUS
OFF
ON
/051a/1C
-A57:-X1
/026a/1B
-A11S.99:-X485:1
/026a/1B
-A11S.99:-X485:2
/026a/1A
-A11S.99:-X485:3
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep.
Oleg Vanin
18.03.2026
Appr.
Mika Asikainen
18.03.2026
Project
ACS880-204LC
R7i
Title
CONTROL UNIT
IGBT Supply Unit
ACS880-204LC-3504-7
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10001871893
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.1
Rev.
F
Sheet
050d
Cont.
051a


AUXILIARY CONTROL CUBICLE (EXTERNAL)
DOOR
#Control Panel Kit
ABB Accessory
-A59
CONTROL PANEL
ACS-AP-W MODULE
-X3
-USB
#Panel Mounting Kit
ABB Accessory
-A58
-X100
CONTROL PANEL KIT
DPMP-01
-X101
-X102
-X103
PE
/050d/3C
-A51:-XPAN
-A57
-X1
-X2
-X3
RJ-11
RJ-45
RJ-45
CHASSIS
SLOT
SLOT
DIAGNOSTICS AND PANEL INTERFACE
FDPI-02
#Panel Interface Kit
ABB Accessory
Terminated
TERMINATION
SLOT
ADAPTER CARD
USCA-0X
SLOT
SLOT1
SLOT
SLOT2
ADAPTER CARD
USCA-0X
SLOT
SLOT3
ADAPTER CARD
USCA-0X
SLOT4
-A51
/059a/1E
CONTROL UNIT
UCU-22
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep.
Oleg Vanin
18.03.2026
App.
Mika Asikainen
18.03.2026
Project
ACS880-204LC
R.7i
Title
OPTION CARDS
IGBT Supply Unit
ACS880-204LC-350A-7
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10001871893
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.1
Rev.
F
Sheet
051a
Cont.

# Frame 4×R7i


Example Circuit Diagrams
Project type
ACS880-204LC
IGBT Supply Unit
Converter type
4xR7i
Frame Size
ACS880-204LC-1340A-7
Type Code
Revision G
Used EPLAN Version: 2025.0.3.23406
Prep. Oleg Vanin 19.03.2026
Appr. Mika Asikainen 19.03.2026
Project ACS880-204LC 4xR7i
Title Title page / cover sheet IGBT Supply Unit ACS880-204LC-1340A-7
Circuit diagram
SAP Doc. No. DMS doc. nr. 3AXD10001968696
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
Rev. G Sheet 000A
Cont. 000B
Cust. Doc. No.
Cust. Ref. No.
Customer Example Circuit Diagrams

| Higher-level function | Page | Page description | Revision |
|---|---|---|---|
| | 000A | Title page / cover sheet | G |
| | 000C | Structured identifier overview | G |
| | 000D | Summarized parts list | G |
| | 000E | Summarized parts list | G |
| | 200A | Overview diagram | G |
| | 300A | Symbol Overview | G |
| 01 | 001a | MAIN CIRCUIT | G |
| | 001b | LINE-UP CHARGING CIRCUIT | G |
| | 002a | LCL FILTER | G |
| | 002b | LCL FILTER | G |
| | 003a | MAIN CIRCUIT | G |
| | 005a | MODULE CONTROL CONNECTIONS | G |
| | 005b | MODULE CONTROL CONNECTIONS | G |
| | 007a | CURRENT AND VOLTAGE MEASUREMENT | G |
| | 020a | AUXILIARY VOLTAGE DISTRIBUTION | G |
| | 022a | CONTROL VOLTAGE DISTRIBUTION | G |
| | 026a | CABINET FAN CONTROL | G |
| | 026b | CABINET FAN CONTROL | G |
| | 030a | MAIN BREAKER CONTROL | G |
| | 050a | CONTROL UNIT | G |
| | 050b | CONTROL UNIT | G |
| | 050c | CONTROL UNIT | G |
| | 050d | CONTROL UNIT | G |
| | 051a | OPTION CARDS | G |

| | | | | | |
|---|---|---|---|---|---|
| Cust. Doc. No. | Prep. Oleg Vanin 19.03.2026 | Title Table of contents<br>IGBT Supply Unit<br>ACS880-204LC-1340A-7 | Circuit diagram EFS2 | Item Des. | |
| Cust. Ref. No. | App. Mika Asikainen 19.03.2026 | | SAP Doc. No. DMS doc. nr. 3AXD10001968696 | = | |
| Customer Example Circuit Diagrams | Project ACS880-204LC<br>4xR7i | | EPLAN Doc. No. | + | |
| | | ABB | ABB Ref. No. | Rev. G | Sheet 000B |
| | | | Resp. Dept. | Cont. | 000C |

## Function designations

| Designation | Structure description |
|---|---|
| =01 | IGBT Supply Unit |
| | |
| | |
| | |
| | |
| | |
| | |

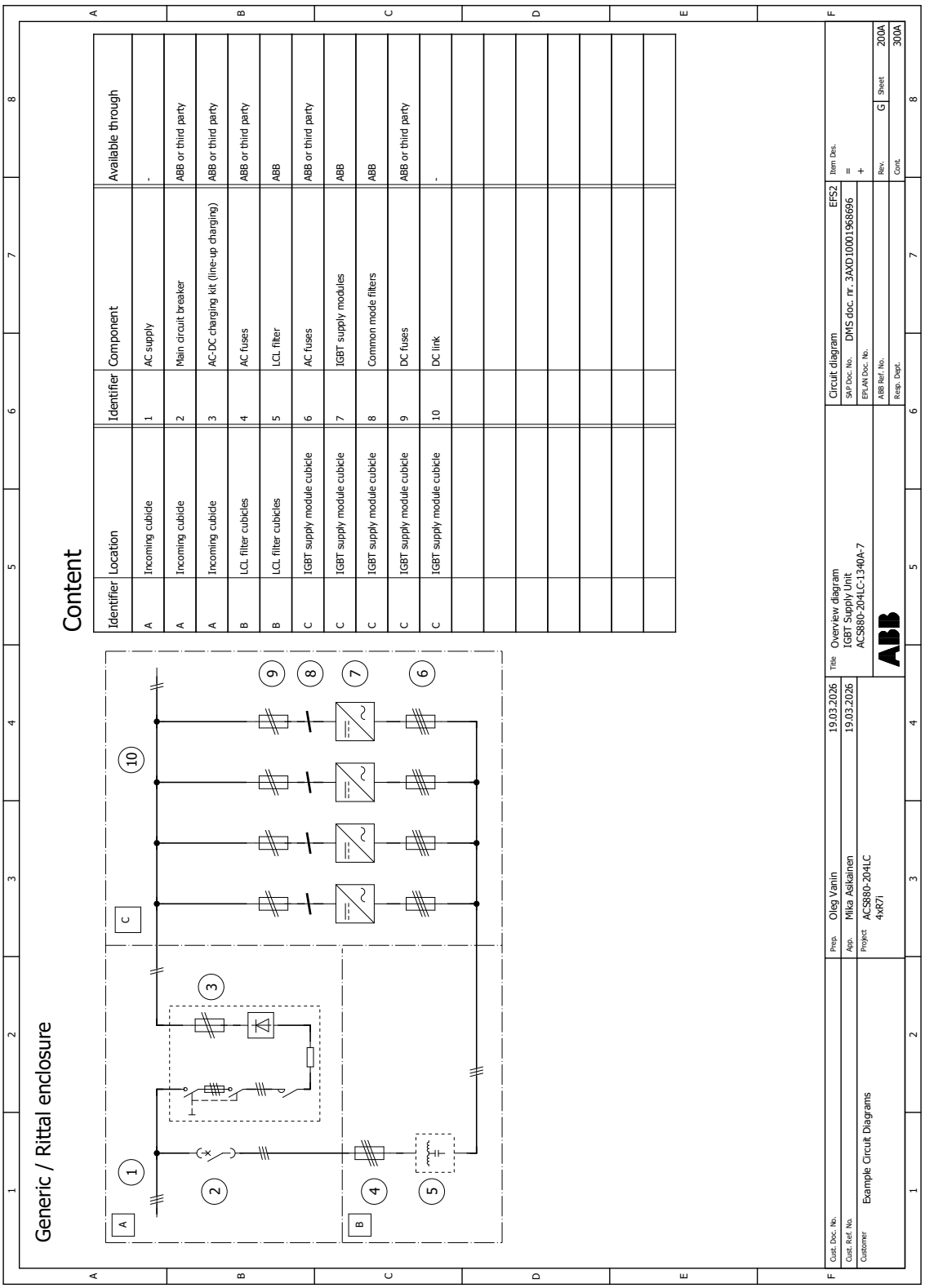
## Location designations

| Designation | Structure description |
|---|---|
| +01.1 | Auxiliary Control Cubicle (External) |
| +01.2 | Incoming Cubicle (External) |
| +01.3 | 1st LCL Cubicle |
| +01.4 | 2nd LCL Cubicle |
| +01.5 | IGBT Supply Cubicle |
| | |
| | |
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| | |
| | |

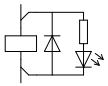
## Electrical option designations

| Designation | Material Code | Quantity |
|---|---|---|
| #AC Fuse | 68752591, 3AXD50000000246 | 15 |
| #BAMU | 3AXD50000045879 | 1 |
| #CMF Filter | 3AXD50000566785 | 8 |
| #Control Panel Kit | 3AXD50000025965 | 1 |
| #Control Unit Kit | ACS880UCU-204LC-23-0 | 1 |
| #DC Fuse | 68735980 | 8 |
| #Fibre Optic | 58948233, 58948250 | 5 |
| #LCL Filter Kit | 3AXD50000234448 | 1 |
| #Line-up Charging Kit | 3AXD50000250790 | 1 |
| #Main Breaker | 3AXD50000903375 | 1 |
| #Panel Interface Kit | 3AUA0000108650 | 1 |
| #Panel Mounting Kit | 3AUA0000108878 | 1 |
| #Supply Module | ACS880-104LC-0389A-7+E205 | 4 |
| | | |
| | | |
| | | |
| | | |
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| | | | | | |
|---|---|---|---|---|---|
| Cust. Doc. No. | Prep. Oleg Vanin 19.03.2026 | Title Structured identifier overview<br>IGBT Supply Unit<br>ACS880-204LC-1340A-7 | Circuit diagram EFS2 | Item Des. | |
| Cust. Ref. No. | App. Mika Asikainen 19.03.2026 | | SAP Doc. No. DMS doc. nr. 3AXD10001968696 | = | |
| Customer Example Circuit Diagrams | Project ACS880-204LC<br>4xR7i | | EPLAN Doc. No. | + | |
| | | ABB | ABB Ref. No. | Rev. G | Sheet 000C |
| | | | Resp. Dept. | Cont. | 000D |


Generic / Rittal enclosure
Content
Identifier Location Identifier Component Available through
A Incoming cubicle 1 AC supply -
A Incoming cubicle 2 Main circuit breaker ABB or third party
A Incoming cubicle 3 AC-DC charging kit (line-up charging) ABB or third party
B LCL filter cubicles 4 AC fuses ABB or third party
B LCL filter cubicles 5 LCL filter ABB
C IGBT supply module cubicle 6 AC fuses ABB or third party
C IGBT supply module cubicle 7 IGBT supply modules ABB
C IGBT supply module cubicle 8 Common mode filters ABB
C IGBT supply module cubicle 9 DC fuses ABB or third party
C IGBT supply module cubicle 10 DC link -
Cust. Doc. No.
Cust. Ref. No.
Customer Example Circuit Diagrams
Prep. Oleg Vanin 19.03.2026
Appr. Mika Aalkainen 19.03.2026
Project ACS880-204LC 4xR7i
Title Overview diagram IGBT Supply Unit ACS880-204LC-1340A-7
ABB
Circuit diagram EFS2
SAP Doc. No. DMS doc. nr. 3AXD10001968696
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
=
+
Rev. G Sheet 200A
Cont. 300A

GENERAL/RELAY COIL, WITH PROTECTIVE CIRCUIT DIODE AND R+LED



GENERAL/RELAY COIL



COIL WITH PICK-UP DELAY



COIL WITH OFF-DELAY



NO CONTACT



NC CONTACT



CHANGE OVER CONTACT



NO CONTACT, WITH CLOSING DELAY



TWO NO CONTACTS ONE INPUT, TWO OUTPUTS



TWO CONNECTED CHANGE OVER CONTACTS



POWER NO CONTACT OF A CONTACTOR



PUSH BUTTON WITH NO CONTACT



PUSH BUTTON WITH NC CONTACT



NO SWITCH, OPERATED BY TURNING, 2 POSITIONS



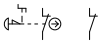

LIMIT SWITCH NC CONTACT MECHANICALLY OPERATED



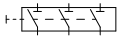

NC SWITCH, TEMPERATURE OPERATED



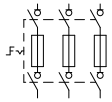

EMERGENCY STOP PUSH BUTTON



DISCONNECT SWITCH, THREE-POLE



SWITCH DISCONNECTOR WITH FUSES, THREE-POLE



FUSE



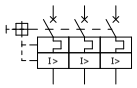
FUSE DISCONNECTOR



CIRCUIT BREAKER



MOTOR OVERLOAD SWITCH WITH SWITCH MECHANISM




COMMON MODE FILTER FOR HIGH FREQUENCY CURRENTS



PROTECTIVE EARTH CONNECTED TO FRAME




PROTECTIVE EARTH CONNECTED TO TERMINAL / PE BUSBAR



FUNCTIONAL EARTHING CONNECTED TO TERMINAL



FUNCTIONAL BONDING TO FRAME



LIGHT



INDUCTOR



CAPACITOR



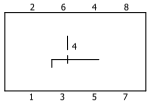
RESISTOR



POWER RESISTOR WITH FUSE

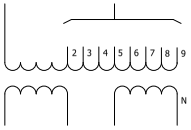


PHASE SELECTING SWITCH

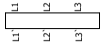



PRIMARY, VOLTAGE SELECTION

TRANSFORMER




EMC FILTER




TERMINAL, FOUR POLE



PLUG AND SOCKET TERMINAL BLOCK WITH 4 CONNECTION POINTS



FEMALE AND MALE PLUG



AMPERE METER




CURRENT TRANSFORMER



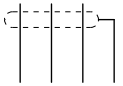
VOLTAGE METER




WIRE TERMINATION, INSULATED



SHIELDED CABLE



THERMAL OPERATION



DISCONNECT



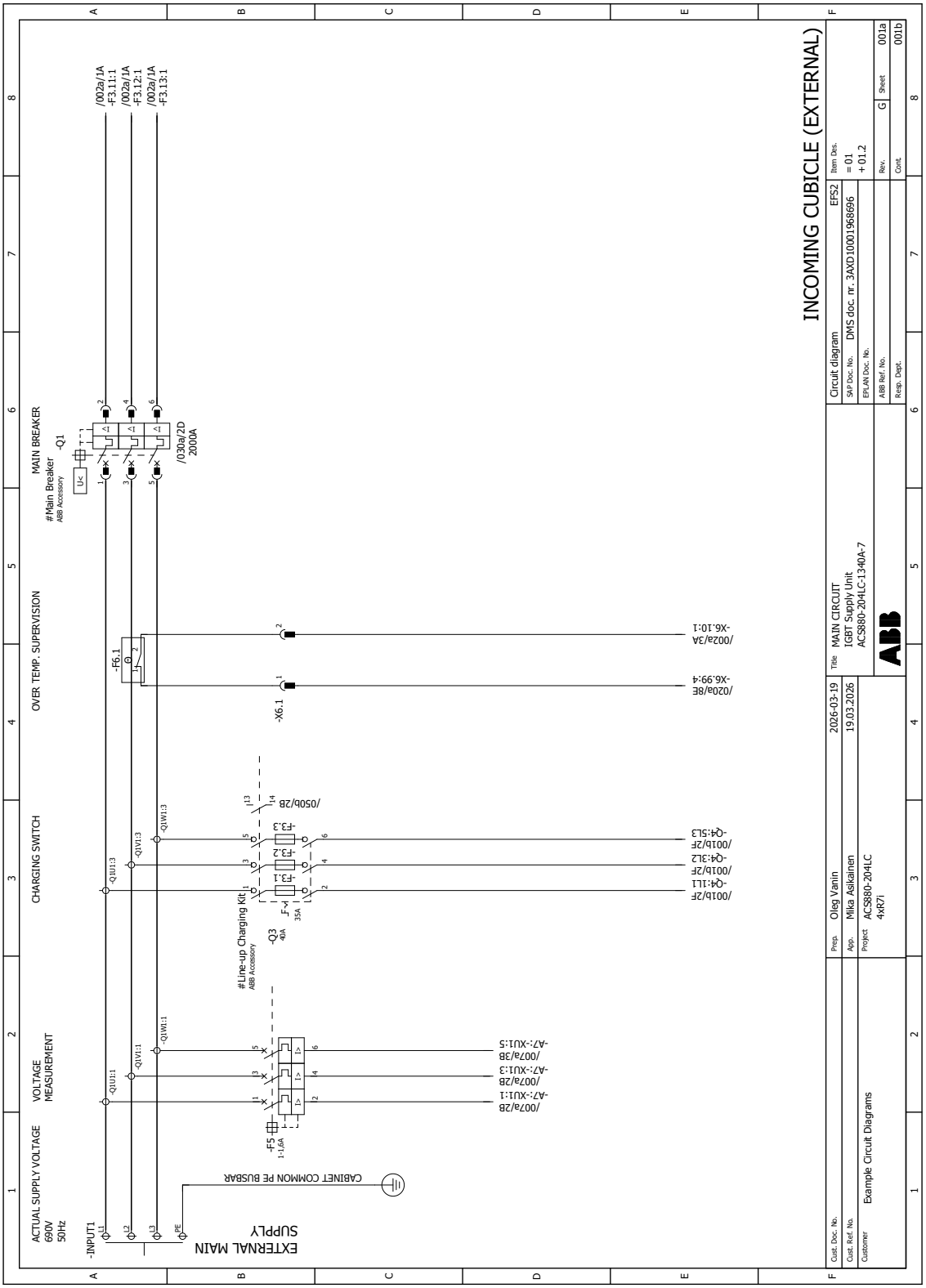
DISCONNECT, CAN BE OPERATED WHILE NOMINAL CURRENT IS APPLIED

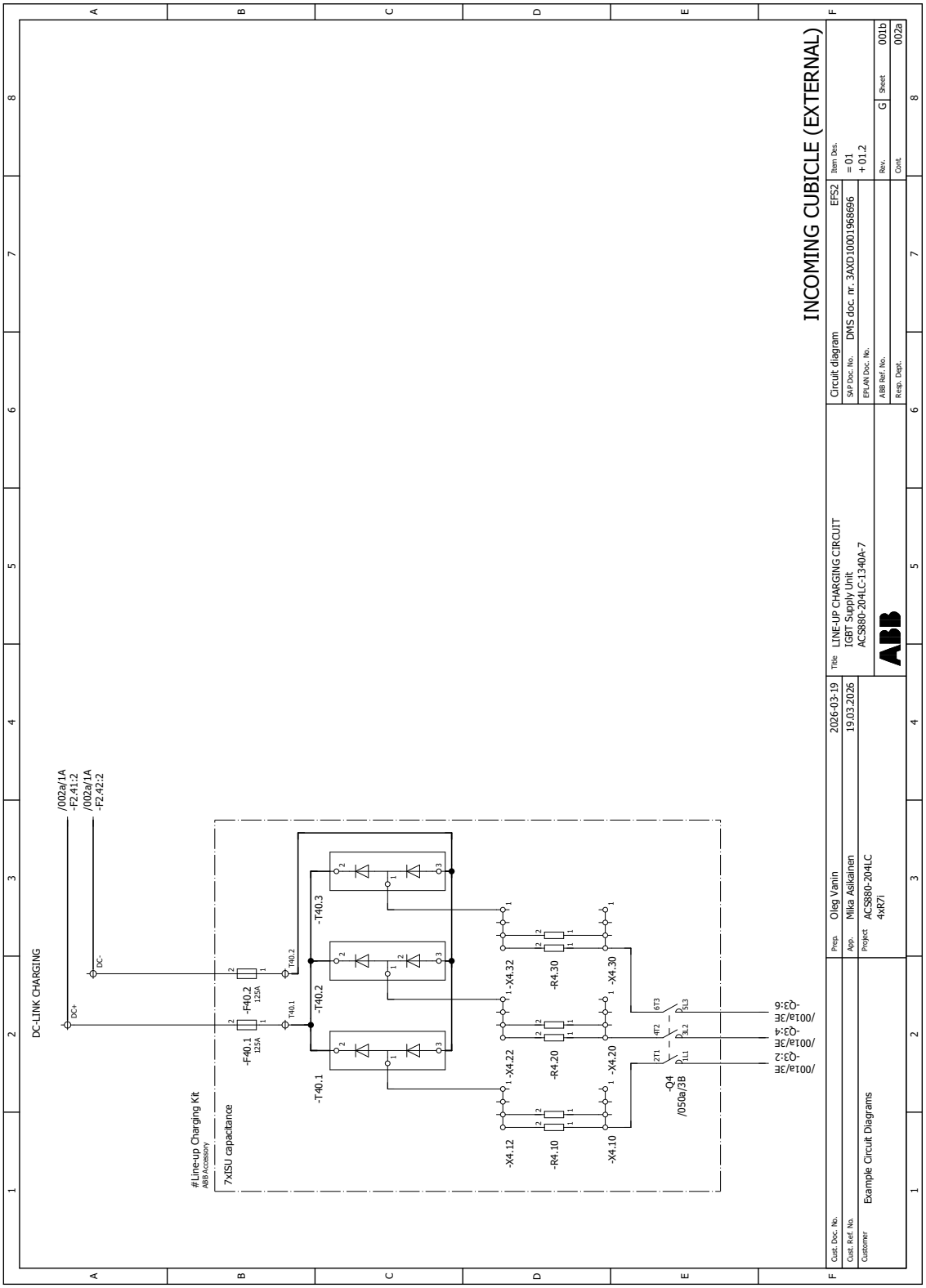


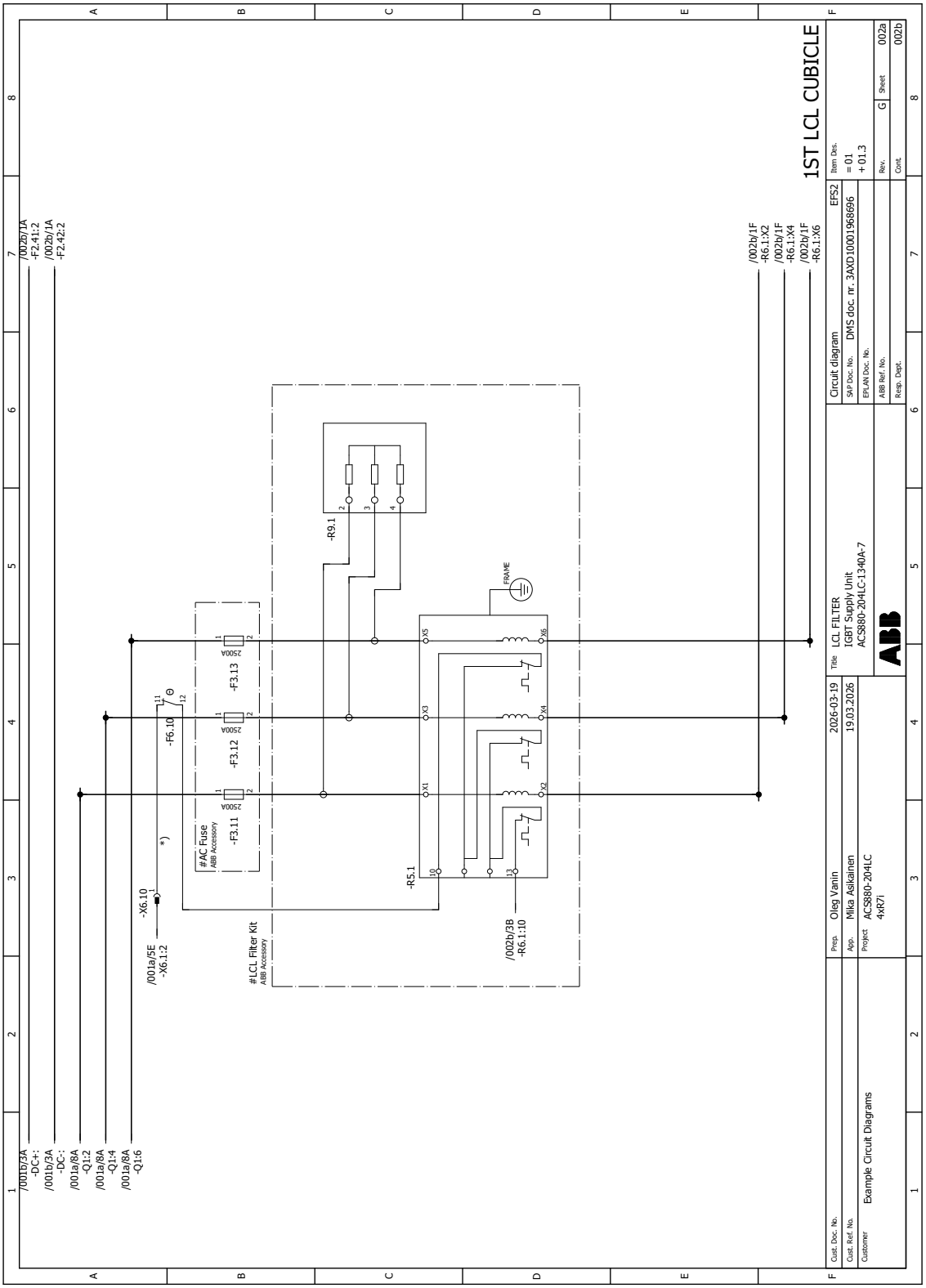
BREAKER, SHORTCIRCUIT BREAKING CAPABILITY

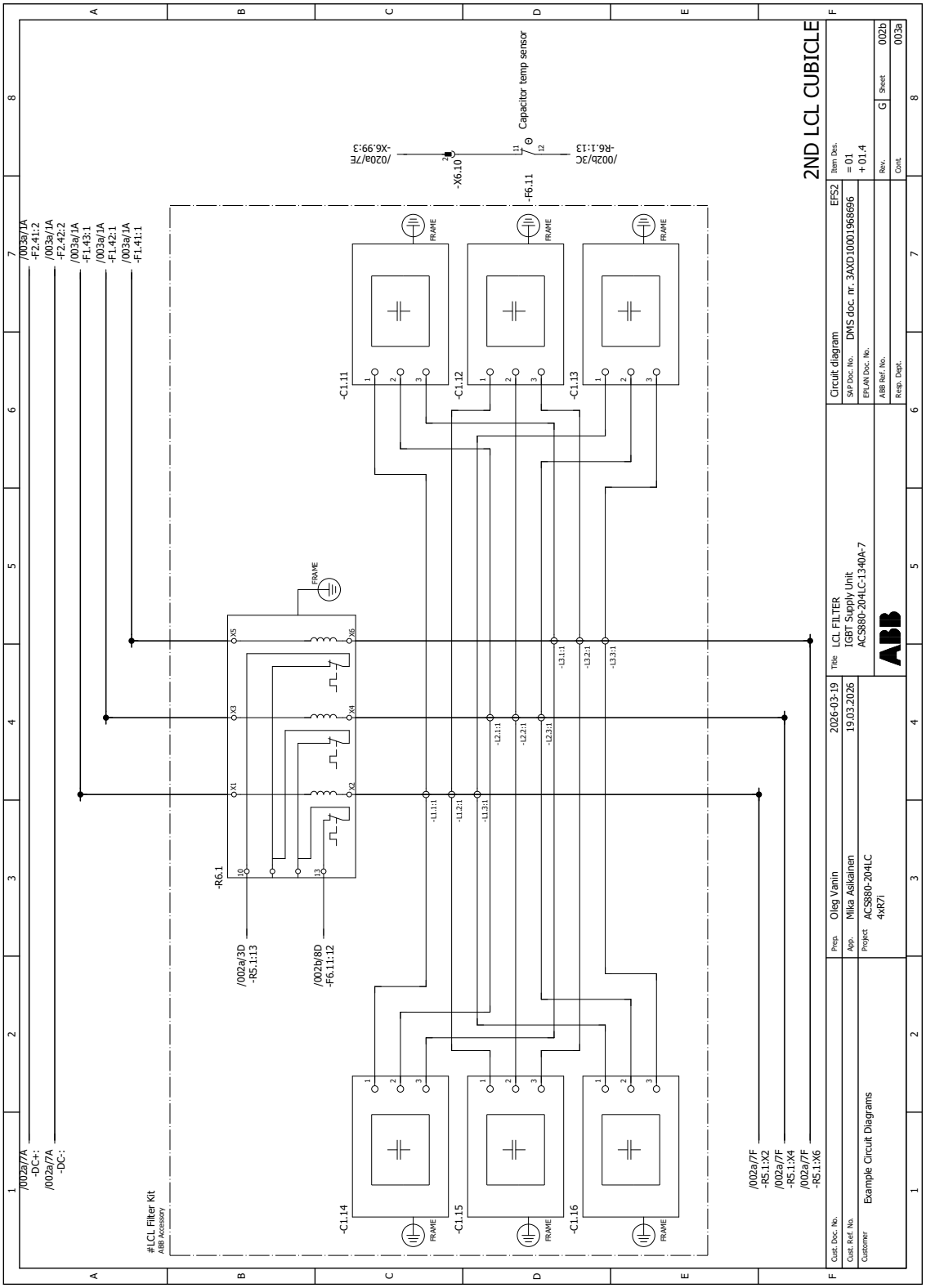


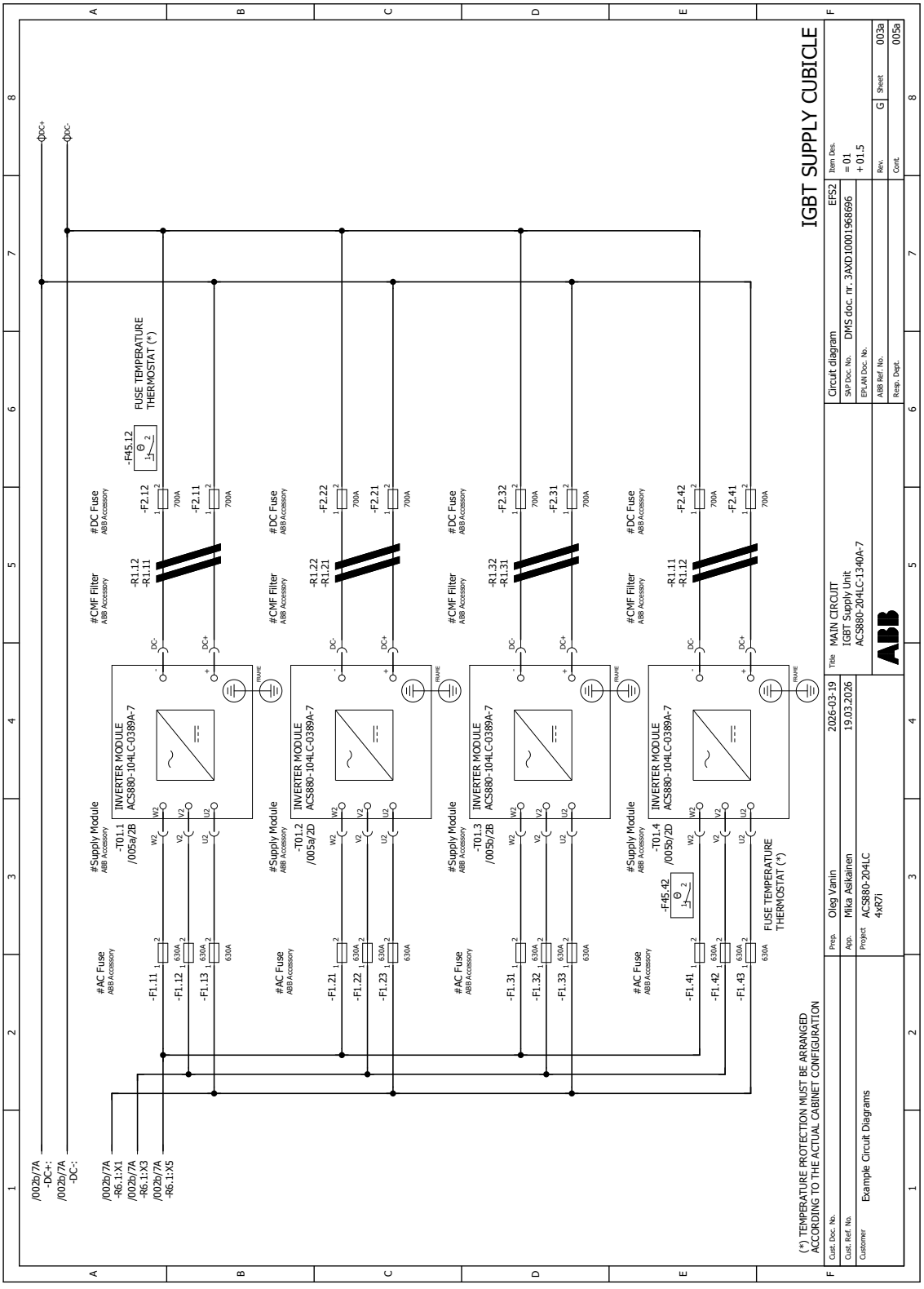
| | | | |
|---|---|---|---|
| Cust. Doc. No. | Prep. Oleg Vanin 19.03.2026 | Title Symbol Overview<br>IGBT Supply Unit<br>ACS880-204LC-1340A-7 | Circuit diagram EFS2 / Item Des. |
| Cust. Ref. No. | App. Mika Asikainen 19.03.2026 | | SAP Doc. No. DMS doc. nr. 3AXD10001968696 / = |
| Customer Example Circuit Diagrams | Project ACS880-204LC 4xR7i | ABB | EPLAN Doc. No. / + |
| | | | ABB Ref. No. / Rev. G / Sheet 300A |
| | | | Resp. Dept. / Cont. =01/001a |

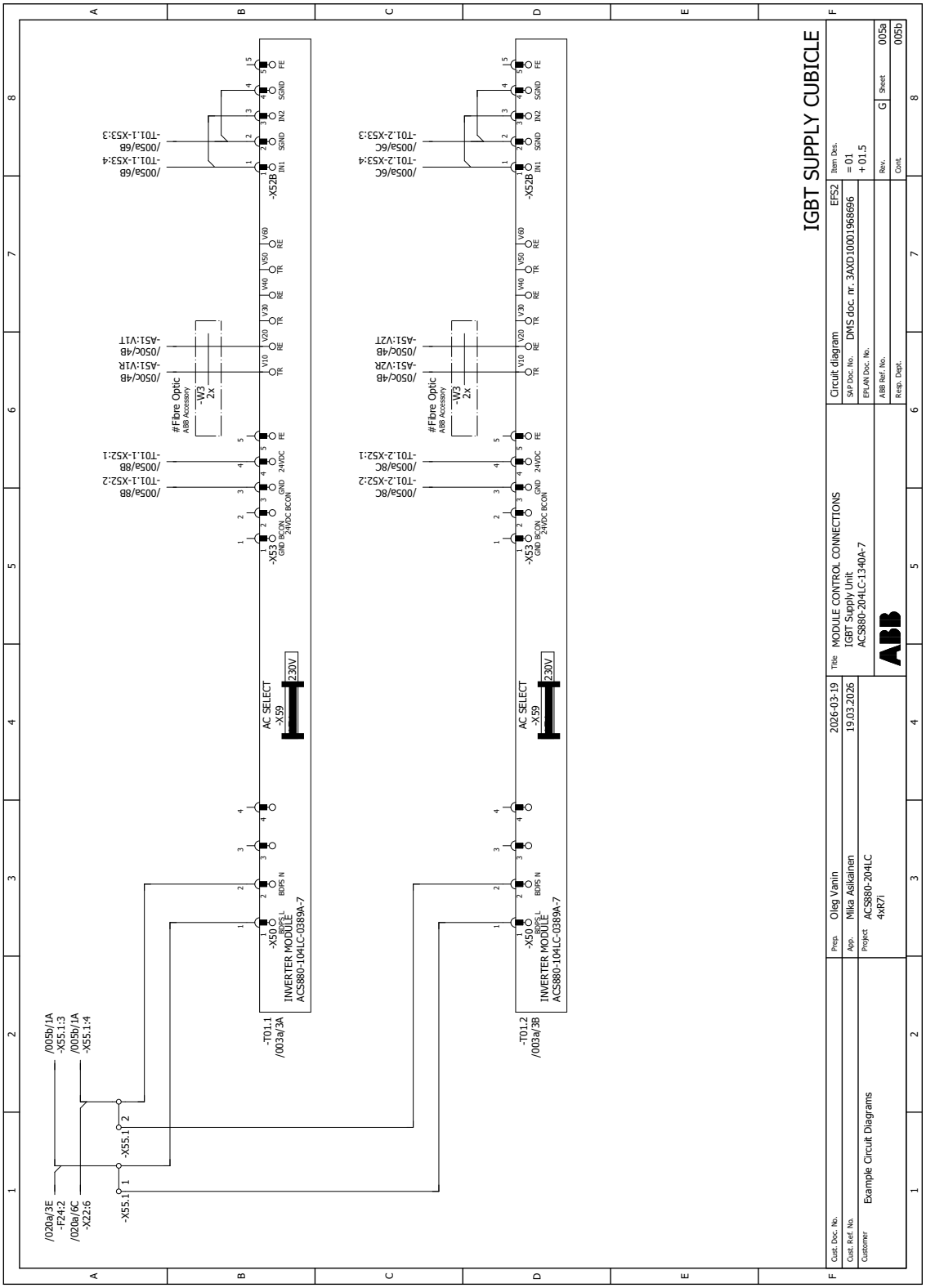

INCOMING CUBICLE (EXTERNAL)
ACTUAL SUPPLY VOLTAGE
690V
50Hz
VOLTAGE MEASUREMENT
CHARGING SWITCH
OVER TEMP. SUPERVISION
MAIN BREAKER
-Q1
#Main Breaker
ABB Accessory
/030a/2D
2000A
/002a/1A
-F3.11:1
/002a/1A
-F3.12:1
/002a/1A
-F3.13:1
-F6.1
-X6.1
/020a/8E
-X6.99:4
/002a/3A
-X6.10:1
/050b/2B
-F3.3
-F3.2
-F3.1
/001b/2F
-Q4:5L3
/001b/2F
-Q4:3L2
/001b/2F
-Q4:1L1
#Line-up Charging Kit
ABB Accessory
-Q3
40A
35A
-F5
1-1.6A
/007a/2B
-A7:-XU1:1
/007a/2B
-A7:-XU1:3
/007a/3B
-A7:-XU1:5
-Q1U1:1
-Q1V1:1
-Q1W1:1
-Q1U1:3
-Q1V1:3
-Q1W1:3
-INPUT1
L1
L2
L3
PE
EXTERNAL MAIN SUPPLY
CABINET COMMON PE BUSBAR
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep.
Oleg Vanin
2026-03-19
App.
Mika Asikainen
19.03.2026
Project
ACS880-204LC
4xR7i
Title
MAIN CIRCUIT
IGBT Supply Unit
ACS880-204LC-1340A-7
ABB
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10001968696
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.2
Rev.
G
Sheet
001a
Cont.
001b

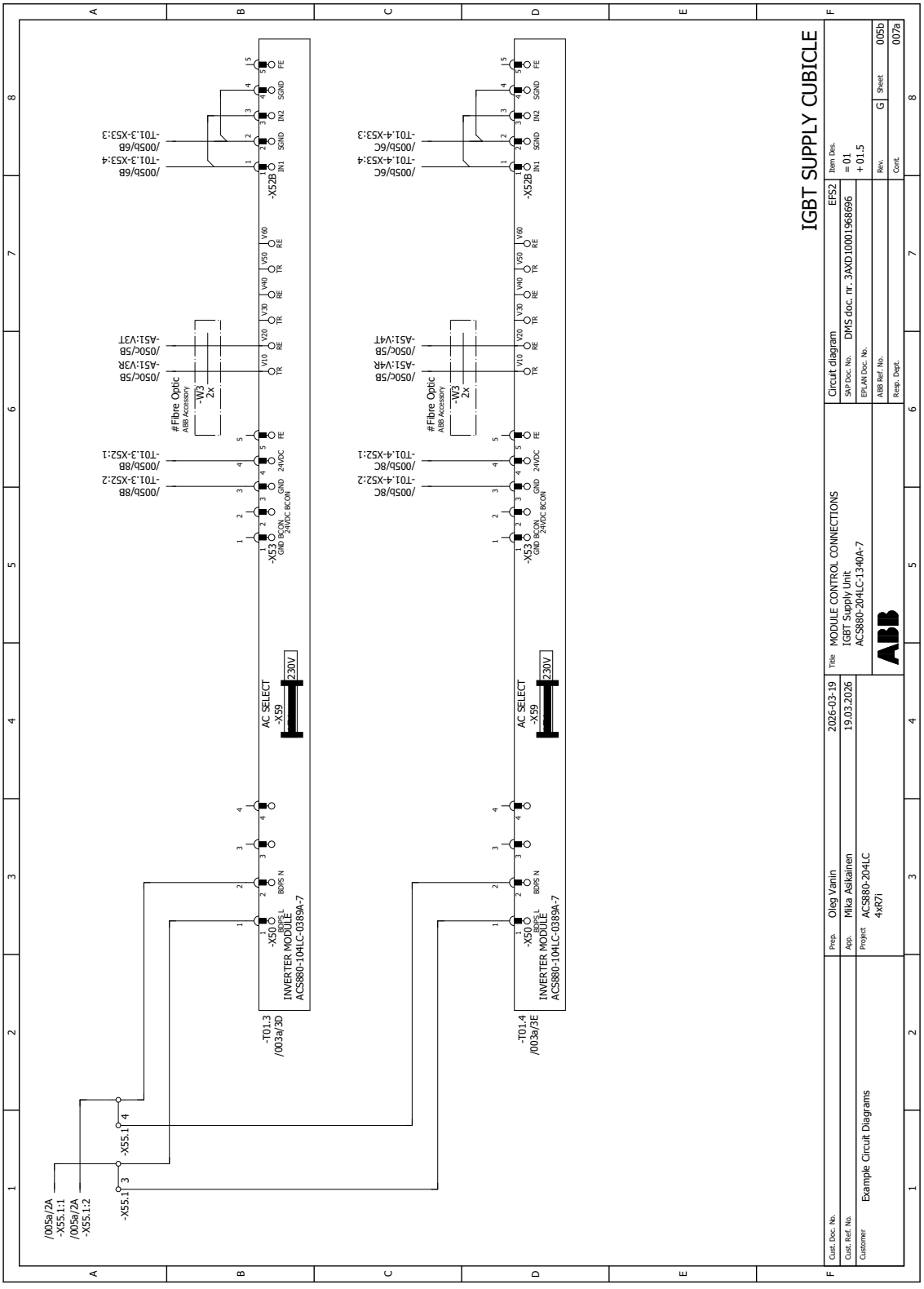

INCOMING CUBICLE (EXTERNAL)
DC-LINK CHARGING
/002a/1A
-F2.41:2
/002a/1A
-F2.42:2
DC+
DC-
-F40.1
125A
-F40.2
125A
T40.1
T40.2
-T40.1
-T40.2
-T40.3
#Line-up Charging Kit
ABB Accessory
7xI5U capacitance
-X4.12
-R4.10
-X4.22
-R4.20
-X4.32
-R4.30
-X4.10
-X4.20
-X4.30
-Q4
/050a/3B
/001a/3E
-Q3:2
/001a/3E
-Q3:4
/001a/3E
-Q3:6
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10001968696
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.2
Rev.
G
Sheet
001b
Cont.
002a
Title
LINE-UP CHARGING CIRCUIT
IGBT Supply Unit
ACS880-2041C-1340A-7
Prep.
Oleg Vanin
2026-03-19
Appr.
Mika Asikainen
19.03.2026
Project
ACS880-2041C
4xR7i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams

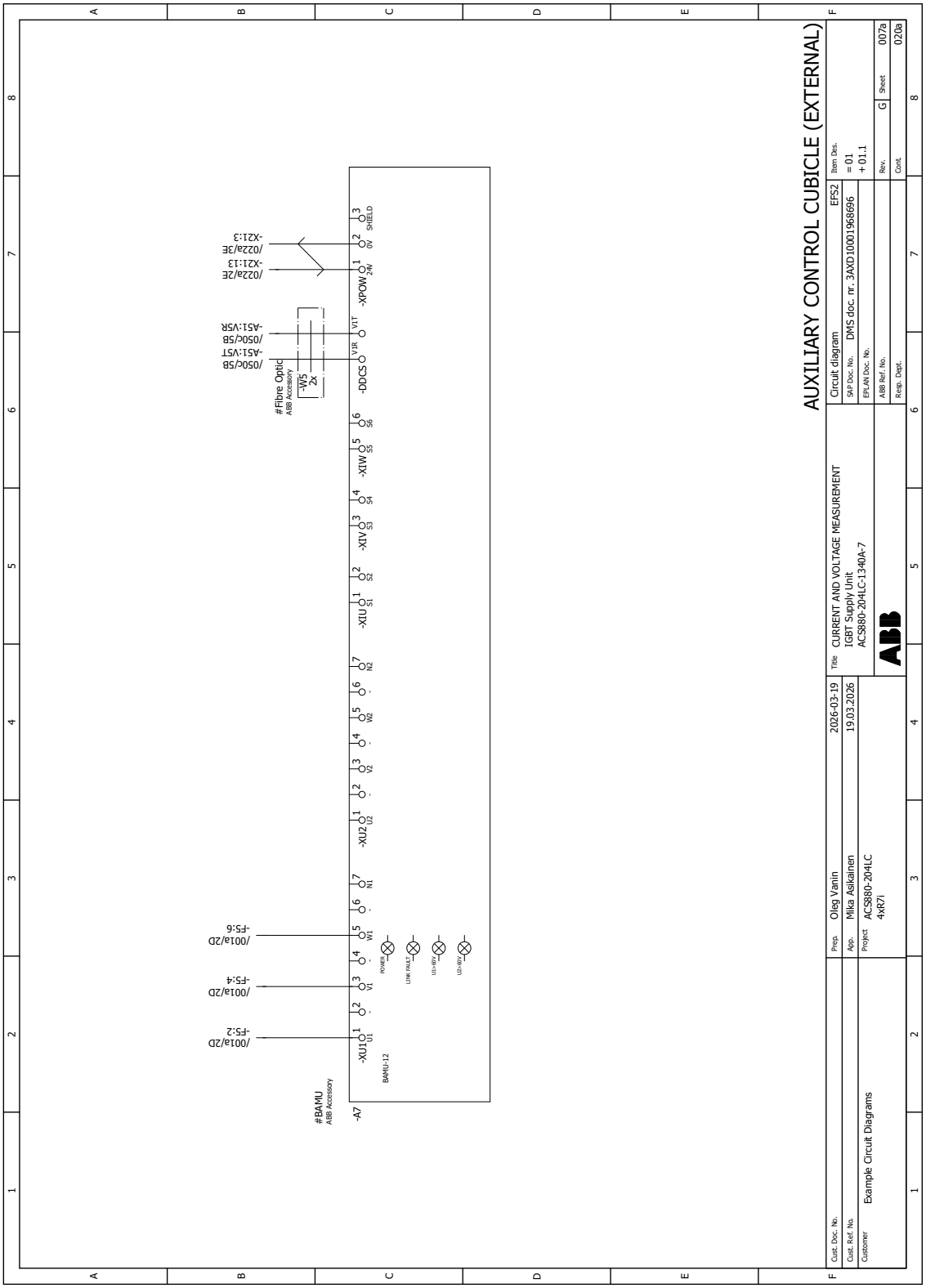

1ST LCL CUBICLE
LCL FILTER
IGBT Supply Unit
ACS880-204LC-1340A-7
Circuit diagram
DMS doc. nr. 3AXD10001968696
Example Circuit Diagrams
ACS880-204LC
4xR7i
Oleg Vanin
Mika Asikainen
2026-03-19
19.03.2026
#AC Fuse
ABB Accessory
#LCL Filter Kit
ABB Accessory
-F3.11
-F3.12
-F3.13
-F6.10
-R9.1
-R5.1
-X6.10
FRAME
/001b/3A -DC+:
/001b/3A -DC-:
/001a/8A -Q1:2
/001a/8A -Q1:4
/001a/8A -Q1:6
/001a/5E -X6.1:2
/002b/3B -R6.1:10
/002b/1A -F2.41:2
/002b/1A -F2.42:2
/002b/1F -R6.1:X2
/002b/1F -R6.1:X4
/002b/1F -R6.1:X6

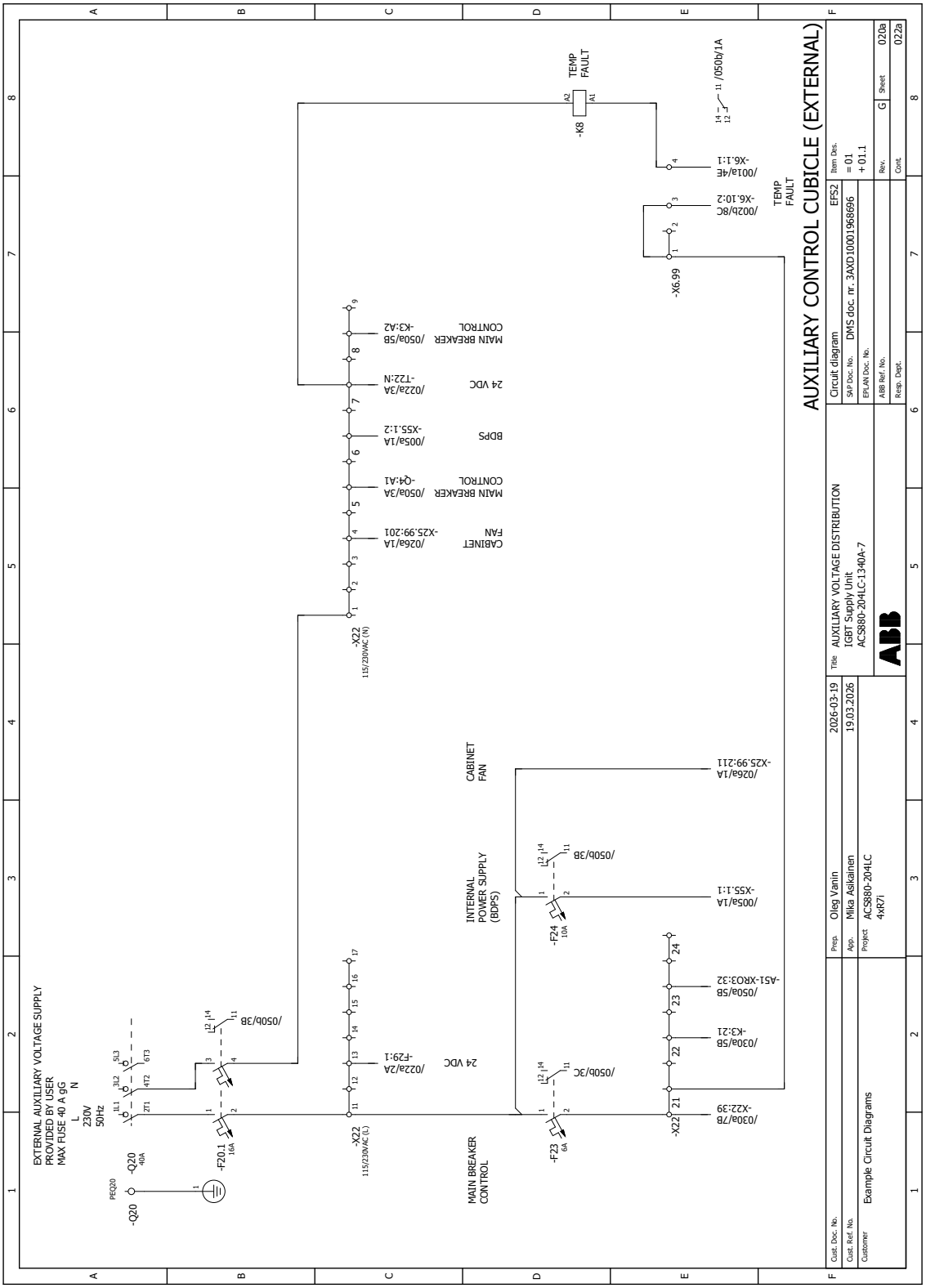

2ND LCL CUBICLE
LCL FILTER
IGBT Supply Unit
ACS880-2041LC-1340A-7
Capacitor temp sensor
-X6.10
-F6.11
-R6.1
-C1.11
-C1.12
-C1.13
-C1.14
-C1.15
-C1.16
FRAME
#LCL Filter Kit
ABB Accessory
Example Circuit Diagrams
ACS880-2041LC
4xR7i
Oleg Vanin
Mika Aslkainen
2026-03-19
19.03.2026
Circuit diagram
DMS doc. nr. 3AXD10001968696
EFS2
= 01
+ 01.4
002b
003a

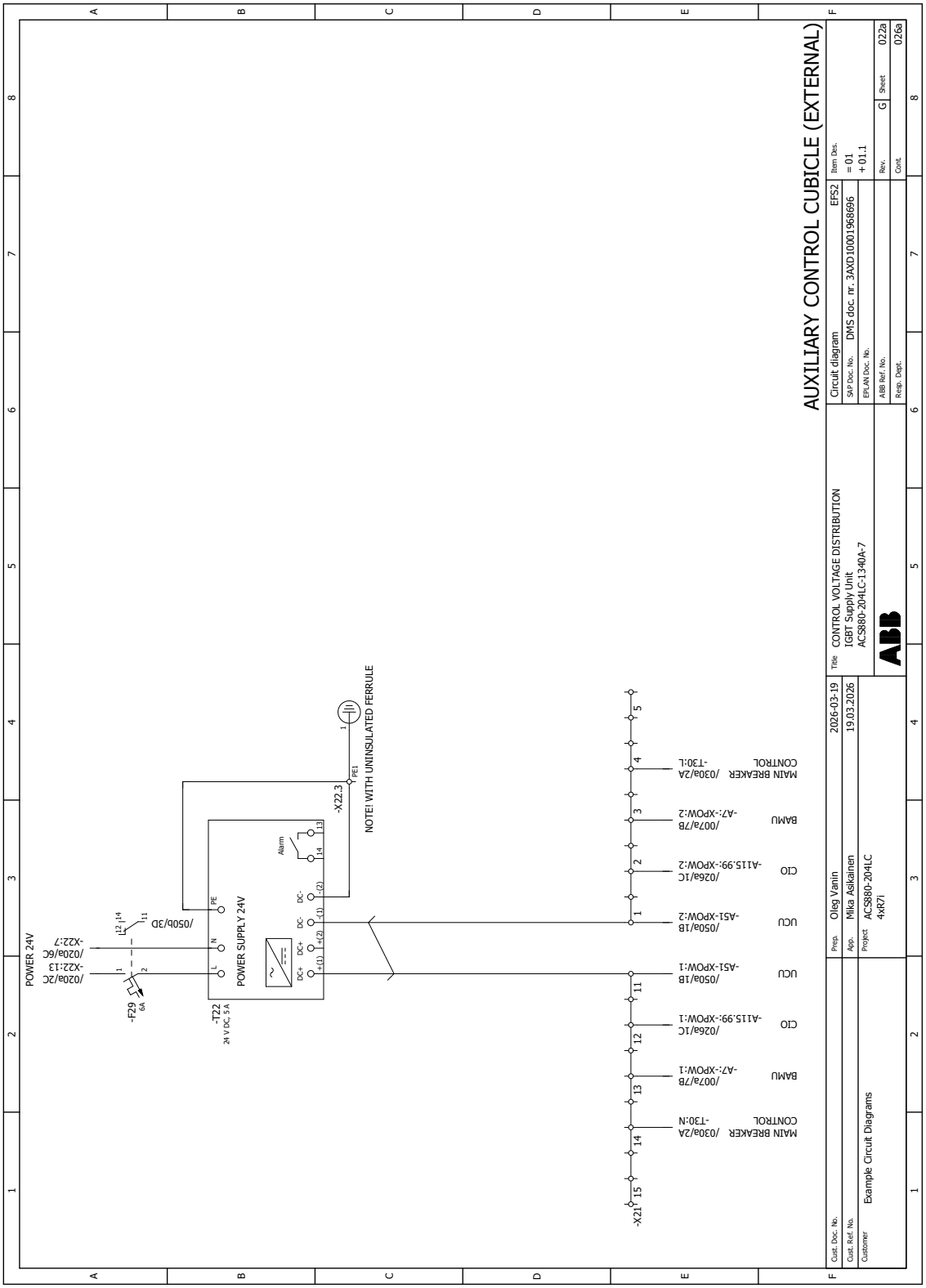

IGBT SUPPLY CUBICLE
DC+
DC-
/002b/7A -DC+:
/002b/7A -DC-:
/002b/7A -R6.1:X1
/002b/7A -R6.1:X3
/002b/7A -R6.1:X5
#Supply Module ABB Accessory
-T01.1 /005a/2B
-T01.2 /005a/2D
-T01.3 /005b/2B
-T01.4 /005b/2D
INVERTER MODULE ACS880-104LC-0389A-7
#AC Fuse ABB Accessory
-F1.11
-F1.12
-F1.13
-F1.21
-F1.22
-F1.23
-F1.31
-F1.32
-F1.33
-F1.41
-F1.42
-F1.43
630A
#CMF Filter ABB Accessory
-R1.12
-R1.11
-R1.22
-R1.21
-R1.32
-R1.31
-R1.11
-R1.12
#DC Fuse ABB Accessory
-F2.12
-F2.11
-F2.22
-F2.21
-F2.32
-F2.31
-F2.42
-F2.41
700A
-F45.12
FUSE TEMPERATURE THERMOSTAT (*)
-F45.42
FUSE TEMPERATURE THERMOSTAT (*)
(*) TEMPERATURE PROTECTION MUST BE ARRANGED ACCORDING TO THE ACTUAL CABINET CONFIGURATION
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep. Oleg Vanin 2026-03-19
App. Mika Asikainen 19.03.2026
Project ACS880-204LC 4xR7i
Title MAIN CIRCUIT IGBT Supply Unit ACS880-204LC-1340A-7
ABB
Circuit diagram EFS2
SAP Doc. No. DMS doc. nr. 3AXD10001968696
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Dis. = 01 + 01.5
Rev. G Sheet 003a
Cont. 005a

