

ENGINEERING
TOMORROW



Installation Guide

iC7 Series Air-cooled System Modules

Active Front-End, Grid Converter, and Inverter Modules



drives.danfoss.com |



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1 Overview

1.1 Safety and Installation Awareness

Before starting installation, read all safety guidelines and precautions related to installing the products. For more information, see the product-specific design guide. Supplemental information and other guides can be downloaded from www.danfoss.com/en/service-and-support/documentation/.

1.2 Checking the Delivery and the Contents

Make sure that the items supplied and the information on the product label correspond to the order confirmation.

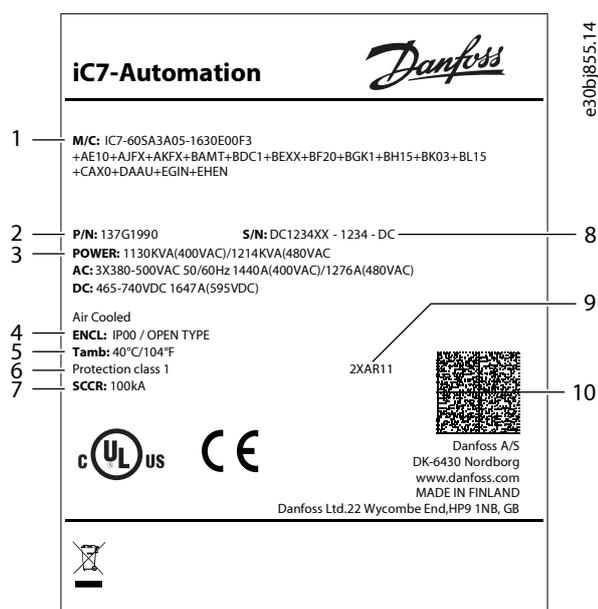


Figure 1: Product Label for iC7 Series Air-cooled System Modules

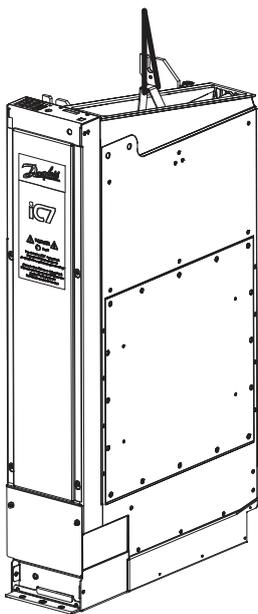
1	Model code of the product	2	Product number
3	Power, input, and output ratings	4	Protection rating
5	Temperature rating for ambient air	6	Protective class
7	Short-circuit current rating	8	Serial number
9	Frame designation	10	2D code accessible with a Datamatrix ECC 200 compatible barcode reader

If the optional sea container package (+TASE) was ordered, remove the yellow VCI capsule from the product.

1.3 Lifting the Product

The weights of system modules and different frames are different. It can be necessary to use a lifting device to move the drive from its package. For lifting the product, follow these instructions.

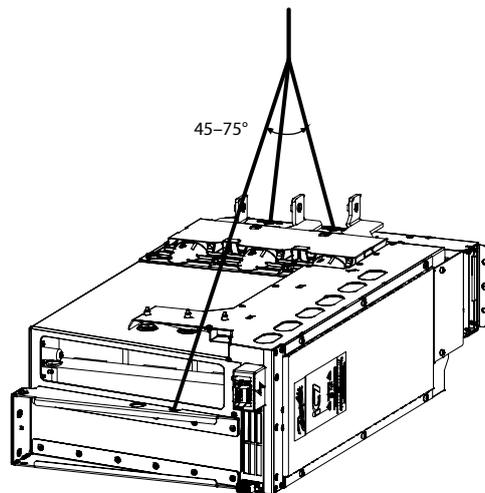
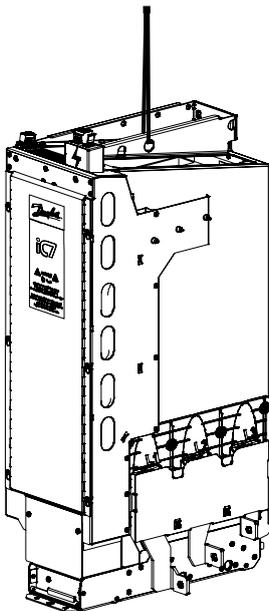
1. Remove the system module from the pallet where it was bolted to.
2. Use a lifting device that is sufficiently strong for the weight of the system module or filter.
3. Put the lifting hooks in the lifting loop or lifting hole on top of the product.



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Figure 2: Lifting the System Module

4. Lift the upper part of the LCL Filter for the AFE module vertically or horizontally.



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Figure 3: Lifting the Upper Part of the LCL Filter

5. When lifting the integration unit, make sure that the maximum lifting angle is correct ($60^\circ \pm 15^\circ$). Use the 4 lifting holes.

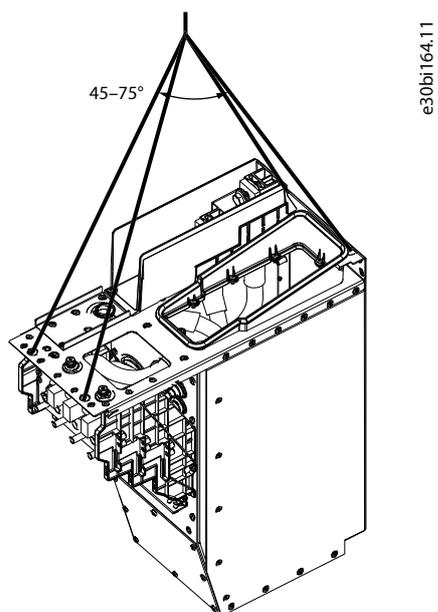


Figure 4: Lifting the Integration Unit

2 Mechanical Installation

2.1 Installation Direction

The system modules can be installed in different directions.

NOTICE

INSTALLATION DIRECTION OF SIZE 11 SYSTEM MODULES

The size 11 system modules (IM11, IR11, AM11, AR11) use a heat pipe technology that limits the installation direction. The heat pipes rely on gravitation, thus do not operate fully in certain orientations.

- Do not install the system module on its right side.

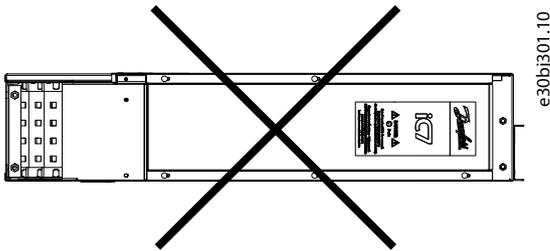


Figure 5: Forbidden Installation Direction of the System Module, Size 11

The system modules with integration units must be installed in a vertical position.

2.2 Installation Requirements

The system modules that are described in this guide have the protection rating IP00/Open Type. Install them in a cabinet or other enclosure that has a correct level of protection against the ambient conditions in the installation area.

The installation procedure varies between product categories and mechanical variants depending on selected options.

Reserve enough space around the system module to ensure sufficient cooling. The mounting plane must be relatively even.

2.3 Installing System Modules into Cabinet

When there are 2 or more system modules, they can be installed side by side.

1. To install the system module, use the mounting holes.

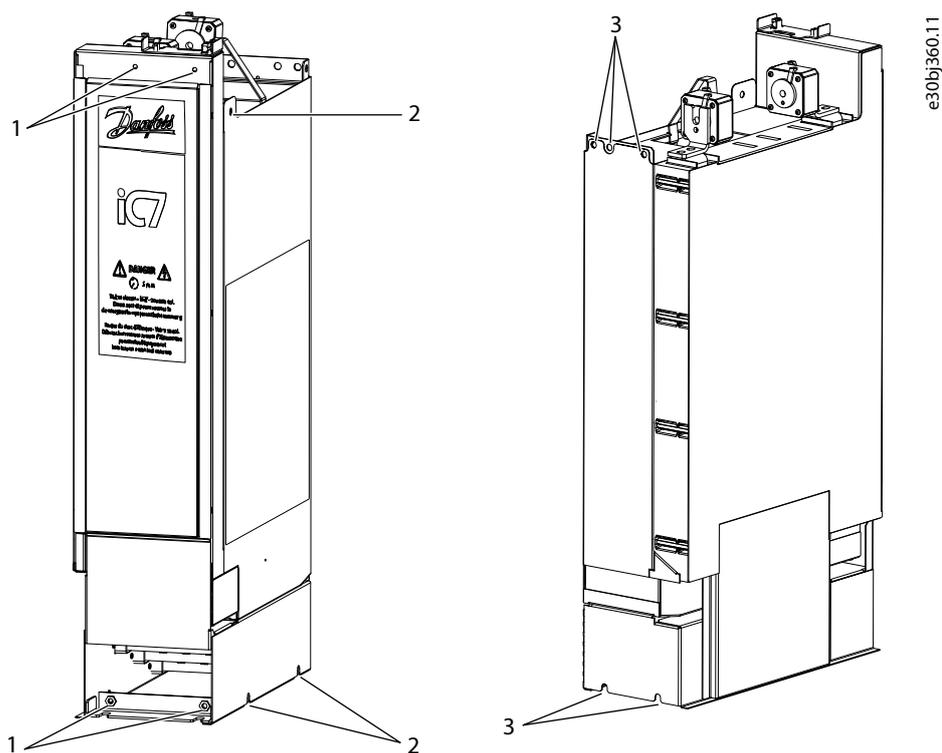


Figure 6: Mounting Holes for IM10, IM11, AM10, AM11

- | | | | |
|---|-----------------------------|---|----------------------------|
| 1 | Mounting holes at the front | 2 | Mounting holes at the side |
| 3 | Mounting holes at the back | | |

2. Attach the system module to the back wall of the cabinet and to the front mounting brackets.

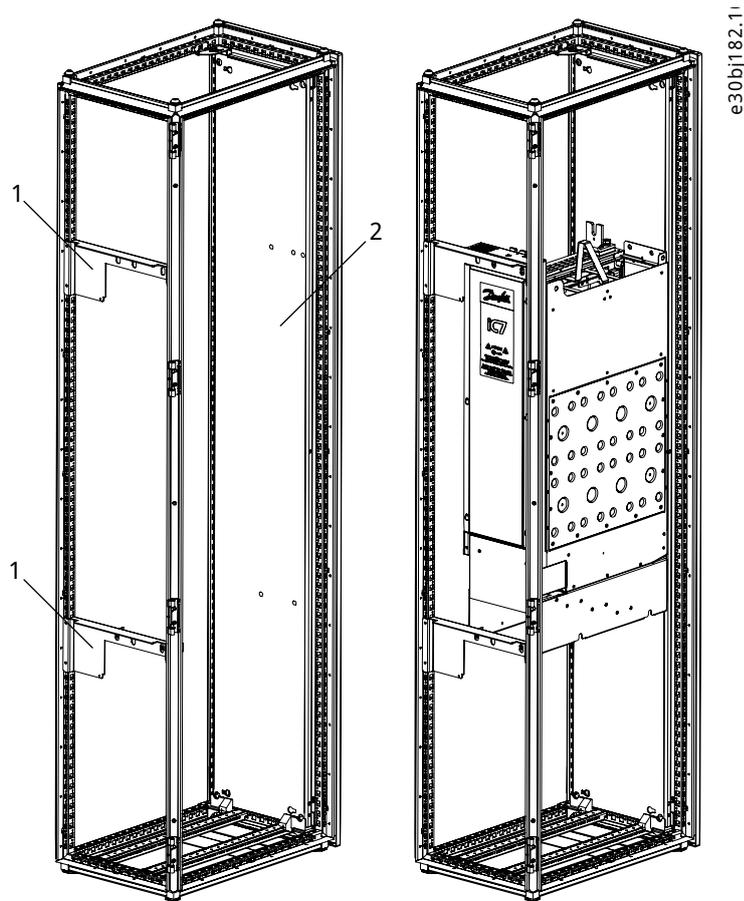


Figure 7: Mounting on the Back Wall, IM10, IM11, AM10, AM11

- | | | | |
|---|-------------------------|---|--------------------------|
| 1 | Front mounting brackets | 2 | Back wall of the cabinet |
|---|-------------------------|---|--------------------------|

3. If the cabinet does not have a back wall, attach the system module to the front and side mounting brackets.

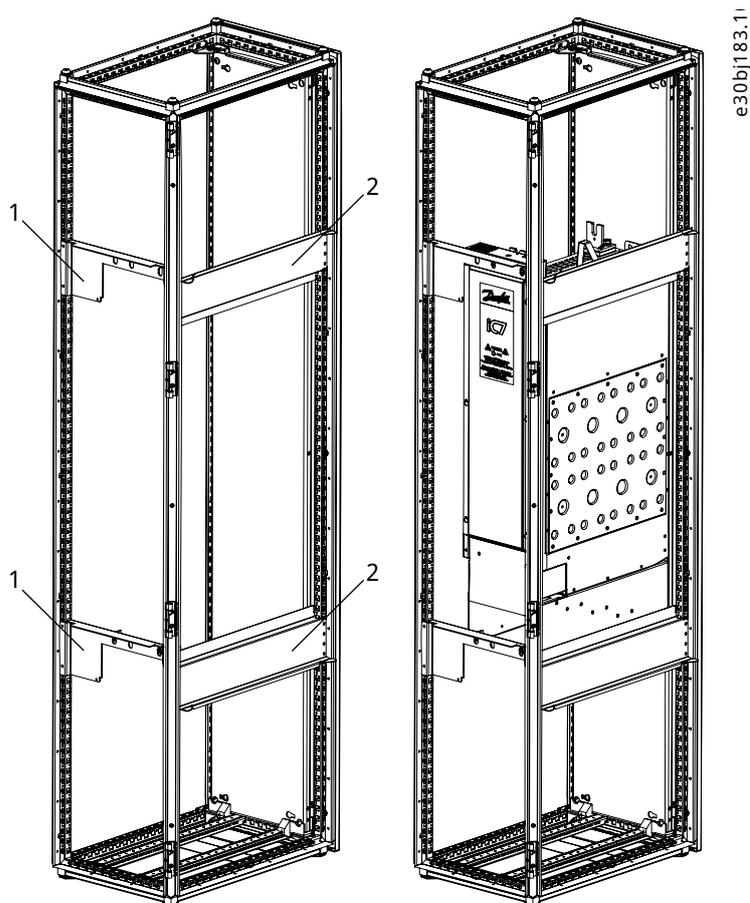


Figure 8: Mounting on the Mounting Brackets, IM10, IM11, AM10, AM11

- | | | | |
|---|-------------------------|---|------------------------|
| 1 | Front mounting brackets | 2 | Side mounting brackets |
|---|-------------------------|---|------------------------|

2.4 Installing Inverter Modules with Integration Units into Cabinet



RISK OF ELECTRIC SHOCK

Using power units that have AR or IR in their frame designation without integration units will cause death or severe injury.

- Do not use AR10, AR11, IR10, or IR11 power units without integration units.

1. Install mounting brackets to the cabinet.

Mounting brackets are not included in the delivery.

2. Attach the table and the standard integration unit to the front and rear brackets, and to the cabinet floor.

In the front, use countersunk screws.

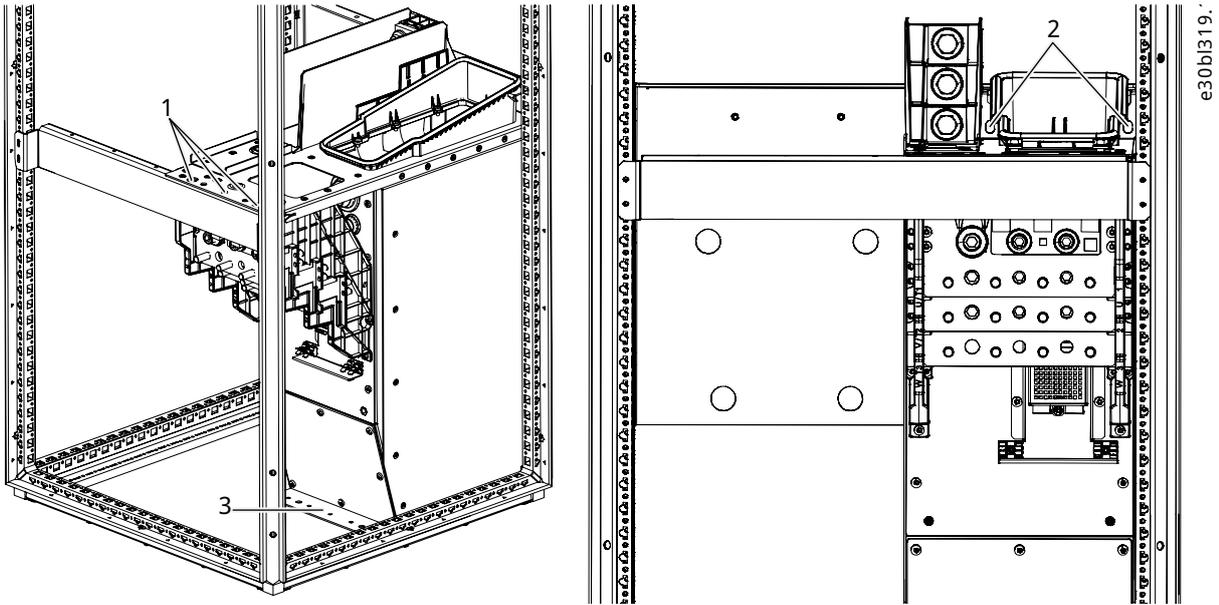


Figure 9: Installing the Standard Integration Unit into the Cabinet, IR10, IR11

- | | |
|--------------------------------|------------------------------|
| 1 Mounting holes at the front | 2 Mounting holes at the back |
| 3 Mounting holes at the bottom | |

