Installation Guide

iC7 Series Liquid-cooled System Modules

Active Front-End, Grid Converter, Inverter, Brake Chopper Unit, and DC/DC Converter Modules

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Contents

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.

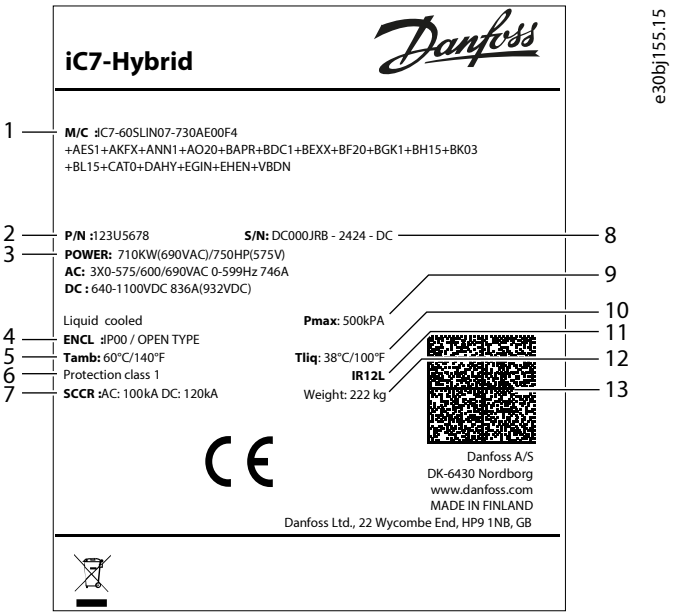

Figure 1: Product Label for iC7 Series Liquid-cooled System Modules

1	Model code of the product	2	Code number
3	Power, input, and output ratings	4	Protection rating
5	Temperature rating for ambient air	6	Protection rating
7	Short-circuit current rating	8	Serial number
9	Maximum continuous coolant pressure	10	Temperature rating for coolant
11	Frame designation	12	Weight
13	2D code accessible with a Datamatrix ECC 200 compatible barcode reader		

1.3 Unpacking the Product

The products are packed in cardboard on a wooden pallet.

The system modules and the filters are delivered horizontally. The 400 A L Filter is delivered vertically.

1. Open the package only when installing the product.
2. See the center of gravity in the relevant dimensional drawing in the design guide.
3. See the weight in the design guide.
4. Remove the product from the pallet where it was connected to.

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

1.4 Lifting the System Modules

1. Attach the lifting device in the hole on the top of the system module.
2. If necessary, lift the system module into a vertical position.

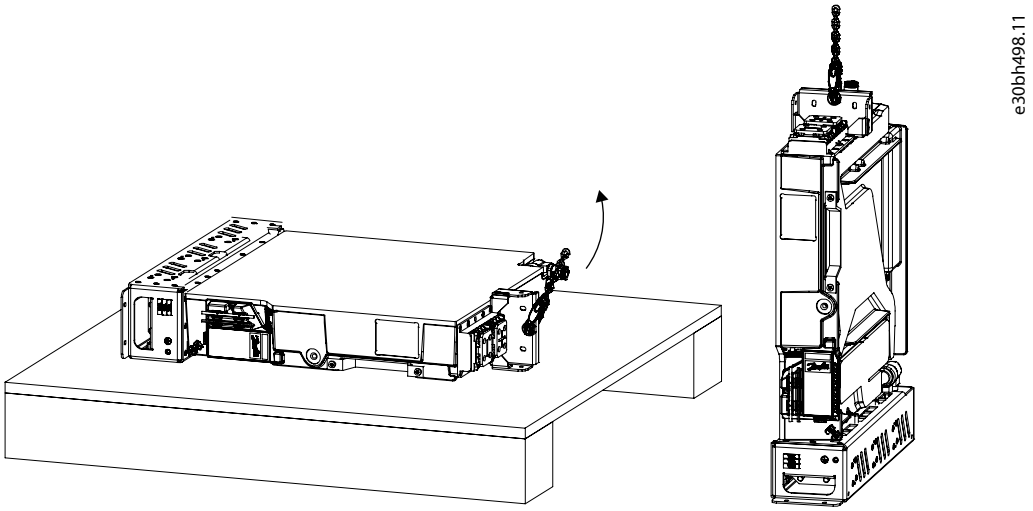

Figure 2: Lifting the System Module

3. Lift the system module to the required location.

1.5 Lifting the System Modules with Integration Unit

1. Place the lifting hooks in 4 holes at the top of the system module.

A product with a short integration unit has the same lifting holes.

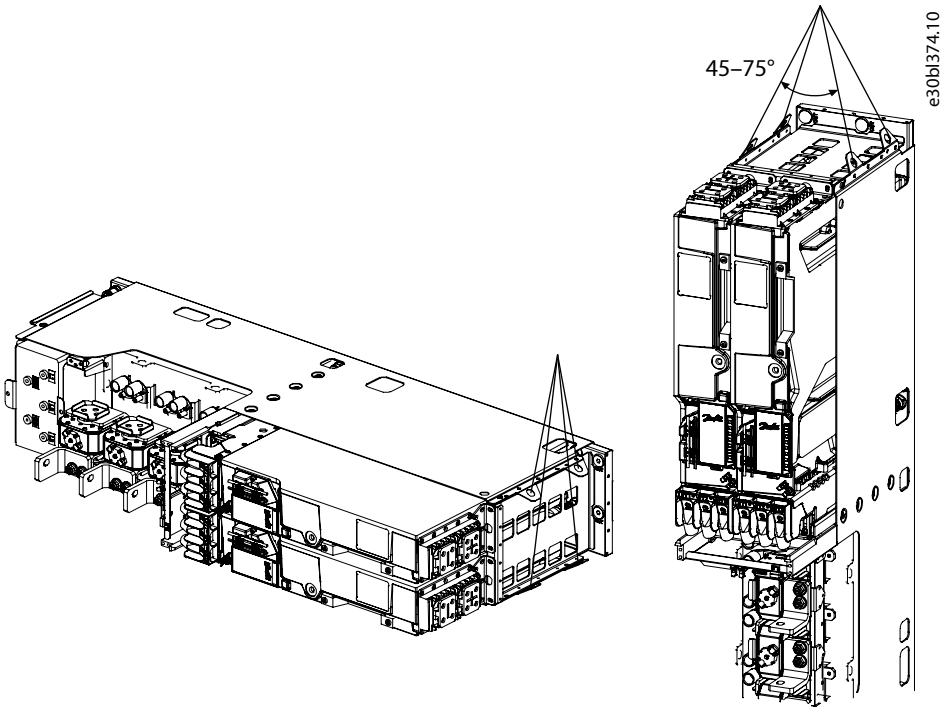

Figure 3: Lifting the System Module with Integration Unit

2. If necessary, lift the system module into a vertical position.

The recommended lifting angle is 60° ± 15°.

3. Lift the system module to the required location.

1.6 Lifting the Filters

Use these instructions to lift the L Filter, the LC Filter, the dU/dt Filter, the dU/dt and Common-mode Filter, and the DC/DC Filter.

1. Place the lifting hooks in 4 holes at the top of the filter.
2. If necessary, lift the filter into a vertical position.

The recommended lifting angle is 60° ± 15°.

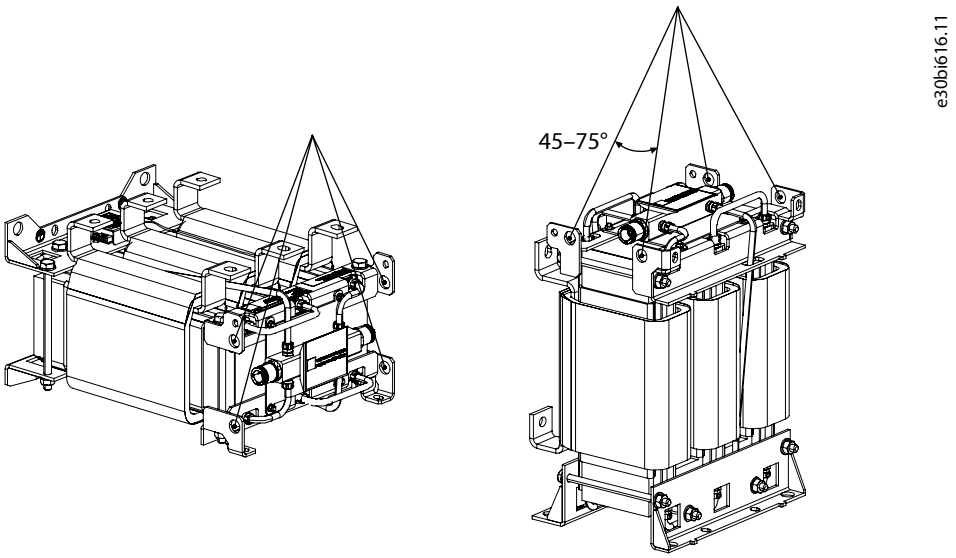

Figure 4: Example: Lifting the L Filter

3. Lift the filter to the required location.

2 Mechanical Installation

2.1 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.

2.2 Installation Directions

NOTICE

Do not install the system module upside down or the front side facing down.

The system module can be installed vertically, horizontally, and on its backside.

2.3 Installing System Modules

2.3.1 Installing System Modules into a Cabinet Vertically

1. Install the system module into the cabinet in a vertical position.
2. Use mounting holes to attach the system module into the cabinet.
   a. Use M6 grade 8.8 screws.
   b. For an AM12L or IM12L, use M8 grade 8.8 screws for the lower parts.

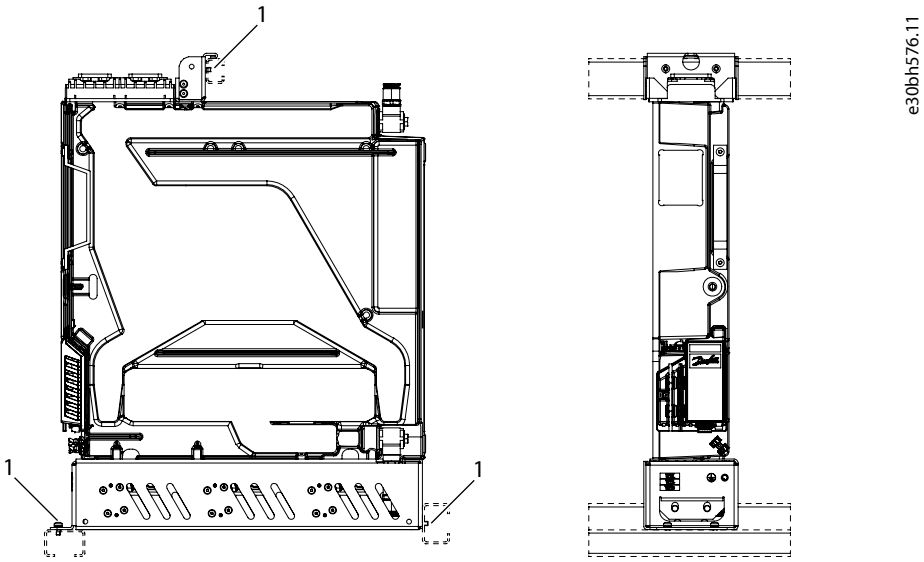

Figure 5: Mounting Holes of the System Module in Vertical Position

1	Mounting holes

3. Attach the system module to the mounting brackets of the cabinet.

   The mounting brackets are not included in the delivery.

   a. To ease the removal of the system module from the cabinet for service, use support bars under the system module.

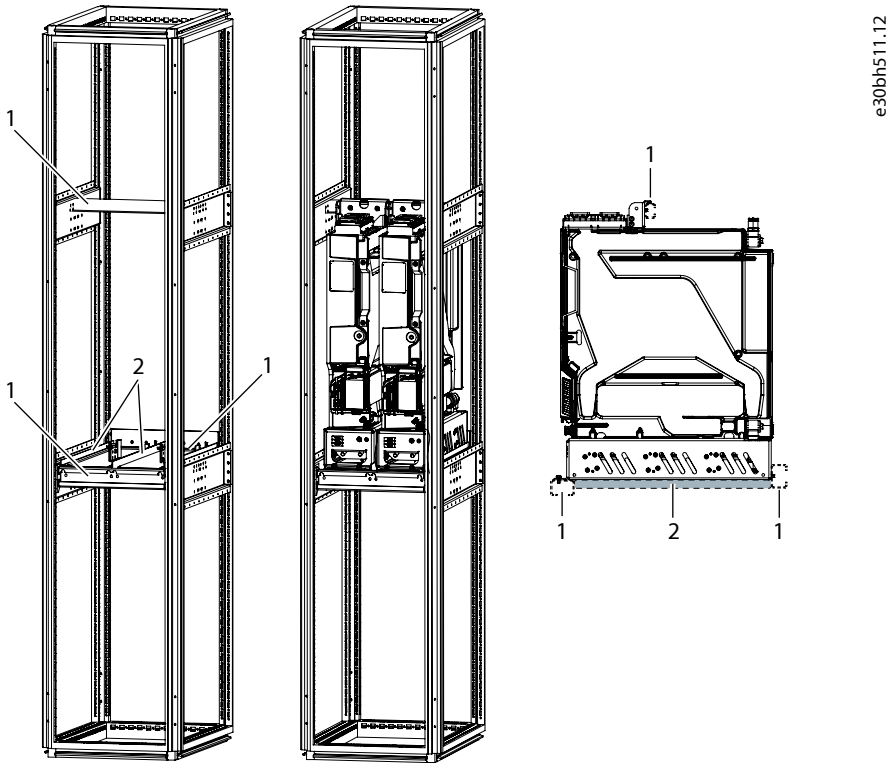

Figure 6: The Mounting Brackets and the Installation of System Modules into the Cabinet

1	Mounting brackets	2	Support bars

2.3.2 Installing System Modules into a Cabinet Horizontally

1. Install the system module into the cabinet in a horizontal position on its side.

   Make sure that the cover plate is pointing up. See Figure 7.

2. Use mounting holes to attach the system module into the cabinet.
   a. Use M6 grade 8.8 screws.
   b. For an AM12L or IM12L, use M8 grade 8.8 screws for the lower parts.

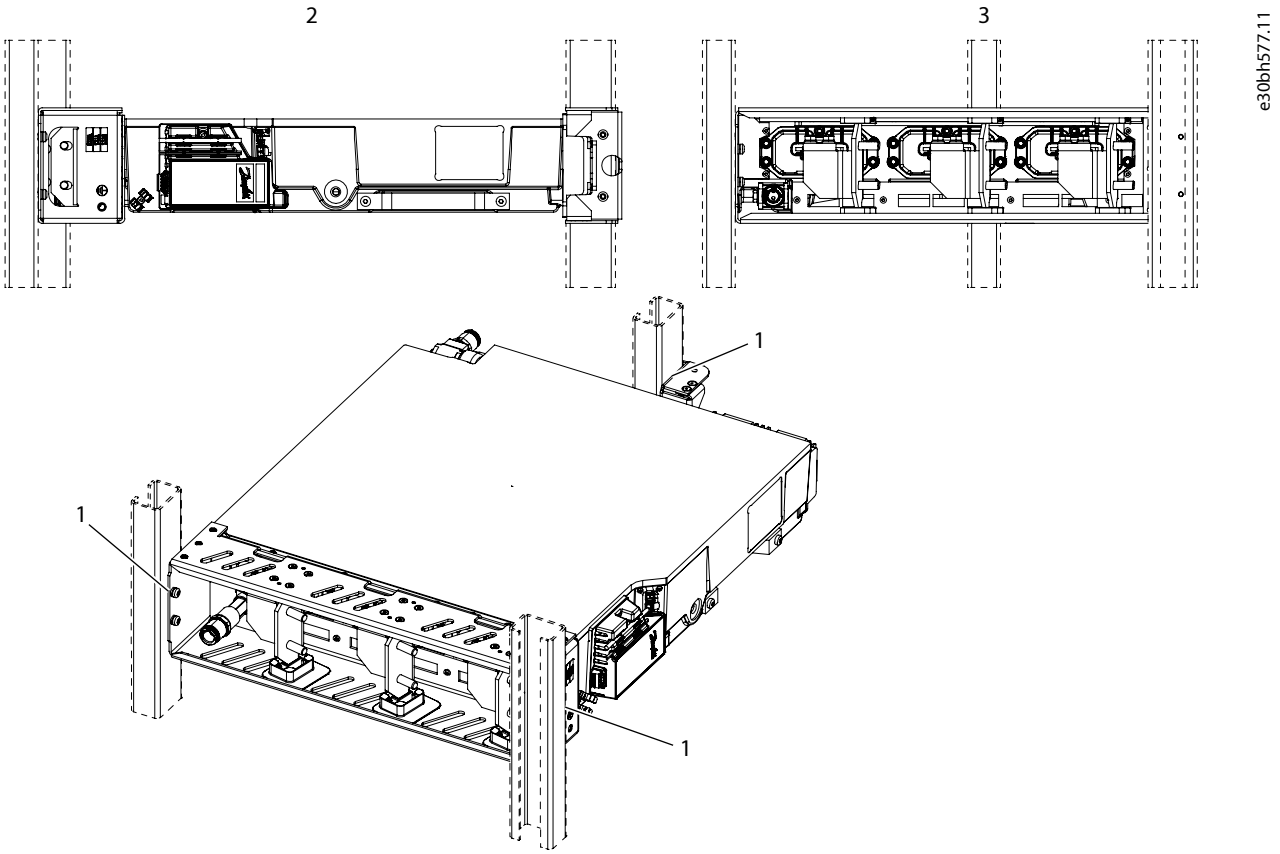

Figure 7: Mounting Holes of the System Module in Horizontal Position

1	Mounting holes	2	View from the front
3	View from the bottom		

3. Attach the system module to the mounting brackets of the cabinet.

The mounting brackets are not included in the delivery.

2.3.3 Installing System Modules into a Cabinet on their Backsides

1. Install the system module into the cabinet on its backside.
2. Use mounting holes to attach the system module into the cabinet.
   a. Use M6 grade 8.8 screws.
   b. For an AM12L or IM12L, use M8 grade 8.8 screws for the lower parts.

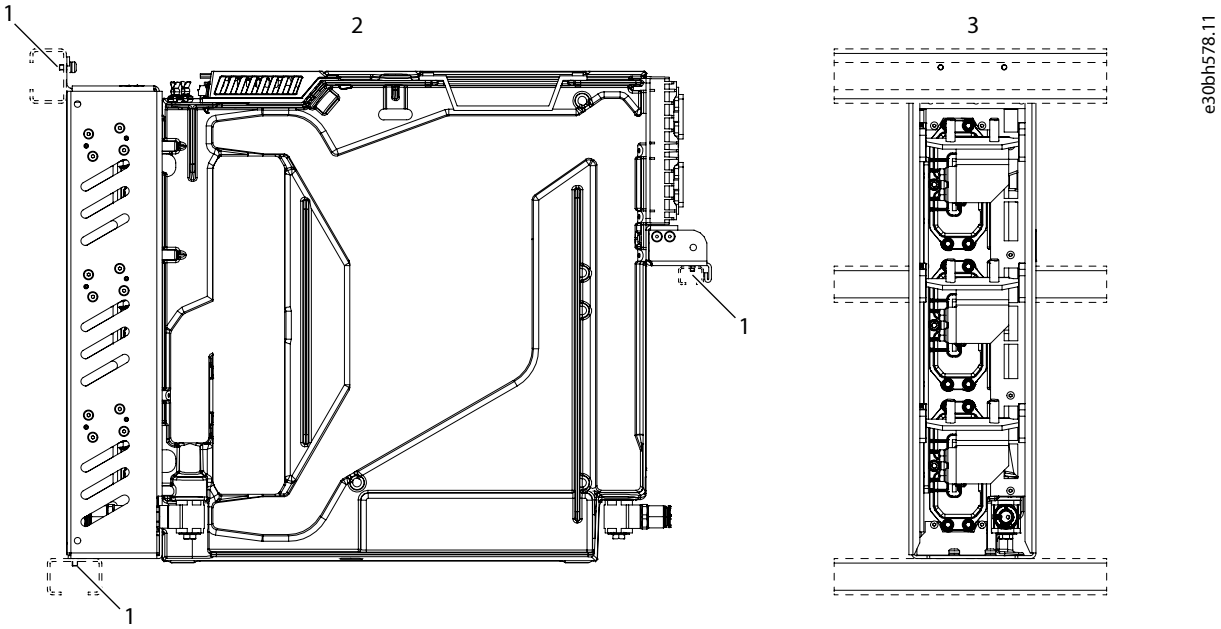

Figure 8: Mounting Holes of the System Module on its Backside

1	Mounting holes	2	View from the side
3	View from the bottom		

3. Attach the system module to the mounting brackets of the cabinet.

The mounting brackets are not included in the delivery.

2.4 Installing System Modules with Integration Units

2.4.1 Installing System Modules with Integration Units into a Cabinet Vertically

1. Install the system module into the cabinet in a vertical position.
2. Use mounting holes to attach the system module into the cabinet.
   a. For aluminum parts, use M6 grade 8.8 screws with a thread depth of 6–14 mm (0.24–0.55 in), and a tightening torque of 6–8 Nm (53–71 in-lb).
   b. For sheet metal parts, use M5 (DIN 7500) thread-forming screws with a maximum thread depth of 20 mm (0.78 in), and a tightening torque of 3–4 Nm (27–35 in-lb).

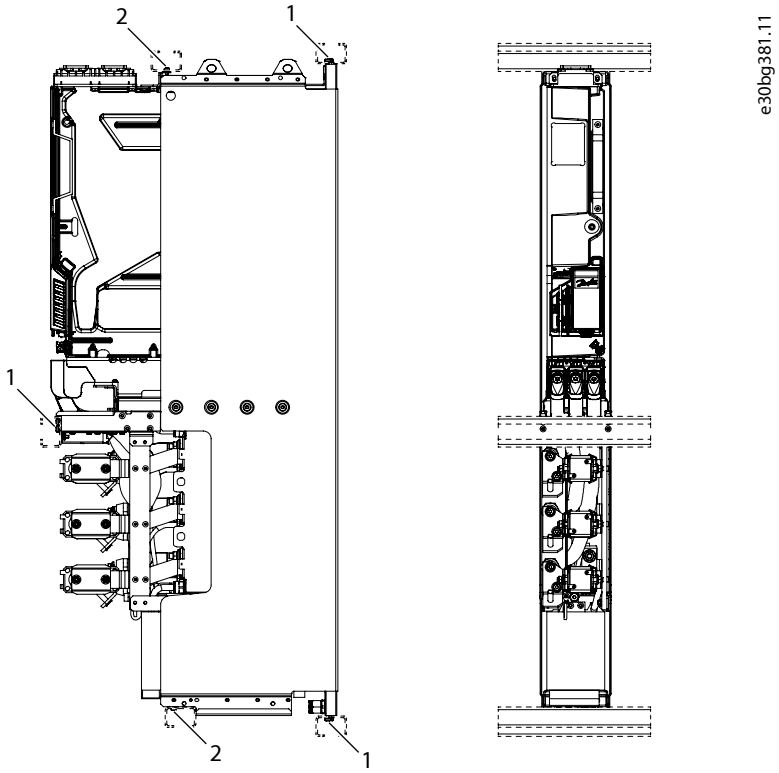

Figure 9: Mounting Holes of the System Module, AFE with the Integration Unit

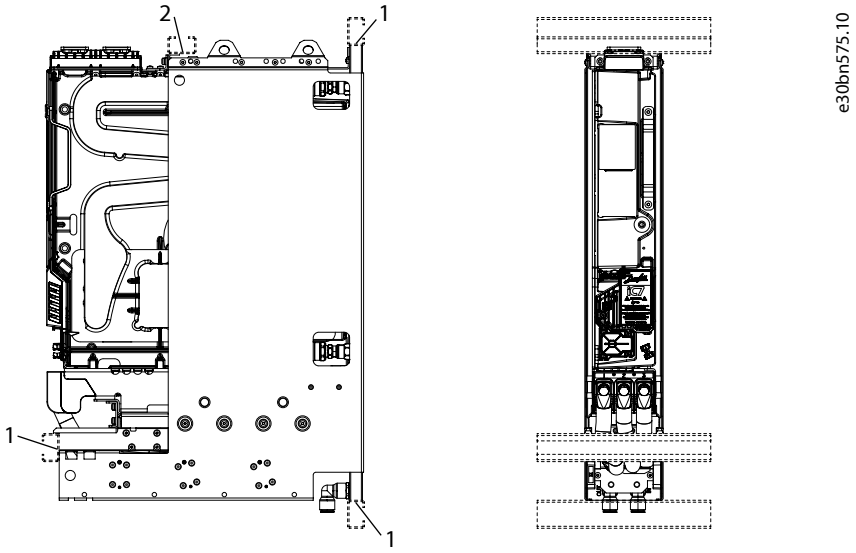

Figure 10: Mounting Holes of the System Module with Short Integration Unit (+AE01)

1	Mounting holes in aluminum parts	2	Mounting holes in sheet metal parts

3. Attach the system module to the mounting brackets of the cabinet.

The mounting brackets are not included in the delivery.

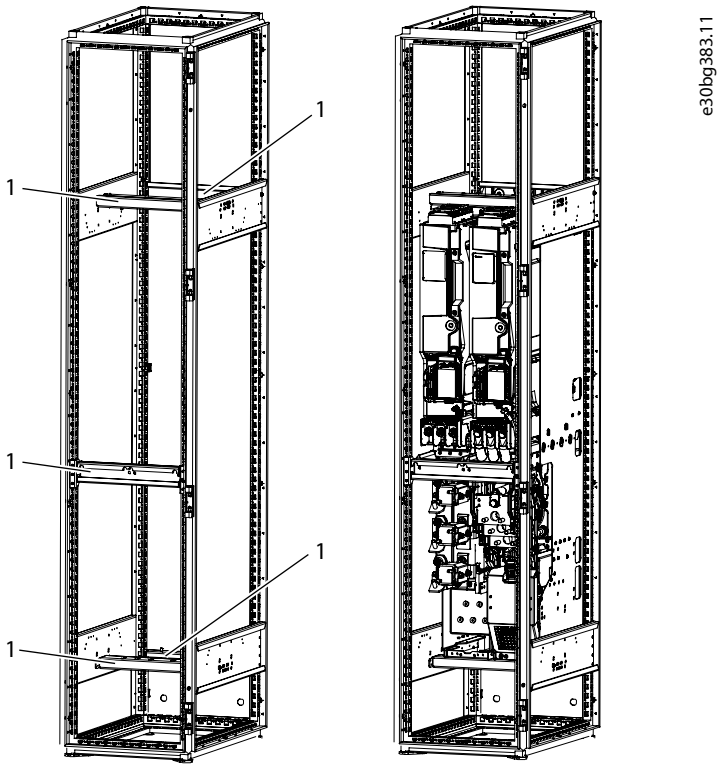

Figure 11: The Mounting Brackets and the Installation of System Modules with the Integration Unit into the Cabinet

1	Mounting brackets

2.4.2 Installing System Modules with Integration Units into a Cabinet Horizontally

1. Install the system module into the cabinet in a horizontal position on its side.

   Make sure that the cover plate is pointing up. See Figure 12.

2. Use mounting holes to attach the system module into the cabinet.
   a. For aluminum parts, use M8 grade 8.8 screws with a thread depth of 6–14 mm (0.24–0.55 in), and a tightening torque of 6–8 Nm (53–71 in-lb).
   b. For sheet metal parts, use M5 (DIN 7500) thread-forming screws with a maximum thread depth of 20 mm (0.78 in), and a tightening torque of 3–4 Nm (27–35 in-lb).

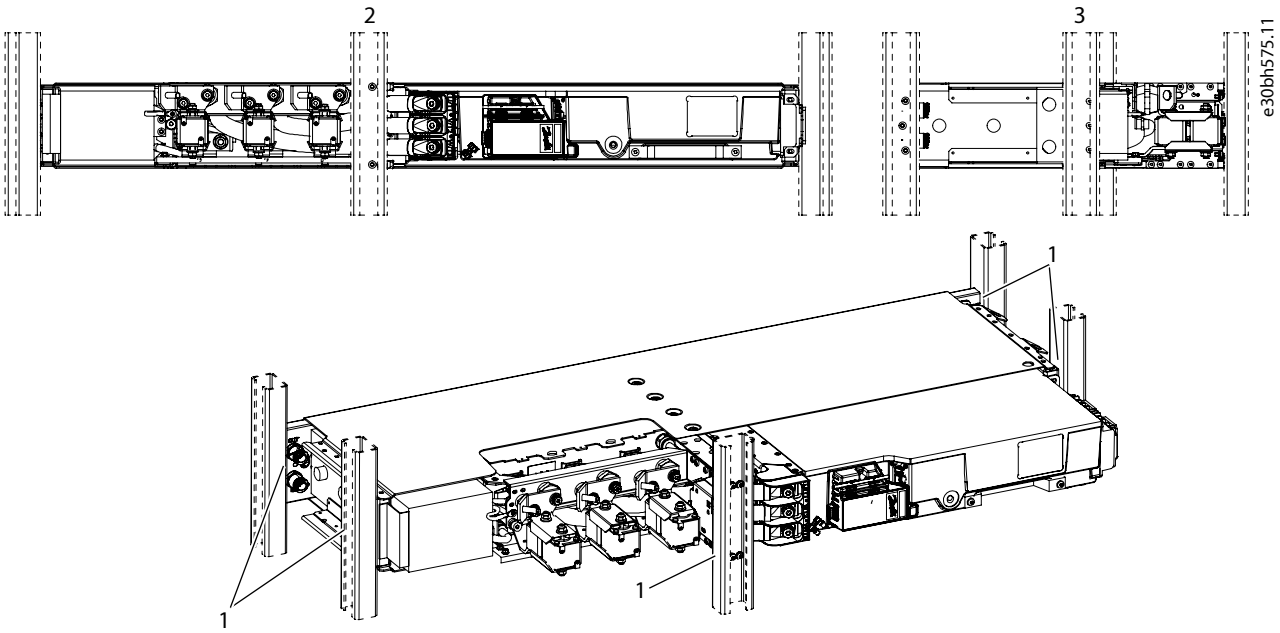

Figure 12: Mounting Holes of the System Module with the Integration Unit in Horizontal Position

1	Mounting holes	2	View from the front
3	View from the bottom		

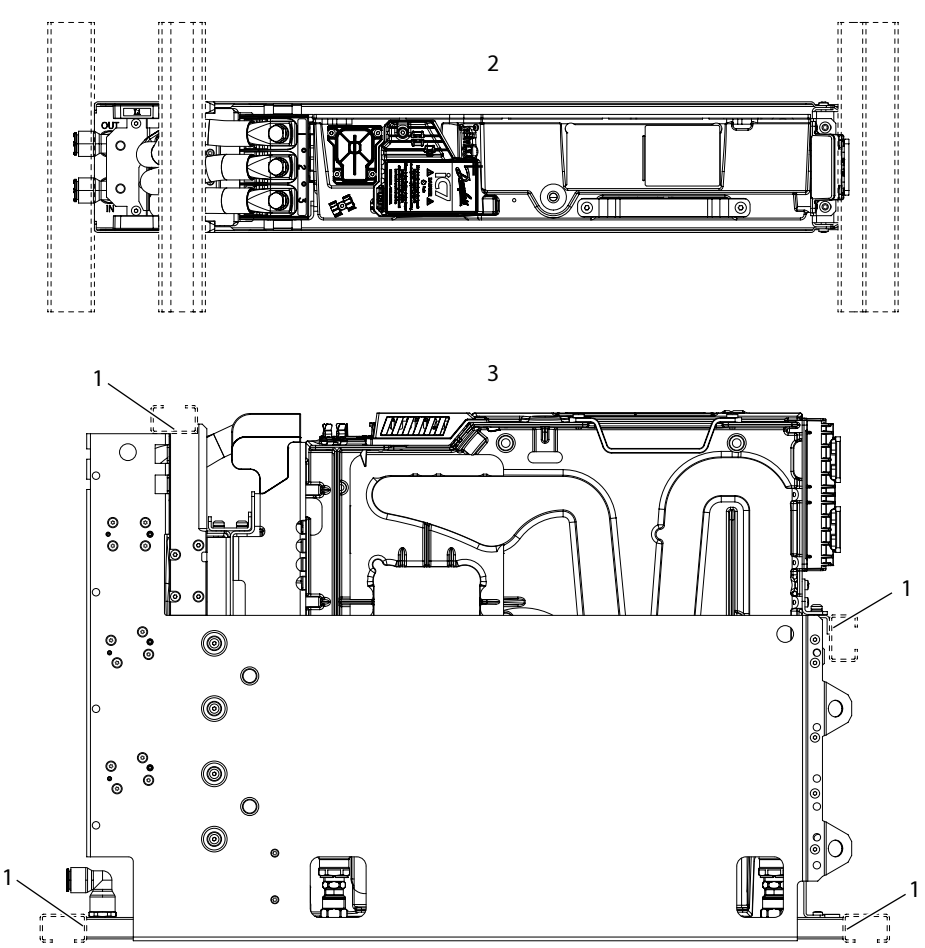

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Figure 13: Mounting Holes of the System Module with Short Integration Unit (+AE01) in Horizontal Position

1	Mounting holes	2	View from the front
3	View from below		

3. Attach the system module to the mounting brackets of the cabinet.

The mounting brackets are not included in the delivery.

2.4.3 Installing System Modules with Integration Units into a Cabinet on their Backsides

1. Install the system module into the cabinet on its backside.
2. Use mounting holes to attach the system module into the cabinet.
   a. For aluminum parts, use M6 grade 8.8 screws with a thread depth of 6–14 mm (0.24–0.55 in), and a tightening torque of 6–8 Nm (53–71 in-lb).
   b. For sheet metal parts, use M5 (DIN 7500) thread-forming screws with a maximum thread depth of 20 mm (0.78 in), and a tightening torque of 3–4 Nm (27–35 in-lb).

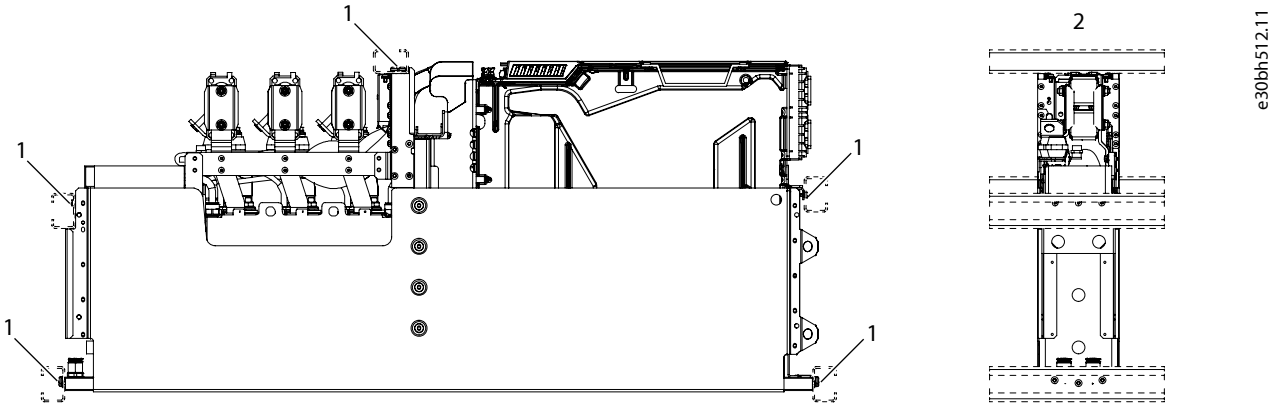

Figure 14: Mounting Holes of the System Module with the Integration Unit on its Backside

1	Mounting holes	2	View from the bottom of the module

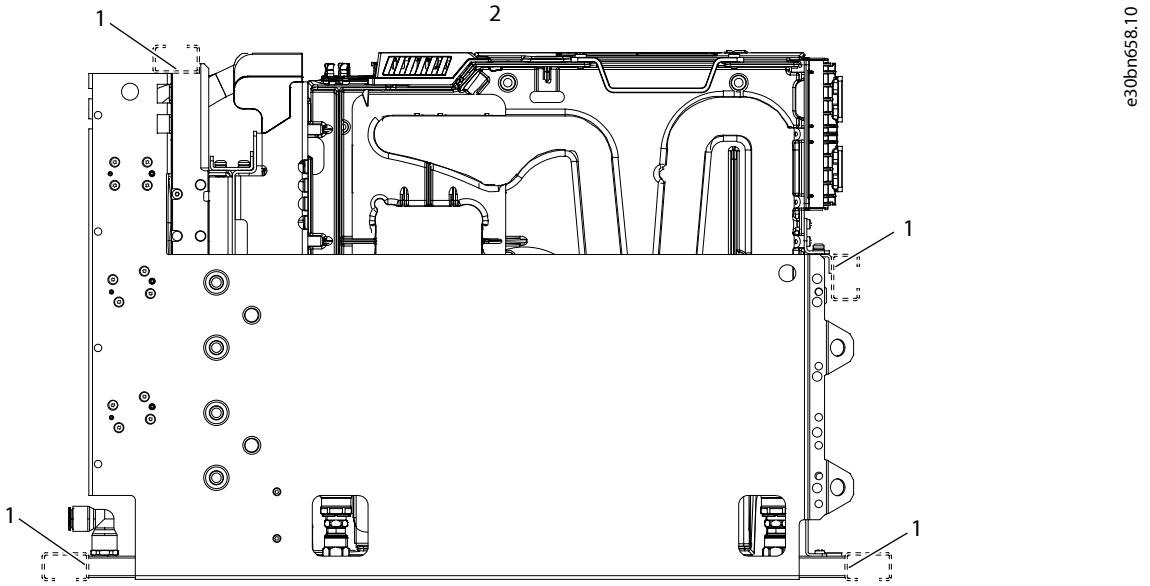

Figure 15: Mounting Holes of the System Module with Short Integration Unit (+AE01) on its Backside

1	Mounting holes	2	View from the side

3. Attach the system module to the mounting brackets of the cabinet.

The mounting brackets are not included in the delivery.