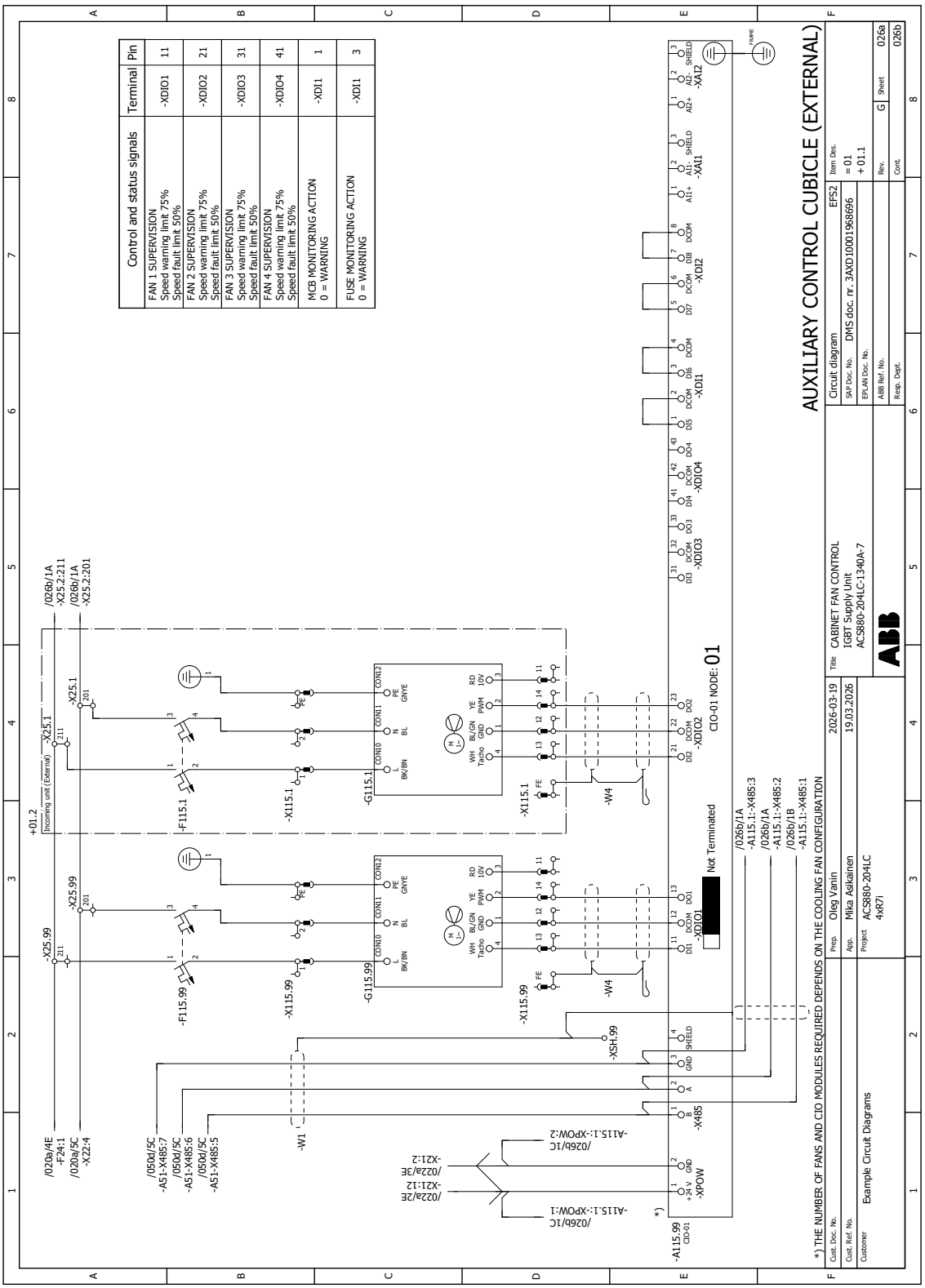

IGBT SUPPLY CUBICLE
MODULE CONTROL CONNECTIONS
IGBT Supply Unit
ACS880-204LC-1340A-7
EFS2
Circuit diagram
DMS doc. nr. 3AXD10001968696
= 01
+ 01.5
005a
005b
2026-03-19
19.03.2026
Oleg Vanin
Mika Asikainen
ACS880-204LC
4xR7i
Example Circuit Diagrams
INVERTER MODULE
ACS880-104LC-0389A-7
-T01.1
/003a/3A
-T01.2
/003a/3B
AC SELECT
-X59
230V
-X50
-X53
-X52B
-X55.1
/020a/3E
-F24:2
/020a/6C
-X22:6
/005b/1A
-X55.1:3
/005b/1A
-X55.1:4
#Fibre Optic
ABB Accessory
-W3
2x
-A51:V1R
-A51:V1T
-A51:V2R
-A51:V2T
/005a/8B
-T01.1-X52:2
/005a/8B
-T01.1-X52:1
/005a/6B
-T01.1-X53:4
/005a/6B
-T01.1-X53:3
/005a/8C
-T01.2-X52:2
/005a/8C
-T01.2-X52:1
/005a/6C
-T01.2-X53:4
/005a/6C
-T01.2-X53:3

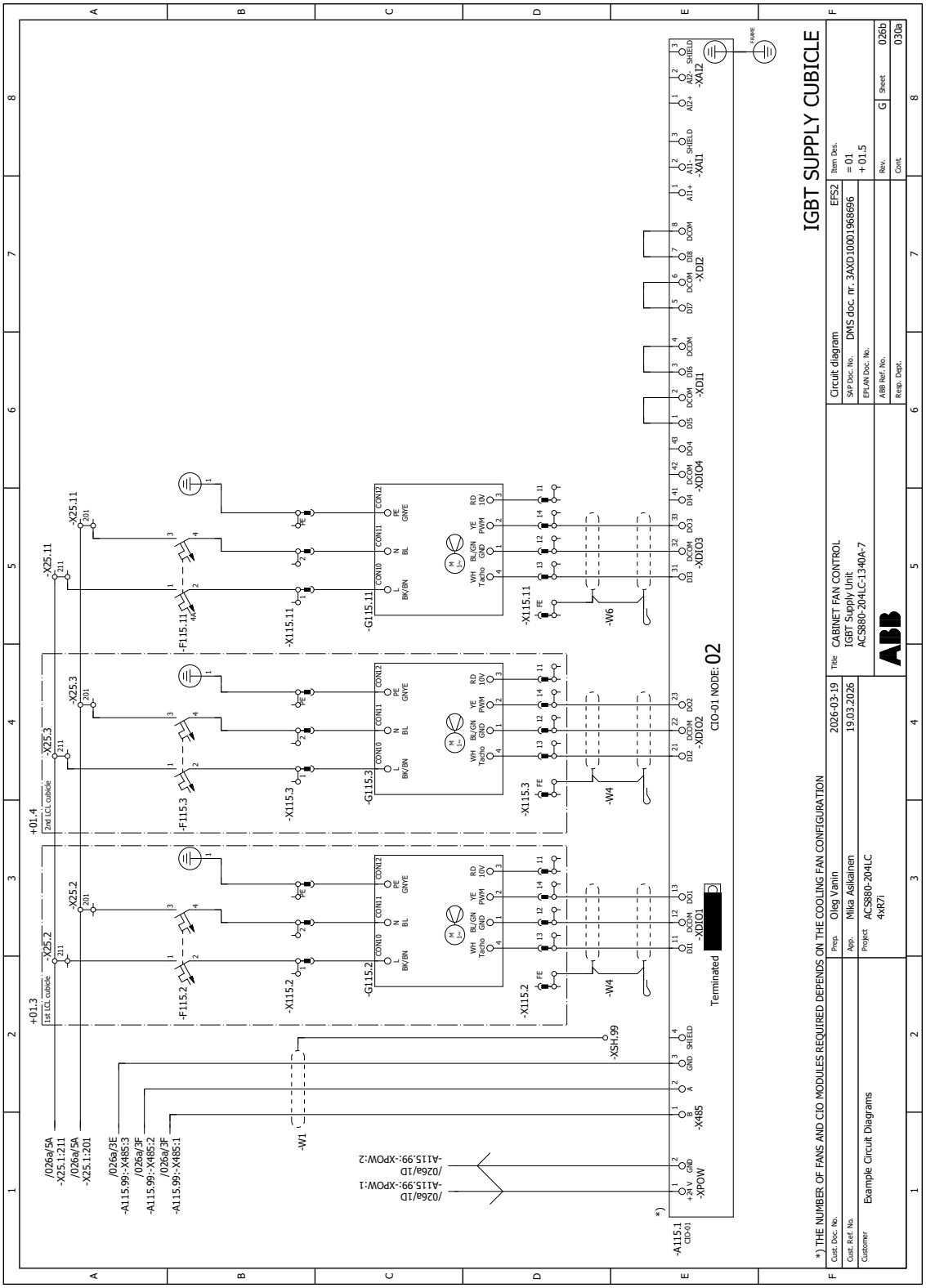

IGBT SUPPLY CUBICLE
EFS2
Circuit diagram
SAP Doc. No.
DMS doc. nr. 3AXD10001968696
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.5
Rev.
G
Sheet
005b
Cont.
007a
Title
MODULE CONTROL CONNECTIONS
IGBT Supply Unit
ACS880-204LC-1340A-7
Prep.
Oleg Vanin
2026-03-19
Appr.
Mika Asikainen
19.03.2026
Project
ACS880-204LC
4xR7i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
/005a/2A
-X55.1:1
/005a/2A
-X55.1:2
-X55.1
-T01.3
/003a/3D
INVERTER MODULE
ACS880-104LC-0389A-7
-T01.4
/003a/3E
AC SELECT
-X59
230V
#Fibre Optic
ABB Accessory
-W3
2x
-X50
-X53
-X52B
-A51:V4R
-A51:V4T
-A51:V3R
-A51:V3T
/005b/8B
/005b/8C
/005b/6B
/005b/6C
/050c/5B

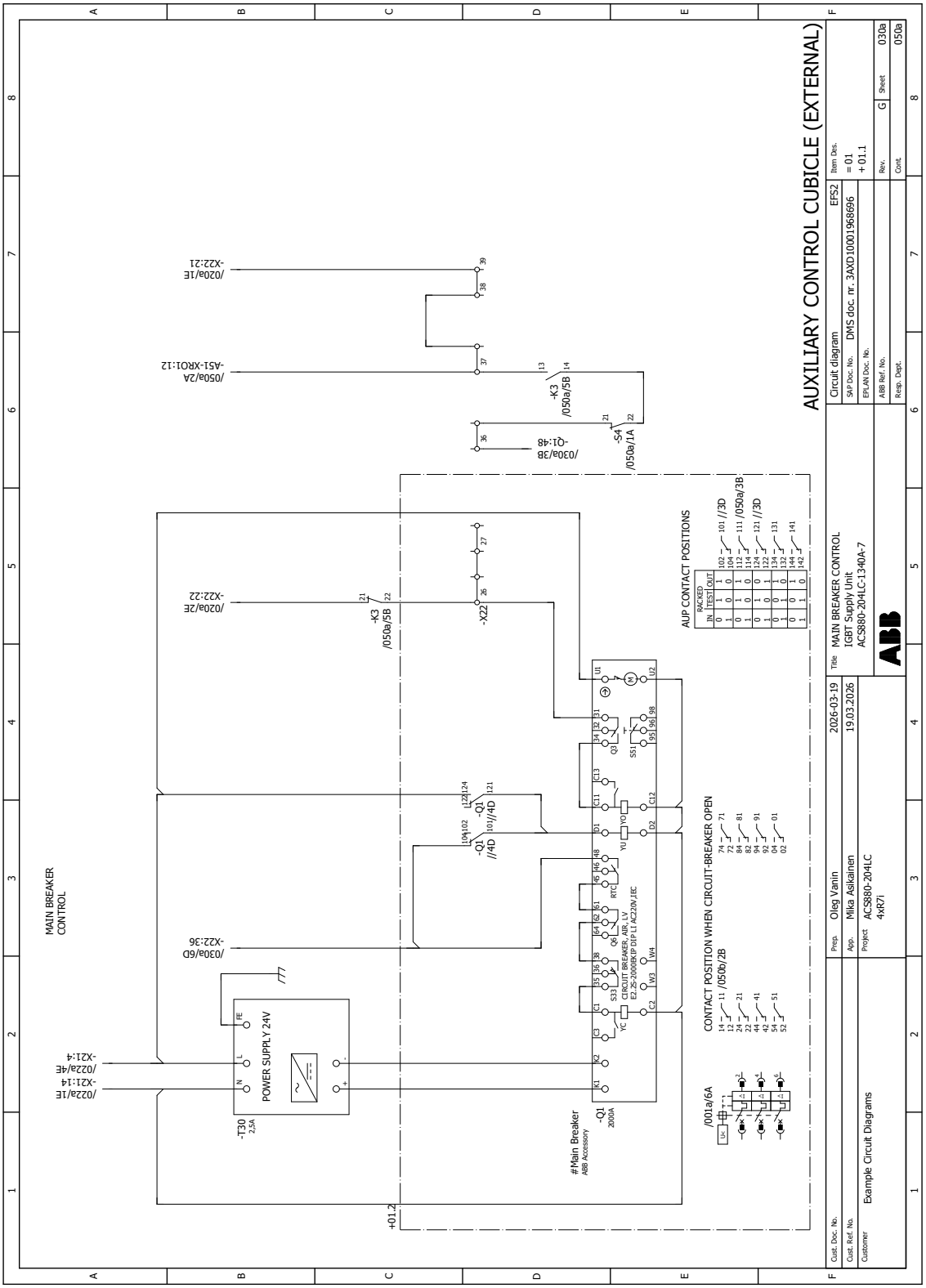

AUXILIARY CONTROL CUBICLE (EXTERNAL)
CURRENT AND VOLTAGE MEASUREMENT
IGBT Supply Unit
ACS880-204LC-1340A-7
Circuit diagram
EFS2
DMS doc. nr. 3AXD10001968696
Example Circuit Diagrams
ACS880-204LC
4xR7i
Oleg Vanin
Mika Aalkainen
2026-03-19
19.03.2026
-A7
BAMU-12
#BAMU
A1B8 Accessory
-XU1
-XU2
-XIU
-XIV
-XIW
-XPOW
-DDCS
#Fibre Optic
A1B8 Accessory
-W5
2x
/0013/ZD
-FS:2
/0013/ZD
-FS:4
/0013/ZD
-FS:6
/050C/SB
-A51:VST
/050C/SB
-A51:VSR
/022a/ZE
-XZ1:13
/022a/3E
-XZ1:3
POWER
LINK FAULT
LED-REV
LED-REV

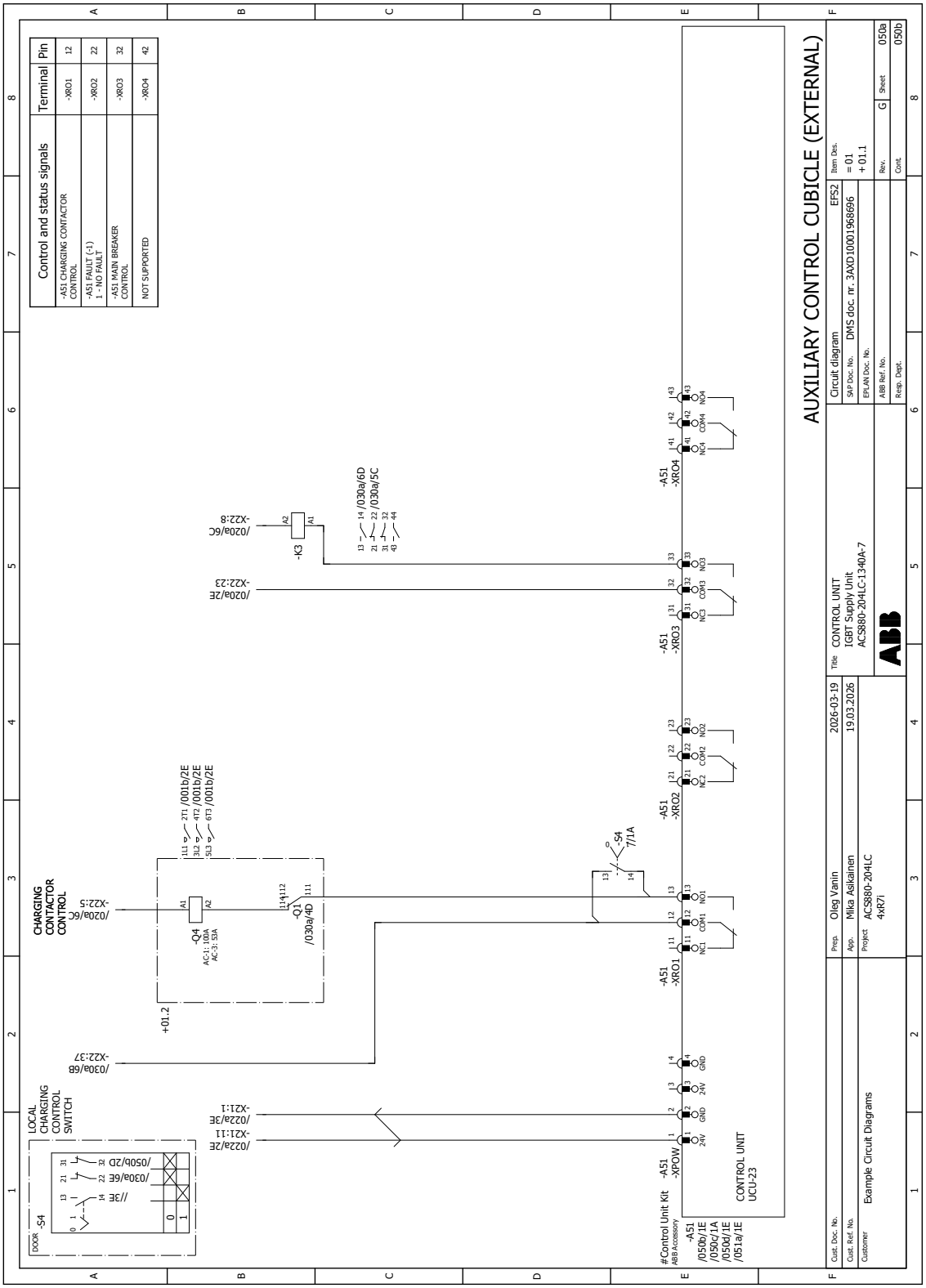

AUXILIARY CONTROL CUBICLE (EXTERNAL)
EXTERNAL AUXILIARY VOLTAGE SUPPLY
PROVIDED BY USER
MAX FUSE 40 A gG
L
230V
50Hz
N
-Q20
40A
-F20.1
16A
-X22
115/230VAC (L)
-X22
115/230VAC (N)
-F29:1
24 VDC
-F24
10A
-F23
6A
-X22
-K8
TEMP
FAULT
-X6.99
-X6.1:1
-X6.10:2
MAIN BREAKER
CONTROL
-K3:A2
24 VDC
-T22:N
BDPS
-XSS.1:2
MAIN BREAKER
CONTROL
-Q4:A1
CABINET
FAN
-XZ5.99:201
INTERNAL
POWER SUPPLY
(BDPS)
CABINET
FAN
-XZ5.99:211
-XSS.1:1
-A51-XRO3:32
-K3:21
-XZ2:39
AUXILIARY VOLTAGE DISTRIBUTION
IGBT Supply Unit
ACS880-204LC-1340A-7
ABB
EFS2
= 01
+ 01.1
020a
022a

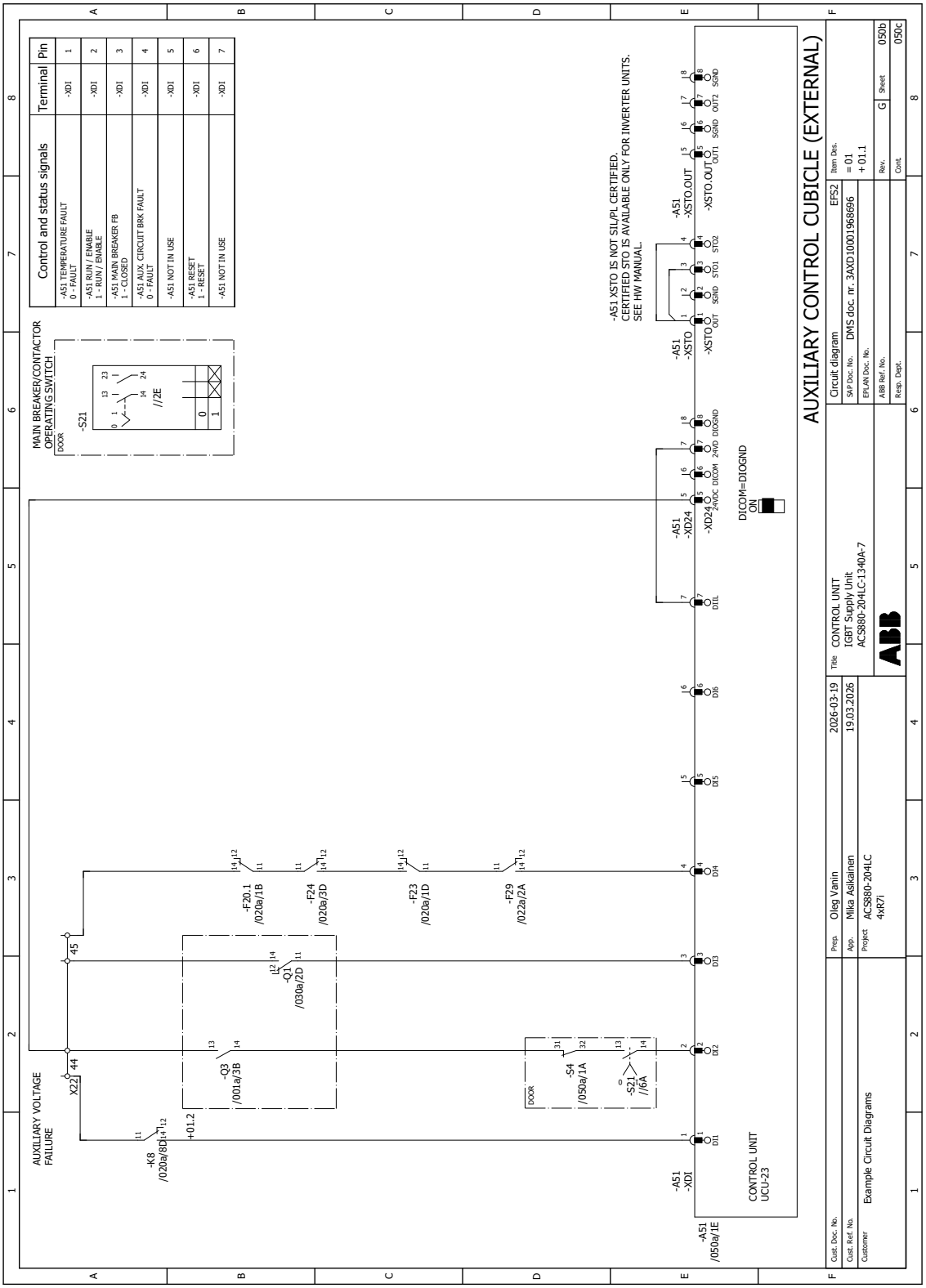

AUXILIARY CONTROL CUBICLE (EXTERNAL)
Circuit diagram
EFS2
Item Des.
= 01
+ 01.1
SAP Doc. No.
DMS doc. nr. 3AXD10001968696
EPLAN Doc. No.
ABB Ref. No.
Rev.
G
Sheet
022a
026a
Resp. Dept.
Cont.
Title
CONTROL VOLTAGE DISTRIBUTION
IGBT Supply Unit
ACS880-2041LC-1340A-7
Prep.
Oleg Vanin
2026-03-19
Appr.
Mika Aalkainen
19.03.2026
Project
ACS880-2041LC
4xR7i
Customer
Example Circuit Diagrams
Cust. Doc. No.
Cust. Ref. No.
POWER 24V
/020a/2C
-XZ2:13
/020a/6C
-XZ2:7
-F29
6A
/050b/3D
-T22
24 V DC, 5 A
POWER SUPPLY 24V
Alarm
-X22.3
PE1
NOTE! WITH UNINSULATED FERRULE
-X21
MAIN BREAKER CONTROL
/030a/2A
-T30:L
BAMU
/007a/7B
-A7:-XPOW:2
CIO
/026a/1C
-A115.99:-XPOW:2
UCU
/050a/1B
-A51-XPOW:2
UCU
/050a/1B
-A51-XPOW:1
CIO
/026a/1C
-A115.99:-XPOW:1
BAMU
/007a/7B
-A7:-XPOW:1
MAIN BREAKER CONTROL
/030a/2A
-T30:N

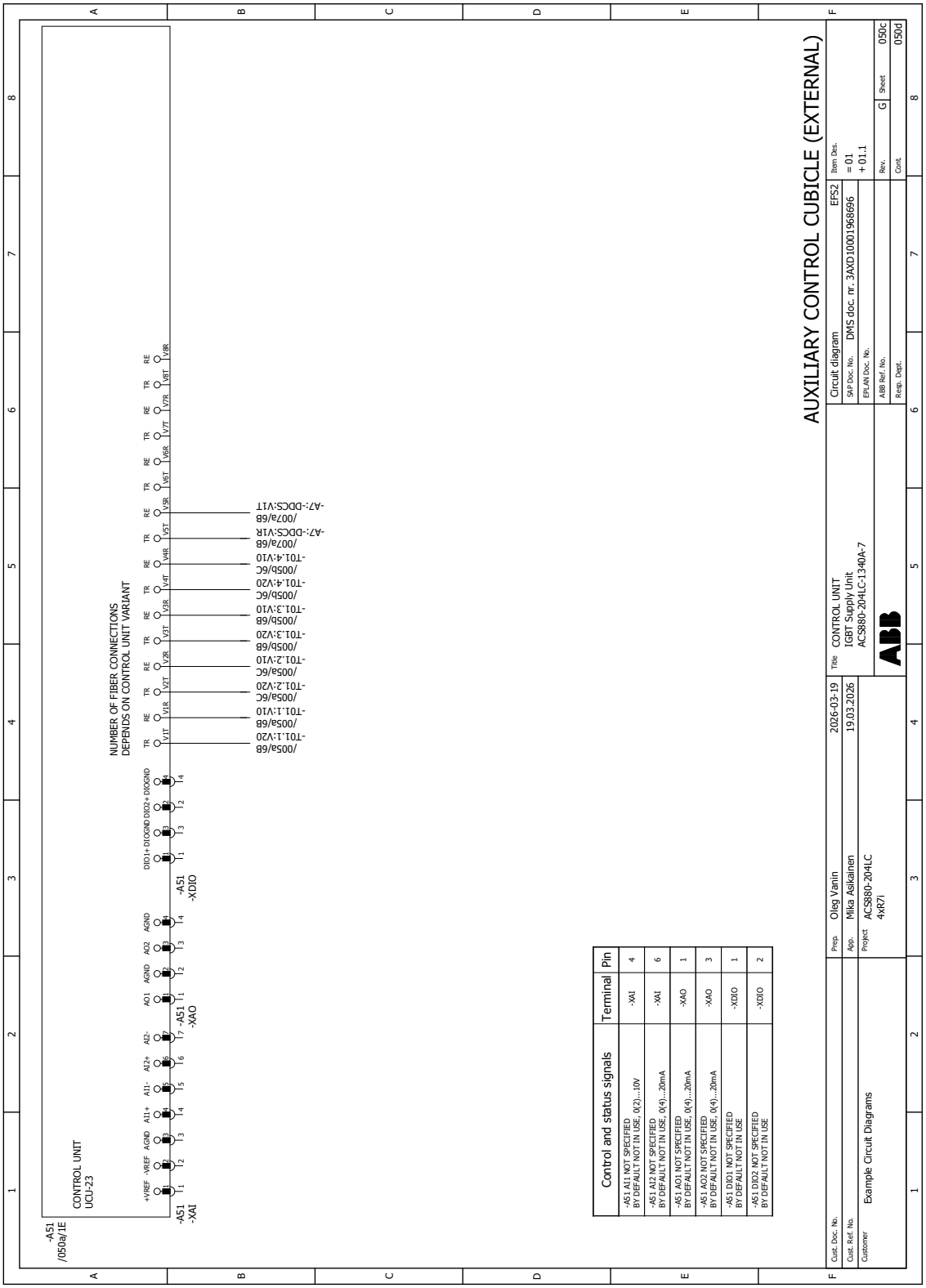

AUXILIARY CONTROL CUBICLE (EXTERNAL)
CABINET FAN CONTROL
IGBT Supply Unit
ACS880-204LC-1340A-7
EFS2
Circuit diagram
DMS doc. nr. 3AXD10001968696
= 01
+ 01.1
Oleg Vanin
Mika Aslkainen
ACS880-204LC
4xR7i
2026-03-19
19.03.2026
Example Circuit Diagrams
*) THE NUMBER OF FANS AND CIO MODULES REQUIRED DEPENDS ON THE COOLING FAN CONFIGURATION
Control and status signals
Terminal
Pin
FAN 1 SUPERVISION
Speed warning limit 75%
Speed fault limit 50%
-XDIO1
11
FAN 2 SUPERVISION
Speed warning limit 75%
Speed fault limit 50%
-XDIO2
21
FAN 3 SUPERVISION
Speed warning limit 75%
Speed fault limit 50%
-XDIO3
31
FAN 4 SUPERVISION
Speed warning limit 75%
Speed fault limit 50%
-XDIO4
41
MCB MONITORING ACTION
0 = WARNING
-XDI1
1
FUSE MONITORING ACTION
0 = WARNING
-XDI1
3
CIO-01 NODE: 01
Not Terminated
-A115.99
CIO-01
-XPOW
-X485
-XSH.99
-W1
-W4
-X115.99
-G115.99
-F115.99
-X115.1
-G115.1
-F115.1
-XDIO1
-XDIO2
-XDIO3
-XDIO4
-XDI1
-XDI2
-XAI1
-XAI2
+01.2
Incoming unit (External)
-X25.99
-X25.1
-F24:1
-X22:4
-A51-X485:7
-A51-X485:6
-A51-X485:5
-X21:12
-X21:2
-A115.1:-XPOW:1
-A115.1:-XPOW:2
-A115.1:-X485:3
-A115.1:-X485:2
-A115.1:-X485:1
FRAME

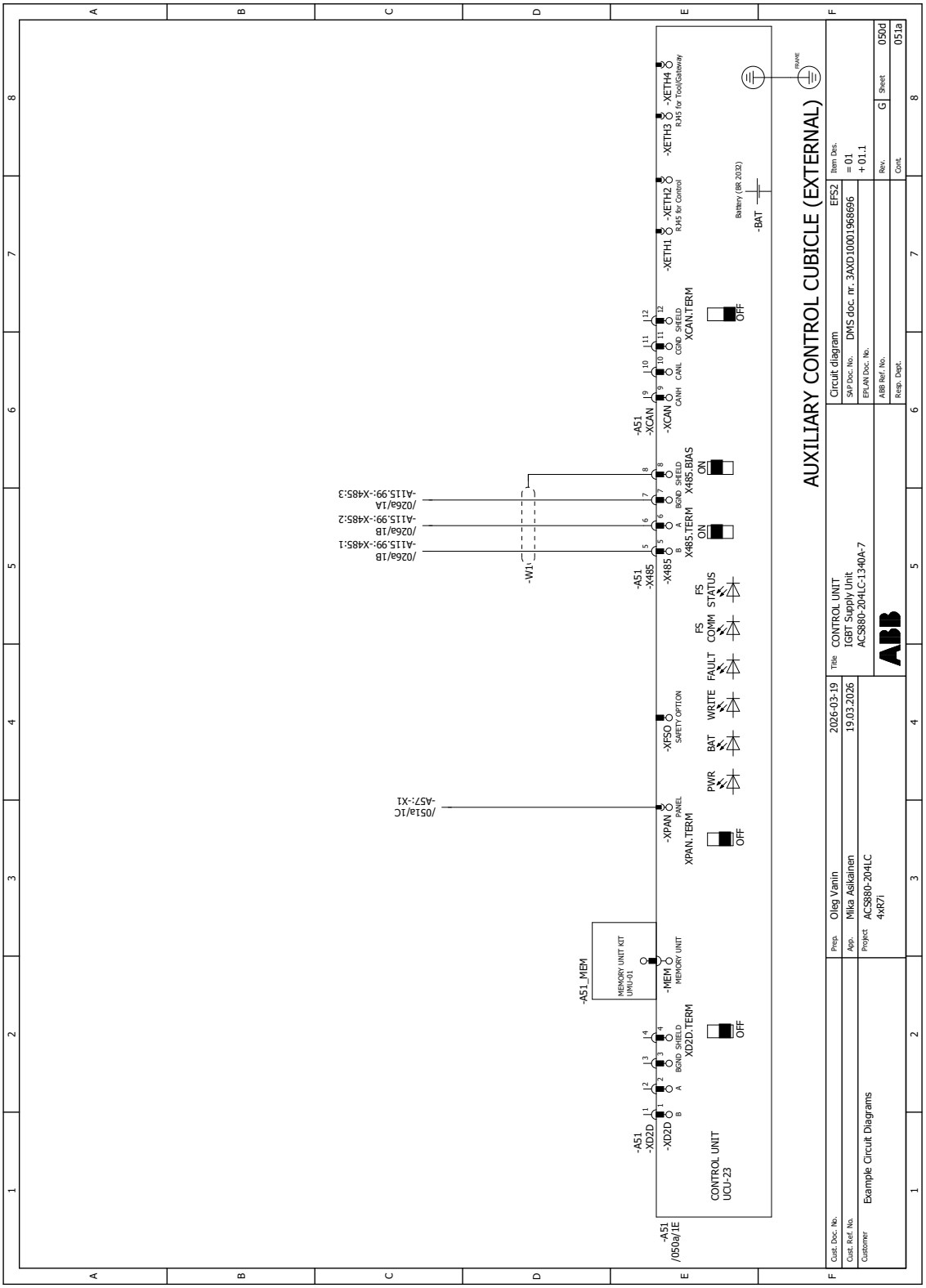

IGBT SUPPLY CUBICLE
CIO-01 NODE: 02
Terminated
*) THE NUMBER OF FANS AND CIO MODULES REQUIRED DEPENDS ON THE COOLING FAN CONFIGURATION
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10001968696
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.5
Rev.
G
Sheet
026b
Cont.
030a
Title
CABINET FAN CONTROL
IGBT Supply Unit
ACS880-2041LC-1340A-7
2026-03-19
19.03.2026
Prep.
Oleg Vanin
Appr.
Mika Asikainen
Project
ACS880-2041LC
4xR7i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
+01.3
1st LCL cubicle
+01.4
2nd LCL cubicle
-A115.1
CIO-01
-XPOW
-X485
-XSH.99
-XDIO1
-XDIO2
-XDIO3
-XDIO4
-XDI1
-XDI2
-XAI1
-XAI2
-X25.2
-X25.3
-X25.11
-F115.2
-F115.3
-F115.11
-X115.2
-X115.3
-X115.11
-G115.2
-G115.3
-G115.11
-W1
-W4
-W6
FRAME

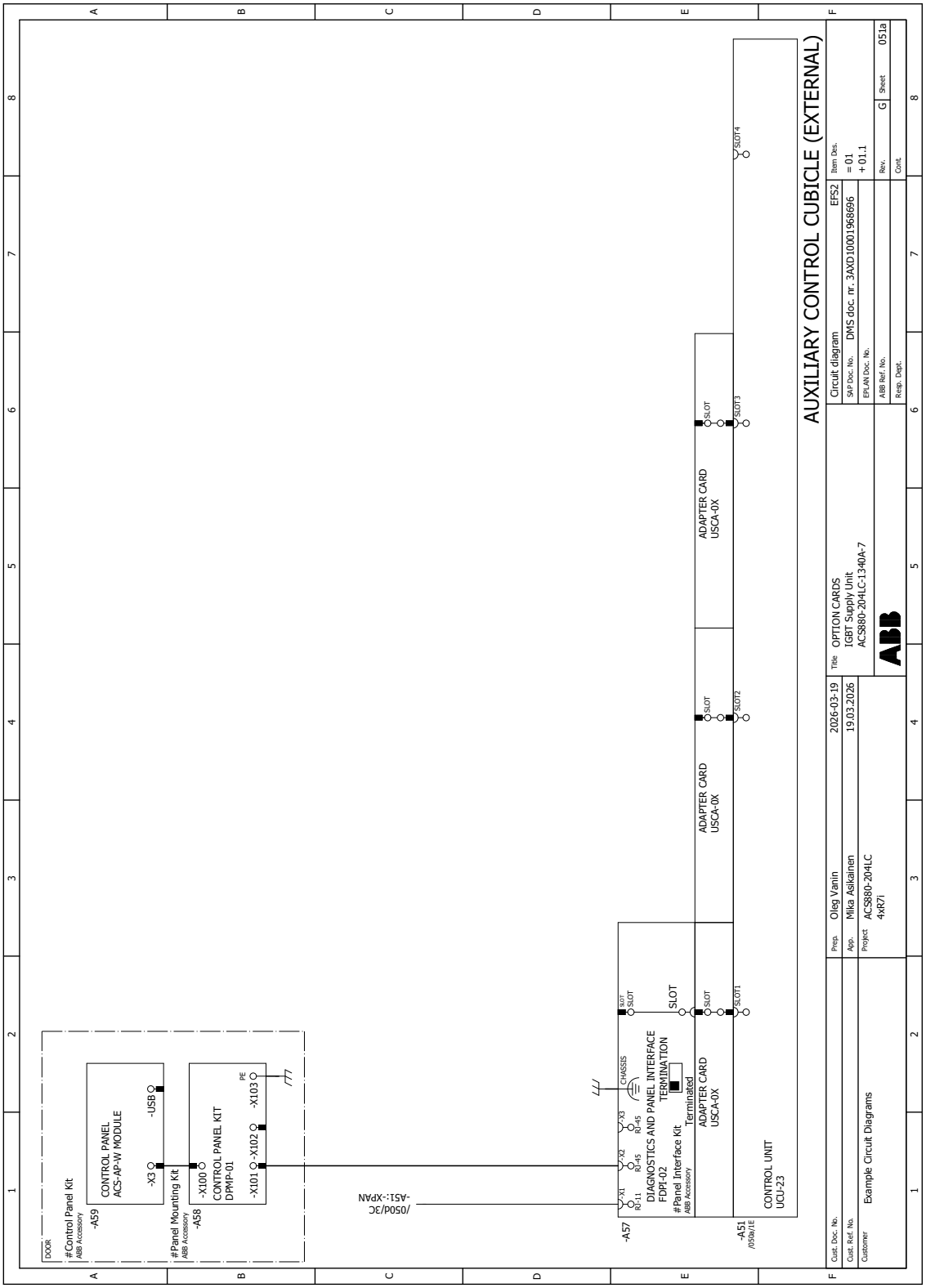

AUXILIARY CONTROL CUBICLE (EXTERNAL)
MAIN BREAKER CONTROL
POWER SUPPLY 24V
-T30
2,5A
-Q1
2000A
#Main Breaker
ABB Accessory
-K3
/050a/5B
-S4
/050a/1A
-X22
AUP CONTACT POSITIONS
CONTACT POSITION WHEN CIRCUIT-BREAKER OPEN
/001a/6A
MAIN BREAKER CONTROL
IGBT Supply Unit
ACS880-204LC-1340A-7
ABB
EFS2
= 01
+ 01.1
030a
050a
Example Circuit Diagrams
ACS880-204LC
4xR7i
2026-03-19
19.03.2026
Oleg Vanin
Mika Asikainen


AUXILIARY CONTROL CUBICLE (EXTERNAL)
Control and status signals
Terminal
Pin
-A51 CHARGING CONTACTOR CONTROL
-XRO1
12
-A51 FAULT (-1) 1 - NO FAULT
-XRO2
22
-A51 MAIN BREAKER CONTROL
-XRO3
32
NOT SUPPORTED
-XRO4
42
LOCAL CHARGING CONTROL SWITCH
-S4
DOOR
CHARGING CONTACTOR CONTROL
-Q4
AC-1: 10kA
AC-3: 5kA
-Q1
/030a/4D
+01.2
-A51
-XPOW
-A51
-XRO1
-A51
-XRO2
-A51
-XRO3
-A51
-XRO4
CONTROL UNIT
UCU-23
#Control Unit Kit
ABB Accessory
-A51
/050b/1E
/050c/1A
/050d/1E
/051a/1E
CONTROL UNIT
IGBT Supply Unit
ACS880-204LC-1340A-7
Circuit diagram
EFS2
DMS doc. nr. 3AXD10001968696
Example Circuit Diagrams
ACS880-204LC
4xR7i
Oleg Vanin
Mika Asikainen
2026-03-19
19.03.2026


AUXILIARY CONTROL CUBICLE (EXTERNAL)
Control and status signals
Terminal
Pin
-A51 TEMPERATURE FAULT 0 - FAULT
-A51 RUN / ENABLE 1 - RUN / ENABLE
-A51 MAIN BREAKER FB 1 - CLOSED
-A51 AUX. CIRCUIT BRK FAULT 0 - FAULT
-A51 NOT IN USE
-A51 RESET 1 - RESET
-A51 NOT IN USE
-XDI
MAIN BREAKER/CONTACTOR OPERATING SWITCH
DOOR
-S21
//2E
-A51 XSTO IS NOT SIL/PL CERTIFIED.
CERTIFIED STO IS AVAILABLE ONLY FOR INVERTER UNITS.
SEE HW MANUAL.
-A51 -XSTO
-XSTO.OUT
-A51 -XD24
-XD24
DICOM=DIOGND
ON
AUXILIARY VOLTAGE FAILURE
X22
44
45
+01.2
-K8 /020a/8D
-Q3 /001a/3B
-Q1 /030a/2D
-F20.1 /020a/1B
-F24 /020a/3D
-F23 /020a/1D
-F29 /022a/2A
-S4 /050a/1A
-S21 //6A
-A51 -XDI
-A51 /050a/1E
CONTROL UNIT UCU-23
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10001968696
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.1
Rev.
G
Sheet
050b
Cont.
050c
Title
CONTROL UNIT
IGBT Supply Unit
ACS880-204LC-1340A-7
Prep.
Oleg Vanin
2026-03-19
Appr.
Mika Aalkainen
19.03.2026
Project
ACS880-204LC
4xR7i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams


AUXILIARY CONTROL CUBICLE (EXTERNAL)
CONTROL UNIT
UCU-23
-A51
/050a/1E
-A51
-XAI
-A51
-XAO
-A51
-XDIO
NUMBER OF FIBER CONNECTIONS
DEPENDS ON CONTROL UNIT VARIANT
-A7:-DDCS:V1T /007a/6B
-A7:-DDCS:V1R /007a/6B
-T01.4:V10 /005b/6C
-T01.4:V20 /005b/6C
-T01.3:V10 /005b/6B
-T01.3:V20 /005b/6B
-T01.2:V10 /005a/6C
-T01.2:V20 /005a/6C
-T01.1:V10 /005a/6B
-T01.1:V20 /005a/6B
Control and status signals
Terminal
Pin
-A51 AI1 NOT SPECIFIED BY DEFAULT NOT IN USE, 0(2)...10V
-XAI
4
-A51 AI2 NOT SPECIFIED BY DEFAULT NOT IN USE, 0(4)...20mA
-XAI
6
-A51 AO1 NOT SPECIFIED BY DEFAULT NOT IN USE, 0(4)...20mA
-XAO
1
-A51 AO2 NOT SPECIFIED BY DEFAULT NOT IN USE, 0(4)...20mA
-XAO
3
-A51 DIO1 NOT SPECIFIED BY DEFAULT NOT IN USE
-XDIO
1
-A51 DIO2 NOT SPECIFIED BY DEFAULT NOT IN USE
-XDIO
2
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep.
Oleg Vanin
2026-03-19
Appr.
Mika Asikainen
19.03.2026
Project
ACS880-204LC
4xR7i
Title
CONTROL UNIT
IGBT Supply Unit
ACS880-204LC-1340A-7
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10001968696
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.1
Rev.
G
Sheet
050c
Cont.
050d


AUXILIARY CONTROL CUBICLE (EXTERNAL)
CONTROL UNIT
UCU-23
-A51
-XD2D
-XD2D
-XPAN
-XFSO
-X485
-XCAN
-XETH1
-XETH2
-XETH3
-XETH4
-MEM
-A51_MEM
-W1
-BAT
Battery (BR 2032)
XD2D.TERM
XPAN.TERM
X485.TERM
X485.BIAS
XCAN.TERM
PWR
BAT
WRITE
FAULT
FS COMM
FS STATUS
CONTROL UNIT
IGBT Supply Unit
ACS880-204LC-1340A-7
EFS2
DMS doc. nr: 3AXD10001968696
Example Circuit Diagrams
ACS880-204LC
4xR7i
2026-03-19
19.03.2026
Oleg Vanin
Mika Asikainen


AUXILIARY CONTROL CUBICLE (EXTERNAL)
DOOR
#Control Panel Kit
ABB Accessory
-A59
CONTROL PANEL
ACS-AP-W MODULE
-X3
-USB
#Panel Mounting Kit
ABB Accessory
-A58
-X100
CONTROL PANEL KIT
DPMP-01
-X101
-X102
-X103
PE
/050d/3C
-A51:-XPAN
-A57
X1
RJ-11
X2
RJ-45
X3
RJ-45
CHASSIS
SLOT
DIAGNOSTICS AND PANEL INTERFACE
FDPI-02
#Panel Interface Kit
ABB Accessory
TERMINATION
Terminated
ADAPTER CARD
USCA-0X
CONTROL UNIT
UCU-23
-A51
/050a/1E
SLOT1
SLOT2
SLOT3
SLOT4
Prep.
Oleg Vanin
2026-03-19
Appr.
Mika Asikainen
19.03.2026
Project
ACS880-204LC
4xR7i
Title
OPTION CARDS
IGBT Supply Unit
ACS880-204LC-1340A-7
EFS2
Item Des.
= 01
+ 01.1
SAP Doc. No.
DMS doc. nr. 3AXD10001968696
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Rev.
G
Sheet
051a
Cont.
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams

# Frame 2×R8i


Example Circuit Diagrams
Project type
ACS880-204LC
IGBT Supply Unit
Converter type
2×R8i
Frame Size
ACS880-204LC-1180A-7
Type Code
Revision L
Used EPLAN Version: 2025.0.3.23406
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep. Oleg Vanin 19.03.2026
App. Mika Asikainen 19.03.2026
Project ACS880-204LC 2×R8i
Title Title page / cover sheet IGBT Supply Unit ACS880-204LC-1180A-7
ABB
Circuit diagram
EFS2
SAP Doc. No. DMS doc. nr. 3AXD10000695767
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
=
+
Rev. L Sheet 000A
Cont. 000B

| Higher-level function | Page | Page description | Revision |
|---|---|---|---|
| | 000A | Title page / cover sheet | L |
| | 000C | Structured identifier overview | L |
| | 000D | Summarized parts list | L |
| | 000E | Summarized parts list | L |
| | 000F | Summarized parts list | L |
| | 200A | Overview diagram | L |
| | 300A | Symbol Overview | L |
| 01 | 001a | Main supply, Aux. supply switch | L |
| | 001b | Line-up charging circuit | L |
| | 002a | LCL filter | L |
| | 003a | Drive main circuit | L |
| | 004a | Unit charging circuit | L |
| | 005a | Module control circuit | L |
| | 020a | Auxiliary transformer | L |
| | 020b | External fan supply | L |
| | 021a | Auxiliary circuit | L |
| | 022a | 24V Distribution | L |
| | 026a | ACU/ICU fan control | L |
| | 026c | LCL fan control | L |
| | 026d | ISU fan control | L |
| | 030a | Air circuit breaker | L |
| | 050a | Control unit | L |
| | 050b | Control unit | L |
| | 050c | Control unit | L |
| | 050d | Control unit | L |
| | 051a | Option cards | L |

| | | | |
|---|---|---|---|
| Cust. Doc. No. | Prep. Oleg Vanin 19.03.2026 | Title Table of contents<br>IGBT Supply Unit<br>ACS880-204LC-1180A-7 | Circuit diagram EFS2 / Item Des. |
| Cust. Ref. No. | App. Mika Asikainen 19.03.2026 | SAP Doc. No. DMS doc. nr. 3AXD10000695767 | = |
| Customer Example Circuit Diagrams | Project ACS880-204LC 2×R8i | EPLAN Doc. No. | + |
| | | ABB Ref. No. | Rev. L / Sheet 000B |
| | | Resp. Dept. | Cont. 000C |

## Function designations

| Designation | Structure description |
|---|---|
| =01 | IGBT Supply Unit |
| | |
| | |
| | |
| | |
| | |
| | |

## Location designations

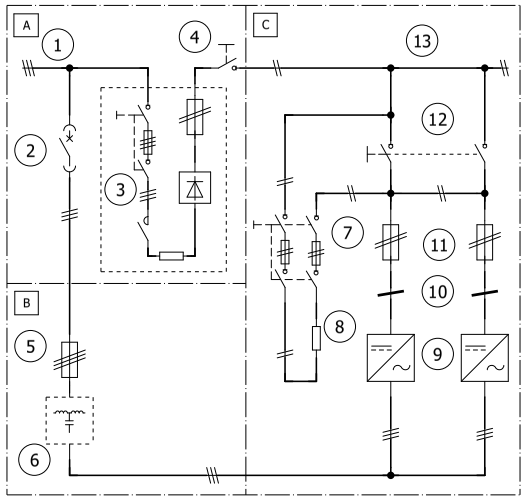
| Designation | Structure description |
|---|---|
| +01.1 | Auxiliary Control Cubicle (External) |
| +01.2 | Incoming Cubicle (External) |
| +01.3 | LCL Filter Cubicle |
| +01.4 | IGBT Supply Cubicle |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

## Electrical option designations

| Designation | Material Code | Quantity |
|---|---|---|
| #AC Fuse | 68689589 | 3 |
| #Air Circuit Breaker | 3AXD50000902965 | 1 |
| #CM Filter | 3AXD50000566785 | 4 |
| #Control Panel Kit | 3AXD50000025965 | 1 |
| #Control Unit Kit | ACS880UCU-204LC-22-0 | 1 |
| #Cooling Fan | 3AXD50000043886, 3AXD50000050763 | 3 |
| #DC Fuse | 63919462 | 4 |
| #DC Switch Kit | 3AXD50000227044 | 1 |
| #Fiber Optic | 58948233, 58988821 | 4 |
| #Fieldbus Adapter | 3AUA0000072069 | 1 |
| #Filter Unit Kit | 3AXD50000234431 | 1 |
| #Line-up Charging Kit | 3AXD50000250783 | 1 |
| #Line-up Charging Switch Kit | 3AXD50000507078 | 1 |
| #Panel Interface Kit | 3AUA0000108650 | 1 |
| #Panel Mounting Kit | 3AUA0000108878 | 1 |
| #Resistor | 10028531 | 6 |
| #Supply Module | ACS880-104LC-0670A-7 | 2 |
| #Unit Charging Kit | 3AXD50000226801 | 1 |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | | | | |
|---|---|---|---|---|---|
| Cust. Doc. No. | Prep. Oleg Vanin 19.03.2026 | Title Structured identifier overview<br>IGBT Supply Unit<br>ACS880-204LC-1180A-7 | Circuit diagram EFS2 | Item Des. | |
| Cust. Ref. No. | App. Mika Asikainen 19.03.2026 | | SAP Doc. No. DMS doc. nr. 3AXD10000695767 | = | |
| Customer Example Circuit Diagrams | Project ACS880-204LC<br>2×R8i | | EPLAN Doc. No. | + | |
| | | ABB | ABB Ref. No. | Rev. L | Sheet 000C |
| | | | Resp. Dept. | Cont. | 000D |