3. Attach the short integration unit to the brackets. Attach it from the rear bottom to the rear bracket.

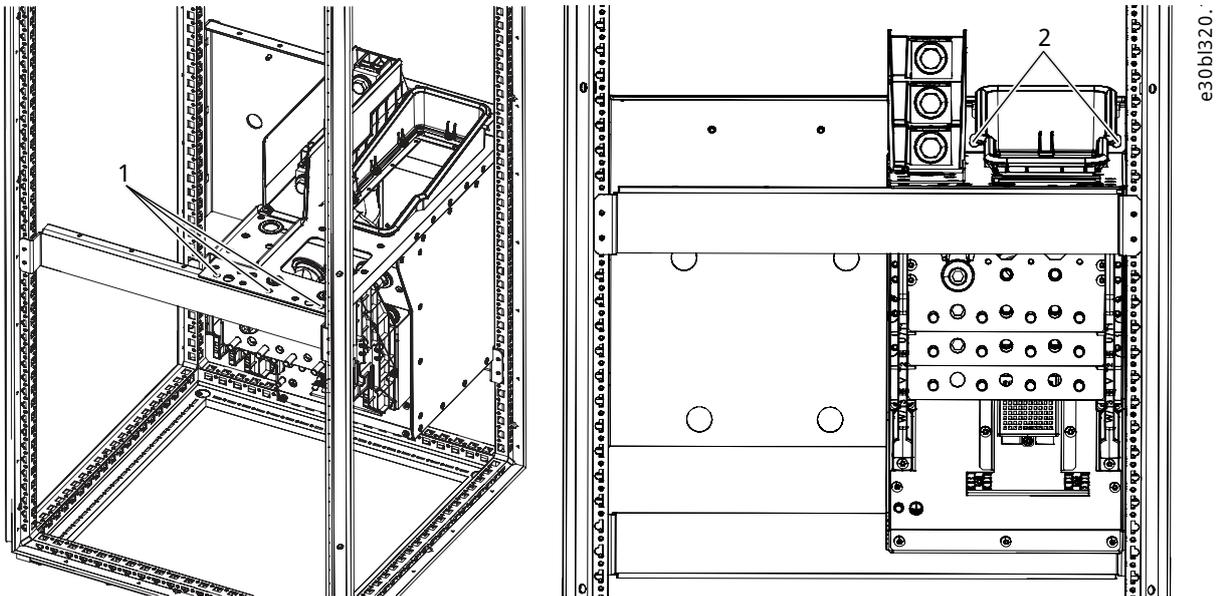


Figure 10: Front and Back Screws of the Short Integration Unit, IR10, IR11

- | | |
|-------------------------------|------------------------------|
| 1 Mounting holes at the front | 2 Mounting holes at the back |
|-------------------------------|------------------------------|

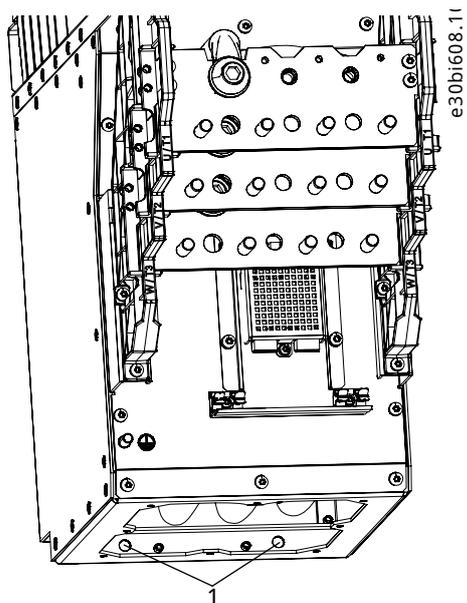


Figure 11: Bottom Screws of the Short Integration Unit, IR10, IR11

1 Mounting holes at the bottom

4. Push and slide the inverter module into the cabinet.
 - a. Add the top front bracket.
 - b. Attach the system module to the table and to the top front bracket (screw M8x20).

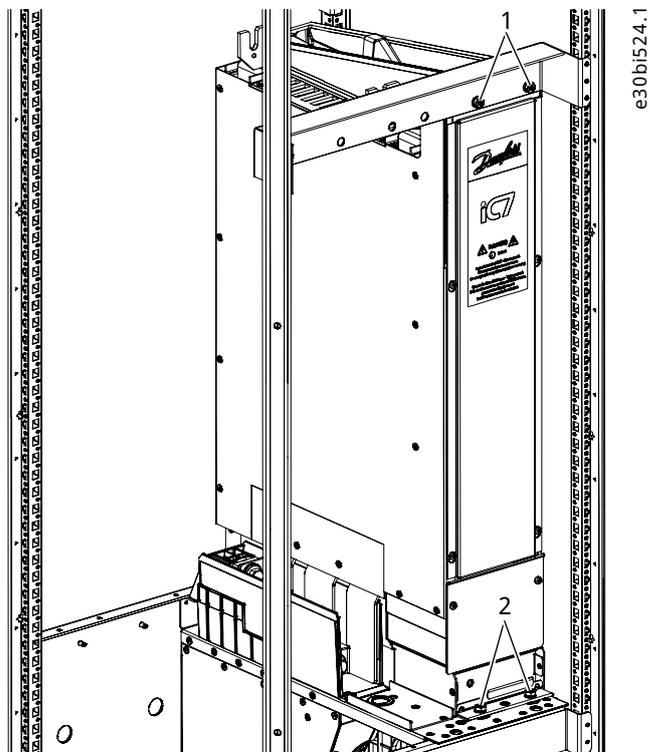


Figure 12: Installing the Inverter Module into the Cabinet, IR10, IR11

1 Upper mounting holes in the front

2 Lower mounting holes in the front

2.5 Installing LCL Filters and AFE Modules with Integration Units into Cabinet



RISK OF ELECTRIC SHOCK

Using power units that have AR or IR in their frame designation without integration units will cause death or severe injury.

- Do not use AR10, AR11, IR10, or IR11 power units without integration units.

1. Install mounting brackets to the cabinet.

Mounting brackets are not included in the delivery.

2. Install the lower part of the LCL Filter into the cabinet.

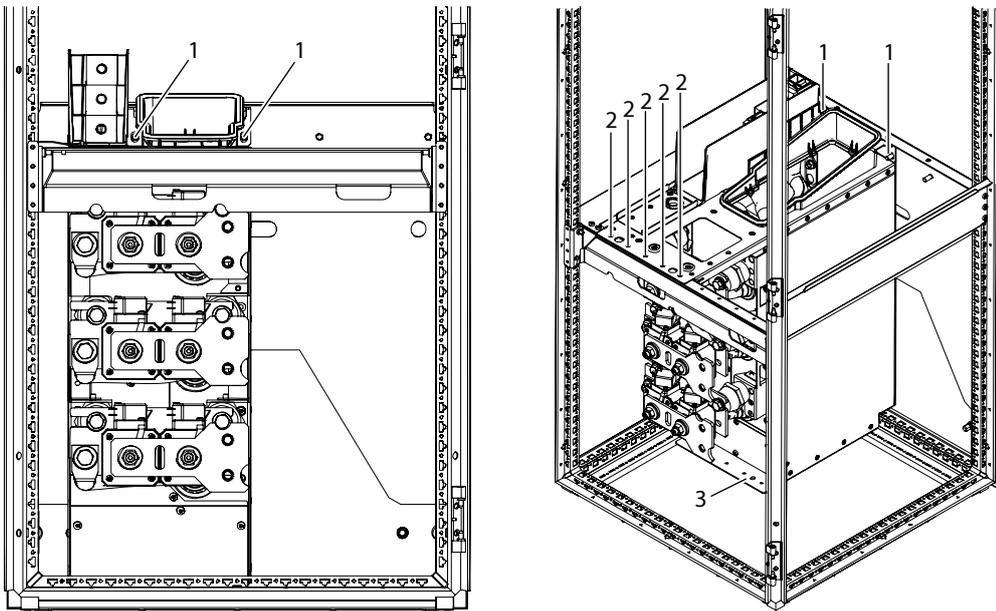


Figure 13: Installing the Lower Part of the LCL Filter

- 1 Mounting holes at the back
- 3 Bottom mounting bracket

- 2 Mounting holes at the front

3. Install the integration unit of the AFE module into the cabinet.

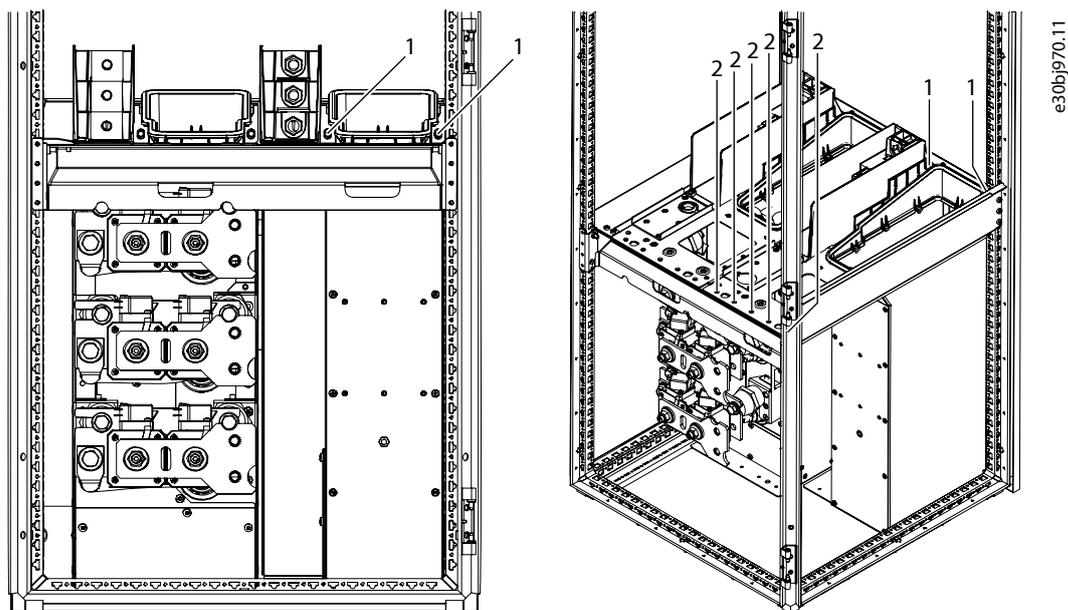


Figure 14: Installing the Integration Unit of the AFE Module, AR10, AR11

- | | |
|----------------------------------|-----------------------------------|
| 1 Mounting holes at the back | 2 Mounting holes at the front |
|----------------------------------|-----------------------------------|

4. Push and slide the upper part of the LCL Filter into the cabinet.

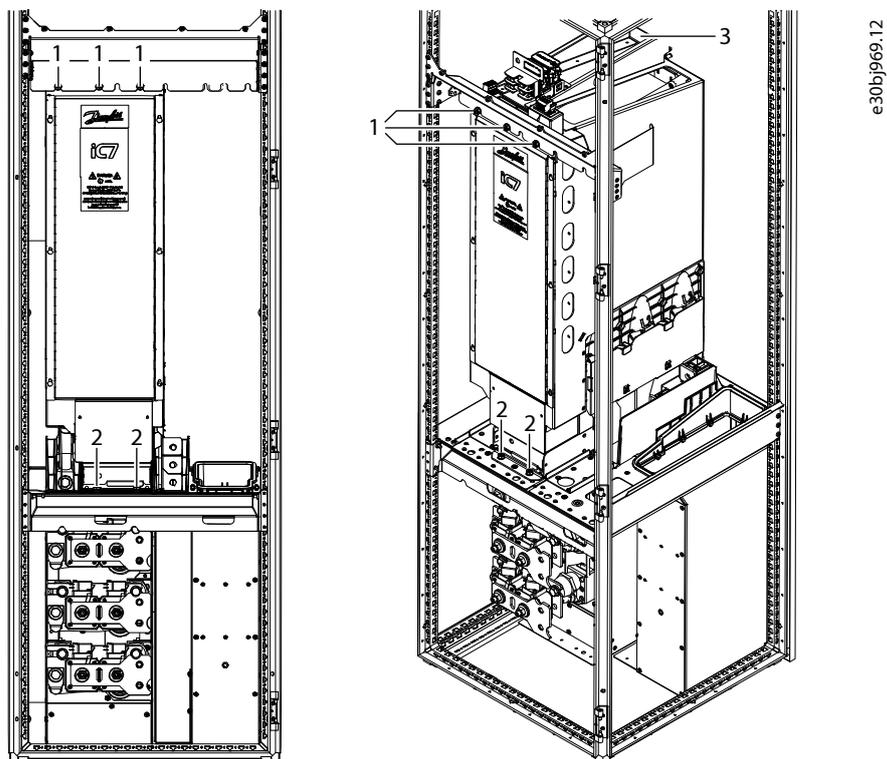


Figure 15: Installing the Upper Part of the LCL Filter

- | | |
|--|---|
| 1 Upper mounting holes at the front | 2 Lower mounting holes at the front |
| 3 The upper mounting holes at the back | |

5. Push and slide the AFE module into the cabinet.

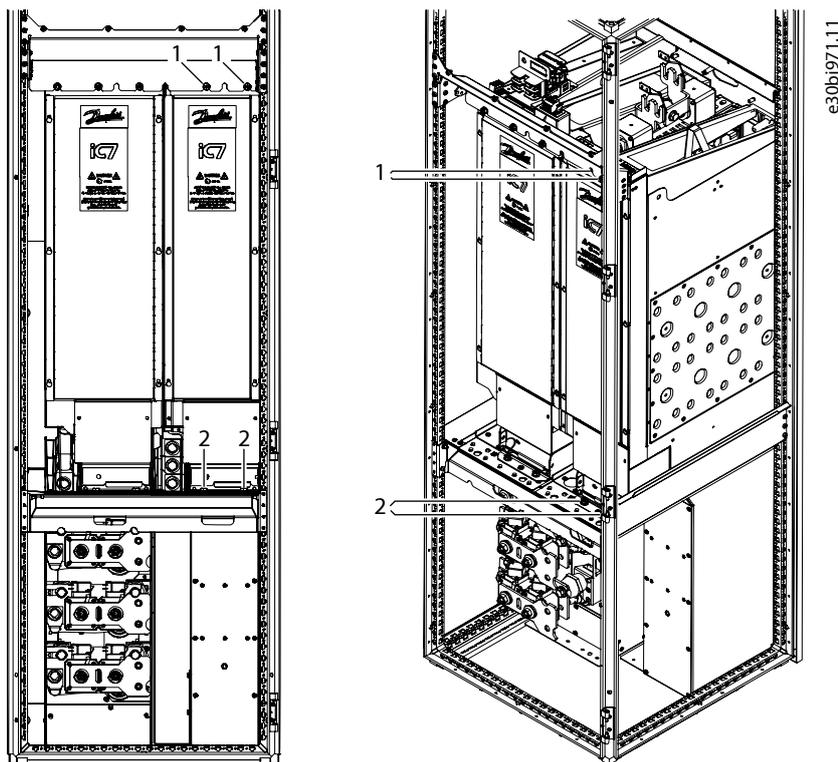


Figure 16: Installing the AFE Module, AR10, AR11

1 Upper mounting holes at the front

2 Lower mounting holes at the front

6. Add the top front bracket.

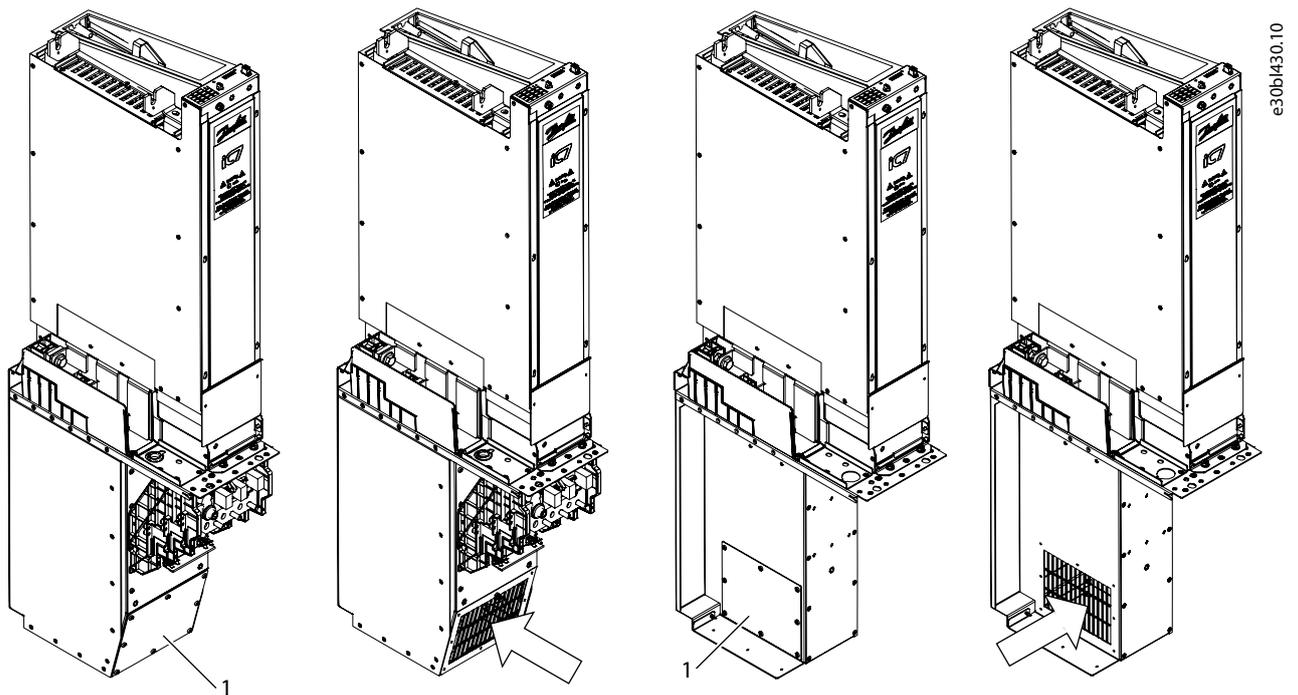
- a. Attach the upper part of the LCL Filter and the AFE module to the table and to the top front bracket (screw M8x20).

2.6 Arranging Cooling

2.6.1 Removing the Air Inlet Cover of Integration Unit

In the system modules with integration units, there are 2 methods to arrange inlet airflow. The inlet airflow can enter from the front or from below of the product. The integration unit is delivered with the air inlet cover preinstalled.