2.5 Installing Filters

2.5.1 Installing L Filter into a Cabinet, 400 A and 1000 A

1. Install the filter into the cabinet in a vertical position.
2. Align the filter so that the pins of the filter fit into the square holes at the back wall of the cabinet.

Check the precise location of the pins in the dimensional drawing of the filter.

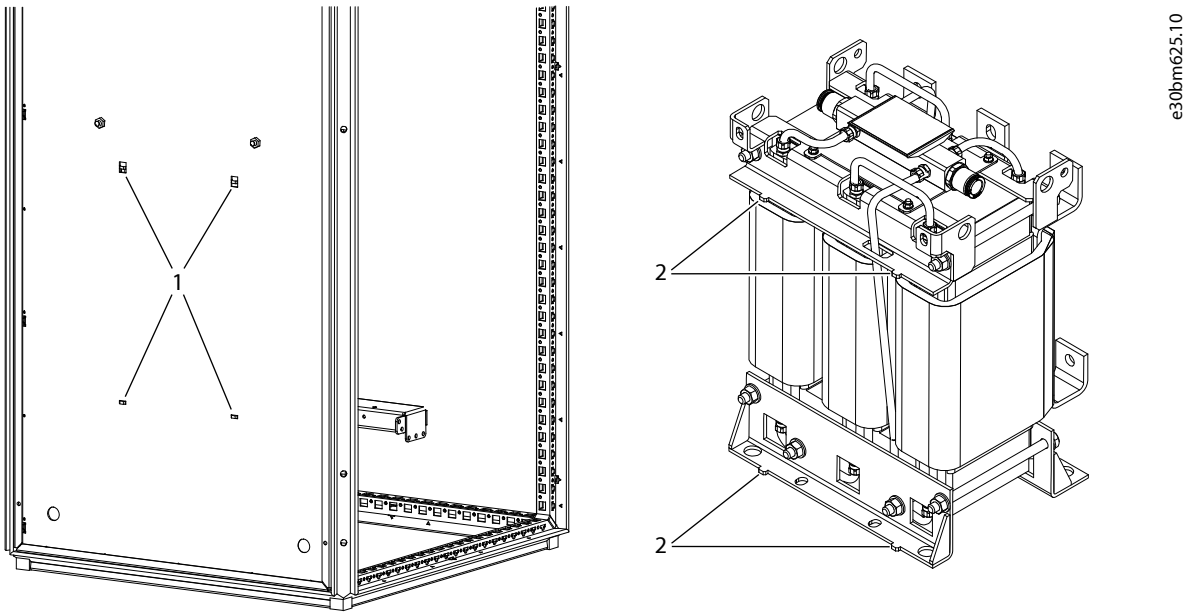

Figure 16: Aligning the Filter Pins with the Back Wall

1	Square mounting holes	2	Pins

3. Use the mounting holes to attach the filter. Attach the filter from all these corners: top back, bottom front, and bottom back.

Check the precise location of the mounting holes in the dimensional drawing of the filter.

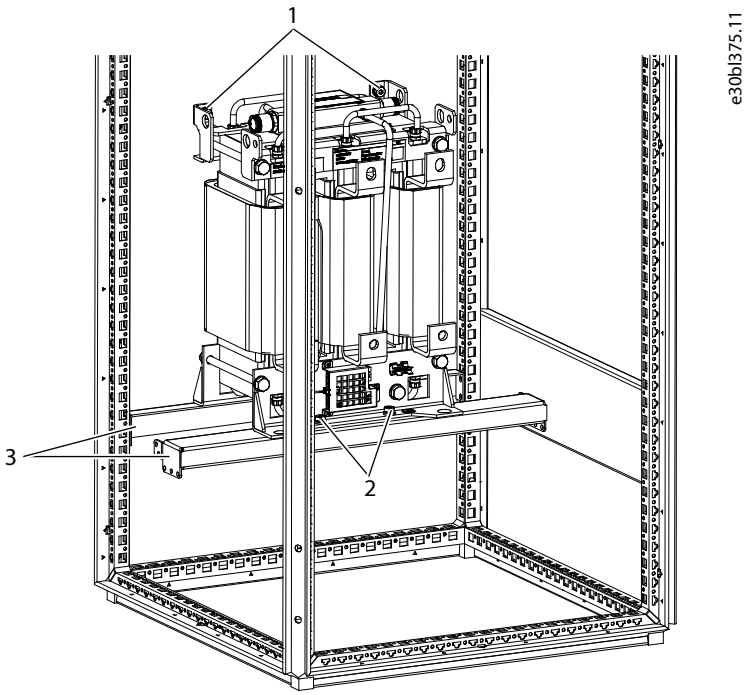

Figure 17: Installing the L Filter into a Cabinet (400 A, 1000 A)

1	The mounting holes at the top	2	The mounting holes at the bottom
3	Brackets		

4. Use brackets to attach the filter from below.

The mounting brackets are not included in the delivery.

2.5.2 Installing L Filter into a Cabinet, 1640 A and 2300 A

1. Install the filter into the cabinet in a vertical position.

   The filter can also be installed upside down.

2. Use the mounting holes to attach the filter.

   a. Attach the filter from all the corners: top front, top back, bottom front, and bottom back.

   Check the precise location of the mounting holes in the dimensional drawing of the filter.

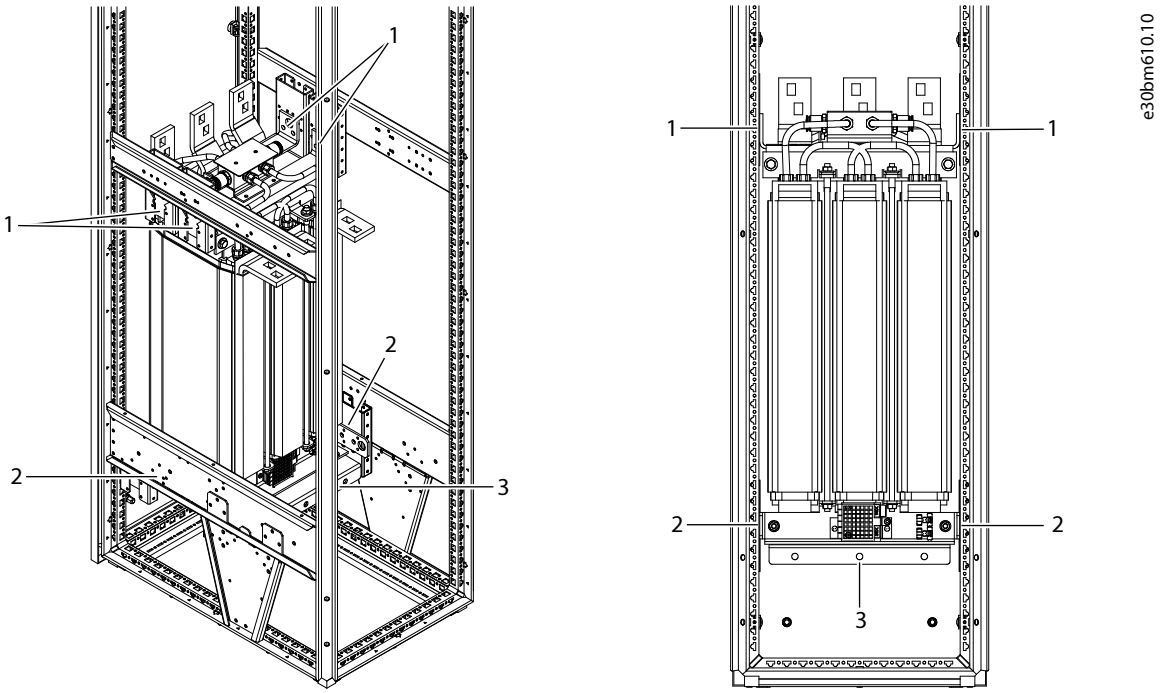

Figure 18: Installing the L Filter into a Cabinet (1640 A, 2300 A)

1	Mounting holes at the top	2	Mounting holes at the bottom
3	Brackets below the filter		

3. Use brackets to attach the filter from below.

   The mounting brackets are not included in the delivery.

   IMPORTANT: To make a stable installation, it is important to use brackets.

2.5.3 Installing the SISO Filter Feedback Capacitors into a Cabinet

1. Install the capacitors with the terminals upright.

   If another mounting orientation is required, make sure that the capacitor bank is properly supported. If necessary, contact Danfoss for instructions.

2. Make sure that the inductors or other components do not heat up the capacitors. For example, install the capacitors and inductors in separate sections.

   When selecting the installation location, consider the maximum cable lengths, see iC7 Series Liquid-cooled System Modules Design Guide.

3. Mount the capacitor bank with 4 screws.

   For mechanical dimensions and the positions of the mounting holes, see iC7 Series Liquid-cooled System Modules Design Guide.

4. Install the fuse holder for the feedback DC fuses on a DIN rail.

3 Cooling

3.1 Insertion of Pipes into Cooling Circuit Connectors

The insertion length of a Ø16 mm (0.63 in) pipe is 29 mm (1.14 in). Make a mark on the pipe where it can be checked that the pipe is correctly inserted into the cooling circuit connector.

To remove the pipe from the connector, push the release sleeve towards the connector and pull out the pipe.

For cold PA11 plastic pipes, the minimum bending radius is 138 mm (5.43 in). A smaller bending radius requires heating of the pipe. See 3.3 Cooling Circuit Pipes.

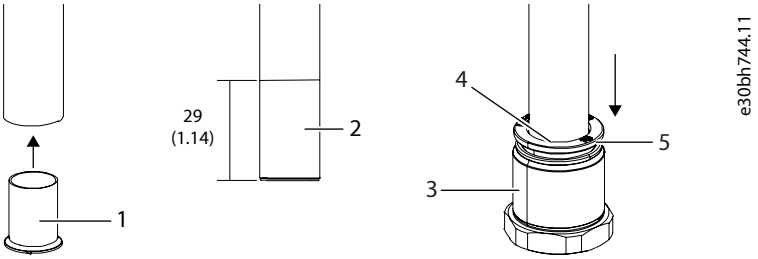

Figure 19: Inserting a Pipe into the Cooling Circuit Connector, mm (in)

1	The pipe ferrule	2	The pipe ferrule inside the pipe
3	A cooling circuit connector (available as option)	4	The mark in the pipe
5	The release sleeve		

3.2 Inlet and Outlet Connectors

3.2.1 Inlet and Outlet Connectors of System Modules

NOTICE

INCORRECT INLET AND OUTLET CONNECTIONS IN THE COOLING SYSTEM

If inlet and outlet connectors are connected incorrectly, the cooling does not work as expected. Incorrect cooling can damage the product.

- Make the connections carefully.

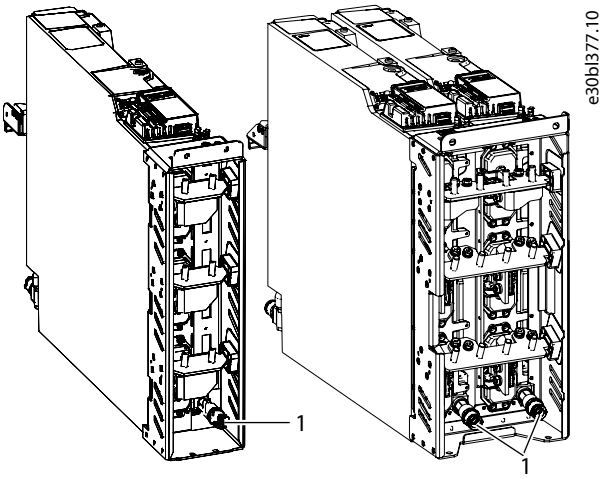

Figure 20: Inlet Connectors of IM10L (left) and IM12L (right)

1	Inlet connectors

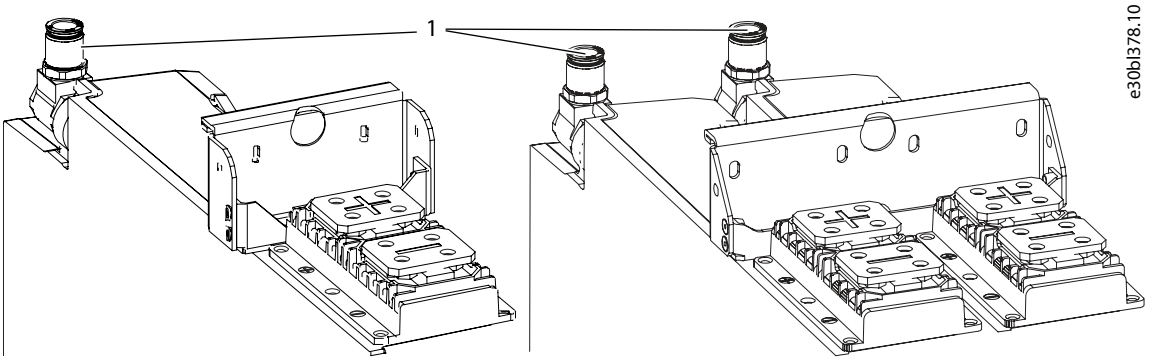

Figure 21: Outlet Connectors of IM10L (left) and IM12L (right)

1	Outlet connectors

3.2.2 Inlet and Outlet Connectors of System Modules with Integration Units

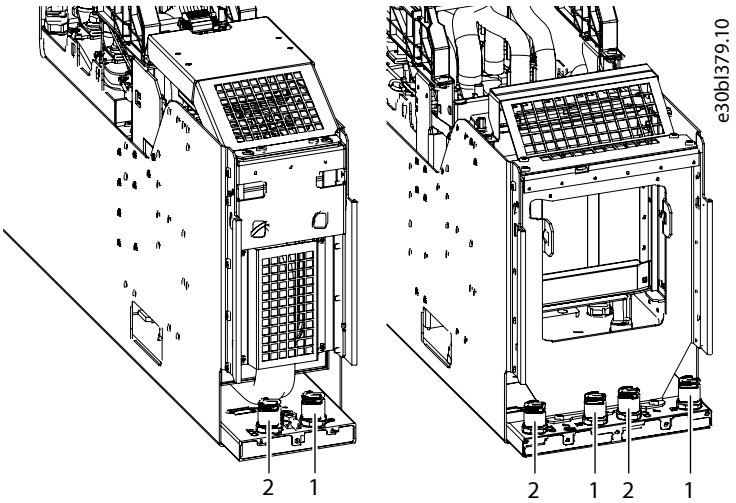

Figure 22: Inlet and Outlet Connectors of IR10L (left) and IR12L (right)

1	Inlet connector	2	Outlet connector

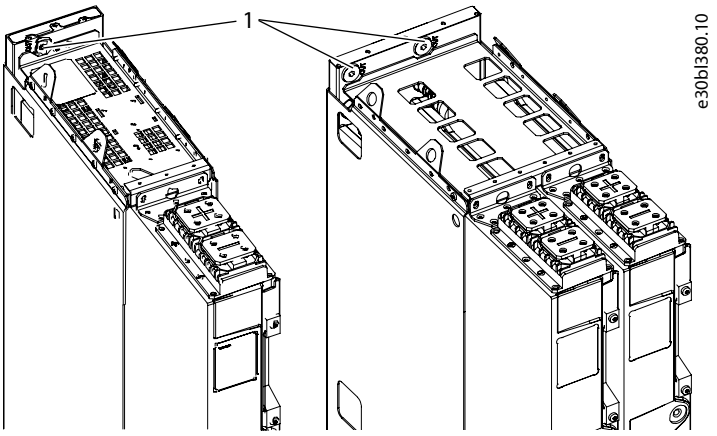

Figure 23: Optional Outlet Connectors of IR10L (left) and IR12L (right)

1	Optional outlet connector

3.2.3 Inlet and Outlet Connectors of System Modules with Short Integration Units

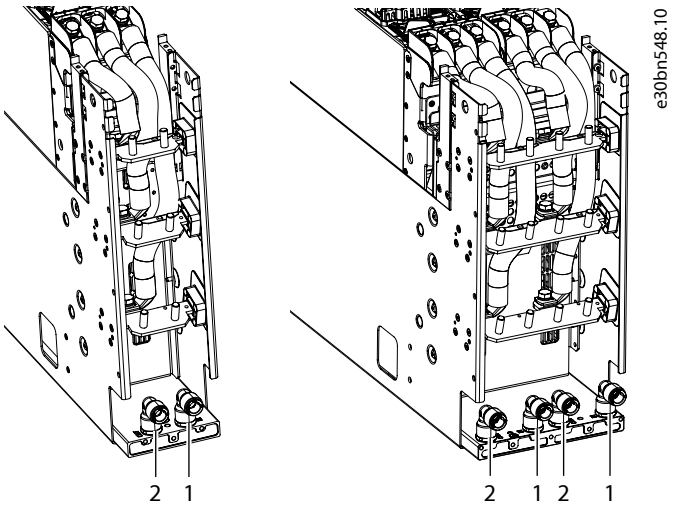

Figure 24: Inlet and Outlet Connectors of IR10/AR10/DR10/BR10 (+AE01) (left) and IR12L/AR12/DR12L/BR12L (+AE01) (right)

1	Inlet connector	2	Outlet connector

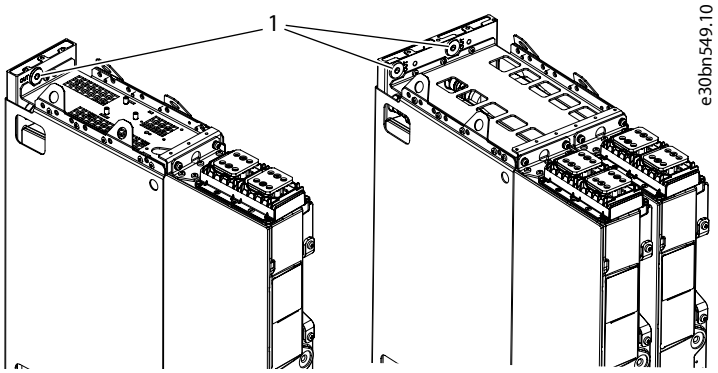

Figure 25: Optional Outlet Connectors of IR10/AR10/DR10/BR10 (+AE01) (left) and IR12L/AR12/DR12L/BR12L (+AE01) (right)

1	Optional outlet connector

3.2.4 Inlet and Outlet Connectors of the L Filter

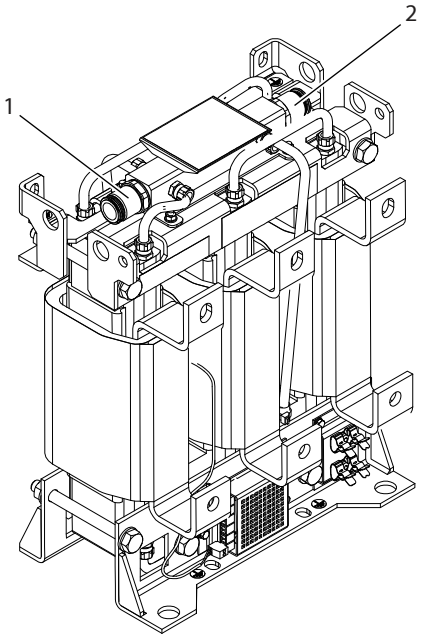

Figure 26: Inlet and Outlet Connectors of the L Filter

1	Inlet/outlet connector	2	Inlet/outlet connector

3.2.5 Inlet and Outlet Connectors of the SISO Filter Reactor

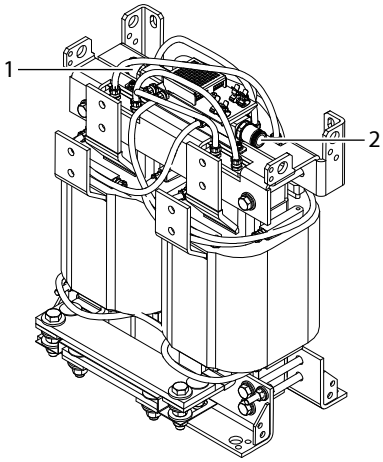

Figure 27: Inlet and Outlet Connectors of the SISO Filter Reactor

1	Inlet/outlet connector	2	Inlet/outlet connector

3.3 Cooling Circuit Pipes

The pipes used in the cooling circuit are PA11 plastic pipes with a diameter of Ø16/13 mm (0.63/0.51 in) (Rilsan model code BESNOP40TL).

There are 2 ways to make permanent bends to the pipes.

- The quickest and easiest way is to make the bend in the air by bending it by hand. Do this if only 1 bend is needed and the dimensions do not matter, or the dimension can be adjusted by cutting the pipe after bending.

- If multiple precise pipes with several bends are needed, it is recommended to use a bending jig. There are commercial jigs on the market (for example, Eiskoffer Bending Kit from Alphacool), but the jig can be also self-made from plywood or some other easy-to-work material. But the material must be able to withstand at least 200 °C (392 °F).

Required tools for bending the pipes:

- Gloves
- Adjustable heat gun
- Round silicone rubber cord
  - Ø12–12.5 mm (0.47–0.49 in)
  - Solid
  - Hardness: minimum 60 Shore A, recommended >70 Shore A

Recommended tools for bending the pipes:

- Water bucket or sink
- Distilled water
- Bending jig

NOTICE

OVERHEATING OF THE PIPES

If the pipe is overheated, the wall thickness and pressure resistance change, and the shape of the pipe collapses easily.

- Do not heat the pipes above 180 °C (356 °F).

NOTICE

UNEVEN HEATING OF THE PIPES

If the pipe is heated unevenly or over a too small area, it wrinkles easily when the pipe is bent. The wall strength and pressure resistance at the wrinkled point is uncertain.

- Before bending the pipes, heat the pipes evenly and over the whole bending area.

3.4 Bending the Pipes

3.4.1 Bending Pipes in the Air

1. Insert the silicon cord into the pipe and to the bending location.

   It is recommended that the pipe end is at least 5 cm (2 in) from the bending area. If the bending area is too close to the pipe end, the pipe end can become oval, which can cause the pipe and fitting joint to leak.

   It is recommended to moisten the cord with distilled water to make it easier to insert into the pipe.

   The cord is inserted into the pipe before it is heated, to produce equal counter pressure and to prevent the tube from buckling. The hard pipe is easy to bend evenly with the cord inside.

2. Set the heat gun upright on the table and set the temperature to 350 °C (662 °F).

   Make sure that the heat gun does not fall down.

3. Slowly move the pipe back and forth while rotating it over the heat gun.

The aim is to heat the pipe evenly over the entire bending area to around 150–170 °C (302–338 °F). Examples of heating times:

- When making a simple L-bend, a suitable heating time is approximately 2 minutes for a distance of 5–10 cm (2–4 in).
- When making a U-bend, the heating time is approximately 4 minutes for 15–20 cm (6–8 in).

Beware of overheating. If the pipe temperature rises above 180 °C (356 °F), it starts to melt, and the wall thickness can change. As the temperature of the pipe approaches the melting point, the pipe changes color from cloudy to clear, and starts to smell burned.

4. Once the tube is heated all around the bending area, bend it to the desired shape.

   The recommended minimum bending radius >30 mm (1.18 in).

5. Hold the pipe in the desired position and cool it quickly, for example, in a sink or under a tap.

   If the pipe was heated enough, the bending is permanent.

6. Pull the cord out of the pipe. If the bend is steep, it can be necessary to open the bend slightly to get out the cord.
7. After bending the pipe, check the circularity of the pipe ends.

   A Ø16/13 mm (0.63/0.51 in) tube ferrule (for example, 1827-16-13 from Parker) can be inserted into the pipe as an aid to assess the circularity of the pipe.

3.4.2 Bending Pipes with a Bending Jig

These instructions were prepared with the Eiskoffer bending kit from Alphacool, but other commercial or self-made jigs can also be used.

1. Prepare the bending jig.
2. Insert the silicon cord in to the pipe and to the bending location.

   It is recommended that the pipe end is at least 5 cm (2 in) from the bending area. If the bending area is too close to the pipe end, the pipe end can become oval, which can cause the pipe and fitting joint to leak.

   It is recommended to moisten the cord with distilled water to make it easier to insert into the pipe.

   The cord is inserted into the pipe before it is heated to produce equal counter pressure and to prevent the tube from buckling. The hard pipe is easy to bend evenly with the cord inside.

3. With the cord inside, bend the pipe to the jig.

   The recommended minimum bending radius >30 mm (1.18 in).

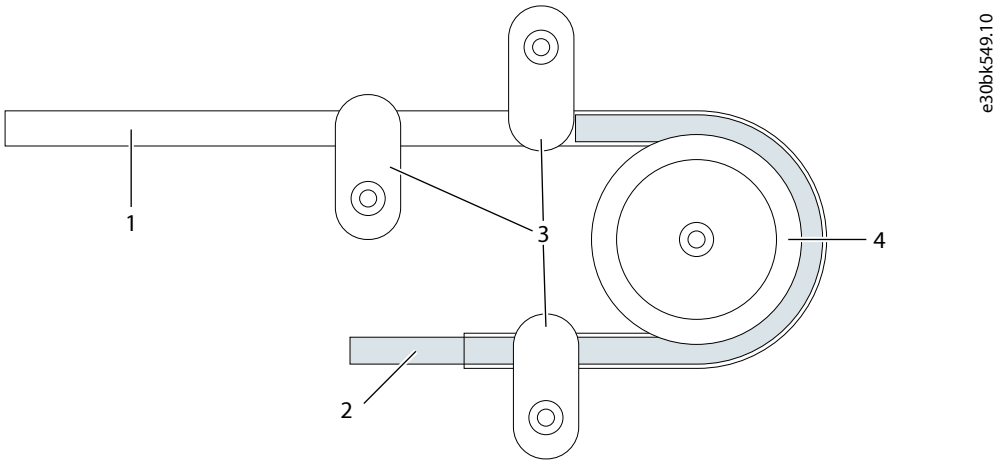

Figure 28: Pipe Bending Jig Example

1	Pipe	2	Silicon cord
3	Pipe holders	4	Bending wheel

4. Set the heat gun temperature to 200 °C (392 °F).
5. Slowly move the heat gun back and forth over the entire bending area.

   The aim is to heat the pipe evenly over the entire bending area to around 150–170 °C (302–338 °F). When the pipe is heated only at the outer edge, it takes time to heat the inner edge of the pipe as well. Therefore, the temperature used is fairly low and, for example, when making a 180° bend with radius Ø32 mm (Ø1.26 in), the suitable heating time is 10 minutes.

   Beware of overheating. If the pipe temperature rises above 180 °C (356 °F), it starts to melt, and the wall thickness can change. As the temperature of the pipe approaches the melting point, the pipe changes color from cloudy to clear, and starts to smell burned.
6. Before removing the pipe from the jig, let it cool completely. The cooling takes more than 10 minutes.

   To accelerate the cooling process, submerge the jig and pipe in water.
7. Once the pipe has cooled, remove it from the jig.

   If the pipe was heated enough, the bending is permanent.
8. Pull the cord out of the pipe. If the bend is steep, it can be necessary to open the bend slightly to get out the cord.
9. After bending the pipe, check the circularity of the pipe ends.

   A Ø16/13 mm (0.63/0.51 in) tube ferrule (for example, 1827-16-13 from Parker) can be inserted into the pipe as an aid to assess the circularity of the pipe.

An alternative way to use the bending jig is to preheat the pipes as advised in 3.4.1 Bending Pipes in the Air, and then fold them into the jig and let them cool down.

4 Electrical Installation

4.1 Control System of the System Modules

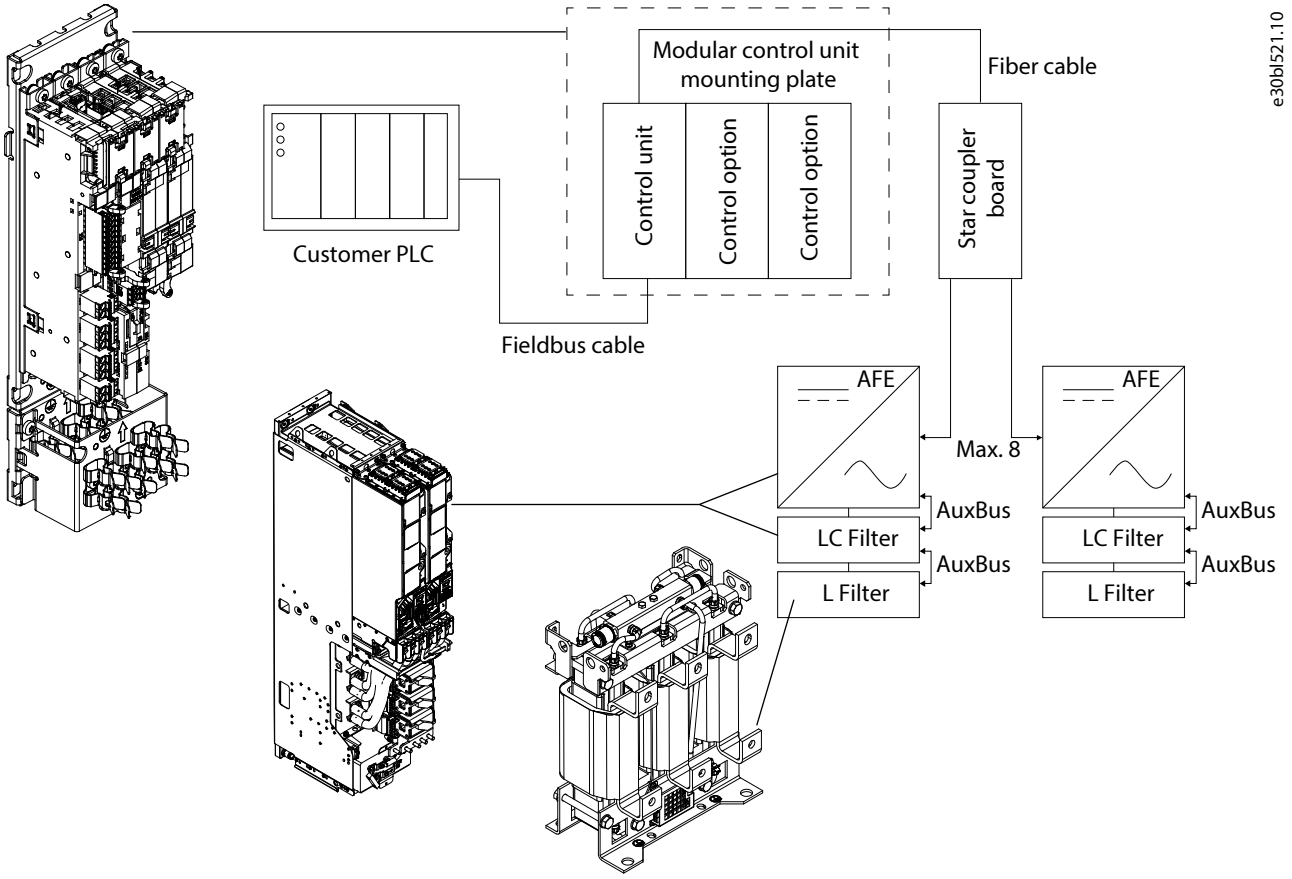

Figure 29: Example of a Control System of an AFE Module

4.2 Grounding Principles

Ground the product 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 ½ 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.

4.3 Prerequisites for Cable Installation

Table 1: Minimum Separation Distances between Motor and Other Cables

Length of the shielded motor cable m (ft)	Minimum separation distance between motor and other cables m (ft)
0–50 (0–164)	0.3 (1.0)
50–150 (164–492)	1.0 (3.3)

1. Before starting, make sure that none of the components of the product 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, 416 A INU module is based on 2 parallel cables, and 820 A INU 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 the 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 Ix10L: 2x(3x120+70) mm^2, 150 m, 0.75 nF/m → C_{TOT} = 2 x 150 m x 0.75 nF/m = 225 nF = C_{MAX}
   b. Example where the number of motor cables connected in parallel is higher than the default: 3x(3x120+70) mm^2, 100 m, 0.75 nF/m → C_{TOT} = 3 x 100 m x 0.75 nF/m = 225 nF = C_{MAX}
   c. Example where motor cable capacitance is higher than the default: 2x(3x120+70) mm^2, 130 m, 0.85 nF/m → C_{TOT} = 2 x 130 m x 0.85 nF/m = 221 nF < C_{MAX}
8. The minimum length of the motor cables without output filters is 5 m (16.4 ft).
9. See the maximum cable length of the filters in iC7 Series Liquid-cooled System Modules Design Guide.
10. Only use symmetrical and shielded motor cables.
11. 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.
12. Perform the cable insulation checks if necessary.

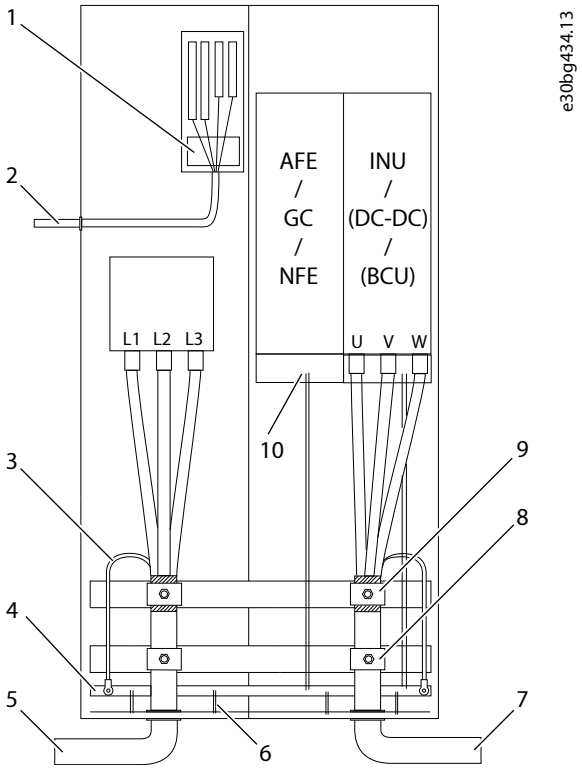

Figure 30: Cabling Principle

1	Grounding of the control cable	2	Control cable
3	Grounding conductor	4	PE busbar
5	Mains cables	6	Grounding of the enclosure
7	Motor cables	8	Strain relief
9	The grounding clamp, 360° grounding	10	Grounding of the system module to the PE busbar

4.4 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.

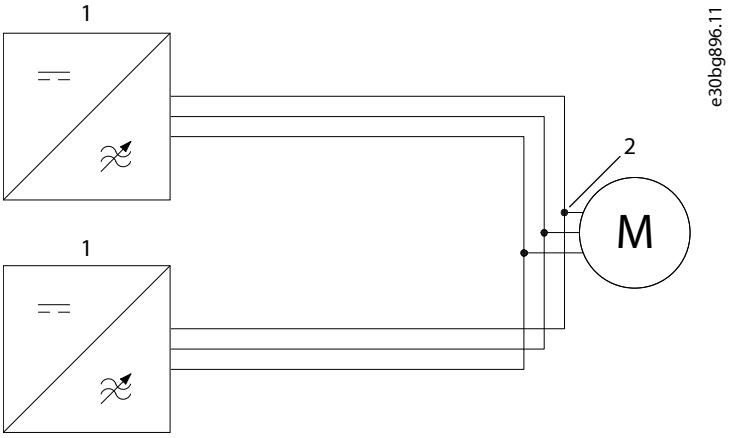

Figure 31: Recommended Installation

1	Inverter module	2	Common coupling point at the motor terminals

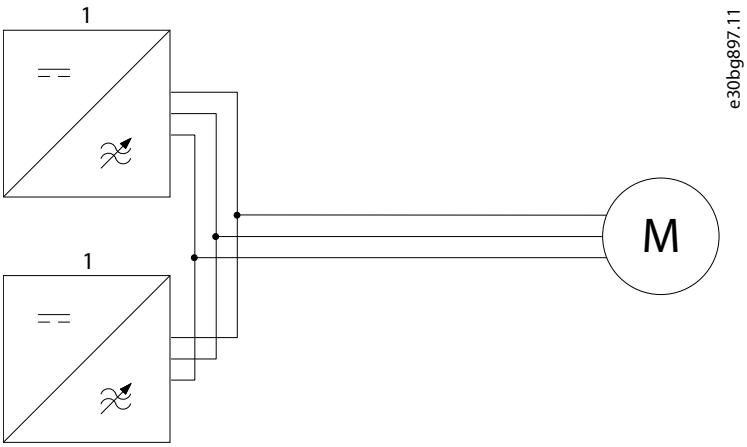

Figure 32: Alternative Installation Method

1	Inverter module

4.5 Installing the Cables

4.5.1 AFE and Grid Converter Field Cabling Installation

The field cabling terminals are not included in the delivery of the AFE or GC module. Install field cabling to the appropriate terminals. Connect the terminals of the AFE/GC to the LCL Filter terminals with internal cables or busbars. Define the size of the internal cables or busbars according to the nominal current of the drive, and according to local regulations. Also see 7.2.5 Bolt Sizes for the Internal AC Busbars/Cables for AFE and GC Modules, 380–690 V AC and 7.2.7 Internal AC Busbar Sizing within the Enclosure of the AFE/GC Modules.