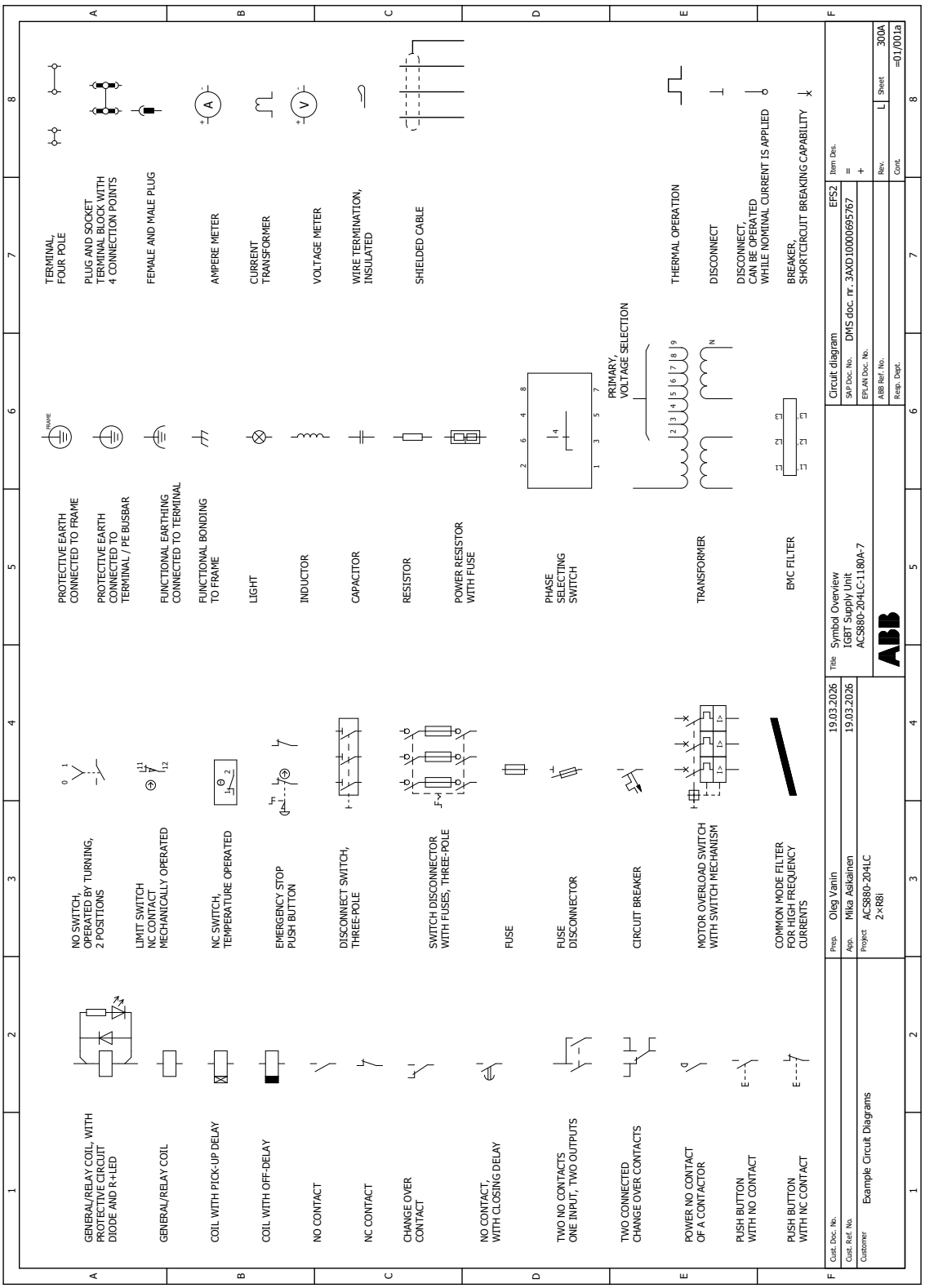
## Generic / Rittal enclosure

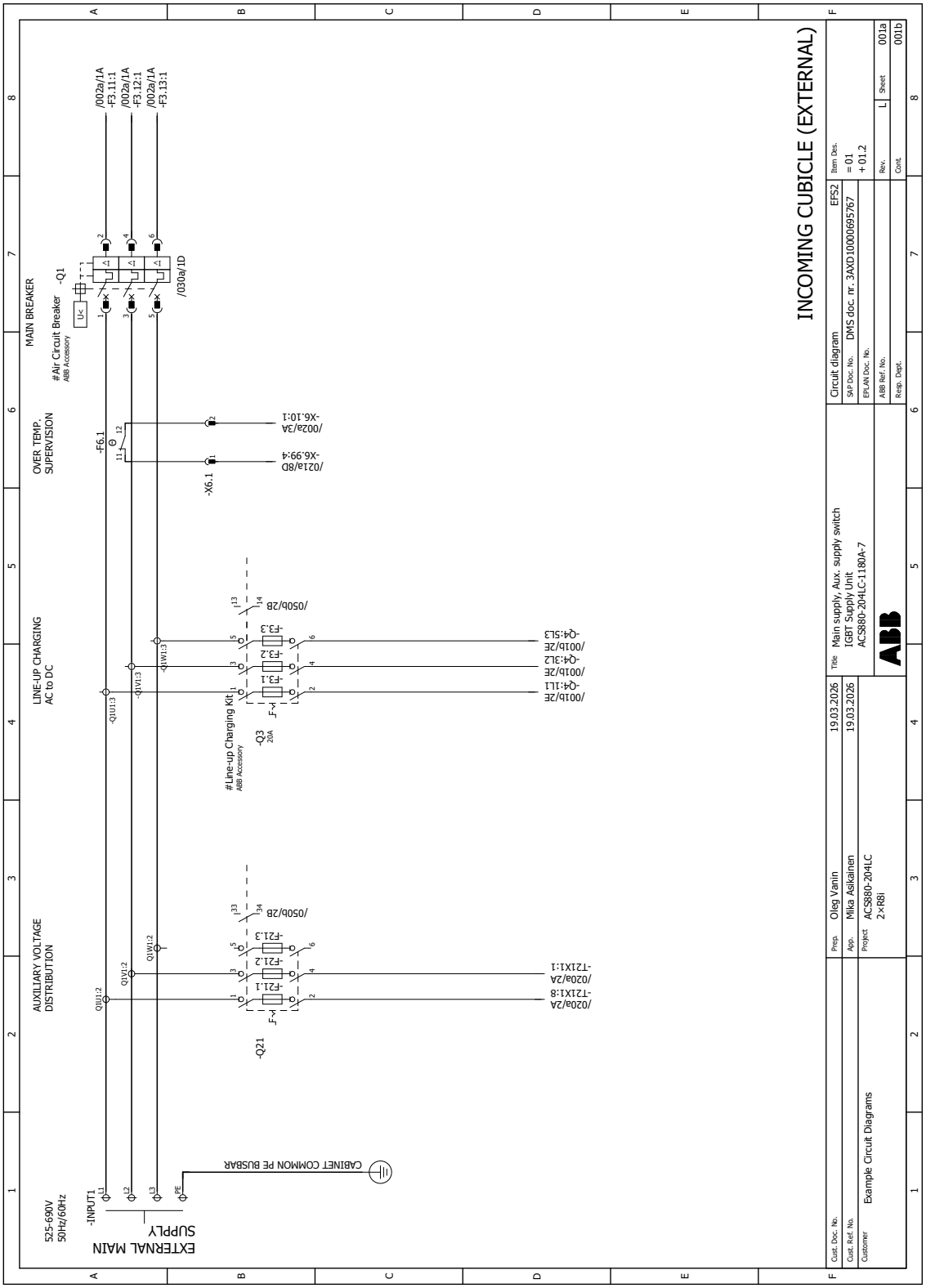


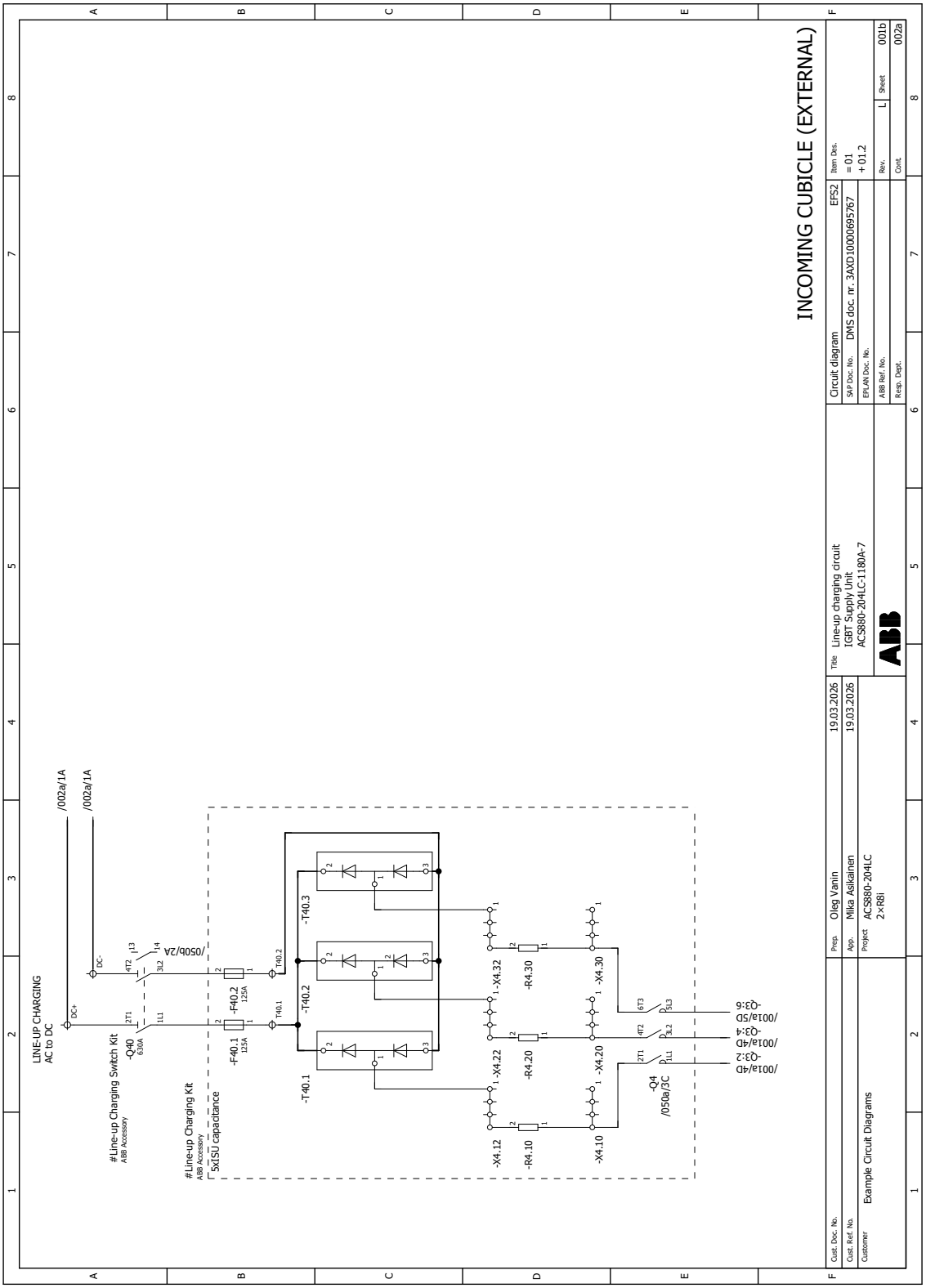

## Content

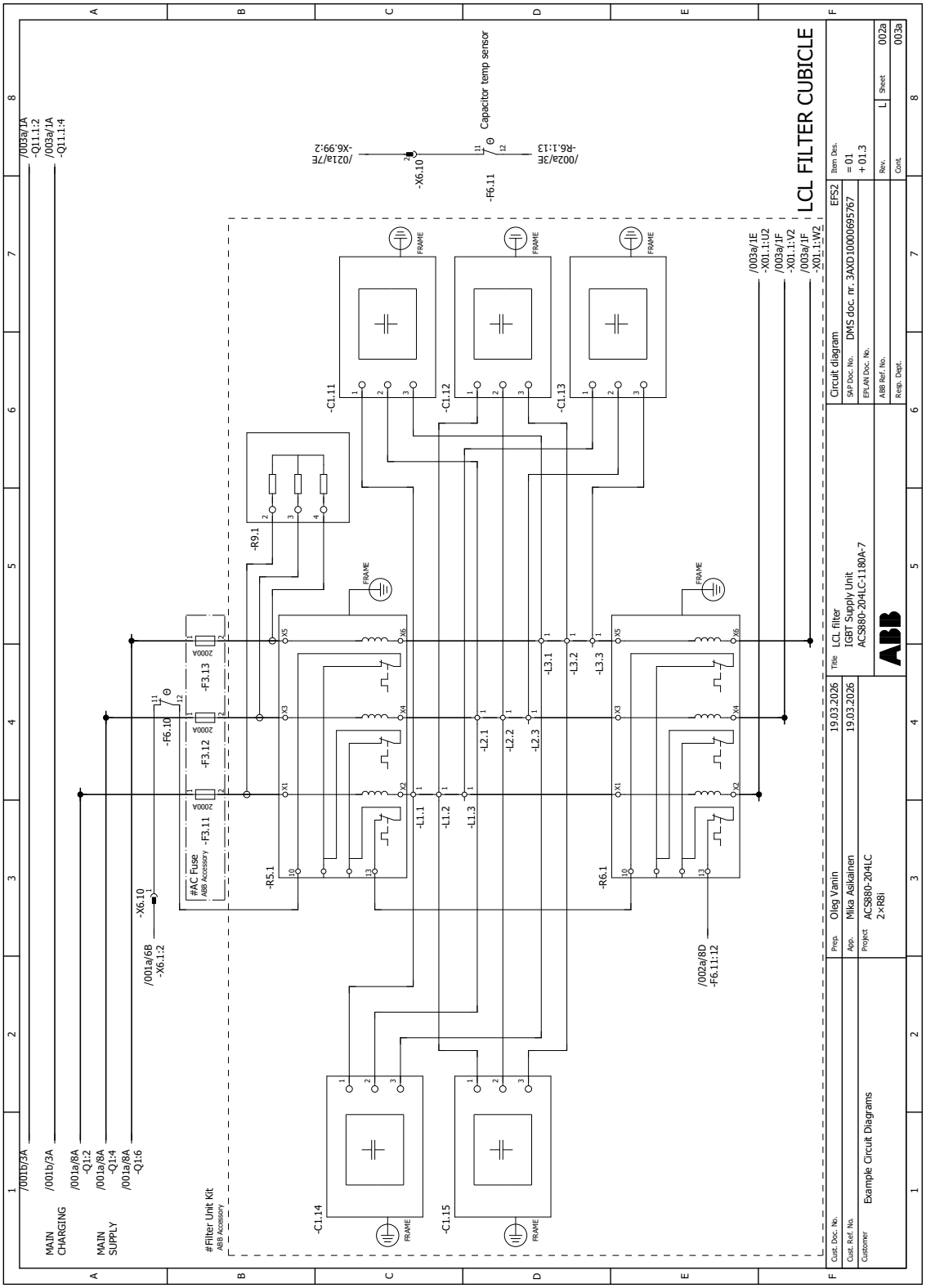
| Identifier | Location | Identifier | Component | Available through |
|---|---|---|---|---|
| A | Incoming cubicle | 1 | AC supply | - |
| A | Incoming cubicle | 2 | Main circuit breaker | ABB or third party |
| A | Incoming cubicle | 3 | AC-DC charging kit (line-up charging) | ABB or third party |
| A | Incoming cubicle | 4 | DC switch-disconnector for line-up charging | ABB or third party |
| B | LCL filter cubicle | 5 | AC fuses | ABB or third party |
| B | LCL filter cubicle | 6 | LCL filter kit | ABB |
| C | IGBT supply module cubicle | 7 | DC-DC charging kit (unit charging) | ABB or third party |
| C | IGBT supply module cubicle | 8 | Resistors for DC-DC charging | ABB or third party |
| C | IGBT supply module cubicle | 9 | IGBT supply module | ABB |
| C | IGBT supply module cubicle | 10 | Common mode filter | ABB |
| C | IGBT supply module cubicle | 11 | DC fuse | ABB or third party |
| C | IGBT supply module cubicle | 12 | DC switch-disconnector | ABB or third party |
| C | IGBT supply module cubicle | 13 | DC link | - |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

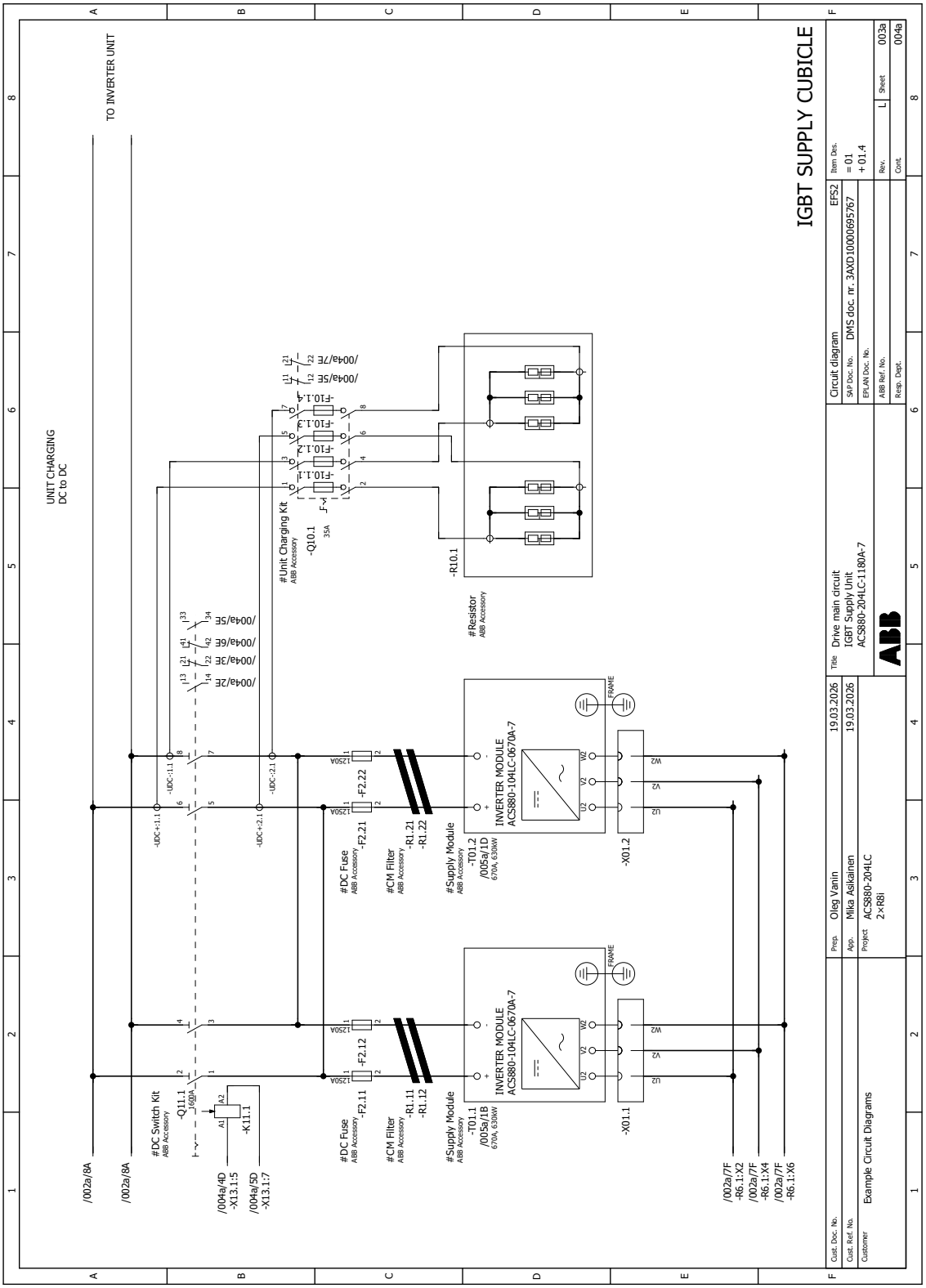
| | | | | |
|---|---|---|---|---|
| Cust. Doc. No. | Prep. Oleg Vanin 19.03.2026 | Title Overview diagram<br>IGBT Supply Unit<br>ACS880-204LC-1180A-7 | Circuit diagram EFS2 | Item Des. |
| Cust. Ref. No. | App. Mika Asikainen 19.03.2026 | | SAP Doc. No. DMS doc. nr. 3AXD10000695767 | = |
| Customer Example Circuit Diagrams | Project ACS880-204LC<br>2×R8i | | EPLAN Doc. No. | + |
| | | ABB | ABB Ref. No. | Rev. L Sheet 200A |
| | | | Resp. Dept. | Cont. 300A |

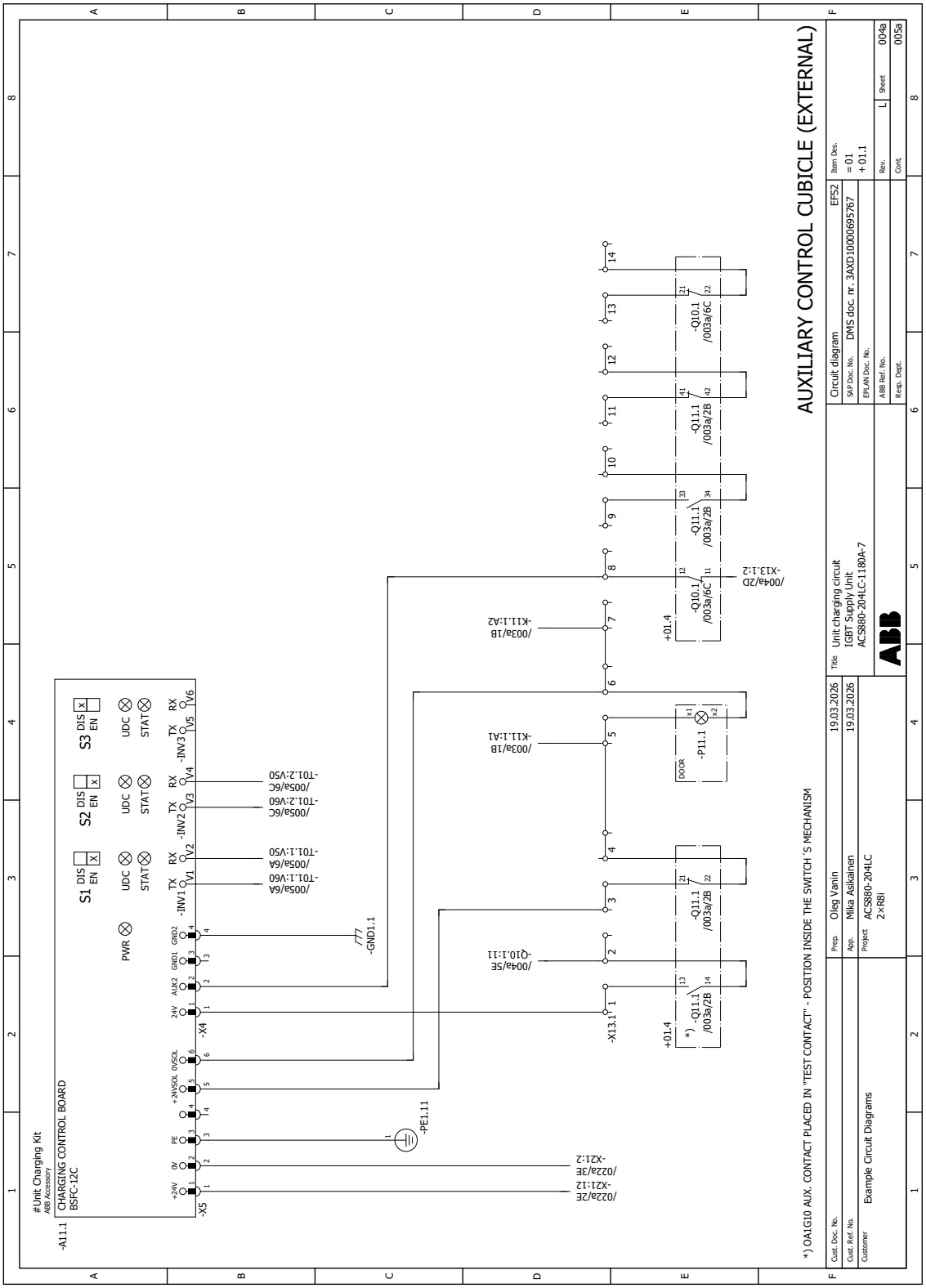

GENERAL/RELAY COIL, WITH PROTECTIVE CIRCUIT DIODE AND R+LED
GENERAL/RELAY COIL
COIL WITH PICK-UP DELAY
COIL WITH OFF-DELAY
NO CONTACT
NC CONTACT
CHANGE OVER CONTACT
NO CONTACT, WITH CLOSING DELAY
TWO NO CONTACTS ONE INPUT, TWO OUTPUTS
TWO CONNECTED CHANGE OVER CONTACTS
POWER NO CONTACT OF A CONTACTOR
PUSH BUTTON WITH NO CONTACT
PUSH BUTTON WITH NC CONTACT
NO SWITCH, OPERATED BY TURNING, 2 POSITIONS
LIMIT SWITCH NC CONTACT MECHANICALLY OPERATED
NC SWITCH, TEMPERATURE OPERATED
EMERGENCY STOP PUSH BUTTON
DISCONNECT SWITCH, THREE-POLE
SWITCH DISCONNECTOR WITH FUSES, THREE-POLE
FUSE
FUSE DISCONNECTOR
CIRCUIT BREAKER
MOTOR OVERLOAD SWITCH WITH SWITCH MECHANISM
COMMON MODE FILTER FOR HIGH FREQUENCY CURRENTS
PROTECTIVE EARTH CONNECTED TO FRAME
PROTECTIVE EARTH CONNECTED TO TERMINAL / PE BUSBAR
FUNCTIONAL EARTHING CONNECTED TO TERMINAL
FUNCTIONAL BONDING TO FRAME
LIGHT
INDUCTOR
CAPACITOR
RESISTOR
POWER RESISTOR WITH FUSE
PHASE SELECTING SWITCH
BMC FILTER
TERMINAL, FOUR POLE
PLUG AND SOCKET TERMINAL BLOCK WITH 4 CONNECTION POINTS
FEMALE AND MALE PLUG
AMPERE METER
CURRENT TRANSFORMER
VOLTAGE METER
WIRE TERMINATION, INSULATED
SHIELDED CABLE
PRIMARY, VOLTAGE SELECTION
TRANSFORMER
THERMAL OPERATION
DISCONNECT
DISCONNECT, CAN BE OPERATED WHILE NOMINAL CURRENT IS APPLIED
BREAKER, SHORTCIRCUIT BREAKING CAPABILITY
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep. Oleg Vanin 19.03.2026
Appr. Mika Aalkainen 19.03.2026
Project ACS880-204LC 2×R8i
Title Symbol Overview IGBT Supply Unit ACS880-204LC-1180A-7
ABB
Circuit diagram EFS2
SAP Doc. No. DMS doc. nr. 3AXD10000695767
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Dss.
Rev. L Sheet 300A
Cont. =01/001a

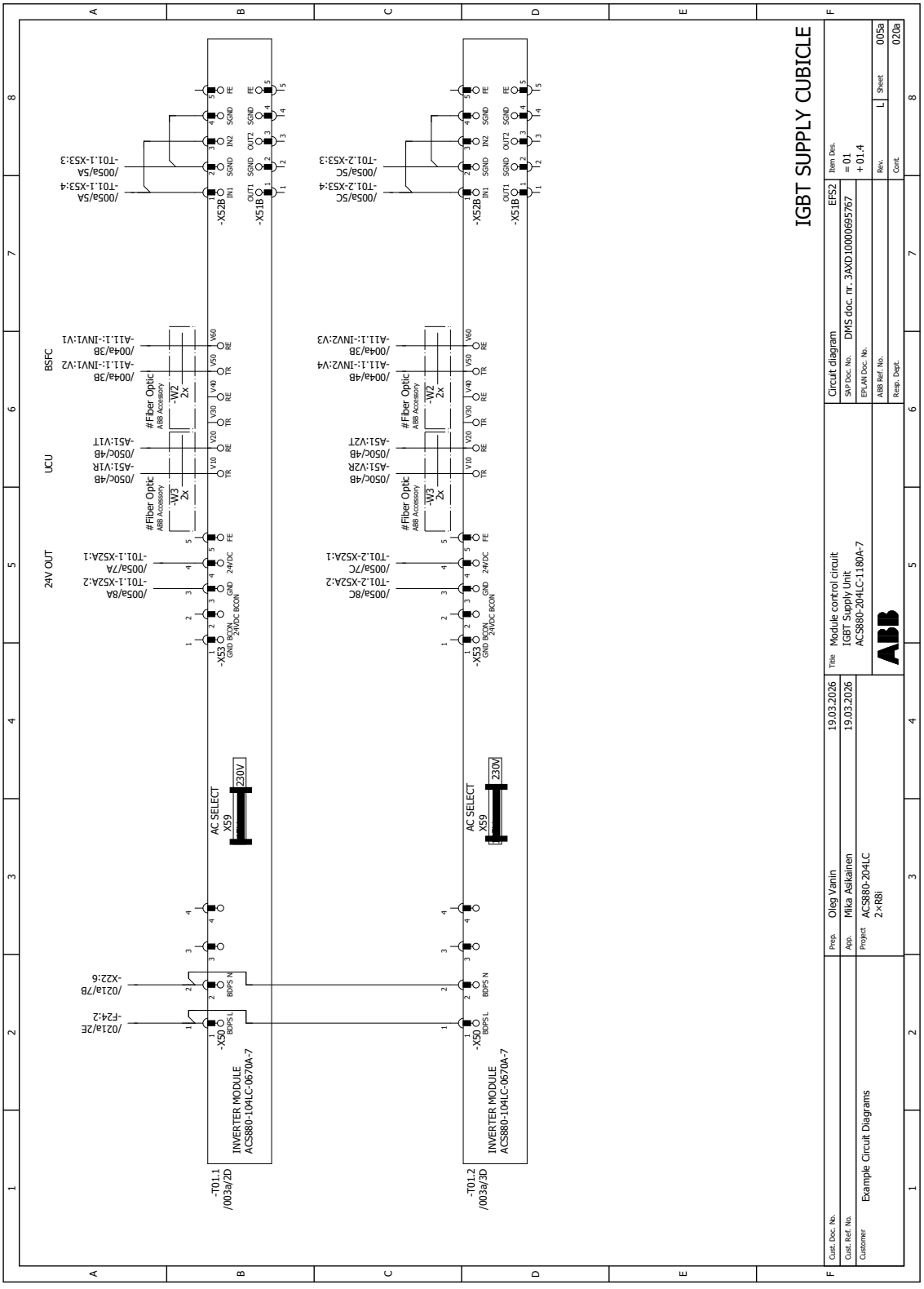

INCOMING CUBICLE (EXTERNAL)
EXTERNAL MAIN SUPPLY
525-690V 50Hz/60Hz
-INPUT1
AUXILIARY VOLTAGE DISTRIBUTION
LINE-UP CHARGING AC to DC
OVER TEMP. SUPERVISION
MAIN BREAKER
#Air Circuit Breaker ABB Accessory
-Q1
-F6.1
-X6.1
-Q21
-Q3 20A
#Line-up Charging Kit ABB Accessory
CABINET COMMON PE BUSBAR
Main supply, Aux. supply switch
IGBT Supply Unit
ACS880-204LC-1180A-7
EFS2
Circuit diagram
DMS doc. nr. 3AXD10000695767
Oleg Vanin
Mika Asikainen
19.03.2026
ACS880-204LC
2×R8i
Example Circuit Diagrams

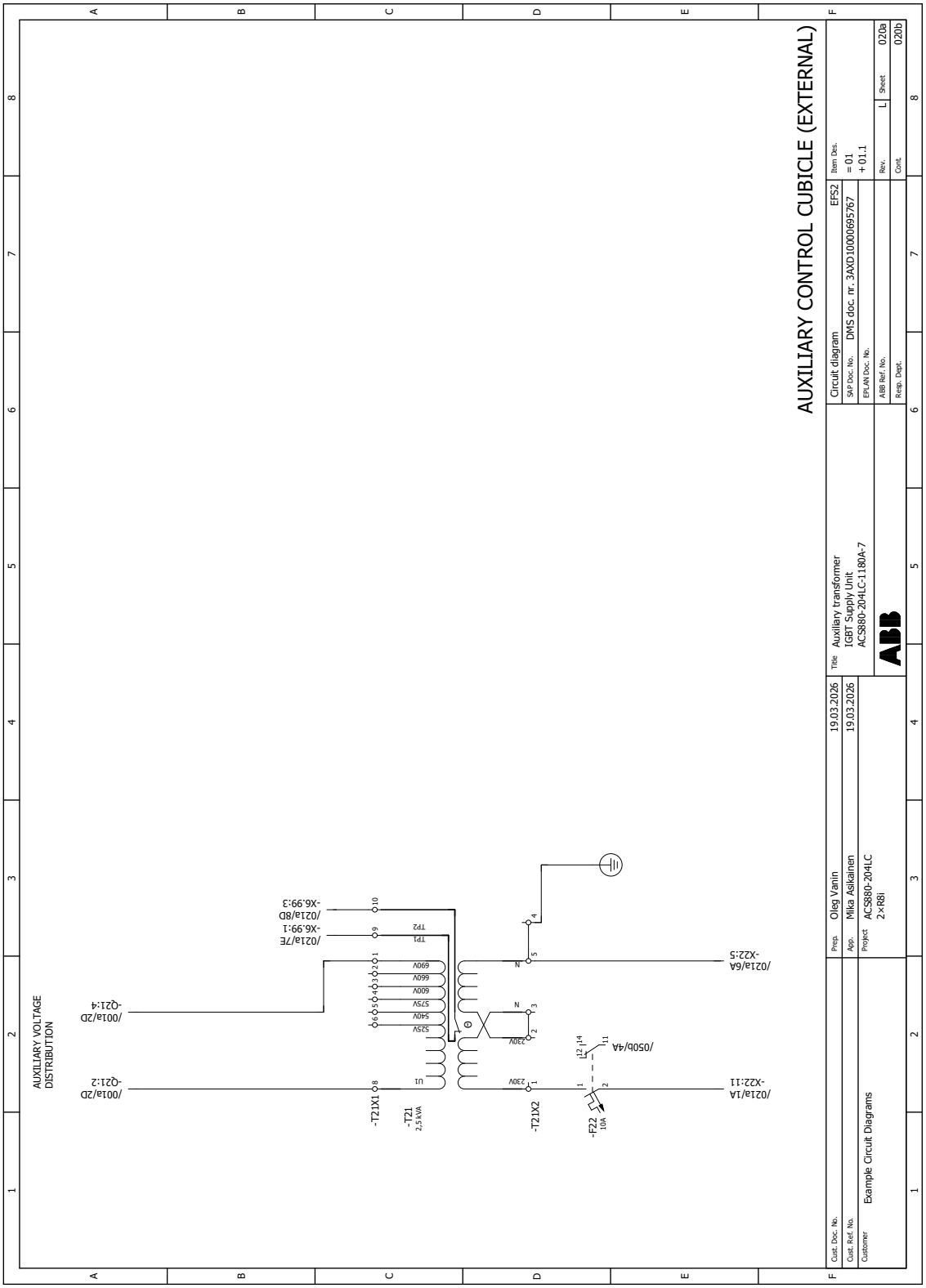

INCOMING CUBICLE (EXTERNAL)
LINE-UP CHARGING
AC to DC
/002a/1A
/002a/1A
DC+
DC-
#Line-up Charging Switch Kit
ABB Accessory
-Q40
630A
/050b/2A
#Line-up Charging Kit
ABB Accessory
5x1SU capacitance
-F40.1
125A
-F40.2
125A
-T40.1
-T40.2
-T40.3
-X4.12
-R4.10
-X4.22
-R4.20
-X4.32
-R4.30
-X4.10
-X4.20
-X4.30
-Q4
/050a/3C
/001a/4D
-Q3:2
/001a/4D
-Q3:4
/001a/5D
-Q3:6
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep.
Oleg Vanin
19.03.2026
Appr.
Mika Aalkainen
19.03.2026
Project
ACS880-204LC
2×R8i
Title
Line-up charging circuit
IGBT Supply Unit
ACS880-204LC-1180A-7
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10000695767
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.2
Rev.
L
Sheet
001b
Cont.
002a

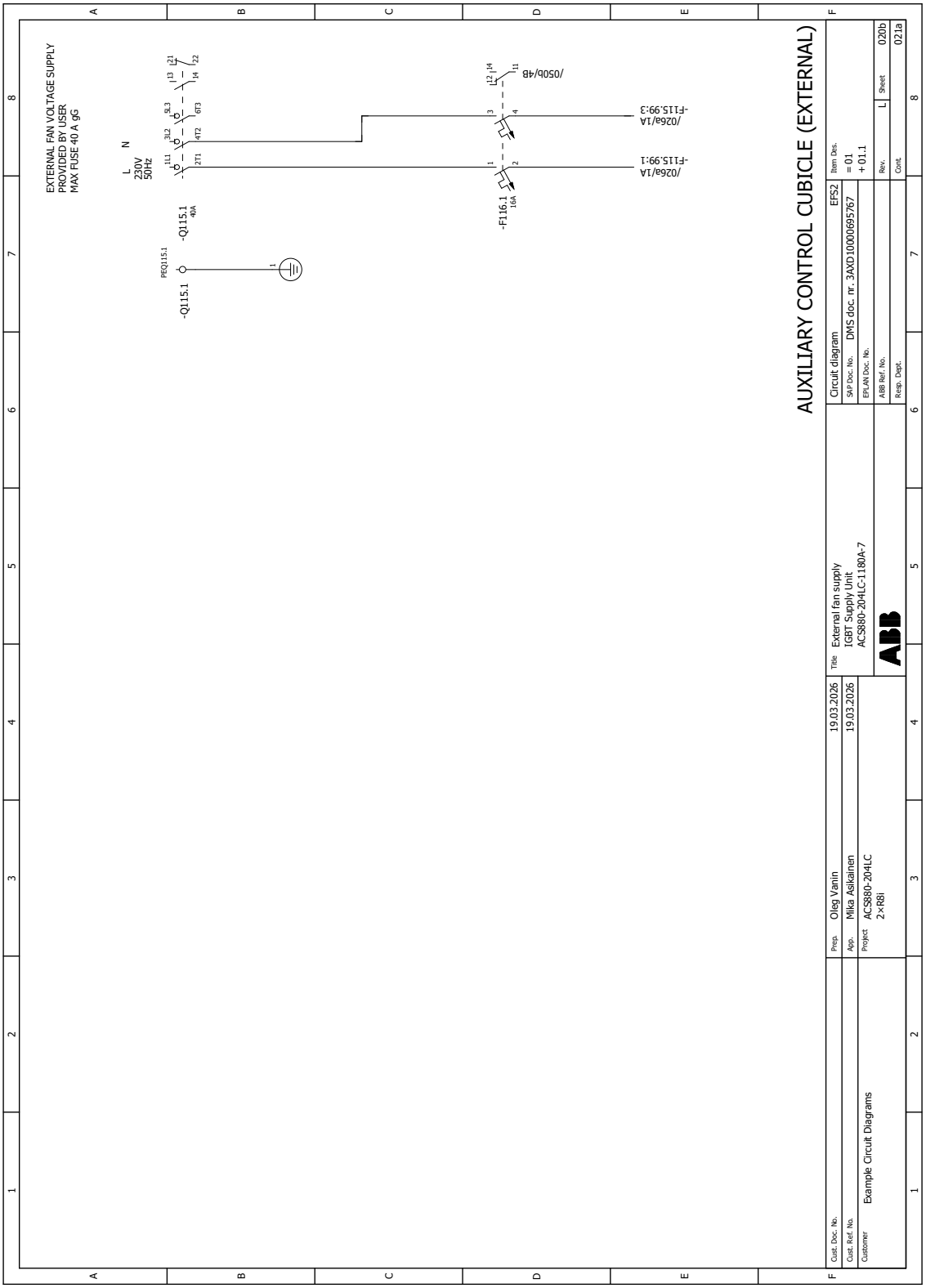

LCL FILTER CUBICLE
Capacitor temp sensor
/003a/JA -Q11.1:2
/003a/1A -Q11.1:4
/001b/3A
MAIN CHARGING
MAIN SUPPLY
/001a/8A -Q1:2
/001a/8A -Q1:4
/001a/8A -Q1:6
/001a/6B -X6.1:2
-X6.10
#Filter Unit Kit
ABB Accessory
#AC Fuse
ABB Accessory
-F3.11
-F3.12
-F3.13
-F6.10
-R5.1
-R6.1
-R9.1
-L1.1
-L1.2
-L1.3
-L2.1
-L2.2
-L2.3
-L3.1
-L3.2
-L3.3
-C1.11
-C1.12
-C1.13
-C1.14
-C1.15
FRAME
/002a/8D -f6.11:12
/003a/1E -X01.1:U2
/003a/1F -X01.1:V2
/003a/1F -X01.1:W2
/002a/3E -R6.1:13
-F6.11
-X6.10
/021a/7E -X6.99:2
Circuit diagram
EFS2
Item Des.
= 01
+ 01.3
SAP Doc. No.
DMS doc. nr. 3AXD10000695767
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Rev.
L
Sheet
002a
Cont.
003a
Title
LCL filter
IGBT Supply Unit
ACS880-204LC-1180A-7
Prep.
Oleg Vanin
19.03.2026
Appr.
Mika Asikainen
19.03.2026
Project
ACS880-204LC
2×R8i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams

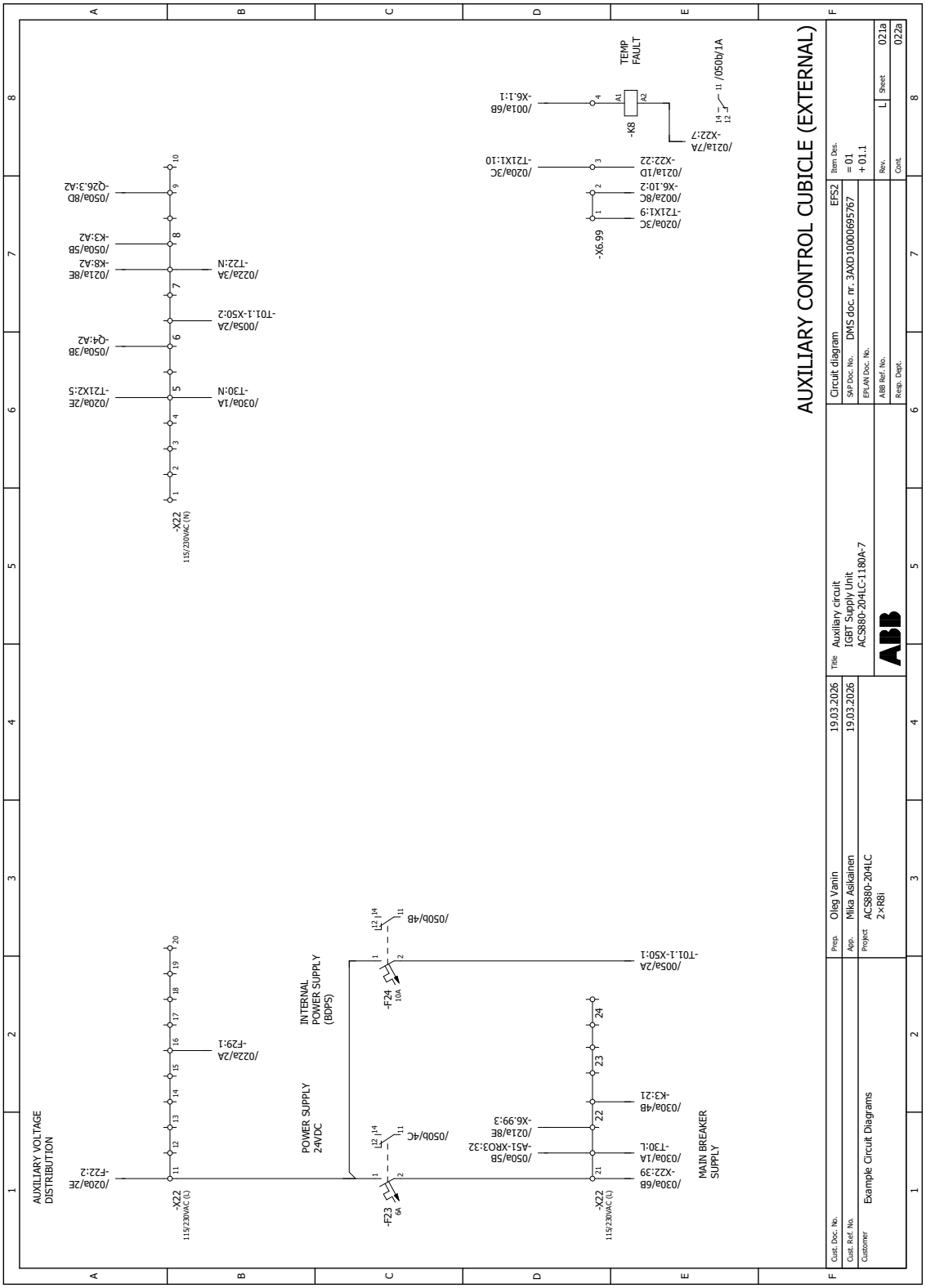

IGBT SUPPLY CUBICLE
TO INVERTER UNIT
UNIT CHARGING
DC to DC
#Unit Charging Kit
ABB Accessory
-Q10.1
35A
-F10.1.1
-F10.1.2
-F10.1.3
-F10.1.4
/004a/7E
/004a/5E
#Resistor
ABB Accessory
-R10.1
/004a/7R
/004a/3E
/004a/6E
/004a/5E
-UDC+1.1
-UDC-1.1
-UDC+2.1
-UDC-2.1
#DC Switch Kit
ABB Accessory
-Q11.1
160A
-K11.1
/004a/4D
-X13.1:5
/004a/5D
-X13.1:7
/002a/8A
/002a/8A
#DC Fuse
ABB Accessory
-F2.11
-F2.12
-F2.21
-F2.22
#CM Filter
ABB Accessory
-R1.11
-R1.12
-R1.21
-R1.22
#Supply Module
ABB Accessory
-T01.1
/005a/1B
670A, 630kW
-T01.2
/005a/1D
670A, 630kW
INVERTER MODULE
ACS880-104LC-0670A-7
FRAME
-X01.1
-X01.2
/002a/7F
-R6.1:X2
/002a/7F
-R6.1:X4
/002a/7F
-R6.1:X6
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10000695767
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.4
Rev.
L
Sheet
003a
Cont.
004a
Title
Drive main circuit
IGBT Supply Unit
ACS880-204LC-1180A-7
Prep.
Oleg Vanin
19.03.2026
App.
Mika Asikainen
19.03.2026
Project
ACS880-204LC
2×R8i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams

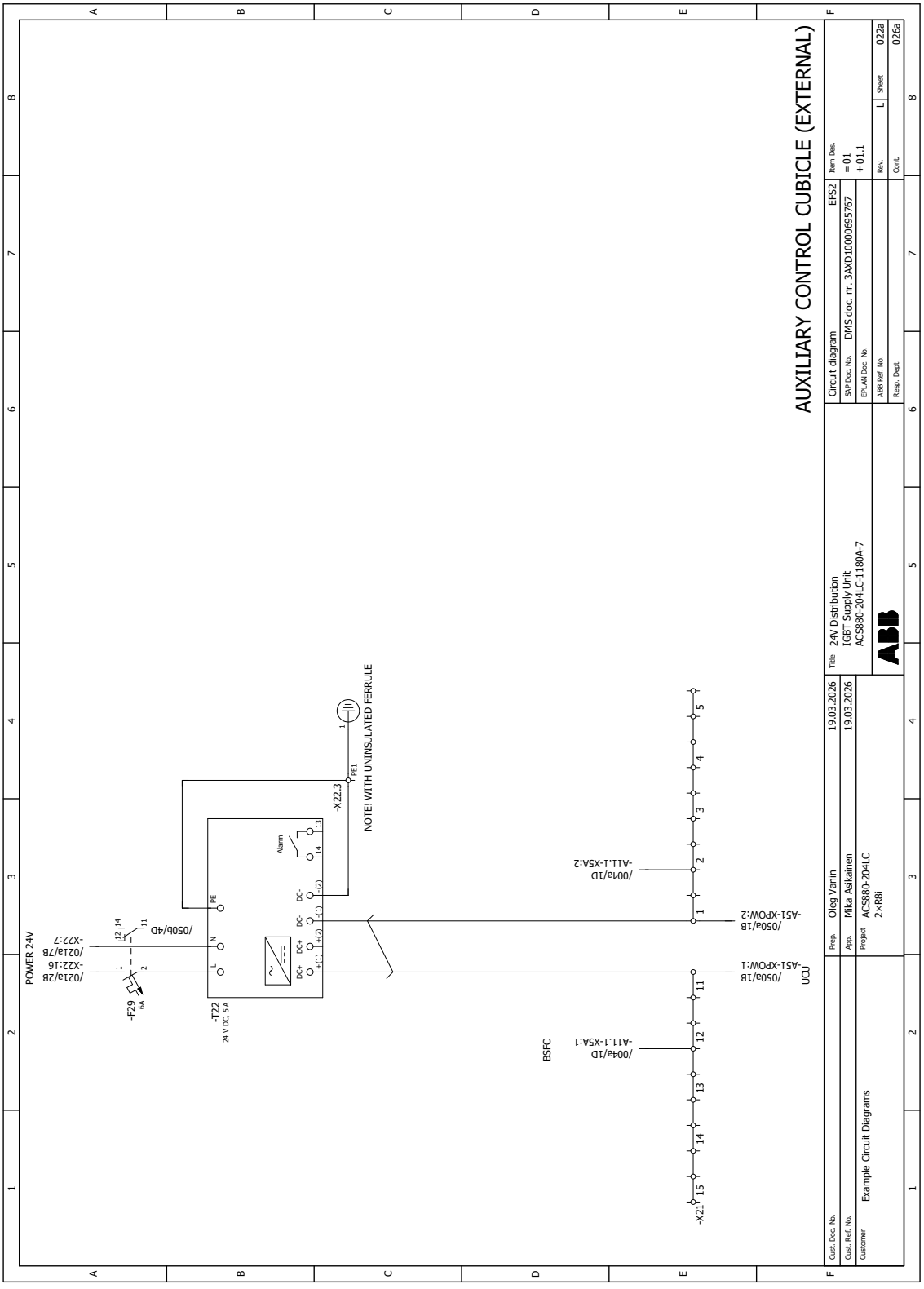

AUXILIARY CONTROL CUBICLE (EXTERNAL)
*) OA1G10 AUX. CONTACT PLACED IN "TEST CONTACT" - POSITION INSIDE THE SWITCH´S MECHANISM
-A11.1
#Unit Charging Kit
ABB Accessory
CHARGING CONTROL BOARD
BSFC-12C
-X5
-X4
-INV1
-INV2
-INV3
S1 DIS EN
S2 DIS EN
S3 DIS EN
PWR
UDC
STAT
-GND1.1
-PE1.11
-X13.1:1
-Q10.1:11
-K11.1:A1
-K11.1:A2
-X13.1:2
-P11.1
-Q10.1 /003a/6C
-Q11.1 /003a/2B
-X21:1Z
-X21:2
-X21:3E
Circuit diagram
EFS2
Item Des.
= 01
+ 01.1
Unit charging circuit
IGBT Supply Unit
ACS880-204LC-1180A-7
DMS doc. nr. 3AXD10000695767
Prep. Oleg Vanin 19.03.2026
Appr. Mika Asikainen 19.03.2026
Project ACS880-204LC 2×R8i
Example Circuit Diagrams
Customer
Sheet 004a
Cont. 005a

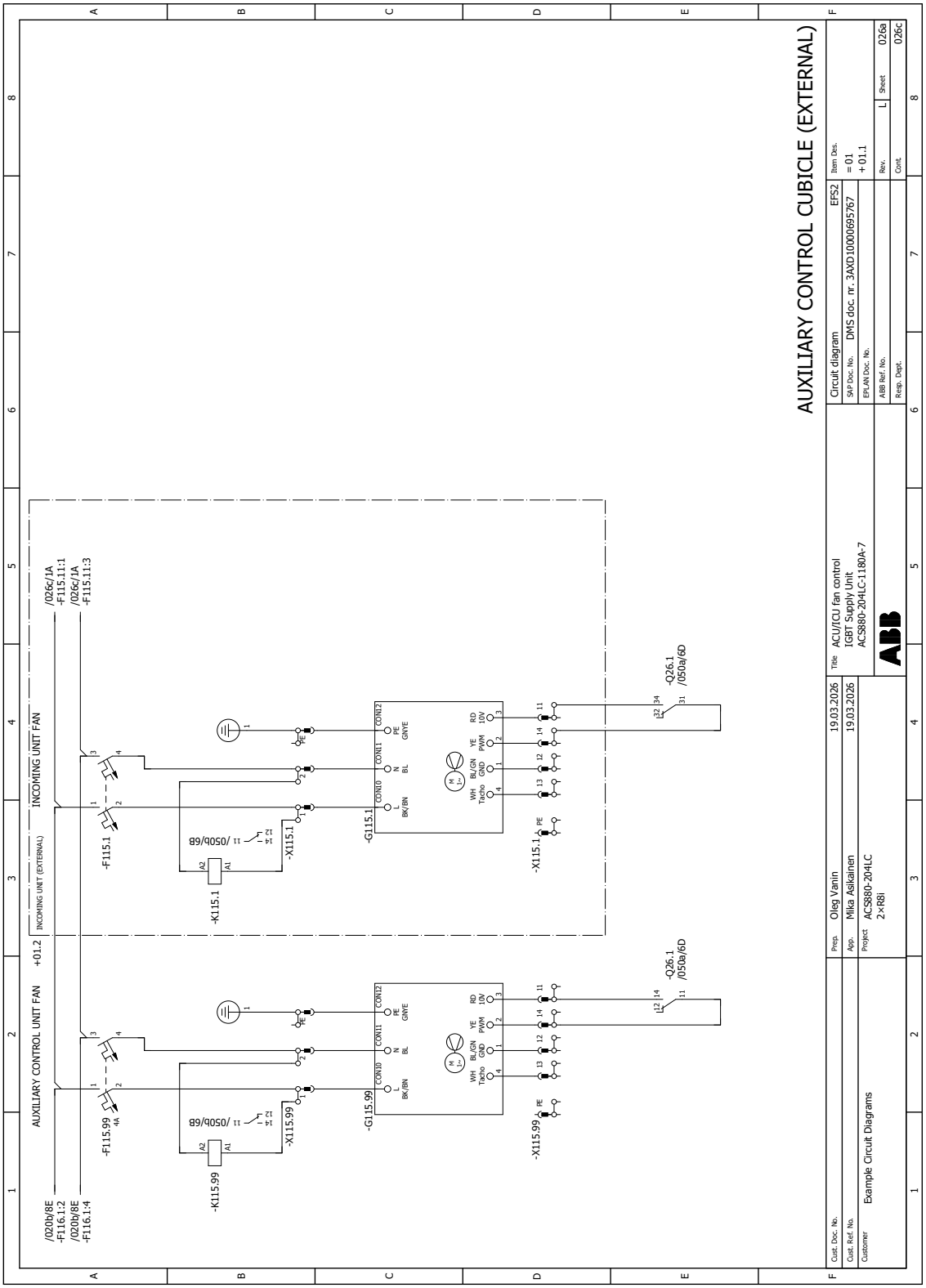

IGBT SUPPLY CUBICLE
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10000695767
EPLAN Doc. No.
ABB Ref. No.
Item Des.
= 01
+ 01.4
Rev.
L
Sheet
005a
Cont.
020a
Title
Module control circuit
IGBT Supply Unit
ACS880-204LC-1180A-7
Prep.
Oleg Vanin
19.03.2026
App.
Mika Asikainen
19.03.2026
Project
ACS880-204LC
2×R8i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
INVERTER MODULE
ACS880-104LC-0670A-7
-T01.1
/003a/2D
-T01.2
/003a/3D
-X50
-X53
-X52B
-X51B
-X59
AC SELECT
230V
24V OUT
UCU
BSFC
#Fiber Optic
ABB Accessory
-W2
-W3
2x
-A51.V1R
-A51.V1T
-A51.V2R
-A51.V2T
-A11.1:-INV1:V1
-A11.1:-INV1:V2
-A11.1:-INV2:V3
-A11.1:-INV2:V4
-TO1.1-XS2A:1
-TO1.1-XS2A:2
-TO1.2-XS2A:1
-TO1.2-XS2A:2
-TO1.1-XS3:4
-TO1.1-XS3:3
-TO1.2-XS3:4
-TO1.2-XS3:3
-Z4:2
-X22:6
/005a/5A
/005a/7A
/005a/8A
/005a/8C
/005a/7C
/005a/5C
/004a/3B
/004a/4B
/050C/4B
/021a/7E
/021a/7B

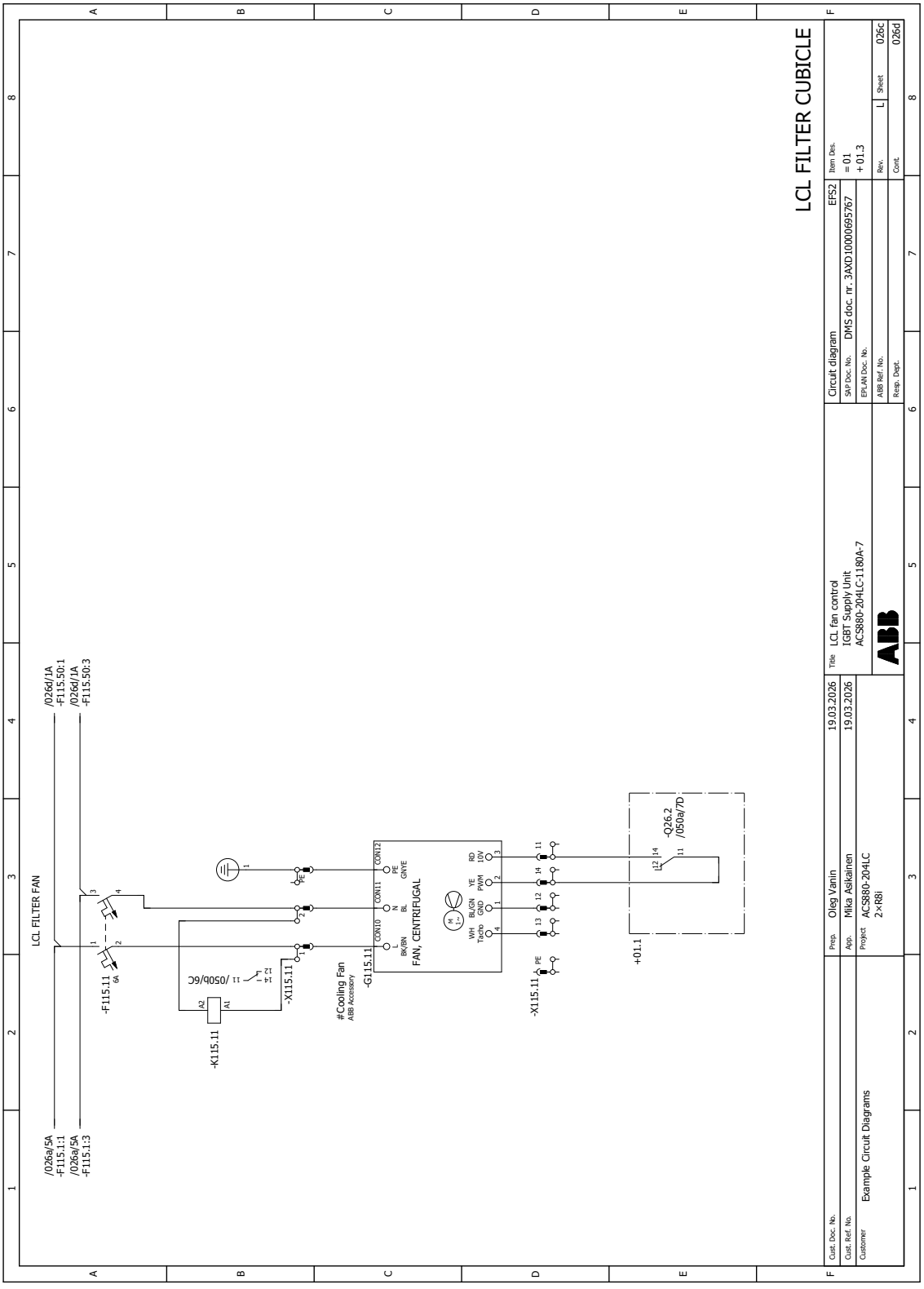

AUXILIARY CONTROL CUBICLE (EXTERNAL)
AUXILIARY VOLTAGE DISTRIBUTION
/001a/2D -Q21:2
/001a/2D -Q21:4
/021a/1A -X22:11
/021a/6A -X22:5
/050b/4A
-T21X1
-T21X2
-T21
2,5 kVA
-F22
10A
/021a/7E -X6.99:1
/021a/8D -X6.99:3
Auxiliary transformer
IGBT Supply Unit
ACS880-2041LC-1180A-7
EFS2
DMS doc. nr. 3AXD10000695767
Oleg Vanin
Mika Asikainen
19.03.2026
ACS880-2041LC
2×R8i
Example Circuit Diagrams
Circuit diagram
Item Des.
= 01
+ 01.1
Sheet
020a
020b

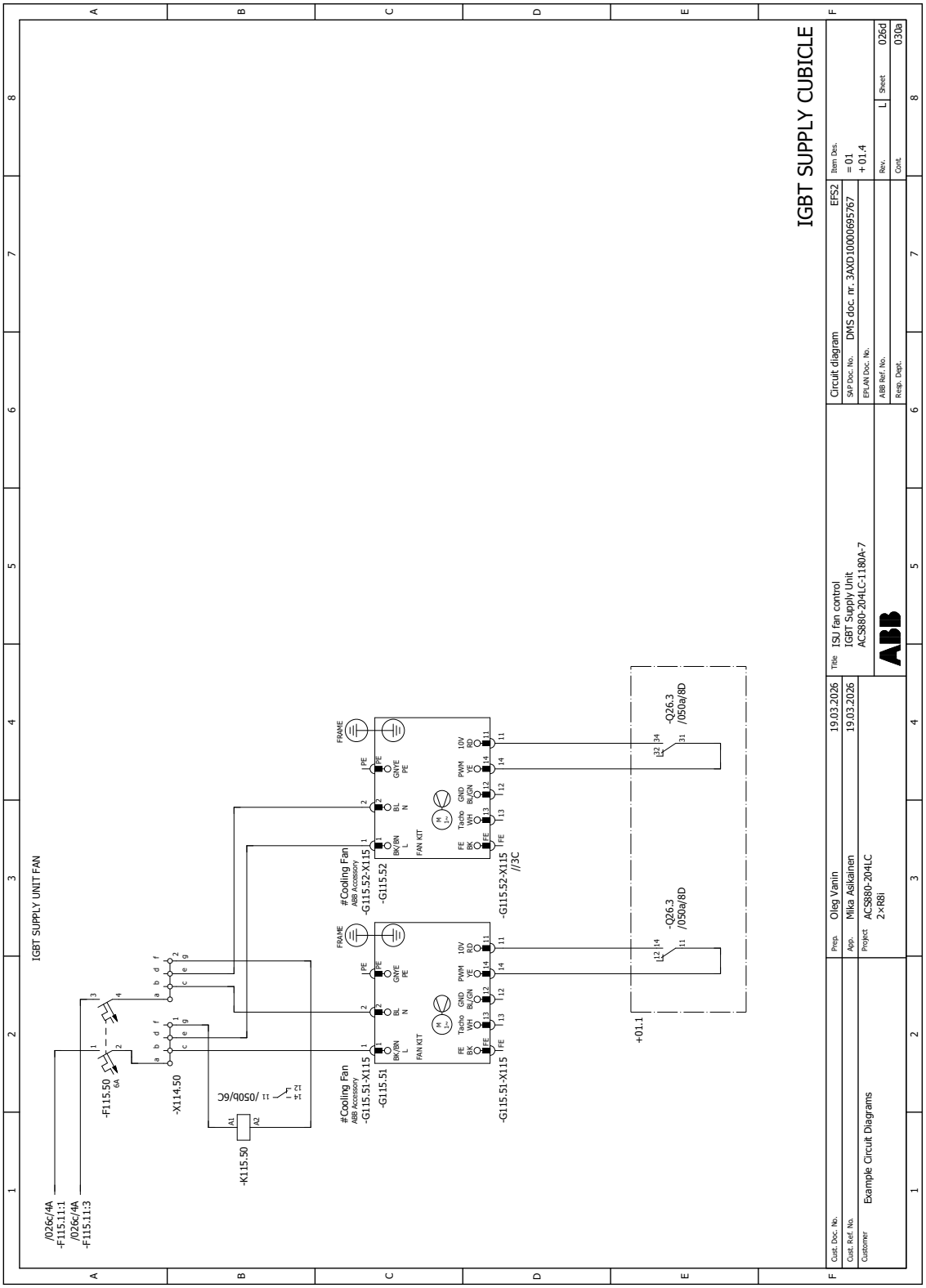

AUXILIARY CONTROL CUBICLE (EXTERNAL)
EXTERNAL FAN VOLTAGE SUPPLY
PROVIDED BY USER
MAX FUSE 40 A gG
L
N
230V
50Hz
-Q115.1
40A
-Q115.1
PEQ115.1
-F116.1
16A
/050b/4B
/026a/1A
-F115.99:3
/026a/1A
-F115.99:1
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10000695767
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Dss.
= 01
+ 01.1
Rev.
L
Sheet
020b
Cont.
021a
Title
External fan supply
IGBT Supply Unit
ACS880-204LC-1180A-7
Prep.
Oleg Vanin
19.03.2026
Appr.
Mika Asikainen
19.03.2026
Project
ACS880-204LC
2×R8i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams

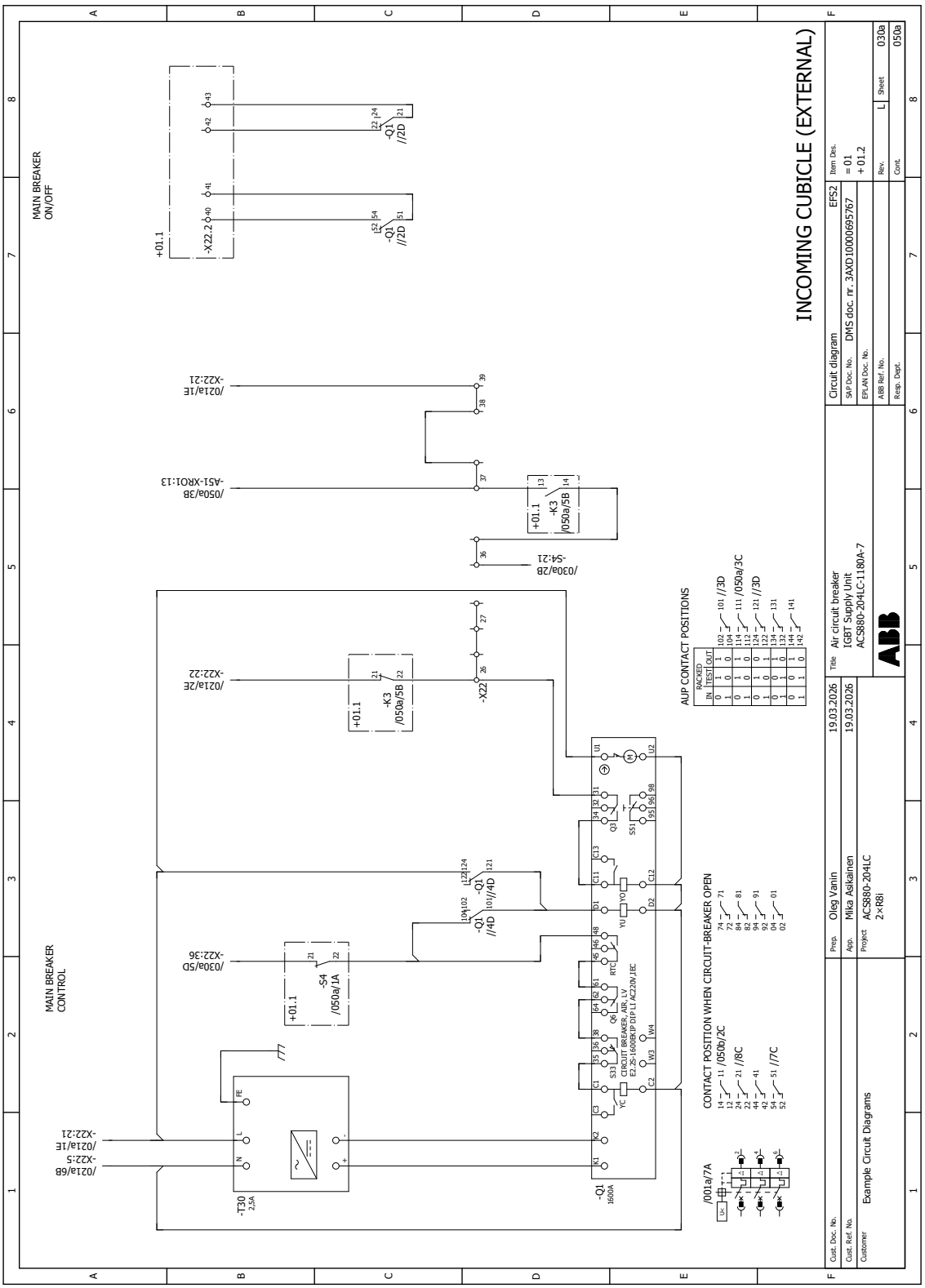

AUXILIARY CONTROL CUBICLE (EXTERNAL)
AUXILIARY VOLTAGE DISTRIBUTION
POWER SUPPLY 24VDC
INTERNAL POWER SUPPLY (BDPS)
MAIN BREAKER SUPPLY
TEMP FAULT
-X22 115/230VAC (1)
-X6.99
-K8
-FZ2:2
-FZ9:1
-FZ3 6A
-FZ4 10A
-TZ1X2:5
-TZ1X1:9
-TZ1X1:10
-Q4:A2
-Q26.3:A2
-K3:A2
-K8:A2
-TZ2:N
-T30:N
-T30:L
-T01.1-X50:1
-T01.1-X50:2
-AS1-XRO3:32
-X6.99:3
-K3:21
-X22:39
-X22:7
-X22:22
-X6.1:1
-X6.10:2
/020a/2E
/020a/3C
/020a/1D
/020a/8C
/020a/3B
/020a/1A
/020a/3A
/020a/8E
/020a/8D
/020a/6B
/020a/5B
/020a/4B
/020a/1A
/020a/2A
/005a/2A
/005a/4C
/005b/4B
/005b/1A
/021a/7A
/021a/8E
/021a/3A
/021a/1D
/021a/8C
/021a/6B
/050a/8D
/050a/5B
/050a/3B
/050a/2A
/050b/4C
/050b/4B
Prep. Oleg Vanin 19.03.2026
Appr. Mika Asikainen 19.03.2026
Project ACS880-204LC 2×R8i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Title Auxiliary circuit IGBT Supply Unit ACS880-204LC-1180A-7
EFS2
Circuit diagram
SAP Doc. No. DMS doc. nr. 3AXD10000695767
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des. = 01 + 01.1
Rev. L Sheet 021a
Cont. 022a

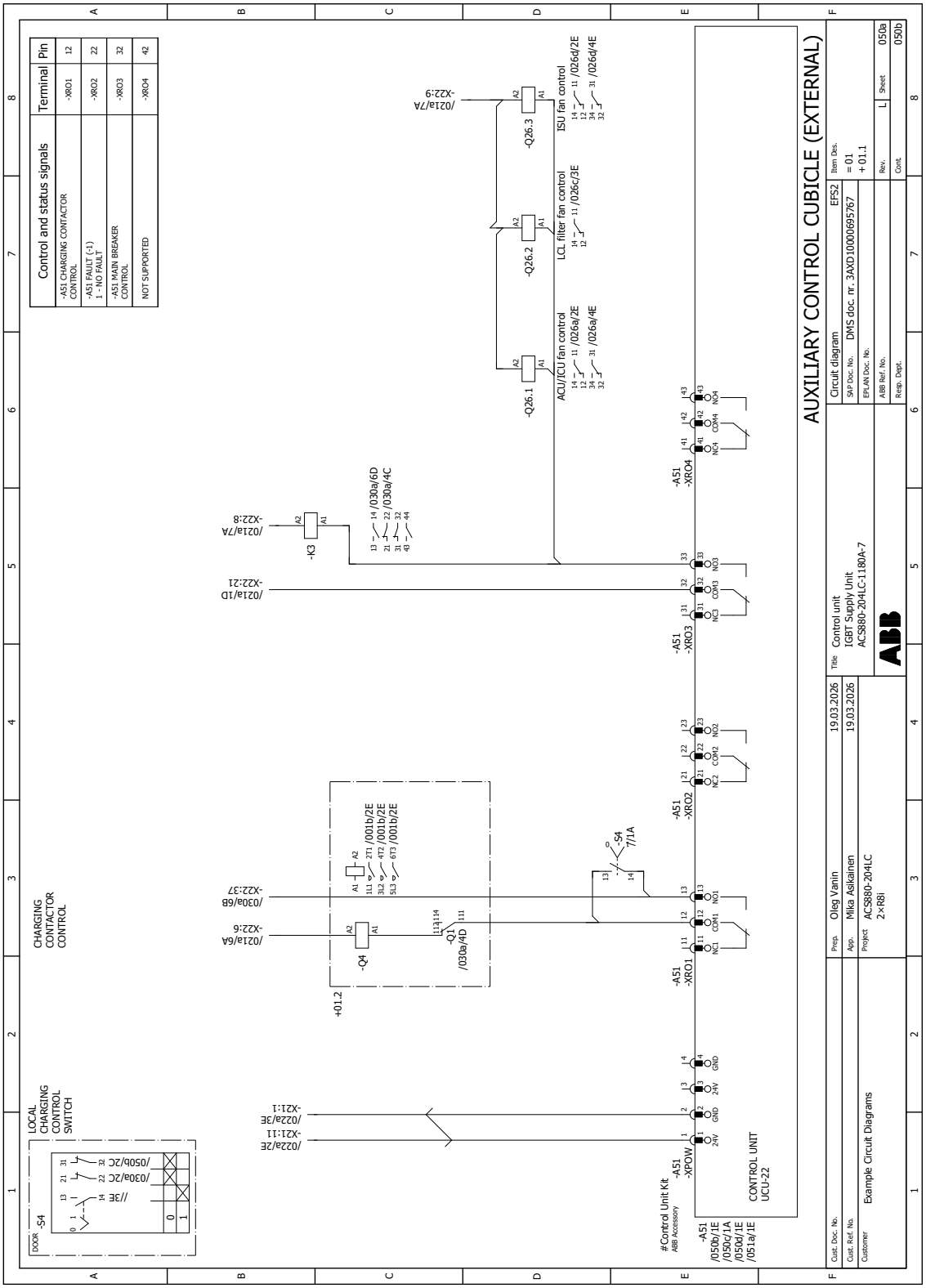

AUXILIARY CONTROL CUBICLE (EXTERNAL)
POWER 24V
/021a/2B
-XZ2:1B
/021a/7B
-XZ2:7
/050b/4D
-F29
6A
-T22
24 V DC, 5 A
PE
N
L
DC-
DC
DC+
-(2)
-(1)
+(2)
+(1)
Alarm
13
14
-X22.3
PE1
NOTE! WITH UNINSULATED FERRULE
/004a/1D
-A11.1-XSA:2
/050a/1B
-A51-XPOW:2
/004a/1D
-A11.1-XSA:1
/050a/1B
-A51-XPOW:1
BSFC
UCU
-X21
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep.
Oleg Vanin
19.03.2026
Appr.
Mika Asikainen
19.03.2026
Project
ACS880-204LC
2×R8i
Title
24V Distribution
IGBT Supply Unit
ACS880-204LC-1180A-7
ABB
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10000695767
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.1
Rev.
L
Sheet
022a
Cont.
026a

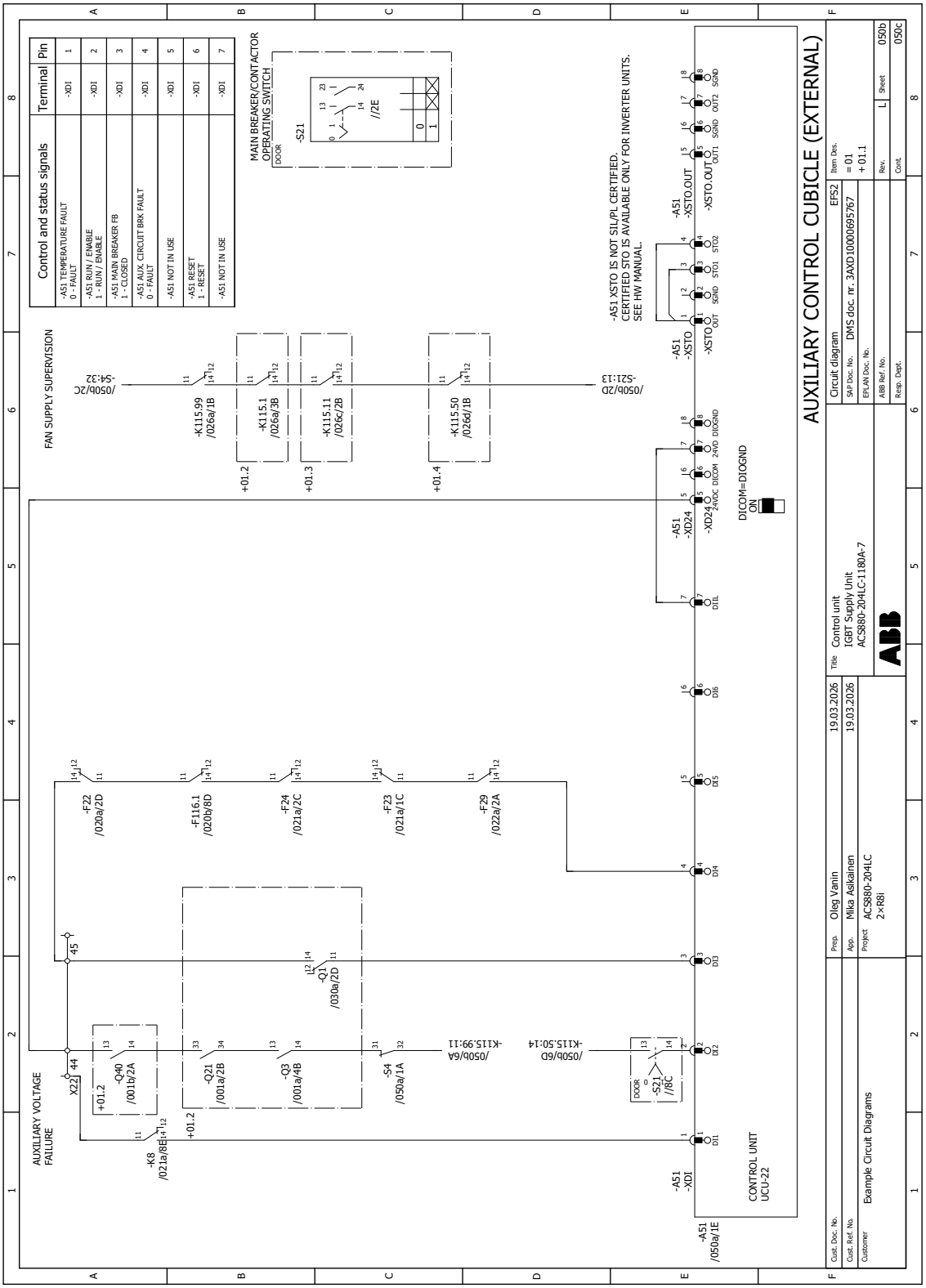

AUXILIARY CONTROL CUBICLE (EXTERNAL)
AUXILIARY CONTROL UNIT FAN
INCOMING UNIT FAN
INCOMING UNIT (EXTERNAL)
+01.2
-F115.99
-K115.99
-X115.99
-G115.99
-Q26.1
-F115.1
-K115.1
-X115.1
-G115.1
ACU/CU fan control
IGBT Supply Unit
ACS880-204LC-1180A-7
Oleg Vanin
Mika Asikainen
ACS880-204LC
2×R8i
Example Circuit Diagrams
EFS2
DMS doc. nr. 3AXD10000695767
Circuit diagram

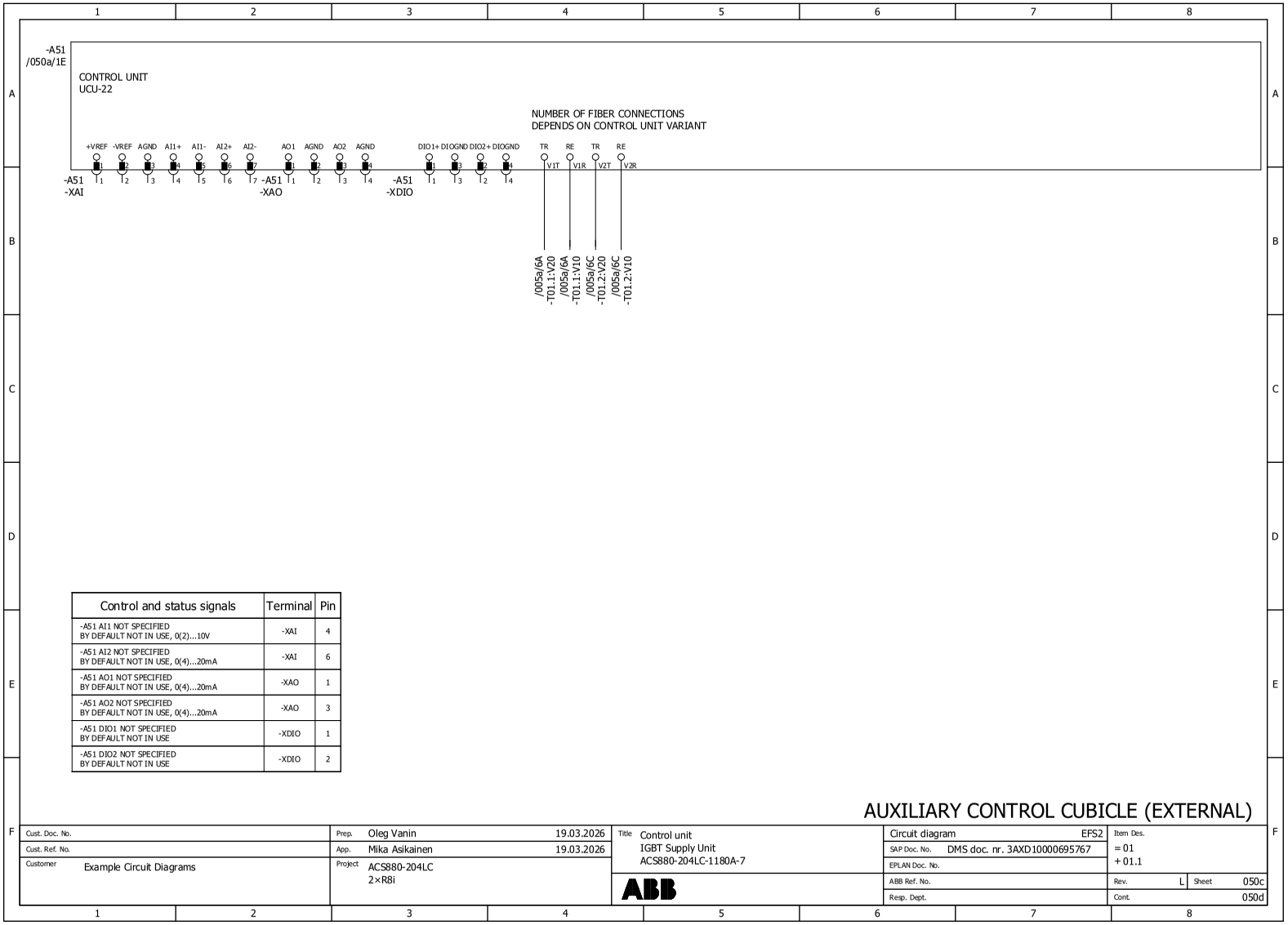

LCL FILTER CUBICLE
LCL FILTER FAN
/026d/1A
-F115.50:1
/026d/1A
-F115.50:3
/026a/5A
-F115.1:1
/026a/5A
-F115.1:3
-F115.11
-K115.11
/050b/6C
-X115.11
#Cooling Fan
ABB Accessory
-G115.11
FAN, CENTRIFUGAL
CON10
CON11
CON12
-X115.11
+01.1
-Q26.2
/050a/7D
Prep. Oleg Vanin 19.03.2026
Appr. Mika Asikainen 19.03.2026
Project ACS880-204LC 2×R8i
Customer Example Circuit Diagrams
Title LCL fan control IGBT Supply Unit ACS880-204LC-1180A-7
Circuit diagram
SAP Doc. No. DMS doc. nr. 3AXD10000695767
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
EFS2
Item Des. = 01 + 01.3
Rev. L Sheet 026c
Cont. 026d


IGBT SUPPLY CUBICLE
IGBT SUPPLY UNIT FAN
/026c/4A
-F115.11:1
/026c/4A
-F115.11:3
-F115.50
6A
-X114.50
-K115.50
/050b/6C
-G115.51-X115
-G115.51
#Cooling Fan
ABB Accessory
-G115.52-X115
-G115.52
-G115.52-X115
//3C
-Q26.3
/050a/8D
-Q26.3
/050a/8D
+01.1
FRAME
PE
BK/BN
L
BL
N
GN/YE
PE
FAN KIT
FE
BK
WH
Thrbo
GND
BU/GN
PWM
YE
10V
RD
Prep. Oleg Vanin 19.03.2026
Appr. Mika Asikainen 19.03.2026
Project ACS880-2041C 2×R8i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Title ISU fan control
IGBT Supply Unit
ACS880-2041C-1180A-7
Circuit diagram EFS2
SAP Doc. No. DMS doc. nr. 3AXD10000695767
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Dos. = 01 + 01.4
Rev. L Sheet 026d
Cont. 030a


INCOMING CUBICLE (EXTERNAL)
MAIN BREAKER ON/OFF
MAIN BREAKER CONTROL
-T30 2.5A
-Q1 1600A
-S4 /050a/1A
-K3 /050a/5B
-X22
CONTACT POSITION WHEN CIRCUIT-BREAKER OPEN
AUP CONTACT POSITIONS
Circuit diagram
EFS2
Air circuit breaker
IGBT Supply Unit
ACS880-204LC-1180A-7
DMS doc. nr. 3AXD10000695767
ABB
Example Circuit Diagrams
ACS880-204LC
2×R8i
Oleg Vanin
Mika Asikainen
19.03.2026


AUXILIARY CONTROL CUBICLE (EXTERNAL)
Control and status signals
-A51 CHARGING CONTACTOR CONTROL
-A51 FAULT (-1) 1 - NO FAULT
-A51 MAIN BREAKER CONTROL
NOT SUPPORTED
Terminal
Pin
-XRO1
12
-XRO2
22
-XRO3
32
-XRO4
42
LOCAL CHARGING CONTROL SWITCH
CHARGING CONTACTOR CONTROL
CONTROL UNIT UCU-22
ACU/ICU fan control
LCL filter fan control
ISU fan control
-Q26.1
-Q26.2
-Q26.3
-Q4
-Q1
-K3
-S4
Control unit
IGBT Supply Unit
ACS880-204LC-1180A-7
Circuit diagram
EFS2
DMS doc. nr. 3AXD10000695767
Oleg Vanin
Mika Asikainen
ACS880-204LC
2×R8i
Example Circuit Diagrams
19.03.2026

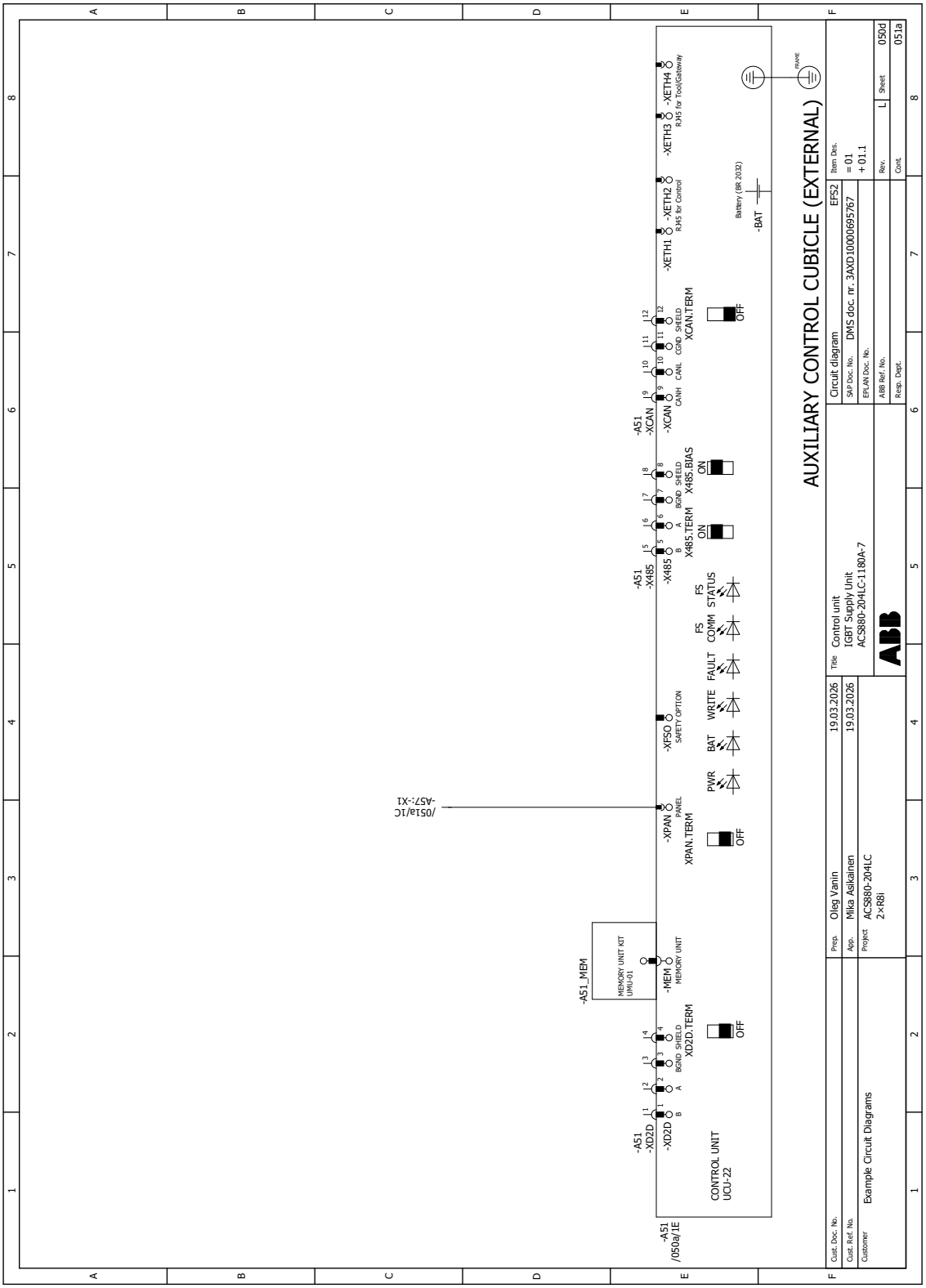

AUXILIARY CONTROL CUBICLE (EXTERNAL)
Control and status signals
Terminal
Pin
-A51 TEMPERATURE FAULT 0 - FAULT
-A51 RUN / ENABLE 1 - RUN / ENABLE
-A51 MAIN BREAKER FB 1 - CLOSED
-A51 AUX. CIRCUIT BRK FAULT 0 - FAULT
-A51 NOT IN USE
-A51 RESET 1 - RESET
-A51 NOT IN USE
-XD1
MAIN BREAKER/CONTACTOR OPERATING SWITCH
-S21
//2E
FAN SUPPLY SUPERVISION
-K115.99 /026a/1B
-K115.1 /026a/3B
-K115.11 /026c/2B
-K115.50 /026d/1B
-A51 XSTO IS NOT SIL/PL CERTIFIED. CERTIFIED STO IS AVAILABLE ONLY FOR INVERTER UNITS. SEE HW MANUAL.
-A51 -XSTO
-A51 -XSTO.OUT
-A51 -XD24
DICOM=DIOGND ON
AUXILIARY VOLTAGE FAILURE
-K8 /021a/8E
-Q40 /001b/2A
-Q21 /001a/2B
-Q3 /001a/4B
-S4 /050a/1A
-Q1 /030a/2D
-F22 /020a/2D
-F116.1 /020b/8D
-F24 /021a/2C
-F23 /021a/1C
-F29 /022a/2A
CONTROL UNIT UCU-22
-A51 -XD1
-A51 /050a/1E
Prep. Oleg Vanin 19.03.2026
App. Mika Asikainen 19.03.2026
Project ACS880-204LC 2×R8i
Title Control unit IGBT Supply Unit ACS880-204LC-1180A-7
Circuit diagram EFS2
SAP Doc. No. DMS doc. nr. 3AXD10000695767
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des. = 01 + 01.1
Rev. L Sheet 050b
Cont. 050c
Cust. Doc. No.
Cust. Ref. No.
Customer Example Circuit Diagrams




| Control and status signals | Terminal | Pin |
|---|---|---|
| -A51 AI1 NOT SPECIFIED<br>BY DEFAULT NOT IN USE, 0(2)...10V | -XAI | 4 |
| -A51 AI2 NOT SPECIFIED<br>BY DEFAULT NOT IN USE, 0(4)...20mA | -XAI | 6 |
| -A51 AO1 NOT SPECIFIED<br>BY DEFAULT NOT IN USE, 0(4)...20mA | -XAO | 1 |
| -A51 AO2 NOT SPECIFIED<br>BY DEFAULT NOT IN USE, 0(4)...20mA | -XAO | 3 |
| -A51 DIO1 NOT SPECIFIED<br>BY DEFAULT NOT IN USE | -XDIO | 1 |
| -A51 DIO2 NOT SPECIFIED<br>BY DEFAULT NOT IN USE | -XDIO | 2 |

# AUXILIARY CONTROL CUBICLE (EXTERNAL)

| | | | |
|---|---|---|---|
| Cust. Doc. No. | Prep. Oleg Vanin 19.03.2026 | Title Control unit<br>IGBT Supply Unit<br>ACS880-204LC-1180A-7 | Circuit diagram EFS2 / Item Des. |
| Cust. Ref. No. | App. Mika Asikainen 19.03.2026 | SAP Doc. No. DMS doc. nr. 3AXD10000695767 | = 01<br>+ 01.1 |
| Customer Example Circuit Diagrams | Project ACS880-204LC<br>2×R8i | EPLAN Doc. No. | |
| | | ABB Ref. No. | Rev. L / Sheet 050c |
| | | Resp. Dept. | Cont. 050d |


AUXILIARY CONTROL CUBICLE (EXTERNAL)
CONTROL UNIT
UCU-22
-A51
-XD2D
XD2D.TERM
-A51_MEM
MEMORY UNIT KIT
UMU-01
-MEM
MEMORY UNIT
-XPAN
PANEL
XPAN.TERM
-XFSO
SAFETY OPTION
PWR
BAT
WRITE
FAULT
FS COMM
FS STATUS
-A51
-X485
X485.TERM
X485.BIAS
-A51
-XCAN
XCAN.TERM
-XETH1
-XETH2
RJ45 for Control
-XETH3
-XETH4
RJ45 for TOOl/Gateway
Battery (BR 2032)
-BAT
FRAME
/051a/1C
-A57:-X1
/050a/1E
Control unit
IGBT Supply Unit
ACS880-204LC-1180A-7
Circuit diagram
EFS2
DMS doc. nr. 3AXD10000695767
= 01
+ 01.1
Sheet
050d
051a
Oleg Vanin
Mika Asikainen
ACS880-204LC
2×R8i
Example Circuit Diagrams
19.03.2026
19.03.2026

# Frame 4×R8i


Example Circuit Diagrams
Project type
ACS880-204LC
IGBT Supply Unit
Converter type
4×R8i
Frame Size
ACS880-204LC-2930A-7
Type Code
Revision K
Used EPLAN version: 2025.0.3.23406
Prep. Oleg Vanin 2026-03-19
Appr. Mika Asikainen 19.03.2026
Project ACS880-204LC 4×R8i
Customer Example Circuit Diagrams
Title Title page / cover sheet IGBT Supply Unit ACS880-204LC-2930A-7
Circuit diagram EFS2
SAP Doc. No. DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
Rev. K
Sheet 000A
Cont. 000B

| Higher-level function | Page | Page description | Revision |
|---|---|---|---|
| | 000A | Title page / cover sheet | K |
| | 000C | Structured identifier overview | K |
| | 000D | Summarized parts list | K |
| | 000E | Summarized parts list | K |
| | 000F | Summarized parts list | K |
| | 200A | Overview diagram | K |
| | 300A | Symbol Overview | K |
| 01 | 001a | Main supply, Aux. supply switch | K |
| | 001b | Line-up charging circuit | K |
| | 002a | LCL filter | K |
| | 002b | LCL filter | K |
| | 003a | Drive main circuit | K |
| | 003b | Drive main circuit | K |
| | 004a | Unit charging circuit | K |
| | 004b | Unit charging circuit | K |
| | 005a | Module control circuit | K |
| | 005b | Module control circuit | K |
| | 020a | Auxiliary transformer | K |
| | 020b | External fan supply | K |
| | 021a | Auxiliary circuit | K |
| | 022a | 24V Distribution | K |
| | 026a | ACU/ICU fan control | K |
| | 026c | LCL fan control | K |
| | 026d | ISU fan control | K |
| | 026e | ISU fan control | K |
| | 030a | Air circuit breaker | K |
| | 050a | Control unit | K |
| | 050b | Control unit | K |

Cust. Doc. No.
Cust. Ref. No.
Customer: Example Circuit Diagrams

Prep. Oleg Vanin 2026-03-19
App. Mika Asikainen 19.03.2026
Project: ACS880-204LC 4×R8i

Title: Table of contents
IGBT Supply Unit
ACS880-204LC-2930A-7

ABB

Circuit diagram EFS2
SAP Doc. No. DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.

Item Des.
=
+
Rev. K Sheet 000B
Cont. 000C

## Function designations

| Designation | Structure description |
|---|---|
| =01 | IGBT Supply Unit |
| | |
| | |
| | |
| | |
| | |
| | |

## Location designations

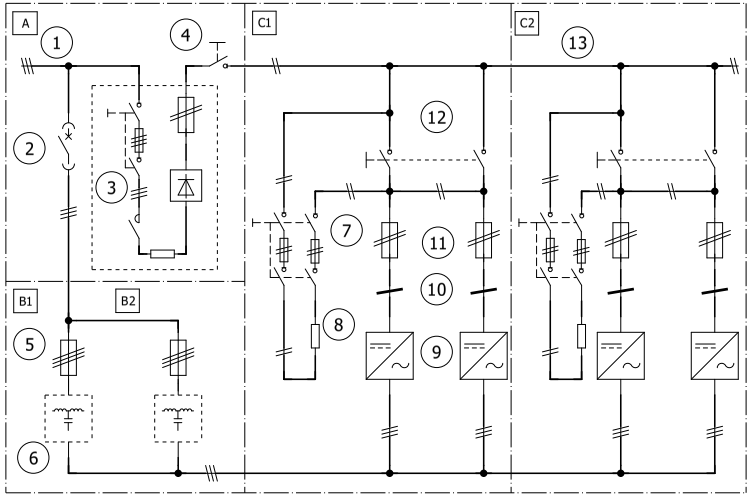
| Designation | Structure description |
|---|---|
| +01.1 | Auxiliary Control Cubicle (External) |
| +01.2 | Incoming Cubicle (External) |
| +01.3 | First LCL Filter Cubicle |
| +01.4 | Second LCL Filter Cubicle |
| +01.5 | First IGBT Supply Cubicle |
| +01.6 | Second IGBT Supply Cubicle |
| | |
| | |
| | |
| | |
| | |
| | |

## Electrical option designations

| Designation | Material Code | Quantity |
|---|---|---|
| #AC Fuse | 68752591 | 6 |
| #Air Circuit Breaker | 3AXD50000189571 | 1 |
| #CIO I/O Module | 3AXD50000041983 | 2 |
| #CM Filter | 3AXD50000566785 | 8 |
| #Control Panel Kit | 3AXD50000025965 | 1 |
| #Control Unit Kit | ACS880UCU-204LC-23-0 | 1 |
| #Cooling Fan | 3AXD50000043886, 3AXD50000050763 | 6 |
| #DC Fuse | 3AUA0000086673 | 8 |
| #DC Switch Kit | 3AXD50000227044 | 2 |
| #Fiber Optic | 58948250, 58988821 | 8 |
| #Fieldbus Adapter | 3AUA0000072069 | 1 |
| #Filter Unit Kit | 3AXD50000234448 | 2 |
| #Line-up Charging Kit | 3AXD50000251216 | 1 |
| #Line-up Charging Switch Kit | 3AXD50000507078 | 1 |
| #Panel Interface Kit | 3AUA0000108650 | 1 |
| #Panel Mounting Kit | 3AUA0000108878 | 1 |
| #Resistor | 10028531 | 12 |
| #Supply Module | ACS880-104LC-0850A-7 | 4 |
| #Unit Charging Kit | 3AXD50000226801 | 2 |
| | | |
| | | |
| | | |
| | | |

| | | | |
|---|---|---|---|
| Cust. Doc. No. | Prep. Oleg Vanin 2026-03-19 | Title Structured identifier overview<br>IGBT Supply Unit<br>ACS880-204LC-2930A-7 | Circuit diagram EFS2 / Item Des. |
| Cust. Ref. No. | App. Mika Asikainen 19.03.2026 | | SAP Doc. No. DMS doc. nr. 3AXD10000695768 / = |
| Customer Example Circuit Diagrams | Project ACS880-204LC 4×R8i | | EPLAN Doc. No. / + |
| | | ABB | ABB Ref. No. / Rev. K / Sheet 000C |
| | | | Resp. Dept. / Cont. 000D |

## Generic / Rittal enclosure

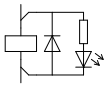



## Content

| Identifier | Location | Identifier | Component | Available through |
|---|---|---|---|---|
| A | Incoming cubicle | 1 | AC supply | - |
| A | Incoming cubicle | 2 | Main circuit breaker | ABB or third party |
| A | Incoming cubicle | 3 | AC-DC charging kit (line-up charging) | ABB or third party |
| A | Incoming cubicle | 4 | DC switch-disconnector for line-up charging | ABB or third party |
| B | LCL filter cubicle | 5 | AC fuses | ABB or third party |
| B | LCL filter cubicle | 6 | LCL filter kit | ABB |
| C | IGBT supply module cubicle | 7 | DC-DC charging kit (unit charging) | ABB or third party |
| C | IGBT supply module cubicle | 8 | Resistors for DC-DC charging | ABB or third party |
| C | IGBT supply module cubicle | 9 | IGBT supply module | ABB |
| C | IGBT supply module cubicle | 10 | Common mode filter | ABB |
| C | IGBT supply module cubicle | 11 | DC fuse | ABB or third party |
| C | IGBT supply module cubicle | 12 | DC switch-disconnector | ABB or third party |
| C | IGBT supply module cubicle | 13 | DC link | - |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| | | | | |
|---|---|---|---|---|
| Cust. Doc. No. | Prep. Oleg Vanin 2026-03-19 | Title Overview diagram IGBT Supply Unit ACS880-204LC-2930A-7 | Circuit diagram EFS2 | Item Des. |
| Cust. Ref. No. | App. Mika Asikainen 19.03.2026 | | SAP Doc. No. DMS doc. nr. 3AXD10000695768 | = |
| Customer Example Circuit Diagrams | Project ACS880-204LC 4×R8i | | EPLAN Doc. No. | + |
| | | ABB | ABB Ref. No. | Rev. K Sheet 200A |
| | | | Resp. Dept. | Cont. 300A |

GENERAL/RELAY COIL, WITH PROTECTIVE CIRCUIT DIODE AND R+LED



GENERAL/RELAY COIL



COIL WITH PICK-UP DELAY



COIL WITH OFF-DELAY



NO CONTACT



NC CONTACT



CHANGE OVER CONTACT



NO CONTACT, WITH CLOSING DELAY



TWO NO CONTACTS ONE INPUT, TWO OUTPUTS



TWO CONNECTED CHANGE OVER CONTACTS



POWER NO CONTACT OF A CONTACTOR



PUSH BUTTON WITH NO CONTACT



PUSH BUTTON WITH NC CONTACT



NO SWITCH, OPERATED BY TURNING, 2 POSITIONS



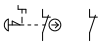

LIMIT SWITCH NC CONTACT MECHANICALLY OPERATED



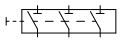

NC SWITCH, TEMPERATURE OPERATED



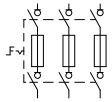

EMERGENCY STOP PUSH BUTTON



DISCONNECT SWITCH, THREE-POLE



SWITCH DISCONNECTOR WITH FUSES, THREE-POLE



FUSE



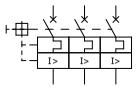
FUSE DISCONNECTOR



CIRCUIT BREAKER



MOTOR OVERLOAD SWITCH WITH SWITCH MECHANISM




COMMON MODE FILTER FOR HIGH FREQUENCY CURRENTS



PROTECTIVE EARTH CONNECTED TO FRAME




PROTECTIVE EARTH CONNECTED TO TERMINAL / PE BUSBAR



FUNCTIONAL EARTHING CONNECTED TO TERMINAL



FUNCTIONAL BONDING TO FRAME



LIGHT



INDUCTOR



CAPACITOR



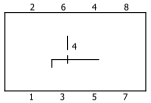
RESISTOR



POWER RESISTOR WITH FUSE

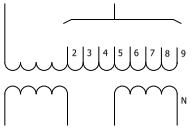


PHASE SELECTING SWITCH

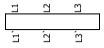



PRIMARY, VOLTAGE SELECTION

TRANSFORMER




EMC FILTER




TERMINAL, FOUR POLE



PLUG AND SOCKET TERMINAL BLOCK WITH 4 CONNECTION POINTS



FEMALE AND MALE PLUG



AMPERE METER




CURRENT TRANSFORMER



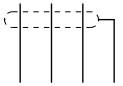
VOLTAGE METER




WIRE TERMINATION, INSULATED



SHIELDED CABLE



THERMAL OPERATION



DISCONNECT



DISCONNECT, CAN BE OPERATED WHILE NOMINAL CURRENT IS APPLIED

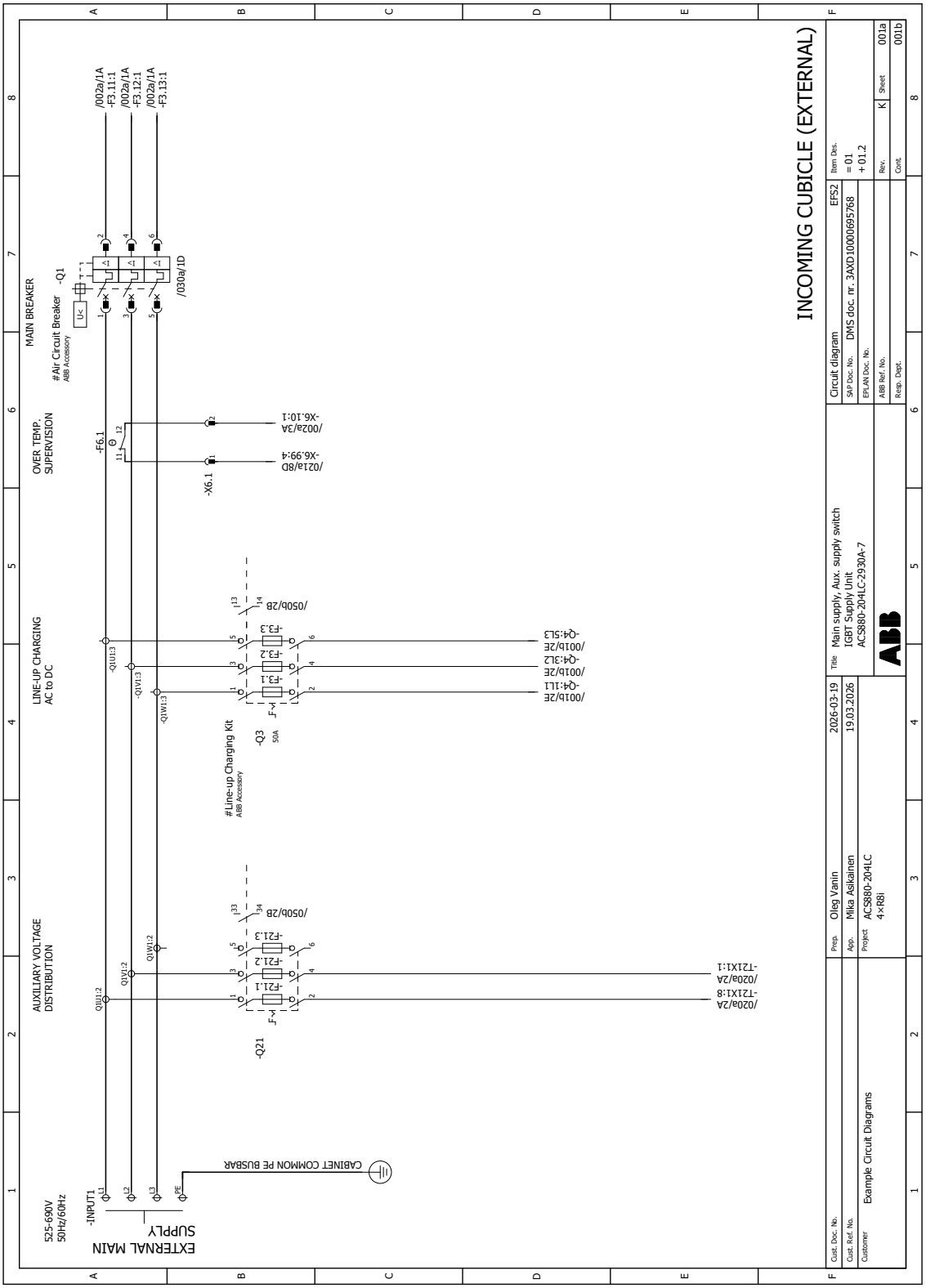


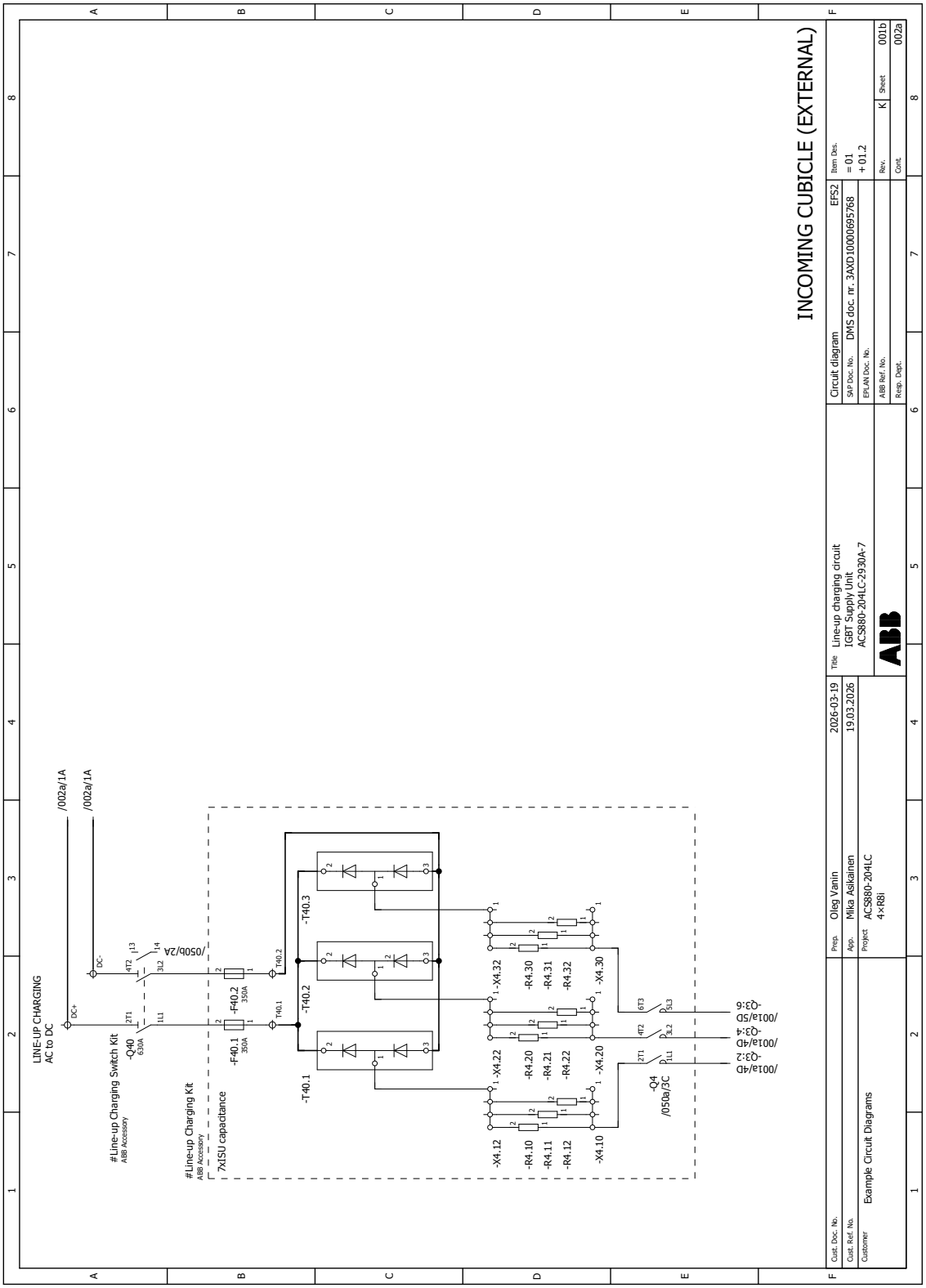
BREAKER, SHORTCIRCUIT BREAKING CAPABILITY

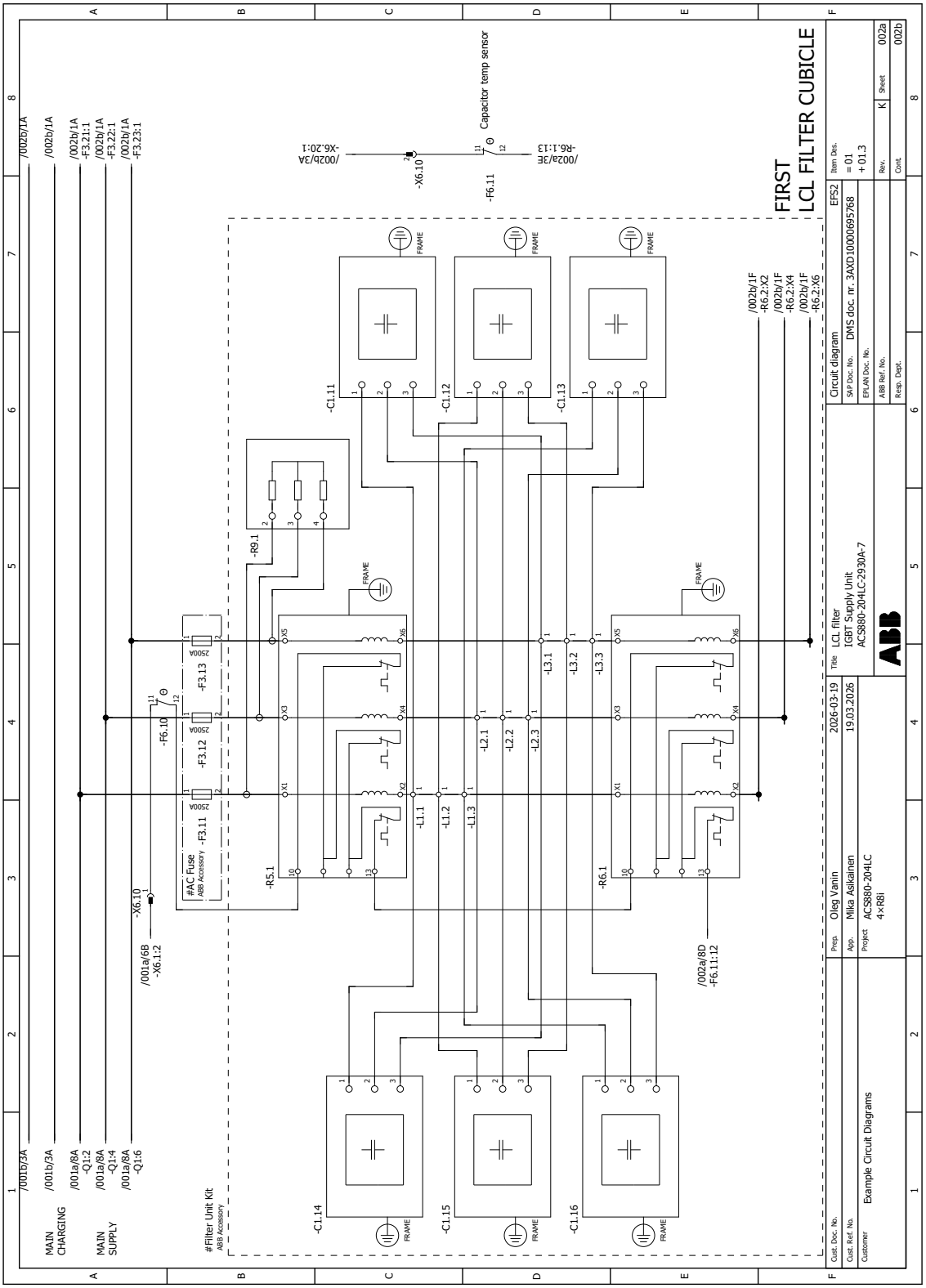


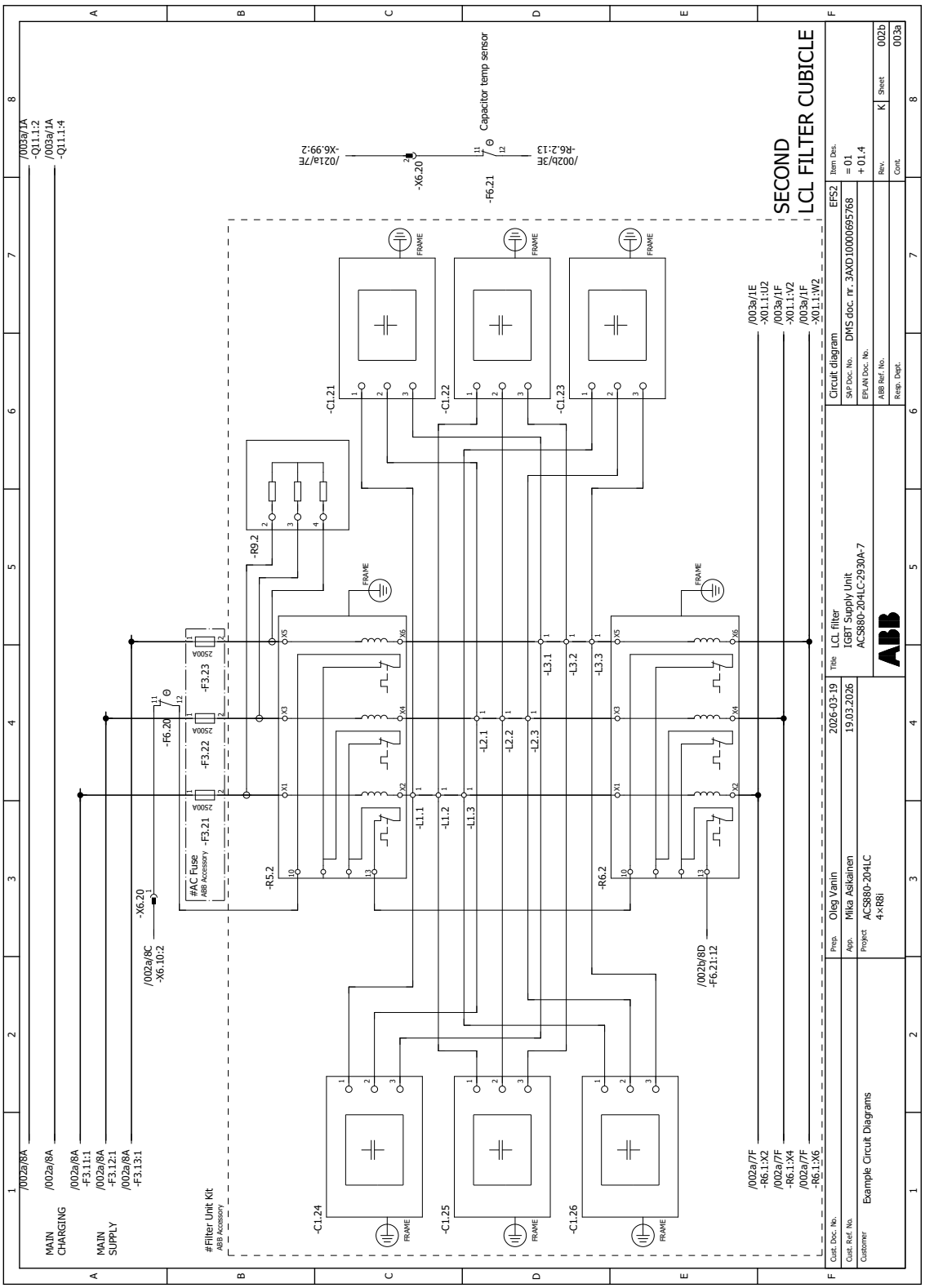
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| Cust. Doc. No. | Prep. Oleg Vanin 2026-03-19 | Title Symbol Overview<br>IGBT Supply Unit<br>ACS880-204LC-2930A-7 | Circuit diagram EFS2 / Item Des. |
| Cust. Ref. No. | App. Mika Asikainen 19.03.2026 | SAP Doc. No. DMS doc. nr. 3AXD10000695768 | = |
| Customer Example Circuit Diagrams | Project ACS880-204LC 4×R8i | EPLAN Doc. No. | + |
| | | ABB Ref. No. | Rev. K / Sheet 300A |
| | | Resp. Dept. | Cont. =01/001a |