1. To allow cooling air to enter from the front, remove the air inlet cover of the integration unit.



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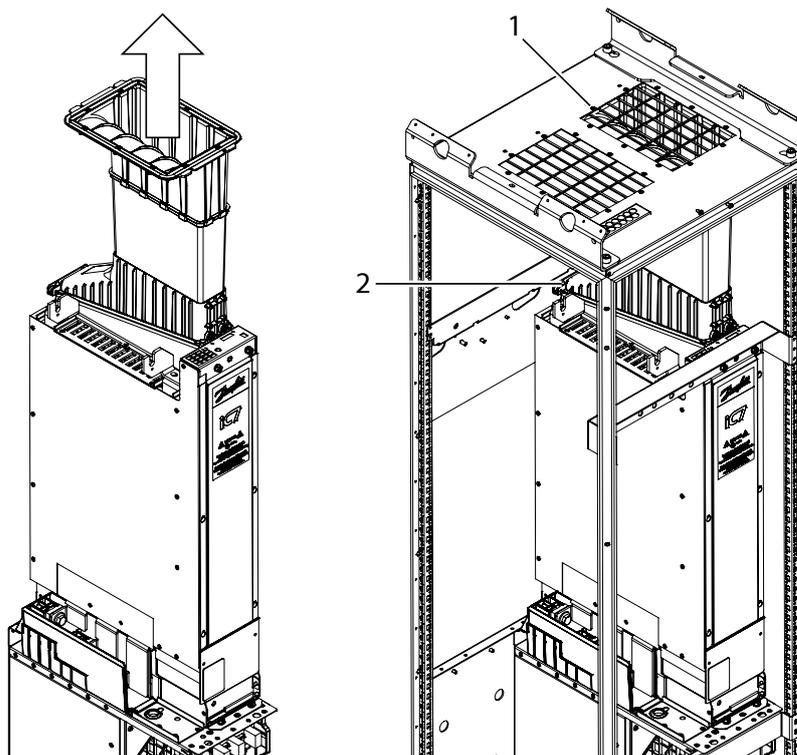
Figure 17: Removing the Air Inlet Cover for Cooling, Inverter (left) and AFE (right)

- 1 Air inlet cover

2.6.2 Installing the Top Duct

In the system modules with integration units, there are 2 methods to arrange outlet airflow. The outlet airflow can exit the system module directly from the top or through a top duct.

1. Attach the top duct to the cabinet roof and back wall.



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Figure 18: Outlet Airflow with or without a Top Duct

1 Top duct mounted to roof of cabinet

2 Top duct mounted to back wall of cabinet

2.6.3 Steering the Airflow

Cooling air must be taken in through the ventilation gaps on the door and blown out at the top of the enclosure. To steer the hot air from the power unit to the outlet at the top of the enclosure and prevent it from circulating back, follow these instructions.

1. Install air guides in the gaps between the power unit and the cabinet walls. Place the air guides below the air outlet gaps at the sides of the module.

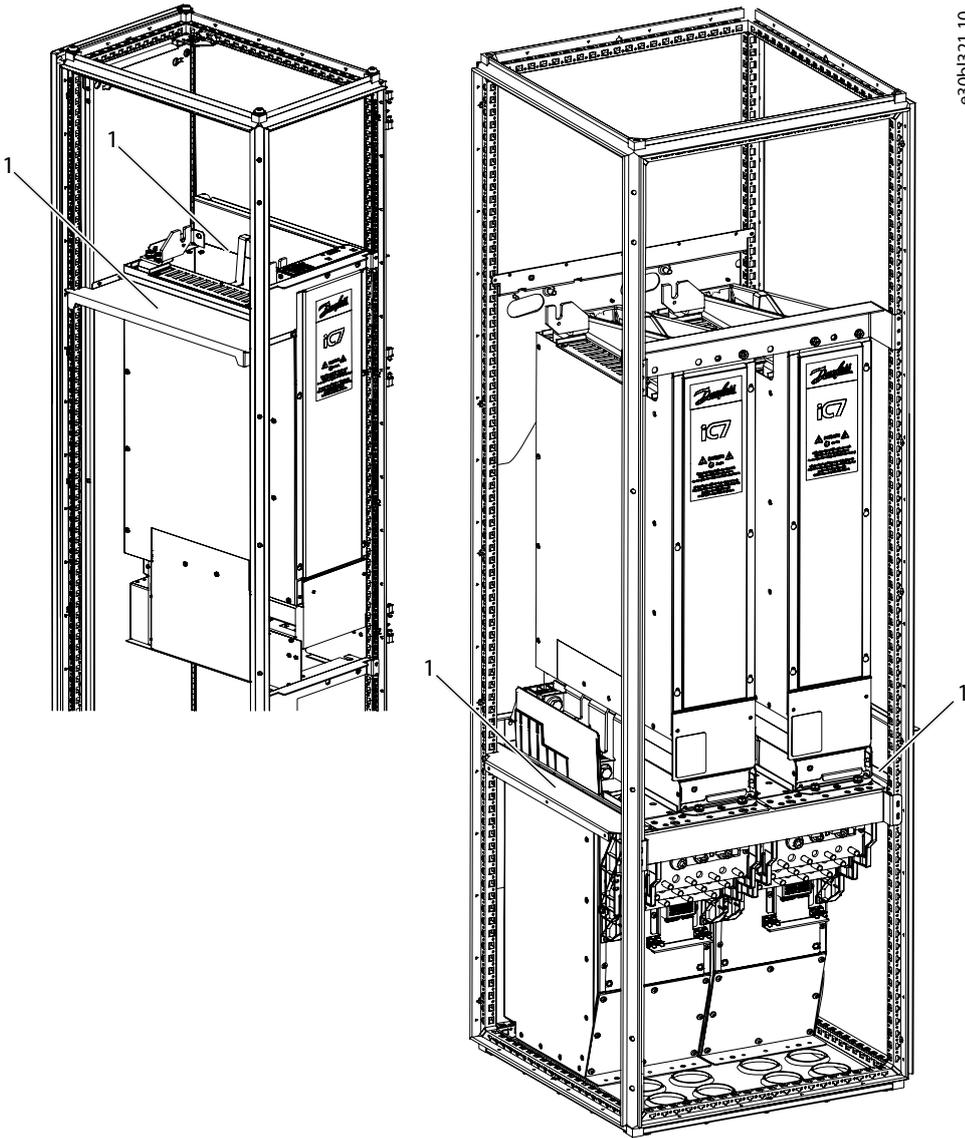


Figure 19: Air Guides of the IM10/IM11 (left) or IR10/IR11 (right) Modules in the Cabinet

1 Air guide

3 Electrical Installation

3.1 Control System of the System Modules

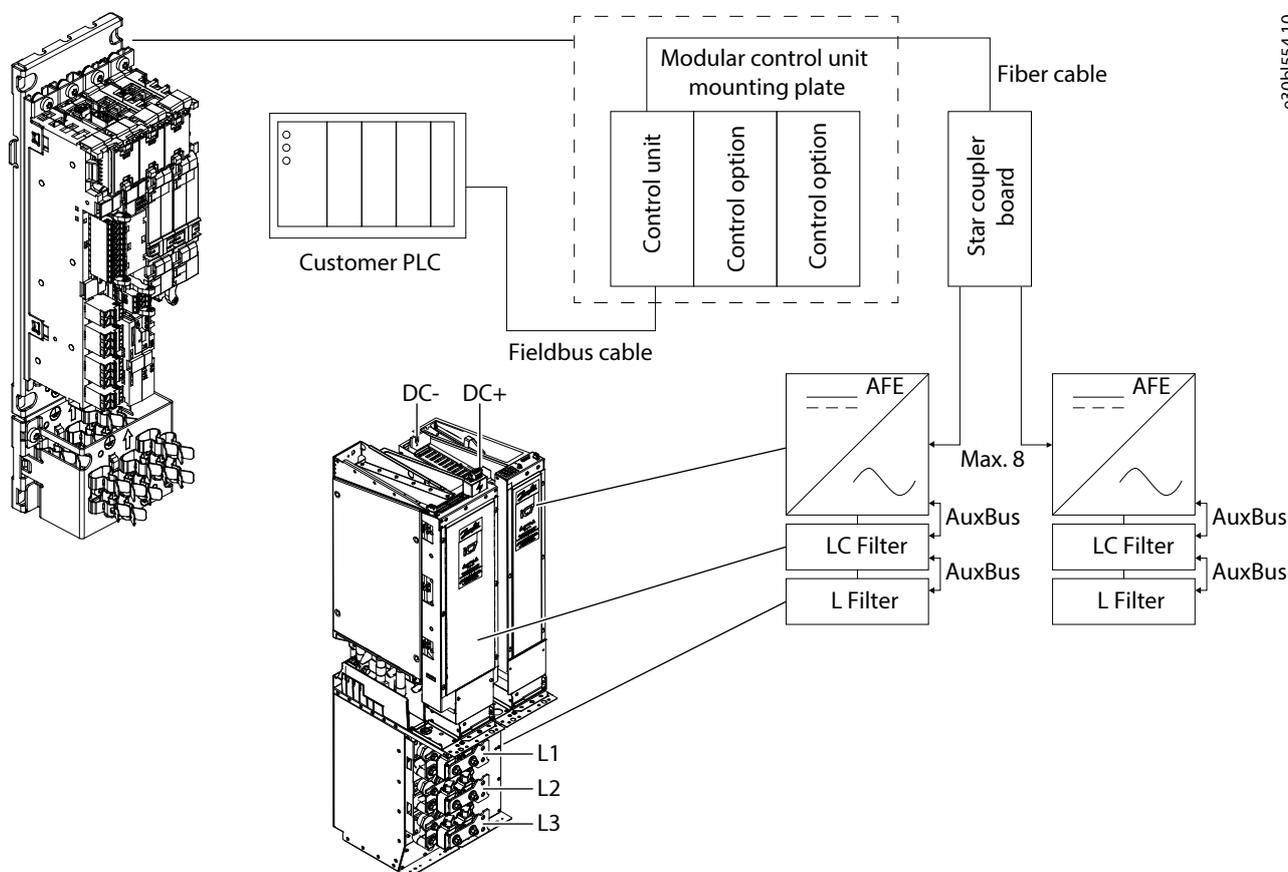


Figure 20: Example of a Control System of an AFE Module and LCL Filter

3.2 Grounding Principles

Ground the AC drive in accordance with applicable standards and directives.

According to IEC 60364-5-54; 543.1, unless local wiring regulations state otherwise, the cross-sectional area of the protective grounding conductor must be at least $\frac{1}{2}$ times of the phase conductor and made of the same material when the phase conductor cross-section is above 35 mm^2 (AWG 2).

The connection must be fixed.

3.3 Grounding the Products

1. Ground the products at the grounding spots.

See [6.1 Tightening Torques](#).

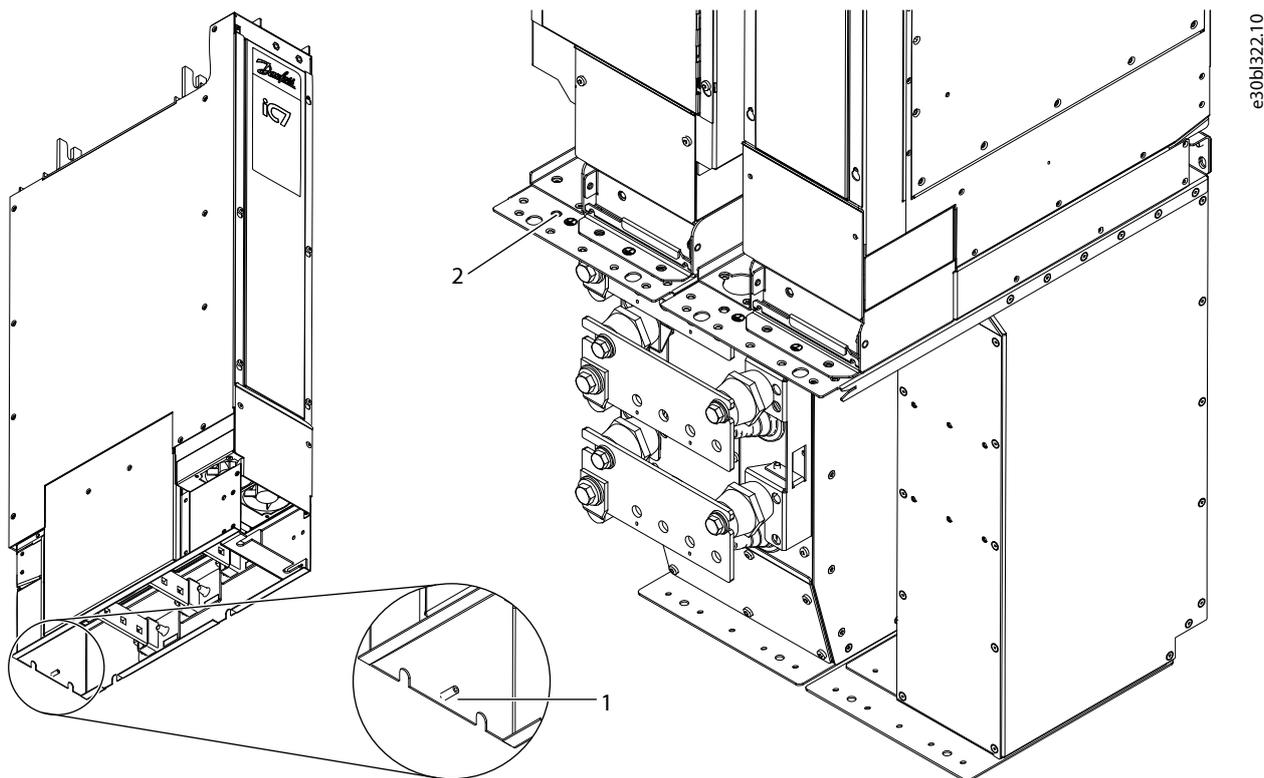


Figure 21: Grounding Stud of the Inverter Module and Grounding Terminal of the LCL Filter

1 Grounding stud

2 Grounding terminal

3.4 Prerequisites for Cable Installation

Table 1: Minimum Distances from Motor Cables to Other Cables

Distance to other cables [m (ft)]	Length of the shielded motor cable [m (ft)]
0.3 (1.0)	≤ 50 (164)
1.0 (3.3)	≤ 150 (492)

1. Before starting, make sure that none of the components of the AC drive is live. Read all safety precautions in this guide and other documents available for this product.
2. Make sure that the motor cables are sufficiently far from other cables.
3. The motor cables must cross other cables at an angle of 90°.
4. If it is possible, do not put the motor cables in long parallel lines with other cables.
5. If the motor cables are in parallel with other cables, obey the minimum distances (see [Table 1](#)).
6. The distances are also valid between the motor cables and the signal cables of other systems.
7. The maximum length of shielded motor cables is 150 m (492 ft). If the used motor cables are longer, contact the vendor to get more information. The motor cable length is based on the maximum number of cables for each frame. For example, the 590 A inverter module is based on 3 parallel cables, and the 880 A inverter module on 4 parallel cables. The default motor cable

operating capacitance is 0.75 nF/m. If some other cable type is used, or the number of cables connected in parallel does not match with recommendations, the maximum motor cable length must be derated so that the maximum total motor cable capacitance is not exceeded.

- a. Default maximum motor cable setup for IM11: $4 \times (3 \times 120 + 70) \text{ mm}^2$, 150 m, 0.75 nF/m \rightarrow $CTOT = 4 \times 150 \text{ m} \times 0.75 \text{ nF/m} = 450 \text{ nF} = CMAX$
 - b. Example where the number of motor cables connected in parallel is higher than the default: $6 \times (3 \times 120 + 70) \text{ mm}^2$, 100 m, 0.75 nF/m \rightarrow $CTOT = 6 \times 100 \text{ m} \times 0.75 \text{ nF/m} = 450 \text{ nF} = CMAX$
 - c. Example where the motor cable capacitance is higher than the default: $4 \times (3 \times 120 + 70) \text{ mm}^2$, 130 m, 0.85 nF/m \rightarrow $CTOT = 4 \times 130 \text{ m} \times 0.85 \text{ nF/m} = 442 \text{ nF} < CMAX$
8. The maximum cable length of the filters is also 150 m (492 ft).
 9. Only use symmetrical and shielded motor cables.
 10. Use symmetrical power cabling with power units connected in parallel. Each power unit must have the same number of cables with an equal cross-section and equal length.
 11. Perform the cable insulation checks if necessary.

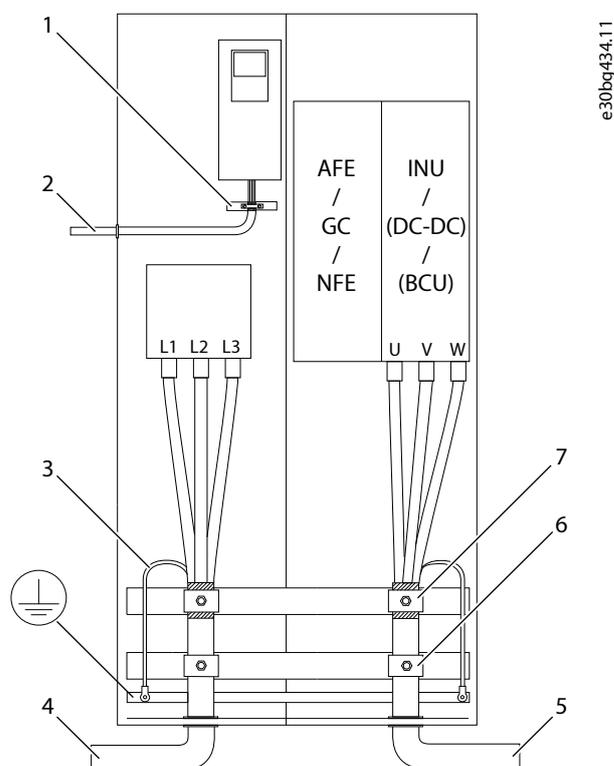


Figure 22: Cabling Principle

1	Grounding bar of the control cable	2	Control cable
3	Grounding conductor	4	Mains cables
5	Motor cables	6	Strain relief
7	The grounding clamp, 360° grounding		

3.5 Recommended Installation of Motor Cables

If the power units are connected in parallel without output filters or only with a common-mode filter, the recommended common coupling point of motor cables is at the motor terminals. It is also possible to use an alternative installation method where the common coupling point of the motor cables is near the drives. In this case, to avoid current imbalance, the installation must be symmetrical and the tolerance of cable length (impedance) to common coupling point is maximum 5%. If the cable connections are not symmetrical, use a dU/dt filter or a sine-wave filter.