4.5.2 Installing the Cables, AFE and GC (AR10L, AR12L)

1. Find the mains terminals in the lower part of the system module. Notice the location of the L1, L2, and L3 terminals.

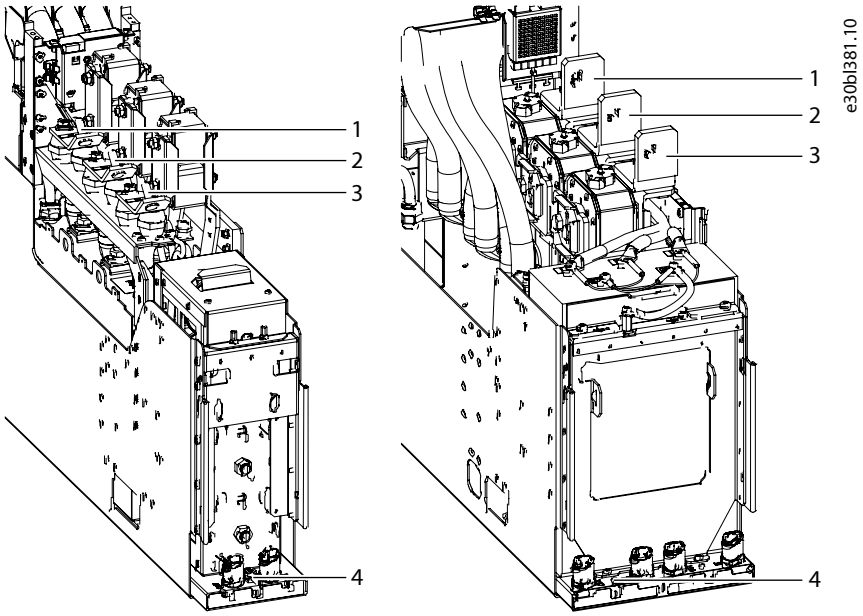

Figure 33: The Mains Terminals and Grounding Terminal of AFE and GC, AR10L (left) and AR12L (right)

1	Mains terminal L1	2	Mains terminal L2
3	Mains terminal L3	4	Grounding terminal

2. Connect the mains cables to the corresponding mains terminals.

   See the bolt sizes in 7.2.1 General Information on the Cable Tables.

   See the correct tightening torques in 7.1 Tightening Torques.

4.5.3 Installing the Cables, INU (IR10L, IR12L)

1. Find the motor terminals in the lower part of the system module. Notice the location of the U, V, and W terminals.

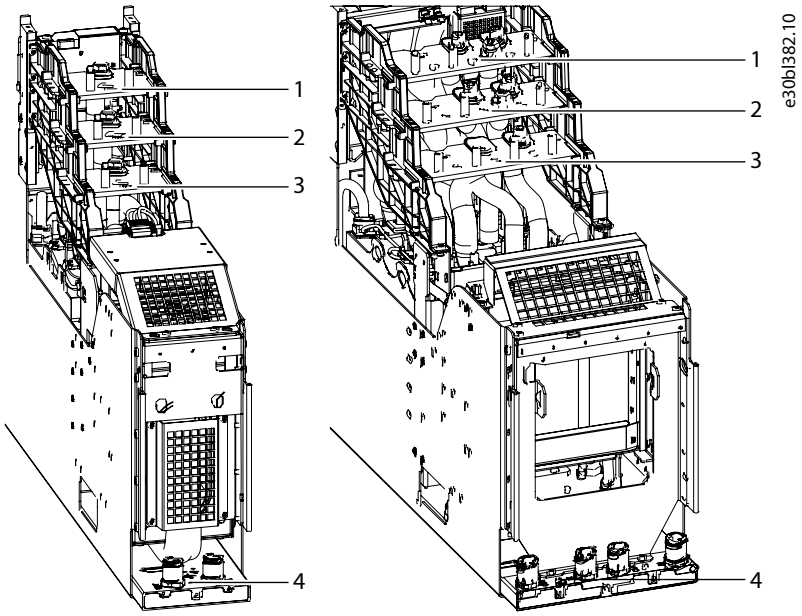

Figure 34: The Motor Terminals and the Grounding Terminal of INU, IR10L (left) and IR12L (right)

1	Motor terminal U	2	Motor terminal V
3	Motor terminal W	4	Grounding terminal

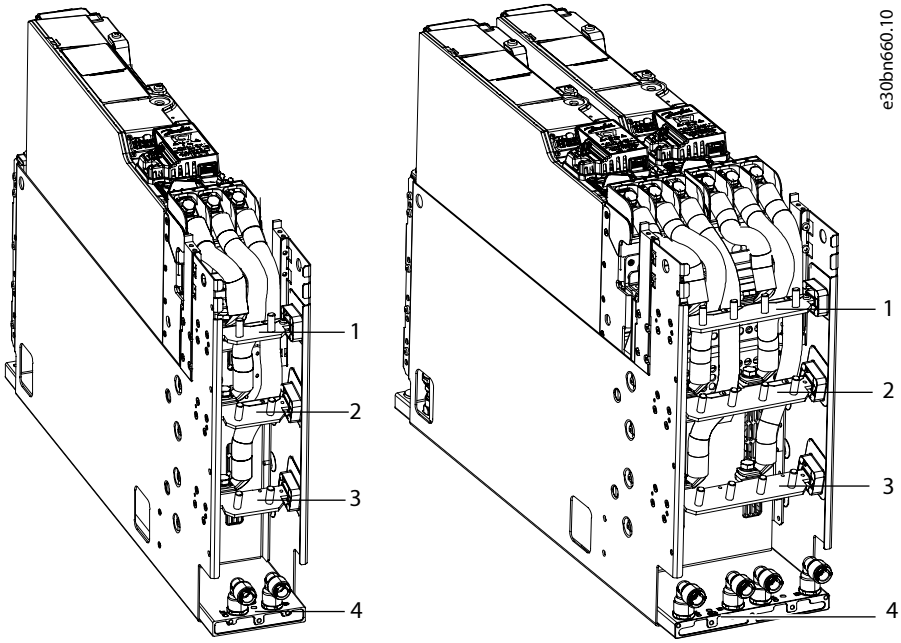

Figure 35: The Motor Terminals and the Grounding Terminal of INU with the Short Integration Unit, IR10L (left) and IR12L (right)

1	Motor terminal U	2	Motor terminal V
3	Motor terminal W	4	Grounding terminal

2. Connect the motor cables to the corresponding motor terminals.

See the bolt sizes in 7.2.1 General Information on the Cable Tables.

See the correct tightening torques in 7.1 Tightening Torques.

The terminal bolt spacing is 48 mm (1.89 in).

4.5.4 Installing the Cables, DC/DC Converter (DR10L, DR12L)

1. Find the DC and grounding terminals in the lower part of the system module.

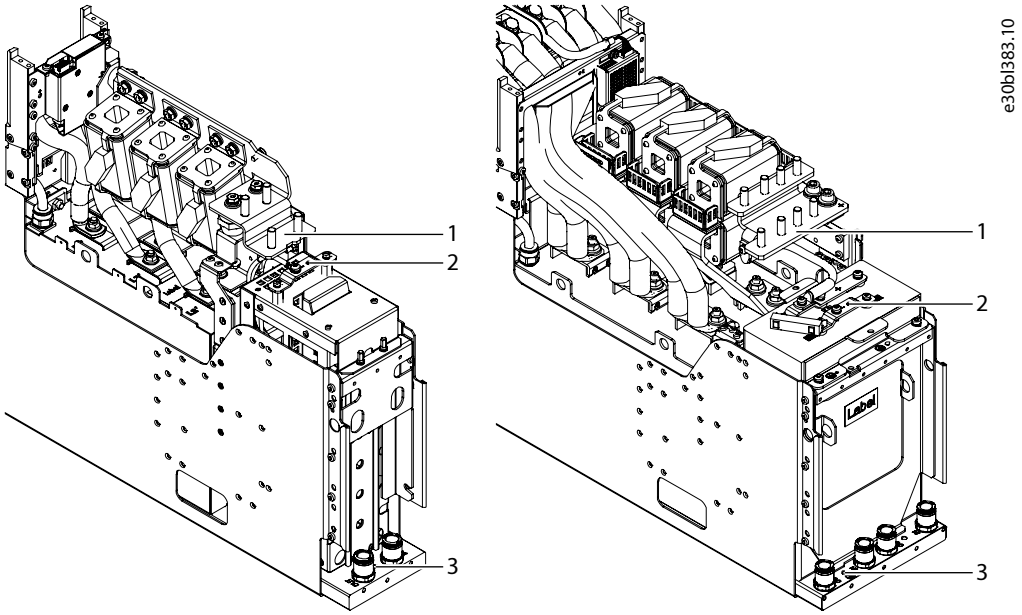

Figure 36: The DC and Grounding Terminals of DC/DC Converter, DR10L (left) and DR12L (right)

1	+ terminal (source DC+)	2	DC- connection point for DC source to filter capacitor
3	Grounding terminal		

2. Connect the DC cables to the terminals.

See the bolt sizes in 7.2.1 General Information on the Cable Tables.

See the correct tightening torques in 7.1 Tightening Torques.

The terminal bolt spacing is 48 mm (1.89 in).

To optimize the performance of the DC-filter capacitor, make sure that the wire between the capacitor and the DC bus is as short as possible.

4.5.5 Installing the Cables, INU (IM10L, IM12L), AFE and CG (AM10L, AM12L), and DC/DC Converter (DM10L, DM12L)

1. Find the power terminals below the system module. Notice the location of the different terminals.

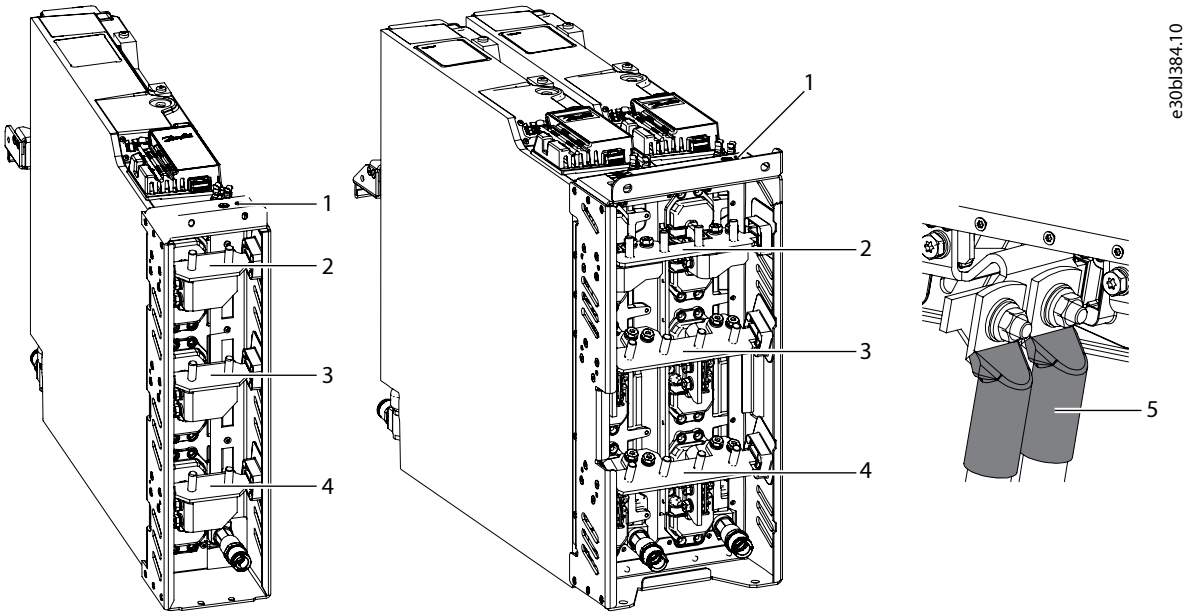

Figure 37: The Power Terminals of IM10L, AM10L, and DM10L (left) and IM12L, AM12L, and DM12L (right)

1	Grounding terminal	2	Motor terminal U (IM10L), mains terminal L1 (AM10L), or DC terminal U (DM10L)
3	Motor terminal V (IM10L), mains terminal L2 (AM10L), or DC terminal V (DM10L)	4	Motor terminal W (IM10L), mains terminal L3 (AM10L), or DC terminal W (DM10L)
5	Cable lugs and heat-shrink tubes		

2. Attach the cable lugs to the cables.
3. Put heat-shrink tubes around the cable lugs and shrink them.
4. Install the cable lugs to the corresponding motor terminals with washers and nuts.

See the bolt sizes in 7.2.1 General Information on the Cable Tables.

See the correct tightening torques in 7.1 Tightening Torques.

The terminal bolt spacing is 48 mm (1.89 in).

4.5.6 Installing the Cables with the Power Terminal Adapter, INU IR10L, IR12L, and BCU BR10L, BR12L

Use this procedure to install cables when more than 2 smaller power cables are preferred, for example in marine installations. See 7.2.13 Marine Cable Sizes for INU Modules 380–500 V AC and 7.2.14 Marine Cable Sizes for INU Modules 525–690 V AC.

One power terminal adapter (+AFMC) is needed for IR10L, and 2 adapters for IR12L.

Procedure

1. Install a power terminal adapter first to the lowest terminal W/T3.

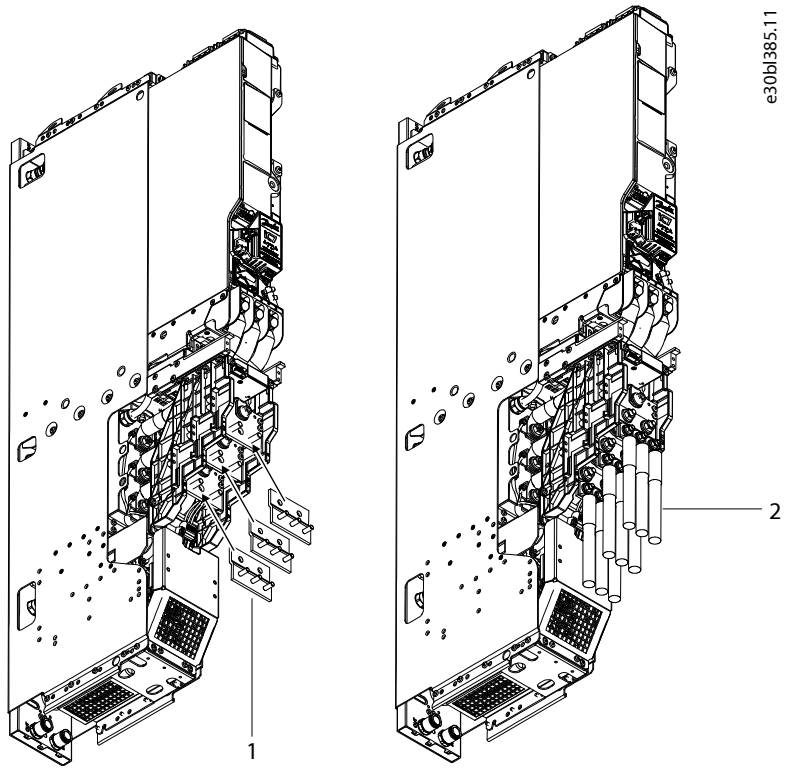

Figure 38: Installing Power Terminal Adapters to the Terminals, and Cables to the Power Terminal Adapter, Example of IR10L

1	Power terminal adapter	2	Motor cables

2. Use M10 pressure balancing washers SFS 3738, M10 conical spring washers DIN 6796, and M10 grade 8 hex nuts DIN 934.
3. Tighten the nuts to 40 Nm (354 in-lb).
4. Install the motor cables to the lowest terminal.
5. Use M8 pressure balancing washers SFS 3738, M8 conical spring washers DIN 6796, and M8 grade 8 hex nuts DIN 934.
6. Tighten the nuts to 20 Nm (177 in-lb).
7. Repeat the steps 2–6 for the middle terminal V/T2.
8. Repeat the steps 2–6 for the uppermost terminal U/T1.

4.5.7 Installing the Cables with the Power Terminal Adapter, INU IM10L, IM12L

Use this procedure to install cables when more than 2 smaller power cables are preferred, for example in marine installations. See 7.2.13 Marine Cable Sizes for INU Modules 380–500 V AC and 7.2.14 Marine Cable Sizes for INU Modules 525–690 V AC.

One power terminal adapter (+AFMC) is needed for IM10L, and 2 adapters for IM12L.

These instructions also apply to the inverter module IR10L and IR12L with the short integration unit.

Procedure

1. Install a power terminal adapter first to the lowest terminal.

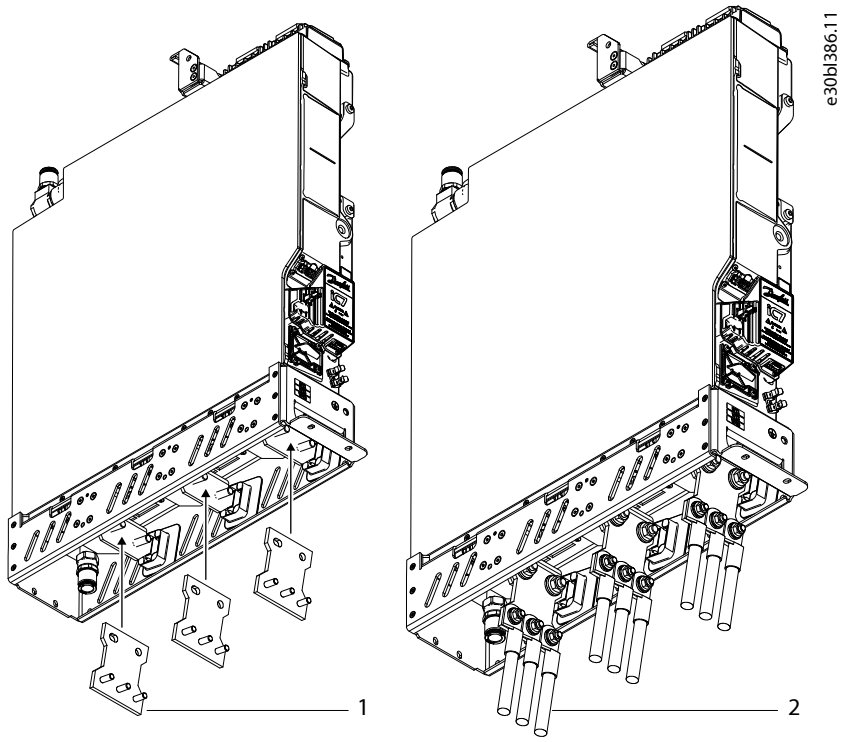

Figure 39: Installing Power Terminal Adapters to the Terminals, and Cables to the Power Terminal Adapter, Example of IM10L

1	Power terminal adapter	2	Motor cables

2. Use M10 pressure balancing washers SFS 3738, M10 conical spring washers DIN 6796, and M10 grade 8 hex nuts DIN 934.
3. Tighten the nuts to 40 Nm (354 in-lb).
4. Install the motor cables to the lowest terminal.
5. Use M8 pressure balancing washers SFS 3738, M8 conical spring washers DIN 6796, and M8 grade 8 hex nuts DIN 934.
6. Tighten the nuts to 20 Nm (177 in-lb).
7. Repeat the steps 2–6 for the middle terminal.
8. Repeat the steps 2–6 for the uppermost terminal.

4.5.8 Grounding the Liquid-cooled L Filters

See the grounding details of the L filter in the iC7 Series Liquid-cooled L Filter OF7Z5 Installation Guide.

4.6 Installing the DC Fuses to the DC Terminals

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

1. Attach busbars to the DC fuses. Make sure that the visual indicator (the red dot) of the DC fuse is facing forward.
   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).

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.

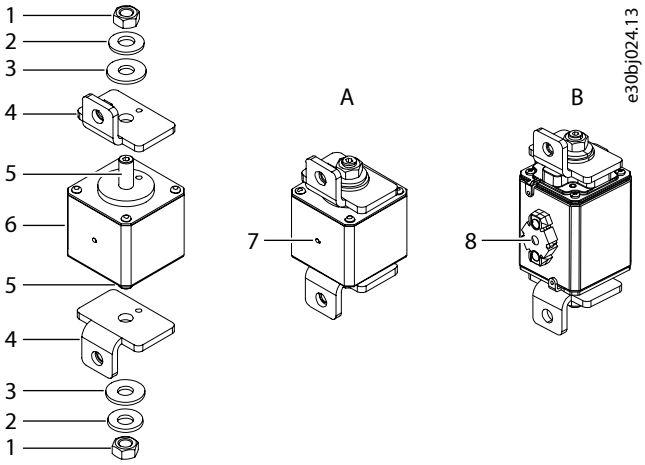

Figure 40: Installing Busbars to the DC Fuses

1	M12 nut	2	M12 spring washer
3	M12 washer	4	Busbar
5	Stud	6	Fuse
7	Visual indicator	8	Striker (visual indicator)
A	Fuse type for the voltage class 07, B5, and A5 products	B	Fuse type for the voltage class G7 products

2. Attach DC-terminal busbars to the DC terminals of the system modules.

   - Use Combi M8 screws.
   - Use the tightening torque 20 Nm (177 in-lb).

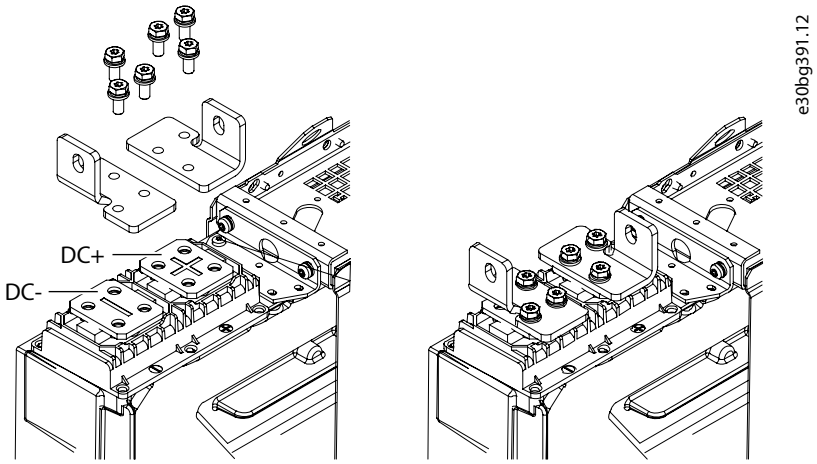

Figure 41: Installing DC-terminal Busbars to the DC Terminals

3. Attach the DC fuse assemblies to the DC-terminal busbars and to the common DC busbars.

   - Use M10 screws and washers.
   - Use the tightening torque 35–40 Nm (310–354 in-lb).
   - Make sure that the common DC busbars are supported properly, so that the weight of the busbars does not stress the fuses and the DC terminals of the module.
   - The common DC busbars are not included in the delivery.

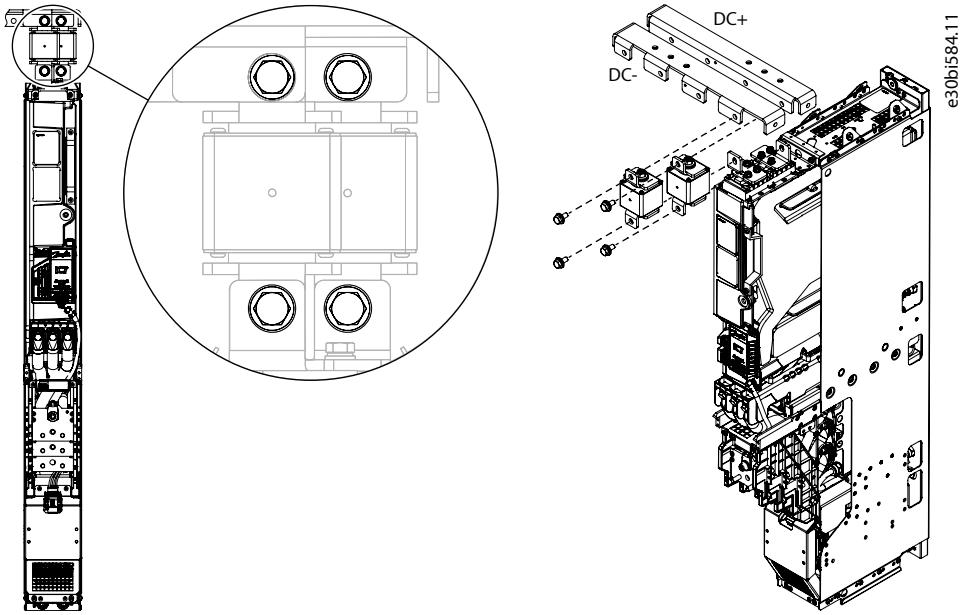

Figure 42: Installing DC Fuse Assemblies

4.7 Changing the EMC Protection Level

4.7.1 Changing the EMC Protection Level, AR10L

In an IT system, to change the EMC protection level of the drive from C3 to C4, disconnect the LC Filter ground capacitor.

Procedure

1. Loosen the screw of the grounding wire of the LC Filter.
2. Remove the grounding wire from the grounding terminal.
3. Move the cable lug of the grounding wire with the screw onto the insulator and tighten the screw (maximum 0.5 Nm (4.4 in-lb)).

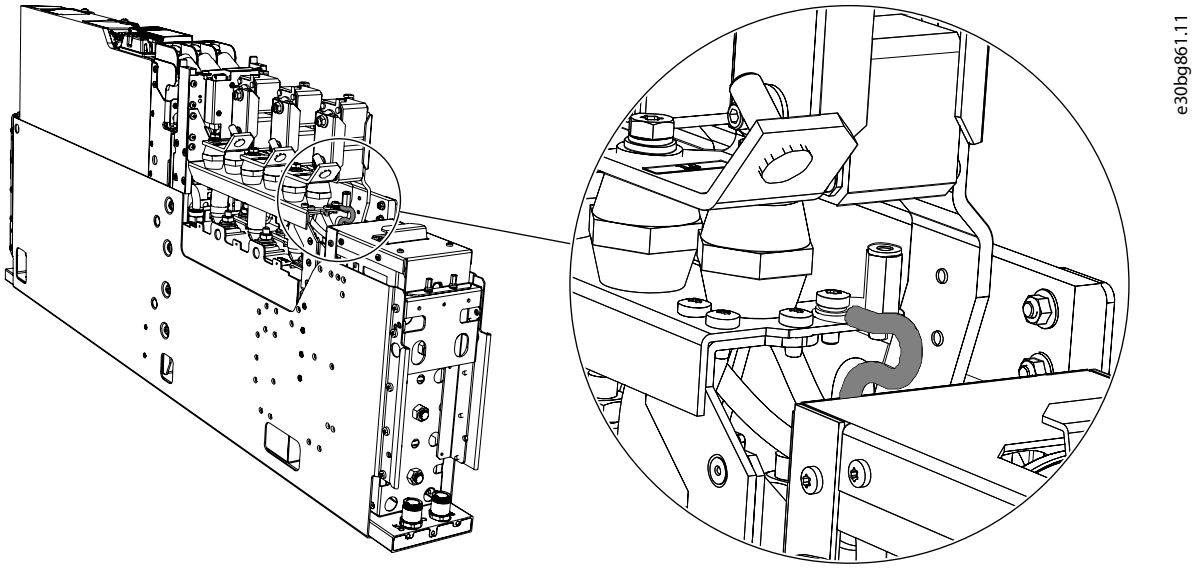

Figure 43: Level C3

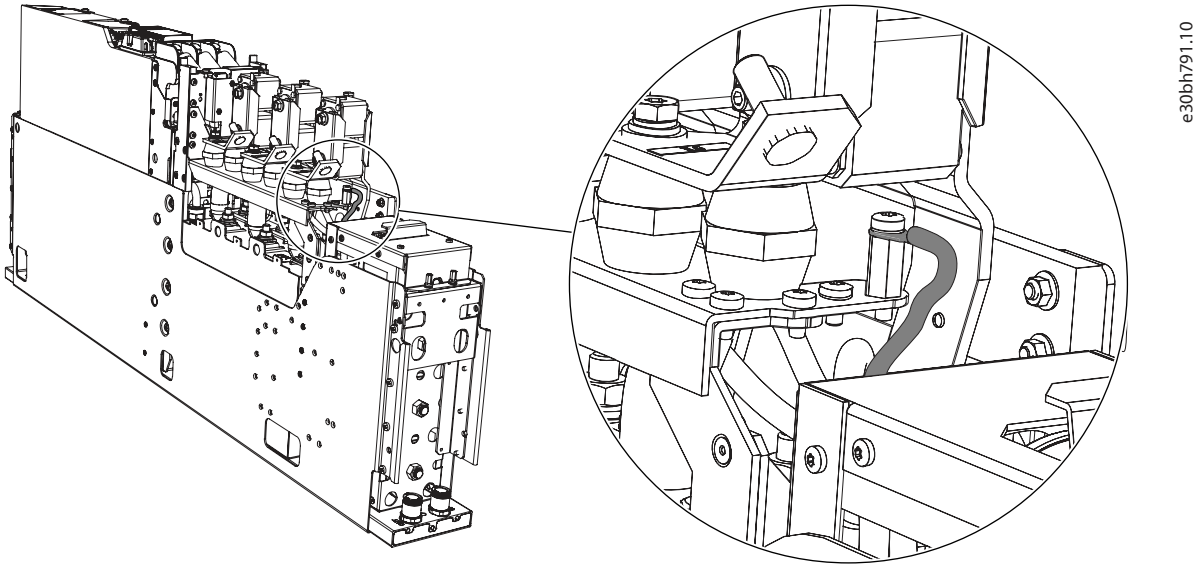

Figure 44: Level C4

4. After the change, write "The EMC level was changed from C3 to C4", and the date on the "product modified" label. If the label is not yet attached, attach it on the drive near the product label.

4.7.2 Changing the EMC Protection Level, AR12L (+AEZ1/+AEZ3)

In an IT system, to change the EMC protection level of the drive from C3 to C4, disconnect the LC Filter ground capacitor.

Procedure

1. Loosen the screw of the grounding wire of the LC Filter.
2. Remove the grounding wire from the grounding terminal.
3. Move the cable lug of the grounding wire with the screw onto the insulator and tighten the screw (maximum 0.5 Nm (4.4 in-lb)).

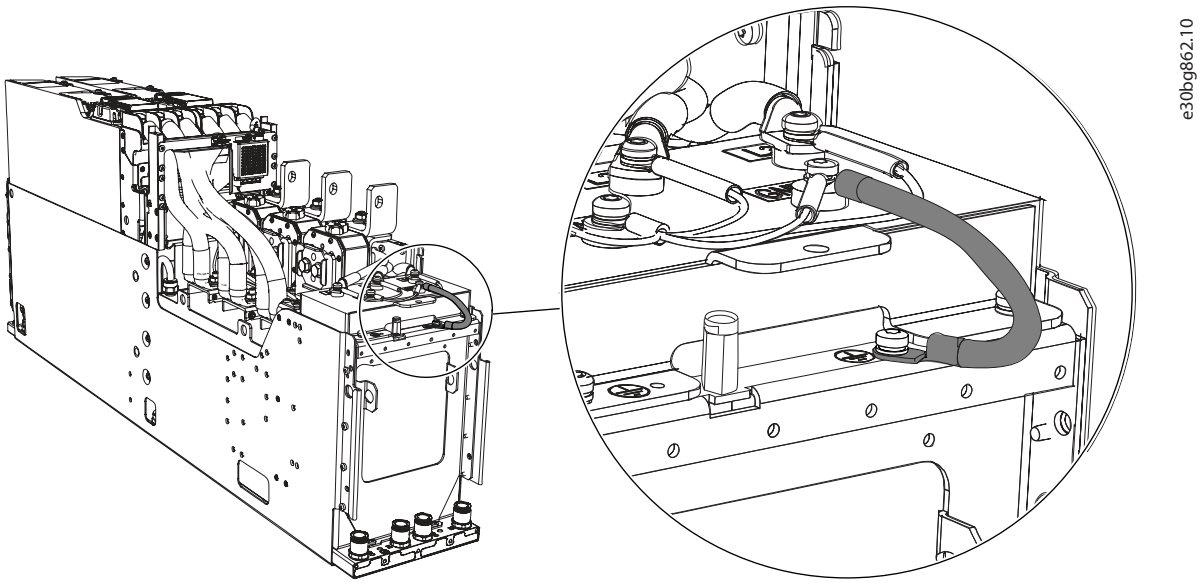

Figure 45: Level C3

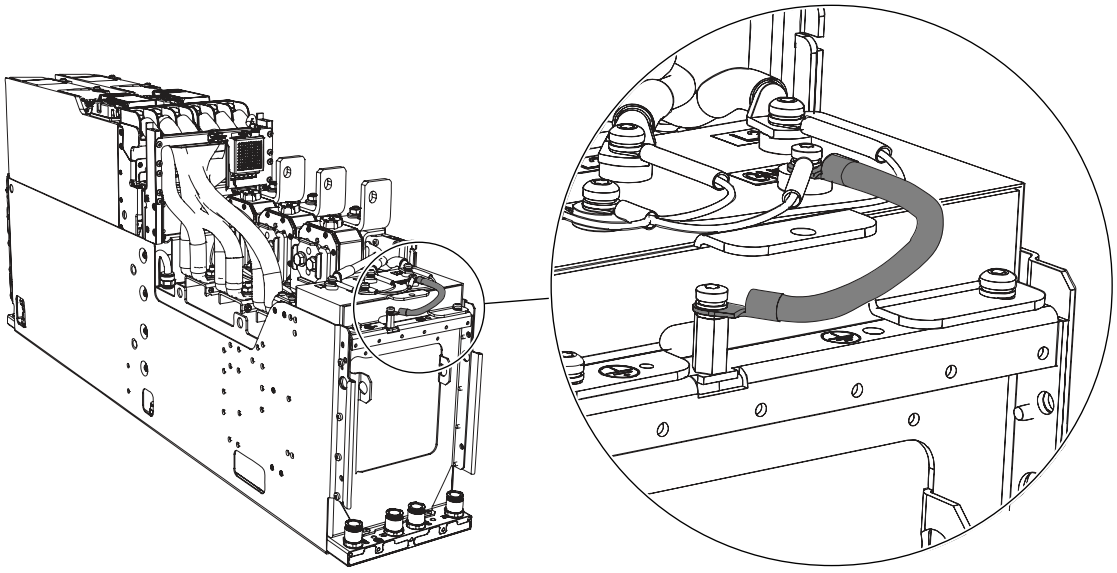

Figure 46: Level C4

4. After the change, write "The EMC level was changed from C3 to C4", and the date on the "product modified" label. If the label is not yet attached, attach it on the drive near the product label.

4.7.3 Changing the EMC Protection Level, LC Filter, OF7Z1, OF7SI2, OF7SI4, Size LC10L

In an IT system, to change the EMC protection level of the drive from C3 to C4, disconnect the LC Filter ground capacitor.

Procedure

1. Loosen the screw of the grounding wire of the LC Filter.
2. Remove the grounding wire from the grounding terminal.
3. Move the cable lug of the grounding wire with the screw onto the insulator and tighten the screw (maximum 0.5 Nm (4.4 in-lb)).