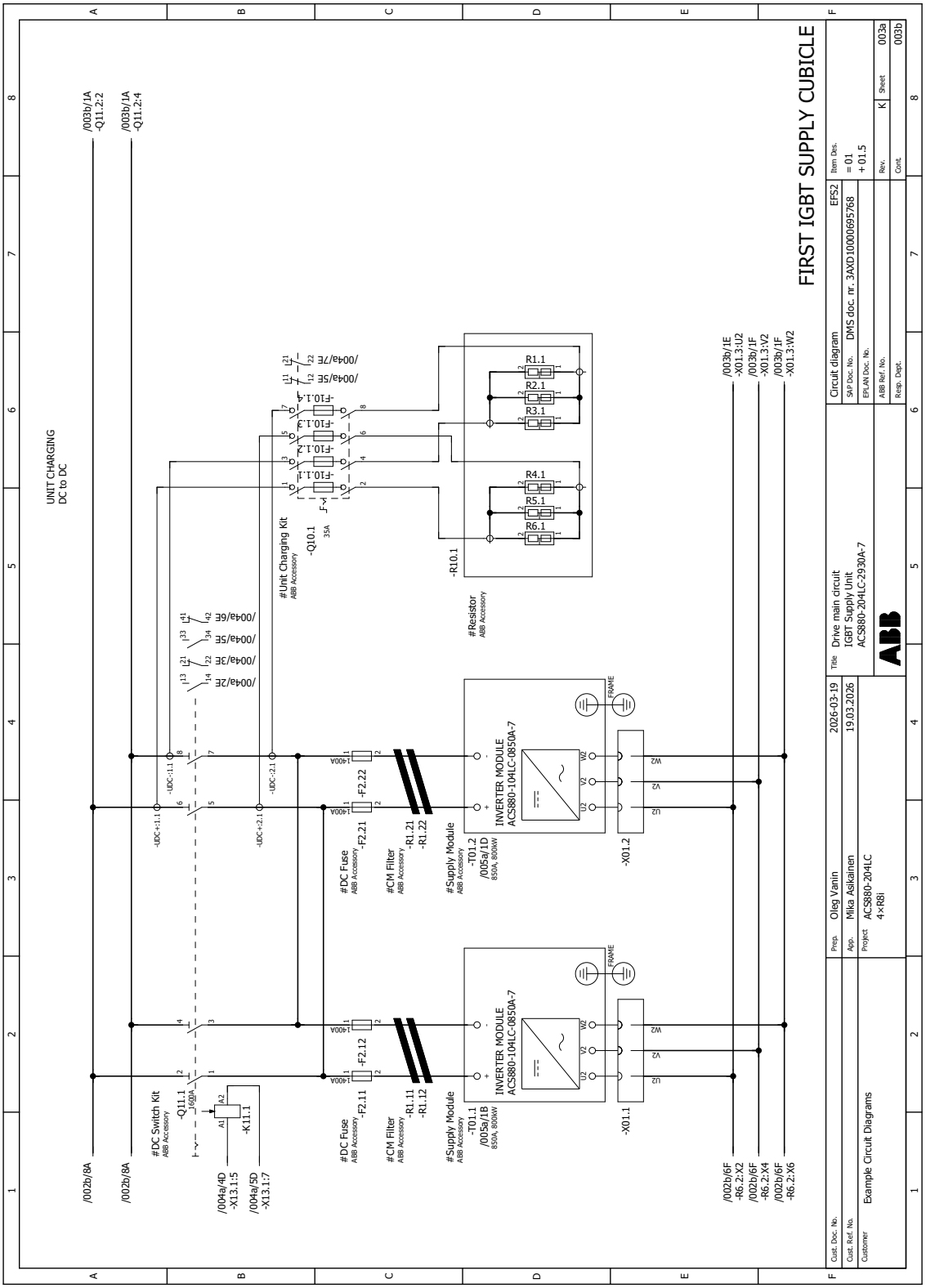
Example circuit diagrams 501

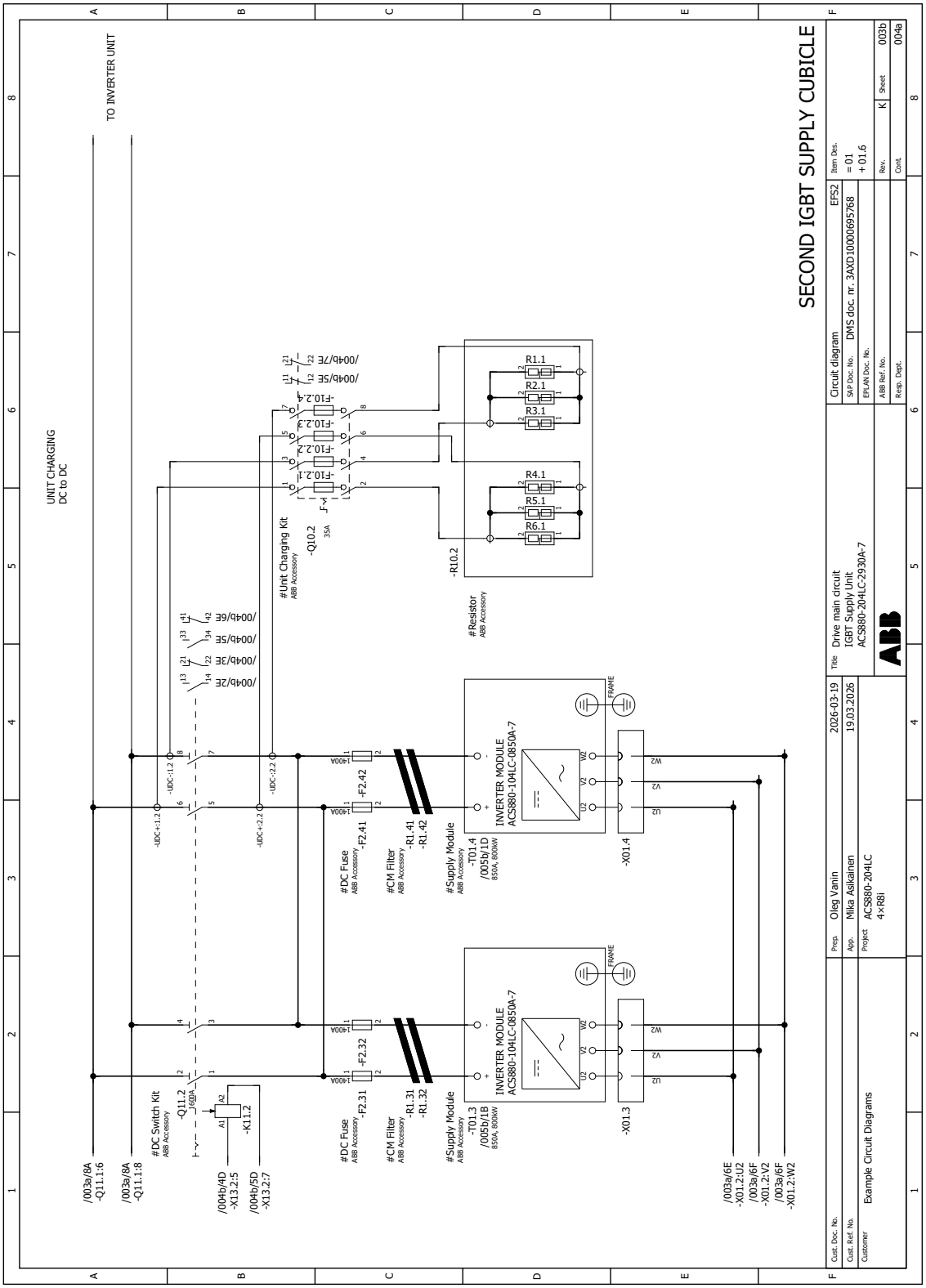

INCOMING CUBICLE (EXTERNAL)
EXTERNAL MAIN SUPPLY
525-690V 50Hz/60Hz
-INPUT1
L1
L2
L3
PE
CABINET COMMON PE BUSBAR
AUXILIARY VOLTAGE DISTRIBUTION
LINE-UP CHARGING AC to DC
OVER TEMP. SUPERVISION
MAIN BREAKER
#Air Circuit Breaker ABB Accessory
-Q1
/030a/1D
/002a/1A -F3.11:1
/002a/1A -F3.12:1
/002a/1A -F3.13:1
-F6.1
/002a/3A -X6.10:1
/021a/8D -X6.99:4
-X6.1
-Q1U1:2
-Q1V1:2
-Q1W1:2
-Q1U1:3
-Q1V1:3
-Q1W1:3
-F2.1
-F2.2
-F2.3
/050b/2B
-Q21
-F3.1
-F3.2
-F3.3
-Q3
50A
#Line-up Charging Kit ABB Accessory
/020a/2A -T2.1X1:8
/020a/2A -T2.1X1:1
/001b/2E -Q4:1L1
/001b/2E -Q4:3L2
/001b/2E -Q4:5L3
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep. Oleg Vanin 2026-03-19
Appr. Mika Asikainen 19.03.2026
Project ACS880-204LC 4×R8i
Title Main supply, Aux. supply switch IGBT Supply Unit ACS880-204LC-2930A-7
ABB
Circuit diagram EFS2
SAP Doc. No. DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Dss. = 01 + 01.2
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Cont. 001b

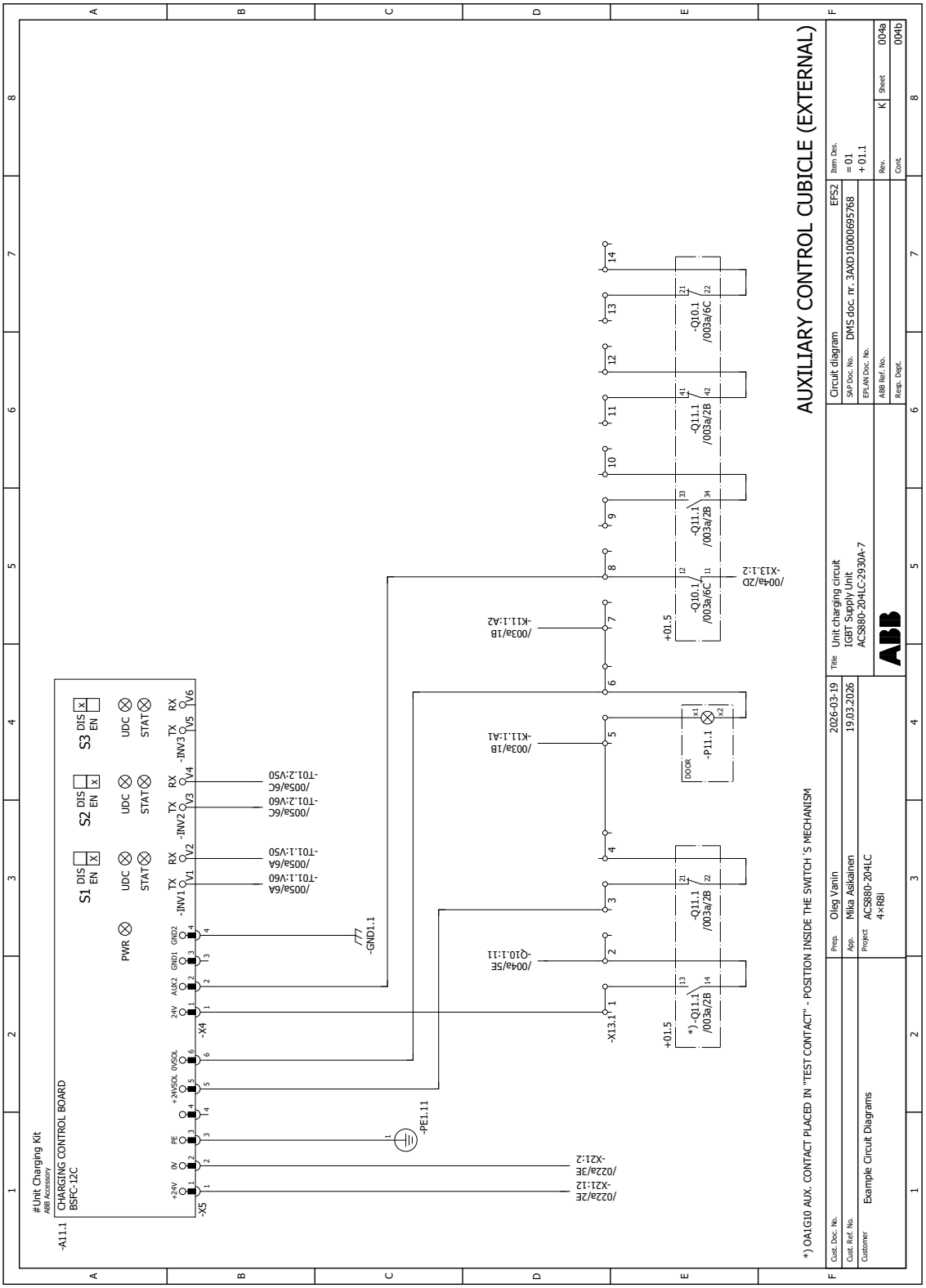

INCOMING CUBICLE (EXTERNAL)
LINE-UP CHARGING
AC to DC
/002a/1A
/002a/1A
DC+
DC-
-Q40
650A
#Line-up Charging Switch Kit
ABB Accessory
/050b/2A
-F40.1
350A
-F40.2
350A
#Line-up Charging Kit
ABB Accessory
7x1SU capacitance
-T40.1
-T40.2
-T40.3
-X4.12
-X4.10
-X4.22
-X4.20
-X4.32
-X4.30
-R4.10
-R4.11
-R4.12
-R4.20
-R4.21
-R4.22
-R4.30
-R4.31
-R4.32
-Q4
/050a/3C
/001a/4D
-Q3:2
/001a/4D
-Q3:4
/001a/5D
-Q3:6
Prep. Oleg Vanin 2026-03-19
Appr. Mika Aslkainen 19.03.2026
Project ACS880-2041C 4×R8i
Title Line-up charging circuit IGBT Supply Unit ACS880-2041LC-2930A-7
Circuit diagram EFS2
SAP Doc. No. DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des. = 01 + 01.2
Rev. K Sheet 001b
Cont. 002a
Cust. Doc. No.
Cust. Ref. No.
Customer Example Circuit Diagrams

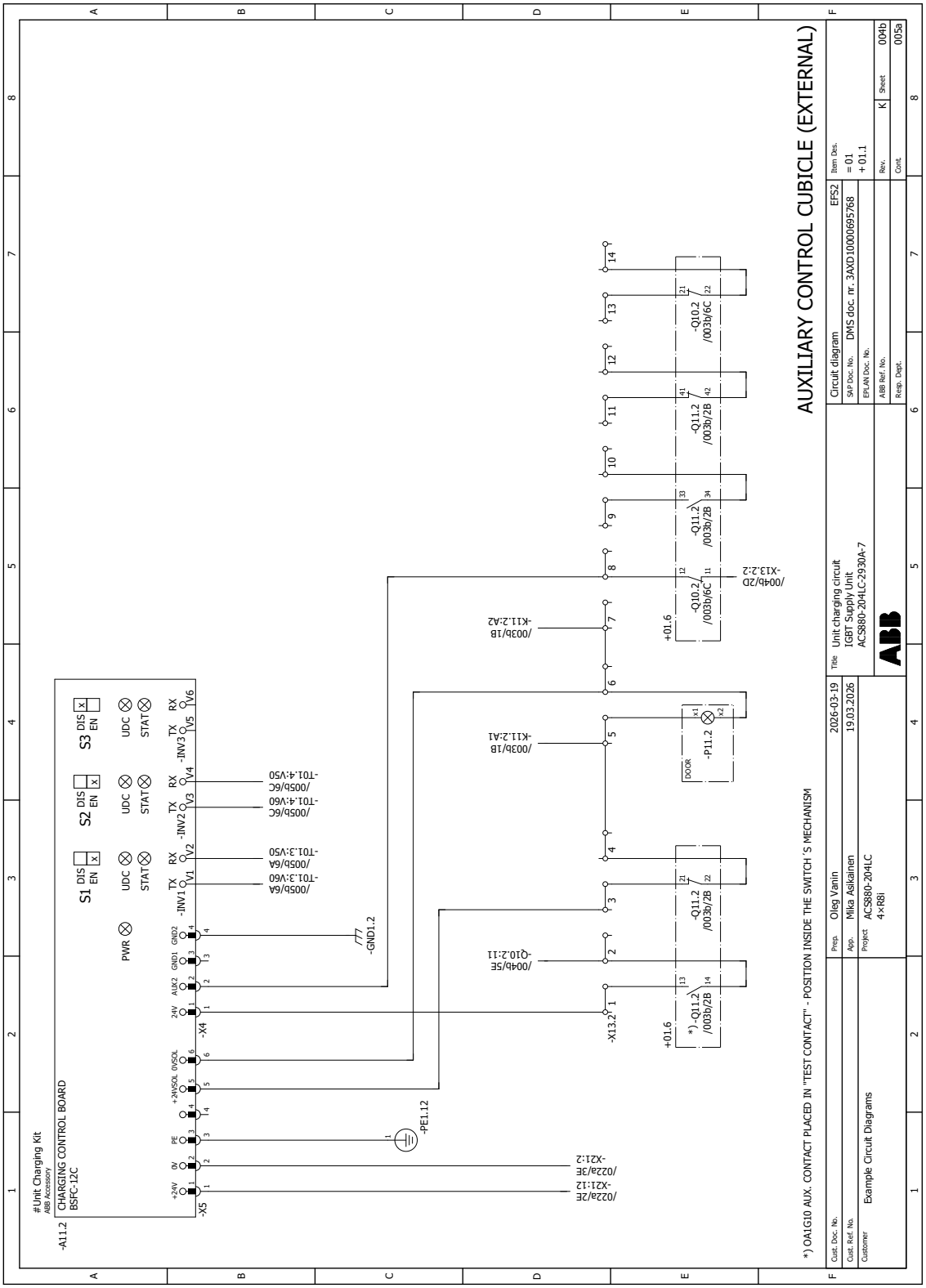

FIRST
LCL FILTER CUBICLE
Capacitor temp sensor
-X6.10
-F6.11
-R6.1:13
/002a/3E
/002b/3A
-X6.20:1
-F6.10
-F3.11
-F3.12
-F3.13
-R9.1
-R5.1
-R6.1
-C1.11
-C1.12
-C1.13
-C1.14
-C1.15
-C1.16
-L1.1
-L1.2
-L1.3
-L2.1
-L2.2
-L2.3
-L3.1
-L3.2
-L3.3
-X6.1:2
/001a/6B
/002a/8D
-F6.11:12
-R6.2:X2
-R6.2:X4
-R6.2:X6
/002b/1F
#AC Fuse
ABB Accessory
#Filter Unit Kit
ABB Accessory
MAIN CHARGING
MAIN SUPPLY
/001b/3A
/002b/1A
/001a/8A
-Q1:2
-Q1:4
-Q1:6
-F3.21:1
-F3.22:1
-F3.23:1
FRAME
Circuit diagram
EFS2
DMS doc. nr. 3AXD10000695768
= 01
+ 01.3
Sheet
002a
002b
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep.
Oleg Vanin
2026-03-19
App.
Mika Asikainen
19.03.2026
Project
ACS880-204LC
4×R8i
Title
LCL filter
IGBT Supply Unit
ACS880-204LC-2930A-7
ABB

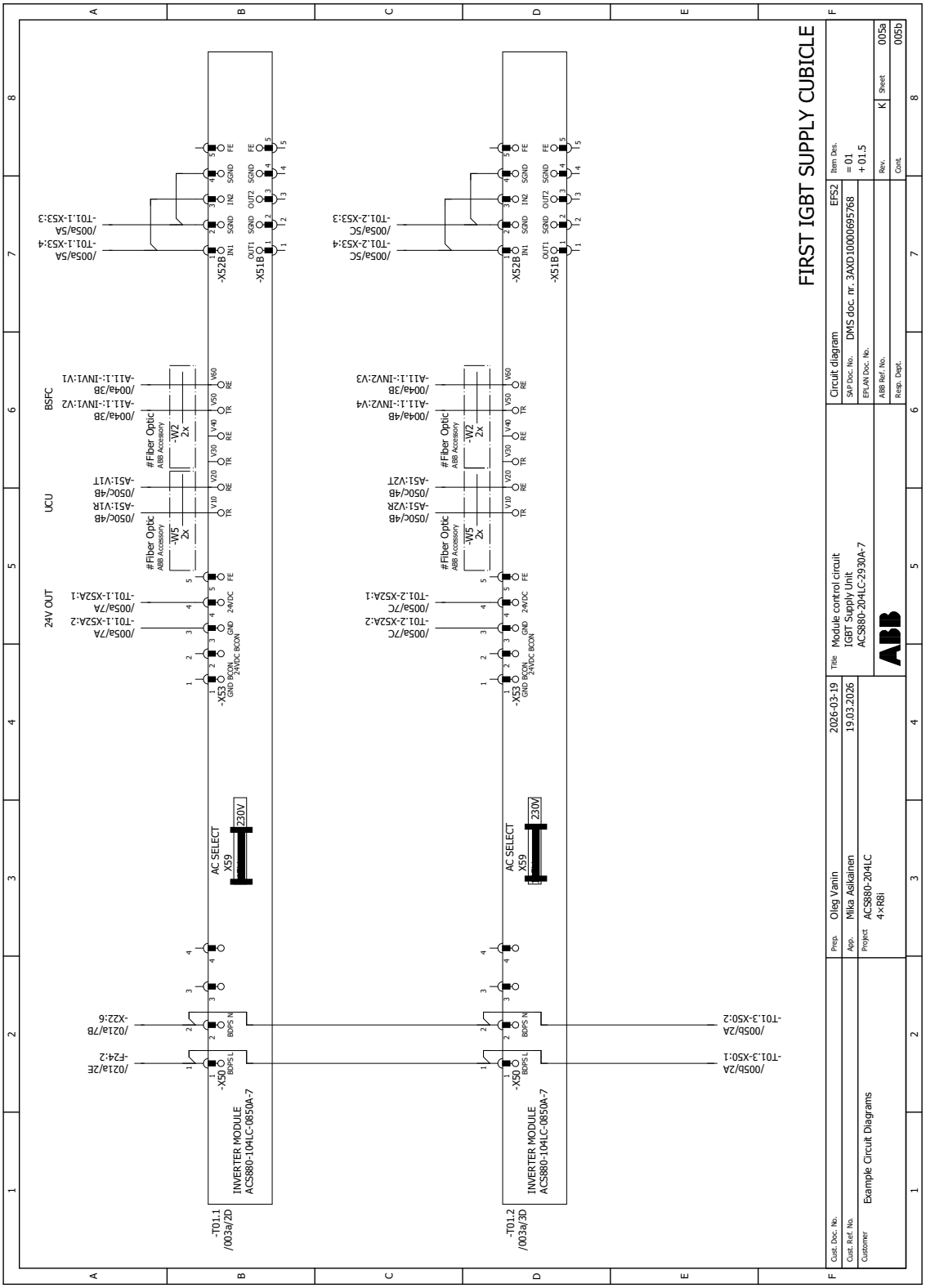

SECOND
LCL FILTER CUBICLE
Capacitor temp sensor
-X6.20
-F6.21
-R6.2:13
/002b/3E
/021a/7E
-X6.99:2
/003a/1A
-Q11.1:4
-Q11.1:2
/003a/1A
/002a/8A
MAIN CHARGING
MAIN SUPPLY
-F3.1:1:1
-F3.12:1
-F3.13:1
/002a/8A
-X6.10:2
/002a/8C
-X6.20
#Filter Unit Kit
ABB Accessory
#AC Fuse
ABB Accessory
-F3.21
-F3.22
-F3.23
-F6.20
-R5.2
-R6.2
-R9.2
-L1.1
-L1.2
-L1.3
-L2.1
-L2.2
-L2.3
-L3.1
-L3.2
-L3.3
-C1.21
-C1.22
-C1.23
-C1.24
-C1.25
-C1.26
FRAME
/003a/1E
-X01.1:U2
/003a/1F
-X01.1:V2
/003a/1F
-X01.1:W2
/002a/7F
-R6.1:X2
/002a/7F
-R6.1:X4
/002a/7F
-R6.1:X6
/002b/8D
-f6.21:12
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep.
Oleg Vanin
2026-03-19
Appr.
Mika Aslkainen
19.03.2026
Project
ACS880-2041LC
4×R8i
Title
LCL filter
IGBT Supply Unit
ACS880-2041LC-2930A-7
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
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Sheet
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003a

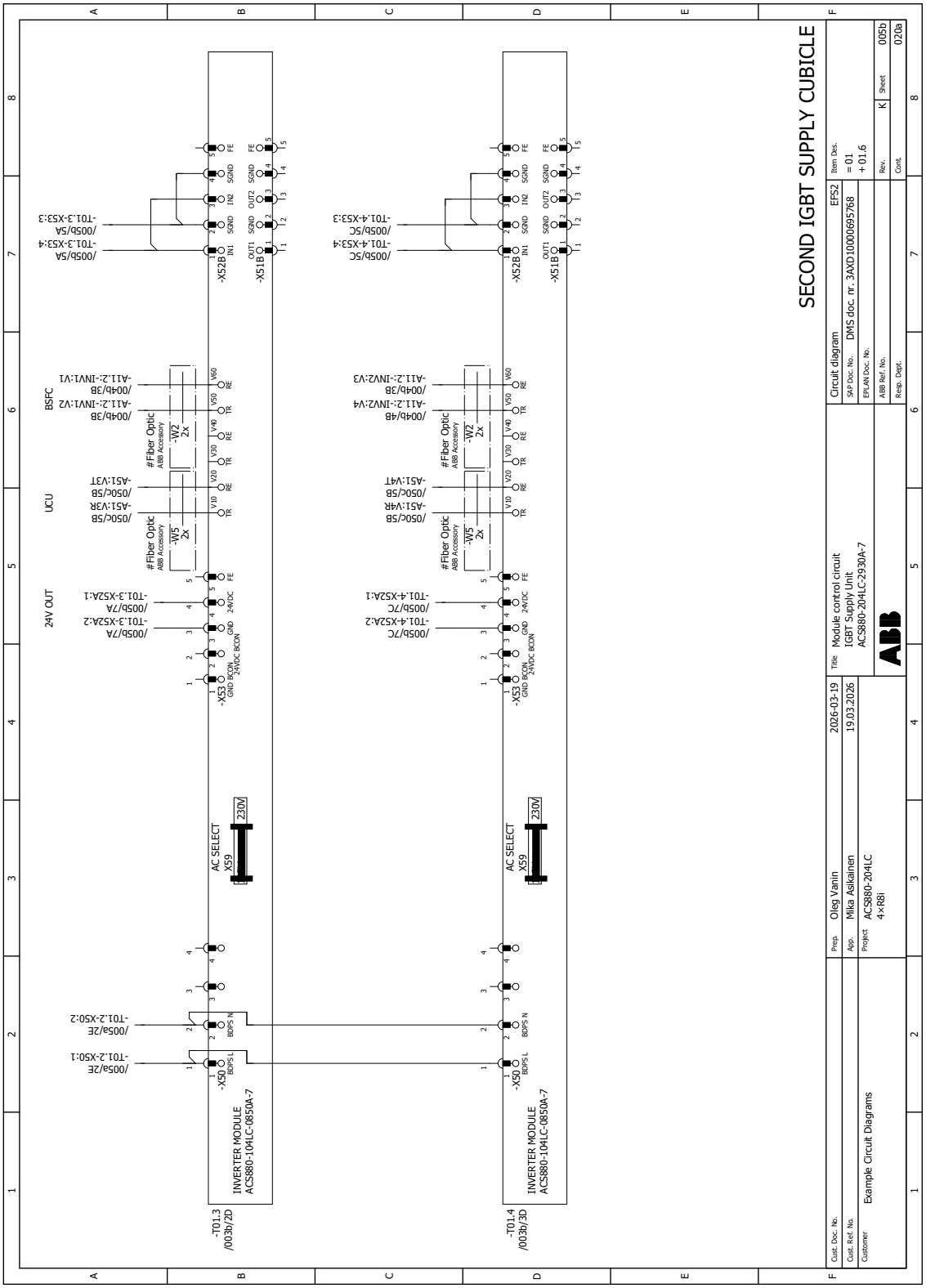

FIRST IGBT SUPPLY CUBICLE
UNIT CHARGING
DC to DC
/003b/1A -Q11.2:2
/003b/1A -Q11.2:4
/002b/8A
/002b/8A
/004a/4D -X13.1:5
/004a/5D -X13.1:7
#DC Switch Kit
ABB Accessory
-Q11.1
1600A
-K11.1
#Unit Charging Kit
ABB Accessory
-Q10.1
35A
-F10.1.1
-F10.1.2
-F10.1.3
-F10.1.4
/004a/7E
/004a/5E
/004a/6E
/004a/3E
/004a/2E
-UDC+:1.1
-UDC-:1.1
-UDC+:2.1
-UDC-:2.1
#DC Fuse
ABB Accessory
-F2.11
-F2.12
-F2.21
-F2.22
#CM Filter
ABB Accessory
-R1.11
-R1.12
-R1.21
-R1.22
#Supply Module
ABB Accessory
-T01.1
/005a/1B
850A, 800kW
-T01.2
/005a/1D
850A, 800kW
INVERTER MODULE
ACS880-104LC-0850A-7
FRAME
-X01.1
-X01.2
#Resistor
ABB Accessory
-R10.1
R1.1
R2.1
R3.1
R4.1
R5.1
R6.1
/003b/1E -X01.3:U2
/003b/1F -X01.3:V2
/003b/1F -X01.3:W2
/002b/6F -R6.2:X2
/002b/6F -R6.2:X4
/002b/6F -R6.2:X6
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.5
Rev.
K
Sheet
003a
Cont.
003b
Title
Drive main circuit
IGBT Supply Unit
ACS880-204LC-2930A-7
Prep.
Oleg Vanin
2026-03-19
App.
Mika Asikainen
19.03.2026
Project
ACS880-204LC
4×R8i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams

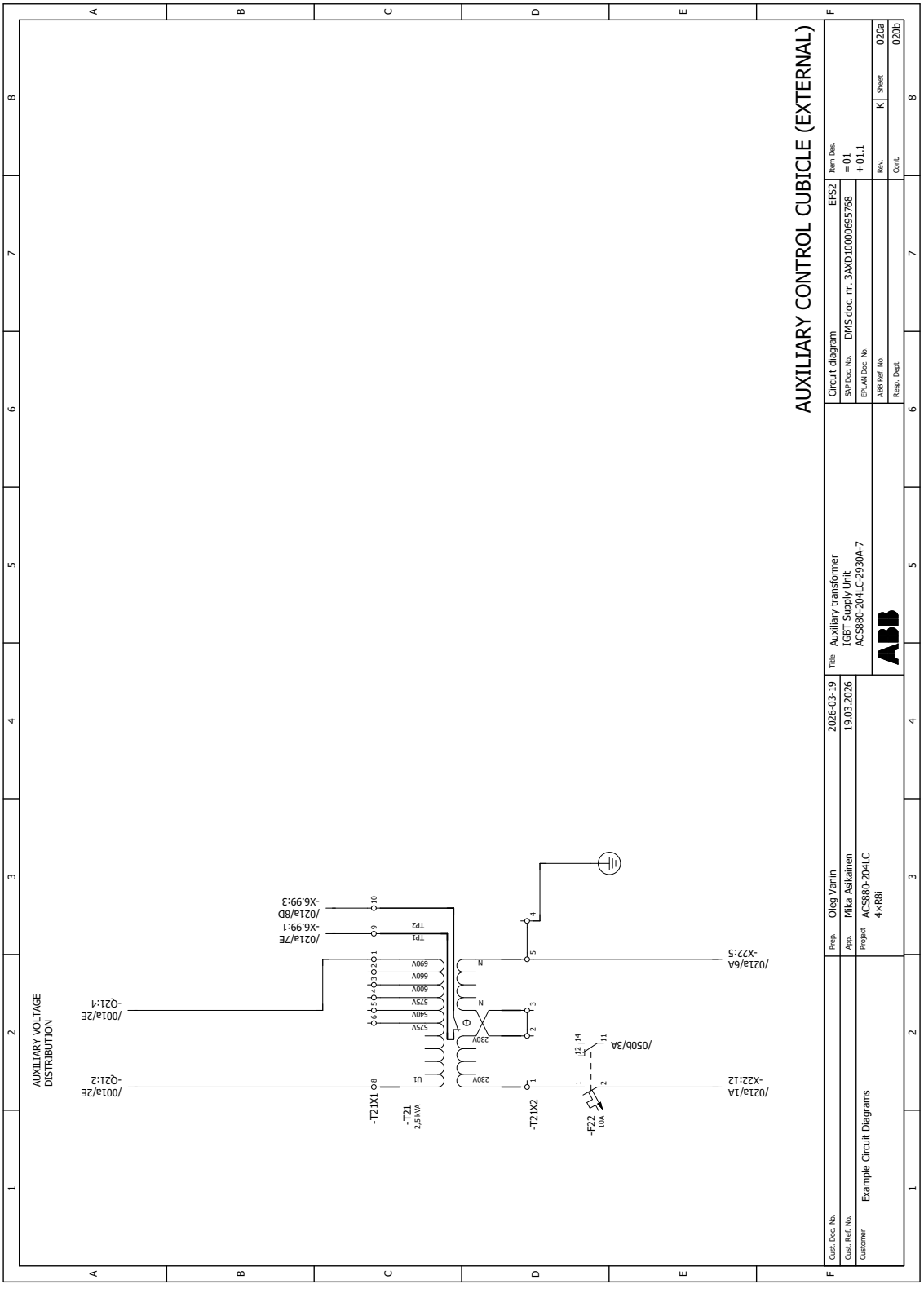

SECOND IGBT SUPPLY CUBICLE
TO INVERTER UNIT
UNIT CHARGING
DC to DC
#Unit Charging Kit
ABB Accessory
-Q10.2
35A
-F10.2.1
-F10.2.2
-F10.2.3
/004b/7E
/004b/5E
-R10.2
#Resistor
ABB Accessory
R1.1
R2.1
R3.1
R4.1
R5.1
R6.1
-UDC+:1.2
-UDC-:1.2
-UDC+:2.2
-UDC-:2.2
/004b/2E
/004b/3E
/004b/5E
/004b/6E
#DC Switch Kit
ABB Accessory
-Q11.2
160A
-K11.2
/003a/8A
-Q11.1:6
/003a/8A
-Q11.1:8
/004b/4D
-X13.2:5
/004b/5D
-X13.2:7
#DC Fuse
ABB Accessory
-F2.31
-F2.32
-F2.41
-F2.42
400A
#CM Filter
ABB Accessory
-R1.31
-R1.32
-R1.41
-R1.42
#Supply Module
ABB Accessory
-T01.3
/005b/1B
850A, 690kW
-T01.4
/005b/1D
850A, 690kW
INVERTER MODULE
ACS880-104LC-0850A-7
FRAME
-X01.3
-X01.4
/003a/6E
-X01.2:U2
/003a/6F
-X01.2:V2
/003a/6F
-X01.2:W2
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep.
Oleg Vanin
2026-03-19
Appr.
Mika Asikainen
19.03.2026
Project
ACS880-204LC
4×R8i
Title
Drive main circuit
IGBT Supply Unit
ACS880-204LC-2930A-7
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.6
Rev.
K
Sheet
003b
Cont.
004a

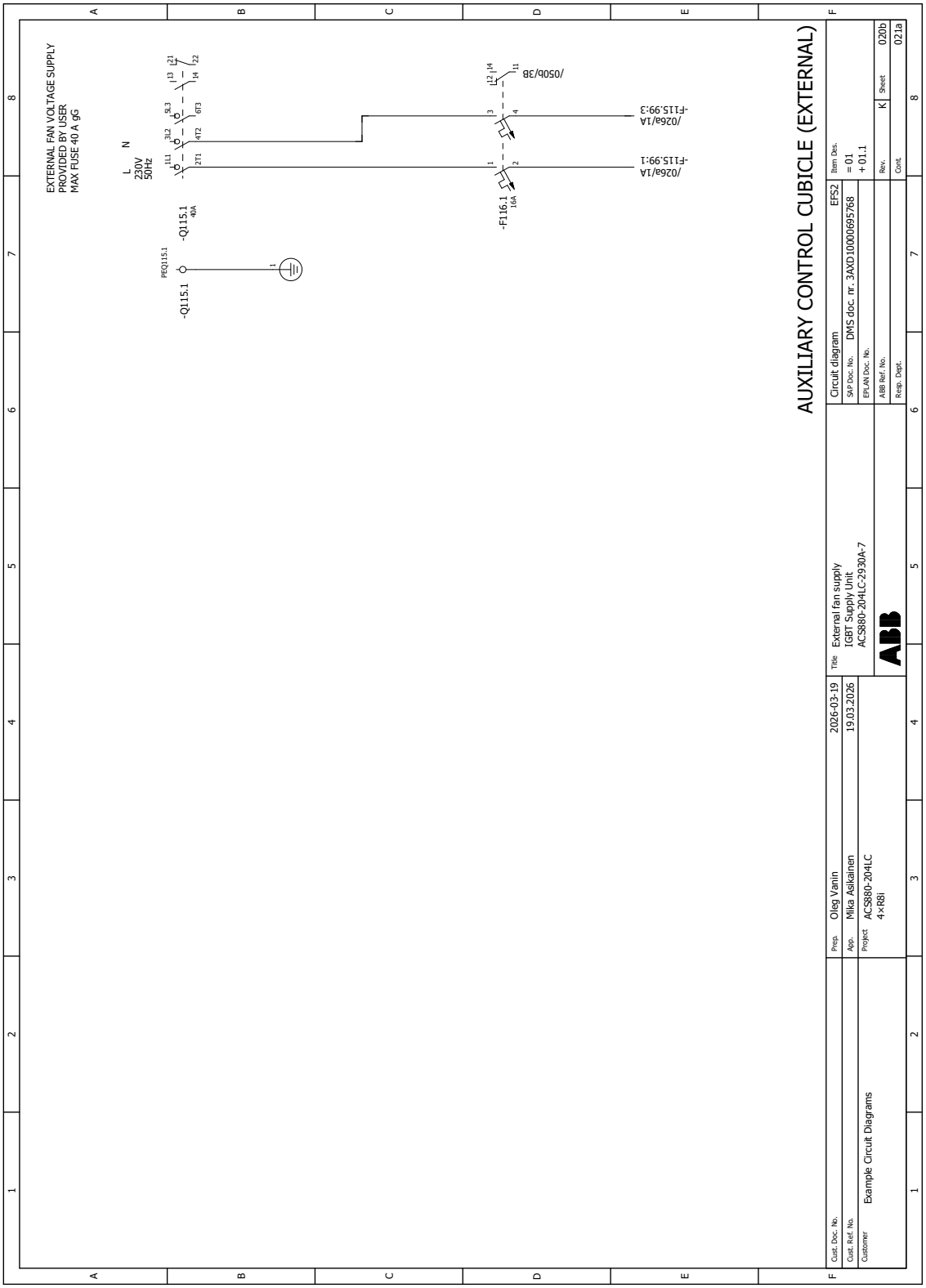

AUXILIARY CONTROL CUBICLE (EXTERNAL)
CHARGING CONTROL BOARD
BSFC-12C
-A11.1
-X5
-X4
-INV1
-INV2
-INV3
S1
S2
S3
PWR
UDC
STAT
-GND1.1
-PE1.11
-Q10.1
-Q11.1
-P11.1
-K11.1
-X13.1
-X13.1:2
-X21:12
-X21:2
*) OA1G10 AUX. CONTACT PLACED IN "TEST CONTACT" - POSITION INSIDE THE SWITCH´S MECHANISM
Unit charging circuit
IGBT Supply Unit
ACS880-204LC-2930A-7
EFS2
DMS doc. nr. 3AXD10000695768
= 01
+ 01.1
004a
004b
Oleg Vanin
Mika Asikainen
2026-03-19
19.03.2026
ACS880-204LC
4×R8i
Example Circuit Diagrams

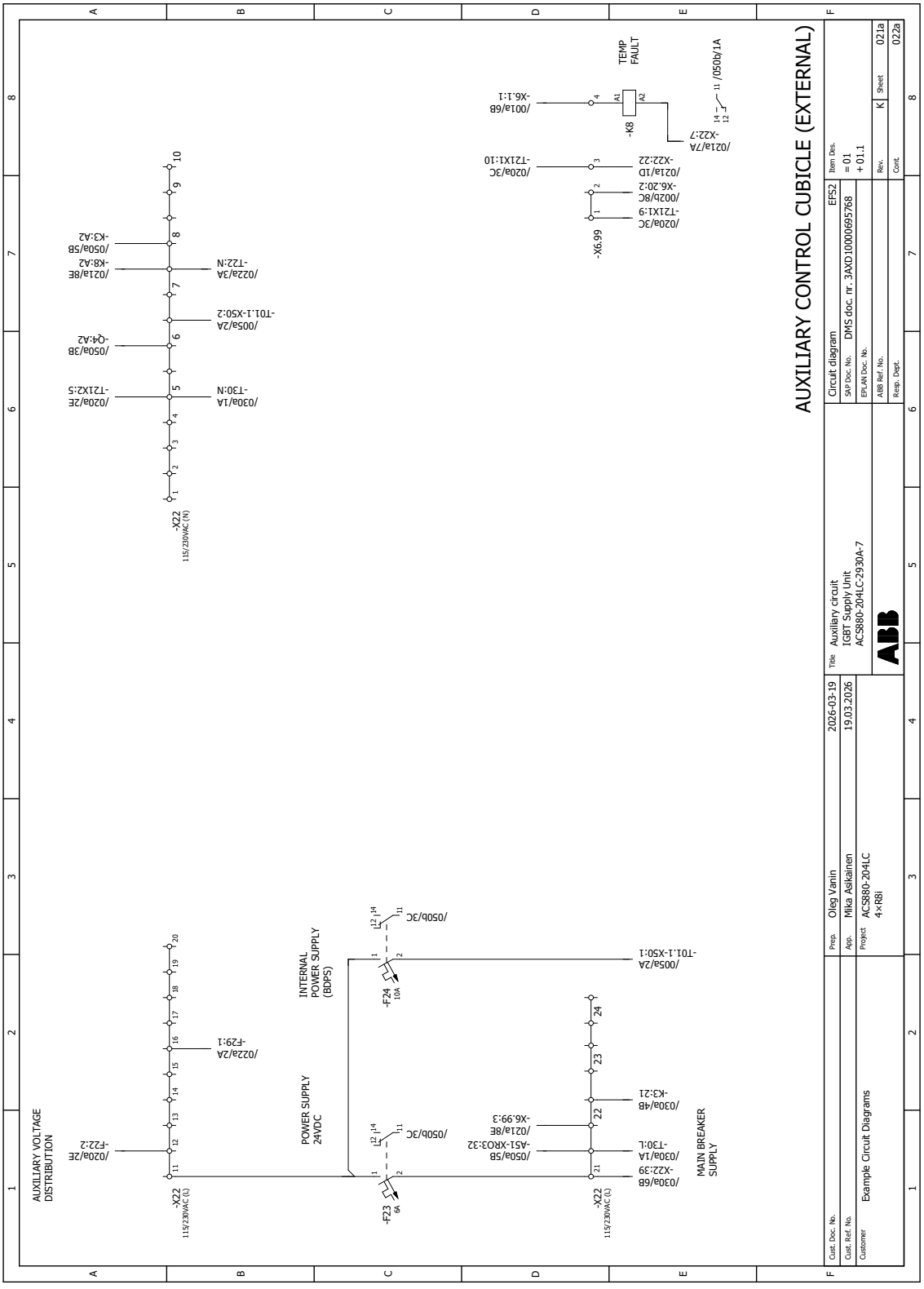

AUXILIARY CONTROL CUBICLE (EXTERNAL)
*) OA1G10 AUX. CONTACT PLACED IN "TEST CONTACT" - POSITION INSIDE THE SWITCH´S MECHANISM
-A11.2
#Unit Charging Kit
ABB Accessory
CHARGING CONTROL BOARD
BSFC-12C
-X5
-X4
-INV1
-INV2
-INV3
S1 DIS EN
S2 DIS EN
S3 DIS EN
PWR
UDC
STAT
-GND1.2
-PE1.12
-X13.2
-Q10.2:11
-K11.2:A1
-K11.2:A2
-P11.2
-Q11.2 /003b/2B
-Q10.2 /003b/6C
-X13.2:2
-X21:2
-X21:1
Unit charging circuit
IGBT Supply Unit
ACS880-204LC-2930A-7
Example Circuit Diagrams
ACS880-204LC
4×R8i
Oleg Vanin
Mika Aalkainen
2026-03-19
19.03.2026
EFS2
DMS doc. nr. 3AXD10000695768
Circuit diagram
= 01
+ 01.1
004b
005a

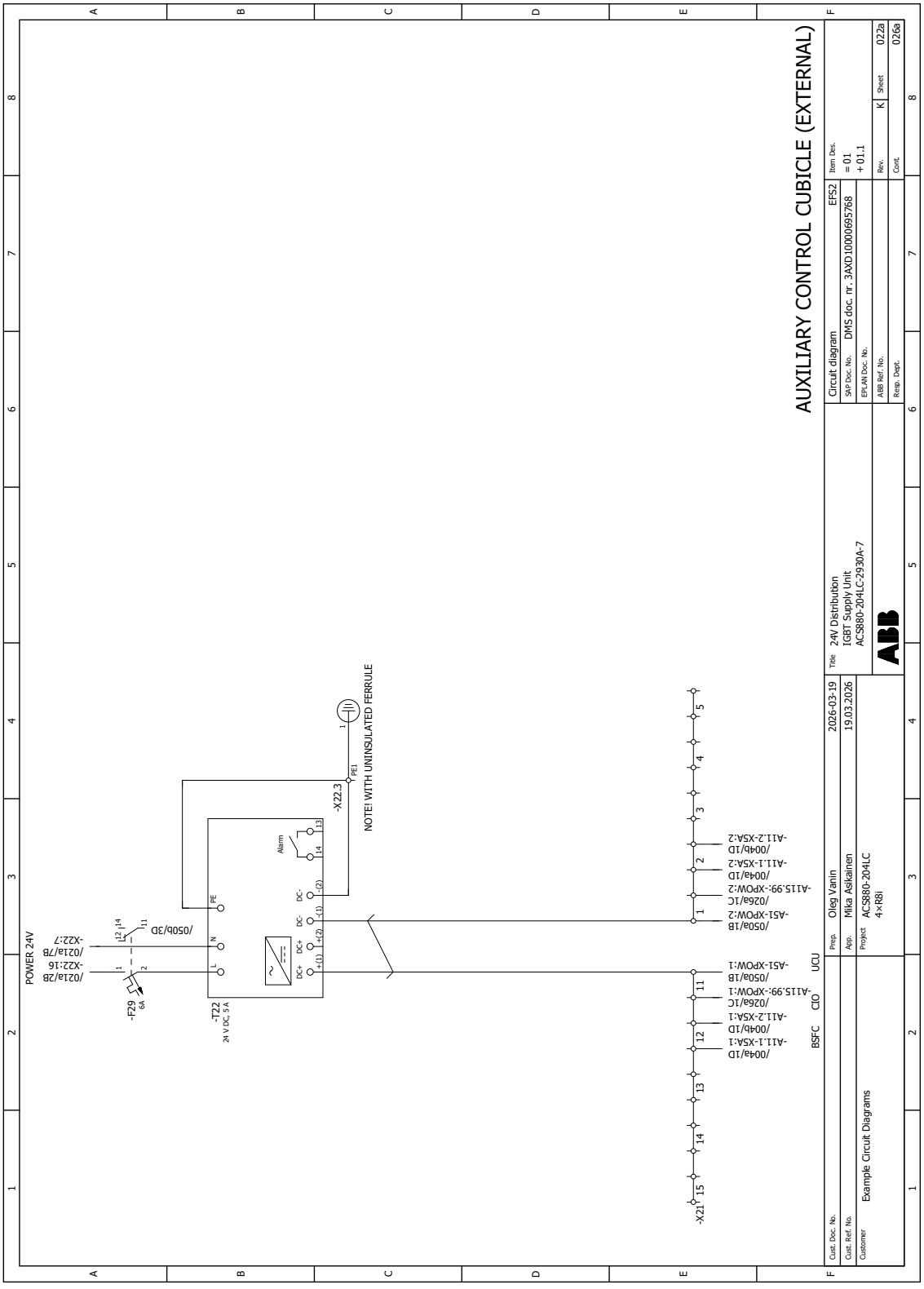

FIRST IGBT SUPPLY CUBICLE
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.5
Rev.
K
Sheet
005a
Cont.
005b
Title
Module control circuit
IGBT Supply Unit
ACS880-204LC-2930A-7
Prep.
Oleg Vanin
2026-03-19
Appr.
Mika Aalkainen
19.03.2026
Project
ACS880-204LC
4×R8i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
INVERTER MODULE
ACS880-104LC-0850A-7
-T01.1
/003a/2D
-T01.2
/003a/3D
AC SELECT
X59
230V
24V OUT
UCU
BSFC
#Fiber Optic
ABB Accessory
-W5
2x
-W2
2x
-X50
-X51B
-X52B
-X53
-F24:2
/021a/2E
-X22:6
/021a/7B
-T01.3-X50:1
/005b/2A
-T01.3-X50:2
/005b/2A
-T01.1-X53:4
/005a/5A
-T01.1-X53:3
/005a/5A
-T01.2-X53:4
/005a/5C
-T01.2-X53:3
/005a/5C
-T01.1-X52A:1
/005a/7A
-T01.1-X52A:2
/005a/7A
-T01.2-X52A:1
/005a/7C
-T01.2-X52A:2
/005a/7C
-A51:V1R
/050c/4B
-A51:V1T
/050c/4B
-A51:V2R
/050c/4B
-A51:V2T
/050c/4B
-A11.1:-INV1:V1
/004a/3B
-A11.1:-INV1:V2
/004a/3B
-A11.1:-INV2:V3
/004a/3B
-A11.1:-INV2:V4
/004a/4B

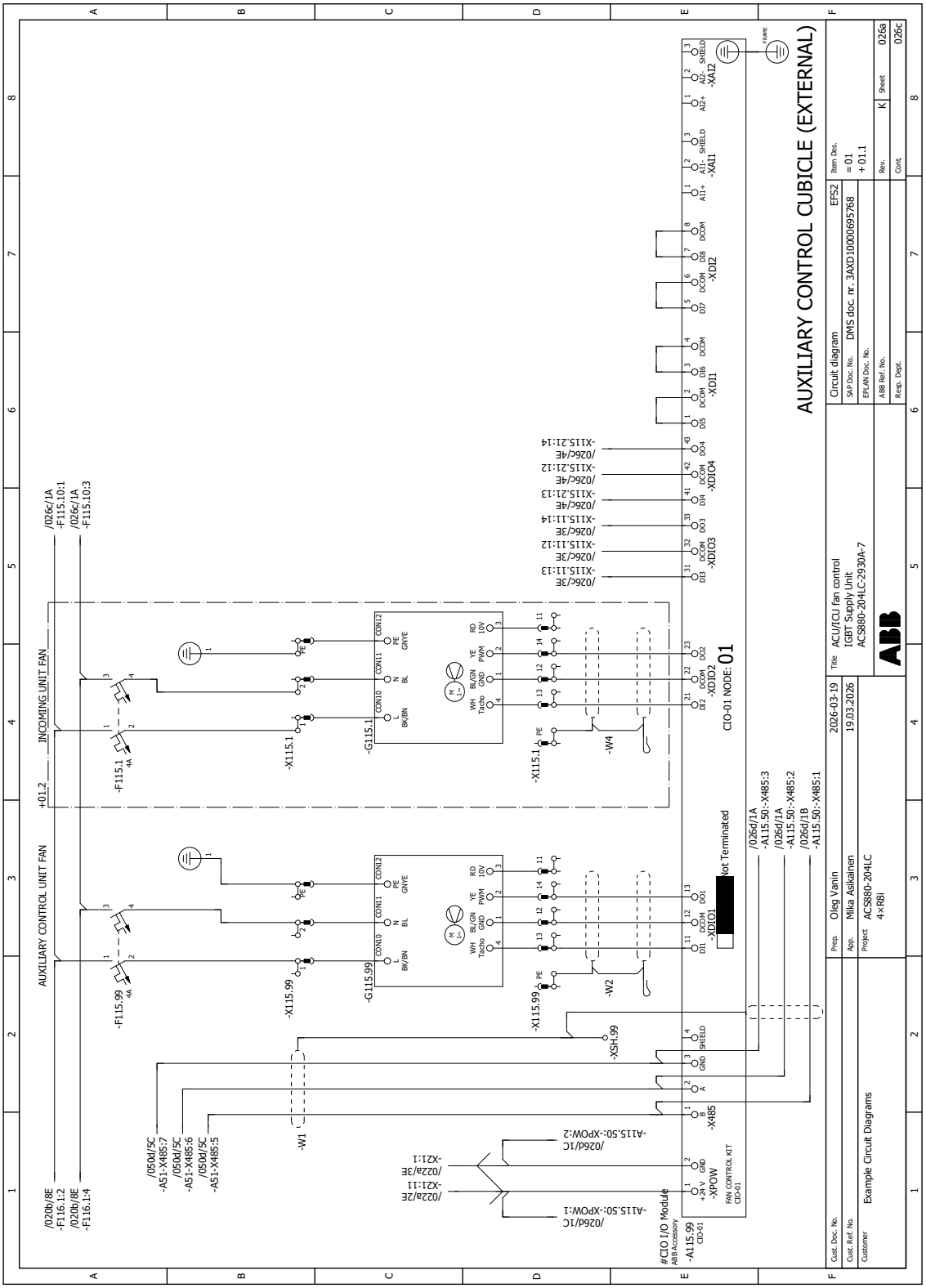

SECOND IGBT SUPPLY CUBICLE
Circuit diagram
EFS2
Item Des.
SAP Doc. No.
DMS doc. nr. 3AXD10000695768
= 01
+ 01.6
EPLAN Doc. No.
ABB Ref. No.
Rev.
K
Sheet
005b
Resp. Dept.
Cont.
020a
Title
Module control circuit
IGBT Supply Unit
ACS880-204LC-2930A-7
Prep.
Oleg Vanin
2026-03-19
Appr.
Mika Aalkainen
19.03.2026
Project
ACS880-204LC
4×R8i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
INVERTER MODULE
ACS880-104LC-0850A-7
-T01.3
/003b/2D
INVERTER MODULE
ACS880-104LC-0850A-7
-T01.4
/003b/3D
AC SELECT
X59
230V
24V OUT
UCU
BSFC
#Fiber Optic
ABB Accessory
-W5
2x
-W2
2x
-X50
-X53
-X52A
-X52B
-X51B
BDPS L
BDPS N
GND
BCON
24VDC
SGND
FE
IN1
IN2
OUT1
OUT2
TR
RE
/005a/ZE
-T01.2-X50:1
/005a/ZE
-T01.2-X50:2
/005b/7A
-T01.3-X52A:2
/005b/7A
-T01.3-X52A:1
/050C/5B
-A51.V3R
/050C/5B
-A51.V3T
/004b/3B
-A11.2:-INV1:V2
/004b/3B
-A11.2:-INV1:V1
/005b/5A
-T01.3-X53:4
/005b/5A
-T01.3-X53:3
/005b/7C
-T01.4-X52A:2
/005b/7C
-T01.4-X52A:1
/050C/5B
-A51.V4R
/050C/5B
-A51.V4T
/004b/4B
-A11.2:-INV2:V4
/004b/3B
-A11.2:-INV2:V3
/005b/5C
-T01.4-X53:4
/005b/5C
-T01.4-X53:3

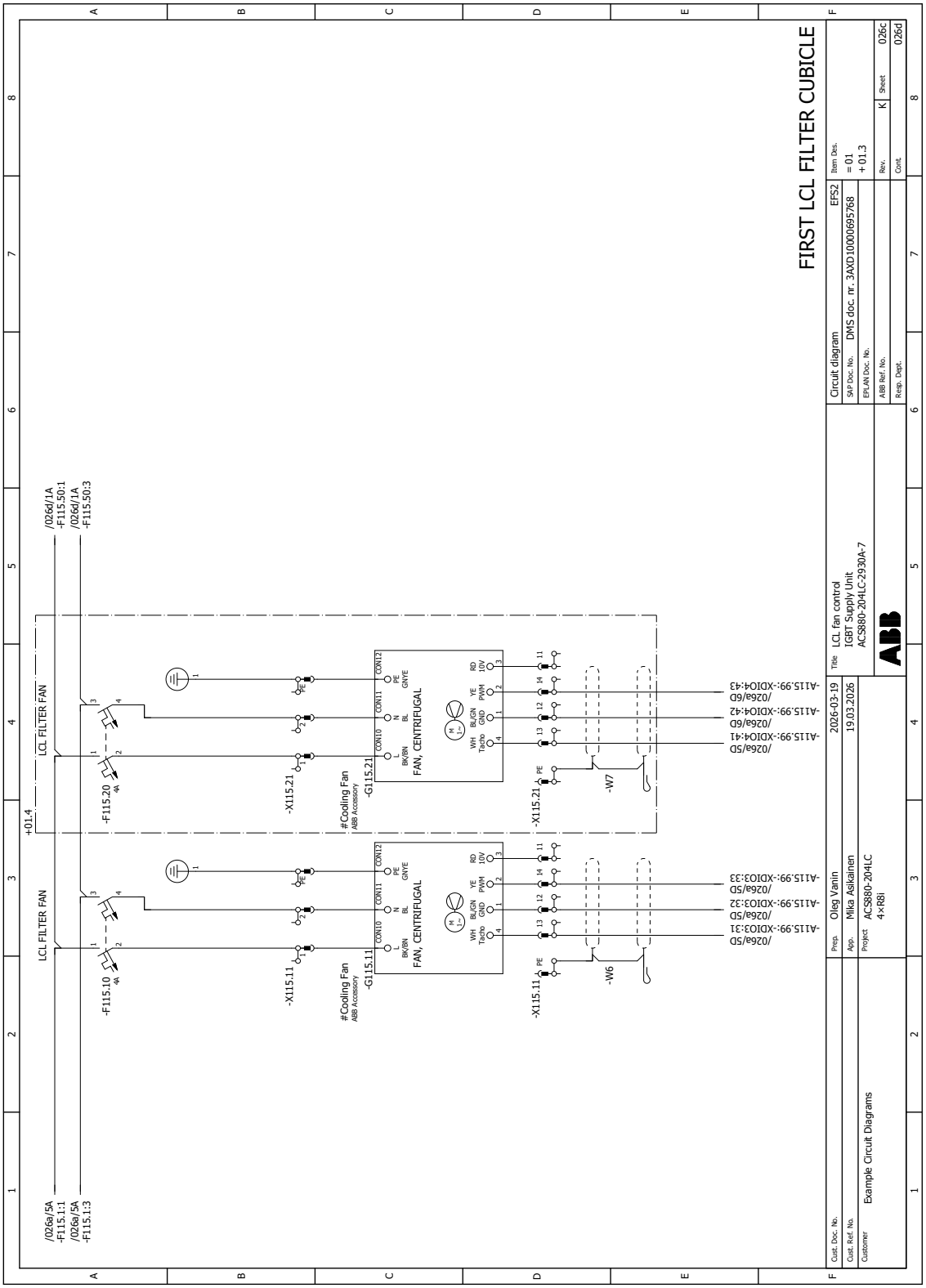

AUXILIARY CONTROL CUBICLE (EXTERNAL)
AUXILIARY VOLTAGE DISTRIBUTION
/001a/ZE -Q21:2
/001a/ZE -Q21:4
/021a/6A -XZ2:5
/021a/1A -XZ2:12
/050b/3A
/021a/7E -X6.99:1
/021a/8D -X6.99:3
-T21X1
-T21 2,5 kVA
-T21X2
-FZ2 10A
Circuit diagram
EFS2
Item Des.
= 01
+ 01.1
Auxiliary transformer
IGBT Supply Unit
ACS880-204LC-2930A-7
Prep. Oleg Vanin 2026-03-19
Appr. Mika Asikainen 19.03.2026
Project ACS880-204LC 4×R8i
Cust. Doc. No.
Cust. Ref. No.
Customer Example Circuit Diagrams
Rev. K Sheet 020a
Cont. 020b