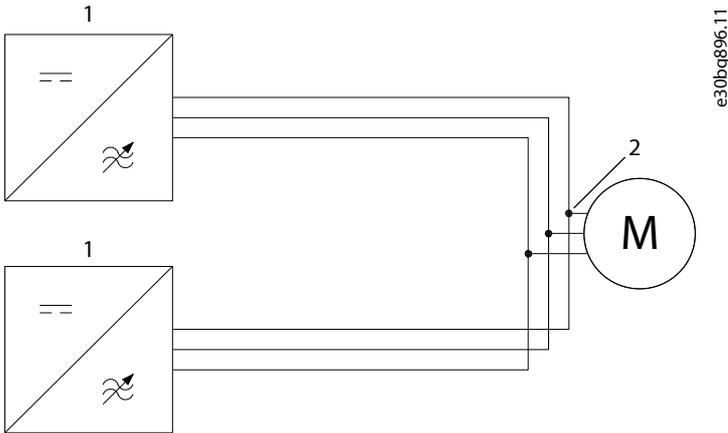


Figure 23: Recommended Installation

1	2
Inverter module	Common coupling point at the motor terminals

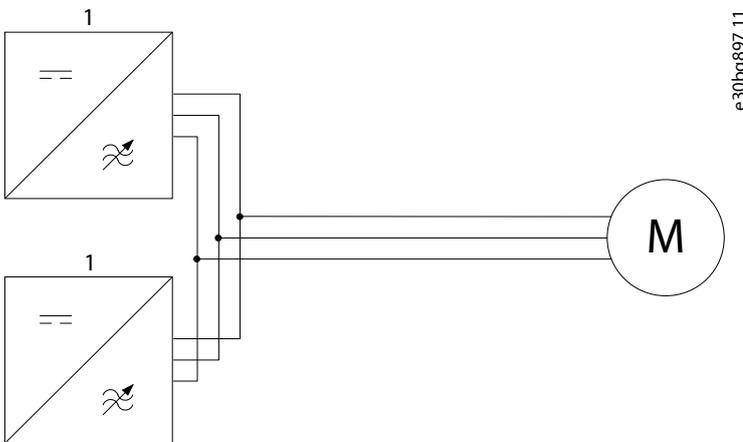


Figure 24: Alternative Installation Method

1	2
Inverter module	Common coupling point at the motor terminals

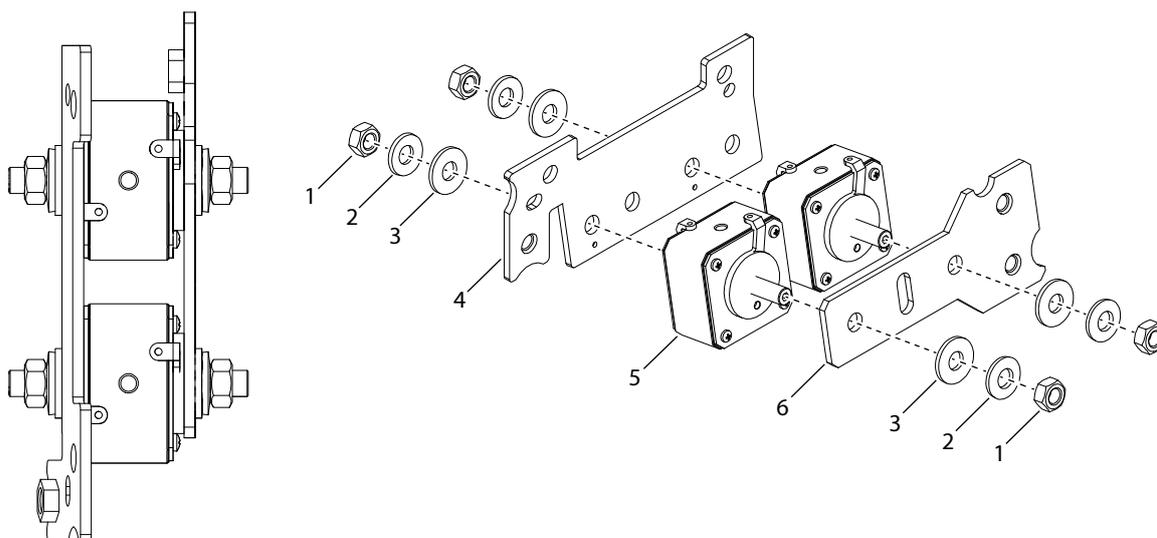
3.6 Installing the AC Fuses

The AC fuses of the AFE module are delivered separately.

1. Screw the stud on the fuse. Make sure that the stud is inserted as far as it goes. The maximum tightening torque is 15 Nm (133 in-lb).
2. Mount the fuses on the base plate and busbar with M12 nuts. Use a 19 mm (0.75 in) bit and tighten the nuts to torque 45 Nm (398).

Use a hex wrench to hold the stud on the fuse in place when tightening the nut.

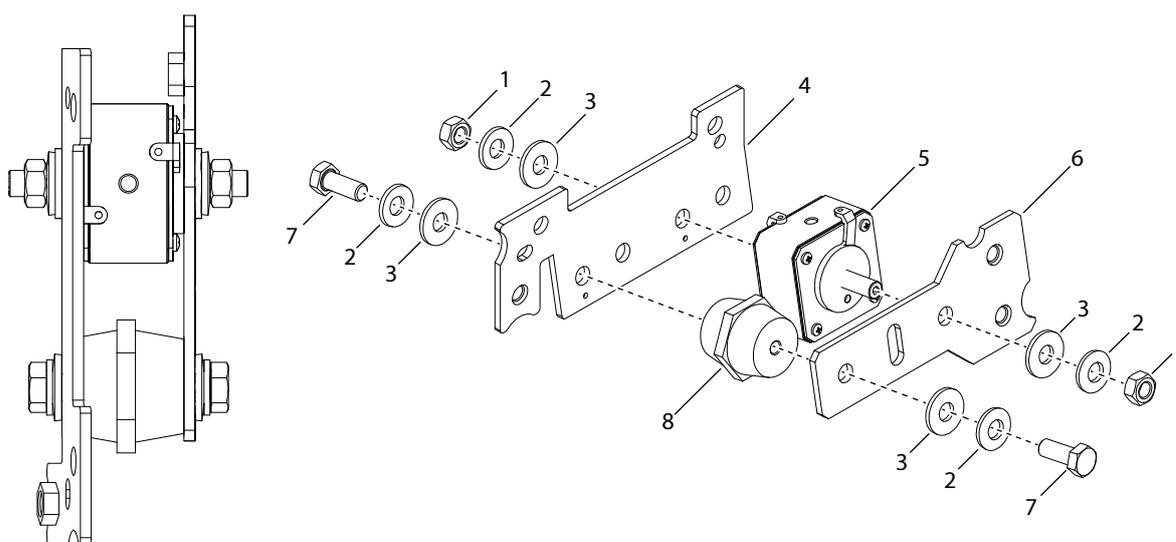
If there is only 1 fuse, install an insulator in place of the other fuse. Mount the insulator with M10x20 screws. Use a 17 mm (0.67 in) bit and tighten the screws to torque 33 Nm (292 in-lb).



e30bj121.12

Figure 25: Installing the Fuses to the Busbars, 2 Fuses

1	M12 nut	2	M12 spring washer
3	M12 washer	4	Base plate
5	AC fuse	6	Busbar

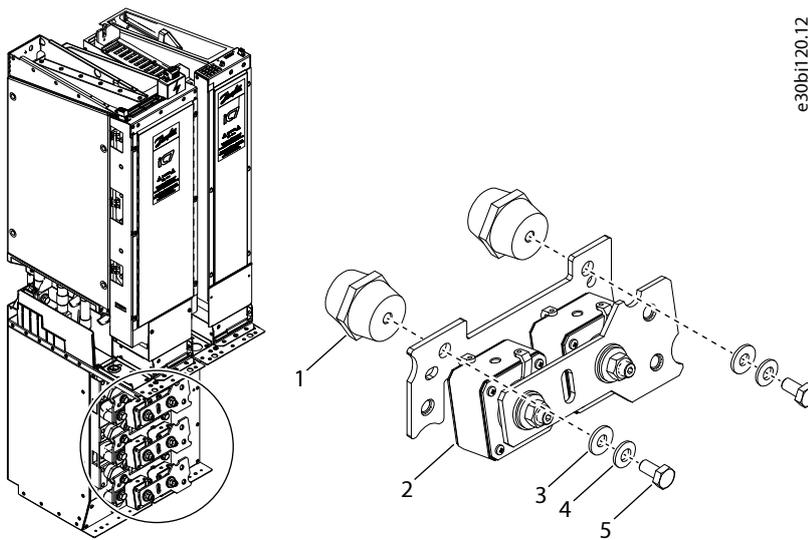


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Figure 26: Installing the Fuse to the Busbars, 1 Fuse

1	M12 nut	2	M12 spring washer
3	M12 washer	4	Base plate
5	AC fuse	6	Busbar
7	M10x20 screw	8	Insulator

3. Mount the AC fuse assembly with two M10x20 screws. Use a 17 mm (0.67 in) bit and tighten the screws to torque 33 Nm (292 in-lb).

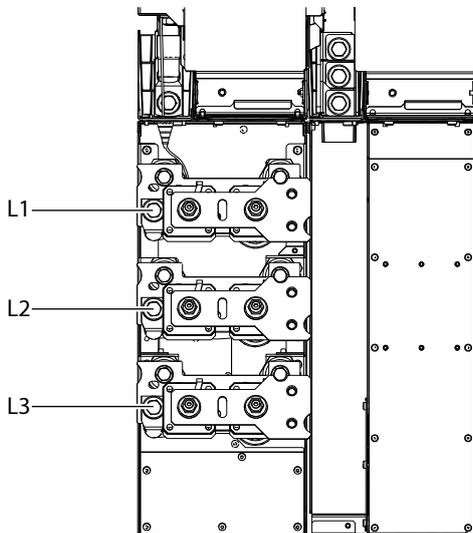


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Figure 27: Installing the AC Fuse Assembly

1	Insulator	2	AC fuse assembly
3	M10 washer	4	M10 spring washer
5	M10x20 screw		

4. Mount the filter cable on the AC fuse assembly with an M12x30 screw. Use a 19 mm (0.75 in) bit and tighten the screw to torque 70 Nm (620 in-lb).



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Figure 28: Filter Cable Mounting Locations

5. Connect the power cables to the AC fuse assemblies.

3.7 Installing the Cables for AFE Modules and LCL Filters

Select the size of the internal cables or busbars according to the nominal current of the drive. See [6.2.1 List of Cable Size Information](#). See the correct tightening torques in [6.1 Tightening Torques](#).

1. Install the mains cables to the mains terminals L1, L2, and L3 of the input device.
2. Find the mains terminals on the front of the LCL Filter.

The 1st illustration shows the terminals on the right side. The terminals can also be rotated to the left side.

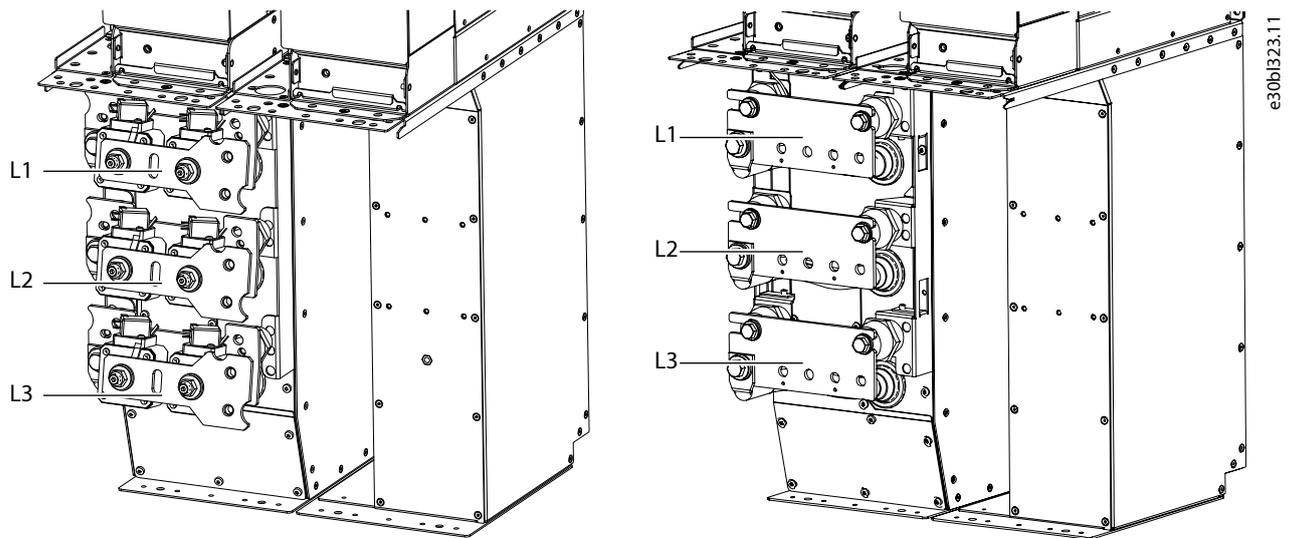


Figure 29: Mains Terminals of the LCL Filter with Fuses (left) and without Fuses (right)

3. Connect the mains terminals of the input device to the mains terminals of the LCL Filter with internal cables or busbars.
4. Find the output terminals to the AFE module on the side of the LCL Filter.

The output terminals are connected to the AFE module during installation.

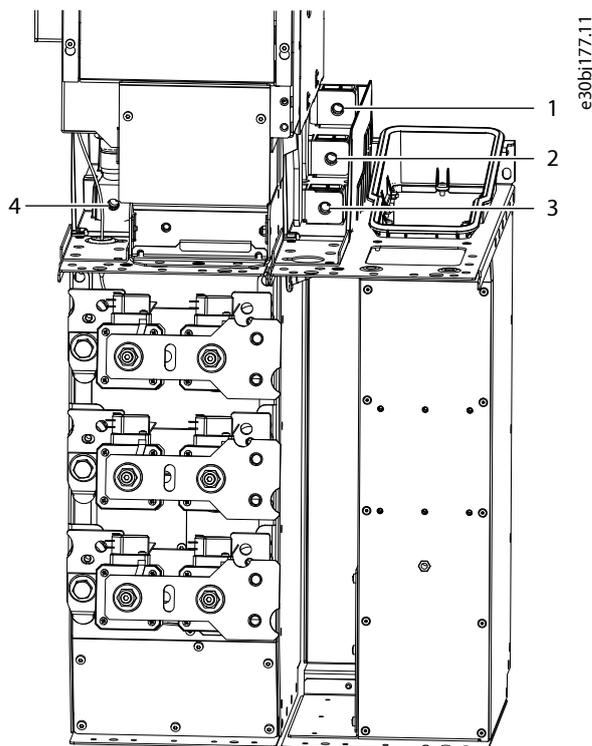


Figure 30: LCL Filter Terminals to the AFE Module

1	Output terminal L3	2	Output terminal L2
3	Output terminal L1	4	Screw for attaching the lower and upper parts of the LCL Filter to each other

3.8 Installing the Cables for Inverter Modules

Select the size of the motor cables according to the nominal current of the drive. See [6.2.1 List of Cable Size Information](#).

1. Find the motor terminals in the lower part of the system module.
2. Connect the motor cables to the corresponding motor terminals.

See the correct tightening torques in [6.1 Tightening Torques](#).

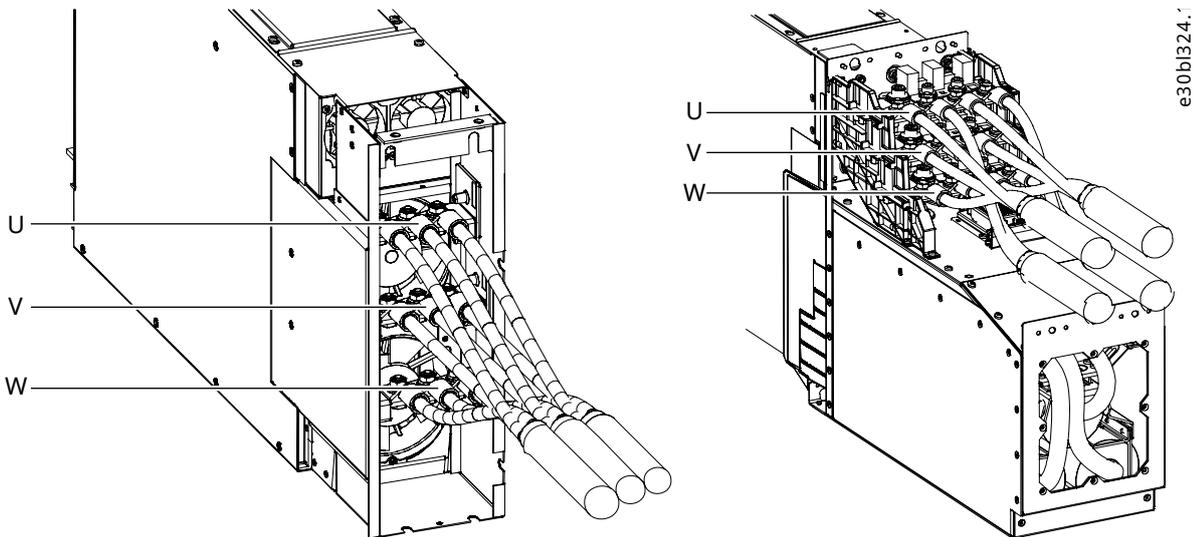


Figure 31: Motor Cable Installation, IM10, IM11 (left) and IR10, IR11 (right)

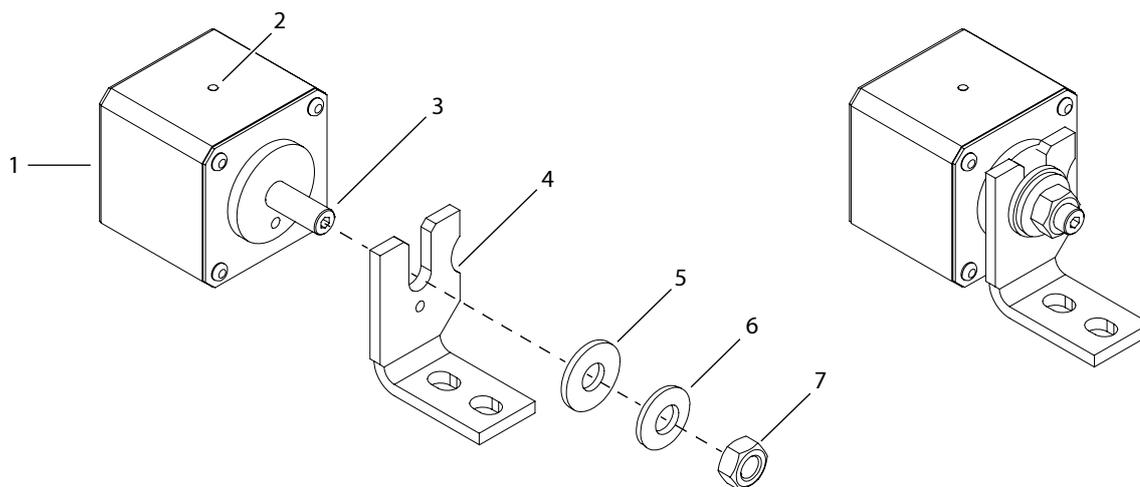
3.9 Installing the DC Fuses to the DC Terminals

Use these instructions to install the DC fuses. The DC fuses are available as option +AKFX.