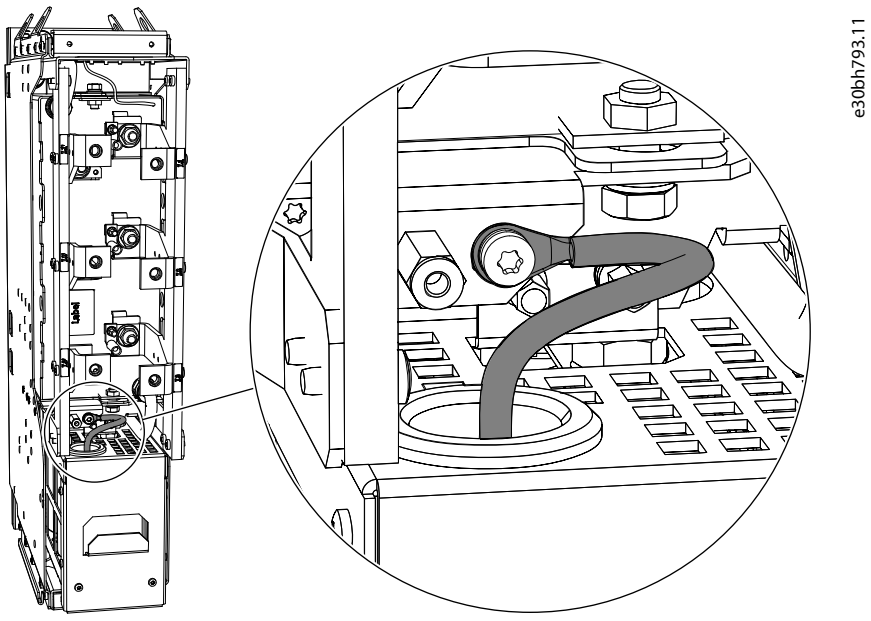

Figure 47: Level C3

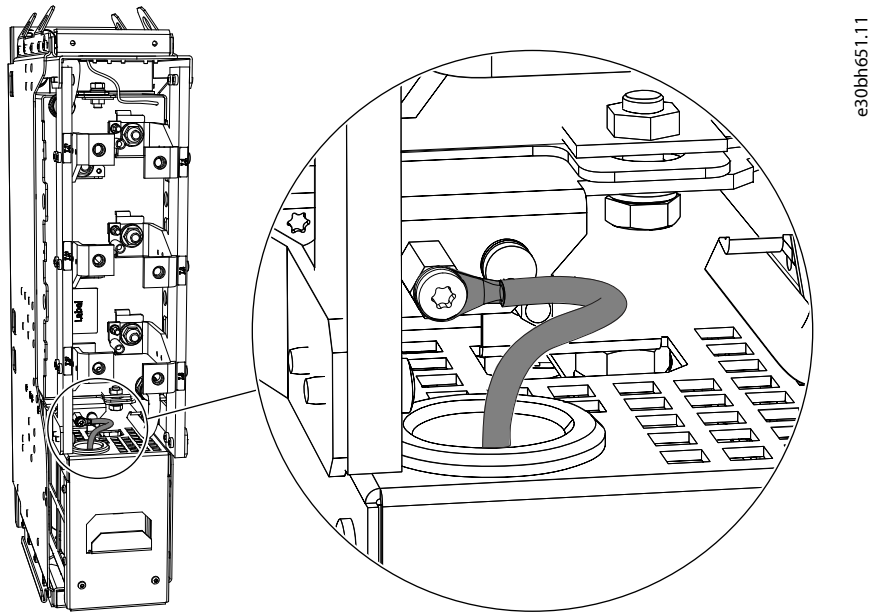

Figure 48: Level C4

4. After the change, write "The EMC level was changed from C3 to C4", and the date on the "product modified" label. If the label is not yet attached, attach it on the drive near the product label.

4.7.4 Changing the EMC Protection Level, LC Filter, OF7Z1, OF7SI2, OF7SI4, Size LC12L

In an IT system, to change the EMC protection level of the drive from C3 to C4, disconnect the LC Filter ground capacitor.

Procedure

1. Loosen the screw of the grounding wire of the LC Filter.
2. Remove the grounding wire from the grounding terminal.
3. Move the cable lug of the grounding wire with the screw onto the insulator and tighten the screw (maximum 0.5 Nm (4.4 in-lb)).

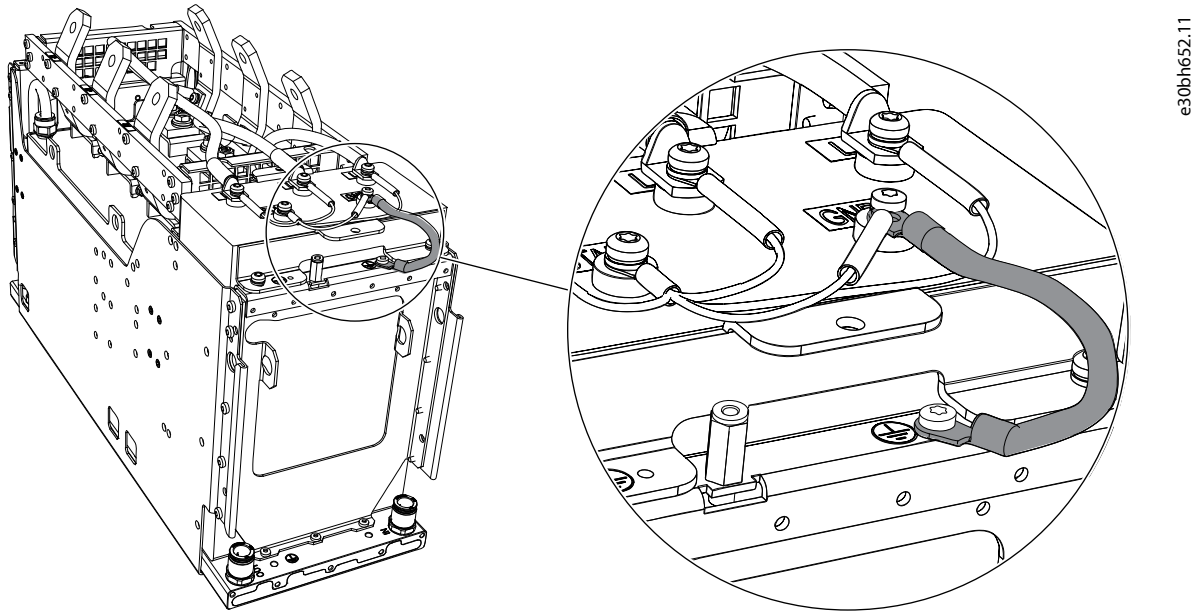

Figure 49: Level C3

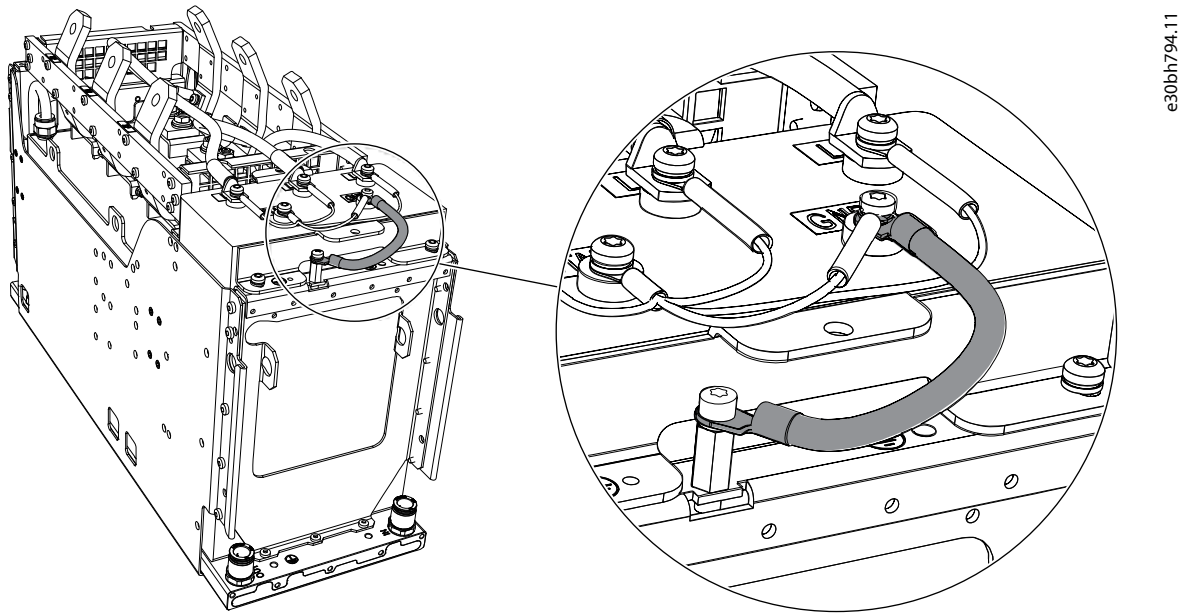

Figure 50: Level C4

4. After the change, write "The EMC level was changed from C3 to C4", and the date on the "product modified" label. If the label is not yet attached, attach it on the drive near the product label.

4.8 AuxBus Communication

4.8.1 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.
   a. For the frame designation AR10L, strip the cable for 90 mm (3.54 in).
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).

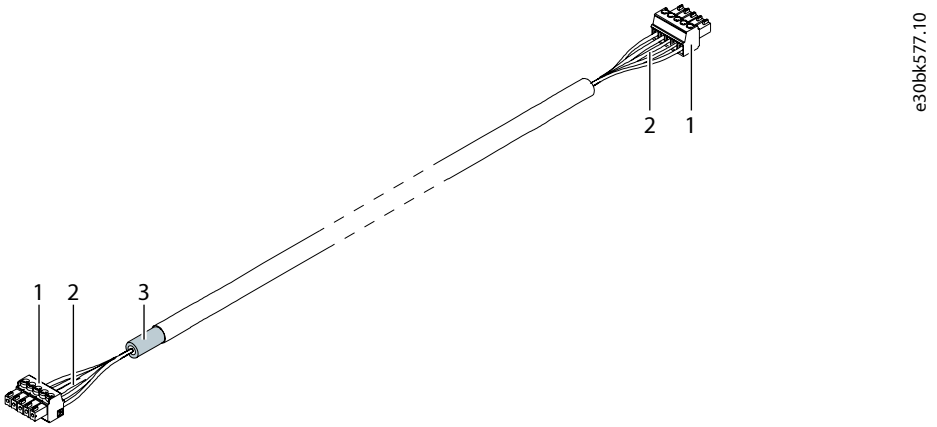

Figure 51: The Ready AuxBus Cable

1	Terminals	2	Wires
3	Shield removed		

4.8.2 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 X79 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 X79 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.

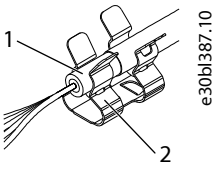

Figure 52: Grounding of the AuxBus Cable

1	Shield removed	2	Cable clamp

4. At the terminal X86 end of the cable, place the cable in a cable clamp for strain relief.

4.9 Installation Requirements for 1500 V DC Applications

If the DC voltage is above 1250 V DC, add a surge protection device (SPD) in the system on the DC bus. See the detailed wiring diagrams in the iC7 Series Liquid-cooled System Modules Design Guide.

5 Control Installation

5.1 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.

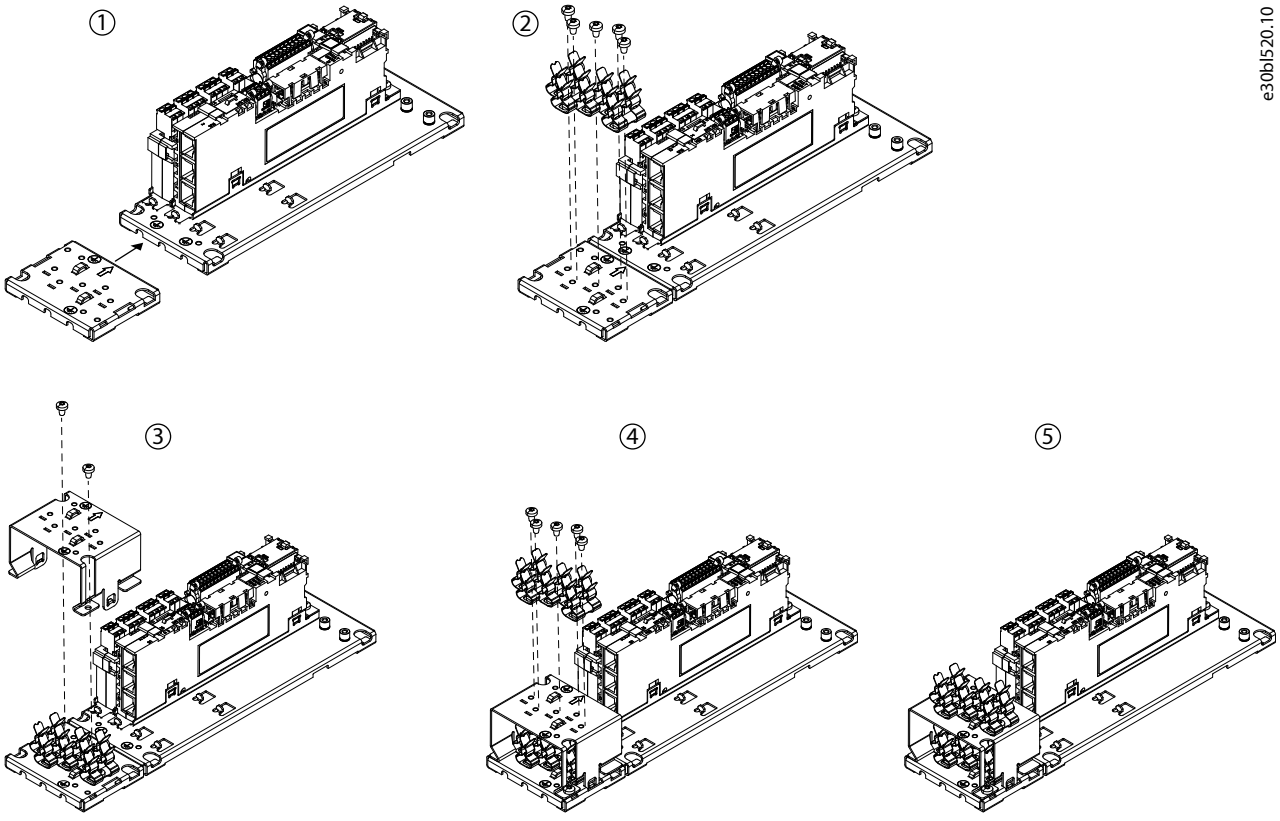

Figure 53: Assembling the Mounting Plate

5.2 Attaching the Control Unit Mounting Plates

Use these instructions to attach 2 or several mounting plates to each other, and to install mounting plates to the cabinet. All the parts can be found in the accessories bag.

1. Install the mounting plates to each other by fitting the sides together.

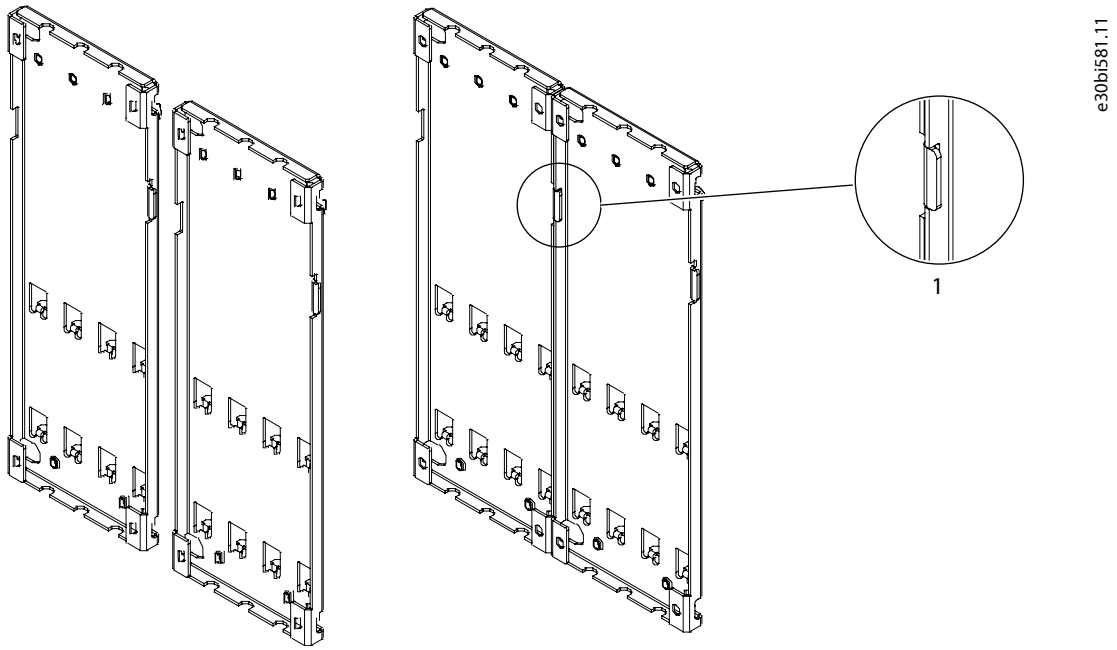

Figure 54: Attaching Mounting Plates to Each Other

1	Lip

2. Attach the mounting plates onto the cabinet with screws by the 4 mounting holes in the corners of the mounting plates.

   The screws are not included in the delivery. Use an M4/M5 screw.

5.3 Installing the Control Unit

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

5.4 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.

   Connect the star coupler board terminals to the power units in numerical order starting from X301. Do not skip terminals.

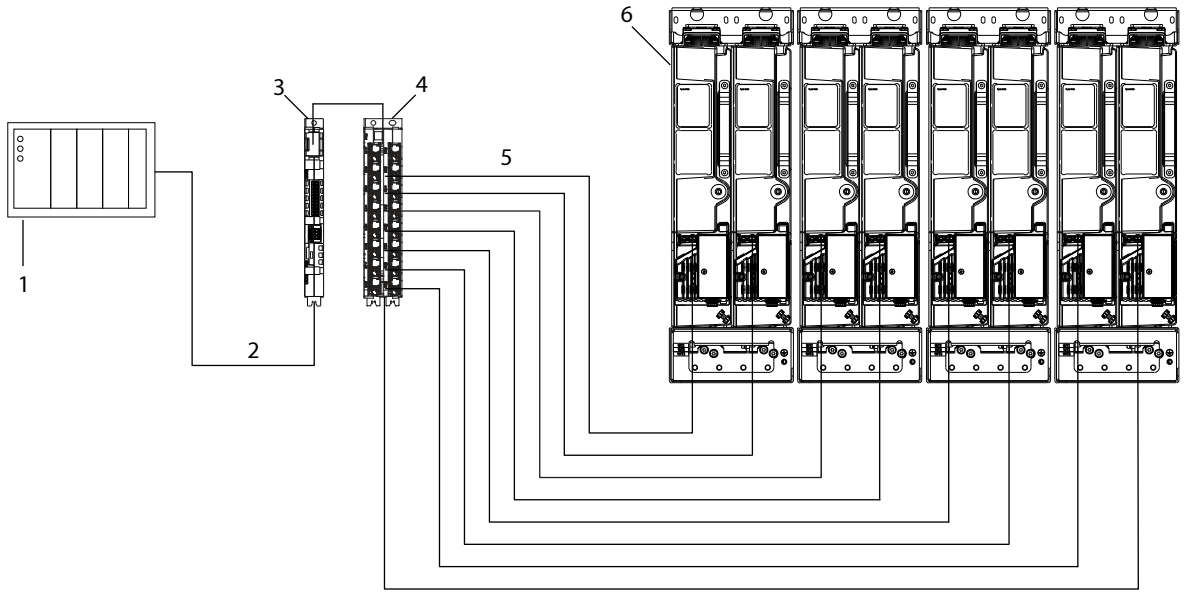

Figure 55: Connecting the Fieldbus Cable and the Fiber Cables

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

5.5 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 5.9 I/O and Relay Option (OC7C1) Connections.

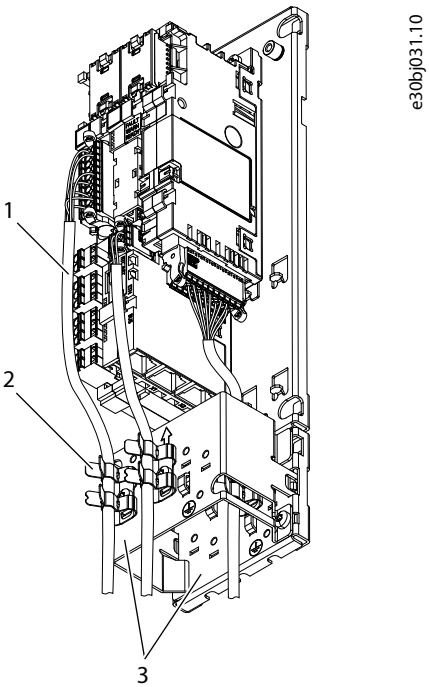

Figure 56: Example of Installing the Control Cables

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.

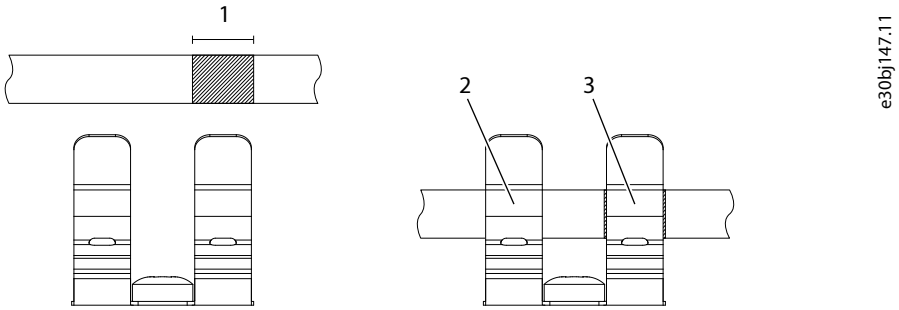

Figure 57: Stripping the Cable and Using the Grounding Plates

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

5.6 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)

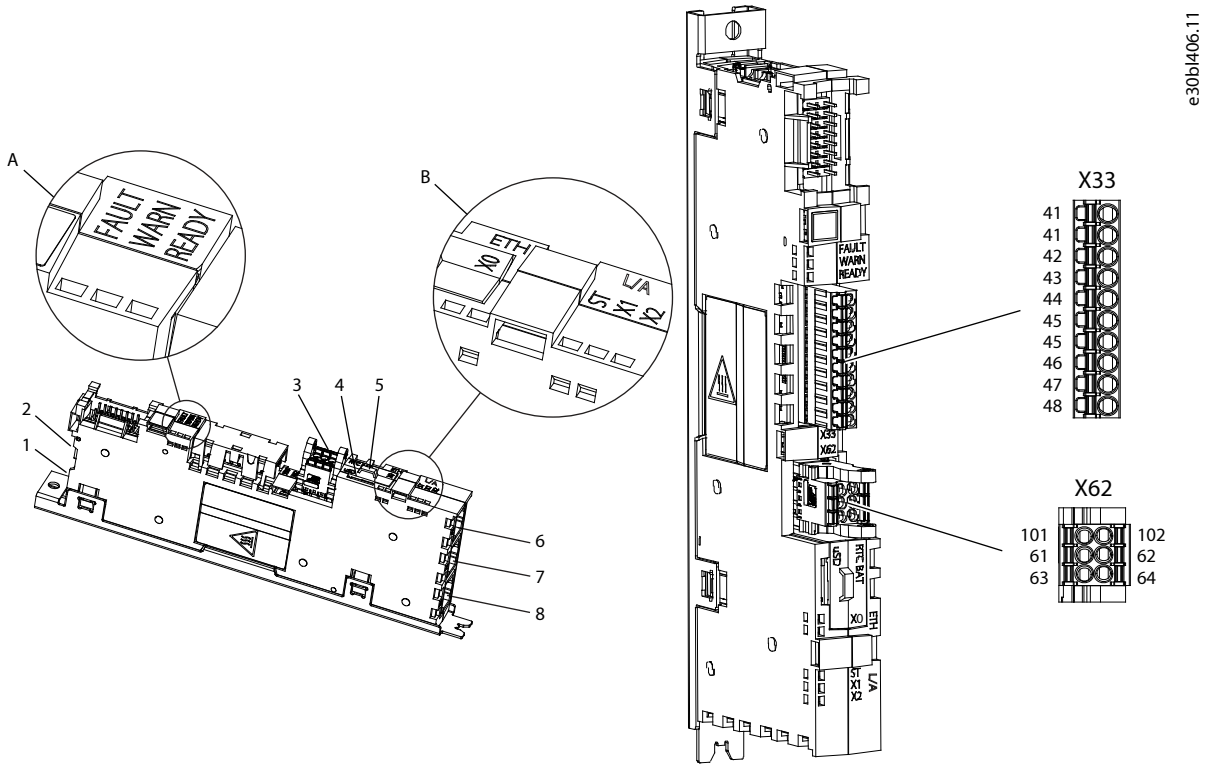

Figure 58: Control Board Terminal Block and Terminal Numbering

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
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.

5.7 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.

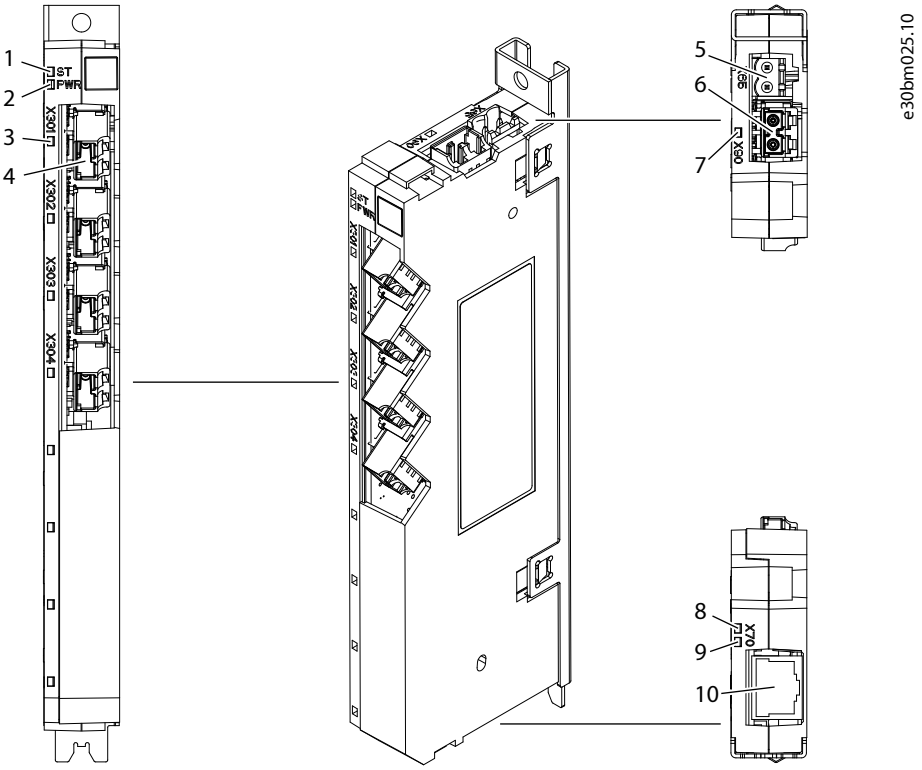

Figure 59: Terminal and Indicator Light Locations on the 4-port Star Coupler Board

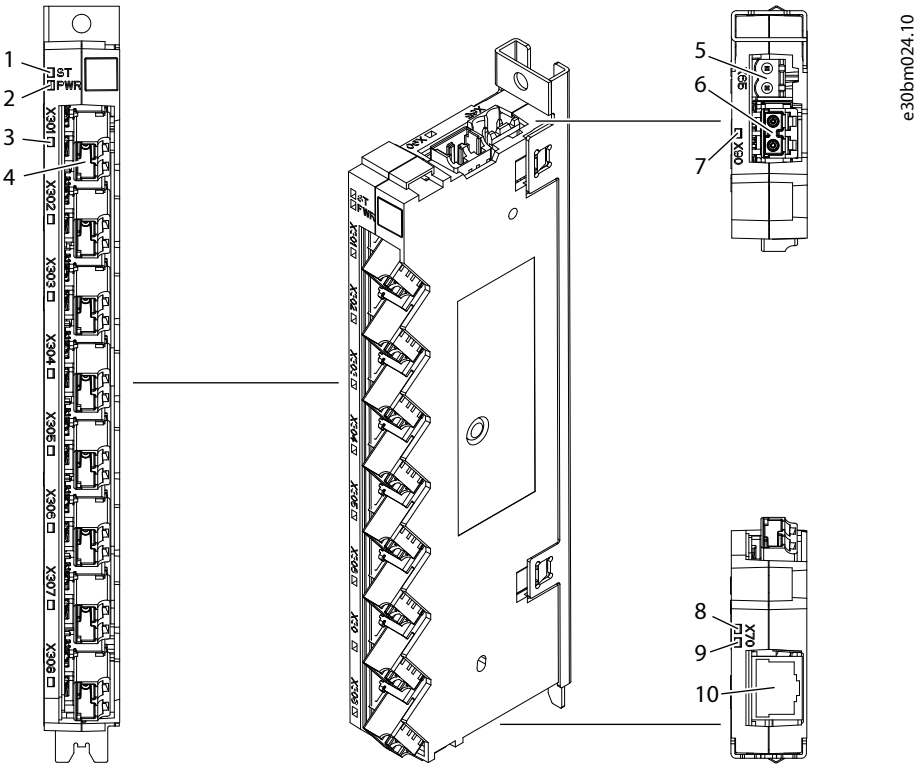

Figure 60: Terminal and Indicator Light Locations on the 8-port Star Coupler Board

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)

5.8 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

5.9 I/O and Relay Option (OC7C1) Connections

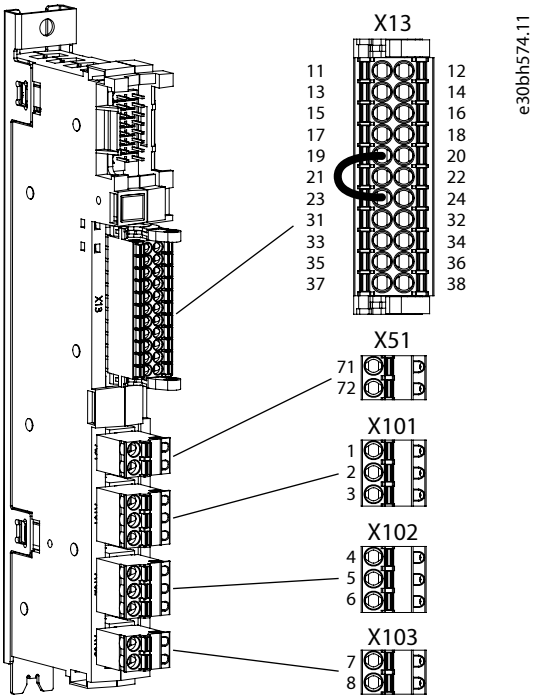

Figure 61: I/O and Relay Option Terminal Block and Terminal Numbering

Table 7: I/O and Relay Option (OC7C1) 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_{trip} = 4 kΩ
72	TI-	

Table 10: Relay 1 Signals (X101)

Terminal	Function	Description
1	COM	Configurable relay output. Switching capacity: • 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: • 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. Switching capacity: • 24 V DC/8 A • 250 V AC/8 A • 125 V DC/0.4 A Minimum switching load: 5 V/10 mA
8	NO	

5.10 Connecting the Control Panel

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

5.11 Installing the microSD Card

Supported microSD card types:

- SD
- SDHC
- SDXC

The microSC 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.

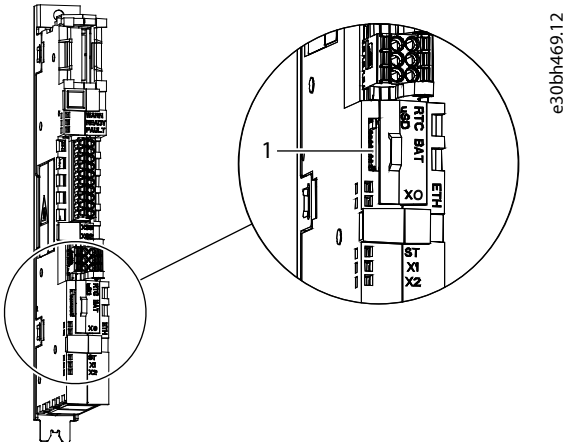

Figure 62: Location of the microSD Card

1	The microSD card

2. Push the new microSD card into the hole.

The contact area must face the text µSD on the right.

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

6 Commissioning

6.1 Commissioning the System Modules

Follow these instructions to commission the drive.

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

1. Make sure that the device connected to the drive output is installed correctly.
2. Make sure that the drive and the device connected to the drive output are grounded.
3. Make sure to select the mains cable and the output cables correctly.

   For information on cable selections, see 7.2.1 General Information on the Cable Tables.
4. Make sure that the control cables are as far as possible from the power cables.
5. Make sure that the shields of the shielded cables are connected to a grounding terminal that is identified with the grounding symbol.
6. Do a check of the tightening torques of all the terminals.
7. Make sure that the cables do not touch the electrical components of the drive.
8. Make sure that the common input +24 V is connected to an external power source.
9. Make sure that the digital input ground is connected to your digital system ground when floating, or to the control terminal ground.
10. Check that the coolant inlets and outlets are connected according to instructions.
11. Open the shut-off valves.
12. Check the quality and quantity of the coolant.
13. Make sure that the liquid circulation system operates correctly.
14. Make sure that there is no condensation on the surfaces of the drive.
15. Make sure that there are no unwanted objects in the installation space.
16. 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 7.3.1 General Information on the Fuse Tables.
17. Perform the insulation checks.
18. Check the status of the LED indicators of the control board, star coupler board, and power unit.

NOTICE

PRE-CHARGING NEEDED

The system modules do not have an internal DC-link charging circuit. If the drive is connected to the supply voltage without first pre-charging the DC-link capacitors, the inrush current can damage the equipment.

- Before closing the main switch and connecting the drive to mains, pre-charge the DC-link capacitors of the system modules.
- See the application guide for details.

NOTICE

DC/DC CONVERTER PRE-CHARGING

If the DC source is connected to the DC/DC converter without first pre-charging the DC filter capacitors, the inrush current can damage the equipment.

- Before connecting the DC source to the DC/DC converter, power on the DC/DC converter and pre-charge the DC filter capacitors to the same voltage as the DC source.
- See the iC7 Series DC/DC Converter Application Guide for details.

6.2 Measuring the Insulation Resistance of the Motor Cable

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

The 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 MΩ at the ambient temperature of 20 °C (68 °F).

6.3 Measuring the Insulation Resistance of the Mains Cable

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

The 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 MΩ at the ambient temperature of 20 °C (68 °F).

6.4 Measuring the Insulation Resistance of the Motor

Use these instructions to check the insulation of the motor.

The 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 MΩ at the ambient temperature of 20 °C (68 °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.

6.5 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.

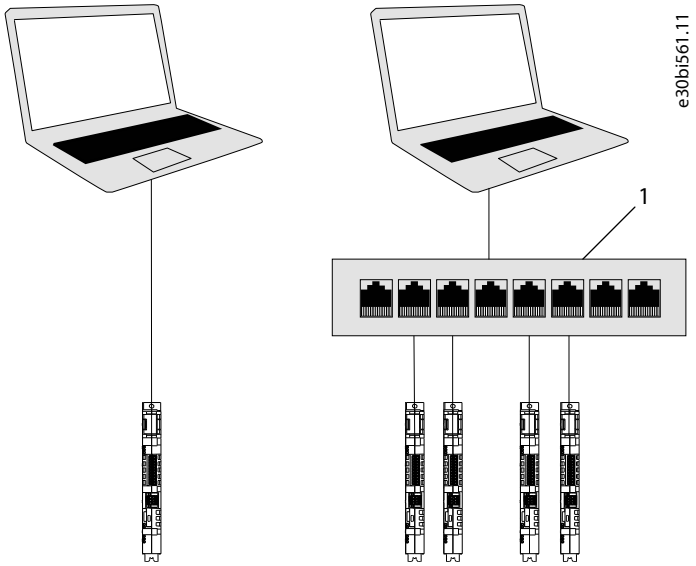

Figure 63: Connecting the Drive to a PC

1	Ethernet switch

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.

7 Specifications

7.1 Tightening Torques

Table 13: Tightening Torques and Bolt Lengths of the Terminals

Bolt	Tightening torque [Nm]	Maximum length of bolt under the busbar [mm]	Tightening torque [in-lb]	Maximum length of bolt under the busbar [in]
M4	2–2.5	–	18–22	–
M5	3–4	–	27–35	–
M6	6–9	–	53–80	–
M8	17–20	10	150–177	0.39
M10	35–40	22	310–354	0.87
M12	65–70	22	575–620	0.87
Grounding bolt (M8)	17–20	20	150–177	0.79

Table 14: Tightening Torques of Fuses

Fuse size	Tightening torque [Nm]	Tightening torque [in-lb]	Stud maximum torque [Nm]	Stud maximum torque [in-lb]	Stud	Bolt
31	13.5 +0/-2	119 +0/-17	10	88	M8x30 Zn DIN913	–
44	26 +0/-2	230 +0/-17	–	–	–	M10x20 DIN933-8.8-Zn
73	46 +0/-4	407 +0/-35	15	132	M12x35 Zn DIN913	–

7.2 Cable Sizes

7.2.1 General Information on the Cable Tables

The IEC cable sizing is based on these conditions:

- Ambient temperature of 40 °C (104 °F).
- Cables laid side by side on cable ladders.
- Maximum 9 cables per ladder.
- 3 ladders on top of each other with a minimum spacing of 300 mm (11.8 in).