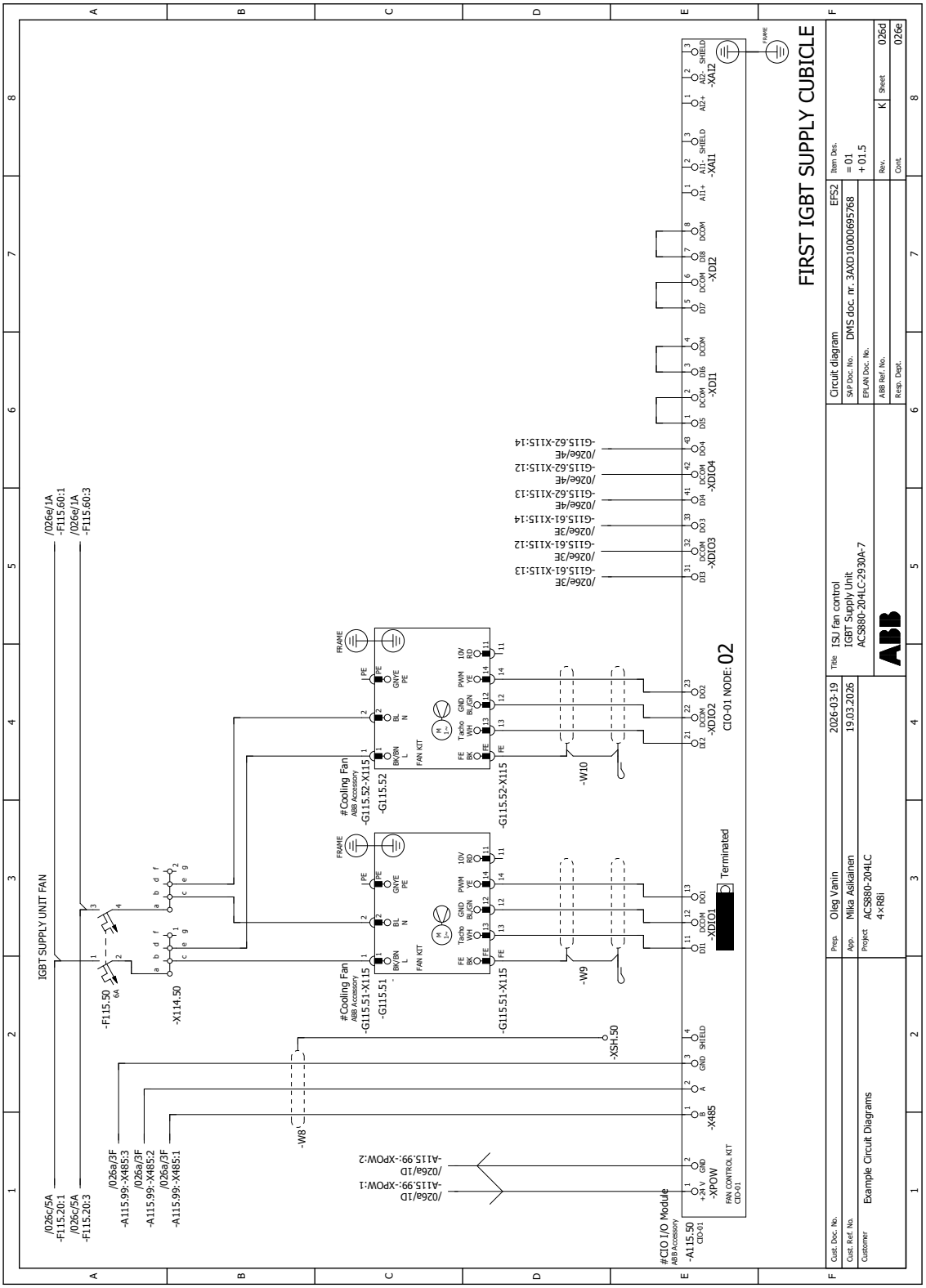

AUXILIARY CONTROL CUBICLE (EXTERNAL)
EXTERNAL FAN VOLTAGE SUPPLY
PROVIDED BY USER
MAX FUSE 40 A gG
L
N
230V
50Hz
-Q115.1
40A
-Q115.1
PEQ115.1
-F116.1
16A
-F115.99:1
/026a/1A
-F115.99:3
/026a/1A
/050b/3B
Circuit diagram
EFS2
Item Des.
= 01
+ 01.1
SAP Doc. No.
DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Rev.
K
Sheet
020b
Cont.
021a
Title
External fan supply
IGBT Supply Unit
ACS880-2041LC-2930A-7
Prep.
Oleg Vanin
2026-03-19
Appr.
Mika Asikainen
19.03.2026
Project
ACS880-2041LC
4×R8i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams

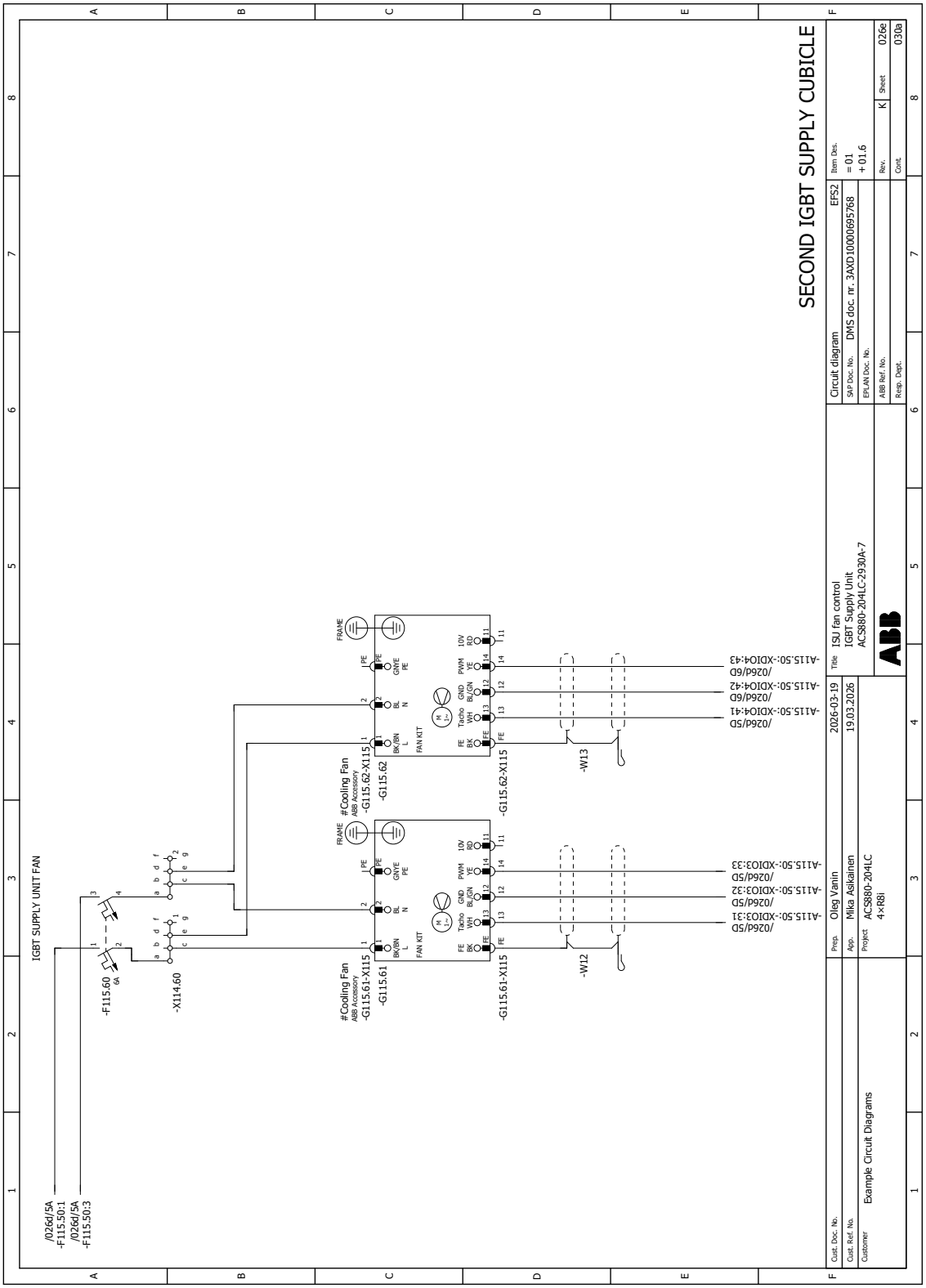

AUXILIARY CONTROL CUBICLE (EXTERNAL)
AUXILIARY VOLTAGE DISTRIBUTION
POWER SUPPLY 24VDC
INTERNAL POWER SUPPLY (BDPS)
MAIN BREAKER SUPPLY
TEMP FAULT
-X22
115/230VAC (N)
-X22
115/230VAC (L)
-X6.99
-K8
-A51-XRO3:32
-T130:L
-T130:N
-T22:N
-T21X1:9
-T21X1:10
-T21X2:5
-T01.1-X50:1
-T01.1-X50:2
-Q4:A2
-K3:A2
-K3:21
-K8:A2
-F22:2
-F29:1
-X6.20:2
-X6.99:3
-X22:2
-X22:7
-X22:39
+F23
6A
+F24
10A
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.1
Rev.
K
Sheet
021a
Cont.
022a
Prep.
Oleg Vanin
2026-03-19
Appr.
Mika Aalkainen
19.03.2026
Project
ACS880-204LC
4×R8i
Title
Auxiliary circuit
IGBT Supply Unit
ACS880-204LC-2930A-7
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams

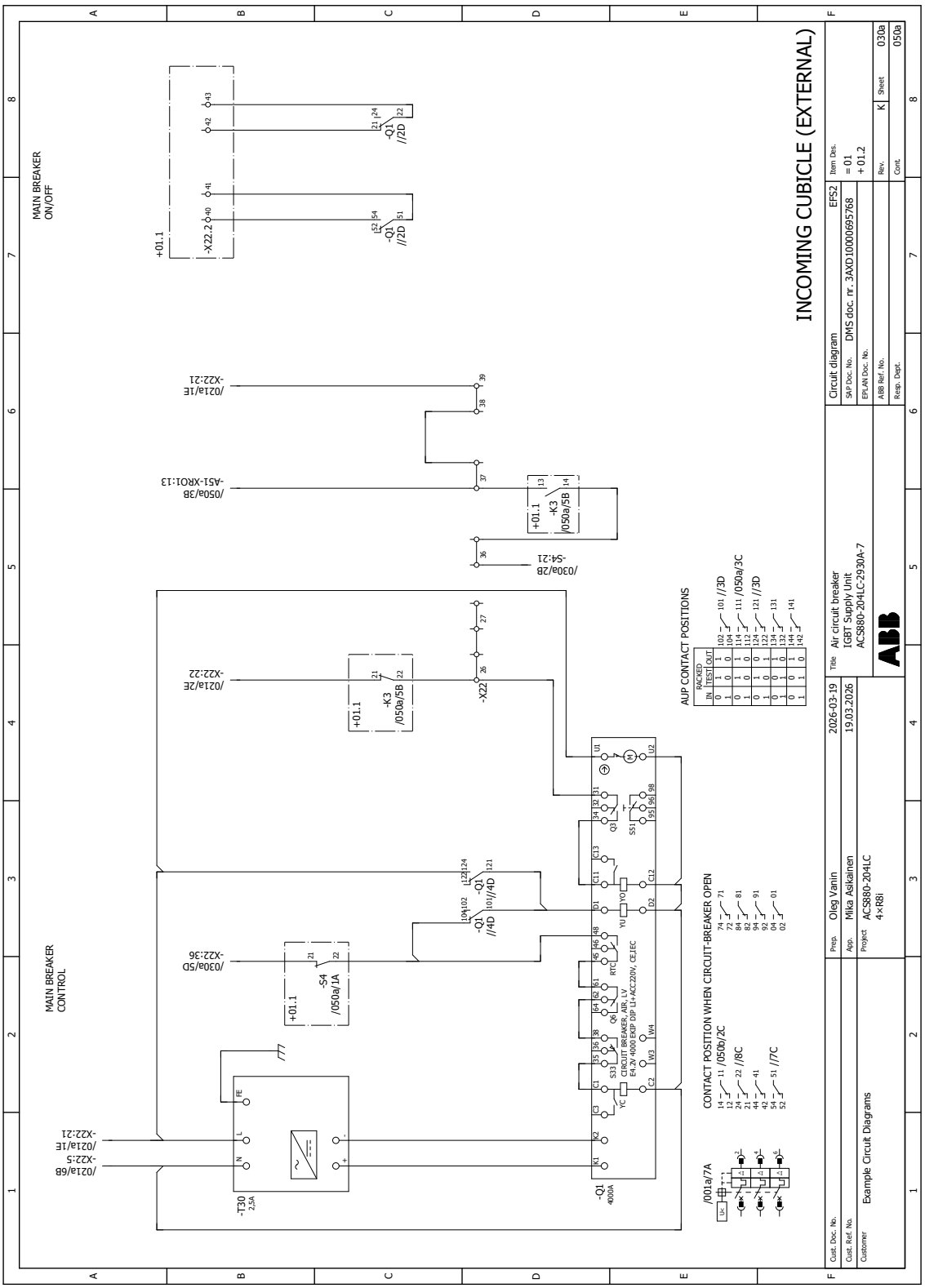

AUXILIARY CONTROL CUBICLE (EXTERNAL)
POWER 24V
/021a/2B
-XZ2:16
/021a/7B
-XZ2:7
/050b/3D
-F29
6A
-T22
24 V DC, 5 A
PE
N
L
DC-
DC+
+(1)
+(2)
Alarm
13
14
-X22.3
PE1
NOTE! WITH UNINSULATED FERRULE
-X21
/050a/1B
-A51-XPOW:2
/026a/1C
-A11.99:-XPOW:2
/004a/1D
-A11.1-XSA:2
/004b/1D
-A11.2-XSA:2
/050a/1B
-A51-XPOW:1
/026a/1C
-A11.99:-XPOW:1
/004a/1D
-A11.1-XSA:1
/004b/1D
-A11.2-XSA:1
BSFC
CIO
UCU
Prep.
Oleg Vanin
2026-03-19
Appr.
Mika Asikainen
19.03.2026
Project
ACS880-2041LC
4×R8i
Example Circuit Diagrams
Cust. Doc. No.
Cust. Ref. No.
Customer
Title
24V Distribution
IGBT Supply Unit
ACS880-2041LC-2930A-7
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.1
Rev.
K
Sheet
022a
Cont.
026a

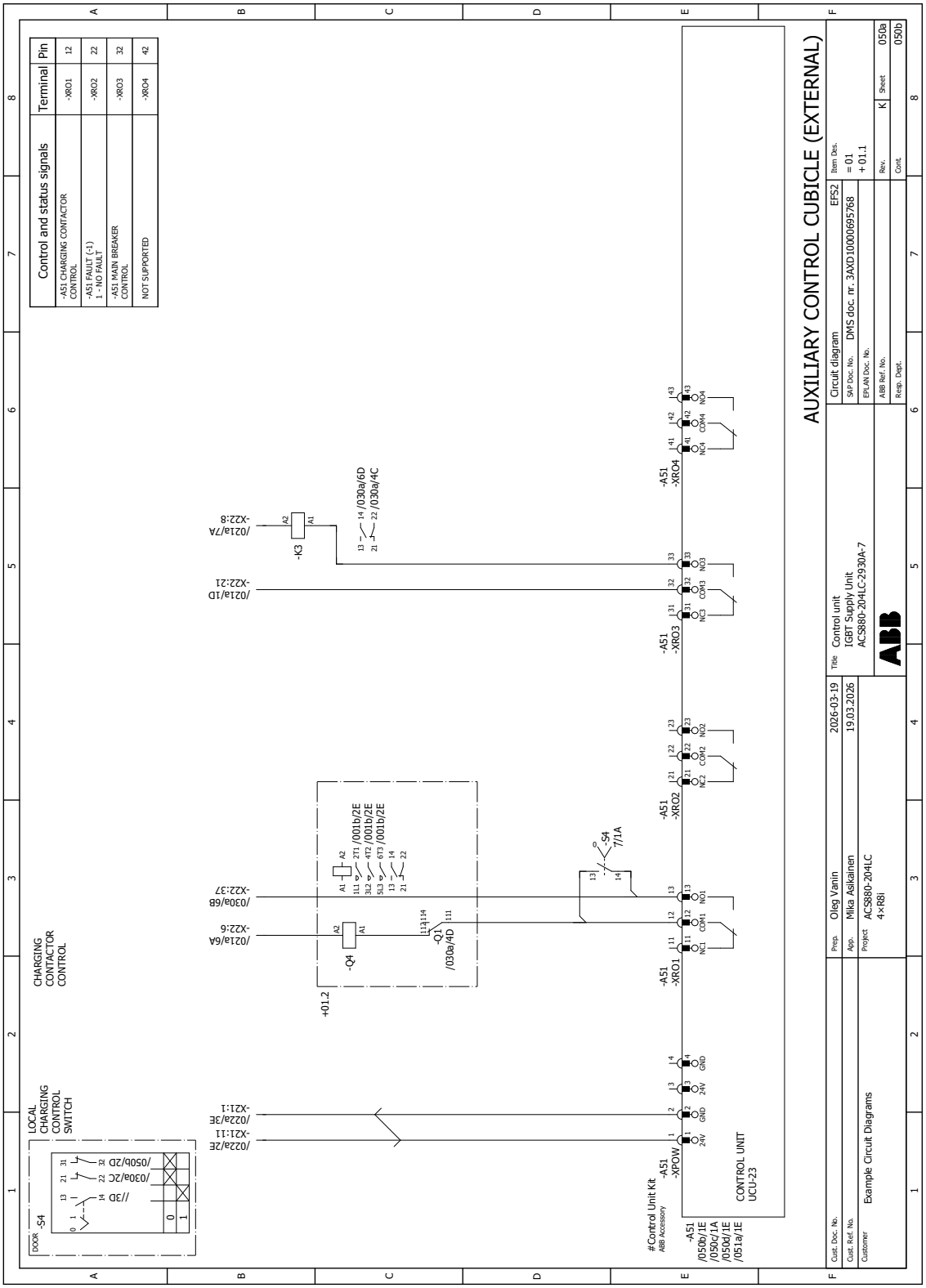

AUXILIARY CONTROL CUBICLE (EXTERNAL)
AUXILIARY CONTROL UNIT FAN
INCOMING UNIT FAN
+01.2
CIO-01 NODE: 01
Not Terminated
Circuit diagram
EFS2
ACU/CU fan control
IGBT Supply Unit
ACS880-204LC-2930A-7
Oleg Vanin
2026-03-19
Mika Aslkainen
19.03.2026
ACS880-204LC
4×R8i
Example Circuit Diagrams
DMS doc. nr: 3AXD10000695768
= 01
+ 01.1
026a
026c

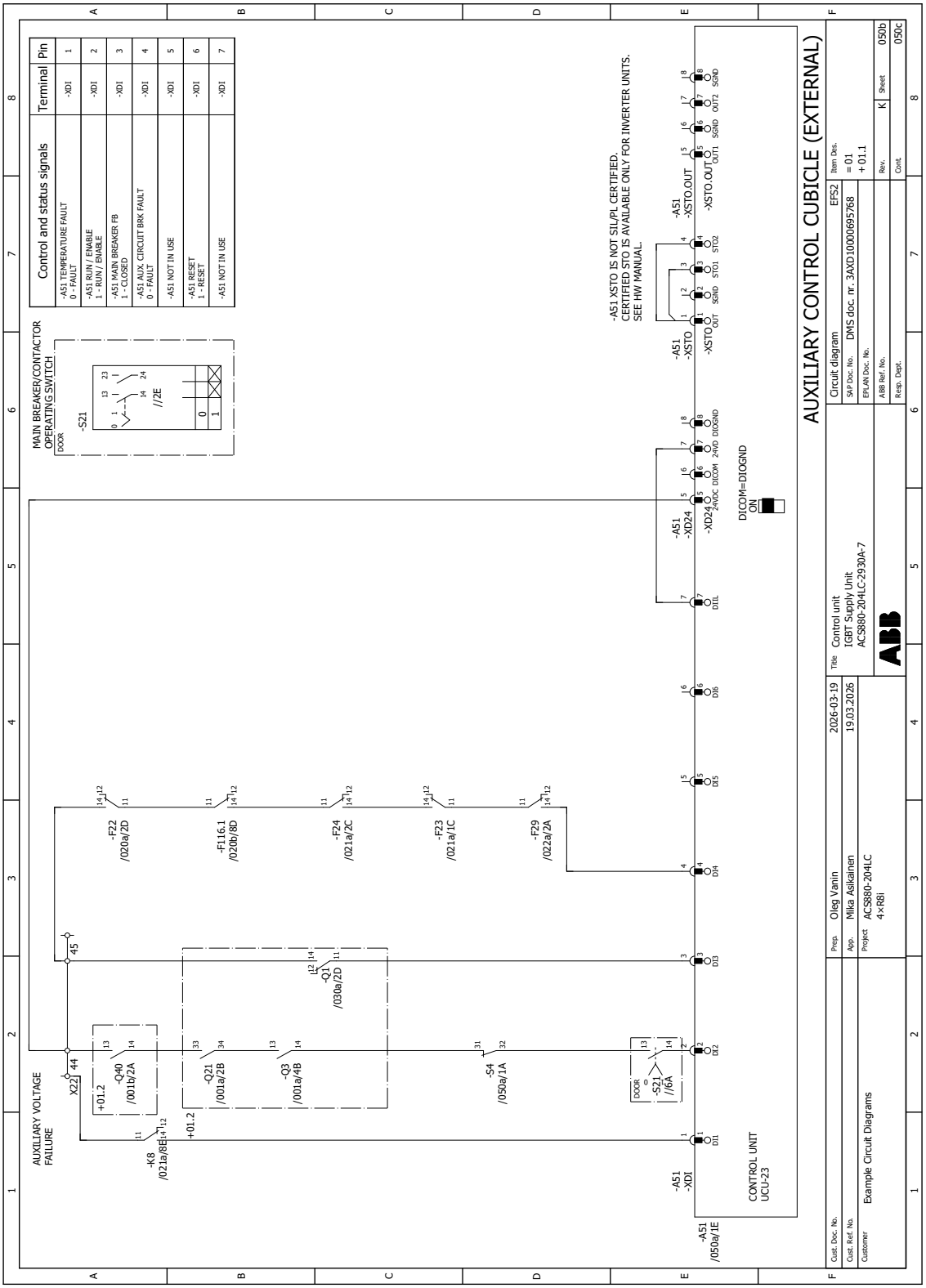

FIRST LCL FILTER CUBICLE
LCL FILTER FAN
LCL FILTER FAN
+01.4
-F115.10
4A
-F115.20
4A
-X115.11
-X115.21
#Cooling Fan
ABB Accessory
-G115.11
-G115.21
FAN, CENTRIFUGAL
FAN, CENTRIFUGAL
-X115.11
-X115.21
-W6
-W7
/026d/1A
-F115.50:1
/026d/1A
-F115.50:3
/026a/5A
-F115.1:1
/026a/5A
-F115.1:3
/026a/5D
-A115.99:-XDIO3:31
/026a/5D
-A115.99:-XDIO3:32
/026a/5D
-A115.99:-XDIO3:33
/026a/5D
-A115.99:-XDIO4:41
/026a/6D
-A115.99:-XDIO4:42
/026a/6D
-A115.99:-XDIO4:43
Prep. Oleg Vanin 2026-03-19
Appr. Mika Asikainen 19.03.2026
Project ACS880-204LC 4×R8i
Example Circuit Diagrams
Title LCL fan control
IGBT Supply Unit
ACS880-204LC-2930A-7
Circuit diagram EFS2
SAP Doc. No. DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Dos. = 01 + 01.3
Rev. K Sheet 026c
Cont. 026d

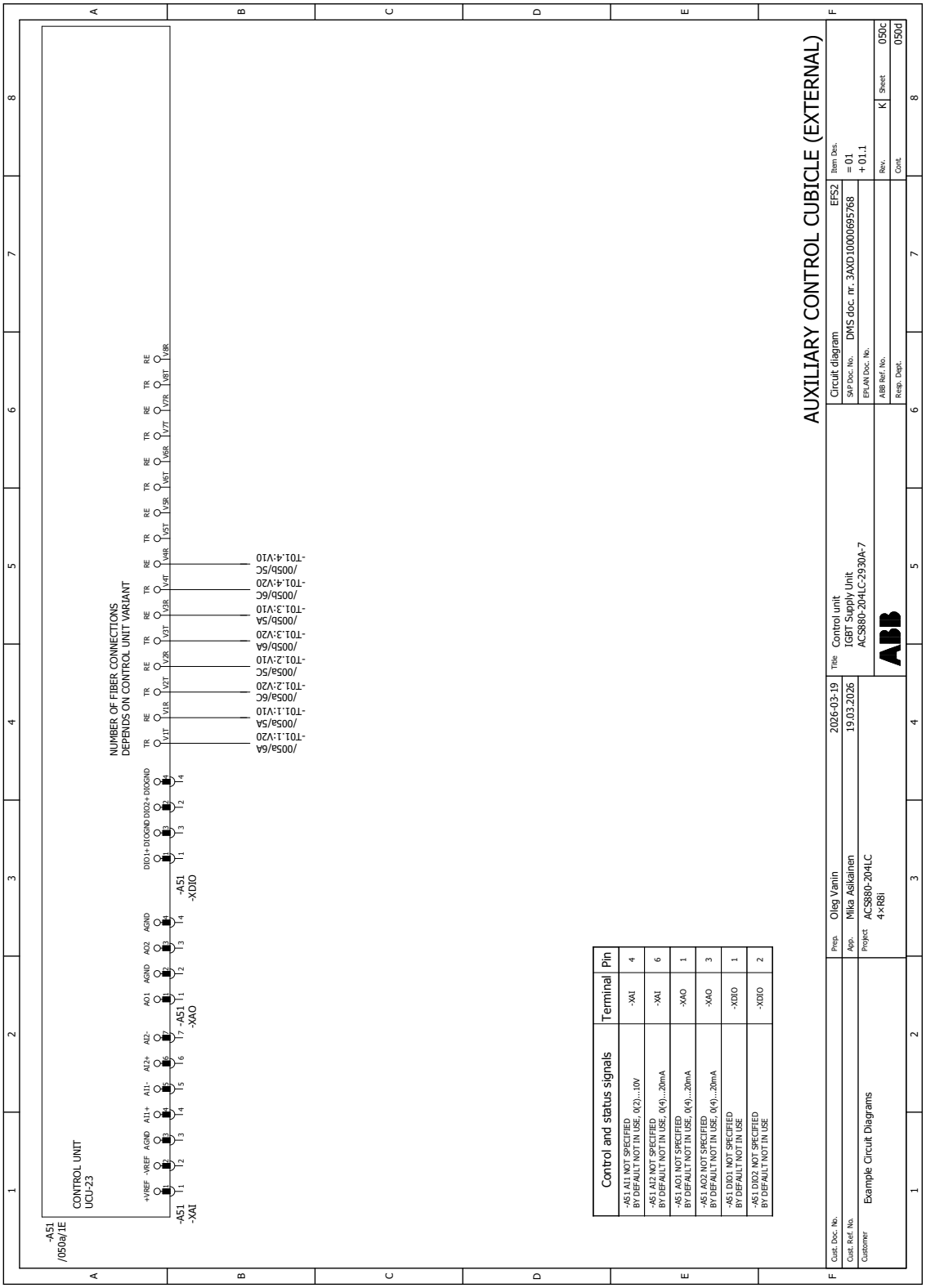

FIRST IGBT SUPPLY CUBICLE
IGBT SUPPLY UNIT FAN
ISU fan control
IGBT Supply Unit
ACS880-204LC-2930A-7
EFS2
DMS doc. nr: 3AXD10000695768
Example Circuit Diagrams
ACS880-204LC
4×R8i
Oleg Vanin
Mika Asikainen
2026-03-19
19.03.2026
CIO-01 NODE: 02
Terminated
-A115.50
-XPOW
-X485
-XSH.50
-W8
-W9
-W10
-G115.51-X115
-G115.52-X115
-G115.51
-G115.52
-X114.50
-F115.50
-XDIO1
-XDIO2
-XDIO3
-XDIO4
-XDI1
-XDI2
-XAI1
-XAI2
-XRO1
-XRO2
-XRO3
-XRO4
-XPOW:1
-XPOW:2
-X485:3
-X485:2
-X485:1
-F115.20:1
-F115.20:3
-F115.60:1
-F115.60:3
-G115.61-X115:13
-G115.61-X115:12
-G115.61-X115:14
-G115.62-X115:13
-G115.62-X115:12
-G115.62-X115:14

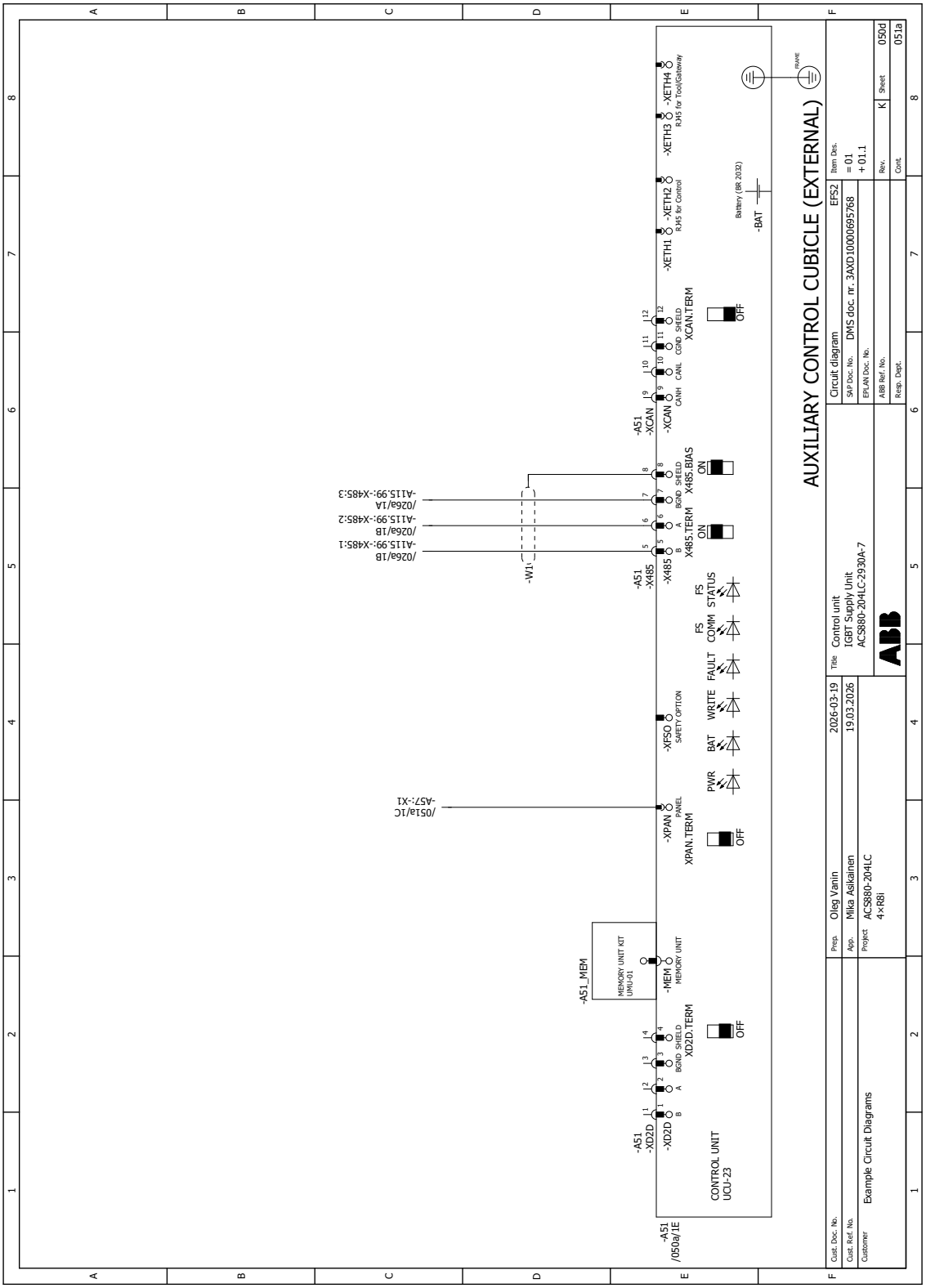

SECOND IGBT SUPPLY CUBICLE
IGBT SUPPLY UNIT FAN
/026d/5A
-F115.50:1
/026d/5A
-F115.50:3
-F115.60
6A
-X114.60
#Cooling Fan
ABB Accessory
-G115.61-X115
-G115.61
#Cooling Fan
ABB Accessory
-G115.62-X115
-G115.62
FAN KIT
-G115.61-X115
-G115.62-X115
-W12
-W13
-A115.50:-XDIO3:31
/026d/5D
-A115.50:-XDIO3:32
/026d/5D
-A115.50:-XDIO3:33
/026d/5D
-A115.50:-XDIO4:41
/026d/6D
-A115.50:-XDIO4:42
/026d/6D
-A115.50:-XDIO4:43
/026d/6D
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Dos.
= 01
+ 01.6
Rev.
K
Sheet
026e
Cont.
030a
Title
ISU fan control
IGBT Supply Unit
ACS880-204LC-2930A-7
Prep.
Oleg Vanin
2026-03-19
Appr.
Mika Aalkainen
19.03.2026
Project
ACS880-204LC
4×R8i
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams

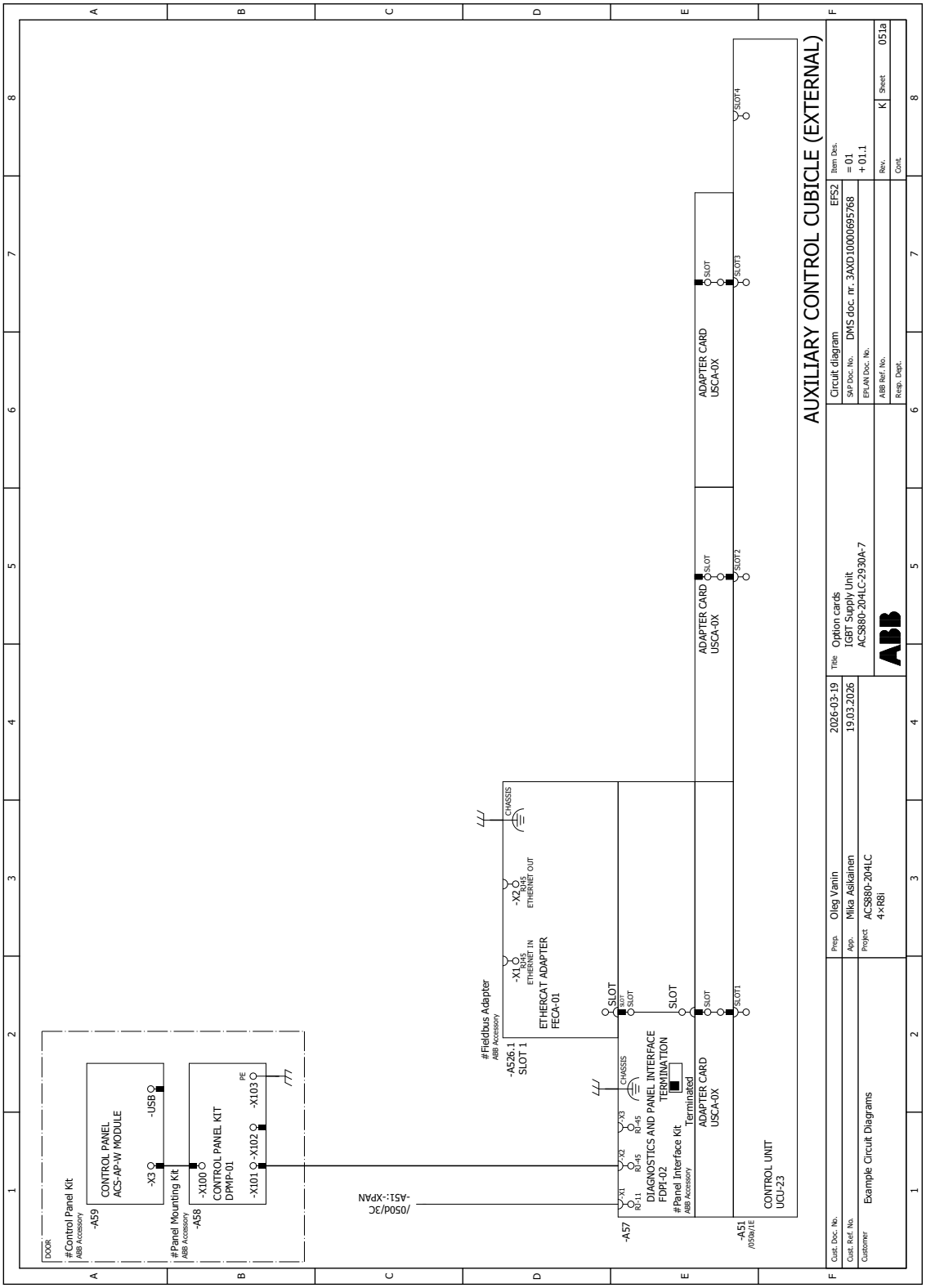

INCOMING CUBICLE (EXTERNAL)
MAIN BREAKER ON/OFF
MAIN BREAKER CONTROL
-T30 2.5A
-Q1 4000A
-S4 /050a/1A
-K3 /050a/5B
-X22
+01.1
-X22.2
-Q1 //2D
-Q1 //4D
-Q1 //3D
-Q1 /050a/3C
-Q1 /050b/2C
-Q1 /8C
-Q1 //7C
/001a/7A
CONTACT POSITION WHEN CIRCUIT-BREAKER OPEN
AUP CONTACT POSITIONS
CIRCUIT BREAKER, AIR, LV E4.2V 4000 EXDP DIP L1+ACC220V, CE,IEC
RTC
Air circuit breaker
IGBT Supply Unit
ACS880-204LC-2930A-7
ABB
Circuit diagram
EFS2
DMS doc. nr. 3AXD10000695768
Example Circuit Diagrams
ACS880-204LC
4×R8i
Oleg Vanin
Mika Asikainen
2026-03-19
19.03.2026


AUXILIARY CONTROL CUBICLE (EXTERNAL)
Control and status signals
Terminal
Pin
-A51 CHARGING CONTACTOR CONTROL
-XRO1
12
-A51 FAULT (-1) 1 - NO FAULT
-XRO2
22
-A51 MAIN BREAKER CONTROL
-XRO3
32
NOT SUPPORTED
-XRO4
42
LOCAL CHARGING CONTROL SWITCH
DOOR
-S4
CHARGING CONTACTOR CONTROL
CONTROL UNIT UCU-23
#Control Unit Kit
ABB Accessory
-A51 -XPOW
-A51 -XRO1
-A51 -XRO2
-A51 -XRO3
-A51 -XRO4
-Q4
-Q1
-K3
-S4
+01.2
Prep. Oleg Vanin 2026-03-19
Appr. Mika Asikainen 19.03.2026
Project ACS880-2041LC 4×R8i
Customer Example Circuit Diagrams
Title Control unit IGBT Supply Unit ACS880-2041LC-2930A-7
Circuit diagram EFS2
SAP Doc. No. DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des. = 01 + 01.1
Rev. K Sheet 050a
Cont. 050b

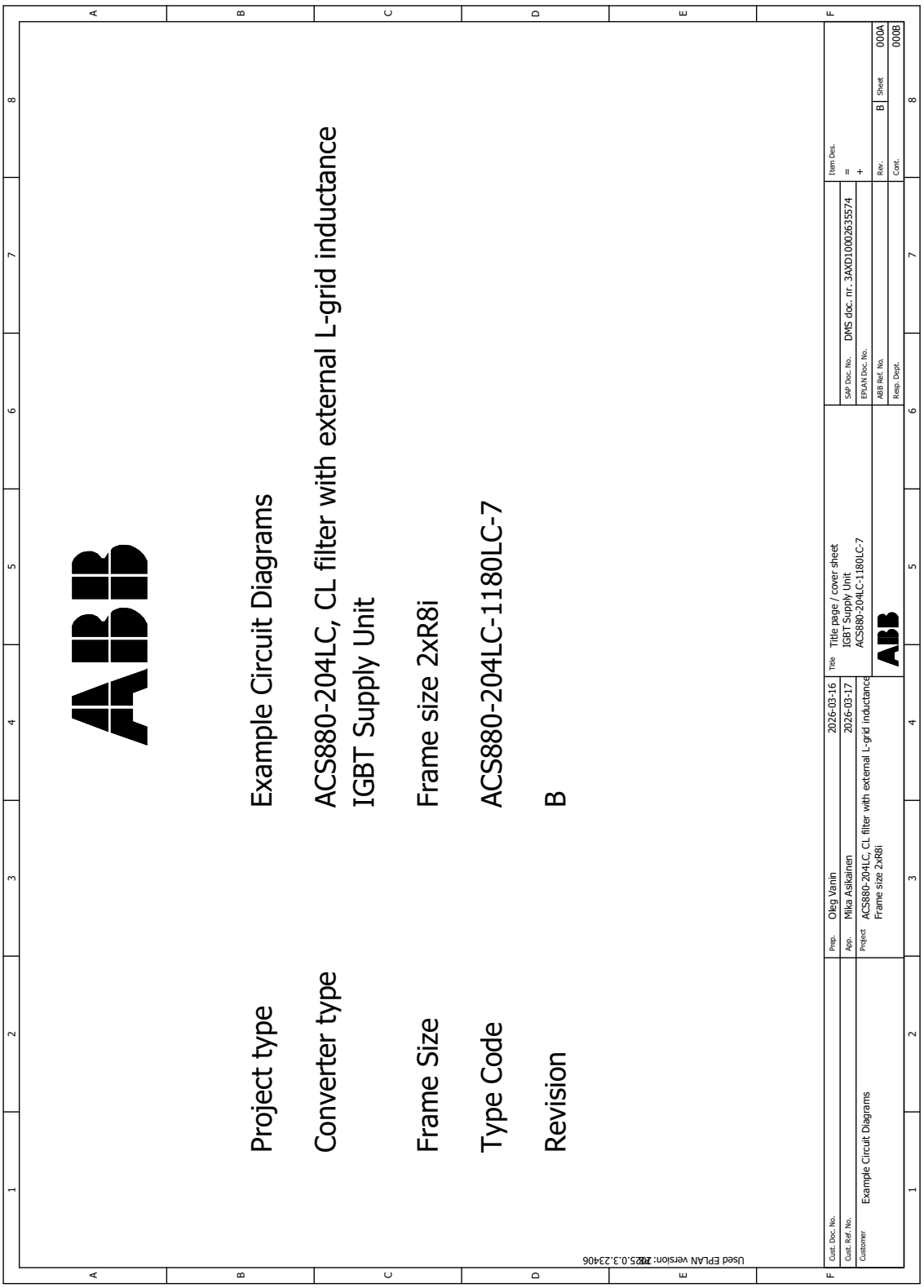

AUXILIARY CONTROL CUBICLE (EXTERNAL)
Control and status signals
Terminal
Pin
-A51 TEMPERATURE FAULT
0 - FAULT
-A51 RUN / ENABLE
1 - RUN / ENABLE
-A51 MAIN BREAKER FB
1 - CLOSED
-A51 AUX. CIRCUIT BRK. FAULT
0 - FAULT
-A51 NOT IN USE
-A51 RESET
1 - RESET
-A51 NOT IN USE
MAIN BREAKER/CONTACTOR OPERATING SWITCH
-S21
//2E
-A51 XSTO IS NOT SIL/PL CERTIFIED.
CERTIFIED STO IS AVAILABLE ONLY FOR INVERTER UNITS.
SEE HW MANUAL.
DICOM=DIOGND
ON
AUXILIARY VOLTAGE FAILURE
-K8 /021a/8E
-Q40 /001b/2A
-Q21 /001a/2B
-Q3 /001a/4B
-Q1 /030a/2D
-S4 /050a/1A
-S21 //6A
-F22 /020a/2D
-F116.1 /020b/8D
-F24 /021a/2C
-F23 /021a/1C
-F29 /022a/2A
CONTROL UNIT UCU-23
-A51 /050a/1E
Prep. Oleg Vanin 2026-03-19
App. Mika Asikainen 19.03.2026
Project ACS880-204LC 4×R8i
Title Control unit IGBT Supply Unit ACS880-204LC-2930A-7
Circuit diagram EFS2
SAP Doc. No. DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des. = 01 + 01.1
Rev. K Sheet 050b
Cont. 050c
Cust. Doc. No.
Cust. Ref. No.
Customer Example Circuit Diagrams


AUXILIARY CONTROL CUBICLE (EXTERNAL)
-A51
/050a/1E
CONTROL UNIT
UCU-23
-A51
-XAI
-A51
-XAO
-A51
-XDIO
NUMBER OF FIBER CONNECTIONS
DEPENDS ON CONTROL UNIT VARIANT
-T01.1:V20
/005a/6A
-T01.1:V10
/005a/5A
-T01.2:V20
/005a/6C
-T01.2:V10
/005a/5C
-T01.3:V20
/005b/6A
-T01.3:V10
/005b/5A
-T01.4:V20
/005b/6C
-T01.4:V10
/005b/5C
Control and status signals
-A51 AI1 NOT SPECIFIED
BY DEFAULT NOT IN USE, 0(2)...10V
-A51 AI2 NOT SPECIFIED
BY DEFAULT NOT IN USE, 0(4)...20mA
-A51 AO1 NOT SPECIFIED
BY DEFAULT NOT IN USE, 0(4)...20mA
-A51 AO2 NOT SPECIFIED
BY DEFAULT NOT IN USE, 0(4)...20mA
-A51 DIO1 NOT SPECIFIED
BY DEFAULT NOT IN USE
-A51 DIO2 NOT SPECIFIED
BY DEFAULT NOT IN USE
Terminal
Pin
-XAI
4
-XAI
6
-XAO
1
-XAO
3
-XDIO
1
-XDIO
2
Prep.
Oleg Vanin
2026-03-19
Appr.
Mika Asikainen
19.03.2026
Project
ACS880-204LC
4×R8i
Title
Control unit
IGBT Supply Unit
ACS880-204LC-2930A-7
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.1
Rev.
K
Sheet
050c
Cont.
050d
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams


AUXILIARY CONTROL CUBICLE (EXTERNAL)
CONTROL UNIT
UCU-23
-A51
/050a/1E
-A51
-XD2D
-XD2D
XD2D.TERM
-A51_MEM
MEMORY UNIT KIT
UMU-01
-MEM
MEMORY UNIT
-XPAN
PANEL
XPAN.TERM
/051a/1C
-A57:-X1
-XFSO
SAFETY OPTION
PWR
BAT
WRITE
FAULT
FS COMM
FS STATUS
-A51
-X485
X485.TERM
X485.BIAS
-W1
/026a/1B
-A11S.99:-X485:1
/026a/1B
-A11S.99:-X485:2
/026a/1A
-A11S.99:-X485:3
-A51
-XCAN
-XCAN
XCAN.TERM
-XETH1
-XETH2
RJ45 for Control
-XETH3
-XETH4
RJ45 for Tool/Gateway
Battery (BR 2032)
-BAT
FRAME
Prep.
Oleg Vanin
2026-03-19
Appr.
Mika Asikainen
19.03.2026
Project
ACS880-204LC
4×R8i
Title
Control unit
IGBT Supply Unit
ACS880-204LC-2930A-7
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.1
Rev.
K
Sheet
050d
Cont.
051a
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams


AUXILIARY CONTROL CUBICLE (EXTERNAL)
DOOR
#Control Panel Kit
ABB Accessory
-A59
CONTROL PANEL
ACS-AP-W MODULE
-X3
-USB
#Panel Mounting Kit
ABB Accessory
-A58
-X100
CONTROL PANEL KIT
DPMP-01
-X101
-X102
PE
-X103
/050d/3C
-A51:-XPAN
#Fieldbus Adapter
ABB Accessory
-A526.1
SLOT 1
-X1
RJ45
ETHERNET IN
-X2
RJ45
ETHERNET OUT
CHASSIS
ETHERCAT ADAPTER
FECA-01
-A57
-X1
RJ-11
-X2
RJ-45
-X3
RJ-45
CHASSIS
DIAGNOSTICS AND PANEL INTERFACE
FDPI-02
#Panel Interface Kit
ABB Accessory
TERMINATION
Terminated
SLOT
ADAPTER CARD
USCA-0X
-A51
/050a/1E
CONTROL UNIT
UCU-23
SLOT1
SLOT2
SLOT3
SLOT4
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep.
Oleg Vanin
2026-03-19
Appr.
Mika Asikainen
19.03.2026
Project
ACS880-204LC
4×R8i
Title
Option cards
IGBT Supply Unit
ACS880-204LC-2930A-7
EFS2
Circuit diagram
SAP Doc. No.
DMS doc. nr. 3AXD10000695768
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.1
Rev.
K
Sheet
051a
Cont.

# Frame 2×R8i (with CL filter)



| Higher-level function | Page | Page description | Revision |
|---|---|---|---|
| | 000A | Title page / cover sheet | B |
| | 000C | Structured identifier overview | B |
| | 000D | Summarized parts list | B |
| | 000E | Summarized parts list | B |
| | 000F | Summarized parts list | B |
| | 200A | Overview diagram | B |
| | 300A | Symbol Overview | B |
| 01 | 001a | Main supply, Aux. supply switch | B |
| | 001b | Line-up charging circuit | B |
| | 002a | CL filter | B |
| | 003a | Drive main circuit | B |
| | 004a | Unit charging circuit | B |
| | 005a | Module control circuit | B |
| | 020a | Auxiliary circuit. External supplies | B |
| | 021a | Auxiliary circuit | B |
| | 022a | Control voltage distribution 24V | B |
| | 026a | ACU fan control | B |
| | 026b | ICU fan control | B |
| | 026c | ICU fan control | B |
| | 026d | ISU fan control | B |
| | 030a | Air circuit breaker | B |
| | 050a | Control unit | B |
| | 050b | Control unit | B |
| | 050c | Control unit | B |
| | 050d | Control unit | B |
| | 051a | Option cards | B |
| | 066a | Module STO connections | B |

| | | | |
|---|---|---|---|
| Cust. Doc. No. | Prep. Oleg Vanin 2026-03-16 | Title Table of contents<br>IGBT Supply Unit<br>ACS880-204LC-1180LC-7 | Item Des. |
| Cust. Ref. No. | App. Mika Asikainen 2026-03-17 | SAP Doc. No. DMS doc. nr. 3AXD10002635574 | = |
| Customer Example Circuit Diagrams | Project ACS880-204LC, CL filter with external L-grid inductance<br>Frame size 2xR8i | EPLAN Doc. No. | + |
| | | ABB Ref. No. | Rev. B Sheet 000B |
| | | Resp. Dept. | Cont. 000C |

## Function designations

| Designation | Structure description |
|---|---|
| =01 | IGBT Supply Unit |
| | |
| | |
| | |
| | |
| | |
| | |

## Location designations

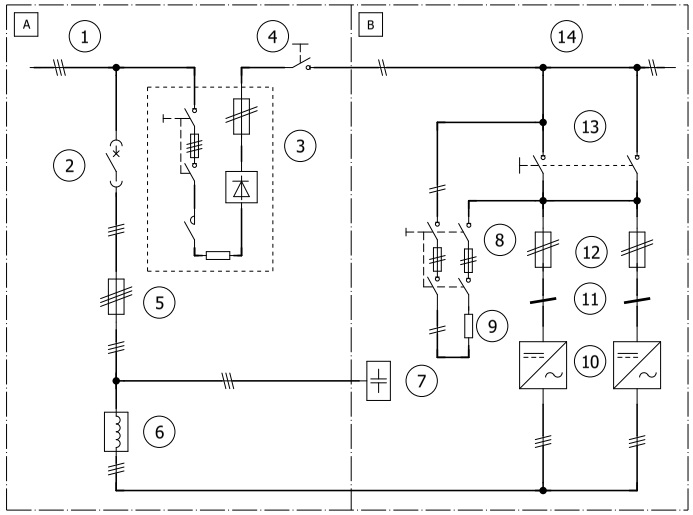
| Designation | Structure description |
|---|---|
| +01.1 | Auxiliary Control Cubicle (External) |
| +01.2 | Incoming & Filter Cubicle |
| +01.3 | IGBT Supply Cubicle |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

## Electrical option designations

| Designation | Material Code | Quantity |
|---|---|---|
| #AC Fuse | 68689589 | 3 |
| #Air Circuit Breaker | 3AXD50000902941 | 1 |
| #CIO I/O Module | 3AXD50000041983 | 1 |
| #CM Filter | 3AXD50000566785 | 4 |
| #Control Panel Kit | 3AXD50000025965 | 1 |
| #Control Unit Kit | ACS880UCU-204LC-22-0 | 1 |
| #Cooling Fan | 3AXD50001325244, 3AXD50000043886 | 4 |
| #DC Fuse | 63919462 | 4 |
| #DC Switch Kit | 3AXD50000227044 | 1 |
| #Fiber Optic | 58948233, 58988821 | 4 |
| #Fieldbus Adapter | 3AUA0000072069 | 1 |
| #Filter Unit Kit | 3AXD50001373986 | 1 |
| #Line-up Charging Kit | 3AXD50000250783 | 1 |
| #Line-up Charging Switch Kit | 3AXD50001383534 | 1 |
| #Panel Interface Kit | 3AUA0000108650 | 1 |
| #Panel Mounting Kit | 3AUA0000108878 | 1 |
| #Resistor | 10028531 | 6 |
| #Supply Module | ACS880-104LC-0670A-7 | 2 |
| #Unit Charging Kit | 3AXD50000226801 | 1 |
| | | |
| | | |
| | | |
| | | |

| | | | | | |
|---|---|---|---|---|---|
| Cust. Doc. No. | Prep. Oleg Vanin 2026-03-16 | Title Structured identifier overview<br>IGBT Supply Unit<br>ACS880-204LC-1180LC-7 | | Item Des. | |
| Cust. Ref. No. | App. Mika Asikainen 2026-03-17 | | SAP Doc. No. DMS doc. nr. 3AXD10002635574 | = | |
| Customer Example Circuit Diagrams | Project ACS880-204LC, CL filter with external L-grid inductance<br>Frame size 2xR8i | ABB | EPLAN Doc. No. | + | |
| | | | ABB Ref. No. | Rev. B | Sheet 000C |
| | | | Resp. Dept. | Cont. | 000D |