NOTICE

To ensure correct operation of the DC fuses when there is a short circuit, it is important that there is low inductance in the DC link. Do not use DC inductors in the DC link.

1. Attach busbars to the DC fuses. Make sure that the visual indicator (the red dot) of the DC fuse is facing upward.
 - a. Screw the stud on the fuse. Make sure that the stud is inserted as far as it goes. The maximum tightening torque is 15 Nm (133 in-lb).
 - b. Place the busbar on the stud.
 - c. Mount the busbar with an M12 nut and washers, and tighten to torque 45 Nm (398 in-lb).



e30bj139.10

Figure 32: Installing Busbars to the DC Fuses

1	Fuse	2	Visual indicator
3	Stud	4	Busbar
5	M12 washer	6	M12 spring washer
7	M12 nut		

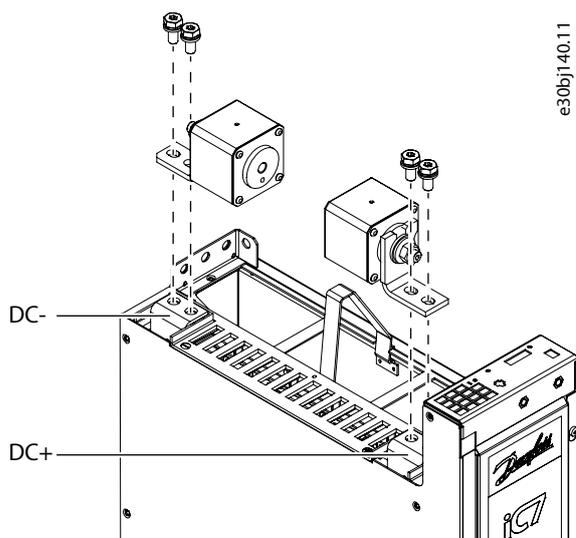
NOTICE

If the busbars on the DC fuses are not aligned, they can strain the fuse structure and break it over time. When tightening the screws, make sure that the busbars stay aligned.

2. Attach the DC fuse assemblies to the DC terminals.

Use M10 screws and washers.

Use the tightening torque 35–40 Nm (310–354 in-lb).



e30bj140.11

Figure 33: Installing DC Fuse Assemblies

3.10 Terminals of the System Modules

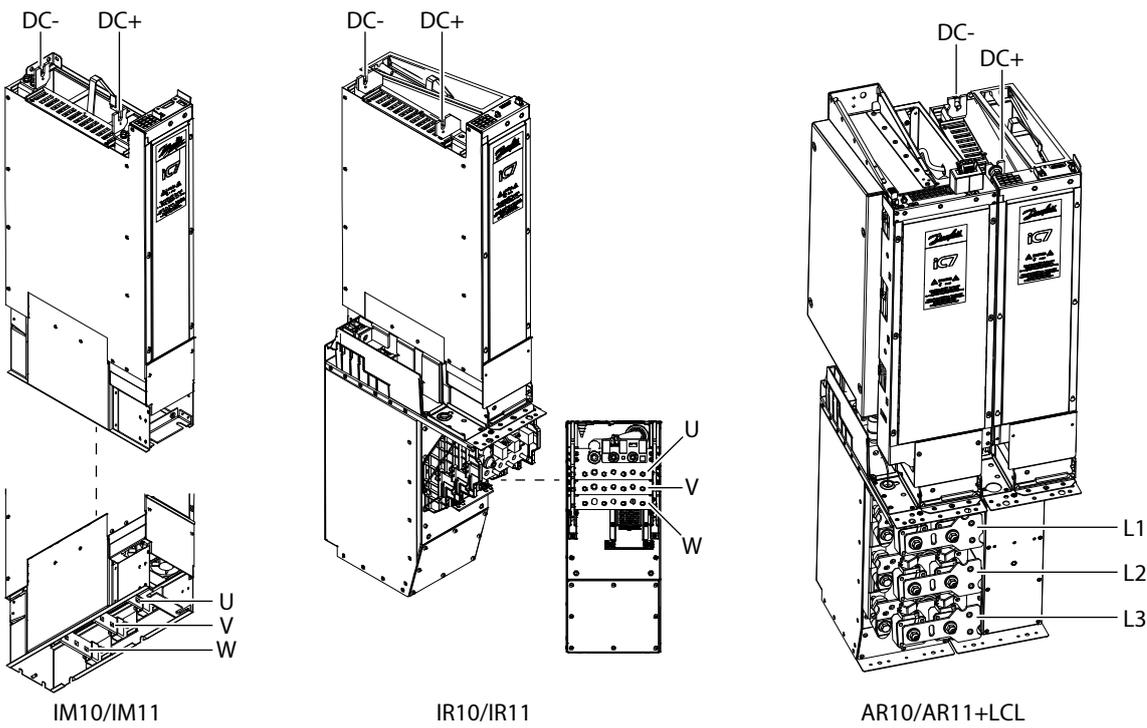


Figure 34: Locations of the Terminals on the System Modules

3.11 AuxBus Communication

3.11.1 AuxBus Terminals

AuxBus is used for the temperature measurement of the filters.

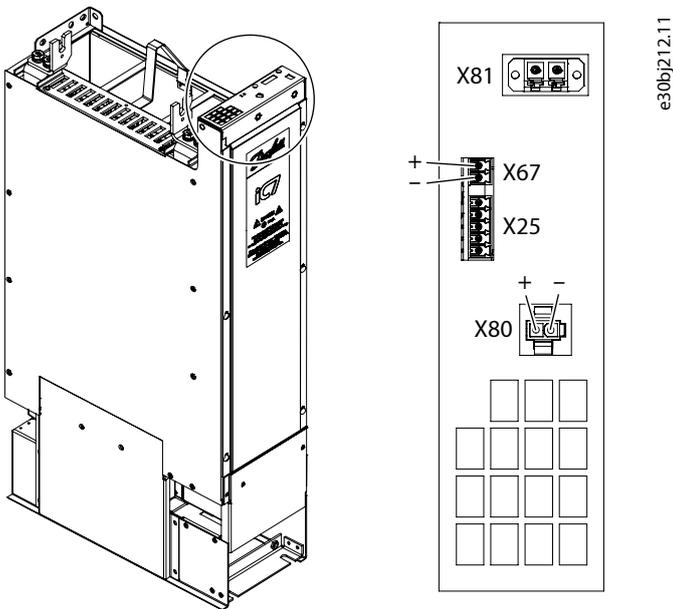
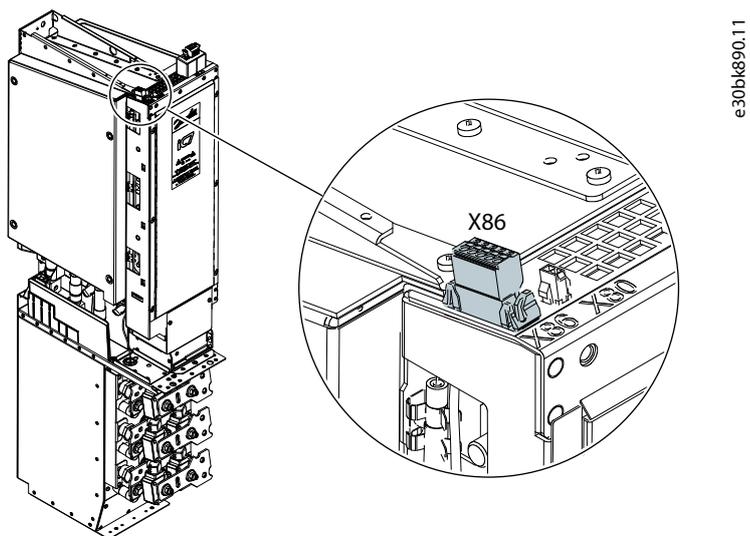


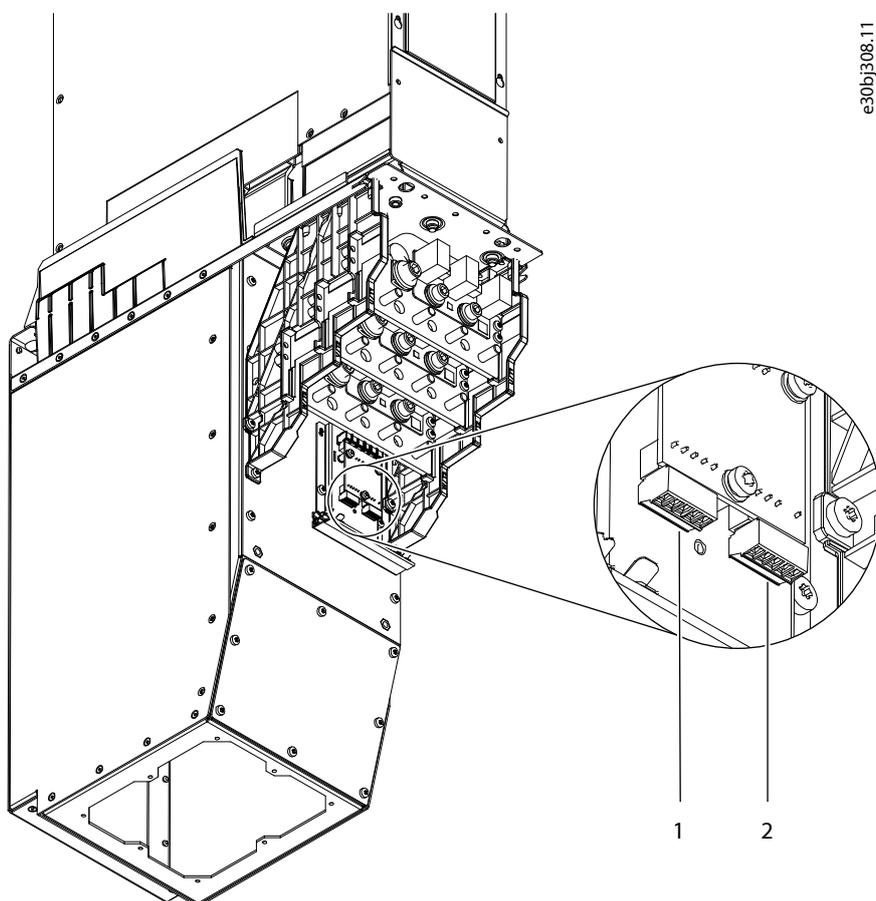
Figure 35: Auxiliary Terminals of the Power Unit

X25	AuxBus terminal	X80	Service 24 V DC supply terminal
X81	Control terminal	X67	24 V DC output terminal



e-30bk890.11

Figure 36: AuxBus Terminal of the LCL Filter (X86)



e-30bj308.11

Figure 37: AuxBus Terminals of the Integration Unit with Filter

1	AuxBus out (X85)	2	AuxBus in (X86)
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3.11.2 Preparing the AuxBus Cable

An AuxBus cable is included in the delivery. If the AuxBus cable was ordered as a loose option (a 10-meter cable), use these instructions.

1. Cut the cable to the required length.
2. To reveal the wires, strip the cable for 50 mm (1.97 in) at both ends.

3. At 1 end of the cable, remove approximately 15 mm (0.59 in) of the insulation of the cable.
4. Strip the wires 7 mm (0.28 in), except for the LCL terminal 10–11 mm (0.39–0.43 in).

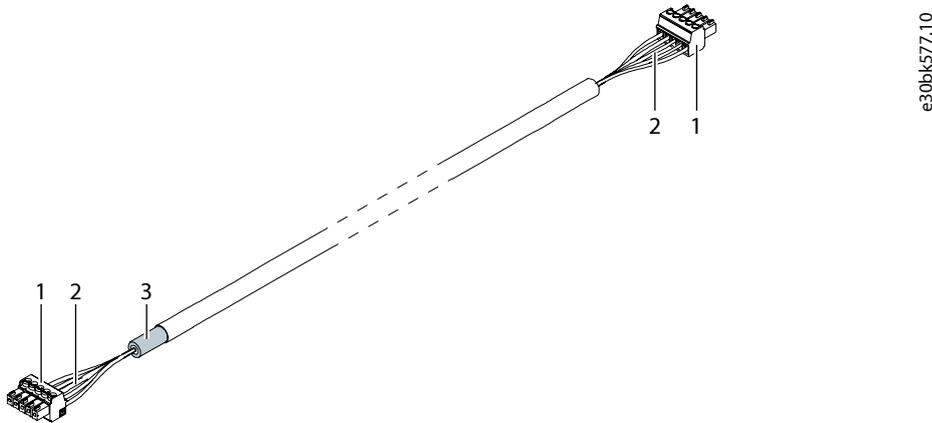


Figure 38: The Ready AuxBus Cable

1	Terminals	2	Wires
3	Shield removed		

3.11.3 AuxBus Cabling

1. Connect the AuxBus cable between the filter and the power unit. If there are several power units and filters, connect each filter to the power units individually.
 - a. Connect the end of the AuxBus cable where the insulation was removed to terminal X25 on the power unit.
 - b. Connect the other end of the AuxBus cable to terminal X86 on the filter.

Use the tightening torque 0.22–0.25 Nm (1.9–2.2 in-lb).

2. Route the cable so that there is no risk of getting in touch with bare busbars or terminals.
3. Ground each AuxBus cable at 1 end, at the X25 terminal. To make the grounding connection, attach the shield of the cable to the frame with a cable clamp.

The lower part of the cable clamp fixes the cable to the plate and provides strain relief. The upper part provides ~360° grounding for the cable shield.

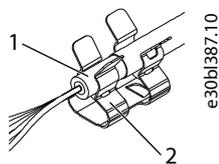


Figure 39: Grounding of the AuxBus Cable

1	Shield removed	2	Cable clamp
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4. At the terminal X86 end of the cable, place the cable in a cable clamp for strain relief.

4 Control Installation

4.1 Assembling the Control Unit Mounting Plates

Use these instructions to assemble the mounting plate of the modular control unit. All the parts can be found in the accessories bag.

1. Assemble the mounting plate as shown in the illustration.
 - a. Attach the base grounding plate into the mounting plate.
 - b. Align the cable clamps in the holes in a wave-like form and attach with screws.
 - c. Attach the grounding plate extension onto the base grounding plate with 2 screws.
 - d. Attach the cable clamps with screws.

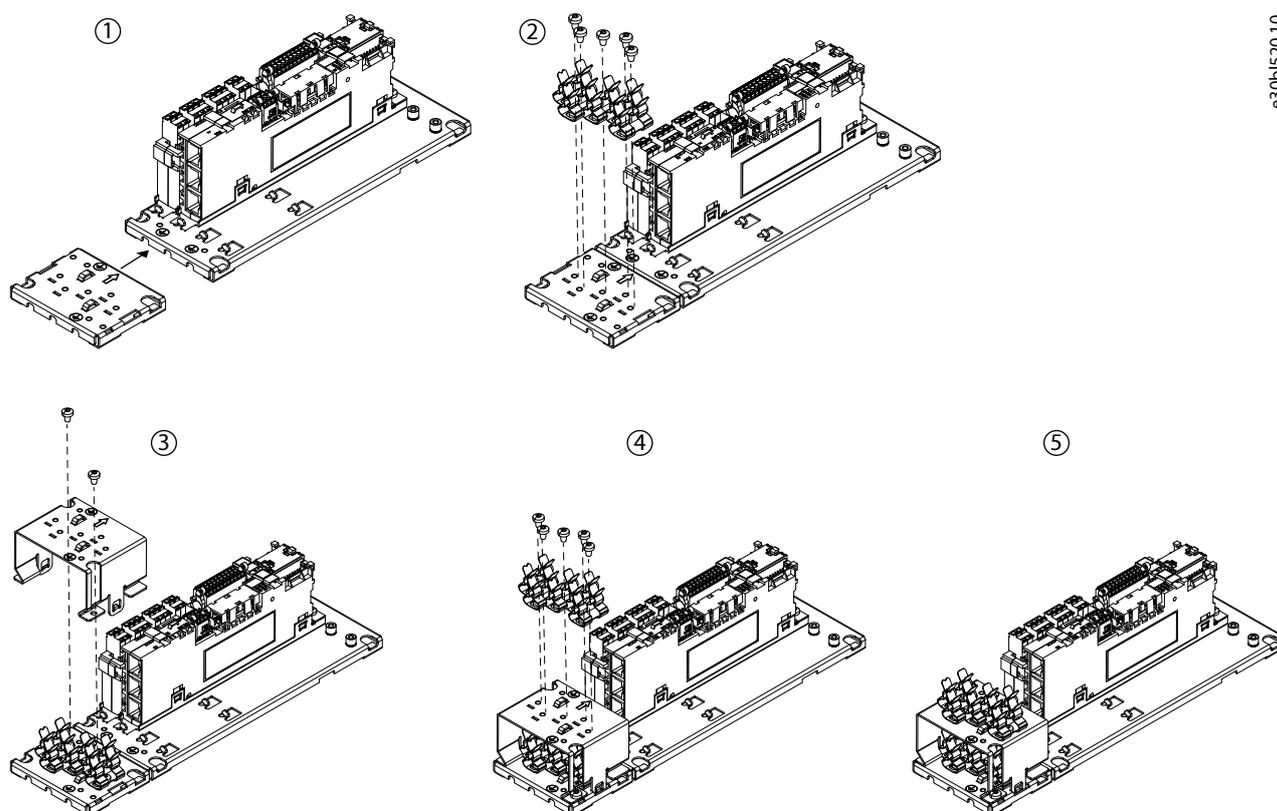


Figure 40: Assembling the Mounting Plate

4.2 Installing the Control Unit

Install the control unit to the selected location. Use the 4 mounting holes in the corners of the mounting plate.