Use cable insulation that can withstand a temperature of at least 90 °C (194 °F). In other conditions, refer to the local safety regulations, the input voltage, and the load current of the drive.

The UL cable sizing is based on these conditions:

- Ambient temperature of 40 °C (104 °F). Conductor sizing is based on NEC table 310.15(B)(16).
- 90 °C (194 °F) rated copper cables.
- Multicore cables installed in cable ducts.
- If cable ducts are not used, keep sufficient spacing between the cables.
- Do not stack or bundle the cables without proper spacing for longer than 600 mm (24 in).

In other conditions, refer to the local safety regulations, the input voltage, and the load current of the drive.

NOTE: Use symmetrical cabling with system modules connected in parallel. Each module must have the same number of cables with equal cross-section.

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

- 7.2.2 Field Cable Sizes for AFE and GC Modules, 380–500 V AC
- 7.2.3 Field Cable Sizes for AFE and GC Modules, 525–690 V AC
- 7.2.4 Field Cable Sizes for GC Modules, 380–690 V AC
- 7.2.5 Bolt Sizes for the Internal AC Busbars/Cables for AFE and GC Modules, 380–690 V AC
- 7.2.6 Cable Sizes for the Internal AC Cables for AFE and GC Modules, 380–690 V AC
- 7.2.7 Internal AC Busbar Sizing within the Enclosure of the AFE/GC Modules
- 7.2.8 Field Cable Sizes for INU Module, 380–500 V AC
- 7.2.9 Field Cable Sizes for INU Module, 525–690 V AC
- 7.2.10 Source Cable Sizes for DC/DC Converter Modules, 640–1100 V DC
- 7.2.11 Marine Cable Sizes for AFE or GC Modules 380–500 V AC
- 7.2.12 Marine Cable Sizes for AFE or GC Modules 525–690 V AC
- 7.2.13 Marine Cable Sizes for INU Modules 380–500 V AC
- 7.2.14 Marine Cable Sizes for INU Modules 525–690 V AC
- 7.2.15.2 Mains Cable Sizes for AFE or GC Modules, UL 600 V
- 7.2.15.4 Motor Cable Sizes for Inverter Modules, UL 575 V
- 7.2.16 Brake Cable Sizes for BCU, 525–690 V AC
- 7.2.17 Internal DC Cable Sizes for SISO Filters

7.2.2 Field Cable Sizes for AFE and GC Modules, 380–500 V AC

The AFE and GC modules with integration units do not have field cabling terminals for mains. Connect the AFE and GC modules to adequate size field cabling terminals or switching device.

Table 15: Field Cable Sizes for AFE and GC Modules, 380-500 V AC

Model code	Frame[1]	I_N [A]	Mains cable Cu [mm^2]	Mains cable Al [mm^2]
iC7-60SLxxA5-271AE00Fx	A_10L	277	3x185+120	3x240+72
iC7-60SLxxA5-317AE00Fx		324	3x185+120	2x(3x150+41)
iC7-60SLxxA5-400AE00Fx		409	2x(3x120+70)	2x(3x185+57)
iC7-60SLxxA5-460AE00Fx		470	2x(3x120+70)	2x(3x185+57)
iC7-60SLxxA5-520AE00Fx	A_12L	531	2x(3x150+70)	2x(3x240+72)
iC7-60SLxxA5-580AE00Fx		593	2x(3x185+95)	2x(3x240+72)
iC7-60SLxxA5-650AE00Fx		664	4x(3x120+70)	4x(3x150+41)
iC7-60SLxxA5-730AE00Fx		746	4x(3x120+70)	4x(3x150+41)
iC7-60SLxxA5-816AE00Fx		833	4x(3x120+70)	4x(3x185+57)
iC7-60SLxxA5-970AE00Fx		991	4x(3x150+70)	4x(3x185+57)

Table 15: Field Cable Sizes for AFE and GC Modules, 380-500 V AC - (continued)

Model code	Frame[1]	I_N [A]	Mains cable Cu [mm^2]	Mains cable Al [mm^2]
iC7-60SLxxA5-1040E00Fx	2 x A_12L	1062	4x(3x150+70)	4x(3x240+72)
iC7-60SLxxA5-1210E00Fx		1236	4x(3x185+95)	4x(3x240+72)
iC7-60SLxxA5-1300E00Fx		1328	6x(3x150+70)	6x(3x185+57)
iC7-60SLxxA5-1410E00Fx		1440	6x(3x150+70)	6x(3x185+57)
iC7-60SLxxA5-1630E00Fx		1664	6x(3x185+95)	8x(3x185+57)
iC7-60SLxxA5-1900E00Fx		1940	6x(3x185+95)	8x(3x185+57)
iC7-60SLxxA5-2080E00Fx	3 x A_12L	2124	9x(3x150+70)	9x(3x185+57)
iC7-60SLxxA5-2200E00Fx		2246	9x(3x150+70)	9x(3x240+72)
iC7-60SLxxA5-2450E00Fx		2501	9x(3x185+95)	9x(3x240+72)
iC7-60SLxxA5-2800E00Fx		2859	9x(3x185+95)	9x(3x240+72)
iC7-60SLxxA5-3120E00Fx	4 x A_12L	3185	12x(3x185+95)	12x(3x240+72)
iC7-60SLxxA5-3270E00Fx		3338	12x(3x185+95)	12x(3x240+72)
iC7-60SLxxA5-3720E00Fx		3798	12x(3x185+95)	12x(3x240+72)
iC7-60SLxxA5-4160E00Fx	5 x A_12L	4247	15x(3x185+95)	15x(3x240+72)
iC7-60SLxxA5-4650E00Fx		4747	15x(3x185+95)	15x(3x240+72)
iC7-60SLxxA5-5200E00Fx	6 x A_12L	5309	18x(3x185+95)	18x(3x240+72)
iC7-60SLxxA5-5550E00Fx		5666	18x(3x185+95)	18x(3x240+72)
iC7-60SLxxA5-5930E00Fx	7 x A_12L	6054	21x(3x185+95)	21x(3x240+72)
iC7-60SLxxA5-6450E00Fx		6585	21x(3x185+95)	21x(3x240+72)
iC7-60SLxxA5-6900E00Fx	8 x A_12L	7044	24x(3x185+95)	24x(3x240+72)
iC7-60SLxxA5-7370E00Fx		7524	24x(3x185+95)	24x(3x240+72)

1) AM10L, AR10L, AM12L, or AR12L

7.2.3 Field Cable Sizes for AFE and GC Modules, 525–690 V AC

The AFE and GC modules with integration units do not have field cabling terminals for mains. Connect the AFE and GC modules to adequate size field cabling terminals or switching device.

Table 16 for cable recommendation is also applicable to the voltage class B5.

Table 16: Field Cable Sizes for AFE and GC Modules, 525–690 V AC

Model code	Frame [1]	I_N [A]	Mains cable Cu [mm^2]	Mains cable Al [mm^2]
iC7-60SLxx07-236AE00Fx	Ax10L	241	3x150+70	3x240+72
iC7-60SLxxB5-261AE00Fx[2]		267	3x185+95	3x240+72
iC7-60SLxx07-300AE00Fx		307	3x240+120	2x(3x120+41)
iC7-60SLxxB5-325AE00Fx[2]		332	3x240+120	2x(3x150+41)
iC7-60SLxx07-334AE00Fx		341	2x(3x120+70)	2x(3x150+41)
iC7-60SLxx07-380AE00Fx		388	2x(3x120+70)	2x(3x185+57)

Table 16: Field Cable Sizes for AFE and GC Modules, 525–690 V AC - (continued)

Model code	Frame [1]	I_N [A]	Mains cable Cu [mm^2]	Mains cable Al [mm^2]
iC7-60SLxx07-425AE00Fx	Ax12L	434	2x(3x120+70)	2x(3x185+57)
iC7-60SLxx07-475AE00Fx		485	2x(3x150+70)	2x(3x240+72)
iC7-60SLxx07-530AE00Fx		542	2x(3x185+70)	3x(3x150+41)
iC7-60SLxx07-595AE00Fx		608	2x(3x240+120)	3x(3x185+57)
iC7-60SLxx07-670AE00Fx		684	4x(3x120+70)	4x(3x150+41)
iC7-60SLxx07-760AE00Fx		776	4x(3x120+70)	4x(3x150+41)
iC7-60SLxx07-850AE00Fx	2 x Ax12L	868	4x(3x120+70)	4x(3x185+57)
iC7-60SLxx07-945AE00Fx		965	4x(3x150+70)	4x(3x240+72)
iC7-60SLxx07-1040E00Fx		1062	4x(3x185+95)	6x(3x150+41)
iC7-60SLxx07-1230E00Fx		1256	4x(3x240+120)	6x(3x185+57)
iC7-60SLxx07-1325E00Fx		1353	8x(3x120+70)	8x(3x150+41)
iC7-60SLxx07-1500E00Fx		1532	8x(3x120+70)	8x(3x150+41)
iC7-60SLxx07-1700E00Fx	3 x Ax12L	1736	6x(3x185+95)	9x(3x150+41)
iC7-60SLxx07-1800E00Fx		1838	6x(3x240+120)	9x(3x185+57)
iC7-60SLxx07-2000E00Fx		2042	6x(3x240+120)	9x(3x240+72)
iC7-60SLxx07-2250E00Fx		2297	12x(3x120+70)	9x(3x240+72)
iC7-60SLxx07-2500E00Fx	4 x Ax12L	2552	8x(3x240+120)	12x(3x185+57)
iC7-60SLxx07-2650E00Fx		2706	12x(3x150+70)	12x(3x240+72)
iC7-60SLxx07-2940E00Fx		3002	12x(3x150+70)	12x(3x240+72)
iC7-60SLxx07-3120E00Fx	5 x Ax12L	3185	10x(3x240+120)	15x(3x185+57)
iC7-60SLxx07-3600E00Fx		3675	15x(3x150+70)	15x(3x240+72)
iC7-60SLxx07-3900E00Fx	6 x Ax12L	3982	18x(3x150+70)	18x(3x240+72)
iC7-60SLxx07-4320E00Fx		4410	18x(3x150+70)	18x(3x240+72)
iC7-60SLxx07-4750E00Fx	7 x Ax12L	4849	21x(3x150+70)	21x(3x240+72)
iC7-60SLxx07-5040E00Fx		5145	21x(3x150+70)	21x(3x240+72)
iC7-60SLxx07-5400E00Fx	8 x Ax12L	5513	24x(3x150+70)	24x(3x240+72)
iC7-60SLxx07-5750E00Fx		5870	24x(3x150+70)	24x(3x240+72)

1) AM10L, AR10L, AM12L, or AR12L

2) Only for B5 voltage class.

7.2.4 Field Cable Sizes for GC Modules, 380–690 V AC

Table 17: Field Cable Sizes for GC Modules, 380–690 V AC

Model code	Frame	I_N [A]	Mains cable Cu [mm^2]	Mains cable Al [mm^2]
iC7-60SLGCG7-760A	AR12L	776	4x(3x120+70)	4x(3x185+57)
iC7-60SLGCG7-970A		1 000	4x(3x150+70)	4x(3x185+57)

Table 17: Field Cable Sizes for GC Modules, 380–690 V AC - (continued)

Model code	Frame	I_N [A]	Mains cable Cu [mm^2]	Mains cable Al [mm^2]
iC7-60SLGCG7-1500	2 x AR12L	1532	6x(3x150+70)	8x(3x185+57)
iC7-60SLGCG7-1700		1736	6x(3x185+70)	8x(3x185+57)
iC7-60SLGCG7-1900		1950	6x(3x185+70)	8x(3x185+57)
iC7-60SLGCG7-2450	3 x AR12L	2501	9x(3x185+95)	9x(3x240+72)
iC7-60SLGCG7-2800		2900	9x(3x185+95)	9x(3x240+72)
iC7-60SLGCG7-3270	4 x AR12L	3338	12x(3x185+95)	12x(3x240+72)
iC7-60SLGCG7-3720		3850	12x(3x185+95)	12x(3x240+72)
iC7-60SLGCG7-4160	5 x AR12L	4247	15x(3x185+95)	15x(3x240+72)
iC7-60SLGCG7-4650		4800	15x(3x185+95)	15x(3x240+72)
iC7-60SLGCG7-5550	6 x AR12L	5750	18x(3x185+95)	18x(3x240+72)
iC7-60SLGCG7-6450	7 x AR12L	6650	21x(3x185+95)	21x(3x240+72)
iC7-60SLGCG7-7370	8 x AR12L	7600	24x(3x185+95)	24x(3x240+72)

7.2.5 Bolt Sizes for the Internal AC Busbars/Cables for AFE and GC Modules, 380–690 V AC

Table 18: Bolt Sizes for the AFE and GC Modules

Frame[1]	Bolt size for internal cable or busbar	Number of grounding terminals/bolt size
Ax10L	M10	1/M8
Ax12L	M10	1/M8
2 x Ax12L	M10	2/M8
3 x Ax12L	M10	3/M8
4 x Ax12L	M10	4/M8
5 x Ax12L	M10	5/M8
6 x Ax12L	M10	6/M8
7 x Ax12L	M10	7/M8
8 x Ax12L	M10	8/M8

1) AM10L, AR10L, AM12L, or AR12L

7.2.6 Cable Sizes for the Internal AC Cables for AFE and GC Modules, 380–690 V AC

The AC terminals of the frame AR10L are designed for cable connection. Use cables between the active front-end (AFE) or grid converter (GC), and the grid side L terminals, or the switching device.

The cable sizing is based on the following conditions:

- Ambient temperature 60 °C (140 °F).
- Use cable insulation that can withstand a temperature of at least 105 °C (221 °F).

Minimum internal cable sizes for voltage class A5, see Table 19.

Minimum internal cable sizes for voltage class 07 and, B5, see Table 20.

Table 19: Minimum Internal Cable Sizes, Voltage Class A5

Model code	Frame	I_N [A]	Cable Cu [mm^2]
iC7-60SLxxA5-271AE00Fx	A_10L	277	1x120
iC7-60SLxxA5-317AE00Fx		324	1x150
iC7-60SLxxA5-400AE00Fx		409	1x185
iC7-60SLxxA5-460AE00Fx		470	1x185

Table 20: Minimum Internal Cable Sizes, Voltage Class 07, and B5

Model code	Frame	I_N [A]	Cable Cu [mm^2]
iC7-60SLxx07-236AE00Fx	A_10L	241	1x120
iC7-60SLxxB5-261AE00Fx		267	1x120
iC7-60SLxx07-300AE00Fx		307	1x150
iC7-60SLxxB5-325AE00Fx		332	1x150
iC7-60SLxx07-334AE00Fx		341	1x150
iC7-60SLxx07-380AE00Fx		388	1x150

7.2.7 Internal AC Busbar Sizing within the Enclosure of the AFE/GC Modules

The power terminals of the frame AR12L are designed for busbar connection. Use busbars or cables between the grid converter terminals and the field cabling terminals or the switching device.

Size the busbar size according to the switchgear standard IEC 61439-1 and -2 or follow the local regulations. For North American installations, size the busbars according to UL508A and the National Electrical Code (NEC).

If busbars are selected with a cross-sectional area smaller than the values specified in the applicable standard, perform a temperature-rise test for the enclosure.

The starting point for sizing the busbars with 2 m/s forced air cooling:

- Single AR12L: 60x10 mm busbar per phase
- Multiple AR12L: 80x10 mm busbar per phase per AR12L with parallel busbars (for example: 2 x (80x10) for 2 x AR12L)

This starting point with forced air cooling is with smaller cross-sections than in the switchgear standard.

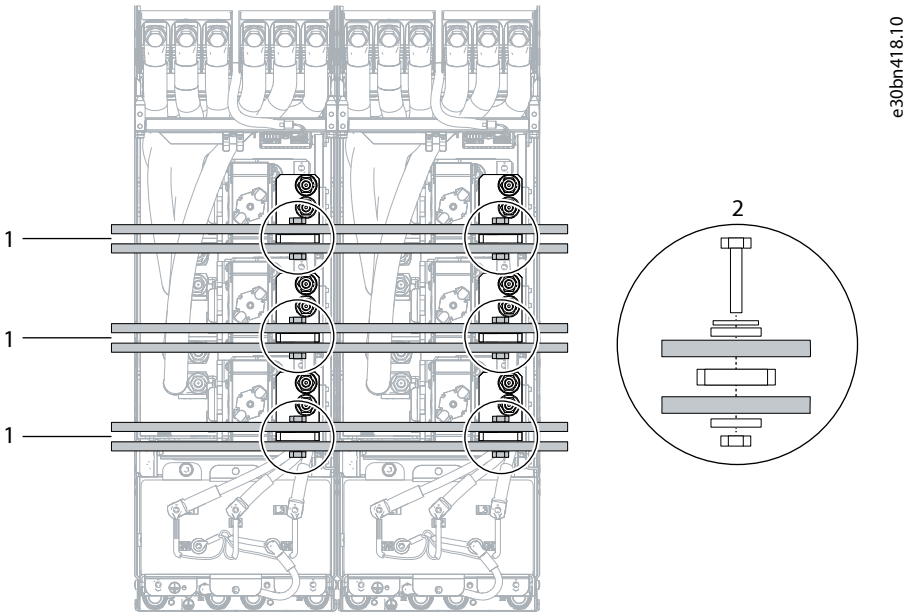

Figure 64: Mounting the AC Busbars to 2 x AR12L

1	80x10 mm busbars	2	Mounting the busbars

7.2.8 Field Cable Sizes for INU Module, 380–500 V AC

Table 21: Field Cable Sizes for INU Modules, 380-500 V AC

Model code	Frame[1]	I_N [A]	Motor cable Cu [mm^2]	Motor cable Al [mm^2]	Terminal max. cable size	Number of grounding terminals/ bolt size	Max. number of cables/ bolt size
iC7-60SLINA5-206AE00Fx	I_10L	211	3x120+70	3x185+57	300 Cu/Al	1/M8	2/M10
iC7-60SLINA5-245AE00Fx		251	3x150+70	3x185+57	300 Cu/Al	1/M8	2/M10
iC7-60SLINA5-302AE00Fx		309	3x185+95	3x240+72	300 Cu/Al	1/M8	2/M10
iC7-60SLINA5-385AE00Fx		394	3x240+120	2x(3x150+41)	300 Cu/Al	1/M8	2/M10
iC7-60SLINA5-480AE00Fx		490	2x(3x150+70)	2x(3x185+57)	300 Cu/Al	1/M8	2/M10
iC7-60SLINA5-520AE00Fx		531	2x(3x150+70)	2x(3x240+72)	300 Cu/Al	1/M8	2/M10
iC7-60SLINA5-658AE00Fx	I_12L	672	2x(3x240+120)	3x(3x185+57)	300 Cu/Al	1/M8	4/M10
iC7-60SLINA5-730AE00Fx		746	2x(3x240+120)	4x(3x150+41)	300 Cu/Al	1/M8	4/M10
iC7-60SLINA5-820AE00Fx		838	2x(3x240+120)	4x(3x185+57)	300 Cu/Al	1/M8	4/M10
iC7-60SLINA5-880AE00Fx		899	4x(3x150+70	4x(3x185+57)	300 Cu/Al	1/M8	4/M10
iC7-60SLINA5-1000E00Fx		1021	4x(3x150+70	4x(3x240+72)	300 Cu/Al	1/M8	4/M10
iC7-60SLINA5-1270E00Fx	2 x I_12L	1297	4x(3x185+95)	6x(3x185+57)	300 Cu/Al	2/M8	8/M10
iC7-60SLINA5-1460E00Fx		1491	4x(3x240+120)	6x(3x240+72)	300 Cu/Al	2/M8	8/M10
iC7-60SLINA5-1630E00Fx		1664	4x(3x240+120)	6x(3x240+72)	300 Cu/Al	2/M8	8/M10
iC7-60SLINA5-1760E00Fx		1797	8x(3x150+70)	8x(3x185+57)	300 Cu/Al	2/M8	8/M10
iC7-60SLINA5-1960E00Fx		2001	8x(3x150+70)	8x(3x240+72)	300 Cu/Al	2/M8	8/M10

Table 21: Field Cable Sizes for INU Modules, 380-500 V AC - (continued)

Model code	Frame[1]	I_N [A]	Motor cable Cu [mm^2]	Motor cable Al [mm^2]	Terminal max. cable size	Number of grounding terminals/ bolt size	Max. number of cables/ bolt size
iC7-60SLINA5-2130E00Fx	3 x I_12L	2195	9x(3x150+70)	9x(3x185+57)	300 Cu/Al	3/M8	12/M10
iC7-60SLINA5-2340E00Fx		2389	9x(3x150+70)	9x(3x240+72)	300 Cu/Al	3/M8	12/M10
iC7-60SLINA5-2510E00Fx		2563	9x(3x185+95)	9x(3x240+72)	300 Cu/Al	3/M8	12/M10
iC7-60SLINA5-2880E00Fx		2940	9x(3x185+95)	12x(3x185+57)	300 Cu/Al	3/M8	12/M10
iC7-60SLINA5-3120E00Fx	4 x I_12L	3185	12x(3x185+95)	12x(3x240+72)	300 Cu/Al	4/M8	16/M10
iC7-60SLINA5-3420E00Fx		3492	12x(3x185+95)	12x(3x240+72)	300 Cu/Al	4/M8	16/M10
iC7-60SLINA5-3820E00Fx		3900	12x(3x185+95)	16x(3x185+57)	300 Cu/Al	4/M8	16/M10
iC7-60SLINA5-4140E00Fx	5 x I_12L	4227	15x(3x185+95)	20x(3x185+57)	300 Cu/Al	5/M8	20/M10
iC7-60SLINA5-4500E00Fx		4594	15x(3x185+95)	20x(3x185+57)	300 Cu/Al	5/M8	20/M10
iC7-60SLINA5-4750E00Fx		4849	15x(3x185+95)	20x(3x185+57)	300 Cu/Al	5/M8	20/M10
iC7-60SLINA5-5220E00Fx	6 x I_12L	5329	18x(3x185+95)	24x(3x185+57)	300 Cu/Al	6/M8	24/M10
iC7-60SLINA5-5680E00Fx		5799	18x(3x185+95)	24x(3x185+57)	300 Cu/Al	6/M8	24/M10

1) IM10L, IR10L, IM12L, or IR12L

7.2.9 Field Cable Sizes for INU Module, 525–690 V AC

Table 22 for cable recommendation is also applicable to the voltage class B5.

Table 22: Field Cable Sizes for INU Module, 525–690 V AC

Model code	Frame[1]	I_N [A]	Motor cable Cu [mm^2]	Motor cable Al [mm^2]	Terminal max. cable size	Number of grounding terminals/ bolt size	Max. number of cables/ bolt size
iC7-60SLIN07-170E00Fx	Ix10L	174	3x120+70	3x185+57	300 Cu/Al	1/M8	2/M10
iC7-60SLINB5-206AE00Fx[2]		211	3x120+70	3x185+57	300 Cu/Al	1/M8	2/M10
iC7-60SLIN07-208AE00Fx		213	3x120+70	3x185+57	300 Cu/Al	1/M8	2/M10
iC7-60SLINB5-245AE00Fx[2]		251	3x150+70	2x(3x95+29)	300 Cu/Al	1/M8	2/M10
iC7-60SLIN07-261E00Fx		267	3x185+95	2x(3x95+29)	300 Cu/Al	1/M8	2/M10
iC7-60SLINB5-302AE00Fx[2]		309	3x185+95	2x(3x120+41)	300 Cu/Al	1/M8	2/M10
iC7-60SLIN07-325E00Fx		332	3x240+120	2x(3x120+41)	300 Cu/Al	1/M8	2/M10
iC7-60SLIN07-365E00Fx		373	2x(3x120+70)	2x(3x150+41)	300 Cu/Al	1/M8	2/M10
iC7-60SLINB5-385AE00Fx[2]		394	2x(3x120+70)	2x(3x150+41)	300 Cu/Al	1/M8	2/M10
iC7-60SLIN07-416E00Fx		425	2x(3x120+70)	2x(3x185+57)	300 Cu/Al	1/M8	2/M10

Table 22: Field Cable Sizes for INU Module, 525–690 V AC - (continued)

Model code	Frame[1]	I_N [A]	Motor cable Cu [mm²]	Motor cable Al [mm²]	Terminal max. cable size	Number of grounding terminals/ bolt size	Max. number of cables/ bolt size
iC7-60SLIN07-465E00Fx	Ix12L	475	2x(3x150+70)	2x(3x240+72)	300 Cu/Al	1/M8	4/M10
iC7-60SLIN07-525E00Fx		536	2x(3x185+95)	3x(3x150+41)	300 Cu/Al	1/M8	4/M10
iC7-60SLIN07-590E00Fx		603	2x(3x240+120)	3x(3x185+57)	300 Cu/Al	1/M8	4/M10
iC7-60SLIN07-650E00Fx		664	2x(3x240+120)	3x(3x185+57)	300 Cu/Al	1/M8	4/M10
iC7-60SLIN07-730E00Fx		746	3x(3x150+70)	4x(3x150+41)	300 Cu/Al	1/M8	4/M10
iC7-60SLIN07-820E00Fx		838	4x(3x120+70)	4x(3x185+57)	300 Cu/Al	1/M8	4/M10
iC7-60SLIN07-945E00Fx	2 x Ix12L	965	4x(3x150+70)	4x(3x240+72)	300 Cu/Al	2/M8	8/M10
iC7-60SLIN07-1060E00Fx		1 083	4x(3x185+95)	6x(3x150+41)	300 Cu/Al	2/M8	8/M10
iC7-60SLIN07-1230E00Fx		1 256	4x(3x240+120)	6x(3x185+57)	300 Cu/Al	2/M8	8/M10
iC7-60SLIN07-1400E00Fx		1 430	4x(3x240+120)	8x(3x150+41)	300 Cu/Al	2/M8	8/M10
iC7-60SLIN07-1500E00Fx		1 532	8x(3x120+70)	8x(3x150+41)	300 Cu/Al	2/M8	8/M10
iC7-60SLIN07-1640E00Fx		1 675	8x(3x120+70)	8x(3x185+57)	300 Cu/Al	2/M8	8/M10
iC7-60SLIN07-1795E00Fx	3 x Ix12L	1 833	9x(3x120+70)	9x(3x185+57)	300 Cu/Al	3/M8	12/M10
iC7-60SLIN07-2080E00Fx		2 124	9x(3x150+70)	12x(3x150+41)	300 Cu/Al	3/M8	12/M10
iC7-60SLIN07-2300E00Fx		2 348	12x(3x120+70)	12x(3x150+41)	300 Cu/Al	3/M8	12/M10
iC7-60SLIN07-2460E00Fx		2 512	12x(3x120+70)	12x(3x185+57)	300 Cu/Al	3/M8	12/M10
iC7-60SLIN07-2830E00Fx	4 x Ix12L	2 889	12x(3x150+70)	16x(3x150+41)	300 Cu/Al	4/M8	16/M10
iC7-60SLIN07-3050E00Fx		3 114	16x(3x120+70)	16x(3x185+57)	300 Cu/Al	4/M8	16/M10
iC7-60SLIN07-3260E00Fx		3 328	16x(3x120+70)	16x(3x185+57)	300 Cu/Al	4/M8	16/M10
iC7-60SLIN07-3500E00Fx	5 x Ix12L	3 573	15x(3x150+70)	20x(3x150+41)	300 Cu/Al	5/M8	20/M10
iC7-60SLIN07-4035E00Fx		4 119	20x(3x120+70)	20x(3x185+57)	300 Cu/Al	5/M8	20/M10
iC7-60SLIN07-4400E00Fx	6 x Ix12L	4 492	18x(3x150+70)	24x(3x150+41)	300 Cu/Al	6/M8	24/M10
iC7-60SLIN07-4850E00Fx		4 951	24x(3x120+70)	24x(3x185+57)	300 Cu/Al	6/M8	24/M10
iC7-60SLIN07-5300E00Fx	7 x Ix12L	5 411	28x(3x120+70)	28x(3x150+41)	300 Cu/Al	7/M8	28/M10
iC7-60SLIN07-5600E00Fx		5 717	28x(3x120+70)	28x(3x185+57)	300 Cu/Al	7/M8	28/M10
iC7-60SLIN07-6100E00Fx	8 x Ix12L	6 227	32x(3x120+70)	32x(3x185+57)	300 Cu/Al	8/M8	32/M10
iC7-60SLIN07-6400E00Fx		6 534	32x(3x120+70)	32x(3x185+57)	300 Cu/Al	8/M8	32/M10

1) IM10L, IR10L, IM12L, or IR12L

2) Only for B5 voltage class.

7.2.10 Source Cable Sizes for DC/DC Converter Modules, 640–1100 V DC

Ambient air temperature is a maximum of 60 °C (140 °F). Cable insulation is rated for a minimum of 90 °C (194 °F).

Use symmetrical cabling with modules connected in parallel. Each module must have the same number of cables with equal cross-section.

The number of cables in the table is for source DC+ connection only. The DC- connection requires the same number of cables.

Table 23: DC/DC Converter Module 640–1100 V DC Source Cable Sizes, IP00/Open Type.

Model code	Frame	Current (I_L) [A]	1-core cable Cu [mm^2]	3-core cable Cu [mm^2]	4-core cable Cu [mm^2]	Max. number of terminals/ bolt size
iC7-60SLDC07-300A	DR10L	300	3x(1x95)	2x(3x70)	1x(4x70)	4 / M10
iC7-60SLDC07-360A		360	3x(1x95)	2x(3x70)	1x(4x70)	
iC7-60SLDC07-420A		420	4x(1x95)	2x(3x95)	1x(4x95)	
iC7-60SLDC07-480A		480	4x(1x95)	2x(3x95)	1x(4x95)	
iC7-60SLDC07-570A		570	4x(1x120)	2x(3x120)	1x(4x120)	
iC7-60SLDC07-720A	DR12L	720	5x(1x95)	3x(3x95)	2x(4x70)	8 / M10
iC7-60SLDC07-840A		840	6x(1x95)	3x(3x95)	2x(4x70)	
iC7-60SLDC07-960A		960	7x(1x95)	3x(3x120)	2x(4x95)	
iC7-60SLDC07-1080		1080	7x(1x95)	3x(3x120)	2x(4x95)	
iC7-60SLDC07-1200		1200	8x(1x95)	4x(3x120)	2x(4x120)	
iC7-60SLDC07-1440	2 x DR12L	1440	10x(1x95)	6x(3x95)	4x(4x70)	16 / M10
iC7-60SLDC07-1680		1680	12x(1x95)	6x(3x95)	4x(4x70)	
iC7-60SLDC07-1920		1920	14x(1x95)	6x(3x120)	4x(4x95)	
iC7-60SLDC07-2160		2160	14x(1x95)	6x(3x120)	4x(4x95)	
iC7-60SLDC07-2400		2400	16x(1x95)	8x(3x120)	4x(4x120)	
iC7-60SLDC07-2880	3 x DR12L	2880	21x(1x95)	9x(3x120)	6x(4x95)	24 / M10
iC7-60SLDC07-3240		3240	21x(1x95)	9x(3x120)	6x(4x95)	
iC7-60SLDC07-3600		3600	24x(1x95)	12x(3x120)	6x(4x120)	
iC7-60SLDC07-3840	4 x DR12L	3840	28x(1x95)	12x(3x120)	8x(4x95)	32 / M10
iC7-60SLDC07-4320		4320	28x(1x95)	12x(3x120)	8x(4x95)	
iC7-60SLDC07-4800		4800	32x(1x95)	16x(3x120)	8x(4x120)	

1) 3-core cables: Use 2 conductors for 'plus' and 'minus', and a third conductor for PE.

2) 4-core cables: Use 2 conductors for 'plus' and 2 conductors for 'minus'.

7.2.11 Marine Cable Sizes for AFE or GC Modules 380–500 V AC

Table 24: Cable Sizes for AFE or GC Module 380-500 V AC for Marine Applications (Marine cables according to IEC 60092-352)

Model code	Frame[1]	I_N [A]	Mains cable Cu [mm^2]	Terminal max. cable size	Number of grounding terminals/ bolt size	Max. number of cables/ bolt size
iC7-60SL3AA5-271A	A_10L	277	2x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SL3AA5-317A		324	2x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SL3AA5-400A		409	3x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SL3AA5-460A		470	3x(3x95)	150 Cu/Al	1/M8	3/M8

Table 24: Cable Sizes for AFE or GC Module 380-500 V AC for Marine Applications (Marine cables according to IEC 60092-352) - (continued)

Model code	Frame[1]	I_N [A]	Mains cable Cu [mm^2]	Terminal max. cable size	Number of grounding terminals/ bolt size	Max. number of cables/ bolt size
iC7-60SL3AA5-520A	A_12L	531	4x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SL3AA5-580A		593	4x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SL3AA5-650A		664	4x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SL3AA5-730A		746	5x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SL3AA5-816A		833	5x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SL3AA5-970A		991	6x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SL3AA5-1040A	2 x A_12L	1062	8x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SL3AA5-1210		1236	8x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SL3AA5-1300		1328	8x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SL3AA5-1410		1440	10x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SL3AA5-1630		1664	10x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SL3AA5-1900		1940	12x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SL3AA5-2080	3 x A_12L	2124	15x(3x95)	150 Cu/Al	3/M8	18/M10
iC7-60SL3AA5-2200		2246	15x(3x95)	150 Cu/Al	3/M8	18/M10
iC7-60SL3AA5-2450		2501	15x(3x95)	150 Cu/Al	3/M8	18/M10
iC7-60SL3AA5-2800		2859	18x(3x95)	150 Cu/Al	3/M8	18/M10
iC7-60SL3AA5-3120	4 x A_12L	3185	20x(3x95)	150 Cu/Al	4/M8	24/M10
iC7-60SL3AA5-3270		3338	20x(3x95)	150 Cu/Al	4/M8	24/M10
iC7-60SL3AA5-3720		3798	24x(3x95)	150 Cu/Al	4/M8	24/M10
iC7-60SL3AA5-4160	5 x A_12L	4247	30x(3x95)	150 Cu/Al	5/M8	30/M10
iC7-60SL3AA5-4650		4747	30x(3x95)	150 Cu/Al	5/M8	30/M10
iC7-60SL3AA5-5200	6 x A_12L	5309	36x(3x95)	150 Cu/Al	6/M8	36/M10
iC7-60SL3AA5-5550		5666	36x(3x95)	150 Cu/Al	6/M8	36/M10
iC7-60SL3AA5-5930	7 x A_12L	6054	42x(3x95)	150 Cu/Al	7/M8	42/M10
iC7-60SL3AA5-6450		6585	42x(3x95)	150 Cu/Al	7/M8	42/M10
iC7-60SL3AA5-6900	8 x A_12L	7044	48x(3x95)	150 Cu/Al	8/M8	48/M10
iC7-60SL3AA5-7370		7524	48x(3x95)	150 Cu/Al	8/M8	48/M10

1) AM10L, AR10L, AM12L, or AR12L

7.2.12 Marine Cable Sizes for AFE or GC Modules 525–690 V AC

Table 25 for cable recommendation is also applicable to the voltage class B5.

Table 25: Cable Sizes for AFE or GC Module 525–690 V AC for Marine Applications (Marine cables according to IEC 60092-352)

Model code	Frame[1]	I_N [A]	Mains cable Cu [mm^2]	Terminal max. cable size	Number of grounding terminals/ bolt size	Max. number of cables/ bolt size
iC7-60SLxx07-236AE00Fx	Ax10L	241	2x(3x70)	150 Cu/Al	1/M8	3/M8
iC7-60SLxxB5-261AE00Fx[2]		267	2x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SLxx07-300AE00Fx		307	2x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SLxxB5-325AE00Fx[2]		332	2x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SLxx07-334AE00Fx		341	3x(3x70)	150 Cu/Al	1/M8	3/M8
iC7-60SLxx07-380AE00Fx		388	3x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SLxx07-425AE00Fx	Ax12L	434	3x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SLxx07-475AE00Fx		485	3x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SLxx07-530AE00Fx		542	4x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SLxx07-595AE00Fx		608	4x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SLxx07-670AE00Fx		684	5x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SLxx07-760AE00Fx		776	5x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SLxx07-850AE00Fx	2 x Ax12L	868	6x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SLxx07-945AE00Fx		965	6x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SLxx07-1040E00Fx		1062	8x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SLxx07-1230E00Fx		1256	8x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SLxx07-1325E00Fx		1353	10x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SLxx07-1500E00Fx		1532	10x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SLxx07-1700E00Fx	3 x Ax12L	1736	12x(3x95)	150 Cu/Al	3/M8	18/M10
iC7-60SLxx07-1800E00Fx		1838	12x(3x95)	150 Cu/Al	3/M8	18/M10
iC7-60SLxx07-2000E00Fx		2042	12x(3x95)	150 Cu/Al	3/M8	18/M10
iC7-60SLxx07-2250E00Fx		2297	12x(3x95)	150 Cu/Al	3/M8	18/M10
iC7-60SLxx07-2500E00Fx	4 x Ax12L	2552	16x(3x95)	150 Cu/Al	4/M8	24/M10
iC7-60SLxx07-2650E00Fx		2706	20x(3x95)	150 Cu/Al	4/M8	24/M10
iC7-60SLxx07-2940E00Fx		3002	20x(3x95)	150 Cu/Al	4/M8	24/M10
iC7-60SLxx07-3120E00Fx	5 x Ax12L	3185	25x(3x95)	150 Cu/Al	5/M8	30/M10
iC7-60SLxx07-3600E00Fx		3675	25x(3x95)	150 Cu/Al	5/M8	30/M10
iC7-60SLxx07-3900E00Fx	6 x Ax12L	3982	30x(3x95)	150 Cu/Al	6/M8	36/M10
iC7-60SLxx07-4320E00Fx		4410	30x(3x95)	150 Cu/Al	6/M8	36/M10
iC7-60SLxx07-4750E00Fx	7 x Ax12L	4849	35x(3x95)	150 Cu/Al	7/M8	42/M10
iC7-60SLxx07-5040E00Fx		5145	35x(3x95)	150 Cu/Al	7/M8	42/M10
iC7-60SLxx07-5400E00Fx	8 x Ax12L	5513	40x(3x95)	150 Cu/Al	8/M8	48/M10
iC7-60SLxx07-5750E00Fx		5870	40x(3x95)	150 Cu/Al	8/M8	48/M10

1) AM10L, AR10L, AM12L, or AR12L

2) Only for B5 voltage class.