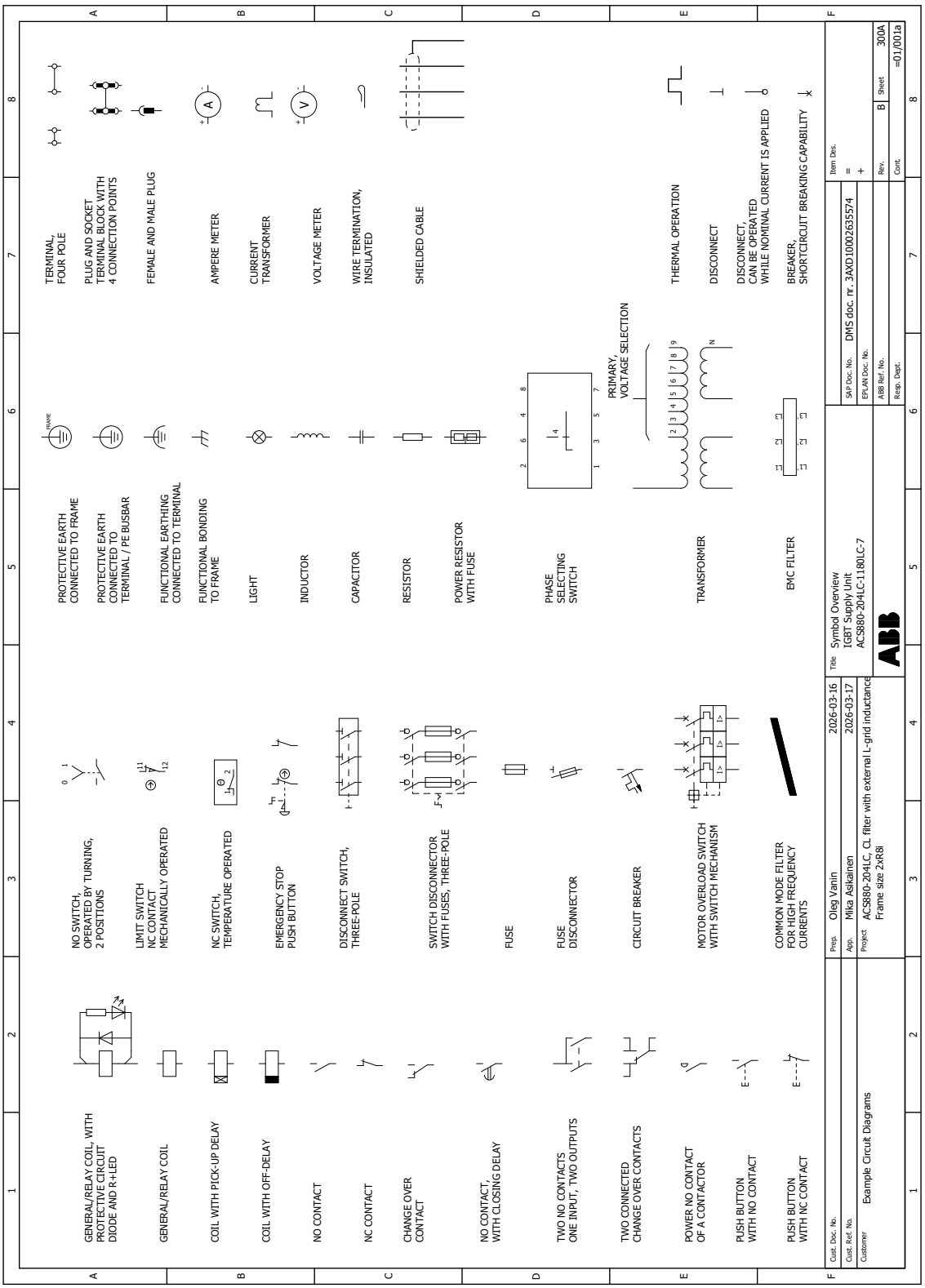
## Rittal enclosure

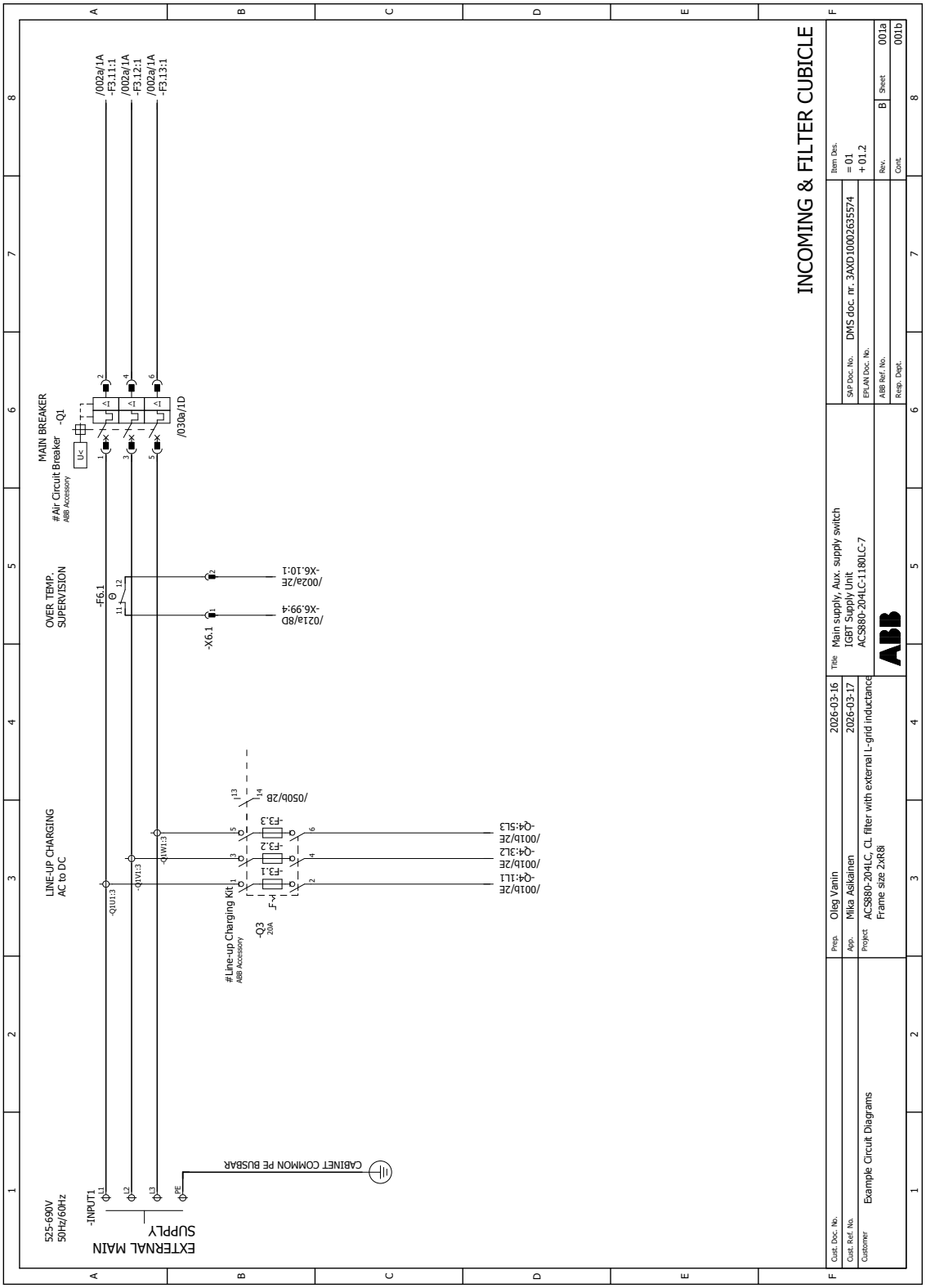


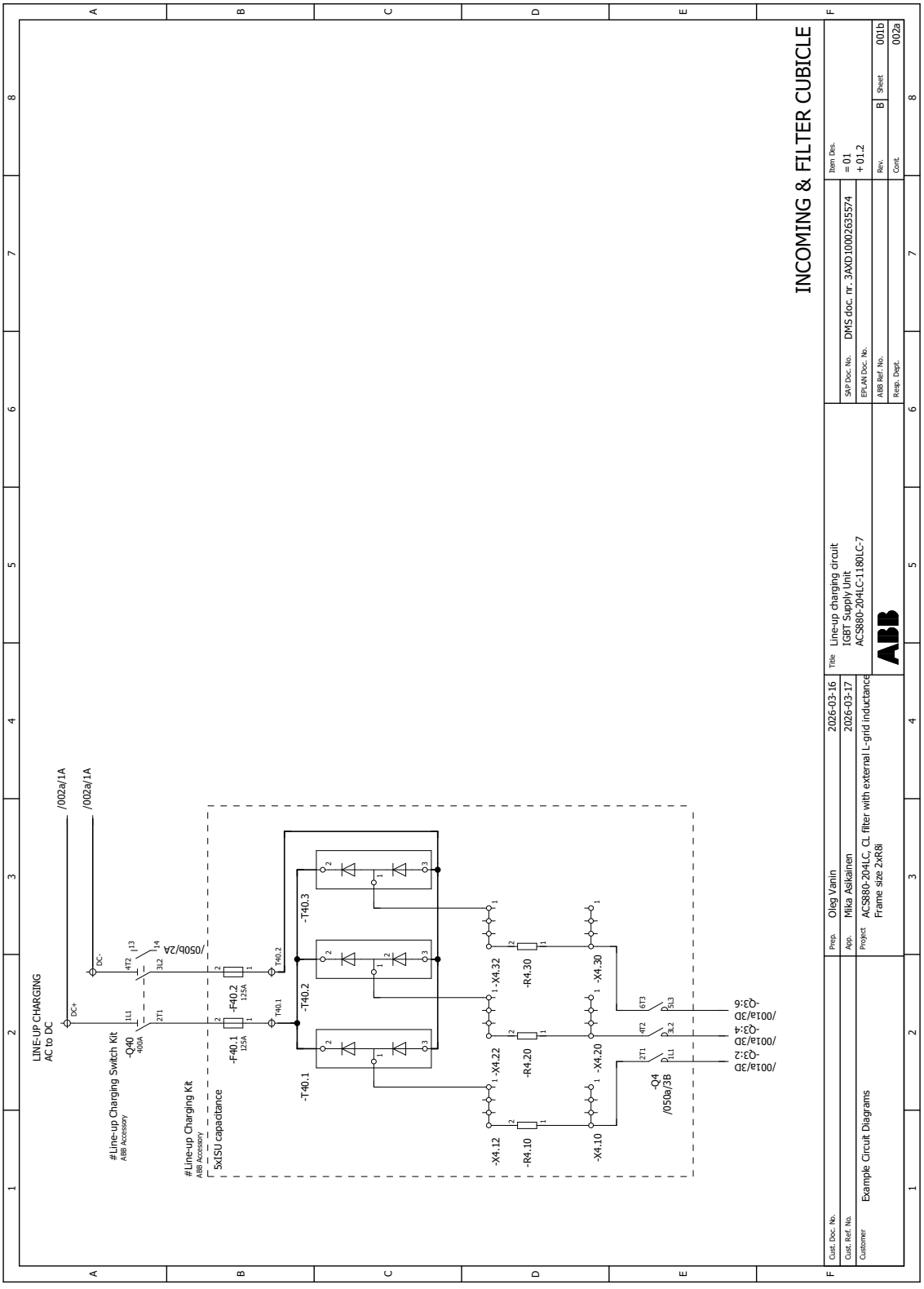

## Content

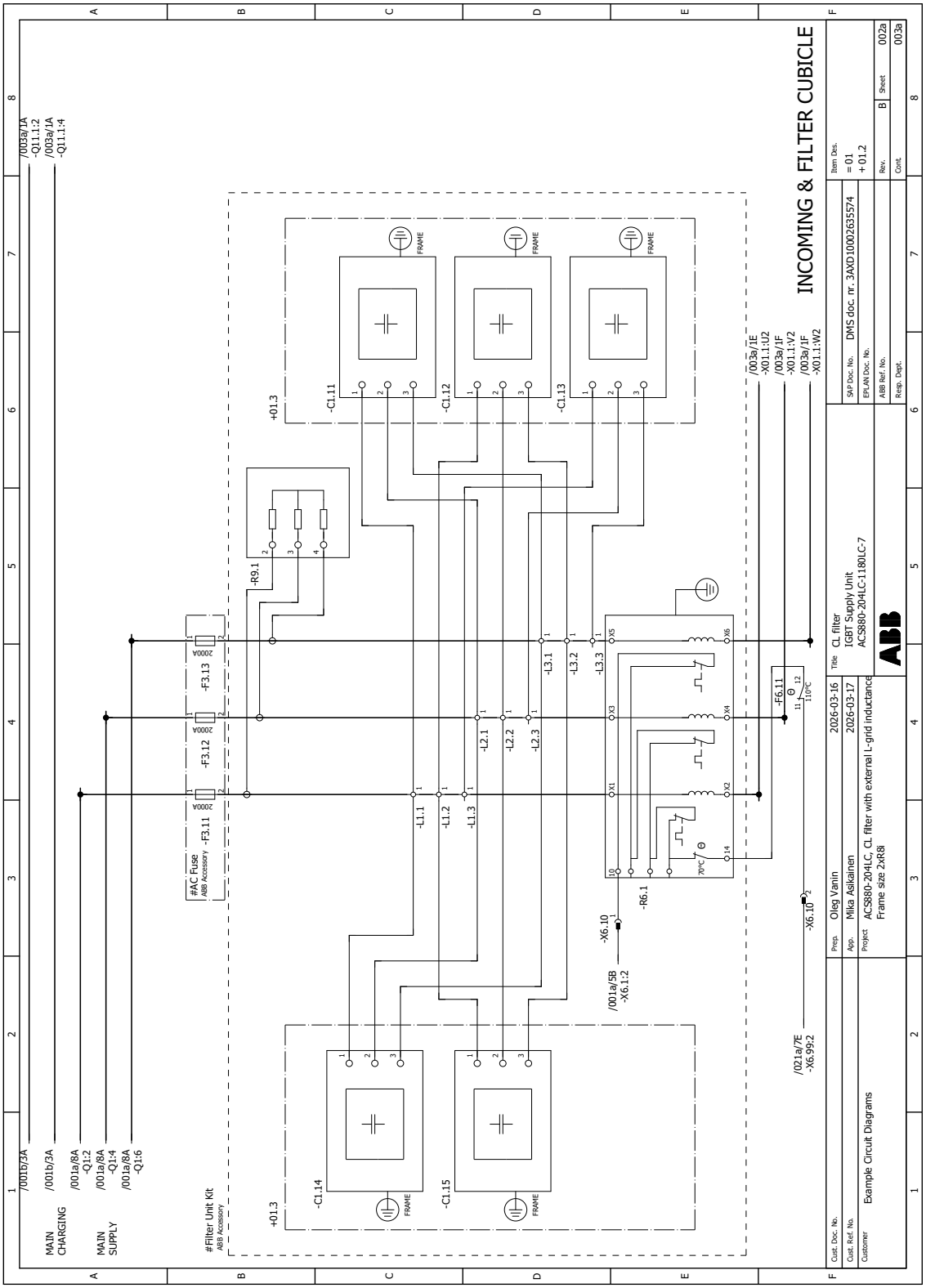
| Identifier | Location | Identifier | Component | Available through |
|---|---|---|---|---|
| A | Incoming & Filter Cubicle | 1 | AC supply | - |
| A | Incoming & Filter Cubicle | 2 | Main circuit breaker | ABB or third party |
| A | Incoming & Filter Cubicle | 3 | AC-DC charging kit (line-up charging) | ABB or third party |
| A | Incoming & Filter Cubicle | 4 | DC switch-disconnector for line-up charging | ABB or third party |
| A | Incoming & Filter Cubicle | 5 | AC fuses | ABB or third party |
| A | Incoming & Filter Cubicle | 6 | CL filter Lconv | ABB |
| B | IGBT Supply Cubicle | 7 | CL filter Capacitor | ABB or third party |
| B | IGBT Supply Cubicle | 8 | DC-DC charging kit (unit charging) | ABB or third party |
| B | IGBT Supply Cubicle | 9 | Resistors for DC-DC charging | ABB or third party |
| B | IGBT Supply Cubicle | 10 | IGBT supply module | ABB |
| B | IGBT Supply Cubicle | 11 | Common mode filter | ABB |
| B | IGBT Supply Cubicle | 12 | DC fuse | ABB or third party |
| B | IGBT Supply Cubicle | 13 | DC switch-disconnector | ABB or third party |
| B | IGBT Supply Cubicle | 14 | DC link | - |
| | | | | |
| | | | | |
| | | | | |

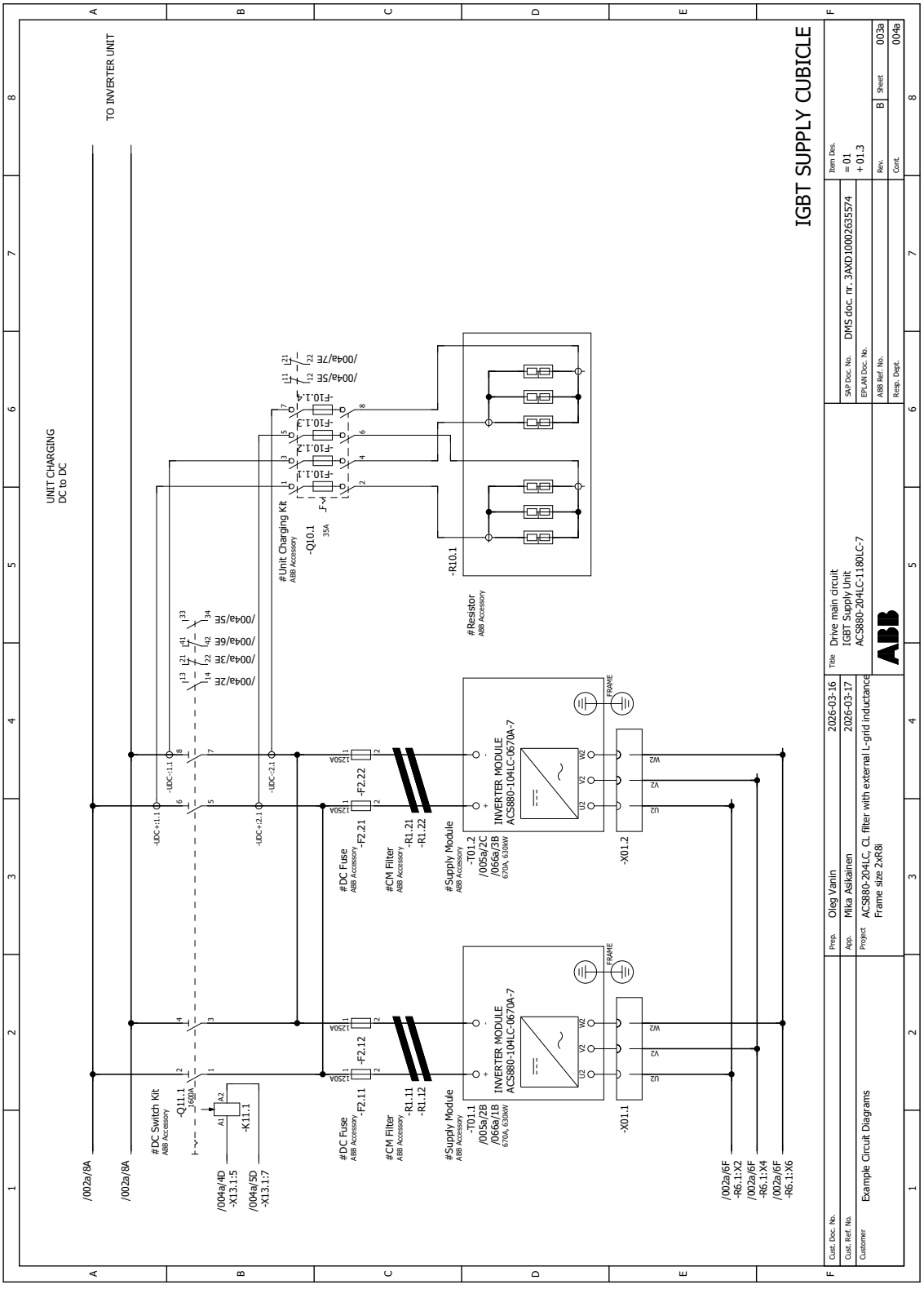
| | | | | |
|---|---|---|---|---|
| Cust. Doc. No. | Prep. Oleg Vanin 2026-03-16 | Title Overview diagram<br>IGBT Supply Unit<br>ACS880-204LC-1180LC-7 | | Item Des. |
| Cust. Ref. No. | App. Mika Asikainen 2026-03-17 | | SAP Doc. No. DMS doc. nr. 3AXD10002635574 | = |
| Customer Example Circuit Diagrams | Project ACS880-204LC, CL filter with external L-grid inductance<br>Frame size 2xR8i | | EPLAN Doc. No. | + |
| | | ABB | ABB Ref. No. | Rev. B Sheet 200A |
| | | | Resp. Dept. | Cont. 300A |

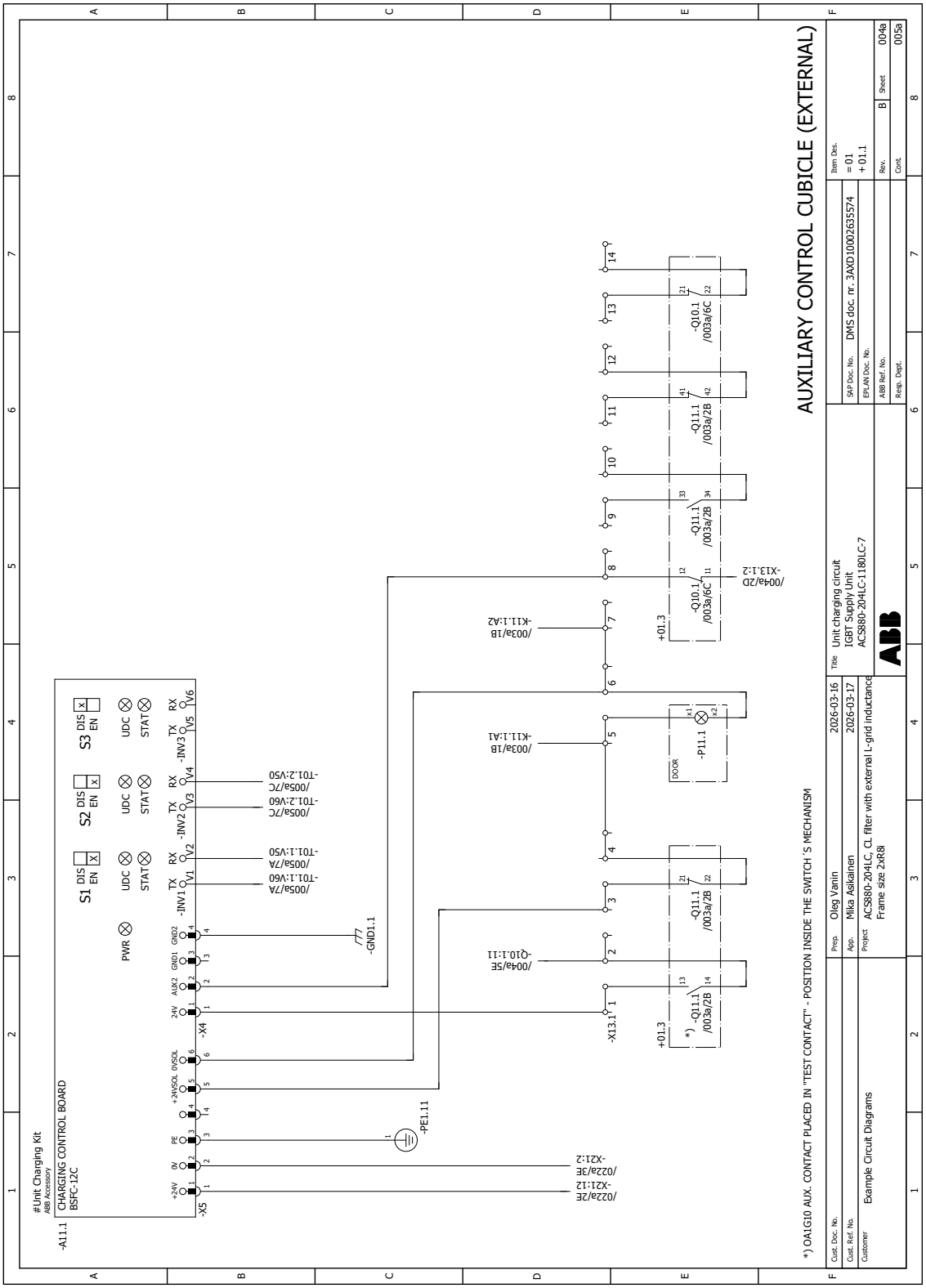

GENERAL/RELAY COIL, WITH PROTECTIVE CIRCUIT DIODE AND R+LED
GENERAL/RELAY COIL
COIL WITH PICK-UP DELAY
COIL WITH OFF-DELAY
NO CONTACT
NC CONTACT
CHANGE OVER CONTACT
NO CONTACT, WITH CLOSING DELAY
TWO NO CONTACTS ONE INPUT, TWO OUTPUTS
TWO CONNECTED CHANGE OVER CONTACTS
POWER NO CONTACT OF A CONTACTOR
PUSH BUTTON WITH NO CONTACT
PUSH BUTTON WITH NC CONTACT
NO SWITCH, OPERATED BY TURNING, 2 POSITIONS
LIMIT SWITCH NC CONTACT MECHANICALLY OPERATED
NC SWITCH, TEMPERATURE OPERATED
EMERGENCY STOP PUSH BUTTON
DISCONNECT SWITCH, THREE-POLE
SWITCH DISCONNECTOR WITH FUSES, THREE-POLE
FUSE
FUSE DISCONNECTOR
CIRCUIT BREAKER
MOTOR OVERLOAD SWITCH WITH SWITCH MECHANISM
COMMON MODE FILTER FOR HIGH FREQUENCY CURRENTS
PROTECTIVE EARTH CONNECTED TO FRAME
PROTECTIVE EARTH CONNECTED TO TERMINAL / PE BUSBAR
FUNCTIONAL EARTHING CONNECTED TO TERMINAL
FUNCTIONAL BONDING TO FRAME
LIGHT
INDUCTOR
CAPACITOR
RESISTOR
POWER RESISTOR WITH FUSE
PHASE SELECTING SWITCH
BMC FILTER
TRANSFORMER
PRIMARY, VOLTAGE SELECTION
TERMINAL, FOUR POLE
PLUG AND SOCKET TERMINAL BLOCK WITH 4 CONNECTION POINTS
FEMALE AND MALE PLUG
AMPERE METER
CURRENT TRANSFORMER
VOLTAGE METER
WIRE TERMINATION, INSULATED
SHIELDED CABLE
THERMAL OPERATION
DISCONNECT
DISCONNECT, CAN BE OPERATED WHILE NOMINAL CURRENT IS APPLIED
BREAKER, SHORTCIRCUIT BREAKING CAPABILITY
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep. Oleg Vanin 2026-03-16
Appr. Mika Aalkainen 2026-03-17
Project ACS880-204LC, CL filter with external L-grid inductance Frame size 2xR8i
Title Symbol Overview IGBT Supply Unit ACS880-204LC-1180LC-7
ABB
SAP Doc. No. DMS doc. nr: 3AXD10002635574
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
Rev. B Sheet 300A
Cont. =01/001a

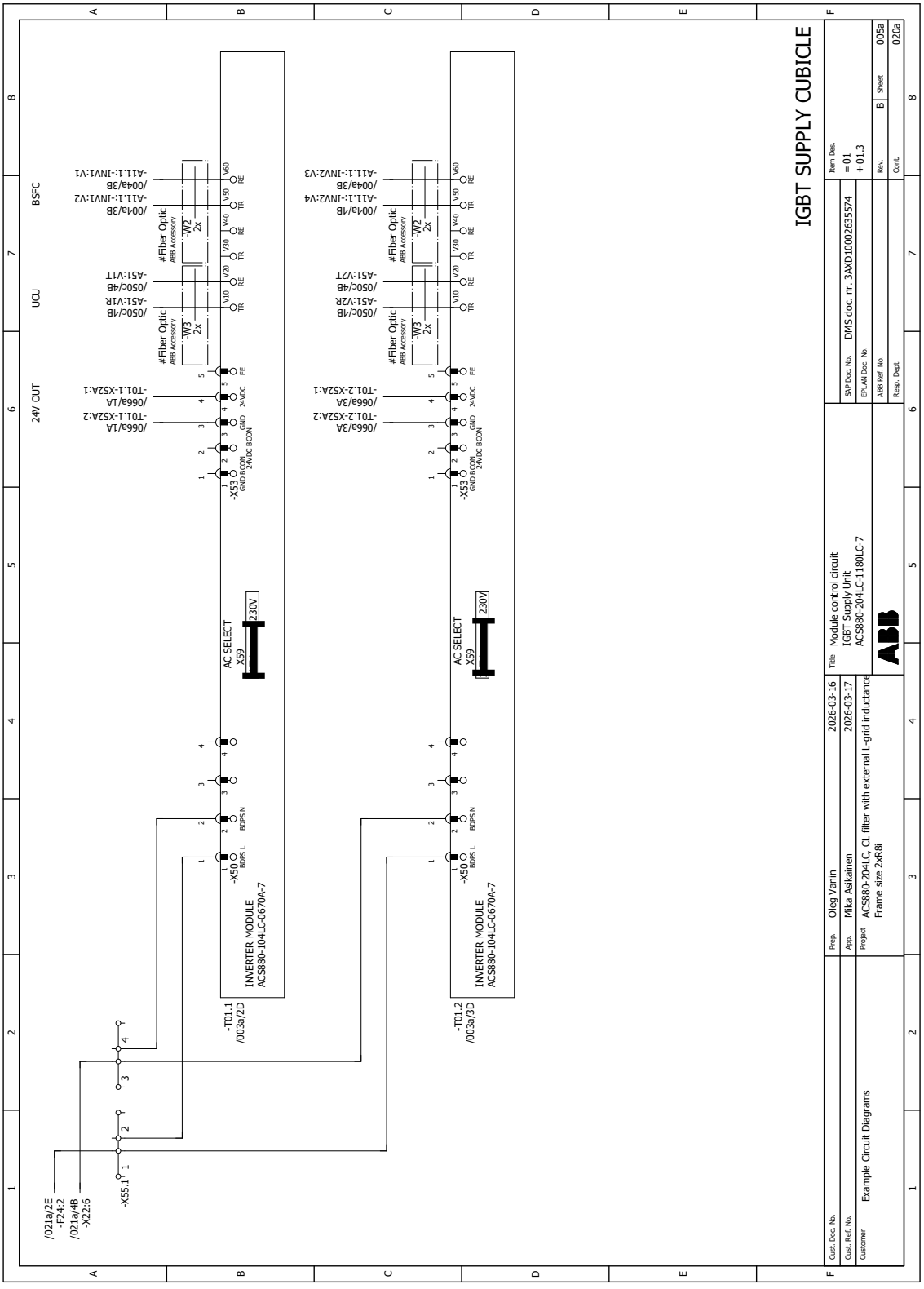

INCOMING & FILTER CUBICLE
EXTERNAL MAIN SUPPLY
525-690V 50Hz/60Hz
-INPUT1
L1
L2
L3
PE
CABINET COMMON PE BUSBAR
LINE-UP CHARGING AC to DC
OVER TEMP. SUPERVISION
MAIN BREAKER -Q1
#Air Circuit Breaker
ABB Accessory
/002a/1A -F3.11:1
/002a/1A -F3.12:1
/002a/1A -F3.13:1
/030a/1D
-F6.1
-X6.1
/002a/ZE -X6.10:1
/021a/BD -X6.99:4
-Q1:U1:3
-Q1:V1:3
-Q1:W1:3
/050b/ZB
-F3.3
-F3.2
-F3.1
#Line-up Charging Kit
ABB Accessory
-Q3
20A
/001b/ZE -Q4:1L1
/001b/ZE -Q4:3L2
/001b/ZE -Q4:5L3
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep. Oleg Vanin 2026-03-16
Appr. Mika Asikainen 2026-03-17
Project ACS880-204LC, CL filter with external L-grid inductance Frame size 2xR8i
Title Main supply, Aux. supply switch IGBT Supply Unit ACS880-204LC-1180LC-7
SAP Doc. No. DMS doc. nr. 3AXD10002635574
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des. = 01 + 01.2
Rev. B Sheet 001a
Cont. 001b

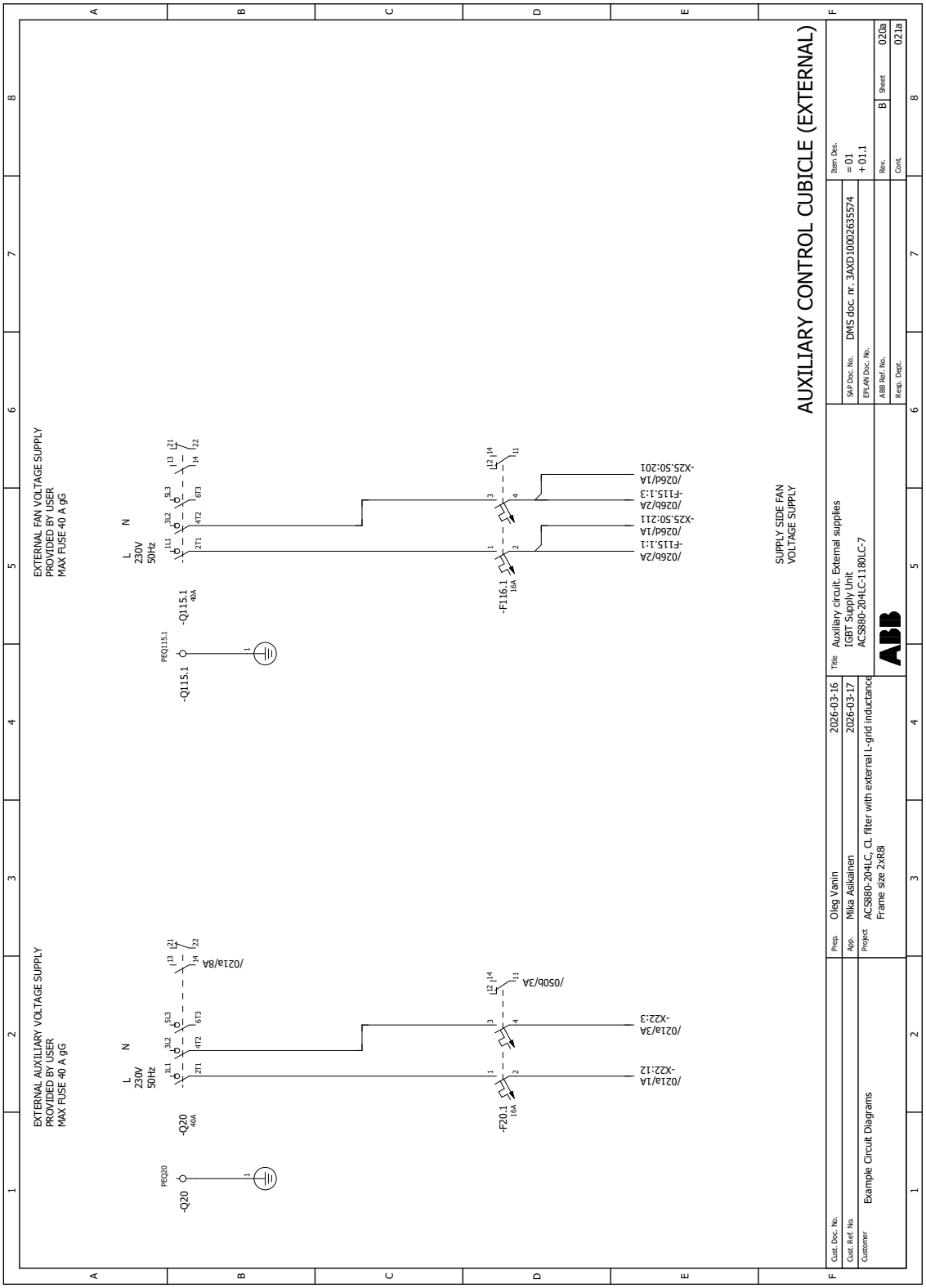

INCOMING & FILTER CUBICLE
LINE-UP CHARGING
AC to DC
/002a/1A
/002a/1A
DC+
DC-
#Line-up Charging Switch Kit
ABB Accessory
-Q40
400A
/050b/2A
-F40.1
125A
-F40.2
125A
#Line-up Charging Kit
ABB Accessory
5x1SU capacitance
-T40.1
-T40.2
-T40.3
-X4.12
-X4.10
-X4.22
-X4.20
-X4.32
-X4.30
-R4.10
-R4.20
-R4.30
-Q4
/050a/3B
/001a/3D
/001a/3D
/001a/3D
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep.
Oleg Vanin
2026-03-16
Appr.
Mika Asikainen
2026-03-17
Project
ACS880-204LC, CL filter with external L-grid inductance
Frame size 2xR8i
Title
Line-up charging circuit
IGBT Supply Unit
ACS880-204LC-1180LC-7
SAP Doc. No.
DMS doc. nr. 3AXD10002635574
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.2
Rev.
B
Sheet
001b
Cont.
002a

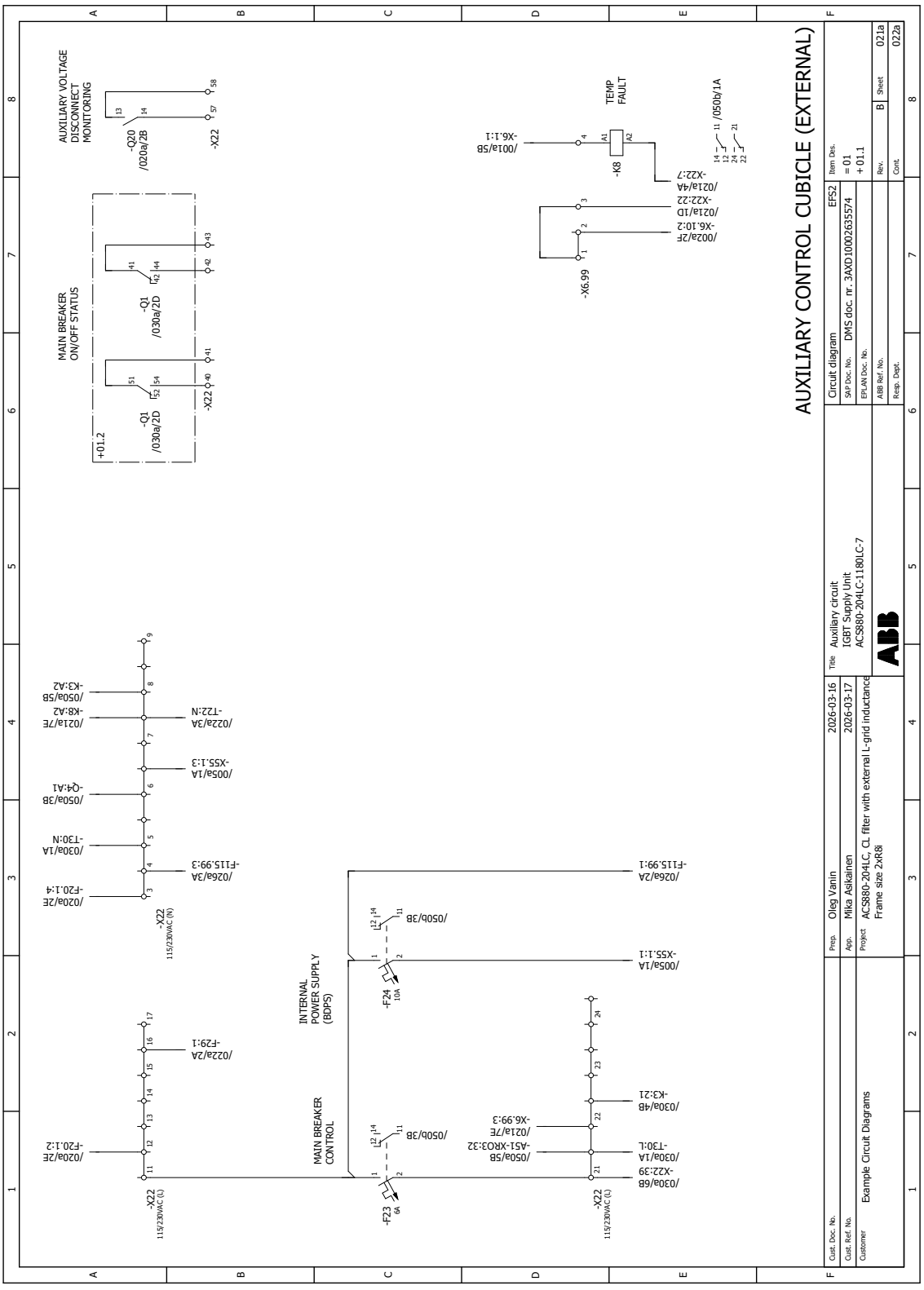

INCOMING & FILTER CUBICLE
MAIN CHARGING
MAIN SUPPLY
#Filter Unit Kit
#AC Fuse
-F3.11
-F3.12
-F3.13
-R9.1
-C1.11
-C1.12
-C1.13
-C1.14
-C1.15
-L1.1
-L1.2
-L1.3
-L2.1
-L2.2
-L2.3
-L3.1
-L3.2
-L3.3
-R6.1
-F6.11
-X6.10
-X6.99:2
-X01.1:U2
-X01.1:V2
-X01.1:W2
/003a/1A -Q11.1:4
/003a/JA -Q11.1:2
/001b/3A
/001a/8A -Q1:2
/001a/8A -Q1:4
/001a/8A -Q1:6
/001a/5B -X6.1:2
/021a/7E
/003a/1E
/003a/1F
Prep. Oleg Vanin 2026-03-16
Appr. Mika Asikainen 2026-03-17
Project ACS880-204LC, CL filter with external L-grid inductance Frame size 2xR8i
Title CL filter IGBT Supply Unit ACS880-204LC-1180LC-7
SAP Doc. No. DMS doc. nr. 3AXD10002635574
Item Des. = 01 + 01.2
Customer Example Circuit Diagrams
Sheet 002a 003a

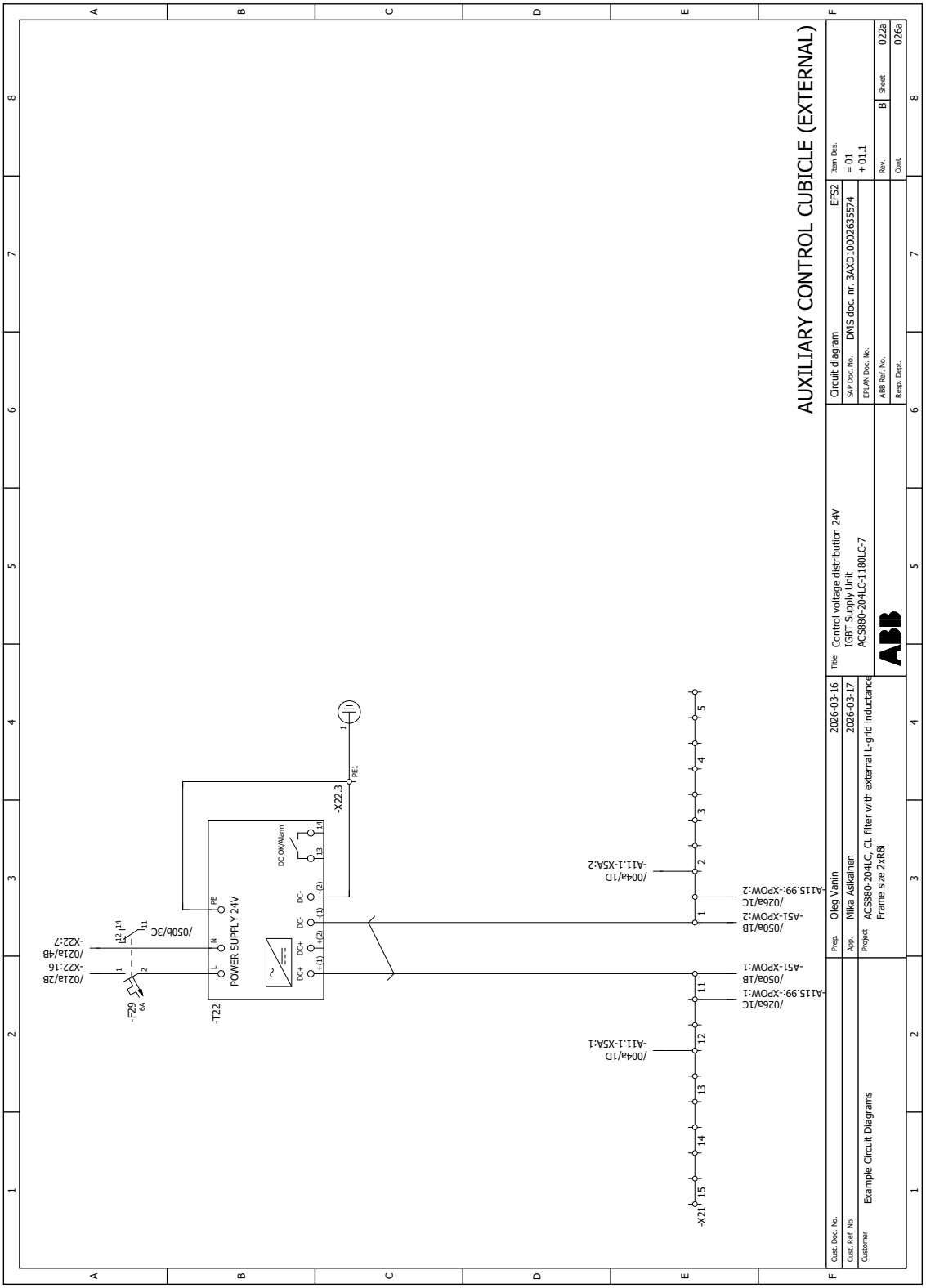

IGBT SUPPLY CUBICLE
TO INVERTER UNIT
UNIT CHARGING
DC to DC
#Unit Charging Kit
ABB Accessory
-Q10.1
35A
-F10.1.1
-F10.1.2
-F10.1.3
-F10.1.4
/004a/7E
/004a/5E
#Resistor
ABB Accessory
-R10.1
/004a/5F
/004a/6F
/004a/3E
/004a/2E
-UDC+1.1
-UDC-1.1
-UDC+2.1
-UDC-2.1
#DC Switch Kit
ABB Accessory
-Q11.1
160A
-K11.1
/002a/8A
/004a/4D
-X13.1:5
/004a/5D
-X13.1:7
#DC Fuse
ABB Accessory
-F2.11
-F2.12
-F2.21
-F2.22
#CM Filter
ABB Accessory
-R1.11
-R1.12
-R1.21
-R1.22
#Supply Module
ABB Accessory
-T01.1
/005a/2B
/066a/1B
-T01.2
/005a/2C
/066a/3B
INVERTER MODULE
ACS880-104LC-0670A-7
670A, 630kW
FRAME
-X01.1
-X01.2
/002a/6F
-R6.1:X2
-R6.1:X4
-R6.1:X6
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep.
Oleg Vanin
2026-03-16
App.
Mika Asikainen
2026-03-17
Project
ACS880-2041C, CL filter with external L-grid inductance
Frame size 2xR8i
Title
Drive main circuit
IGBT Supply Unit
ACS880-204LC-1180LC-7
SAP Doc. No.
DMS doc. nr. 3AXD10002635574
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.3
Rev.
B
Sheet
003a
Cont.
004a

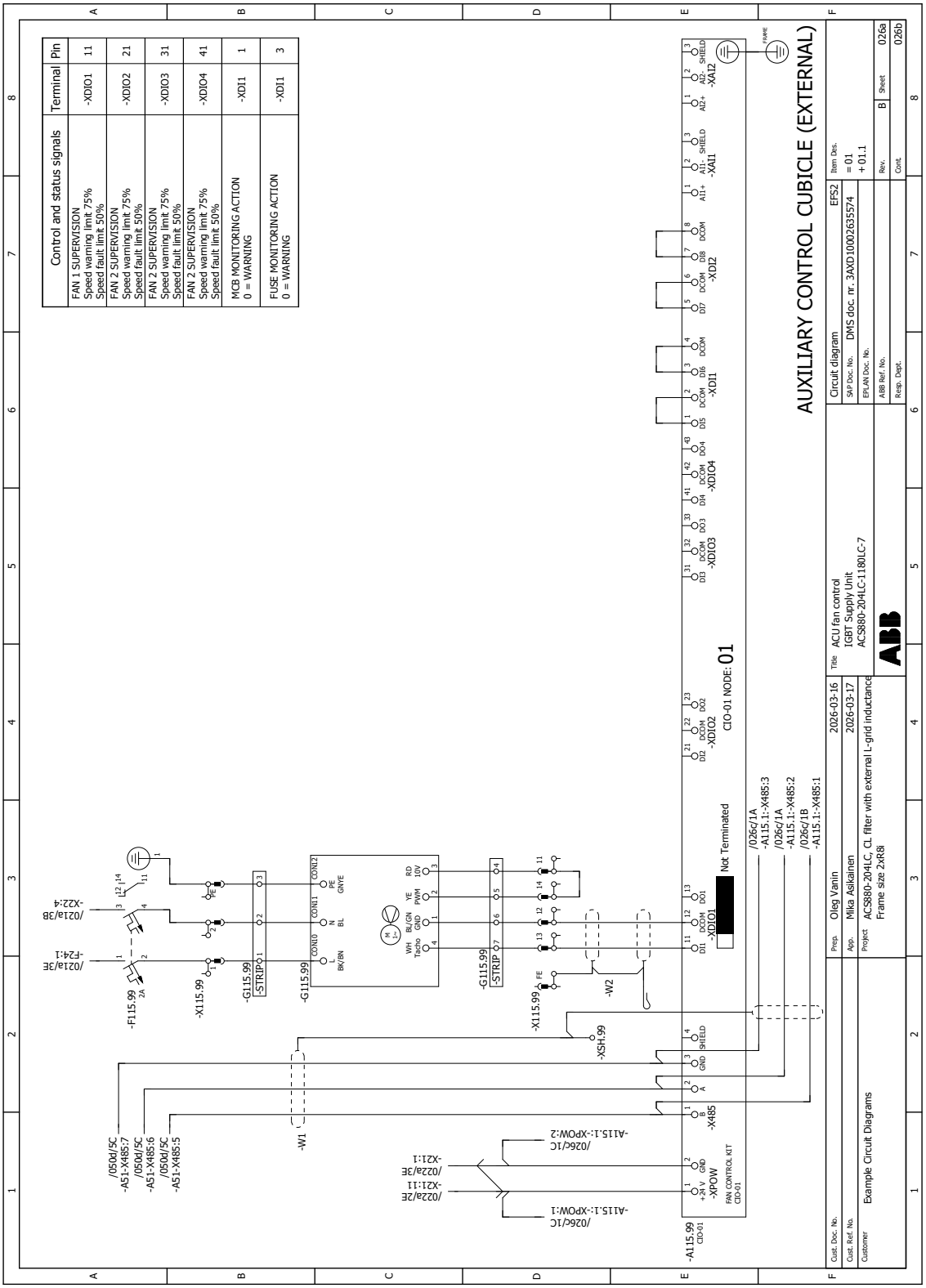

AUXILIARY CONTROL CUBICLE (EXTERNAL)
*) OA1G10 AUX. CONTACT PLACED IN "TEST CONTACT" - POSITION INSIDE THE SWITCH´S MECHANISM
-A11.1
#Unit Charging Kit
ABB Accessory
CHARGING CONTROL BOARD
BSFC-12C
-X5
-X4
-INV1
-INV2
-INV3
S1 DIS EN
S2 DIS EN
S3 DIS EN
PWR
UDC
STAT
-GND1.1
-PE1.11
-X13.1:1
-K11.1:A1
-K11.1:A2
-K13.1:2
-Q10.1 /003a/6C
-Q11.1 /003a/2B
-P11.1
DOOR
+01.3
Unit charging circuit
IGBT Supply Unit
ACS880-204LC-1180LC-7
DMS doc. nr. 3AXD10002635574
Example Circuit Diagrams
ACS880-204LC, CL filter with external L-grid inductance
Frame size 2xR8i
Oleg Vanin
Mika Asikainen
2026-03-16
2026-03-17

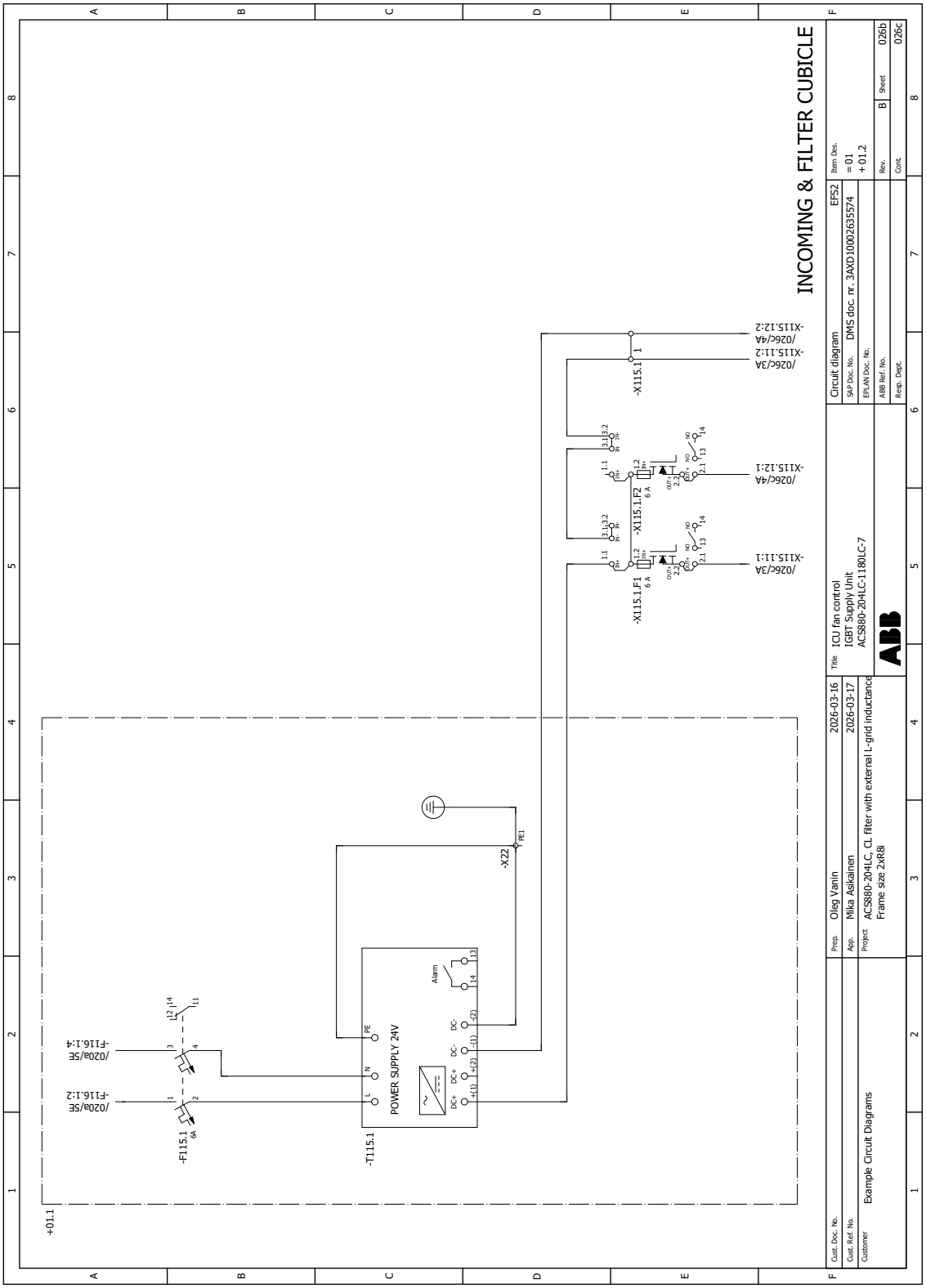

IGBT SUPPLY CUBICLE
24V OUT
UCU
BSFC
INVERTER MODULE
ACS880-104LC-0670A-7
AC SELECT
X59
230V
#Fiber Optic
ABB Accessory
-W2
2x
-W3
2x
-X50
-X53
-X55.1
/021a/2E
-F24:2
/021a/4B
-X22:6
-T01.1
/003a/2D
-T01.2
/003a/3D
Module control circuit
IGBT Supply Unit
ACS880-204LC-1180LC-7
ACS880-2041LC, CL filter with external L-grid inductance
Frame size 2xR8i
Example Circuit Diagrams
Oleg Vanin
Mika Asikainen
2026-03-16
2026-03-17
DMS doc. nr. 3AXD10002635574
= 01
+ 01.3
005a
020a

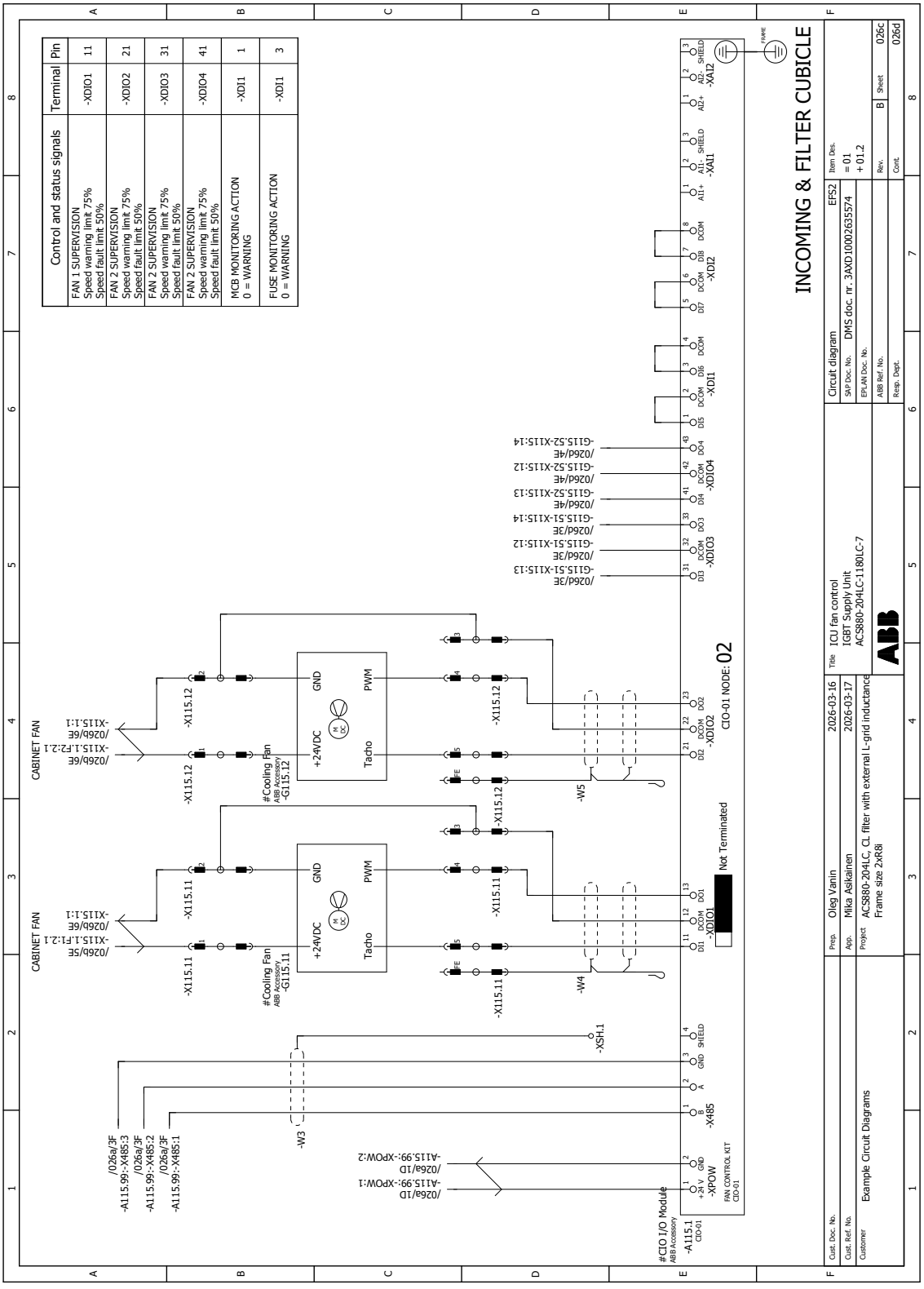

AUXILIARY CONTROL CUBICLE (EXTERNAL)
EXTERNAL AUXILIARY VOLTAGE SUPPLY
PROVIDED BY USER
MAX FUSE 40 A gG
EXTERNAL FAN VOLTAGE SUPPLY
PROVIDED BY USER
MAX FUSE 40 A gG
SUPPLY SIDE FAN
VOLTAGE SUPPLY
L
N
230V
50Hz
-Q20
40A
-F20.1
16A
-Q115.1
40A
-F116.1
16A
-XZ2:12
-XZ2:3
-XZS.50:21
-XZS.50:20
-FI15.1:1
-FI15.1:3
Auxiliary circuit. External supplies
IGBT Supply Unit
ACS880-204LC-1180LC-7
DMS doc. nr. 3AXD10002635574
Example Circuit Diagrams
ACS880-204LC, CL filter with external L-grid inductance
Frame size 2xR8i
Oleg Vanin
Mika Asikainen
2026-03-16
2026-03-17

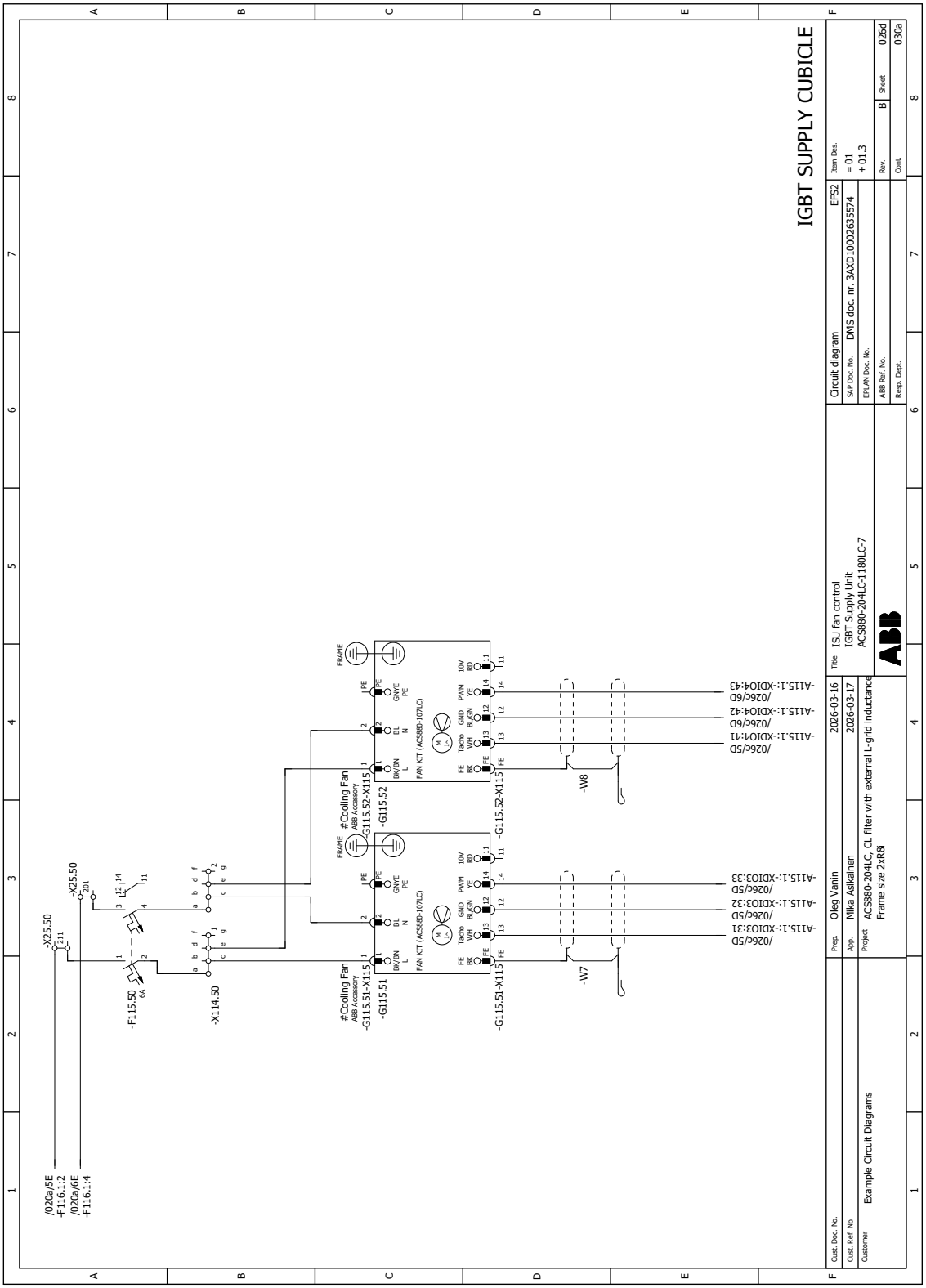

AUXILIARY CONTROL CUBICLE (EXTERNAL)
AUXILIARY VOLTAGE DISCONNECT MONITORING
MAIN BREAKER ON/OFF STATUS
TEMP FAULT
INTERNAL POWER SUPPLY (BDPS)
MAIN BREAKER CONTROL
-Q20 /020a/2B
-Q1 /030a/2D
-K8
-F23 6A
-F24 10A
-X22
-X6.99
Circuit diagram
EFS2
Auxiliary circuit
IGBT Supply Unit
ACS880-204LC-1180LC-7
Example Circuit Diagrams
ACS880-204LC, CL filter with external L-grid inductance
Frame size 2xR8i
Oleg Vanin
Mika Asikainen
2026-03-16
2026-03-17
DMS doc. nr. 3AXD10002635574
Sheet
021a
022a