4.3 Connecting the Fieldbus Cable and the Fiber Cables

1. Connect the PLC to the Ethernet port X1 or X2 in the control board with a fieldbus cable.
2. Connect the terminal X80 in the control board to the terminal X90 in the star coupler board with a fiber cable.
3. Connect the terminals X301–X316 in the star coupler board to the power units with fiber cables.

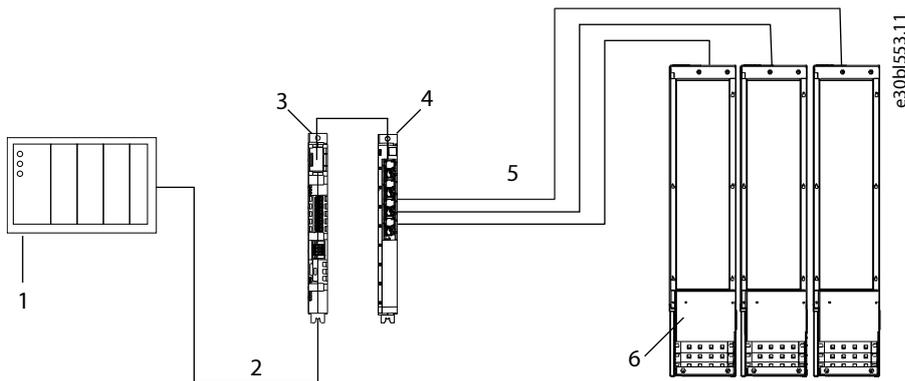


Figure 41: Connecting the Fieldbus Cable and the Fiber Cables

1	PLC (not included in the delivery)	2	Fieldbus cable
3	Control board	4	Star coupler board
5	Fiber cables	6	Power units

4.4 Installing the Control Cables into the Control Terminals

1. Install the control cables into the control terminals.

See the pin numbering of the I/O and Relay Option in [4.8 I/O and Relay Option Connections](#).

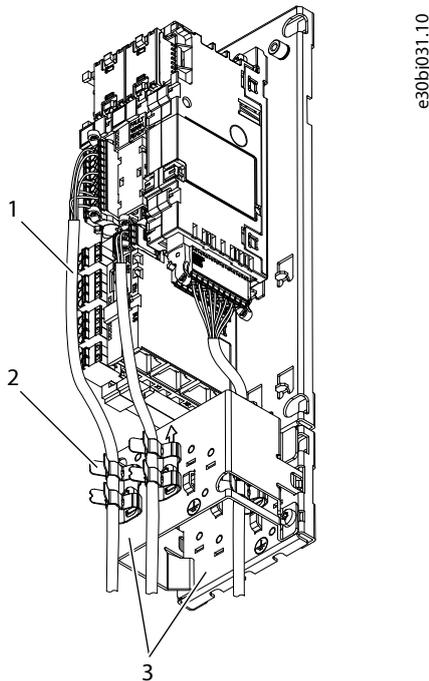
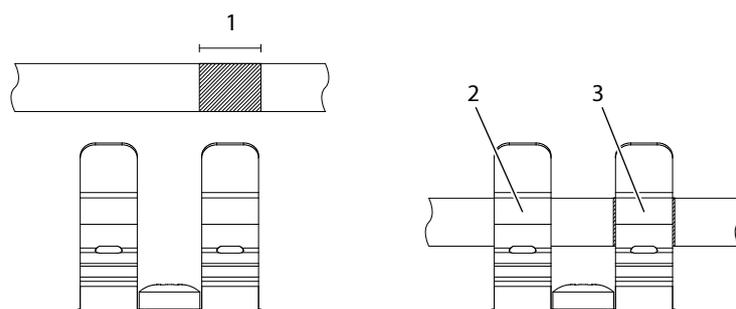


Figure 42: Example of Installing the Control Cables

1	Control cable	2	Cable clamp
3	Grounding plates		

2. Strip the control cables. Attach the control cables to the cable clamps on the suitable grounding plate.

The lower part of the cable clamp fixes the cable to the plate and provides strain relief. The upper part provides ~360° grounding for the cable shield.



e30bj147.11

Figure 43: Stripping the Cable and Using the Grounding Plates

1	Stripping length, 10 mm (0.4 in)	2	Strain relief
3	Grounding		

4.5 Control Board Connections

Table 2: Control Board Connections

Terminal	Function	Connector type
X1	Ethernet port (used for fieldbus)	RJ45
X2	Ethernet port (used for fieldbus)	RJ45
X0	Ethernet port (used for the PC tool)	RJ45
Micro SD	microSD card	Micro SD
X62	24 V DC supply	2 x 3 spring force connector 0.2–1.5 mm ²
X33 for inverter module	STO terminal	1 x 10 spring force connector 0.2–1.5 mm ²
Option bus	Option bus (internal connection)	Custom
X80	Fiber optic link to power unit or star coupler board	LC-duplex
X9	Control panel terminal	iX Industrial
RTC battery	RTC battery	BR1632 (battery type)

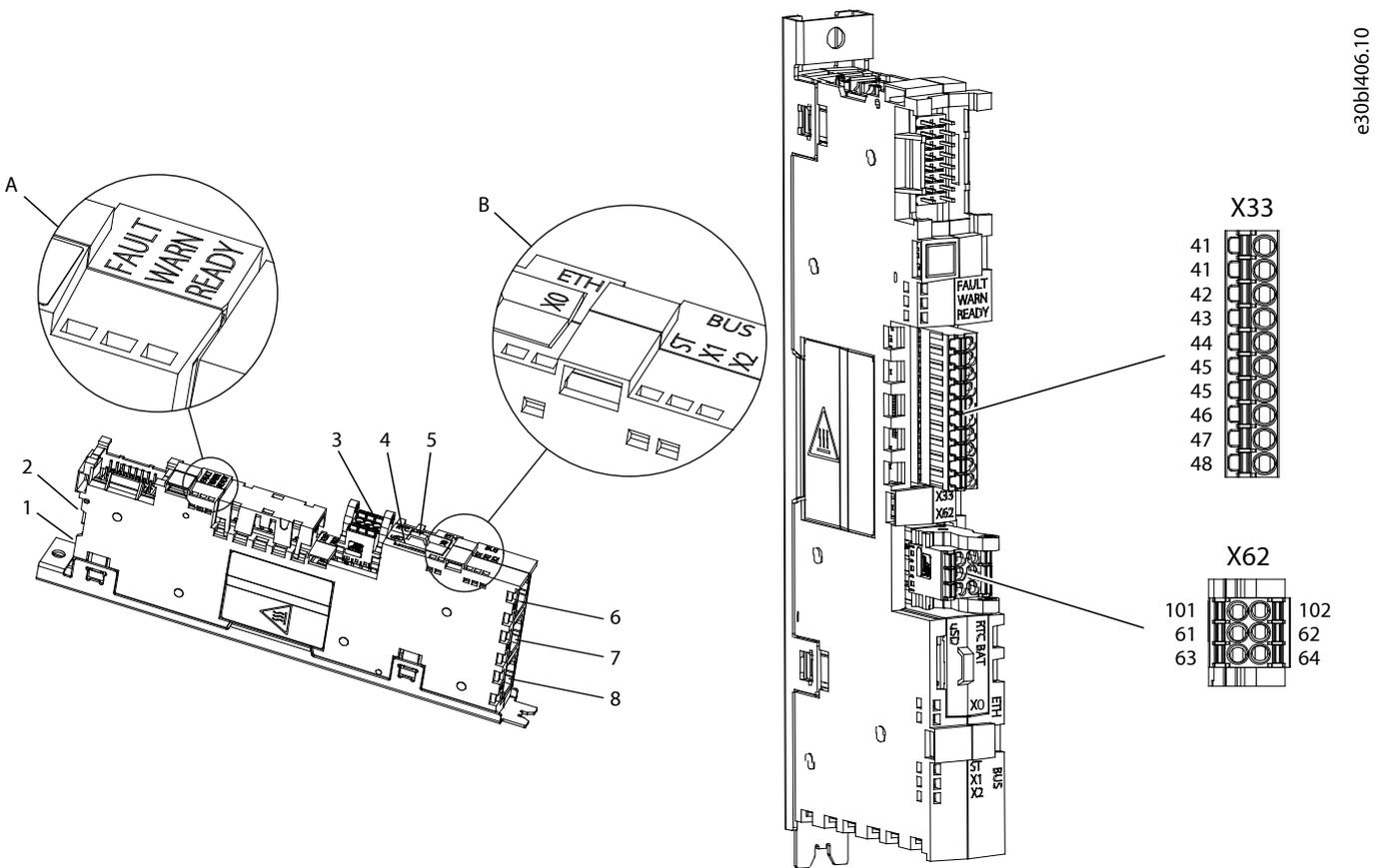


Figure 44: Control Board Terminal Block and Terminal Numbering

A	Status indicators (FAULT, WARN, READY)	B	Fieldbus indicators (ST, X1, X2) and Ethernet port indicators (X0)
1	Control panel connector (X9)	2	Fiber optic link to power unit (X80)
3	24 V DC supply (X62)	4	microSD card
5	RTC battery holder	6	Ethernet port (X0)
7	Ethernet port (X1)	8	Ethernet port (X2)

Table 3: STO Terminal Signals (X33) for the Inverter Module

Terminal	Function	Description
41A ⁽¹⁾	24 V	+ 24 V DC Output
41B ⁽¹⁾	24 V	+ 24 V DC Output
42	S.INA+	+ Safe Input Channel A
43	S.INB+	+ Safe Input Channel B
44	S.FB+	+ STO Feedback
45A ⁽¹⁾	GND	0 V/GND
45B ⁽¹⁾	GND	0 V/GND
46	S.INA-	- Safe Input Channel A

Table 3: STO Terminal Signals (X33) for the Inverter Module (continued)

Terminal	Function	Description
47	S.INB-	- Safe Input Channel B
48	S.FB-	- STO Feedback

1) Terminals 41A, 41B, 45A, and 45B have double pins to make connections easier.

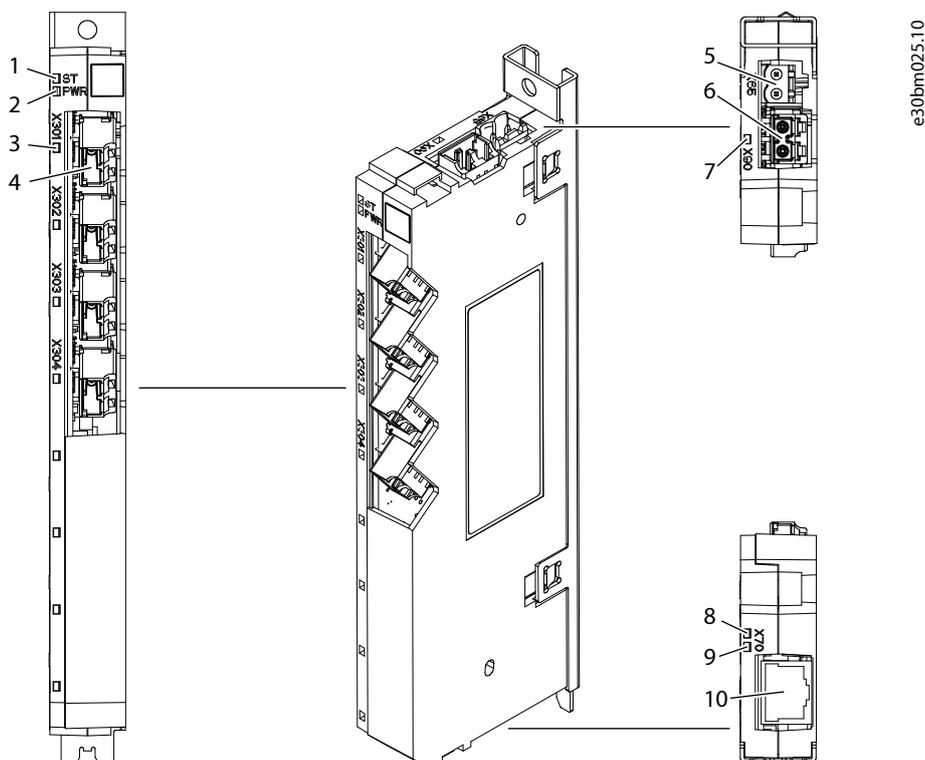
Table 4: 24 V DC Supply Signals (X62)

Terminal	Function	Description
101	+24 V input	Internal +24 V DC, 60 W control supply
102	GND	Power supply ground
61	+24 V external input	External +24 V DC control supply, maximum 10 A. Must be fuse-protected. Possible to daisy chain for multiple controllers.
62	GND	Power supply ground
63	+24 V output	+24 V DC output for daisy chain, only available when the +24 V DC external input control supply is used.
64	GND	Power supply ground

For the circuit diagrams of the control unit, see the product-specific design guide.

4.6 Star Coupler Board

The star coupler board can be installed next to the control unit. The star coupler board can also be installed near the power units to make the cabling from the star coupler board to the power units easier.


Figure 45: Terminal and Indicator Light Locations on the 4-port Star Coupler Board

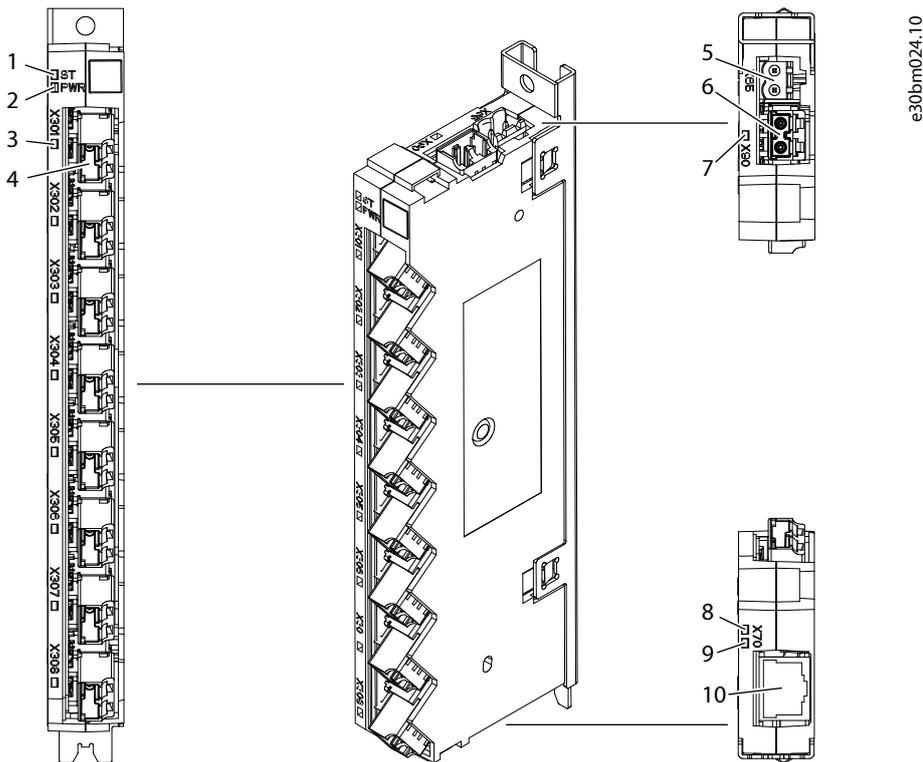


Figure 46: Terminal and Indicator Light Locations on the 8-port Star Coupler Board

1	Board configuration status indicator	2	+24 V power status indicator
3	Power unit connection status indicators	4	Fiber connection to the power unit (X301–X316)
5	+24 V power supply (X65)	6	Fiber connection to the control board (X90)
7	Control link status indicator	8	Ethernet speed indicator
9	Ethernet link activity indicator	10	Ethernet port (X7)

4.7 Star Coupler Board Connections

Table 5: Star Coupler Board Connections

Terminal	Function	Connector type
X7	Ethernet port	RJ45
X65	24 V DC supply	2 x spring force connector 2.5 mm ²
X90	Fiber optic link to control board	LC-duplex
X301–X316	Fiber optic link to power unit	LC-duplex

Table 6: 24 V DC Supply Signals (X65)

Terminal	Function	Description
61	+24 V external input	External +24 V DC star coupler supply, maximum 10 A. Must be fuse-protected.
62	GND	Power supply ground

4.8 I/O and Relay Option Connections

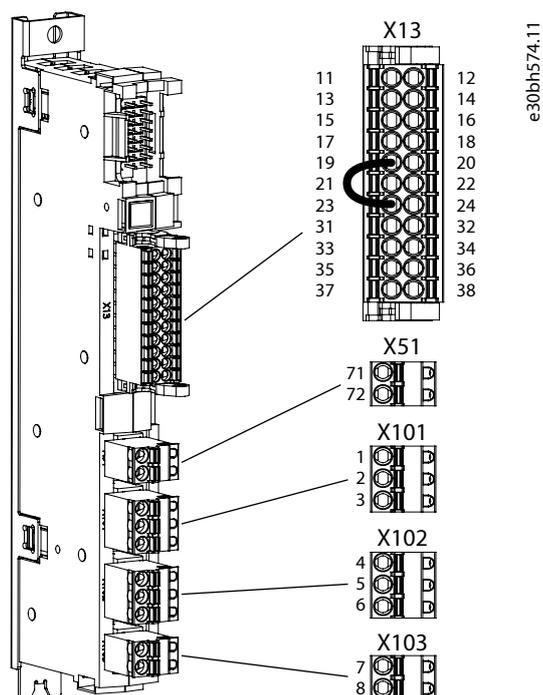


Figure 47: I/O and Relay Option Terminal Block and Terminal Numbering

Table 7: I/O and Relay Option Signals

Terminal	Function	Connector type
X13	I/O terminal	2 x 11 spring force connector 0.2–1.5 mm ²
X51	Thermistor input	1 x 2 spring force connector 0.25–2.5 mm ²
X101	Relay 1	1 x 3 spring force connector 0.25–2.5 mm ²
X102	Relay 2	1 x 3 spring force connector 0.25–2.5 mm ²
X103	Relay 3	1 x 2 spring force connector 0.25–2.5 mm ²

Table 8: I/O Terminal Signals (X13)

Terminal	Function
11	+24 V _{out}
12	+24 V _{out}
13	DI 1
14	DI 2
15	DI 3
16	DI 4
17	DI 5
18	DI 6
19	DGND
20	DGND
21	DO 1

Table 8: I/O Terminal Signals (X13) (continued)

Terminal	Function
22	DO 2
23	GND
24	GND
31	AO 1
32	+10 V ref.
33	AI 1
34	AI 2
35	GND
36	GND
37	GND
38	GND

Table 9: Thermistor Input Signals (X51)

Terminal	Function	Description
71	TI+	Thermistor input, galvanically isolated. $R_{\text{trip}} = 4 \text{ k}\Omega$
72	TI-	

Table 10: Relay 1 Signals (X101)

Terminal	Function	Description
1	COM	Configurable relay output. Switching capacity: <ul style="list-style-type: none"> • 24 V DC/8 A • 250 V AC/8 A • 125 V DC/0.4 A Minimum switching load: 5 V/10 mA
2	NO	
3	NC	

Table 11: Relay 2 Signals (X102)

Terminal	Function	Description
4	COM	Configurable relay output. Switching capacity: <ul style="list-style-type: none"> • 24 V DC/8 A • 250 V AC/8 A • 125 V DC/0.4 A Minimum switching load: 5 V/10 mA
5	NO	
6	NC	

Table 12: Relay 3 Signals (X103)

Terminal	Function	Description
7	COM	Configurable relay output.
8	NO	Switching capacity: <ul style="list-style-type: none"> • 24 V DC/8 A • 250 V AC/8 A • 125 V DC/0.4 A Minimum switching load: 5 V/10 mA

4.9 Connecting the Control Panel

1. Connect the control panel to the terminal X9 in the modular control unit with a panel cable adapter.

4.10 Installing the microSD Card

Supported microSD card types:

- SD
- SDHC
- SDXC

The microSD card must be formatted for the file system FAT32. It is recommended to use SDHC type cards as they are preformatted to FAT32.