7.2.13 Marine Cable Sizes for INU Modules 380–500 V AC

Table 26: Cable Sizes for INU Module 380–500 V AC for Marine Applications (Marine cables according to IEC 60092-352)

Model code	Frame[1]	$I_{N\ [A]}$	Motor cable Cu [mm^2]	Terminal max. cable size	Earth terminal	Max. number of cables/ bolt size
iC7-60SLINA5-206A	I_10L	211	2x(3x70)	150 Cu/Al	1/M8	3/M8
iC7-60SLINA5-245A		251	2x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SLINA5-302A		309	2x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SLINA5-385A		394	3x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SLINA5-480A		490	3x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SLINA5-520A		531	3x(3x120)	150 Cu/Al	1/M8	3/M8
iC7-60SLINA5-658A	I_12L	672	5x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SLINA5-730A		746	5x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SLINA5-820A		838	5x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SLINA5-880A		899	6x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SLINA5-1000A		1021	6x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SLINA5-1270	2 x I_12L	1297	8x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SLINA5-1460		1491	10x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SLINA5-1630		1664	10x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SLINA5-1760		1797	12x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SLINA5-1960		2001	12x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SLINA5-2130	3 x I_12L	2195	15x(3x95)	150 Cu/Al	3/M8	18/M10
iC7-60SLINA5-2340		2389	15x(3x95)	150 Cu/Al	3/M8	18/M10
iC7-60SLINA5-2510		2563	18x(3x95)	150 Cu/Al	3/M8	18/M10
iC7-60SLINA5-2880		2940	18x(3x95)	150 Cu/Al	3/M8	18/M10
iC7-60SLINA5-3120	4 x I_12L	3185	20x(3x95)	150 Cu/Al	4/M8	24/M10
iC7-60SLINA5-3420		3492	24x(3x95)	150 Cu/Al	4/M8	24/M10
iC7-60SLINA5-3820		3900	24x(3x95)	150 Cu/Al	4/M8	24/M10
iC7-60SLINA5-4140	5 x I_12L	4227	30x(3x95)	150 Cu/Al	5/M8	30/M10
iC7-60SLINA5-4500		4594	30x(3x95)	150 Cu/Al	5/M8	30/M10
iC7-60SLINA5-4750		4849	30x(3x95)	150 Cu/Al	6/M8	30/M10
iC7-60SLINA5-5220	6 x I_12L	5329	36x(3x95)	150 Cu/Al	6/M8	36/M10
iC7-60SLINA5-5680		5799	36x(3x95)	150 Cu/Al	6/M8	36/M10

1) IM10L, IR10L, IM12L, or IR12L

7.2.14 Marine Cable Sizes for INU Modules 525–690 V AC

Table 27 for cable recommendation is also applicable to the voltage class B5.

Table 27: Cable Sizes for INU Module 525–690 V AC for Marine Applications (Marine cables according to IEC 60092-352)

Model code	Frame[1]	$I_{N\ [A]}$	Motor cable Cu [mm^2]	Terminal max. cable size	Earth terminal	Max. number of cables/ bolt size
iC7-60SLIN07-170E00Fx	Ix10L	174	2x(3x70)	150 Cu/Al	1/M8	3/M8
iC7-60SLINB5-206AE00Fx[2]		211	2x(3x70)	150 Cu/Al	1/M8	3/M8
iC7-60SLIN07-208AE00Fx		213	2x(3x70)	150 Cu/Al	1/M8	3/M8
iC7-60SLINB5-245AE00Fx[2]		251	2x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SLIN07-261E00Fx		267	2x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SLINB5-302AE00Fx[2]		309	2x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SLIN07-325E00Fx		332	2x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SLIN07-365E00Fx		373	3x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SLINB5-385AE00Fx[2]		394	3x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SLIN07-416E00Fx		425	3x(3x95)	150 Cu/Al	1/M8	3/M8
iC7-60SLIN07-465E00Fx	Ix12L	475	3x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SLIN07-525E00Fx		536	4x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SLIN07-590E00Fx		603	4x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SLIN07-650E00Fx		664	4x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SLIN07-730E00Fx		746	5x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SLIN07-820E00Fx		838	5x(3x95)	150 Cu/Al	1/M8	6/M10
iC7-60SLIN07-945E00Fx	2 x Ix12L	965	6x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SLIN07-1060E00Fx		1083	8x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SLIN07-1230E00Fx		1256	8x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SLIN07-1400E00Fx		1430	10x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SLIN07-1500E00Fx		1532	10x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SLIN07-1640E00Fx		1675	10x(3x95)	150 Cu/Al	2/M8	12/M10
iC7-60SLIN07-1795E00Fx	3 x Ix12L	1833	12x(3x95)	150 Cu/Al	3/M8	18/M10
iC7-60SLIN07-2080E00Fx		2124	15x(3x95)	150 Cu/Al	3/M8	18/M10
iC7-60SLIN07-2300E00Fx		2348	15x(3x95)	150 Cu/Al	3/M8	18/M10
iC7-60SLIN07-2460E00Fx		2512	18x(3x95)	150 Cu/Al	3/M8	18/M10
iC7-60SLIN07-2830E00Fx	4 x Ix12L	2889	20x(3x95)	150 Cu/Al	4/M8	24/M10
iC7-60SLIN07-3050E00Fx		3114	20x(3x95)	150 Cu/Al	4/M8	24/M10
iC7-60SLIN07-3260E00Fx		3328	20x(3x95)	150 Cu/Al	4/M8	24/M10
iC7-60SLIN07-3500E00Fx	5 x Ix12L	3573	25x(3x95)	150 Cu/Al	5/M8	30/M10
iC7-60SLIN07-4035E00Fx		4119	25x(3x95)	150 Cu/Al	5/M8	30/M10
iC7-60SLIN07-4400E00Fx	6 x Ix12L	4492	30x(3x95)	150 Cu/Al	6/M8	36/M10
iC7-60SLIN07-4850E00Fx		4951	30x(3x95)	150 Cu/Al	6/M8	36/M10
iC7-60SLIN07-5300E00Fx	7 x Ix12L	5411	35x(3x95)	150 Cu/Al	7/M8	42/M10
iC7-60SLIN07-5600E00Fx		5717	35x(3x95)	150 Cu/Al	7/M8	42/M10

Table 27: Cable Sizes for INU Module 525–690 V AC for Marine Applications (Marine cables according to IEC 60092-352) - (continued)

Model code	Frame[1]	$I_{N\ [A]}$	Motor cable Cu [mm^2]	Terminal max. cable size	Earth terminal	Max. number of cables/ bolt size
iC7-60SLIN07-6100E00Fx	8 x Ix12L	6227	40x(3x95)	150 Cu/Al	8/M8	48/M10
iC7-60SLIN07-6400E00Fx		6534	40x(3x95)	150 Cu/Al	8/M8	48/M10

1) IM10L, IR10L, IM12L, or IR12L

2) Only for B5 voltage class.

7.2.14.1 Cable Sizes for DC-filter Capacitors

For connecting the minus terminal of the DC-filter capacitor to the DC bus, use copper cable or single wire with at least 1100 V DC voltage, and 90 °C (194 °F) temperature rating. See also the iC7 Series Liquid-cooled System Modules Installation Guide.

Minimum cable sizes

- DR10L: 16 mm^2 (AWG 6)
- DR12L: 35 mm^2 (AWG 2)

The terminal size is M6.

7.2.15 UL-Rated Cables

7.2.15.1 Mains Cable Sizes for AFE or GC Modules, UL 480 V

Table 28: Mains Cable Sizes for AFE or GC Modules, UL 480 V (Recommendation)

Model code	Frame[1]	I_N[A]	Mains cable Cu [AWG/MCM]	Mains cable termination Panduit terminal part number
iC7-60SL3AA5-271A	A_10L	277	2x3/0	LCAX3/0-12-X
C7-60SL3AA5-317A		324	2x300	LCAX300-12-6
iC7-60SL3AA5-400A		409	2x500	LCAX500-12-6
iC7-60SL3AA5-460A		445	2x500	LCAX500-12-6
iC7-60SL3AA5-520A	A_12L	531	3x300	LCAX300-12-6
iC7-60SL3AA5-580A		593	3x350	LCAX350-12-6
iC7-60SL3AA5-650A		664	4x300	LCAX300-12-6
iC7-60SL3AA5-730A		746	4x300	LCAX300-12-6
iC7-60SL3AA5-816A		833	4x500	LCAX500-12-6
C7-60SL3AA5-970A		940	4x500	LCAX500-12-6
iC7-60SL3AA5-1040	2 x A_12L	1062	6x350	LCAX350-12-6
iC7-60SL3AA5-1210		1236	6x350	LCAX350-12-6
iC7-60SL3AA5-1300		1328	8x300	LCAX300-12-6
iC7-60SL3AA5-1410		1440	8x300	LCAX300-12-6
iC7-60SL3AA5-1630		1664	8x500	LCAX500-12-6
iC7-60SL3AA5-1900		1838	8x500	LCAX500-12-6

Table 28: Mains Cable Sizes for AFE or GC Modules, UL 480 V (Recommendation) - (continued)

Model code	Frame[1]	I_N[A]	Mains cable Cu [AWG/MCM]	Mains cable termination Panduit terminal part number
iC7-60SL3AA5-2080	3 x A_12L	2124	12x300	LCAX300-12-6
iC7-60SL3AA5-2200		2246	12x300	LCAX300-12-6
iC7-60SL3AA5-2450		2501	12x500	LCAX500-12-6
iC7-60SL3AA5-2800		2726	12x500	LCAX500-12-6
iC7-60SL3AA5-3120	4 x A_12L	3185	16x300	LCAX300-12-6
iC7-60SL3AA5-3270		3338	16x350	LCAX350-12-6
iC7-60SL3AA5-3720		3614	16x500	LCAX500-12-6
iC7-60SL3AA5-4160	5 x A_12L	4247	20x500	LCAX500-12-6
iC7-60SL3AA5-4650		4502	20x500	LCAX500-12-6
iC7-60SL3AA5-5200	6 x A_12L	5002	24x350	LCAX350-12-6
iC7-60SL3AA5-5550		5390	24x500	LCAX500-12-6
iC7-60SL3AA5-5930	7 x A_12L	5717	28x350	LCAX350-12-6
iC7-60SL3AA5-6450		6227	28x500	LCAX500-12-6
iC7-60SL3AA5-6900	8 x A_12L	6534	32x350	LCAX350-12-6
iC7-60SL3AA5-7370		7115	32x500	LCAX500-12-6

1) AM10L, AR10L, AM12L, or AR12L.

7.2.15.2 Mains Cable Sizes for AFE or GC Modules, UL 600 V

Table 29 for cable recommendation is also applicable to the voltage class B5.

Table 29: Mains Cable Sizes for AFE or GC Modules, UL 600 V (Recommendation)

Model code	Frame[1]	I_N[A]	Mains cable Cu [AWG/MCM]	Mains cable termination Panduit terminal part number
iC7-60SL3A07-236A	A_10L	241	2x3/0	LCAX3/0-12-X
iC7-60SL3AB5-261A[2]		267	2x3/0	LCAX3/0-12-X
iC7-60SL3A07-300A		307	2x4/0	LCAX4/0-12-X
iC7-60SL3AB5-325A[2]		332	2x300	LCAX300-12-6
iC7-60SL3A07-334A		341	2x300	LCAX300-12-6
iC7-60SL3A07-380A		388	2x300	LCAX300-12-6
iC7-60SL3A07-425A	A_12L	434	3x4/0	LCAX4/0-12-X
iC7-60SL3A07-475A		485	3x300	LCAX300-12-6
iC7-60SL3A07-530A		542	3x300	LCAX300-12-6
iC7-60SL3A07-595A		608	3x350	LCAX350-12-6
iC7-60SL3A07-670A		684	4x300	LCAX300-12-6
iC7-60SL3A07-760A		776	4x300	LCAX300-12-6

Table 29: Mains Cable Sizes for AFE or GC Modules, UL 600 V (Recommendation) - (continued)

Model code	Frame[1]	I_N[A]	Mains cable Cu [AWG/MCM]	Mains cable termination Panduit terminal part number
iC7-60SL3A07-850A	2 x A_12L	868	6x4/0	LCAX4/0-12-X
iC7-60SL3A07-945A		965	6x4/0	LCAX4/0-12-X
iC7-60SL3A07-1040		1062	6x350	LCAX350-12-6
iC7-60SL3A07-1230		1256	6x350	LCAX350-12-6
iC7-60SL3A07-1325		1353	8x300	LCAX300-12-6
iC7-60SL3A07-1500		1532	8x300	LCAX300-12-6
iC7-60SL3A07-1700	3 x A_12L	1736	12x250	LCAX250-12-X
iC7-60SL3A07-1800		1838	9x350	LCAX350-12-6
iC7-60SL3A07-2000		2042	12x250	LCAX250-12-X
iC7-60SL3A07-2250		2297	12x300	LCAX300-12-6
iC7-60SL3A07-2500	4 x A_12L	2552	16x300	LCAX300-12-6
iC7-60SL3A07-2650		2706	16x300	LCAX300-12-6
iC7-60SL3A07-2940		3002	16x300	LCAX300-12-6
iC7-60SL3A07-3120	5 x A_12L	3185	20x4/0	LCAX4/0-12-X
iC7-60SL3A07-3600		3675	20x300	LCAX300-12-6
iC7-60SL3A07-3900	6 x A_12L	3982	24x250	LCAX250-12-X
iC7-60SL3A07-4320		4410	24x300	LCAX300-12-6
iC7-60SL3A07-4750	7 x A_12L	4849	28x250	LCAX300-12-6
iC7-60SL3A07-5040		5145	28x300	LCAX300-12-6
iC7-60SL3A07-5400	8 x A_12L	5513	32x250	LCAX300-12-6
iC7-60SL3A07-5750		5870	32x300	LCAX300-12-6

1) AM10L, AR10L, AM12L, or AR12L

2) Only for B5 voltage class.

7.2.15.3 Motor Cable Sizes for Inverter Modules, UL 460 V

Table 30: Motor Cable Sizes for Inverter Modules, UL 460 V (Recommendation)

Model code	Frame[1]	I_N [A]	Motor cable Cu [AWG/MCM]	Motor cable termination Panduit terminal part number	Terminal max. cable size	Number of grounding terminals/bolt size	Max. number of cables/bolt size
iC7-60SLINA5-206A	I_10L	211	1x350	LCAX350-12-6	500MCM	1/M8	2/M10
iC7-60SLINA5-245A		251	2x3/0	LCAX3/0-12-X	500MCM	1/M8	2/M10
iC7-60SLINA5-302A		309	2x4/0	LCAX4/0-12-X	500MCM	1/M8	2/M10
iC7-60SLINA5-385A		394	2x300	LCAX300-12-6	500MCM	1/M8	2/M10
iC7-60SLINA5-480A		490	2x500	LCAX500-12-6	500MCM	1/M8	2/M10
iC7-60SLINA5-520A		531	2x500	LCAX500-12-6	500MCM	1/M8	2/M10

Table 30: Motor Cable Sizes for Inverter Modules, UL 460 V (Recommendation) - (continued)

Model code	Frame[1]	I_N [A]	Motor cable Cu [AWG/MCM]	Motor cable termination Panduit terminal part number	Terminal max. cable size	Number of grounding terminals/bolt size	Max. number of cables/bolt size
iC7-60SLINA5-658A	I_12L	672	4x250	LCAX250-12-X	500MCM	1/M8	4/M10
iC7-60SLINA5-730A		746	4x300	LCAX300-12-6	500MCM	1/M8	4/M10
iC7-60SLINA5-820A		838	4x350	LCAX350-12-6	500MCM	1/M8	4/M10
iC7-60SLINA5-880A		899	4x500	LCAX500-12-6	500MCM	1/M8	4/M10
iC7-60SLINA5-1000		970	4x500	LCAX500-12-6	500MCM	1/M8	4/M10
iC7-60SLINA5-1270	2 x I_12L	1297	6x350	LCAX350-12-6	500MCM	2/M8	8/M10
iC7-60SLINA5-1460		1491	8x300	LCAX300-12-6	500MCM	2/M8	8/M10
iC7-60SLINA5-1630		1664	8x350	LCAX350-12-6	500MCM	2/M8	8/M10
iC7-60SLINA5-1760		1797	8x500	LCAX500-12-6	500MCM	2/M8	8/M10
iC7-60SLINA5-1960		1889	8x500	LCAX500-12-6	500MCM	2/M8	8/M10
iC7-60SLINA5-2130	3 x I_12L	2195	12x300	LCAX300-12-6	500MCM	3/M8	12/M10
iC7-60SLINA5-2340		2389	12x300	LCAX300-12-6	500MCM	3/M8	12/M10
iC7-60SLINA5-2510		2563	12x350	LCAX350-12-6	500MCM	3/M8	12/M10
iC7-60SLINA5-2880		2818	12x500	LCAX500-12-6	500MCM	3/M8	12/M10
iC7-60SLINA5-3120	4 x I_12L	3185	16x300	LCAX300-12-6	500MCM	4/M8	16/M10
iC7-60SLINA5-3420		3492	16x350	LCAX350-12-6	500MCM	4/M8	16/M10
iC7-60SLINA5-3820		3726	16x500	LCAX500-12-6	500MCM	4/M8	16/M10
iC7-60SLINA5-4140	5 x I_12L	4024	20x300	LCAX300-12-6	500MCM	5/M8	20/M10
iC7-60SLINA5-4500		4329	20x350	LCAX350-12-6	500MCM	5/M8	20/M10
iC7-60SLINA5-4750		4594	20x500	LCAX500-12-6	500MCM	5/M8	20/M10
iC7-60SLINA5-5220	6 x I_12L	5002	24x350	LCAX350-12-6	500MCM	6/M8	24/M10
iC7-60SLINA5-5680		5462	24x500	LCAX500-12-6	500MCM	6/M8	24/M10

1) IM10L, IR10L, IM12L, or IR12L.

7.2.15.4 Motor Cable Sizes for Inverter Modules, UL 575 V

Table 31 for cable recommendation is also applicable to the voltage class B5.

Table 31: Motor Cable Sizes for Inverter Modules, UL 575 V (Recommendation)

Model code	Frame[1]	I_N [A]	Motor cable Cu [AWG/MCM]	Motor cable termination Panduit terminal part number	Terminal max. cable size	Number of grounding terminals/bolt size	Max. number of cables/bolt size
iC7-60SLIN07-170A	I_10L	174	1x250	LCAX250-12-X	500MCM	1/M8	2/M10
iC7-60SLINB5-206A[2]		211	1x350	LCAX350-12-6	500MCM	1/M8	2/M10
iC7-60SLIN07-208A		213	1x350	LCAX350-12-6	500MCM	1/M8	2/M10
iC7-60SLINB5-245A[2]		251	2x3/0	LCAX3/0-12-X	500MCM	1/M8	2/M10
iC7-60SLIN07-261A		267	2x3/0	LCAX3/0-12-X	500MCM	1/M8	2/M10
iC7-60SLINB5-302A[2]		309	2x4/0	LCAX4/0-12-X	500MCM	1/M8	2/M10
iC7-60SLIN07-325A		332	2x250	LCAX250-12-X	500MCM	1/M8	2/M10
iC7-60SLIN07-365A		373	2x300	LCAX300-12-6	500MCM	1/M8	2/M10
iC7-60SLINB5-385A[2]		394	2x300	LCAX300-12-6	500MCM	1/M8	2/M10
iC7-60SLIN07-416A		425	2x350	LCAX350-12-6	500MCM	1/M8	2/M10
iC7-60SLIN07-465A	I_12L	475	3x4/0	LCAX4/0-12-X	500MCM	1/M8	4/M10
iC7-60SLIN07-525A		536	3x250	LCAX250-12-X	500MCM	1/M8	4/M10
iC7-60SLIN07-590A		603	3x350	LCAX350-12-6	500MCM	1/M8	4/M10
iC7-60SLIN07-650A		664	4x250	LCAX250-12-X	500MCM	1/M8	4/M10
iC7-60SLIN07-730A		746	4x300	LCAX300-12-6	500MCM	1/M8	4/M10
iC7-60SLIN07-820A		838	4x350	LCAX350-12-6	500MCM	1/M8	4/M10
iC7-60SLIN07-945A	2 x I_12L	965	6x4/0	LCAX4/0-12-X	500MCM	2/M8	8/M10
iC7-60SLIN07-1060		1083	6x300	LCAX300-12-6	500MCM	2/M8	8/M10
iC7-60SLIN07-1230		1256	6x350	LCAX350-12-6	500MCM	2/M8	8/M10
iC7-60SLIN07-1400		1430	8x250	LCAX250-12-X	500MCM	2/M8	8/M10
iC7-60SLIN07-1500		1532	8x300	LCAX300-12-6	500MCM	2/M8	8/M10
iC7-60SLIN07-1640		1675	8x350	LCAX350-12-6	500MCM	2/M8	8/M10
iC7-60SLIN07-1795	3 x I_12L	1833	9x350	LCAX350-12-6	500MCM	3/M8	12/M10
iC7-60SLIN07-2080		2124	12x250	LCAX250-12-X	500MCM	3/M8	12/M10
iC7-60SLIN07-2300		2348	12x300	LCAX300-12-6	500MCM	3/M8	12/M10
iC7-60SLIN07-2500		2552	12x350	LCAX350-12-6	500MCM	3/M8	12/M10
iC7-60SLIN07-2830	4 x I_12L	2889	16x300	LCAX300-12-6	500MCM	4/M8	16/M10
iC7-60SLIN07-3050		3114	16x300	LCAX300-12-6	500MCM	4/M8	16/M10
iC7-60SLIN07-3260		3328	16x350	LCAX350-12-6	500MCM	4/M8	16/M10
iC7-60SLIN07-3500	5 x I_12L	3573	20x250	LCAX250-12-X	500MCM	5/M8	20/M10
iC7-60SLIN07-4035		4119	20x350	LCAX350-12-6	500MCM	5/M8	20/M10
iC7-60SLIN07-4400	6 x I_12L	4492	24x300	LCAX300-12-6	500MCM	6/M8	24/M10
iC7-60SLIN07-4850		4951	24x350	LCAX350-12-6	500MCM	6/M8	24/M10

Table 31: Motor Cable Sizes for Inverter Modules, UL 575 V (Recommendation) - (continued)

Model code	Frame[1]	I_N [A]	Motor cable Cu [AWG/MCM]	Motor cable termination Panduit terminal part number	Terminal max. cable size	Number of grounding terminals/bolt size	Max. number of cables/bolt size
iC7-60SLIN07-5300	7 x I_12L	5411	28x300	LCAX300-12-6	500MCM	7/M8	28/M10
iC7-60SLIN07-5600		5717	28x350	LCAX350-12-6	500MCM	7/M8	28/M10
iC7-60SLIN07-6100	8 x I_12L	6227	32x300	LCAX300-12-6	500MCM	8/M8	32/M10
iC7-60SLIN07-6400		6534	32x350	LCAX350-12-6	500MCM	8/M8	32/M10

1) IM10L, IR10L, IM12L, or IR12L

2) Only for B5 voltage class.

7.2.16 Brake Cable Sizes for BCU, 525–690 V AC

Table 32 for cable recommendation is also applicable to the voltage class B5.

Table 32: Brake Cable Sizes for BCU, 525–690 V AC

Model code	Frame	Rated current I_L [A]	Brake cable Cu [mm^2]
iC7-60SLBR07-170A	BM10L	170	3x120+70
iC7-60SLIBR07-261A		261	3x185+95
iC7-60SLBR07-416A		416	2x(3x120+70)
iC7-60SLBR07-525A	BM12L	525	2x(3x185+95)
iC7-60SLBR07-650A		650	2x(3x240+120)
iC7-60SLBR07-820A		820	4x(3x120+70)
iC7-60SLBR07-1060	2xBM12L	1060	4x(3x185+95)
iC7-60SLBR07-1400		1400	4x(3x240+120)
iC7-60SLBR07-1640		1640	8x(3x120+70)

7.2.17 Internal DC Cable Sizes for SISO Filters

The cable sizing is based on the following conditions:

- Ambient temperature maximum 60 °C (140 °F).

Use cable insulation that can withstand a temperature of at least 90 °C (194 °F).

Table 33: Internal DC Cable Sizes for SISO Filters

Model code	Frame	Rated DC current I_N[A]	Cable Cu [mm^2]
OF7SI2-M-LC-07-380-A1-E00-Fx	SILC10L	445	2x150
OF7SI2-M-LC-07-760-A1-E00-Fx	SILC12L	888	4x150
OF7SI2-M-LC-07-1500-A1-E00-Fx	SILC14L	1751	8x150
OF7SI4-M-LC-07-380-A1-E00-Fx	SILC10L	445	2x150
OF7SI4-M-LC-07-760-A1-E00-Fx	SILC12L	888	4x150
OF7SI4-M-LC-07-1500-A1-E00-Fx	SILC14L	1751	8x150

Table 33: Internal DC Cable Sizes for SISO Filters - (continued)

Model code	Frame	Rated DC current I_N[A]	Cable Cu [mm^2]
OF7S02-M-LC-07-730-A1-E00-F4	SOSIN12L	836	4x150
OF7SO2-M-LC-07-1400-A1-E00-F4	SOSIN14L	1530	8x150

7.3 Fuses

7.3.1 General Information on the Fuse Tables

The fuse size tables for the liquid-cooled system modules can be found with these links. The time-current curves of the fuses can be applied for both AC and DC current in selectivity analysis even if the fuses are designated as AC fuses. Drives are protected with high speed aR fuses.

NOTICE

FUSES FROM DIFFERENT MANUFACTURERS

Mixing fuses from different manufacturers can damage the equipment.

- Use fuses from only one manufacturer in the system.

- 7.3.2 AC Fuses for AFE or GC 380–500 V AC, IP00/Open Type
- 7.3.3 AC Fuses for AFE or GC 525–690 V AC, IP00/Open Type
- 7.3.4 DC Fuses for AFE or GC 450–830 V DC, IP00/Open Type
- 7.3.5 DC Fuses for AFE or GC 640–1100 V DC, IP00/Open Type
- 7.3.6 AC Fuses for GC 380–690 V AC, Voltage Class G7, IP00/Open Type
- 7.3.7 DC Fuses for GC 380–690 V AC (500–1500 V DC), Voltage Class G7, IP00/Open Type
- 7.3.8 DC Fuses for INU 450–830 V DC, IP00/Open Type
- 7.3.9 DC Fuses for INU 640–1100 V DC, IP00/Open Type
- 7.3.10 AC Fuses for INU, IP00/Open Type in Generator Use
- 7.3.11 DC-bus Fuses for DC/DC Converter, IP00/Open Type
- 7.3.12 Source DC+ Fuses for DC/DC Converter, IP00/Open Type
- 7.3.13 Source DC- Fuses for DC/DC Converter, IP00/Open Type
- 7.3.14 DC Fuses for BCU, Voltage Class B5 and 07, IP00/Open Type
- 7.3.15 AC Fuses and Circuit Breakers for L Filter, Voltage Class A5
- 7.3.16 AC Fuses and Circuit Breakers for L Filter, Voltage Class B5 and 07
- 7.3.17 AC Fuses and Circuit Breakers for L Filter, Voltage Class G7
- 7.3.18 DC Fuses for SISO Filters 640–1100 V DC, IP00/Open Type

Table 34: Abbreviations Used in the Fuse Tables

Abbreviation	Description
$I_{cp,\ mr}$	Minimum required prospective short-circuit current at 5 ms pre-arcing time. For parallel modules, the short-circuit current of a single module is sufficient.
I_L	Nominal current of the drive with low overload (110%). Allows a +10% load variation for 1 minute every 5 minutes.

Table 34: Abbreviations Used in the Fuse Tables - (continued)

Abbreviation	Description
I_N	Nominal current of the fuse.
U_N	Nominal voltage of the fuse.

7.3.2 AC Fuses for AFE or GC 380–500 V AC, IP00/Open Type

Table 35: AC Fuses for AFE or GC 380–500 V AC, IP00/Open Type, Ax10L (Mersen)

Model code[1]	Frame	Rated current I_L [A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp, mr}$ [A]
iC7-60SLxxA5-271AE00Fx	Ax10L	271	6	31	PC31UD69V315TF	690	315	3600
iC7-60SLxxA5-317AE00Fx		317						
iC7-60SLxxA5-400AE00Fx	Ax10L	400	6	31	PC31UD69V450TF	690	450	6700
iC7-60SLxxA5-460AE00Fx		460						

1) For example, iC7-60SL3AA5-236AE00F4

Table 36: AC Fuses for AFE or GC 380–500 V AC, IP00/Open Type, Ax12L (Mersen)

Model code[1]	Frame	Rated current I_L [A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp, mr}$ [A]
iC7-60SLxxA5-520AE00Fx	Ax12L	520	3	44	PC44UD75V12CTQ	750	1200	7200
iC7-60SLxxA5-580AE00Fx		580						
iC7-60SLxxA5-650AE00Fx		650						
iC7-60SLxxA5-730AE00Fx		730						
iC7-60SLxxA5-816AE00Fx		816			PC44UD75V16CTQ	750	1600	11700
iC7-60SLxxA5-970AE00Fx		970						
iC7-60SLxxA5-1040E00Fx	2xAx12L	1040	6	44	PC44UD75V12CTQ	750	1200	–
iC7-60SLxxA5-1210E00Fx		1210						
iC7-60SLxxA5-1300E00Fx		1300						
iC7-60SLxxA5-1410E00Fx		1410						
iC7-60SLxxA5-1630E00Fx		1630			PC44UD75V16CTQ	750	1600	–
iC7-60SLxxA5-1900E00Fx		1900						
iC7-60SLxxA5-2080E00Fx	3xAx12L	2080	9	44	PC44UD75V12CTQ	750	1200	–
iC7-60SLxxA5-2200E00Fx		2200						
iC7-60SLxxA5-2450E00Fx		2450			PC44UD75V16CTQ	750	1600	–
iC7-60SLxxA5-2800E00Fx		2800						
iC7-60SLxxA5-3120E00Fx	4xAx12L	3120	12	44	PC44UD75V12CTQ	750	1200	–
iC7-60SLxxA5-3270E00Fx		3270			PC44UD75V16CTQ	750	1600	–
iC7-60SLxxA5-3720E00Fx		3720						

Table 36: AC Fuses for AFE or GC 380–500 V AC, IP00/Open Type, Ax12L (Mersen) - (continued)

Model code[1]	Frame	Rated current I_L [A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp, mr}$ [A]
iC7-60SLxxA5-4160E00Fx	5xAx12L	4160	15	44	PC44UD75V16CTQ	750	1600	–
iC7-60SLxxA5-4650E00Fx		4650						
iC7-60SLxxA5-5200E00Fx	6xAx12L	5200	18	44	PC44UD75V16CTQ	750	1600	–
iC7-60SLxxA5-5550E00Fx		5550						
iC7-60SLxxA5-5930E00Fx	7xAx12L	5930	21	44	PC44UD75V16CTQ	750	1600	–
iC7-60SLxxA5-6550E00Fx		6450						
iC7-60SLxxA5-6900E00Fx	8xAx12L	6900	24	44	PC44UD75V16CTQ	750	1600	–
iC7-60SLxxA5-7370E00Fx		7370						

1) For example, iC7-60SL3AA5-520AE00F4

Table 37: AC Fuses for AFE or GC 380–500 V AC, IP00/Open Type, Ax10L (Eaton/Bussmann)

Model code[1]	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp, mr}$ [A]
iC7-60SLxxA5-271AE00Fx	Ax10L	271	6	1	170M4411	690	350	3800
iC7-60SLxxA5-317AE00Fx		317						
iC7-60SLxxA5-400AE00Fx	Ax10L	400	6	1	170M4414	690	500	6500
iC7-60SLxxA5-460AE00Fx		460						

1) For example, iC7-60SL3AA5-236AE00F4

Table 38: AC Fuses for AFE or GC 380–500 V AC, IP00/Open Type, Ax12L (Eaton/Bussmann)

Model code[1]	Frame	Rated current I_L [A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp, mr}$ [A]
iC7-60SLxxA5-520AE00Fx	Ax12L	520	3	4	170M7348	690	1250	6300
iC7-60SLxxA5-580AE00Fx		580						
iC7-60SLxxA5-650AE00Fx		650						
iC7-60SLxxA5-730AE00Fx		730						
iC7-60SLxxA5-816AE00Fx		816			170M7349	690	1800	13100
iC7-60SLxxA5-970AE00Fx		970						
iC7-60SLxxA5-1040E00Fx	2xAx12L	1040	6	4	170M7348	690	1250	–
iC7-60SLxxA5-1210E00Fx		1210						
iC7-60SLxxA5-1300E00Fx		1300						
iC7-60SLxxA5-1410E00Fx		1410						
iC7-60SLxxA5-1630E00Fx		1630			170M7349	690	1800	–
iC7-60SLxxA5-1900E00Fx		1900						

Table 38: AC Fuses for AFE or GC 380–500 V AC, IP00/Open Type, Ax12L (Eaton/Bussmann) - (continued)

Model code[1]	Frame	Rated current I_L [A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp,\ mr}$ [A]
iC7-60SLxxA5-2080E00Fx	3xAx12L	2080	9	4	170M7348	690	1250	–
iC7-60SLxxA5-2200E00Fx		2200						
iC7-60SLxxA5-2450E00Fx		2450			170M7349	690	1800	–
iC7-60SLxxA5-2800E00Fx		2800						
iC7-60SLxxA5-3120E00Fx	4xAx12L	3120	12	4	170M7348	690	1250	–
iC7-60SLxxA5-3270E00Fx		3270			170M7349	690	1800	–
iC7-60SLxxA5-3720E00Fx		3720						
iC7-60SLxxA5-4160E00Fx	5xAx12L	4160	15	4	170M7349	690	1800	–
iC7-60SLxxA5-4650E00Fx		4650						
iC7-60SLxxA5-5200E00Fx	6xAx12L	5200	18	4	170M7349	690	1800	–
iC7-60SLxxA5-5550E00Fx		5550						
iC7-60SLxxA5-5930E00Fx	7xAx12L	5930	21	4	170M7349	690	1800	–
iC7-60SLxxA5-6550E00Fx		6450						
iC7-60SLxxA5-6900E00Fx	8xAx12L	6900	24	4	170M7349	690	1800	–
iC7-60SLxxA5-7370E00Fx		7370						

1) For example, iC7-60SL3AA5-520AE00F4

7.3.3 AC Fuses for AFE or GC 525–690 V AC, IP00/Open Type

Table 39 for fuse recommendation is also applicable to the voltage class B5.