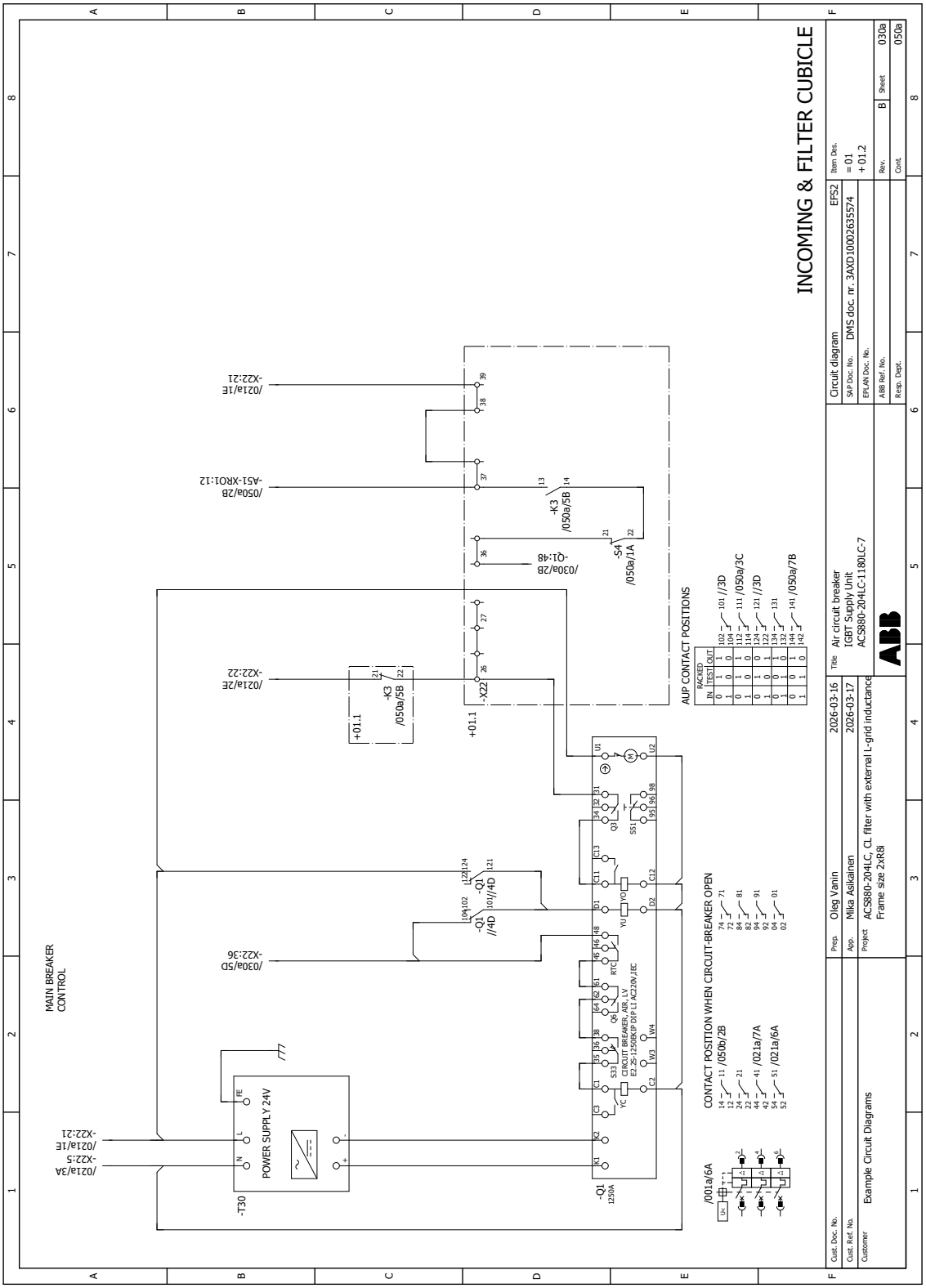

AUXILIARY CONTROL CUBICLE (EXTERNAL)
Control voltage distribution 24V
IGBT Supply Unit
ACS880-2041LC-1180LC-7
Circuit diagram
EFS2
DMS doc. nr. 3AXD10002635574
ABB
Oleg Vanin
2026-03-16
Mika Asikainen
2026-03-17
ACS880-2041LC, CL filter with external L-grid inductance
Frame size 2xR8i
Example Circuit Diagrams
POWER SUPPLY 24V
-T22
-F29
6A
-X22.3
DC OK/Alarm
/050b/3C
/021a/4B
-X22:7
/021a/2B
-X22:16
/004a/1D
-A11.1-X5A:2
/050a/1B
-A51-XPOW:2
/026a/1C
-A11S.99:-XPOW:2
/004a/1D
-A11.1-X5A:1
/050a/1B
-A51-XPOW:1
/026a/1C
-A11S.99:-XPOW:1
-X21

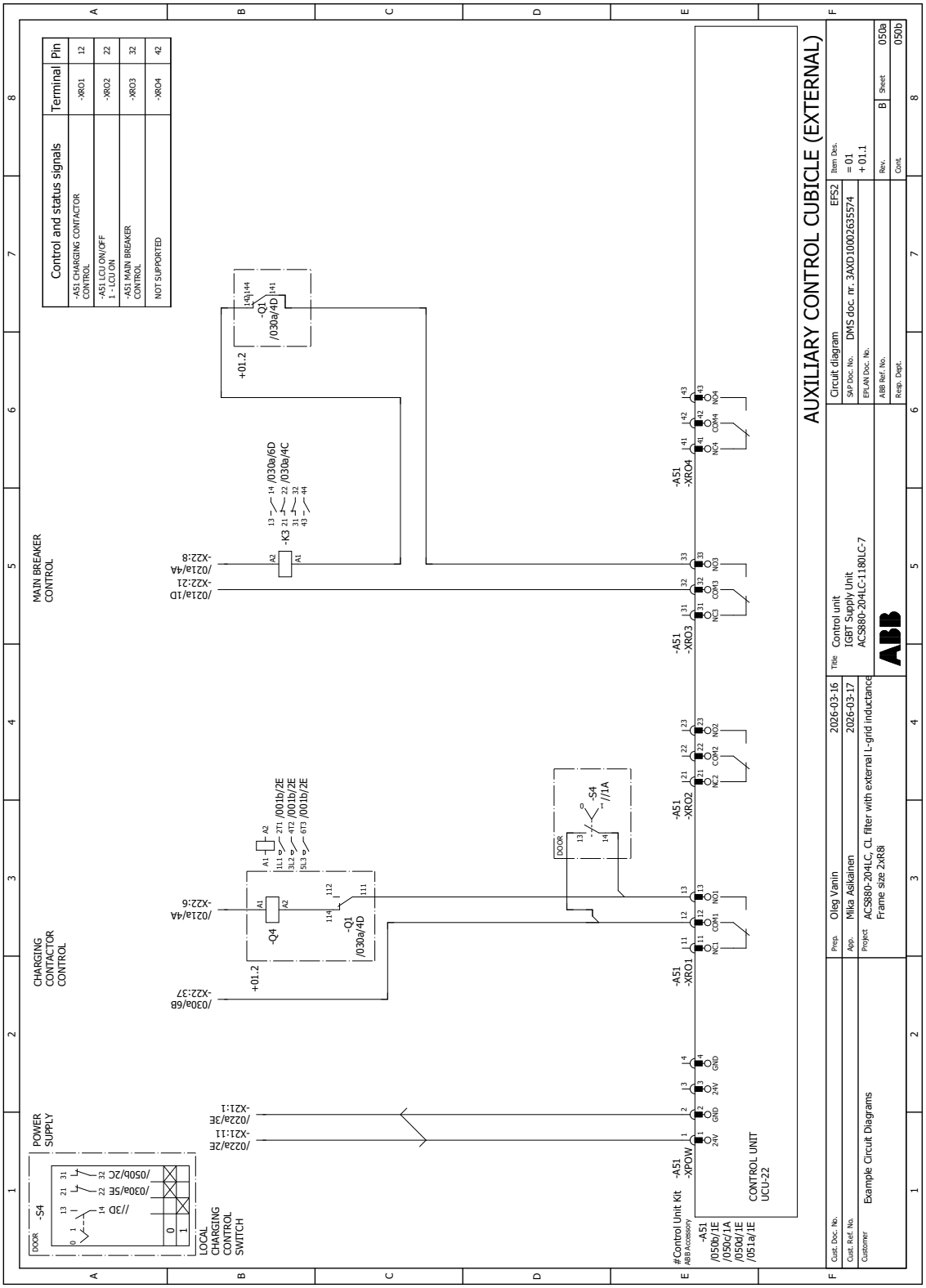

AUXILIARY CONTROL CUBICLE (EXTERNAL)
Control and status signals
FAN 1 SUPERVISION
Speed warning limit 75%
Speed fault limit 50%
FAN 2 SUPERVISION
Speed warning limit 75%
Speed fault limit 50%
FAN 2 SUPERVISION
Speed warning limit 75%
Speed fault limit 50%
FAN 2 SUPERVISION
Speed warning limit 75%
Speed fault limit 50%
MCB MONITORING ACTION
0 = WARNING
FUSE MONITORING ACTION
0 = WARNING
Terminal
-XDIO1
-XDIO2
-XDIO3
-XDIO4
-XDI1
-XDI1
Pin
11
21
31
41
1
3
CIO-01 NODE: 01
Not Terminated
ACU fan control
IGBT Supply Unit
ACS880-204LC-1180LC-7
ACS880-204LC, CL filter with external L-grid inductance
Frame size 2xR8i
Oleg Vanin
Mika Aalkainen
2026-03-16
2026-03-17
EFS2
DMS doc. nr. 3AXD10002635574
Circuit diagram
Example Circuit Diagrams
FAN CONTROL KIT
CIO-01
-A115.99
-XPOW
-X485
-W1
-W2
-XSH.99
-F115.99
-X115.99
-G115.99
-XAI1
-XAI2
-XDI2
-XRO1
-XRO2
-XRO3
-XDIO1
-XDIO2
-XDIO3
-XDIO4
-XSTO
-XFB
-XD2D
-XAO1
-XAO2
-XPTC
-XMIO
-XD24
-XDPI
-XAUX
-XSAFE
-XETH
-XCAN
-XMCB
-XPANEL
-XMEM
-XSLOT1
-XSLOT2
-XSLOT3
-XSLOT4
-XSLOT5
-XSLOT6
-XSLOT7
-XSLOT8
-XSLOT9
-XSLOT10
-XSLOT11
-XSLOT12
-XSLOT13
-XSLOT14
-XSLOT15
-XSLOT16
-XSLOT17
-XSLOT18
-XSLOT19
-XSLOT20
-XSLOT21
-XSLOT22
-XSLOT23
-XSLOT24
-XSLOT25
-XSLOT26
-XSLOT27
-XSLOT28
-XSLOT29
-XSLOT30
-XSLOT31
-XSLOT32
-XSLOT33
-XSLOT34
-XSLOT35
-XSLOT36
-XSLOT37
-XSLOT38
-XSLOT39
-XSLOT40

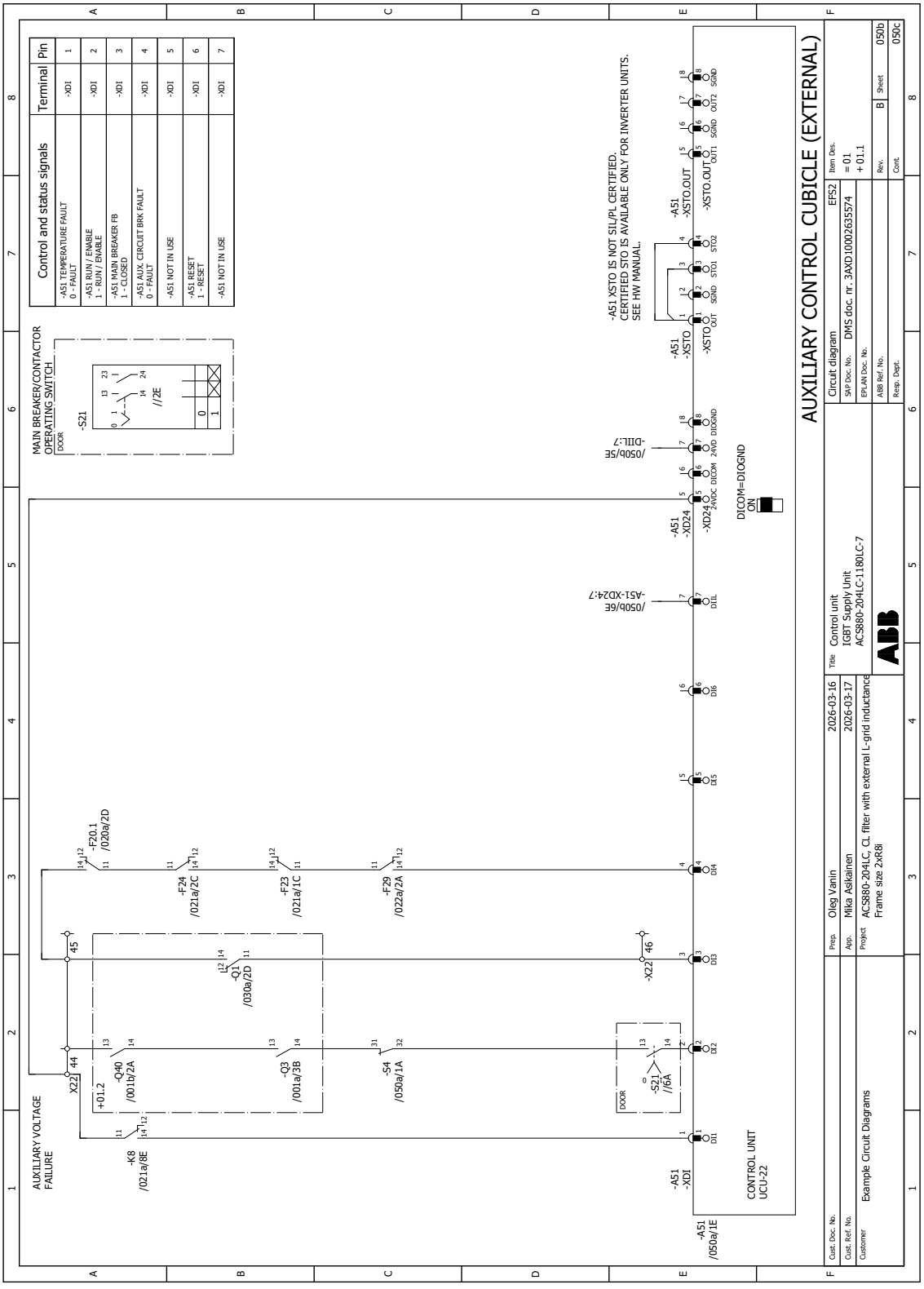

INCOMING & FILTER CUBICLE
+01.1
-F115.1
6A
-T115.1
POWER SUPPLY 24V
Alarm
-X22
PE1
-X115.1 1
-X115.1.F1
6 A
-X115.1.F2
6 A
/026c/3A
-XI15.11:2
/026c/4A
-XI15.12:2
-XI15.11:1
-XI15.12:1
/020a/5E
-FI16.1:2
-FI16.1:4
Circuit diagram
EFS2
SKF Doc. No.
DMS doc. nr. 3AXD10002635574
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.2
Rev.
B
Sheet
026b
Cont.
026c
Prep.
Oleg Vanin
2026-03-16
Appr.
Mika Aalkainen
2026-03-17
Project
ACS880-204LC, CL filter with external L-grid inductance
Frame size 2xR8i
Title
ICU fan control
IGBT Supply Unit
ACS880-204LC-1180LC-7
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams

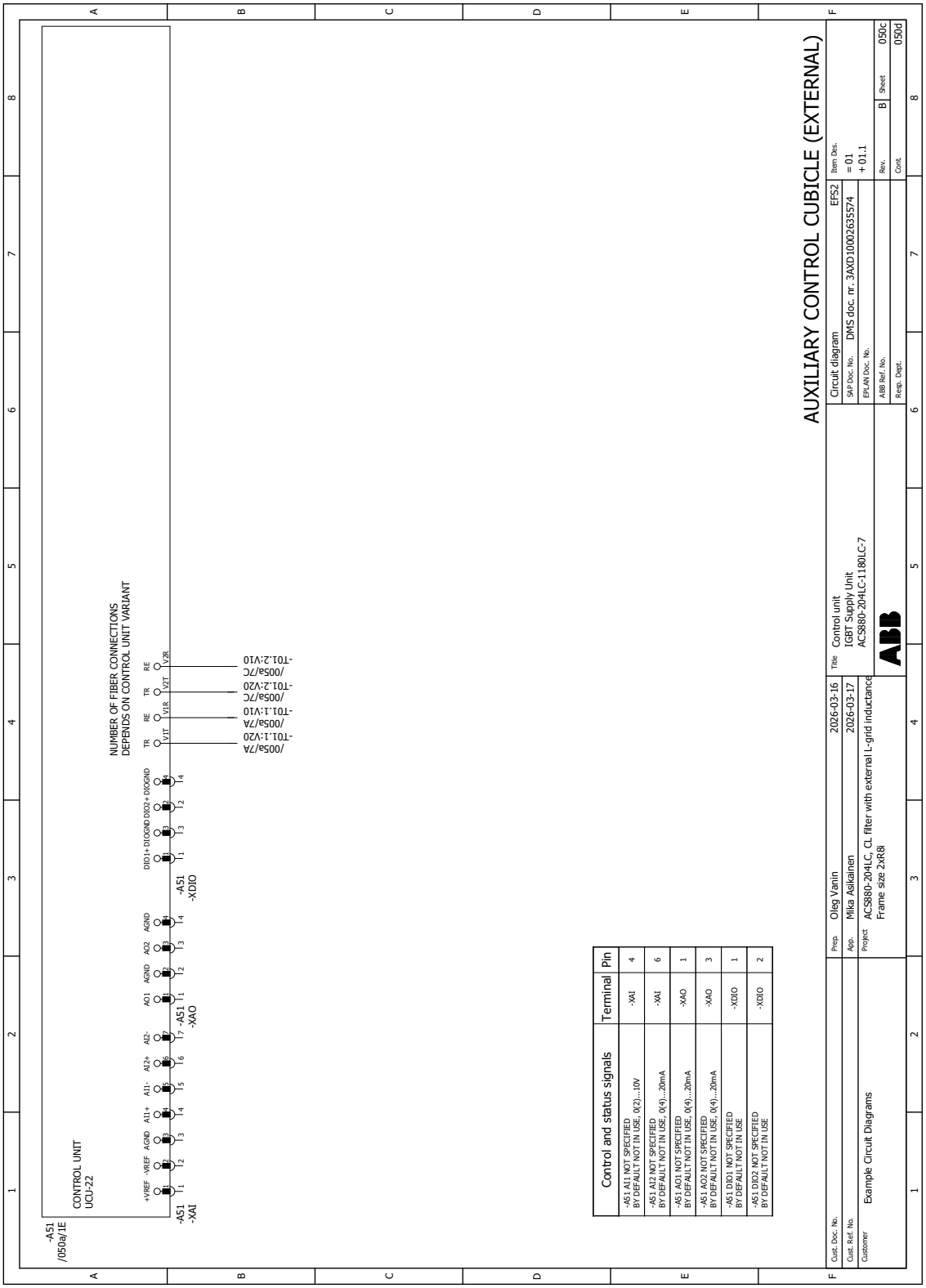

INCOMING & FILTER CUBICLE
ABB
ACS880-204LC-1180LC-7
IGBT Supply Unit
ICU fan control
Example Circuit Diagrams
Frame size 2xR8i
CIO-01 NODE: 02
Not Terminated
CABINET FAN
CABINET FAN
-XPOW
-X485
-XSH.1
-W3
-W4
-W5
-XDIO1
-XDIO2
-XDIO3
-XDIO4
-XDI1
-XDI2
-XAI1
-XAI2
-A115.1
-X115.11
-X115.12
-G115.11
-G115.12
+24VDC
GND
PWM
Tacho
Control and status signals
FAN 1 SUPERVISION
Speed warning limit 75%
Speed fault limit 50%
FAN 2 SUPERVISION
Speed warning limit 75%
Speed fault limit 50%
MCB MONITORING ACTION
0 = WARNING
FUSE MONITORING ACTION
0 = WARNING

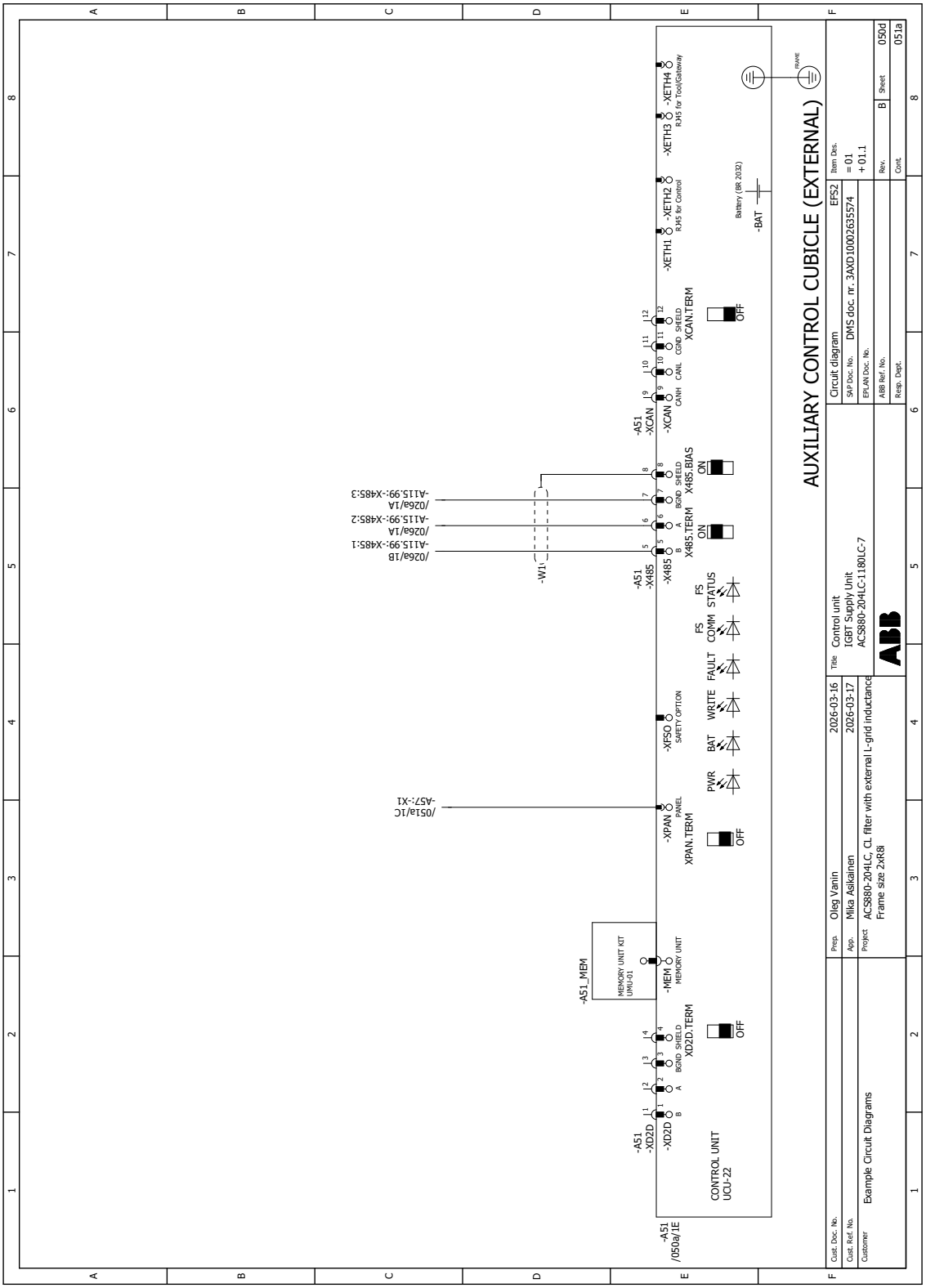

IGBT SUPPLY CUBICLE
ISU fan control
IGBT Supply Unit
ACS880-204LC-1180LC-7
Circuit diagram
EFS2
DMS doc. nr. 3AXD10002635574
Example Circuit Diagrams
ACS880-204LC, CL filter with external L-grid inductance
Frame size 2xR8i
Oleg Vanin
Mika Asikainen
2026-03-16
2026-03-17
-X25.50
-F115.50
-X114.50
-G115.51
-G115.51-X115
-G115.52
-G115.52-X115
-W7
-W8
#Cooling Fan
ABB Accessory
FAN KIT (ACS880-107LC)
/020a/5E
-F116.1:2
/020a/6E
-F116.1:4
/026d/5D
-A11S.1:-XDIO3:31
-A11S.1:-XDIO3:32
-A11S.1:-XDIO3:33
-A11S.1:-XDIO4:41
-A11S.1:-XDIO4:42
-A11S.1:-XDIO4:43

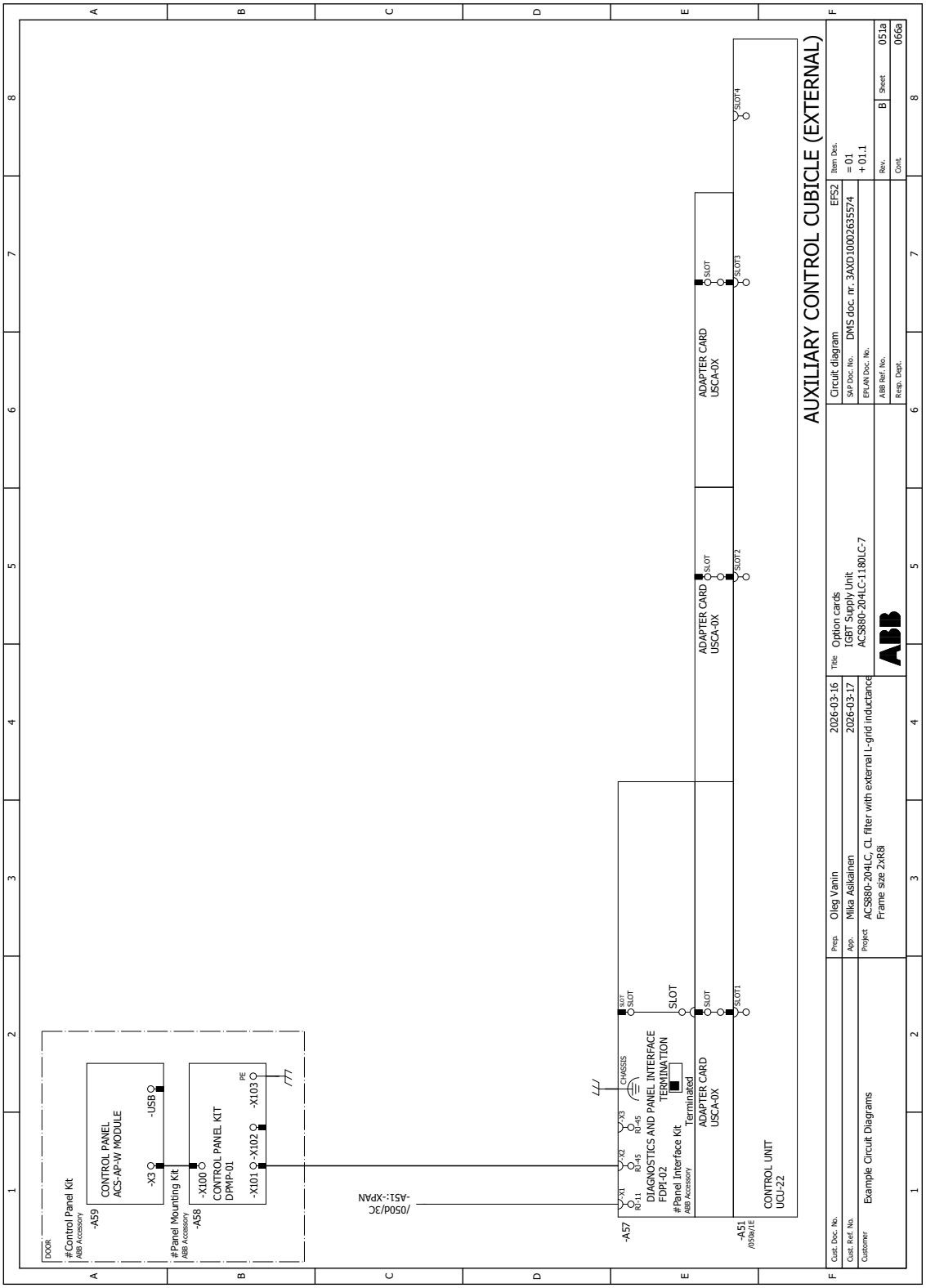

INCOMING & FILTER CUBICLE
MAIN BREAKER CONTROL
POWER SUPPLY 24V
-T30
-Q1 1250A
CIRCUIT BREAKER, AIR, LV E2.2S-1250SK/P DIP L1 AC220V,1EC
CONTACT POSITION WHEN CIRCUIT-BREAKER OPEN
/001a/6A
AUP CONTACT POSITIONS
Circuit diagram
Air circuit breaker
IGBT Supply Unit
ACS880-204LC-1180LC-7
ACS880-204LC, CL filter with external L-grid inductance
Frame size 2xR8i
Example Circuit Diagrams
Oleg Vanin
Mika Aslkainen
2026-03-16
2026-03-17
EFS2
DMS doc. nr. 3AXD10002635574
030a
050a

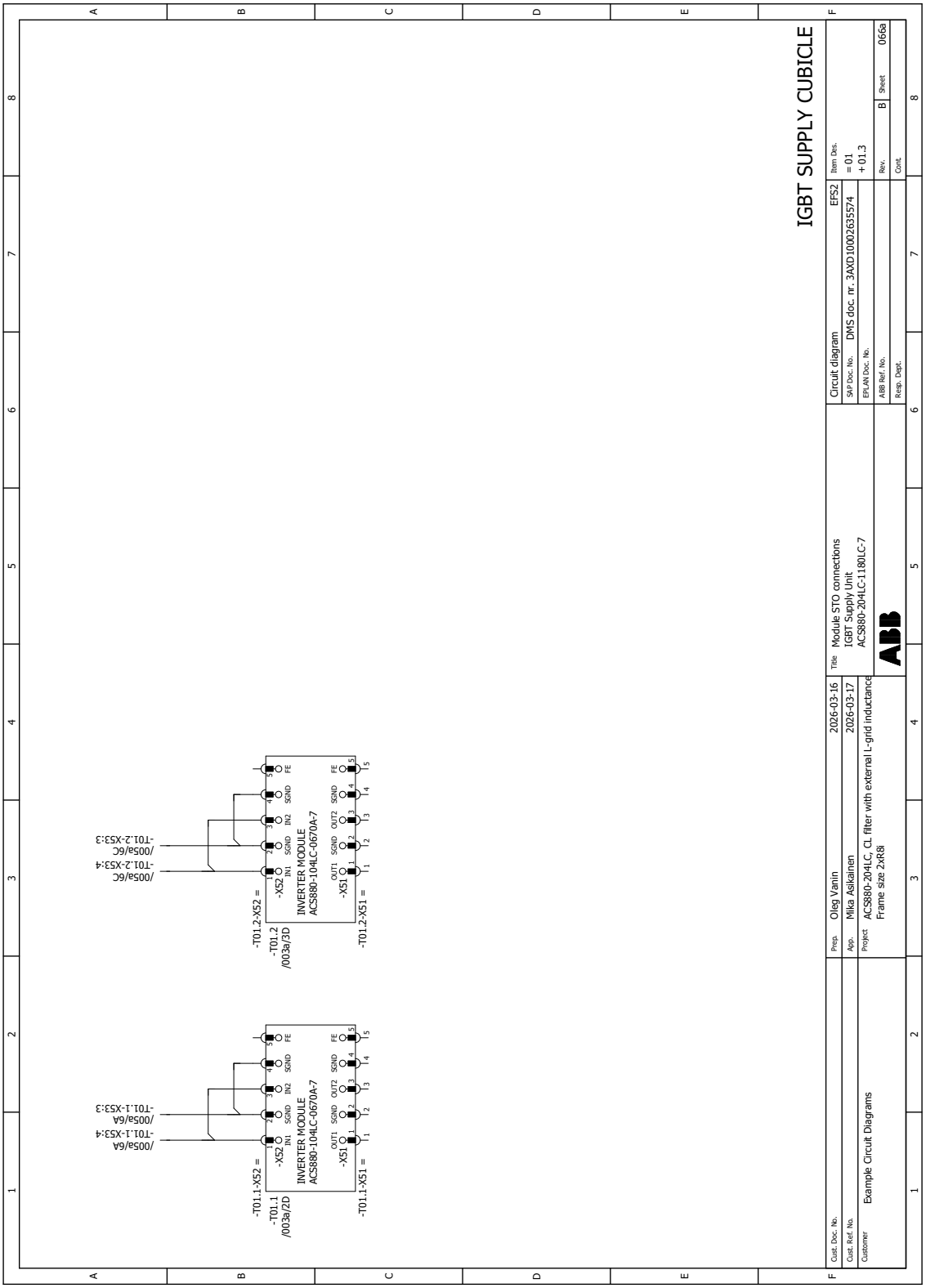

AUXILIARY CONTROL CUBICLE (EXTERNAL)
Control and status signals
-A51 CHARGING CONTACTOR CONTROL
-A51 LCU ON/OFF 1 - LCU ON
-A51 MAIN BREAKER CONTROL
NOT SUPPORTED
Terminal
Pin
-XRO1
12
-XRO2
22
-XRO3
32
-XRO4
42
MAIN BREAKER CONTROL
CHARGING CONTACTOR CONTROL
POWER SUPPLY
LOCAL CHARGING CONTROL SWITCH
CONTROL UNIT UCU-22
-A51 -XPOW
-A51 -XRO1
-A51 -XRO2
-A51 -XRO3
-A51 -XRO4
-Q1 /030a/4D
-Q4
-K3 /030a/6D /030a/4C
-S4 //1A
-S4 //3D
/030a/5E
/050b/2C
/022a/2E
/021a/4A
/021a/1D
/030a/6B
/001b/2E
+01.2
DOOR
Prep. Oleg Vanin 2026-03-16
Appr. Mika Aalkainen 2026-03-17
Project ACS880-204LC, CL filter with external L-grid inductance Frame size 2xR8i
Title Control unit IGBT Supply Unit ACS880-204LC-1180LC-7
Circuit diagram EFS2
SAP Doc. No. DMS doc. nr. 3AXD10002635574
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des. = 01 + 01.1
Rev. B Sheet 050a
Cont. 050b
Cust. Doc. No.
Cust. Ref. No.
Customer Example Circuit Diagrams
#Control Unit Kit ABB Accessory -A51 /050b/1E /050c/1A /050d/1E /051a/1E


AUXILIARY CONTROL CUBICLE (EXTERNAL)
Control and status signals
Terminal
Pin
-A51 TEMPERATURE FAULT 0 - FAULT
-A51 RUN / ENABLE 1 - RUN / ENABLE
-A51 MAIN BREAKER FB 1 - CLOSED
-A51 AUX. CIRCUIT BRK FAULT 0 - FAULT
-A51 NOT IN USE
-A51 RESET 1 - RESET
-A51 NOT IN USE
-XD1
MAIN BREAKER/CONTACTOR OPERATING SWITCH
DOOR
-S21
//2E
-A51 XSTO IS NOT SIL/PL CERTIFIED. CERTIFIED STO IS AVAILABLE ONLY FOR INVERTER UNITS. SEE HW MANUAL.
-A51 -XSTO
-A51 -XSTO.OUT
DICOM=DIOGND
ON
-A51 -XD24
-A51 -XD1
CONTROL UNIT UCU-22
AUXILIARY VOLTAGE FAILURE
-K8 /021a/8E
-Q40 /001b/2A
-Q3 /001a/3B
-S4 /050a/1A
-S21 //6A
-Q1 /030a/2D
-F24 /021a/2C
-F23 /021a/1C
-F29 /022a/2A
-F20.1 /020a/2D
-A51 /050a/1E
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10002635574
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.1
Rev.
B
Sheet
050b
Cont.
050c
Prep.
Oleg Vanin
2026-03-16
Appr.
Mika Asikainen
2026-03-17
Project
ACS880-204LC, CL filter with external L-grid inductance Frame size 2xR8i
Title
Control unit IGBT Supply Unit ACS880-204LC-1180LC-7
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams


AUXILIARY CONTROL CUBICLE (EXTERNAL)
-A51
/050a/1E
CONTROL UNIT
UCU-22
-A51
-XAI
-A51
-XAO
-A51
-XDIO
NUMBER OF FIBER CONNECTIONS
DEPENDS ON CONTROL UNIT VARIANT
/005a/7A
-T01.1:V20
/005a/7A
-T01.1:V10
/005a/7C
-T01.2:V20
/005a/7C
-T01.2:V10
Control and status signals
Terminal
Pin
-A51 AI1 NOT SPECIFIED
BY DEFAULT NOT IN USE, 0(2)...10V
-XAI
4
-A51 AI2 NOT SPECIFIED
BY DEFAULT NOT IN USE, 0(4)...20mA
-XAI
6
-A51 AO1 NOT SPECIFIED
BY DEFAULT NOT IN USE, 0(4)...20mA
-XAO
1
-A51 AO2 NOT SPECIFIED
BY DEFAULT NOT IN USE, 0(4)...20mA
-XAO
3
-A51 DIO1 NOT SPECIFIED
BY DEFAULT NOT IN USE
-XDIO
1
-A51 DIO2 NOT SPECIFIED
BY DEFAULT NOT IN USE
-XDIO
2
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep.
Oleg Vanin
2026-03-16
Appr.
Mika Aalkainen
2026-03-17
Project
ACS880-204LC, CL filter with external L-grid inductance
Frame size 2xR8i
Title
Control unit
IGBT Supply Unit
ACS880-204LC-1180LC-7
ABB
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10002635574
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ABB Ref. No.
Resp. Dept.
Item Dos.
= 01
+ 01.1
Rev.
B
Sheet
050c
Cont.
050d


AUXILIARY CONTROL CUBICLE (EXTERNAL)
CONTROL UNIT
UCU-22
-A51
/050a/1E
-A51
-XD2D
-XD2D
XD2D.TERM
-A51_MEM
MEMORY UNIT KIT
UMU-01
-MEM
MEMORY UNIT
-XPAN
PANEL
XPAN.TERM
-XFSO
SAFETY OPTION
PWR
BAT
WRITE
FAULT
FS COMM
FS STATUS
-A51
-X485
-X485
X485.TERM
X485.BIAS
-A51
-XCAN
-XCAN
XCAN.TERM
-XETH1
-XETH2
-XETH3
-XETH4
RJ45 for Control
RJ45 for Tool/Gateway
-W1
-BAT
Battery (BR 2032)
/051a/1C
-A57:-X1
/026a/1B
-A11.99:-X485:1
/026a/1A
-A11.99:-X485:2
/026a/1A
-A11.99:-X485:3
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep.
Oleg Vanin
2026-03-16
Appr.
Mika Asikainen
2026-03-17
Project
ACS880-204LC, CL filter with external L-grid inductance
Frame size 2xR8i
Title
Control unit
IGBT Supply Unit
ACS880-204LC-1180LC-7
ABB
Circuit diagram
EFS2
SAP Doc. No.
DMS doc. nr. 3AXD10002635574
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Item Des.
= 01
+ 01.1
Rev.
B
Sheet
050d
Cont.
051a


AUXILIARY CONTROL CUBICLE (EXTERNAL)
DOOR
#Control Panel Kit
ABB Accessory
-A59
CONTROL PANEL
ACS-AP-W MODULE
-X3
-USB
#Panel Mounting Kit
ABB Accessory
-A58
-X100
CONTROL PANEL KIT
DPMP-01
-X101
-X102
PE
-X103
/050d/3C
-A51:-XPAN
-A57
-X1
RJ-11
-X2
RJ-45
-X3
RJ-45
CHASSIS
DIAGNOSTICS AND PANEL INTERFACE
FDPI-02
#Panel Interface Kit
ABB Accessory
TERMINATION
Terminated
SLOT
ADAPTER CARD
USCA-0X
CONTROL UNIT
UCU-22
-A51
/050a/1E
SLOT1
SLOT2
SLOT3
SLOT4
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep.
Oleg Vanin
2026-03-16
Appr.
Mika Asikainen
2026-03-17
Project
ACS880-204LC, CL filter with external L-grid inductance
Frame size 2xR8i
Title
Option cards
IGBT Supply Unit
ACS880-204LC-1180LC-7
EFS2
Item Des.
= 01
+ 01.1
Circuit diagram
SAP Doc. No.
DMS doc. nr. 3AXD10002635574
EPLAN Doc. No.
ABB Ref. No.
Resp. Dept.
Rev.
B
Sheet
051a
Cont.
066a


IGBT SUPPLY CUBICLE
Module STO connections
IGBT Supply Unit
ACS880-204LC-1180LC-7
Circuit diagram
EFS2
DMS doc. nr. 3AXD10002635574
= 01
+ 01.3
Rev.
B
Sheet
066a
Cust. Doc. No.
Cust. Ref. No.
Customer
Example Circuit Diagrams
Prep.
Oleg Vanin
2026-03-16
Appr.
Mika Asikainen
2026-03-17
Project
ACS880-204LC, CL filter with external L-grid inductance
Frame size 2xR8i
-T01.1-XS2 =
-T01.1
/003a/2D
-XS2
INVERTER MODULE
ACS880-104LC-0670A-7
-XS1
-T01.1-XS1 =
/005a/6A
-T01.1-XS3:4
/005a/6A
-T01.1-XS3:3
-T01.2-XS2 =
-T01.2
/003a/3D
-T01.2-XS1 =
/005a/6C
-T01.2-XS3:4
/005a/6C
-T01.2-XS3:3

16

# Internal cooling circuit

## Contents of this chapter

The cooling system of a liquid-cooled drive consists of two circuits: the internal cooling circuit and the external cooling circuit. The internal cooling circuit covers the heat-generating electrical components of the drive and transfers the heat to the cooling unit. In the cooling unit, the heat is transferred to the external cooling circuit which is usually part of a larger external cooling system. This chapter deals with the internal cooling circuit.

## Applicability

The information in this chapter is applicable to cabinet-built ACS880 liquid-cooled drives. Except where otherwise indicated, the information is also applicable to drives built out of ACS880 liquid-cooled multidrives modules.

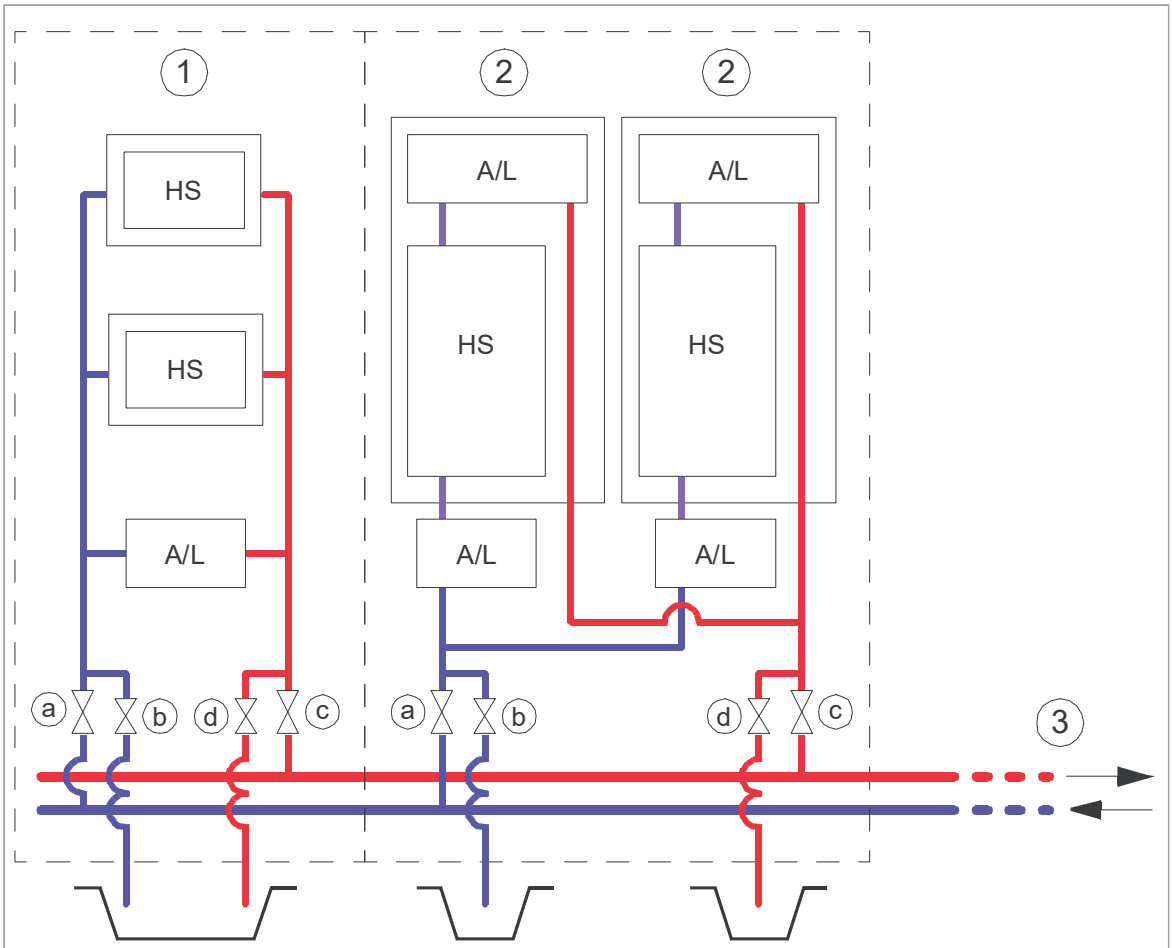
## Internal cooling system

Each cubicle has an inlet and an outlet manifold, fitted with a stop valve and a drain valve. The stop valves can be closed to isolate all modules in the cubicle from the main cooling circuit.

In cabinet line-ups built by ABB, valves are color-coded:

- Blue – Open during operation
- Red – Closed during operation

The following diagram shows the coolant pipe connections in a drive system consisting of a supply unit and an inverter unit. Other units, such as brake units, DC/DC converter units have similar cooling arrangements. Other cubicles containing components that require cooling may also contain heat exchangers.




| | |
|---|---|
| 1 | Supply modules. The drawing shows the configuration of a diode supply unit with two modules, ie. there is a common air-to-liquid exchanger in the cubicle. With an IGBT supply unit, each module has a dedicated air-to-liquid exchanger as shown for item 2. |
| 2 | Inverter modules |
| 3 | To/From cooling unit |
| A/L | Air-to-liquid heat exchanger |
| HS | Heat sink |
| a | Inlet valve |
| b | Inlet-side drain valve |
| c | Outlet valve |
| d | Outlet-side drain valve |

The coolant used with ACS880 liquid-cooled drive systems is Antifrogen® L 25% or 50% mixture. See Coolant specification (page 555).

# Connection to a cooling unit

## Connection to an ACS880-1007LC cooling unit

Refer to ACS880-1007LC cooling unit user's manual (3AXD50000129607 [English]).

## Connection to a custom cooling unit

### General requirements

Equip the system with an expansion tank to damp pressure rise due to volume changes when the temperature varies. Equip the system with a pump that provides a nominal flow and pressure. Keep the pressure within the limits specified in Technical data for the internal cooling circuit (page 555). Install a pressure regulator to make sure that the maximum permissible operating pressure is not exceeded.

Install a bleed valve at the highest point of the cooling circuit, and a drain valve at the lowest point.

The materials that can be used are listed in Cooling circuit materials (page 558).

### Coolant temperature control

The temperature of the coolant in the internal cooling circuit must be kept within the limits specified in Technical data for the internal cooling circuit (page 555). Note that the minimum temperature is dependent on ambient temperature and relative humidity.

# Filling up and bleeding the internal cooling circuit

Both the drive and coolant must be at room temperature before filling up the cooling circuit.

**NOTICE** Make sure that the maximum permissible operating pressure is not exceeded. When necessary, regulate the pressure to appropriate level by draining excess coolant out of the system.

**NOTICE** Bleeding of the cooling circuit is very important and must be done carefully. Air bubbles in the cooling circuit can decrease or completely stop coolant flow and cause overheating. Let the air out of the cooling system while filling in coolant, and after maintenance work (for example, after a power module replacement).

## Drive line-ups with an ACS880-1007LC cooling unit

Obey the filling up and bleeding instructions in ACS880-1007LC cooling unit user's manual (3AXD50000129607 [English]).

## Drive line-ups with a custom cooling unit

**Note:**

- In filling up the system, the drain valves in the line-up are used only to vent the air from the circuit so that it can be displaced by the coolant. The actual bleeding of the circuit must be done via an external bleed valve installed at the highest point of the cooling circuit. The most practical location for the valve is usually near or at the cooling unit.
- Observe the instructions given by the manufacturer of the cooling unit. Pay special attention to filling up and bleeding the pumps properly as they may be damaged if operated when dry.
- Draining coolant into the sewer system is not allowed.

1. Open the bleed valve at the cooling unit.
2. Open the inlet valve and the outlet-side drain valve of one cubicle. Keep the outlet valve and the inlet-side drain valve closed.
3. Attach a hose to the outlet-side drain valve and lead it into a suitable container.
4. Fill the circuit with coolant. For the coolant specification, refer to section Coolant specification (page 555).
   To minimize foaming, do not exceed the filling flow rate of 5 l/min (1.3 US gallon/min).
5. As the piping and modules in the cubicle fills up, coolant starts to flow from the hose. Let some coolant flow out, then close the drain valve.
6. Close the inlet valve.
7. Repeat steps 2…6 for all cubicles in the line-up.
8. Open the inlet and outlet valves in all cubicles. Let any air remaining in the system out through the bleed valve at the cooling unit.
9. Close the bleed valve at the cooling unit.
10. Continue to fill in coolant until a base pressure of approximately 250 kPa is achieved.

11. Open the bleed valve of the pump to let out any air.
12. Re-check the pressure and add coolant if necessary.
13. Start the coolant pump. Let any air remaining in the system out through the bleed valve at the cooling unit.
14. After one to two minutes, stop the pump or block the coolant flow with a valve.
15. Re-check the pressure and add coolant if necessary.
16. Repeat steps 13…15 a few times until all air is let out of the cooling circuit. Listen for a humming sound and/or feel the piping for vibration to find out if there is still air left in the circuit.

## Draining the internal cooling circuit

The modules in each cubicle can be drained through the drain valves without draining the whole internal cooling circuit.

**⚠CAUTION** Stop the pumps and drain the coolant before you do work on the liquid cooling system. There is high-pressure hot coolant (6 bar, max. 50 °C) in the cooling circuit when it is in operation.

1. Attach hoses to each drain valve in the cubicle to be drained. Lead the hoses into a suitable container. Make sure the ends of the hoses are not immersed in coolant at any point so that air can displace the coolant in the system.
2. Open the drain valves. Wait until all coolant has drained.

   **Note:** Draining coolant into the sewer system is not allowed.
3. If required, dry the piping with compressed oil-free air of less than 6 bar.
4. If the drive is to be stored in temperatures below 0 °C (32 °F),
   - dry the cooling circuit with air,
   - fill the cooling circuit with coolant specified under Coolant specification (page 555).
   - drain the cooling circuit again.

## Maintenance intervals of the internal cooling circuit

The coolant replacement interval is specified in the maintenance table. If it is necessary to examine the quality of Antifrogen® L coolant between the replacement intervals, you can send a sample to Clariant through the sample submission process. See ‘Antifrogen analysis service’ at www.clariant.com. To start the sample submission process, you must buy a voucher. You can buy vouchers from Antifrogen® L distributors or through your local ABB representative.

## Technical data for the internal cooling circuit

### Coolant specification

#### Coolant type

Antifrogen® L (by Clariant International Ltd, www.clariant.com) 25% or 50% mixture, available from Clariant distributors and ABB Service representatives.

Do not dilute the coolant. It is ready to use.

Antifrogen® L 25% mixture is usable in storage temperatures down to -16 °C (3.2 °F). Antifrogen® L 50% mixture is usable in storage temperatures down to -40 °C (-40 °F).

Note that operation below 0 °C (32 °F) is not permitted regardless of the freezing point of the coolant.

**NOTICE** The warranty does not cover damage that occurs from the use of incorrect coolant.

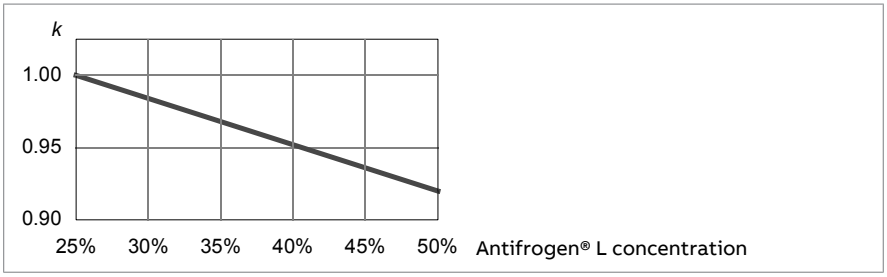
## Temperature limits

**Ambient temperature:** See the technical data of the drive/unit.

**Freeze protection:** The freezing point of the coolant is determined by the concentration of heat transfer fluid in the mixture.

The higher the concentration of heat transfer fluid, the higher the viscosity of the coolant. This results in a higher pressure loss in the system. See Pressure limits (page 557).

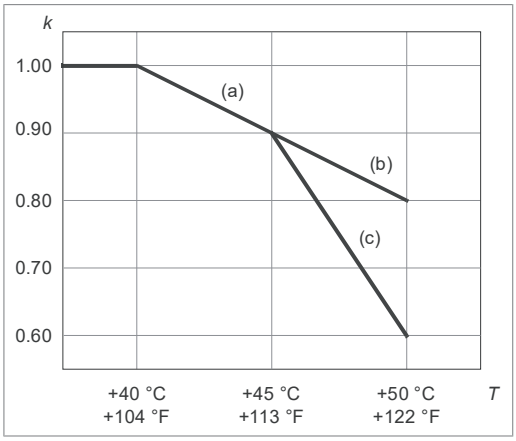
The nominal current ratings of drive system modules apply to an Antifrogen® L / water solution of 25/75% (volume). With the Antifrogen® L concentration between 25% and 50%, the drive output current must be derated by 1/3 percentage point per 1 p.p. increase in Antifrogen® L concentration. The drawing below shows the derating factor *(k)* in relation to Antifrogen® L concentration.




**Incoming coolant temperature:**

- 0…40 °C (32…104 °F): no drive output current derating required
- 40…45 °C (104…113 °F): drive output current must be derated by 2 percentage points per 1 °C (1.8 °F) temperature increase, as shown by curve (a).
- 45…50 °C (113…122 °F):
  - If components with a maximum operating temperature of 55 °C (131 °F) are installed in the same space as the drive modules, drive output current must be derated by 6 percentage points per 1 °C (1.8 °F) temperature increase, as shown by curve (c).
  - If there are no components with a maximum operating temperature of 55 °C (131 °F) installed in the same space as the drive modules, drive output current must be derated by 2 percentage points per 1 °C (1.8 °F) temperature increase, as shown by curve (b).

The drawing below shows the derating factor *(k)* in relation to coolant temperature.




Condensation is not permitted. The minimum coolant temperature to avoid condensation (at an atmospheric pressure of 1 bar) is shown below as a function of relative humidity (RH) and ambient temperature ($T_{air}$).

| $T_{air}$ (°C) | Min. $T_{coolant}$ (°C) | | | | |
|---|---|---|---|---|---|
| | RH = 95% | RH = 80% | RH = 65% | RH = 50% | RH = 40% |
| 5 | 4.3 | 1.9 | -0.9 | -4.5 | -7.4 |
| 10 | 9.2 | 6.7 | 3.7 | -0.1 | -3.0 |
| 15 | 14.2 | 11.5 | 8.4 | 4.6 | 1.5 |
| 20 | 19.2 | 16.5 | 13.2 | 9.4 | 6.0 |
| 25 | 24.1 | 21.4 | 17.9 | 13.8 | 10.5 |
| 30 | 29.1 | 26.2 | 22.7 | 18.4 | 15.0 |
| 35 | 34.1 | 31.1 | 27.4 | 23.0 | 19.4 |
| 40 | 39.0 | 35.9 | 32.2 | 27.6 | 23.8 |
| 45 | 44.0 | 40.8 | 36.8 | 32.1 | 28.2 |
| 50 | 49.0 | 45.6 | 41.6 | 36.7 | 32.8 |
| 55 | 53.9 | 50.4 | 46.3 | 42.2 | 37.1 |
| | = Not permitted as standard but the coolant temperature must be 0 °C (32 °F) or more. | | | | |
| Example: | At an air temperature of 45 °C and relative humidity of 65% the coolant temperature must not be less than +36.8 °C | | | | |

**Maximum temperature rise:** Depends on heat losses and mass flow. Typically 10 °C (18 °F) with nominal losses and flow.

## Pressure limits

**Note:** The pressure limits for ACS880-1007 cooling units manufactured before week 24 of 2020 are given in ACS880-1007LC user's manual, revision C.

**Base pressure:** 250 kPa (recommended); 300 kPa (maximum). “Base pressure” denotes the pressure of the system compared with the atmospheric pressure when the cooling circuit is filled with coolant.

**Air counterpressure in expansion tank (with ACS880-1007LC cooling unit):** 80 kPa

**Design pressure (PS):** 600 kPa

**Nominal pressure difference:** 120 kPa with Antifrogen® L 25% coolant solution, 140 kPa with Antifrogen® L 50% coolant solution. This has to be taken into account when dimensioning the liquid cooling circuit.

**Maximum pressure difference:** 160 kPa

## Coolant flow rate limits

The maximum coolant flow rate for all drive equipment is 1.3 × nominal. See the technical data chapter for nominal values.

## Cooling circuit materials

Materials used in the internal cooling circuit are listed below.

- stainless steel AISI 316L (UNS 31603)
- heavy gauge aluminum
- plastic materials such as PA, PEX and PTFE

  **Note:** PVC hoses are not suitable for use with antifreeze.

- rubber gasketing NBR (nitrile rubber).

***NOTICE*** If you connect external piping to the internal cooling circuit, use only materials that are specified above. Other materials can cause galvanic corrosion. If the external piping contains other materials, use a cooling unit with a heat exchanger (for example, ACS880-1007LC) to keep the external piping separate from the internal cooling circuit.

# 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 new.abb.com/contact-centers.

## Product training

For information on ABB product training, navigate to new.abb.com/service/training.

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