1. Locate the microSD card hole on the control board of the control unit.

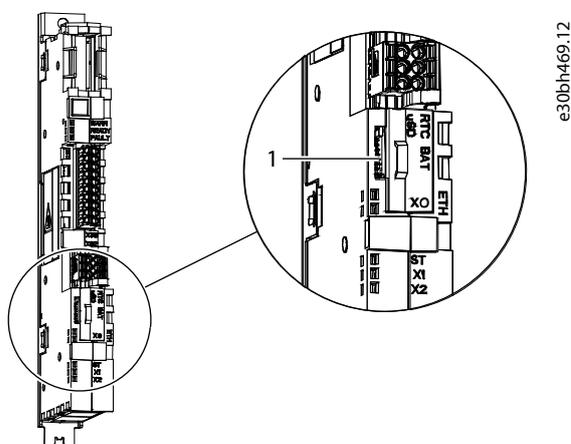


Figure 48: Location of the microSD Card

1 The microSD card

2. Push the new microSD card into the hole.

The contact area must face the text μ SD on the right.

To remove the microSD card, push it. The microSD card pops out.

5 Commissioning

5.1 Commissioning of the Drive

Follow these instructions to commission the drive.

Read the safety instructions in the Safety Guide and obey them.

1. Make sure that the motor is installed correctly.
2. Make sure that the motor is not connected to mains.
3. Make sure that the drive and the motor are grounded.
4. Make sure to select the mains cable and the motor cable correctly.

For information on cable selections, see [6.2.1 List of Cable Size Information](#).

5. Make sure that the control cables are as far as possible from the power cables.
6. Make sure that the shields of the shielded cables are connected to a grounding terminal that is identified with the grounding symbol.
7. Check the tightening torques of all the terminals.
8. Make sure that the cables do not touch the electrical components of the drive.
9. Make sure that the common input +24 V is connected to an external power source and the ground of the digital input is connected to ground of the control terminal.
10. Make sure that there is no condensation on the surfaces of the drive.
11. Make sure that there are no unwanted objects in the installation space.
12. Before connecting the drive to mains, check the installation and the condition of all the fuses and other protective devices.

For information on fuse selections, see [6.3.1 List of Fuse Size Information](#).

13. Perform the cable and motor insulation checks.

5.2 Recommissioning of the Drive

To recommission the drive, use these instructions. There can be a need for recommissioning the drive even during the 1st startup if the hardware configuration has changed. The need is indicated on the control panel or through MyDrive® Insight. Recommissioning is needed, for example, when an option board is changed, or the LCL filter in use is not the same as in the factory commissioning.

1. Power up all system modules and LCL filters.
 - a. To power up the inverter module, use 1 of the following methods:

Connect the 24 V service voltage to terminals X67 and X80.

or

Connect the DC-link voltage to the DC-link busbars of the power units.

- b. To power up the AFE module, use 1 of the following methods:

Connect the 24 V service voltage to terminals X67 and X80.

or

Connect the external DC-link voltage to the DC-link busbars of the power units.

- c. To power up the LCL filter, use 1 of the following methods:

Connect the 24 V service voltage to terminal X80.

or

Connect the external DC-link voltage to the LCL fan supply terminal X121.

- The supply must have $\pm 10\%$ voltage accuracy.
- The supply current must be >2.5 A per power unit, depending on the configuration. This current is also enough for the control unit.
- If there is more than 1 power unit connected to the same control unit, connect an external 24 V DC supply to all the power units.

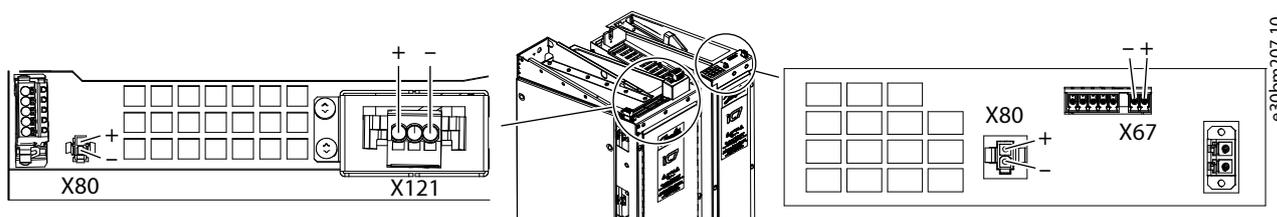


Figure 49: Service Voltage Terminals of the System Modules and LCL Filter

2. Commission the drive from MyDrive® Insight or the control panel.
3. Disconnect the external 24 V DC supply from terminals X67 and X80 of the system modules and LCL filters.

5.3 Downloading the Software without the Mains Supply

Use these instructions to update the drive with new software without mains.

Before downloading the software, read all safety precautions in this guide and other guides available for this product.

1. Connect an external 24 V DC supply to terminals X67 and X80 of the power unit.
 - a. The supply must have $\pm 10\%$ voltage accuracy.
 - b. The supply current must be >2.5 A per power unit, depending on the configuration.
 - c. If there is more than 1 power unit connected to the same control unit, connect an external 24 V DC supply to all the power units.
2. Commission the drive from MyDrive® Insight.
3. Disconnect the external 24 V DC supply from terminals X67 and X80 of the power unit.

5.4 Measuring the Insulation Resistance of the Motor Cable

Use these instructions to check the insulation of the motor cable.

The AC drive is already measured at the factory.

1. Disconnect the motor cable from the terminals U, V, and W, and from the motor.
2. Measure the insulation resistance of the motor cable between phase conductors 1 and 2, between phase conductors 1 and 3, and between phase conductors 2 and 3.
3. Measure the insulation resistance between each phase conductor and the grounding conductor.
4. The insulation resistance must be >1 M Ω at the ambient temperature of 20 °C (68 °F).

5.5 Measuring the Insulation Resistance of the Mains Cable

Use these instructions to check the insulation of the mains cable.

The AC drive is already measured at the factory.

1. Disconnect the mains cable from the terminals L1, L2, and L3, and from mains.
2. Measure the insulation resistance of the mains cable between phase conductors 1 and 2, between phase conductors 1 and 3, and between phase conductors 2 and 3.
3. Measure the insulation resistance between each phase conductor and the grounding conductor.
4. The insulation resistance must be $>1\text{ M}\Omega$ at the ambient temperature of $20\text{ }^{\circ}\text{C}$ ($68\text{ }^{\circ}\text{F}$).

5.6 Measuring the Insulation Resistance of the Motor

Use these instructions to check the insulation of the motor.

The AC drive is already measured at the factory.

NOTICE

Obey the instructions of the motor manufacturer.

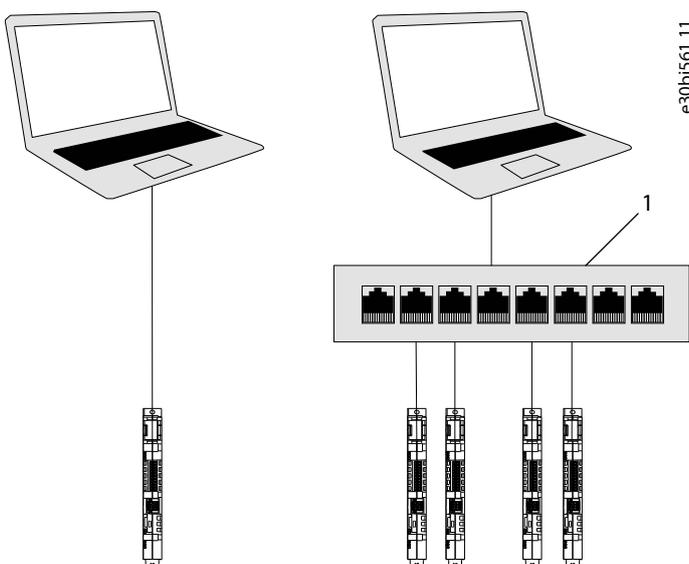
1. Disconnect the motor cable from the motor.
2. Open the bridging connections in the motor connection box.
3. Measure the insulation resistance of each motor winding. The voltage must be the same or higher than the motor nominal voltage, but at least 1000 V .
4. The insulation resistance must be $>1\text{ M}\Omega$ at the ambient temperature of $20\text{ }^{\circ}\text{C}$ ($68\text{ }^{\circ}\text{F}$).
5. Connect the motor cables to the motor.
6. Do the final insulation check on the drive side. Put all phases together and measure to the ground.
7. Connect the motor cables to the drive.

5.7 Preparing for a PC Connection

Use these instructions to connect the drive or several drives to a PC with an RJ45 cable.

1. Connect an RJ45 cable to the PC.

To connect several drives at the same time, use an Ethernet switch between the PC and the control unit.



1 Ethernet switch

Figure 50: Connecting the Drive to a PC

2. Connect the cable coming from the PC or from the Ethernet switch to the Ethernet port X0 on the control unit of the drive.
3. See the application guide for information on the next steps.

6 Specifications

6.1 Tightening Torques

Table 13: Tightening Torques

Bolt	Tightening torque [Nm (in-lb)]	Maximum inward thread length [mm (in)]
M8	20 (177)	10 (0.39)
M10	40 (354)	22 (0.87)
M12	70 (620)	22 (0.87)
Grounding bolt (M8)	13.5 (119)	–

6.2 Cable Sizes

6.2.1 List of Cable Size Information

The cable size tables for the air-cooled system modules can be found with these links.

- [6.2.2 Mains Cable Size Recommendations for AFE Modules, 380–500 V](#)
- [6.2.3 Motor Cable Sizes Recommendation for Inverter Modules, 380–500 V](#)
- [6.2.4 Motor Cable Size Recommendations for Inverter Modules with Integration Units, 380–500 V](#)
- [6.2.5 Mains Cable Size Recommendations for AFE Modules, UL 480 V](#)
- [6.2.6 Motor Cable Sizes Recommendation for Inverter Modules, UL 480 V](#)
- [6.2.7 Motor Cable Size Recommendations for Inverter Modules with Integration Units, UL 480 V](#)

6.2.2 Mains Cable Size Recommendations for AFE Modules, 380–500 V

Table 14: Mains Cable Size Recommendations for AFE Modules, 380–500 V

Model code ⁽¹⁾	Frame	Mains cable Cu [mm ²]	Mains cable Al [mm ²]
iC7-60SA3A05-317AE00	AM10/AR10	1x (3 x 150 + 70)	2x (3 x 95 + 29)
iC7-60SA3A05-400AE00		3x (3 x 50 + 25)	3x (3 x 95 + 29)
iC7-60SA3A05-514AE00		3x (3 x 70 + 35)	3x (3 x 120 + 41)
iC7-60SA3A05-580AE00	AM11/AR11	2x (3 x 150 + 70)	3x (3 x 150 + 41)
iC7-60SA3A05-650AE00		4x (3 x 70 + 35)	4x (3 x 120 + 41)
iC7-60SA3A05-730AE00		4x (3 x 95 + 50)	4x (3 x 150 + 41)
iC7-60SA3A05-816AE00		3x (3 x 150 + 70)	4x (3 x 150 + 41)
iC7-60SA3A05-920AE00	2xAM10/2xAR10	6x (3 x 70 + 35)	4x (3 x 185 + 57)
iC7-60SA3A05-1030E00		4x (3 x 150 + 70)	6x (3 x 150 + 41)

Table 14: Mains Cable Size Recommendations for AFE Modules, 380–500 V (continued)

Model code ⁽¹⁾	Frame	Mains cable Cu [mm ²]	Mains cable Al [mm ²]
iC7-60SA3A05-1210E00	2xAM11/2xAR11	6x (3 x 120 + 70)	6x (3 x 185 + 57)
iC7-60SA3A05-1410E00		6x (3 x 150 + 70)	8x (3 x 150 + 41)
iC7-60SA3A05-1630E00		6x (3 x 185 + 95)	8x (3 x 185 + 57)
iC7-60SA3A05-1860E00	3xAM11/3xAR11	9x (3 x 120 + 70)	9x (3 x 185 + 57)
iC7-60SA3A05-2120E00		9x (3 x 150 + 70)	12x (3 x 150 + 41)
iC7-60SA3A05-2450E00		9x (3 x 185 + 95)	12x (3 x 185 + 57)
iC7-60SA3A05-2800E00	4xAM11/4xAR11	12x (3 x 150 + 70)	16x (3 x 150 + 41)
iC7-60SA3A05-3270E00		12x (3 x 185 + 95)	16x (3 x 185 + 57)
iC7-60SA3A05-3650E00	5xAM11/5xAR11	15x (3 x 150 + 70)	20x (3 x 150 + 41)
iC7-60SA3A05-4080E00		15x (3 x 150 + 70)	20x (3 x 150 + 41)
iC7-60SA3A05-4500E00	6xAM11/6xAR11	18x (3 x 150 + 70)	24x (3 x 150 + 41)
iC7-60SA3A05-4900E00		18x (3 x 185 + 95)	24x (3 x 185 + 57)

1) Model codes starting with iC7-60SA3A05 or iC7-60SA3H05

6.2.3 Motor Cable Sizes Recommendation for Inverter Modules, 380–500 V

Table 15: Motor Cable Size Recommendations for Inverter Modules, 380–500 V

Model code	Frame	Motor cable Cu [mm ²]	Motor cable Al [mm ²]
iC7-60SAIN05-385A	IM10	3x (3 x 50 + 25)	2x (3 x 120 + 41)
iC7-60SAIN05-480A		3x (3 x 70 + 35)	3x (3 x 120 + 41)
iC7-60SAIN05-590A		3x (3 x 95 + 50)	3x (3 x 150 + 41)
iC7-60SAIN05-658A	IM11	4x (3 x 70 + 35)	4x (3 x 120 + 41)
iC7-60SAIN05-730A		4x (3 x 95 + 50)	4x (3 x 150 + 41)
iC7-60SAIN05-820A		3x (3 x 150 + 70)	4x (3 x 150 + 41)
iC7-60SAIN05-880A		4x (3 x 120 + 70)	4x (3 x 185 + 57)
iC7-60SAIN05-1000	2xIM10	6x (3 x 95 + 50)	6x (3 x 120 + 41)
iC7-60SAIN05-1100		6x (3 x 95 + 50)	6x (3 x 150 + 41)
iC7-60SAIN05-1260	2xIM11	6x (3 x 120 + 70)	8x (3 x 120 + 41)
iC7-60SAIN05-1450		8x (3 x 95 + 50)	8x (3 x 150 + 41)
iC7-60SAIN05-1710		8x (3 x 120 + 70)	8x (3 x 185 + 57)
iC7-60SAIN05-1760	3xIM11	9x (3 x 120 + 70)	12x (3 x 120 + 41)
iC7-60SAIN05-1960		9x (3 x 150 + 70)	12x (3 x 120 + 41)
iC7-60SAIN05-2150		9x (3 x 150 + 70)	12x (3 x 150 + 41)
iC7-60SAIN05-2510		12x (3 x 120 + 70)	12x (3 x 185 + 57)
iC7-60SAIN05-2640	4xIM11	12x (3 x 120 + 70)	16x (3 x 120 + 41)
iC7-60SAIN05-2880		12x (3 x 150 + 70)	16x (3 x 150 + 41)
iC7-60SAIN05-3280		16x (3 x 120 + 70)	16x (3 x 150 + 41)

Table 15: Motor Cable Size Recommendations for Inverter Modules, 380–500 V (continued)

Model code	Frame	Motor cable Cu [mm ²]	Motor cable Al [mm ²]
iC7-60SAIN05-3600	5xIM11	15x (3 x 150 + 70)	15x (3 x 185 + 57)
iC7-60SAIN05-4060		20x (3 x 120 + 70)	20x (3 x 150 + 41)
iC7-60SAIN05-4320	6xIM11	18x (3 x 150 + 70)	18x (3 x 185 + 57)
iC7-60SAIN05-4870		24x (3 x 120 + 70)	24x (3 x 150 + 41)

6.2.4 Motor Cable Size Recommendations for Inverter Modules with Integration Units, 380–500 V

Table 16: Motor Cable Size Recommendations for Inverter Modules with Integration Units, 380–500 V