Table 39: AC Fuses for AFE or GC 525–690 V AC, IP00/Open Type, Ax10L (Mersen)

Model code[1]	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp,\ mr}$ [A]
iC7-60SLxx07-236AE00Fx	Ax10L	236	6	31	PC31UD69V250TF	690	250	2900
iC7-60SLxxB5-261AE00Fx[2]		261						
iC7-60SLxx07-300AE00Fx		300						
iC7-60SLxxB5-325AE00Fx[2]	Ax10L	325	6	31	PC31UD69V315TF	690	315	3600
iC7-60SLxx07-334AE00Fx		334						
iC7-60SLxx07-380AE00Fx		380						

1) For example, iC7-60SL3A07-236AE00F4

2) Only for B5 voltage class

Table 40: AC Fuses for AFE or GC 525–690 V AC, IP00/Open Type, Ax12L (Mersen)

Model code[1]	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp, mr}$ [A]
iC7-60SLxx07-425AE00Fx	Ax12L	425	3	44	PC44UD75V12CTQ	750	1200	7200
iC7-60SLxx07-475AE00Fx		475						
iC7-60SLxx07-530AE00Fx		530						
iC7-60SLxx07-595AE00Fx		595						
iC7-60SLxx07-670AE00Fx		670						
iC7-60SLxx07-760AE00Fx		760						
iC7-60SLxx07-850AE00Fx	2 x Ax12L	850	6	44	PC44UD75V12CTQ	750	1200	–
iC7-60SLxx07-945AE00Fx		945						
iC7-60SLxx07-1040E00Fx		1040						
iC7-60SLxx07-1230E00Fx		1230						
iC7-60SLxx07-1325E00Fx		1325						
iC7-60SLxx07-1500E00Fx		1500						
iC7-60SLxx07-1700E00Fx	3 x Ax12L	1700	9	44	PC44UD75V12CTQ	750	1200	–
iC7-60SLxx07-1800E00Fx		1800						
iC7-60SLxx07-2000E00Fx		2000						
iC7-60SLxx07-2250E00Fx		2250						
iC7-60SLxx07-2500E00Fx	4 x Ax12L	2500	12	44	PC44UD75V12CTQ	750	1200	–
iC7-60SLxx07-2650E00Fx		2650						
iC7-60SLxx07-2940E00Fx		2940						
iC7-60SLxx07-3120E00Fx	5 x Ax12L	3120	15	44	PC44UD75V12CTQ	750	1200	–
iC7-60SLxx07-3600E00Fx		3600						
iC7-60SLxx07-3900E00Fx	6 x Ax12L	3900	18	44	PC44UD75V12CTQ	750	1200	–
iC7-60SLxx07-4320E00Fx		4320						
iC7-60SLxx07-4750E00Fx	7 x Ax12L	4750	21	44	PC44UD75V12CTQ	750	1200	–
iC7-60SLxx07-5040E00Fx		5040						
iC7-60SLxx07-5400E00Fx	8 x Ax12L	5400	24	44	PC44UD75V12CTQ	750	1200	–
iC7-60SLxx07-5750E00Fx		5750						

1) For example, iC7-60SL3A07-425AE00F4

Table 41 for fuse recommendation is also applicable to the voltage class B5.

Table 41: AC Fuses for AFE or GC 525–690 V AC, IP00/Open Type, Ax10L (Eaton/Bussmann)

Model code[1]	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp, mr}$ [A]
iC7-60SLxx07-236AE00Fx	Ax10L	236	6	1	170M4410	690	315	3300
iC7-60SLxxB5-261AE00Fx[2]		261						
iC7-60SLxx07-300AE00Fx		300						
iC7-60SLxxB5-325AE00Fx[2]	Ax10L	325	6	1	170M4411	690	350	3900
iC7-60SLxx07-334AE00Fx		334						
iC7-60SLxx07-380AE00Fx		380						

1) For example, iC7-60SL3A07-236AE00F4

2) Only for B5 voltage class

Table 42: AC Fuses for AFE or GC 525-690 V AC, IP00/Open Type, Ax12L (Eaton/Bussmann)

Model code[1]	Frame	Rated current I_L (A)	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp, mr}$ [A]
iC7-60SLxx07-425AE00Fx	Ax12L	425	3	4	170M7348	690	1250	6600
iC7-60SLxx07-475AE00Fx		475						
iC7-60SLxx07-530AE00Fx		530						
iC7-60SLxx07-595AE00Fx		595						
iC7-60SLxx07-670AE00Fx		670						
iC7-60SLxx07-760AE00Fx		760						
iC7-60SLxx07-850AE00Fx	2 x Ax12L	850	6	4	170M7348	690	1250	–
iC7-60SLxx07-945AE00Fx		945						
iC7-60SLxx07-1040E00Fx		1040						
iC7-60SLxx07-1230E00Fx		1230						
iC7-60SLxx07-1325E00Fx		1325						
iC7-60SLxx07-1500E00Fx		1500						
iC7-60SLxx07-1700E00Fx	3 x Ax12L	1700	9	4	170M7348	690	1250	–
iC7-60SLxx07-1800E00Fx		1800						
iC7-60SLxx07-2000E00Fx		2000						
iC7-60SLxx07-2250E00Fx		2250						
iC7-60SLxx07-2500E00Fx	4 x Ax12L	2500	12	4	170M7348	690	1250	–
iC7-60SLxx07-2650E00Fx		2650						
iC7-60SLxx07-2940E00Fx		2940						
iC7-60SLxx07-3120E00Fx	5 x Ax12L	3120	15	4	170M7348	690	1250	–
iC7-60SLxx07-3600E00Fx		3600						
iC7-60SLxx07-3900E00Fx	6 x Ax12L	3900	18	4	170M7348	690	1250	–
iC7-60SLxx07-4320E00Fx		4320						

Table 42: AC Fuses for AFE or GC 525-690 V AC, IP00/Open Type, Ax12L (Eaton/Bussmann) - (continued)

Model code[1]	Frame	Rated current I_L (A)	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp, mr}$ [A]
iC7-60SLxx07-4750E00Fx	7 x Ax12L	4750	21	4	170M7348	690	1250	–
iC7-60SLxx07-5040E00Fx		5040						
iC7-60SLxx07-5400E00Fx	8 x Ax12L	5400	24	4	170M7348	690	1250	–
iC7-60SLxx07-5750E00Fx		5750						

1) For example, iC7-60SL3A07-425AE00F4

7.3.4 DC Fuses for AFE or GC 450–830 V DC, IP00/Open Type

Table 43: DC Fuses for AFE or GC 450–830 V DC, IP00/Open Type (Mersen)

Model code[1]	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]
iC7-60SLxxA5-271AE00Fx	Ax10L	271	2	73	PC73UD13C800TF	1250	800
iC7-60SLxxA5-317AE00Fx		317			PC73UD12C900TF	1200	900
iC7-60SLxxA5-400AE00Fx		400			PC73UD95V11CTF	950	1100
iC7-60SLxxA5-460AE00Fx		460					
iC7-60SLxxA5-520AE00Fx	Ax12L	520	4	73	PC73UD13C800TF	1250	800
iC7-60SLxxA5-580AE00Fx		580					
iC7-60SLxxA5-650AE00Fx		650			PC73UD12C900TF	1200	900
iC7-60SLxxA5-730AE00Fx		730					
iC7-60SLxxA5-816AE00Fx		816			PC73UD95V11CTF	950	1100
iC7-60SLxxA5-970AE00Fx		970					
iC7-60SLxxA5-1040E00Fx	2xAx12L	1040	8	73	PC73UD13C800TF	1250	800
iC7-60SLxxA5-1210E00Fx		1210					
iC7-60SLxxA5-1300E00Fx		1300			PC73UD12C900TF	1200	900
iC7-60SLxxA5-1410E00Fx		1410					
iC7-60SLxxA5-1630E00Fx		1630			PC73UD95V11CTF	950	1100
iC7-60SLxxA5-1900E00Fx		1900					
iC7-60SLxxA5-2080E00Fx	3xAx12L	2080	12	73	PC73UD12C900TF	1200	900
iC7-60SLxxA5-2200E00Fx		2200					
iC7-60SLxxA5-2450E00Fx		2450			PC73UD95V11CTF	950	1100
iC7-60SLxxA5-2800E00Fx		2800					
iC7-60SLxxA5-3120E00Fx	4xAx12L	3120	16	73	PC73UD12C900TF	1200	900
iC7-60SLxxA5-3270E00Fx		3270			PC73UD95V11CTF	950	1100
iC7-60SLxxA5-3720E00Fx		3720					
iC7-60SLxxA5-4160E00Fx	5xAx12L	4160	20	73	PC73UD12C900TF	1200	900
iC7-60SLxxA5-4650E00Fx		4650			PC73UD95V11CTF	950	1100

Table 43: DC Fuses for AFE or GC 450–830 V DC, IP00/Open Type (Mersen) - (continued)

Model code[1]	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]
iC7-60SLxxA5-5200E00Fx	6xAx12L	5200	24	73	PC73UD95V11CTF	950	1100
iC7-60SLxxA5-5550E00Fx		5550					
iC7-60SLxxA5-5930E00Fx	7xAx12L	5930	28	73	PC73UD95V11CTF	950	1100
iC7-60SLxxA5-6550E00Fx		6450					
iC7-60SLxxA5-6900E00Fx	8xAx12L	6900	32	73	PC73UD95V11CTF	950	1100
iC7-60SLxxA5-7370E00Fx		7370					

1) For example, iC7-60SL3AA5-271AE00F4

Table 44: DC Fuses for AFE or GC 450–830 V DC, IP00/Open Type (Eaton/Bussmann)

Model code[1]	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]
iC7-60SLxxA5-271AE00Fx	Ax10L	271	2	3	180D6347	900	900
iC7-60SLxxA5-317AE00Fx		317			180D6349	900	1100
iC7-60SLxxA5-400AE00Fx		400			180D8583	500	1400
iC7-60SLxxA5-460AE00Fx		460					
iC7-60SLxxA5-520AE00Fx	Ax12L	520	4	3	180D6347	900	900
iC7-60SLxxA5-580AE00Fx		580					
iC7-60SLxxA5-650AE00Fx		650			180D6349	900	1100
iC7-60SLxxA5-730AE00Fx		730					
iC7-60SLxxA5-816AE00Fx		816			180D8583	500	1400
iC7-60SLxxA5-970AE00Fx		970					
iC7-60SLxxA5-1040E00Fx	2xAx12L	1040	8	3	180D6347	900	900
iC7-60SLxxA5-1210E00Fx		1210					
iC7-60SLxxA5-1300E00Fx		1300			180D6349	900	1100
iC7-60SLxxA5-1410E00Fx		1410					
iC7-60SLxxA5-1630E00Fx		1630			180D8583	500	1400
iC7-60SLxxA5-1900E00Fx		1900					
iC7-60SLxxA5-2080E00Fx	3xAx12L	2080	12	3	180D6349	900	1100
iC7-60SLxxA5-2200E00Fx		2200					
iC7-60SLxxA5-2450E00Fx		2450			180D8583	500	1400
iC7-60SLxxA5-2800E00Fx		2800					
iC7-60SLxxA5-3120E00Fx	4xAx12L	3120	16	3	180D6349	900	1100
iC7-60SLxxA5-3270E00Fx		3270			180D8583	500	1400
iC7-60SLxxA5-3720E00Fx		3720					

Table 44: DC Fuses for AFE or GC 450–830 V DC, IP00/Open Type (Eaton/Bussmann) - (continued)

Model code[1]	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]
iC7-60SLxxA5-4160E00Fx	5xAx12L	4160	20	3	180D6349	900	1100
iC7-60SLxxA5-4650E00Fx		4650			180D8583	500	1400
iC7-60SLxxA5-5200E00Fx	6xAx12L	5200	24	3	180D8583	500	1400
iC7-60SLxxA5-5550E00Fx		5550					
iC7-60SLxxA5-5930E00Fx	7xAx12L	5930	28	3	180D8583	500	1400
iC7-60SLxxA5-6550E00Fx		6450					
iC7-60SLxxA5-6900E00Fx	8xAx12L	6900	32	3	180D8583	500	1400
iC7-60SLxxA5-7370E00Fx		7370					

1) For example, iC7-60SL3AA5-271AE00F4

7.3.5 DC Fuses for AFE or GC 640–1100 V DC, IP00/Open Type

Table 45 for fuse recommendation is also applicable to the voltage class B5.

Table 45: DC Fuses for AFE or GC 640–1100 V DC, IP00/Open Type (Mersen)

Model code[1]	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]
iC7-60SL3A07-236AE00Fx	Ax10L	236	2	73	PC73UD13C800TF	1250	800
iC7-60SL3AB5-261AE00Fx[2]		261					
iC7-60SL3A07-300AE00Fx		300					
iC7-60SL3AB5-325AE00Fx[2]		325					
iC7-60SL3A07-334AE00Fx		334			PC73UD12C900TF	1200	900
iC7-60SL3A07-380AE00Fx		380					
iC7-60SL3A07-425AE00Fx	Ax12L	425	4	73	PC73UD13C800TF	1250	800
iC7-60SL3A07-475AE00Fx		475					
iC7-60SL3A07-530AE00Fx		530					
iC7-60SL3A07-595AE00Fx		595					
iC7-60SL3A07-670AE00Fx		670			PC73UD12C900TF	1200	900
iC7-60SL3A07-760AE00Fx		760					
iC7-60SL3A07-850AE00Fx	2 x Ax12L	850	8	73	PC73UD13C800TF	1250	800
iC7-60SL3A07-945AE00Fx		945					
iC7-60SL3A07-1040E00Fx		1040					
iC7-60SL3A07-1230E00Fx		1230			PC73UD12C900TF	1200	900
iC7-60SL3A07-1325E00Fx		1325					
iC7-60SL3A07-1500E00Fx		1500					

Table 45: DC Fuses for AFE or GC 640–1100 V DC, IP00/Open Type (Mersen) - (continued)

Model code[1]	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]
iC7-60SL3A07-1700E00Fx	3 x Ax12L	1700	12	73	PC73UD13C800TF	1250	800
iC7-60SL3A07-1800E00Fx		1800			PC73UD12C900TF	1200	900
iC7-60SL3A07-2000E00Fx		2000					
iC7-60SL3A07-2250E00Fx		2250					
iC7-60SL3A07-2500E00Fx	4 x Ax12L	2500	16	73	PC73UD12C900TF	1200	900
iC7-60SL3A07-2650E00Fx		2650					
iC7-60SL3A07-2940E00Fx		2940					
iC7-60SL3A07-3120E00Fx	5 x Ax12L	3120	20	73	PC73UD12C900TF	1200	900
iC7-60SL3A07-3600E00Fx		3600					
iC7-60SL3A07-3900E00Fx	6 x Ax12L	3900	24	73	PC73UD12C900TF	1200	900
iC7-60SL3A07-4320E00Fx		4320					
iC7-60SL3A07-4750E00Fx	7 x Ax12L	4750	28	73	PC73UD12C900TF	1200	900
iC7-60SL3A07-5040E00Fx		5040					
iC7-60SL3A07-5400E00Fx	8 x Ax12L	5400	32	73	PC73UD12C900TF	1200	900
iC7-60SL3A07-5750E00Fx		5750					

1) For example, iC7-60SL3A07-236AE00F4

2) Only for B5 voltage class.

Table 46 for fuse recommendation is also applicable to the voltage class B5.

Table 46: DC Fuses for AFE or GC 640–1100 V DC, IP00/Open Type (Eaton/Bussmann)

Model code[1]	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]
iC7-60SLxx07-236AE00Fx	A_10L	236	2	3	180D6347	900	900
C7-60SLxxB5-261AE00Fx[2]		261					
iC7-60SLxx07-300AE00Fx		300					
iC7-60SLxxB5-325AE00Fx[2]		325					
iC7-60SLxx07-334AE00Fx		334			180D6349	900	1100
iC7-60SLxx07-380AE00Fx		380					
iC7-60SLxx07-425AE00Fx	A_12L	425	4	3	180D6347	900	900
iC7-60SLxx07-475AE00Fx		475					
iC7-60SLxx07-530AE00Fx		530					
C7-60SLxx07-595AE00Fx		595					
iC7-60SLxx07-670AE00Fx		670			180D6349	900	1100
C7-60SLxx07-760AE00Fx		760					

Table 46: DC Fuses for AFE or GC 640–1100 V DC, IP00/Open Type (Eaton/Bussmann) - (continued)

Model code[1]	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]
iC7-60SLxx07-850AE00Fx	2 x A_12L	850	8	3	180D6347	900	900
iC7-60SLxx07-945AE00Fx		945					
iC7-60SLxx07-1040E00Fx		1040					
iC7-60SLxx07-1230E00Fx		1230			180D6349	900	1100
iC7-60SLxx07-1325E00Fx		1325					
iC7-60SLxx07-1500E00Fx		1500					
iC7-60SLxx07-1700E00Fx	3 x A_12L	1700	12	3	180D6347	900	900
iC7-60SLxx07-1800E00Fx		1800			180D6349	900	1100
iC7-60SLxx07-2000E00Fx		2000					
iC7-60SLxx07-2250E00Fx		2250					
iC7-60SLxx07-2500E00Fx	4 x A_12L	2500	16	3	180D6349	900	1100
iC7-60SLxx07-2650E00Fx		2650					
iC7-60SLxx07-2940E00Fx		2940					
iC7-60SLxx07-3120E00Fx	5 x A_12L	3120	20	3	180D6349	900	1100
iC7-60SLxx07-3600E00Fx		3600					
iC7-60SLxx07-3900E00Fx	6 x A_12L	3900	24	3	180D6349	900	1100
iC7-60SLxx07-4320E00Fx		4320					
iC7-60SLxx07-4750E00Fx	7 x A_12L	4750	28	3	180D6349	900	1100
iC7-60SLxx07-5040E00Fx		5040					
iC7-60SLxx07-5400E00Fx	8 x A_12L	5400	32	3	180D6349	900	1100
iC7-60SLxx07-5750E00Fx		5750					

1) For example, iC7-60SL3A07-236AE00F4

2) Only for B5 voltage class.

7.3.6 AC Fuses for GC 380–690 V AC, Voltage Class G7, IP00/Open Type

Table 47: AC Fuses for GC 380–690 V AC, Voltage Class G7, IP00/Open Type

Model code	Frame	Rated current I_L [A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp,mr}$ [A]
iC7-60SLGCG7-760A	AR12L	760	3	44	PC44UD75V12CTQ	750	1200	7200
iC7-60SLGCG7-970A	AR12L	970	3	44	PC44UD75V16CTQ	750	1600	11700
iC7-60SLGCG7-1500	2 x AR12L	1500	6	44	PC44UD75V12CTQ	750	1200	–
iC7-60SLGCG7-1700	2 x AR12L	1700	6	44	PC44UD75V16CTQ	750	1600	–
iC7-60SLGCG7-1900	2 x AR12L	1900	6	44	PC44UD75V16CTQ	750	1600	–
iC7-60SLGCG7-2450	3 x AR12L	2450	9	44	PC44UD75V12CTQ	750	1200	–
iC7-60SLGCG7-2800	3 x AR12L	2800	9	44	PC44UD75V16CTQ	750	1600	–

Table 47: AC Fuses for GC 380–690 V AC, Voltage Class G7, IP00/Open Type - (continued)

Model code	Frame	Rated current I_L [A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp,mr}$ [A]
iC7-60SLGCG7-3270	4 x AR12L	3270	12	44	PC44UD75V12CTQ	750	1200	–
iC7-60SLGCG7-3720	4 x AR12L	3720	12	44	PC44UD75V16CTQ	750	1600	–
iC7-60SLGCG7-4160	5 x AR12L	4160	15	44	PC44UD75V12CTQ	750	1200	–
iC7-60SLGCG7-4650	5 x AR12L	4650	15	44	PC44UD75V16CTQ	750	1600	–
iC7-60SLGCG7-5550	6 x AR12L	5550	18	44	PC44UD75V16CTQ	750	1600	–
iC7-60SLGCG7-6450	7 x AR12L	6450	21	44	PC44UD75V16CTQ	750	1600	–
iC7-60SLGCG7-7370	8 x AR12L	7370	24	44	PC44UD75V16CTQ	750	1600	–

7.3.7 DC Fuses for GC 380–690 V AC (500–1500 V DC), Voltage Class G7, IP00/Open Type

Table 48: DC Fuses for GC 380–690 V AC (500–1500 V DC), Voltage Class G7, IP00/Open Type

Model code	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]
iC7-60SLGCG7-760A	AR12L	879	4	C	ABAT15C1000-AIB	1500	1000
iC7-60SLGCG7-970A	AR12L	1121	4	C	ABAT15C1000-AIB	1500	1000
iC7-60SLGCG7-1500	2 x AR12L	1733	8	C	ABAT15C1000-AIB	1500	1000
iC7-60SLGCG7-1700	2 x AR12L	1964	8	C	ABAT15C1000-AIB	1500	1000
iC7-60SLGCG7-1900	2 x AR12L	2195	8	C	ABAT15C1000-AIB	1500	1000
iC7-60SLGCG7-2450	3 x AR12L	2830	12	C	ABAT15C1000-AIB	1500	1000
iC7-60SLGCG7-2800	3 x AR12L	3234	12	C	ABAT15C1000-AIB	1500	1000
iC7-60SLGCG7-3270	4 x AR12L	3776	16	C	ABAT15C1000-AIB	1500	1000
iC7-60SLGCG7-3720	4 x AR12L	4297	16	C	ABAT15C1000-AIB	1500	1000
iC7-60SLGCG7-4160	5 x AR12L	4804	20	C	ABAT15C1000-AIB	1500	1000
iC7-60SLGCG7-4650	5 x AR12L	5370	20	C	ABAT15C1000-AIB	1500	1000
iC7-60SLGCG7-5550	6 x AR12L	6410	24	C	ABAT15C1000-AIB	1500	1000
iC7-60SLGCG7-6450	7 x AR12L	7449	28	C	ABAT15C1000-AIB	1500	1000
iC7-60SLGCG7-7370	8 x AR12L	8511	32	C	ABAT15C1000-AIB	1500	1000

7.3.8 DC Fuses for INU 450–830 V DC, IP00/Open Type

Table 49: DC Fuses for INU 450–830 V DC, IP00/Open Type (Mersen)

Model code[1]	Frame	Rated current I_L [A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]
iC7-60SLINA5-206AE00Fx	Ix10L	206	2	73	PC73UD13C630TF	1250	630
iC7-60SLINA5-245AE00Fx		245					
iC7-60SLINA5-302AE00Fx		302			PC73UD13C800TF	1250	800
iC7-60SLINA5-385AE00Fx		385			PC73UD12C900TF	1200	900
iC7-60SLINA5-480AE00Fx		480			PC73UD95V11CTF	950	1100
iC7-60SLINA5-520AE00Fx		520					
iC7-60SLINA5-658AE00Fx	Ix12L	658	4	73	PC73UD13C800TF	1250	800
iC7-60SLINA5-730AE00Fx		730			PC73UD12C900TF	1200	900
iC7-60SLINA5-820AE00Fx		820					
iC7-60SLINA5-880AE00Fx		880			PC73UD95V11CTF	950	1100
iC7-60SLINA5-1000E00Fx		1000					
iC7-60SLINA5-1270E00Fx	2xIx12L	1270	8	73	PC73UD13C800TF	1250	800
iC7-60SLINA5-1460E00Fx		1460			PC73UD12C900TF	1200	900
iC7-60SLINA5-1630E00Fx		1630					
iC7-60SLINA5-1760E00Fx		1760			PC73UD95V11CTF	950	1100
iC7-60SLINA5-1960E00Fx		1960					
iC7-60SLINA5-2150E00Fx	3xIx12L	2150	12	73	PC73UD12C900TF	1200	900
iC7-60SLINA5-2340E00Fx		2340					
iC7-60SLINA5-2510E00Fx		2510			PC73UD95V11CTF	950	1100
iC7-60SLINA5-2880E00Fx		2880					
iC7-60SLINA5-3120E00Fx	4xIx12L	3120	16	73	PC73UD12C900TF	1200	900
iC7-60SLINA5-3420E00Fx		3420			PC73UD95V11CTF	950	1100
iC7-60SLINA5-3820E00Fx		3820					
iC7-60SLINA5-4140E00Fx	5xIx12L	4140	20	73	PC73UD12C900TF	1200	900
iC7-60SLINA5-4500E00Fx		4500			PC73UD95V11CTF	950	1100
iC7-60SLINA5-4750E00Fx		4750					
iC7-60SLINA5-5220E00Fx	6xIx12L	5520	24	73	PC73UD95V11CTF	950	1100
iC7-60SLINA5-5680E00Fx		5680					

1) For example, iC7-60SLINA5-206AE00F4

Table 50: DC Fuses for INU 450–830 V DC, IP00/Open Type (Eaton/Bussmann)

Model code[1]	Frame	Rated current I_L [A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]
iC7-60SLINA5-206AE00Fx	Ix10L	206	2	3	180D6344	1000	630
iC7-60SLINA5-245AE00Fx		245					
iC7-60SLINA5-302AE00Fx		302			180D6347	900	900
iC7-60SLINA5-385AE00Fx		385			180D6349	900	1100
iC7-60SLINA5-480AE00Fx		480			180D8583	500	1400
iC7-60SLINA5-520AE00Fx		520					
iC7-60SLINA5-658AE00Fx	Ix12L	658	4	3	180D6347	900	900
iC7-60SLINA5-730AE00Fx		730			180D6349	900	1100
iC7-60SLINA5-820AE00Fx		820					
iC7-60SLINA5-880AE00Fx		880			180D8583	500	1400
iC7-60SLINA5-1000E00Fx		1000					
iC7-60SLINA5-1270E00Fx	2xIx12L	1270	8	3	180D6347	900	900
iC7-60SLINA5-1460E00Fx		1460			180D6349	900	1100
iC7-60SLINA5-1630E00Fx		1630					
iC7-60SLINA5-1760E00Fx		1760			180D8583	500	1400
iC7-60SLINA5-1960E00Fx		1960					
iC7-60SLINA5-2150E00Fx	3xIx12L	2150	12	3	180D6349	900	1100
iC7-60SLINA5-2340E00Fx		2340					
iC7-60SLINA5-2510E00Fx		2510			180D8583	500	1400
iC7-60SLINA5-2880E00Fx		2880					
iC7-60SLINA5-3120E00Fx	4xIx12L	3120	16	3	180D6349	900	1100
iC7-60SLINA5-3420E00Fx		3420			180D8583	500	1400
iC7-60SLINA5-3820E00Fx		3820					
iC7-60SLINA5-4140E00Fx	5xIx12L	4140	20	3	180D6349	900	1100
iC7-60SLINA5-4500E00Fx		4500			180D8583	500	1400
iC7-60SLINA5-4750E00Fx		4750					
iC7-60SLINA5-5220E00Fx	6xIx12L	5520	24	3	180D8583	500	1400
iC7-60SLINA5-5680E00Fx		5680					

1) For example, iC7-60SLINA5-206AE00F4

7.3.9 DC Fuses for INU 640–1100 V DC, IP00/Open Type

Table 51 for fuse recommendation is also applicable to the voltage class B5.

Table 51: DC Fuses for INU 640–1100 V DC, IP00/Open Type (Mersen)

Model code[1]	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]
iC7-60SLIN07-170AE00Fx	Ix10L	170	2	73	PC73UD13C630TF	1250	630
iC7-60SLINB5-206AE00Fx[2]		206					
iC7-60SLIN07-208AE00Fx		208					
iC7-60SLINB5-245AE00Fx[2]		245			PC73UD13C800TF		800
iC7-60SLIN07-261AE00Fx		261					
iC7-60SLINB5-302AE00Fx[2]		302					
iC7-60SLIN07-325AE00Fx		325					
iC7-60SLIN07-365AE00Fx		365			PC73UD12C900TF	1200	900
iC7-60SLINB5-385AE00Fx[2]		385					
iC7-60SLIN07-416AE00Fx		416					
iC7-60SLIN07-465AE00Fx	Ix12L	465	4	73	PC73UD13C800TF	1250	800
iC7-60SLIN07-525AE00Fx		525					
iC7-60SLIN07-590AE00Fx		590					
iC7-60SLIN07-650AE00Fx		650					
iC7-60SLIN07-730AE00Fx		730			PC73UD12C900TF	1200	900
iC7-60SLIN07-820AE00Fx		820					
iC7-60SLIN07-945AE00Fx	2 x Ix12L	945	8	73	PC73UD13C800TF	1250	800
iC7-60SLIN07-1060E00Fx		1060					
iC7-60SLIN07-1230E00Fx		1230					
iC7-60SLIN07-1400E00Fx		1400			PC73UD12C900TF	1200	900
iC7-60SLIN07-1500E00Fx		1500					
iC7-60SLIN07-1640E00Fx		1640					
iC7-60SLIN07-1795E00Fx	3 x Ix12L	1795	12	73	PC73UD13C800TF	1250	800
iC7-60SLIN07-2080E00Fx		2080			PC73UD12C900TF	1200	900
iC7-60SLIN07-2300E00Fx		2300					
iC7-60SLIN07-2500E00Fx		2500					
iC7-60SLIN07-2830E00Fx	4 x Ix12L	2830	16	73	PC73UD12C900TF	1200	900
iC7-60SLIN07-3050E00Fx		3050					
iC7-60SLIN07-3260E00Fx		3260					
iC7-60SLIN07-3500E00Fx	5 x Ix12L	3500	20	73	PC73UD12C900TF	1200	900
iC7-60SLIN07-4035E00Fx		4035					
iC7-60SLIN07-4400E00Fx	6 x Ix12L	4400	24	73	PC73UD12C900TF	1200	900
iC7-60SLIN07-4850E00Fx		4850					
iC7-60SLIN07-5300E00Fx	7 x Ix12L	5300	28	73	PC73UD12C900TF	1200	900
iC7-60SLIN07-5600E00Fx		5600					

Table 51: DC Fuses for INU 640–1100 V DC, IP00/Open Type (Mersen) - (continued)

Model code[1]	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]
iC7-60SLIN07-6100E00Fx	8 x Ix12L	6100	32	73	PC73UD12C900TF	1200	900
iC7-60SLIN07-6400E00Fx		6400					

1) For example, iC7-60SLIN07-140AE00F4

2) Only for B5 voltage class

Table 52 for fuse recommendation is also applicable to the voltage class B5.

Table 52: DC Fuses for INU 640–1100 V DC, IP00/Open Type (Eaton/Bussmann)

Model code[1]	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]
iC7-60SLIN07-170AE00Fx	I_10L	170	2	3	180D6344	1000	630
iC7-60SLINB5-206AE00Fx[2]		206					
iC7-60SLIN07-208AE00Fx		208					
iC7-60SLINB5-245AE00Fx[2]		245			180D6347	900	900
iC7-60SLIN07-261AE00Fx		261					
iC7-60SLINB5-302AE00Fx[2]		302					
iC7-60SLIN07-325AE00Fx		325					
iC7-60SLIN07-365AE00Fx		365			180D6349	900	1100
iC7-60SLINB5-385AE00Fx[2]		385					
iC7-60SLIN07-416AE00Fx		416					
iC7-60SLIN07-465AE00Fx	I_12L	465	4	3	180D6347	900	900
iC7-60SLIN07-525AE00Fx		525					
iC7-60SLIN07-590AE00Fx		590					
iC7-60SLIN07-650AE00Fx		650					
iC7-60SLIN07-730AE00Fx		730			180D6349	900	1100
iC7-60SLIN07-820AE00Fx		820					
iC7-60SLIN07-945AE00Fx	2 x I_12L	945	8	3	180D6347	900	900
iC7-60SLIN07-1060E00Fx		1060					
iC7-60SLIN07-1230E00Fx		1230					
iC7-60SLIN07-1400E00Fx		1400			180D6349	900	1100
iC7-60SLIN07-1500E00Fx		1500					
iC7-60SLIN07-1640E00Fx		1640					
iC7-60SLIN07-1795E00Fx	3 x I_12L	1795	12	3	180D6347	900	900
iC7-60SLIN07-2080E00Fx		2080			180D6349	900	1100
iC7-60SLIN07-2300E00Fx		2300					
iC7-60SLIN07-2500E00Fx		2500					

Table 52: DC Fuses for INU 640–1100 V DC, IP00/Open Type (Eaton/Bussmann) - (continued)

Model code[1]	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]
iC7-60SLIN07-2830E00Fx	4 x I_12L	2830	16	3	180D6349	900	1100
iC7-60SLIN07-3050E00Fx		3050					
iC7-60SLIN07-3260E00Fx		3260					
iC7-60SLIN07-3500E00Fx	5 x I_12L	3500	20	3	180D6349	900	1100
iC7-60SLIN07-4035E00Fx		4035					
iC7-60SLIN07-4400E00Fx	6 x I_12L	4400	24	3	180D6349	900	1100
iC7-60SLIN07-4850E00Fx		4850					
iC7-60SLIN07-5300E00Fx	7 x I_12L	5300	28	3	180D6349	900	1100
iC7-60SLIN07-5600E00Fx		5600					
iC7-60SLIN07-6100E00Fx	8 x I_12L	6100	32	3	180D6349	900	1100
iC7-60SLIN07-6400E00Fx		6400					

1) For example, iC7-60SLIN07-170AE00F4

2) Only for B5 voltage class

7.3.10 AC Fuses for INU, IP00/Open Type in Generator Use

Short-circuit protection of inverter modules is required in generator use cases. Fast-acting semiconductor aR fuses are recommended for short-circuit protection of inverter modules in generator use cases according to the tables in AC fuses for INU 450–830 V DC, IP00/open type in generator use and AC fuses for INU 640–1100 V DC, IP00/open type in generator use. Alternative protection methods, for example, circuit breaker are required in case the short circuit contribution from the generator is not high enough to trip the fuses ($I_{cp,mr}$, refer to the tables in AC fuses for INU 450–830 V DC, IP00/open type in generator use and AC fuses for INU 640–1100 V DC, IP00/open type in generator use).

The circuit breaker tripping functions can be used if the circuit breaker let-through energy I^2t is lower than the fuse clearing I^2t, refer to the tables in AC fuses for INU 450–830 V DC, IP00/open type in generator use and AC fuses for INU 640–1100 V DC, IP00/open type in generator use.

An alternative method is to trip the circuit breaker based on the inverter module trip. In this case, the circuit breaker needs to open quickly enough so that the let-through energy I^2t is lower than the fuse clearing I^2t.

- Circuit breaker trip circuit needs to be connected to the inverter module digital output or relay output.
- Inverter module needs to be parametrized so that any fault or trip results in immediate opening of the circuit breaker. The delay from the fault detection to signal out from the inverter module is less than 6 ms.
- When the inverter module reaches the overcurrent level, the circuit breaker should open as soon as possible to limit the damage in the system.
- Motor breaker control functionality of the generator application can be used to assign the circuit breaker opening digital output or relay output.

AC fuses for INU 450–830 V DC, IP00/open type in generator use

Table 53: AC-side Fuses for Inverter Module with +AEU1/+AEU2/+AE10, 380–500 V AC (Mersen)

Model code	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp, mr}$ [A]	Fuse Clearing I^2t at 500 V AC [A^2s]
iC7-60SLINA5-206AE00Fx	Ix10L	206	6	31	PC31UD69V315TF	690	315	3600	113 520
iC7-60SLINA5-245AE00Fx		245							
iC7-60SLINA5-302AE00Fx		302							
iC7-60SLINA5-385AE00Fx		385							
iC7-60SLINA5-480AE00Fx		480			PC31UD69V450TF	690	450	6700	399 900
iC7-60SLINA5-520AE00Fx		520							
iC7-60SLINA5-658AE00Fx	Ix12L	658	3	44	PC44UD75V12CTQ	750	1200	7200	384 300
iC7-60SLINA5-730AE00Fx		730							
iC7-60SLINA5-820AE00Fx		820			PC44UD75V16CTQ	750	1600	10300	1 008 000
iC7-60SLINA5-880AE00Fx		880							
iC7-60SLINA5-1000E00Fx		1000							
iC7-60SLINA5-1270E00Fx	2xIx12L	1270	6	44	PC44UD75V12CTQ	750	1200	–	384 300
iC7-60SLINA5-1460E00Fx		1460							
iC7-60SLINA5-1630E00Fx		1630			PC44UD75V16CTQ	750	1600	–	1 008 000
iC7-60SLINA5-1760E00Fx		1760							
iC7-60SLINA5-1960E00Fx		1960							
iC7-60SLINA5-2150E00Fx	3xIx12L	2150	9	44	PC44UD75V12CTQ	750	1200	–	384 000
iC7-60SLINA5-2340E00Fx		2340							
iC7-60SLINA5-2510E00Fx		2510			PC44UD75V16CTQ	750	1600	–	1 008 000
iC7-60SLINA5-2880E00Fx		2880							
iC7-60SLINA5-3120E00Fx	4xIx12L	3120	12	44	PC44UD75V12CTQ	750	1200	–	384 000
iC7-60SLINA5-3420E00Fx		3420			PC44UD75V16CTQ	750	1600	–	1 008 000
iC7-60SLINA5-3820E00Fx		3820							
iC7-60SLINA5-4140E00Fx	5xIx12L	4140	15	44	PC44UD75V16CTQ	750	1600	–	1 008 000
iC7-60SLINA5-4500E00Fx		4500							
iC7-60SLINA5-4750E00Fx		4750							
iC7-60SLINA5-5220E00Fx	6xIx12L	5220	18	44	PC44UD75V16CTQ	750	1600	–	1 008 000
iC7-60SLINA5-5680E00Fx		5680							

Table 54: AC-side Fuses for Inverter Module with +AEU1/+AEU2/+AE10, 380–500 V AC (Eaton/Bussmann)

Model code	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp, mr}$ [A]	Fuse Clearing I^2t at 500 V AC [A^2s]
iC7-60SLINA5-206AE00Fx	Ix10L	206	6	1	170M4411	690	350	3800	174 640
iC7-60SLINA5-245AE00Fx		245							
iC7-60SLINA5-302AE00Fx		302							
iC7-60SLINA5-385AE00Fx		385							
iC7-60SLINA5-480AE00Fx		480			170M4414	690	500	6500	503 200
iC7-60SLINA5-520AE00Fx		520							
iC7-60SLINA5-658AE00Fx	Ix12L	658	3	4	170M7348	690	1250	6300	573 500
iC7-60SLINA5-730AE00Fx		730							
iC7-60SLINA5-820AE00Fx		820			170M7349	690	1800	13100	1 883 000
iC7-60SLINA5-880AE00Fx		880							
iC7-60SLINA5-1000E00Fx		1000							
iC7-60SLINA5-1270E00Fx	2xIx12L	1270	6	4	170M7348	690	1250	–	573 500
iC7-60SLINA5-1460E00Fx		1460							
iC7-60SLINA5-1630E00Fx		1630			170M7349	690	1800	–	1 883 300
iC7-60SLINA5-1760E00Fx		1760							
iC7-60SLINA5-1960E00Fx		1960							
iC7-60SLINA5-2150E00Fx	3xIx12L	2150	9	4	170M7348	690	1250	–	573 500
iC7-60SLINA5-2340E00Fx		2340							
iC7-60SLINA5-2510E00Fx		2510			170M7349	690	1800	–	1 883 500
iC7-60SLINA5-2880E00Fx		2880							
iC7-60SLINA5-3120E00Fx	4xIx12L	3120	12	4	170M7348	690	1250	–	573 500
iC7-60SLINA5-3420E00Fx		3420			170M7349	690	1800	–	1 883 300
iC7-60SLINA5-3820E00Fx		3820							
iC7-60SLINA5-4140E00Fx	5xIx12L	4140	15	4	170M7349	690	1800	–	1 883 300
iC7-60SLINA5-4500E00Fx		4500							
iC7-60SLINA5-4750E00Fx		4750							
iC7-60SLINA5-5220E00Fx	6xIx12L	5220	18	4	170M7349	690	1800	–	1 883 300
iC7-60SLINA5-5680E00Fx		5680							

AC fuses for INU 640–1100 V DC, IP00/open type in generator use

Table 55 for fuse recommendation is also applicable to the voltage class B5.