Model code	Frame	Motor cable Cu [mm ²]	Motor cable Al [mm ²]
iC7-60SAIN05-385A	IR10	3x (3 x 50 + 25)	2x (3 x 120 + 41)
iC7-60SAIN05-480A		3x (3 x 70 + 35)	3x (3 x 120 + 41)
iC7-60SAIN05-590A		3x (3 x 95 + 50)	3x (3 x 150 + 41)
iC7-60SAIN05-658A	IR11	4x (3 x 70 + 35)	4x (3 x 120 + 41)
iC7-60SAIN05-730A		4x (3 x 95 + 50)	4x (3 x 150 + 41)
iC7-60SAIN05-820A		3x (3 x 150 + 70)	4x (3 x 150 + 41)
iC7-60SAIN05-880A		4x (3 x 120 + 70)	4x (3 x 185 + 57)
iC7-60SAIN05-1000	2xIR10	6x (3 x 95 + 50)	6x (3 x 120 + 41)
iC7-60SAIN05-1100		6x (3 x 95 + 50)	6x (3 x 150 + 41)
iC7-60SAIN05-1260	2xIR11	6x (3 x 120 + 70)	8x (3 x 120 + 41)
iC7-60SAIN05-1450		8x (3 x 95 + 50)	8x (3 x 150 + 41)
iC7-60SAIN05-1710		8x (3 x 120 + 70)	8x (3 x 185 + 57)
iC7-60SAIN05-1760	3xIR11	9x (3 x 120 + 70)	12x (3 x 120 + 41)
iC7-60SAIN05-1960		9x (3 x 150 + 70)	12x (3 x 120 + 41)
iC7-60SAIN05-2150		9x (3 x 150 + 70)	12x (3 x 150 + 41)
iC7-60SAIN05-2510		12x (3 x 120 + 70)	12x (3 x 185 + 57)
iC7-60SAIN05-2640	4xIR11	12x (3 x 120 + 70)	16x (3 x 120 + 41)
iC7-60SAIN05-2880		12x (3 x 150 + 70)	16x (3 x 150 + 41)
iC7-60SAIN05-3280		16x (3 x 120 + 70)	16x (3 x 150 + 41)
iC7-60SAIN05-3600	5xIR11	15x (3 x 150 + 70)	15x (3 x 185 + 57)
iC7-60SAIN05-4060		20x (3 x 120 + 70)	20x (3 x 150 + 41)
iC7-60SAIN05-4320	6xIR11	18x (3 x 150 + 70)	18x (3 x 185 + 57)
iC7-60SAIN05-4870		24x (3 x 120 + 70)	24x (3 x 150 + 41)

6.2.5 Mains Cable Size Recommendations for AFE Modules, UL 480 V

Table 17: Mains Cable Sizes for AFE Modules, UL 480 V

Model code ⁽¹⁾	Frame	Mains cable Cu [mm ²]	Mains cable termination, Panduit terminal part number
iC7-60SA3A05-317AE00	AM10/AR10	2 x 4/0	LCAX4/0-12-X
iC7-60SA3A05-400AE00		2 x 300MCM	LCAX300-12-X
iC7-60SA3A05-514AE00		3 x 4/0	LCAX4/0-12-X
iC7-60SA3A05-580AE00	AM11/AR11	3 x 250MCM	LCAX250-12-X
iC7-60SA3A05-650AE00		3 x 300MCM	LCAX300-12-X
iC7-60SA3A05-730AE00		4 x 250MCM	LCAX250-12-X
iC7-60SA3A05-816AE00		4 x 300MCM	LCAX300-12-X
iC7-60SA3A05-920AE00	2 x AM10/2 x AR10	4 x 350MCM	LCAX350-12-X
iC7-60SA3A05-1030E00		6 x 4/0	LCAX4/0-12-X
iC7-60SA3A05-1210E00	2 x AM11/2 x AR11	6 x 300MCM	LCAX300-12-X
iC7-60SA3A05-1410E00		6 x 350MCM	LCAX350-12-X
iC7-60SA3A05-1630E00		8 x 300MCM	LCAX300-12-X
iC7-60SA3A05-1860E00	3 x AM11/3 x AR11	9 x 300MCM	LCAX300-12-X
iC7-60SA3A05-2120E00		9 x 350MCM	LCAX350-12-X
iC7-60SA3A05-2450E00		12 x 300MCM	LCAX300-12-X
iC7-60SA3A05-2800E00	4 x AM11/4 x AR11	12 x 350MCM	LCAX350-12-X
iC7-60SA3A05-3270E00		16 x 300MCM	LCAX300-12-X
iC7-60SA3A05-3650E00	5 x AM11/5 x AR11	20 x 250MCM	LCAX250-12-X
iC7-60SA3A05-4080E00		20 x 300MCM	LCAX300-12-X
iC7-60SA3A05-4500E00	6 x AM11/6 x AR11	24 x 250MCM	LCAX250-12-X
iC7-60SA3A05-4900E00		24 x 300MCM	LCAX300-12-X

1) Model codes starting with iC7-60SA3A05 or iC7-60SA3H05

6.2.6 Motor Cable Sizes Recommendation for Inverter Modules, UL 480 V

Table 18: Motor Cable Sizes Recommendation for Inverter Modules, UL 480 V

Model code	Frame	Motor cable Cu [mm ²]	Motor cable termination, Panduit terminal part number
iC7-60SAIN05-385A	IM10	2x300MCM	LCAX300-12-X
iC7-60SAIN05-480A		3x250MCM	LCAX250-12-X
iC7-60SAIN05-590A		3x300MCM	LCAX300-12-X

Table 18: Motor Cable Sizes Recommendation for Inverter Modules, UL 480 V (continued)

Model code	Frame	Motor cable Cu [mm ²]	Motor cable termination, Panduit terminal part number
iC7-60SAIN05-658A	IM11	3x350MCM	LCAN350-12-X
iC7-60SAIN05-730A		4x250MCM	LCAX250-12-X
iC7-60SAIN05-820A		4x300MCM	LCAX300-12-X
iC7-60SAIN05-880A		4x350MCM	LCAN350-12-X
iC7-60SAIN05-1000	2xIM10	6x4/0	LCAX4/0-12-X
iC7-60SAIN05-1100		6x250MCM	LCAX250-12-X
iC7-60SAIN05-1260	2xIM11	6x300MCM	LCAX300-12-X
iC7-60SAIN05-1450		8x250MCM	LCAX250-12-X
iC7-60SAIN05-1710		8x350MCM	LCAN350-12-X
iC7-60SAIN05-1760	3xIM11	9x350MCM	LCAN350-12-X
iC7-60SAIN05-1960		9x350MCM	LCAN350-12-X
iC7-60SAIN05-2150		12x250MCM	LCAX250-12-X
iC7-60SAIN05-2510		12x300MCM	LCAX300-12-X
iC7-60SAIN05-2640	4xIM11	12x350MCM	LCAN350-12-X
iC7-60SAIN05-2880		16x250MCM	LCAX250-12-X
iC7-60SAIN05-3280		16x300MCM	LCAX300-12-X
iC7-60SAIN05-3600	5xIM11	20x250MCM	LCAX250-12-X
iC7-60SAIN05-4060		20x300MCM	LCAX300-12-X
iC7-60SAIN05-4320	6xIM11	24x250MCM	LCAX250-12-X
iC7-60SAIN05-4870		24x300MCM	LCAX300-12-X

6.2.7 Motor Cable Size Recommendations for Inverter Modules with Integration Units, UL 480 V

Table 19: Motor Cable Size Recommendations for Inverter Modules with Integration Units, UL 480 V

Model code	Frame	Motor cable Cu [mm ²]	Motor cable termination, Panduit terminal part number
iC7-60SAIN05-385A	IR10	2x300MCM	LCAX300-12-X
iC7-60SAIN05-480A		3x250MCM	LCAX250-12-X
iC7-60SAIN05-590A		3x300MCM	LCAX300-12-X
iC7-60SAIN05-658A	IR11	3x350MCM	LCAX350-12-X
iC7-60SAIN05-730A		4x250MCM	LCAX250-12-X
iC7-60SAIN05-820A		4x300MCM	LCAX300-12-X
iC7-60SAIN05-880A		4x350MCM	LCAX350-12-X
iC7-60SAIN05-1000	2xIR10	6x4/0	LCAX4/0-12-X
iC7-60SAIN05-1100		6x250MCM	LCAX250-12-X

Table 19: Motor Cable Size Recommendations for Inverter Modules with Integration Units, UL 480 V (continued)

Model code	Frame	Motor cable Cu [mm ²]	Motor cable termination, Panduit terminal part number
iC7-60SAIN05-1260	2xIR11	6x300MCM	LCAX300-12-X
iC7-60SAIN05-1450		8x250MCM	LCAX250-12-X
iC7-60SAIN05-1710		8x350MCM	LCAX350-12-X
iC7-60SAIN05-1760	3xIR11	9x350MCM	LCAX350-12-X
iC7-60SAIN05-1960		9x350MCM	LCAX350-12-X
iC7-60SAIN05-2150		12x250MCM	LCAX250-12-X
iC7-60SAIN05-2510		12x300MCM	LCAX300-12-X
iC7-60SAIN05-2640	4xIR11	12x350MCM	LCAX350-12-X
iC7-60SAIN05-2880		16x250MCM	LCAX250-12-X
iC7-60SAIN05-3280		16x300MCM	LCAX300-12-X
iC7-60SAIN05-3600	5xIR11	20x250MCM	LCAX250-12-X
iC7-60SAIN05-4060		20x300MCM	LCAX300-12-X
iC7-60SAIN05-4320	6xIR11	24x250MCM	LCAX250-12-X
iC7-60SAIN05-4870		24x300MCM	LCAX300-12-X

6.3 Fuses

6.3.1 List of Fuse Size Information

The fuse size tables for the air-cooled system modules can be found with these links.

- [6.3.2 AC Fuses for AFE, 380–500 V AC](#)
- [6.3.3 DC Fuses for AFE, 465–740 V DC](#)
- [6.3.4 DC Fuses for Inverter Modules, 465–740 V DC](#)

6.3.2 AC Fuses for AFE, 380–500 V AC

Table 20: AC Fuses for AFE, 380–500 V AC

Model code ⁽¹⁾	Frame	Rated current I _L [A]	Number of fuses	Fuse size	Mersen part number ⁽²⁾	Fuse U _n [V]	Fuse I _n [A]	Minimum I _{cp,mr} [A]
iC7-60SA3x05-317AE00	AM10/ AR10	317	3	33	PC33UD69V550TF	690	550	3300
iC7-60SA3x05-400AE00		400			PC33UD69V550TF	690	550	3300
iC7-60SA3x05-514AE00		514			PC33UD69V700TF	690	700	4800
iC7-60SA3x05-580AE00	AM11/ AR11	580	6	33	PC33UD69V550TF	690	550	6600
iC7-60SA3x05-650AE00		650			PC33UD69V550TF	690	550	6600
iC7-60SA3x05-730AE00		730			PC33UD69V550TF	690	550	6600
iC7-60SA3x05-816AE00		816			PC33UD69V550TF	690	550	6600

Table 20: AC Fuses for AFE, 380–500 V AC (continued)

Model code ⁽¹⁾	Frame	Rated current I _L [A]	Number of fuses	Fuse size	Mersen part number ⁽²⁾	Fuse U _n [V]	Fuse I _n [A]	Minimum I _{cp,mr} [A]
iC7-60SA3x05-920E00	2 x	920	6	33	PC33UD69V700TF	690	700	–
iC7-60SA3x05-1030E00	AM10/2 x AR10	1030			PC33UD69V700TF	690	700	–
iC7-60SA3x05-1210E00	2 x	1210	12	33	PC33UD69V550TF	690	550	–
iC7-60SA3x05-1410E00	AM11/2 x AR11	1410			PC33UD69V550TF	690	550	–
iC7-60SA3x05-1630E00		1630			PC33UD69V550TF	690	550	–
iC7-60SA3x05-1860E00	3 x	1860	18	33	PC33UD69V550TF	690	550	–
iC7-60SA3x05-2120E00	AM11/3 x AR11	2120			PC33UD69V550TF	690	550	–
iC7-60SA3x05-2450E00		2450			PC33UD69V550TF	690	550	–
iC7-60SA3x05-2800E00	4 x	2800	24	33	PC33UD69V550TF	690	550	–
iC7-60SA3x05-3270E00	AM11/4 x AR11	3270			PC33UD69V550TF	690	550	–
iC7-60SA3x05-3650E00	5 x	3650	30	33	PC33UD69V550TF	690	550	–
iC7-60SA3x05-4080E00	AM11/5 x AR11	4080			PC33UD69V550TF	690	550	–
iC7-60SA3x05-4500E00	6 x	4500	36	33	PC33UD69V550TF	690	550	–
iC7-60SA3x05-4900E00	AM11/6 x AR11	4900			PC33UD69V550TF	690	550	–

1) Model codes starting with iC7-60SA3A05 or iC7-60SA3H05

2) Available as option +AJFX

6.3.3 DC Fuses for AFE, 465–740 V DC

Table 21: DC Fuses for AFE, 465–740 V DC

Model code ⁽¹⁾	Frame	Rated current I _L [A]	Number of fuses	Fuse size	Mersen part number	Fuse U _n [V]	Fuse I _n [A]
iC7-60SA3x05-317AE00	AM10/AR10	317	2	73	PC73UD13C630TF	1250	630
iC7-60SA3x05-400AE00		400			PC73UD13C800TF	1250	800
iC7-60SA3x05-514AE00		514			PC73UD10C1000TF	1000	1000
iC7-60SA3x05-580AE00	AM11/AR11	580	2	73	PC73UD90V13CTF	900	1250
iC7-60SA3x05-650AE00		650			PC73UD90V13CTF	900	1250
iC7-60SA3x05-730AE00		730			PC73UD85V14CTF	850	1400
iC7-60SA3x05-816AE00		816			PC73UD85V14CTF	850	1400
iC7-60SA3x05-920E00	2 x AM10/ 2 x AR10	920	4	73	PC73UD13C800TF	1250	800
iC7-60SA3x05-1030E00		1030			PC73UD10C1000TF	1000	1000
iC7-60SA3x05-1210E00	2 x AM11/ 2 x AR11	1210	4	73	PC73UD90V13CTF	900	1250
iC7-60SA3x05-1410E00		1410			PC73UD85V14CTF	850	1400
iC7-60SA3x05-1630E00		1630			PC73UD85V14CTF	850	1400

Table 21: DC Fuses for AFE, 465–740 V DC (continued)

Model code ⁽¹⁾	Frame	Rated current I _L [A]	Number of fuses	Fuse size	Mersen part number	Fuse U _n [V]	Fuse I _n [A]
iC7-60SA3x05-1860E00	3 x AM11/ 3 x AR11	1860	6	73	PC73UD90V13CTF	900	1250
iC7-60SA3x05-2120E00		2120			PC73UD90V13CTF	900	1250
iC7-60SA3x05-2450E00		2450			PC73UD85V14CTF	850	1400
iC7-60SA3x05-2800E00	4 x AM11/ 4 x AR11	2800	8	73	PC73UD90V13CTF	900	1250
iC7-60SA3x05-3270E00		3270			PC73UD85V14CTF	850	1400
iC7-60SA3x05-3650E00	5 x AM11/ 5 x AR11	3650	10	73	PC73UD85V14CTF	850	1400
iC7-60SA3x05-4080E00		4080			PC73UD85V14CTF	850	1400
iC7-60SA3x05-4500E00	6 x AM11/ 6 x AR11	4500	12	73	PC73UD85V14CTF	850	1400
iC7-60SA3x05-4900E00		4900			PC73UD85V14CTF	850	1400

1) Model codes starting with iC7-60SA3A05 or iC7-60SA3H05

6.3.4 DC Fuses for Inverter Modules, 465–740 V DC

Table 22: DC Fuses for Inverter Modules, 465–740 V DC

Model code	Frame	Rated current I _L [A]	Number of fuses	Fuse size	Mersen part number	Fuse U _n [V]	Fuse I _n [A]
iC7-60SAIN05-385AE00	IM10/IR10	385	2	73	PC73UD13C630TF	1250	630
iC7-60SAIN05-480AE00		480			PC73UD13C800TF	1250	800
iC7-60SAIN05-590AE00		590			PC73UD10C1000TF	1000	1000
iC7-60SAIN05-658AE00	IM11/IR11	658	2	73	PC73UD90V13CTF	900	1250
iC7-60SAIN05-730AE00		730			PC73UD90V13CTF	900	1250
iC7-60SAIN05-820AE00		820			PC73UD85V14CTF	850	1400
iC7-60SAIN05-880AE00		880			PC73UD85V14CTF	850	1400
iC7-60SAIN05-1000E00	2 x IM10/2 x IR10	1000	4	73	PC73UD13C800TF	1250	800
iC7-60SAIN05-1100E00		1100			PC73UD10C1000TF	1000	1000
iC7-60SAIN05-1260E00	2 x IM11/2 x IR11	1260	4	73	PC73UD90V13CTF	900	1250
iC7-60SAIN05-1450E00		1450			PC73UD90V13CTF	900	1250
iC7-60SAIN05-1710E00		1710			PC73UD85V14CTF	850	1400
iC7-60SAIN05-1760E00	3 x IM11/3 x IR11	1760	6	73	PC73UD90V13CTF	900	1250
iC7-60SAIN05-1960E00		1960			PC73UD90V13CTF	900	1250
iC7-60SAIN05-2150E00		2150			PC73UD90V13CTF	900	1250
iC7-60SAIN05-2510E00		2510			PC73UD85V14CTF	850	1400
iC7-60SAIN05-2640E00	4 x IM11/4 x IR11	2640	8	73	PC73UD90V13CTF	900	1250
iC7-60SAIN05-2880E00		2880			PC73UD90V13CTF	900	1250
iC7-60SAIN05-3280E00		3280			PC73UD85V14CTF	850	1400

Table 22: DC Fuses for Inverter Modules, 465–740 V DC (continued)

Model code	Frame	Rated current I_L [A]	Number of fuses	Fuse size	Mersen part number	Fuse U_n [V]	Fuse I_n [A]
iC7-60SAIN05-3600E00	5 x IM11/5 x IR11	3600	10	73	PC73UD90V13CTF	900	1250
iC7-60SAIN05-4060E00		4060			PC73UD85V14CTF	850	1400
iC7-60SAIN05-4320E00	6 x IM11/6 x IR11	4320	12	73	PC73UD90V13CTF	900	1250
iC7-60SAIN05-4870E00		4870			PC73UD85V14CTF	850	1400

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