Table 55: AC-side Fuses for Inverter Module with +AEU1/+AEU2/+AE10, 525–690 V AC (Mersen)

Model code	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp, mr}$ [A]	Fuse Clearing I^2t at 690 V AC [A^2s]
iC7-60SLIN07-170AE00Fx	Ix10L	170	6	31	PC31UD69V250TF	690	250	2900	112 000
iC7-60SLINB5-206AE00Fx(1)		206	6						
iC7-60SLIN07-208AE00Fx		208	6						
iC7-60SLINB5-245AE00Fx(1)		245	6						
iC7-60SLIN07-261AE00Fx		261	6						
iC7-60SLINB5-302AE00Fx(1)		302	6						
iC7-60SLIN07-325AE00Fx		325	6						
iC7-60SLIN07-365AE00Fx		365	6	31	PC31UD69V315TF	690	315	3600	176 000
iC7-60SLINB5-385AE00Fx(1)		385	6						
iC7-60SLIN07-416AE00Fx		416	6						
iC7-60SLIN07-465AE00Fx	Ix12L	465	3	44	PC44UD75V12CTQ	750	1200	7200	549 000
iC7-60SLIN07-525AE00Fx		525	3						
iC7-60SLIN07-590AE00Fx		590	3						
iC7-60SLIN07-650AE00Fx		650	3						
iC7-60SLIN07-730AE00Fx		730	3						
iC7-60SLIN07-820AE00Fx		820	3						
iC7-60SLIN07-945AE00Fx	2 x Ix12L	945	6	44	PC44UD75V12CTQ	750	1200	–	549 000
iC7-60SLIN07-1060E00Fx		1060	6						
iC7-60SLIN07-1230E00Fx		1230	6						
iC7-60SLIN07-1400E00Fx		1400	6						
iC7-60SLIN07-1500E00Fx		1500	6						
iC7-60SLIN07-1640E00Fx		1640	6						
iC7-60SLIN07-1795E00Fx	3 x Ix12L	1795	9	44	PC44UD75V12CTQ	750	1200	–	549 000
iC7-60SLIN07-2080E00Fx		2080	9						
iC7-60SLIN07-2300E00Fx		2300	9						
iC7-60SLIN07-2460E00Fx		2500	9						
iC7-60SLIN07-2830E00Fx	4 x Ix12L	2830	12	44	PC44UD75V12CTQ	750	1200	–	549 000
iC7-60SLIN07-3050E00Fx		3050	12						
iC7-60SLIN07-3260E00Fx		3260	12						
iC7-60SLIN07-3500E00Fx	5 x Ix12L	3500	15	44	PC44UD75V12CTQ	750	1200	–	549 000
iC7-60SLIN07-4035E00Fx		4035	15						
iC7-60SLIN07-4400E00Fx	6 x Ix12L	4400	18	44	PC44UD75V12CTQ	750	1200	–	549 000
iC7-60SLIN07-4850E00Fx		4850	18						

Table 55: AC-side Fuses for Inverter Module with +AEU1/+AEU2/+AE10, 525–690 V AC (Mersen) - (continued)

Model code	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp, mr}$ [A]	Fuse Clearing I^2t at 690 V AC [A^2s]
iC7-60SLIN07-5300E00Fx	7 x Ix12L	5300	21	44	PC44UD75V12CTQ	750	1200	–	549 000
iC7-60SLIN07-5600E00Fx		5600	21						
iC7-60SLIN07-6100E00Fx	8 x Ix12L	6100	24	44	PC44UD75V12CTQ	750	1200	–	549 000
iC7-60SLIN07-6400E00Fx		6400	24						

1) Only for B5 voltage class.

Table 56 for fuse recommendation is also applicable to the voltage class B5.

Table 56: AC-side Fuses for Inverter Module with +AEU1/+AEU2/+AE10, 525–690 V AC (Eaton/Bussmann)

Model code	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp, mr}$ [A]	Fuse Clearing I^2t at 690 V AC [A^2s]
iC7-60SLIN07-170AE00Fx	I_10L	170	6	1	170M4410	690	315	3300	194 040
iC7-60SLINB5-206AE00Fx(1)		206	6						
iC7-60SLIN07-208AE00Fx		208	6						
iC7-60SLINB5-245AE00Fx(1)		245	6						
iC7-60SLIN07-261AE00Fx		261	6						
iC7-60SLINB5-302AE00Fx(1)		302	6						
iC7-60SLIN07-325AE00Fx		325	6	1	170M4411	690	350	3900	272 580
iC7-60SLIN07-365AE00Fx		365	6						
iC7-60SLINB5-385AE00Fx(1)		385	6						
iC7-60SLIN07-416AE00Fx		416	6						
iC7-60SLIN07-465AE00Fx	I_12L	465	3	4	170M7348	690	1250	6600	813 750
iC7-60SLIN07-525AE00Fx		525	3						
iC7-60SLIN07-590AE00Fx		590	3						
iC7-60SLIN07-650AE00Fx		650	3						
iC7-60SLIN07-730AE00Fx		730	3						
iC7-60SLIN07-820AE00Fx		820	3						

Table 56: AC-side Fuses for Inverter Module with +AEU1/+AEU2/+AE10, 525–690 V AC (Eaton/Bussmann) - (continued)

Model code	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp, mr}$ [A]	Fuse Clearing I^2t at 690 V AC [A^2s]
iC7-60SLIN07-945AE00Fx	2 x I_12L	945	6	4	170M7348	690	1250	–	813 750
iC7-60SLIN07-1060E00Fx		1060	6						
iC7-60SLIN07-1230E00Fx		1230	6						
iC7-60SLIN07-1400E00Fx		1400	6						
iC7-60SLIN07-1500E00Fx		1500	6						
iC7-60SLIN07-1640E00Fx		1640	6						
iC7-60SLIN07-1795E00Fx	3 x I_12L	1795	9	4	170M7348	690	1250	–	813 750
iC7-60SLIN07-2080E00Fx		2080	9						
iC7-60SLIN07-2300E00Fx		2300	9						
iC7-60SLIN07-2500E00Fx		2500	9						
iC7-60SLIN07-2830E00Fx	4 x I_12L	2830	12	4	170M7348	690	1250	–	813 750
iC7-60SLIN07-3050E00Fx		3050	12						
iC7-60SLIN07-3260E00Fx		3260	12						
iC7-60SLIN07-3500E00Fx	5 x I_12L	3500	15	4	170M7348	690	1250	–	813 750
iC7-60SLIN07-4035E00Fx		4035	15						
iC7-60SLIN07-4400E00Fx	6 x I_12L	4400	18	4	170M7348	690	1250	–	813 750
iC7-60SLIN07-4850E00Fx		4850	18						
iC7-60SLIN07-5300E00Fx	7 x I_12L	5300	21	4	170M7348	690	1250	–	813 750
iC7-60SLIN07-5600E00Fx		5600	21						
iC7-60SLIN07-6100E00Fx	8 x I_12L	6100	24	4	170M7348	690	1250	–	813 750
iC7-60SLIN07-6400E00Fx		6400	24						

1) Only for B5 voltage class.

Table 57: AC-side Fuses for Inverter Module with +AES1/+AEZ1, 525–690 V AC

Model code	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp, mr}$ [A]	Fuse Clearing I^2t at 690 V AC [A^2s]
iC7-60SLIN07-465AE00Fx	Ix12L	465	3	44	PC44UD75V12CTQ	750	1200	7200	549 000
iC7-60SLIN07-525AE00Fx		525	3						
iC7-60SLIN07-590AE00Fx		590	3						
iC7-60SLIN07-650AE00Fx		650	3						
iC7-60SLIN07-730AE00Fx		730	3						

Table 57: AC-side Fuses for Inverter Module with +AES1/+AEZ1, 525–690 V AC - (continued)

Model code	Frame	Rated current I_L[A]	Number of fuses	Fuse size	Part number	Fuse U_n [V]	Fuse I_n [A]	$I_{cp,\ mr}$ [A]	Fuse Clearing I^2t at 690 V AC [A^2s]
iC7-60SLIN07-945AE00Fx	2 x Ix12L	945	6	44	PC44UD75V12CTQ	750	1200	–	549 000
iC7-60SLIN07-1060E00Fx		1060	6						
iC7-60SLIN07-1230E00Fx		1230	6						
iC7-60SLIN07-1400E00Fx		1400	6						
iC7-60SLIN07-1640E00Fx		1640	6						
iC7-60SLIN07-1795E00Fx	3 x Ix12L	1795	9	44	PC44UD75V12CTQ	750	1200	–	549 000
iC7-60SLIN07-2080E00Fx		2080	9						
iC7-60SLIN07-2830E00Fx	4 x Ix12L	2830	12	44	PC44UD75V12CTQ	750	1200	–	549 000
iC7-60SLIN07-3500E00Fx	5 x Ix12L	3500	15	44	PC44UD75V12CTQ	750	1200	–	549 000
iC7-60SLIN07-4400E00Fx	6 x Ix12L	4400	18	44	PC44UD75V12CTQ	750	1200	–	549 000

The maximum air temperature around the fuses inside the enclosure is:

- 60 °C (140 °F) with 2 m/s forced airflow
- 50 °C (122 °F) with 1 m/s forced airflow
- 40 °C (104 °F) with natural cooling (AN)

Derating of the fuses is required in case the total current harmonic distortion THDi is higher than 15%. Consult Danfoss if THDi is higher than 15%.

7.3.11 DC-bus Fuses for DC/DC Converter, IP00/Open Type

Table 58: DC-bus Fuses for DC/DC Converter, Voltage Classes B5 and 07, IP00/Open Type

Model code[(1)]	Frame	Rated current (I_L) [A]	Number of fuses	Fuse size	Part number (Mersen)	Fuse U_n [V]	Fuse I_n [A]
iC7-60SLDCxx-300AE00F4	DR10L	300	2	73	PC73UD13C630TF	1250	630
iC7-60SLDCxx-360AE00F4		360	2				
iC7-60SLDCxx-420AE00F4		420	2	73	PC73UD13C800TF	1250	800
iC7-60SLDCxx-480AE00F4		480	2	73	PC73UD12C900TF	1200	900
iC7-60SLDCxx-570AE00F4		570	2	73	PC73UD12C900TF	1200	900
iC7-60SLDCxx-720AE00F4	DR12L	720	4	73	PC73UD13C630TF	1250	630
iC7-60SLDCxx-840AE00F4		840	4	73	PC73UD13C800TF	1250	800
iC7-60SLDCxx-960AE00F4		960	4				
iC7-60SLDCxx-1080E00F4		1080	4	73	PC73UD12C900TF	1200	900
iC7-60SLDCxx-1200E00F4		1200	4				

Table 58: DC-bus Fuses for DC/DC Converter, Voltage Classes B5 and 07, IP00/Open Type - (continued)

Model code[1]	Frame	Rated current (I_L) [A]	Number of fuses	Fuse size	Part number (Mersen)	Fuse U_n [V]	Fuse I_n [A]
iC7-60SLDCxx-1440E00F4	2 x DR12L	1440	8	73	PC73UD13C630TF	1250	630
iC7-60SLDCxx-1680E00F4		1680	8	73	PC73UD13C800TF	1250	800
iC7-60SLDCxx-1920E00F4		1920	8				
iC7-60SLDCxx-2160E00F4		2160	8	73	PC73UD12C900TF	1200	900
iC7-60SLDCxx-2400E00F4		2400	8				
iC7-60SLDCxx-2880E00F4	3 x DR12L	2880	12	73	PC73UD13C800TF	1250	800
iC7-60SLDCxx-3240E00F4		3240	12	73	PC73UD12C900TF	1200	900
iC7-60SLDCxx-3600E00F4		3600	12				

1) xx = B5 or 07

7.3.12 Source DC+ Fuses for DC/DC Converter, IP00/Open Type

Table 59: Source DC+ Fuses for DC/DC Converter, Voltage Classes B5 and 07, IP00/Open Type

Model code[1]	Frame	Rated current (I_L) [A]	Number of fuses	Fuse size	Part number (Mersen)	Fuse U_n [V]	Fuse I_n [A]
iC7-60SLDCxx-300AE00F4	DR10L	300	3	72	D72SG120V250QF	1200	250
iC7-60SLDCxx-360AE00F4		360	3				
iC7-60SLDCxx-420AE00F4		420	3				
iC7-60SLDCxx-480AE00F4		480	3	72	D72SG120V315QF	1200	315
iC7-60SLDCxx-570AE00F4		570	3				
iC7-60SLDCxx-720AE00F4	DR12L	720	3	272	D272SG120V500QF	1200	500
iC7-60SLDCxx-840AE00F4		840	3				
iC7-60SLDCxx-960AE00F4		960	3				
iC7-60SLDCxx-1080E00F4		1080	3	272	D272SG120V630QF	1200	630
iC7-60SLDCxx-1200E00F4		1200	3				
iC7-60SLDCxx-1440E00F4	2 x DR12L	1440	6	272	D272SG120V500QF	1200	500
iC7-60SLDCxx-1680E00F4		1680	6				
iC7-60SLDCxx-1920E00F4		1920	6				
iC7-60SLDCxx-2160E00F4		2160	6	272	D272SG120V630QF	1200	630
iC7-60SLDCxx-2400E00F4		2400	6				
iC7-60SLDCxx-2880E00F4	3 x DR12L	2880	9	272	D272SG120V500QF	1200	500
iC7-60SLDCxx-3240E00F4		3240	9	272	D272SG120V630QF	1200	630
iC7-60SLDCxx-3600E00F4		3600	9				

1) xx = B5 or 07

7.3.13 Source DC- Fuses for DC/DC Converter, IP00/Open Type

Table 60: Source DC- Fuses for DC/DC Converter, Voltage Classes B5 and 07, IP00/Open Type

Model code[1]	Frame	Rated current (I_L) [A]	Number of fuses	Fuse size	Part number (Mersen)	Fuse U_n [V]	Fuse I_n [A]
iC7-60SLDCxx-300AE00F4	DR10L	300	1	73	PC73UD13C630TF	1250	630
iC7-60SLDCxx-360AE00F4		360	1				
iC7-60SLDCxx-420AE00F4		420	1	73	PC73UD13C800TF	1250	800
iC7-60SLDCxx-480AE00F4		480	1	73	PC73UD12C900TF	1200	900
iC7-60SLDCxx-570AE00F4		570	1	73			
iC7-60SLDCxx-720AE00F4	DR12L	720	2	73	PC73UD13C630TF	1250	630
iC7-60SLDCxx-840AE00F4		840	2	73	PC73UD13C800TF	1250	800
iC7-60SLDCxx-960AE00F4		960	2				
iC7-60SLDCxx-1080E00F4		1080	2	73	PC73UD12C900TF	1200	900
iC7-60SLDCxx-1200E00F4		1200	2				
iC7-60SLDCxx-1440E00F4	2 x DR12L	1440	4	73	PC73UD13C630TF	1250	630
iC7-60SLDCxx-1680E00F4		1680	4	73	PC73UD13C800TF	1250	800
iC7-60SLDCxx-1920E00F4		1920	4				
iC7-60SLDCxx-2160E00F4		2160	4	73	PC73UD12C900TF	1200	900
iC7-60SLDCxx-2400E00F4		2400	4				
iC7-60SLDCxx-2880E00F4	3 x DR12L	2880	6	73	PC73UD13C800TF	1250	800
iC7-60SLDCxx-3240E00F4		3240	6	73	PC73UD12C900TF	1200	900
iC7-60SLDCxx-3600E00F4		3600	6				

1) xx = B5 or 07

7.3.14 DC Fuses for BCU, Voltage Class B5 and 07, IP00/Open Type

Table 61: DC Fuses for BCU, Voltage Class B5 and 07, IP00/Open Type (Mersen)

Model code[1]	Frame	Rated current I_L [A]	Number of fuses	Fuse size	Part number	Fuse Un [V]	Fuse In [A]
iC7-60SLBRxx-170A	BM10L/BR10L	170	2	73	PC73UD13C630TF	1250	630
iC7-60SLIBRxx-261A		261					
iC7-60SLBRxx-416A		416			PC73UD12C900TF	1200	900
iC7-60SLBRxx-525A	BM12L/BR12L	525	4	73	PC73UD13C800TF	1250	800
iC7-60SLBRxx-650A		650					
iC7-60SLBRxx-820A		820			PC73UD12C900TF	1200	900
iC7-60SLBRxx-1060	2xBM12L/2xBR12L	1060	8	73	PC73UD13C800TF	1250	800
iC7-60SLBRxx-1400		1400					
iC7-60SLBRxx-1640		1640			PC73UD12C900TF	1200	900

1) xx= B5 or 07.

7.3.15 AC Fuses and Circuit Breakers for L Filter, Voltage Class A5

The system modules with a mains contactor or a main switch, and a net-side L filter must be protected with branch circuit fuses or a circuit breaker. Check the coordination type in the contactor datasheet with the corresponding gG fuse. The fuse ratings are based on a maximum ambient temperature of 60 °C (140 °F) , and when using gR fuses, a minimum airflow of 3 m/s is required. gG fuses do not require additional cooling. Check the selectivity with upstream protective devices. Select the circuit breaker I_{cu}/I_{cw} value according to the supply short-circuit current capability.

Table 62: AC Fuses and Circuit Breakers for L Filter +AEZ3, Voltage Class A5

Model code	System module: Rated current IL [A]	IEC gG fuses (at 60 °C (140 °F) ambient, no cooling)	gR fuses (at 60 °C (140 °F) ambient)	Mersen gR fuse type TTF	Recommended circuit breaker type ABB Emax2 (at 60 °C (140 °F) ambient)	Circuit breaker trip unit settings: Ekip DIP/Touch/Hi-Touch LI
OF7Z5-M-LC-07-500A-A1-E00-F4	271	gG 400 A	gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-500A-A1-E00-F4	317	gG 400 A	gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-500A-A1-E00-F4	400	gG 500 A	2 x gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-500A-A1-E00-F4	460	gG 630 A	2 x gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-1000-A1-E00-F4	520	gG 630 A	2 x gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-1000-A1-E00-F4	580	gG 800 A	2 x gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-1000-A1-E00-F4	650	gG 800 A	2 x gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-1000-A1-E00-F4	730	gG 1000 A	2 x gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-1000-A1-E00-F4	816	gG 1000 A	3 x gR 1000 A	PC73GB69V10CTF	–	–
OF7Z5-M-LC-07-1000-A1-E00-F4	970	gG 1250 A	3 x gR 1000 A	PC73GB69V10CTF	–	–
OF7Z5-M-LC-07-1640-A1-E00-F4	1040	gG 1250 A	2 x gR 800 A	PC73GB69V800TF	E1.2 1250 LI	I: 1,5 x IN = 1875 A ±10 %, t ≤ 30 ms | L: 1 x IN = 1250 A, t = 3 s
OF7Z5-M-LC-07-1640-A1-E00-F4	1210	gG 1600 A	2 x gR 900 A	PC73GB69V900TF	E1.2 1600 LI	I: 1,5 x IN = 2400 A ±10 %, t ≤ 30 ms | L: 0,9 x IN = 1440 A, t = 3 s
OF7Z5-M-LC-07-1640-A1-E00-F4	1300	gG 1600 A	2 x gR 1000 A	PC73GB69V10CTF	E1.2 1600 LI	I: 1,5 x IN = 2400 A ±10 %, t ≤ 30 ms | L: 1,0 x IN = 1600 A, t = 3 s

Table 62: AC Fuses and Circuit Breakers for L Filter +AEZ3, Voltage Class A5 - (continued)

Model code	System module: Rated current IL [A]	IEC gG fuses (at 60 °C (140 °F) ambient, no cooling)	gR fuses (at 60 °C (140 °F) ambient)	Mersen gR fuse type TTF	Recommended circuit breaker type ABB Emax2 (at 60 °C (140 °F) ambient)	Circuit breaker trip unit settings: Ekip DIP/Touch/Hi-Touch LI
OF7Z5-M-LC-07-1640-A1-E00-F4	1410	2 x gG 1000 A	3 x gR 800 A	PC73GB69V800TF	E1.2 1600 LI	I: 1,5 x IN = 2400 A ±10 %, t ≤ 30 ms | L: 1,0 x IN = 1600 A, t = 3 s
OF7Z5-M-LC-07-1640-A1-E00-F4	1630	2 x gG 1000 A	3 x gR 1000 A	PC73GB69V10CTF	E2.2 2000 LI	I: 1,5 x IN = 3000 A ±10 %, t ≤ 30 ms | L: 1,0 x IN = 2000 A, t = 3 s
OF7Z5-M-LC-07-2300-A1-E00-F4	1900	2 x gG 1250 A	3 x gR 1000 A	PC73GB69V10CTF	E2.2 2500 LI	I: 1,5 x IN = 3750 A ±10 %, t ≤ 30 ms | L: 0,9 x IN = 2250 A, t = 3 s
OF7Z5-M-LC-07-2300-A1-E00-F4	2080	2 x gG 1250 A	4 x gR 800 A	PC73GB69V800TF	E2.2 2500 LI	I: 1,5 x IN = 3750 A ±10 %, t ≤ 30 ms | L: 1,0 x IN = 2500 A, t = 3 s
OF7Z5-M-LC-07-2300-A1-E00-F4	2200	3 x gG 1000 A	4 x gR 900 A	PC73GB69V900TF	E2.2 2500 LI	I: 1,5 x IN = 3750 A ±10 %, t ≤ 30 ms | L: 1,0 x IN = 2500 A, t = 3 s
2xOF7Z5-M-LC-07-1640-A1-E00-F4	2450	2 x (2 x gG 800 A)	2 x (2 x gR 1000 A)	PC73GB69V10CTF	E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10 %, t ≤ 30 ms | L: 0,9 x IN = 2880 A, t = 3 s
2xOF7Z5-M-LC-07-1640-A1-E00-F4	2800	2 x (2 x gG 1000 A)	2 x (3 x gR 800A)	PC73GB69V800TF	E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10 %, t ≤ 30 ms | L: 1,0 x IN = 3200 A, t = 3 s
2xOF7Z5-M-LC-07-2300-A1-E00-F4	3120	2 x (2 x gG 1000 A)	2 x (3 x gR 800 A)	PC73GB69V800TF	E4.2 4000 LI	I: 1,5 x IN = 6000 A ±10 %, t ≤ 30 ms | L: 0,9 x IN = 3600 A, t = 3 s
2xOF7Z5-M-LC-07-2300-A1-E00-F4	3270	2 x (2 x gG 1000 A)	2 x (3 x gR 800 A)	PC73GB69V800TF	E4.2 4000 LI	I: 1,5 x IN = 6000 A ±10 %, t ≤ 30 ms | L: 1,0 x IN = 4000 A, t = 3 s
2xOF7Z5-M-LC-07-2300-A1-E00-F4	3720	2 x (2 x gG 1250 A)	2 x (3 x gR 1000 A)	PC73GB69V10CTF	2 x E2.2 2500 LI	I: 1,5 x IN = 3750 A ±10 %, t ≤ 30 ms | L: 0,9 x IN = 2250 A, t = 3 s
2xOF7Z5-M-LC-07-2300-A1-E00-F4	4160	2 x (2 x gG 1250 A)	2 x (4 x gR 800 A)	PC73GB69V800TF	2 x E2.2 2500 LI	I: 1,5 x IN = 3750 A ±10 %, t ≤ 30 ms | L: 1,0 x IN = 2500 A, t = 3 s
3xOF7Z5-M-LC-07-2300-A1-E00-F4	4650	3 x (2 x gG 1000 A)	3 x (3 x gR 800 A)	PC73GB69V800TF	2 x E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10 %, t ≤ 30 ms | L: 0,9 x IN = 2880 A, t = 3 s

Table 62: AC Fuses and Circuit Breakers for L Filter +AEZ3, Voltage Class A5 - (continued)

Model code	System module: Rated current IL [A]	IEC gG fuses (at 60 °C (140 °F) ambient, no cooling)	gR fuses (at 60 °C (140 °F) ambient)	Mersen gR fuse type TTF	Recommended circuit breaker type ABB Emax2 (at 60 °C (140 °F) ambient)	Circuit breaker trip unit settings: Ekip DIP/Touch/Hi-Touch LI
3xOF7Z5-M-LC-07-2300-A1-E00-F4	5200	3 x (2 x gG 1250 A)	3 x (3 x gR 1000 A)	PC73GB69V10CTF	2 x E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10 %, t ≤ 30 ms | L: 1,0 x IN = 3200 A, t = 3 s
3xOF7Z5-M-LC-07-2300-A1-E00-F4	5550	3 x (2 x gG 1250 A)	3 x (3 x gR 1000 A)	PC73GB69V10CTF	2 x E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10 %, t ≤ 30 ms | L: 1,0 x IN = 3200 A, t = 3 s
3xOF7Z5-M-LC-07-2300-A1-E00-F4	5930	3 x (2 x gG 1250 A)	3 x (3 x gR 1000 A)	PC73GB69V10CTF	2 x E4.2 4000 LI	I: 1,5 x IN = 6000 A ±10 %, t ≤ 30 ms | L: 0,9 x IN = 3600 A, t = 3 s
3xOF7Z5-M-LC-07-2300-A1-E00-F4	6450	3 x (2 x gG 1250 A)	3 x (4 x gR 800 A)	PC73GB69V800TF	2 x E4.2 4000 LI	I: 1,5 x IN = 6000 A ±10 %, t ≤ 30 ms | L: 1,0 x IN = 4000 A, t = 3 s
4xOF7Z5-M-LC-07-2300-A1-E00-F4	6900	4 x (2 x gG 1250 A)	4 x (3 x gR 1000 A)	PC73GB69V10CTF	2 x E4.2 4000 LI	I: 1,5 x IN = 6000 A ±10 %, t ≤ 30 ms | L: 1,0 x IN = 4000 A, t = 3 s
4xOF7Z5-M-LC-07-2300-A1-E00-F4	7370	4 x (2 x gG 1250 A)	4 x (3 x gR 1000 A)	PC73GB69V10CTF	3 x E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10 %, t ≤ 30 ms | L: 0,9 x IN = 2880 A, t = 3 s

7.3.16 AC Fuses and Circuit Breakers for L Filter, Voltage Class B5 and 07

The system modules with a mains contactor or a main switch, and a net-side L filter must be protected with branch circuit fuses or a circuit breaker. Check the coordination type in the contactor datasheet with the corresponding gG fuse. The fuse ratings are based on a maximum ambient temperature of 60 °C (140 °F) , and when using gR fuses, a minimum airflow of 3 m/s is required. gG fuses do not require additional cooling. Check the selectivity with upstream protective devices. Select the circuit breaker I_{cu}/I_{cw} value according to the supply short-circuit current capability.

Table 63: AC Fuses and Circuit Breakers for L Filter +AEZ3, Voltage Class B5 and 07

Model code	System module: Rated current I_L[A]	IEC gG fuses (at 60 °C (140 °F) ambient, no cooling)	gR fuses (at 60 °C (140 °F) ambient)	Mersen gR fuse type TTF	Recommended circuit breaker type ABB Emax2 (at 60 °C (140 °F) ambient)	Circuit breaker trip unit settings: Ekip DIP/Touch/Hi-Touch LI
OF7Z5-M-LC-07-400A-A1-E00-F4	236	gG 315 A	gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-400A-A1-E00-F4	261	gG 315 A	gR 800 A	PC73GB69V800TF	–	–

Table 63: AC Fuses and Circuit Breakers for L Filter +AEZ3, Voltage Class B5 and 07 - (continued)

Model code	System module: Rated current I_L[A]	IEC gG fuses (at 60 °C (140 °F) ambient, no cooling)	gR fuses (at 60 °C (140 °F) ambient)	Mersen gR fuse type TTF	Recommended circuit breaker type ABB Emax2 (at 60 °C (140 °F) ambient)	Circuit breaker trip unit settings: Ekip DIP/Touch/Hi-Touch LI
OF7Z5-M-LC-07-400A-A1-E00-F4	300	gG 400 A	gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-400A-A1-E00-F4	325	gG 400 A	gR 1000 A	PC73GB69V10CTF	–	–
OF7Z5-M-LC-07-400A-A1-E00-F4	334	gG 400 A	gR 1000 A	PC73GB69V10CTF	–	–
OF7Z5-M-LC-07-400A-A1-E00-F4	380	gG 500 A	gR 1000 A	PC73GB69V10CTF	–	–
OF7Z5-M-LC-07-1000-A1-E00-F4	425	gG 500 A	2 x gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-1000-A1-E00-F4	475	gG 630 A	2 x gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-1000-A1-E00-F4	530	gG 630 A	2 x gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-1000-A1-E00-F4	595	gG 800 A	2 x gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-1000-A1-E00-F4	670	gG 800 A	2 x gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-1000-A1-E00-F4	760	gG 1000 A	2 x gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-1640-A1-E00-F4	850	gG 1000 A	2 x gR 800 A	PC73GB69V800TF	E1.2 1250 LI	I: 1,5 x IN = 1875 A ±10%, t ≤ 30 ms | L: 0,8 x IN = 1000 A, t = 3 s
OF7Z5-M-LC-07-1640-A1-E00-F4	945	2 x gG 630 A	2 x gR 800 A	PC73GB69V800TF	E1.2 1250 LI	I: 1,5 x IN = 1875 A ±10%, t ≤ 30 ms | L: 0,9 x IN = 1125 A, t = 3 s
OF7Z5-M-LC-07-1640-A1-E00-F4	1040	2 x gG 630 A	2 x gR 800 A	PC73GB69V800TF	E1.2 1250 LI	I: 1,5 x IN = 1875 A ±10%, t ≤ 30 ms | L: 1,0 x IN = 1250 A, t = 3 s
OF7Z5-M-LC-07-1640-A1-E00-F4	1230	2 x gG 800 A	2 x gR 900 A	PC73GB69V900TF	E1.2 1600 LI	I: 1,5 x IN = 2400 A ±10%, t ≤ 30 ms | L: 0,9 x IN = 1440 A, t = 3 s
OF7Z5-M-LC-07-1640-A1-E00-F4	1325	2 x gG 800 A	2 x gR 1000 A	PC73GB69V10CTF	E1.2 1600 LI	I: 1,5 x IN = 2400 A ±10%, t ≤ 30 ms | L: 1,0 x IN = 1600 A, t = 3 s

Table 63: AC Fuses and Circuit Breakers for L Filter +AEZ3, Voltage Class B5 and 07 - (continued)

Model code	System module: Rated current I_L[A]	IEC gG fuses (at 60 °C (140 °F) ambient, no cooling)	gR fuses (at 60 °C (140 °F) ambient)	Mersen gR fuse type TTF	Recommended circuit breaker type ABB Emax2 (at 60 °C (140 °F) ambient)	Circuit breaker trip unit settings: Ekip DIP/Touch/Hi-Touch LI
OF7Z5-M-LC-07-1640-A1-E00-F4	1500	2 x gG 1000 A	3 x gR 800 A	PC73GB69V800TF	E2.2 2000 LI	I: 1,5 x IN = 3000 A ±10%, t ≤ 30 ms | L: 0,9 x IN = 1800 A, t = 3 s
OF7Z5-M-LC-07-2300-A1-E00-F4	1700	2 x gG 1000 A	3 x gR 900 A	PC73GB69V900TF	E2.2 2000 LI	I: 1,5 x IN = 3000 A ±10%, t ≤ 30 ms | L: 1,0 x IN = 2000 A, t = 3 s
OF7Z5-M-LC-07-2300-A1-E00-F4	1800	3 x gG 800 A	3 x gR 900 A	PC73GB69V900TF	E2.2 2500 LI	I: 1,5 x IN = 3750 A ±10%, t ≤ 30 ms | L: 0,8 x IN = 2000 A, t = 3 s
OF7Z5-M-LC-07-2300-A1-E00-F4	2000	3 x gG 800 A	3 x gR 1000 A	PC73GB69V10TF	E2.2 2500 LI	I: 1,5 x IN = 3750 A ±10%, t ≤ 30 ms | L: 1,0 x IN = 2500 A, t = 3 s
OF7Z5-M-LC-07-2300-A1-E00-F4	2250	3 x gG 1000 A	4 x gR 900 A	PC73GB69V900TF	E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10%, t ≤ 30 ms | L: 0,8 x IN = 2560 A, t = 3 s
2xOF7Z5-M-LC-07-1640-A1-E00-F4	2500	2 x (2 x gG 800 A)	2 x (2 x gR 1000 A)	PC73GB69V10CTF	E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10%, t ≤ 30 ms | L: 0,9 x IN = 2880 A, t = 3 s
2xOF7Z5-M-LC-07-1640-A1-E00-F4	2650	2 x (2 x gG 800 A)	2 x (2 x gR 1000 A)	PC73GB69V10CTF	E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10%, t ≤ 30 ms | L: 1,0 x IN = 3200 A, t = 3 s
2xOF7Z5-M-LC-07-1640-A1-E00-F4	2940	2 x (2 x gG 1000 A)	2 x (3 x gR 800 A)	PC73GB69V800TF	E4.2 4000 LI	I: 1,5 x IN = 6000 A ±10%, t ≤ 30 ms | L: 0,9 x IN = 3600 A, t = 3 s
2xOF7Z5-M-LC-07-2300-A1-E00-F4	3120	2 x (2 x gG 1000 A)	2 x (3 x gR 800 A)	PC73GB69V800TF	E4.2 4000 LI	I: 1,5 x IN = 6000 A ±10%, t ≤ 30 ms | L: 1,0 x IN = 4000 A, t = 3 s
2xOF7Z5-M-LC-07-2300-A1-E00-F4	3600	2 x (3 x gG 800 A)	2 x (3 x gR 900 A)	PC73GB69V900TF	2 x E2.2 2500 LI	I: 1,5 x IN = 3750 A ±10%, t ≤ 30 ms | L: 0,9 x IN = 2250 A, t = 3 s
2xOF7Z5-M-LC-07-2300-A1-E00-F4	3900	2 x (3 x gG 800 A)	2 x (3 x gR 1000 A)	PC73GB69V10CTF	2 x E2.2 2500 LI	I: 1,5 x IN = 3750 A ±10%, t ≤ 30 ms | L: 1,0 x IN = 2500 A, t = 3 s
2xOF7Z5-M-LC-07-2300-A1-E00-F4	4320	2 x (3 x gG 1000 A)	2 x (4 x gR 800 A)	PC73GB69V800TF	2 x E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10%, t ≤ 30 ms | L: 0,8 x IN = 2560 A, t = 3 s

Table 63: AC Fuses and Circuit Breakers for L Filter +AEZ3, Voltage Class B5 and 07 - (continued)

Model code	System module: Rated current I_L[A]	IEC gG fuses (at 60 °C (140 °F) ambient, no cooling)	gR fuses (at 60 °C (140 °F) ambient)	Mersen gR fuse type TTF	Recommended circuit breaker type ABB Emax2 (at 60 °C (140 °F) ambient)	Circuit breaker trip unit settings: Ekip DIP/Touch/Hi-Touch LI
4xOF7Z5-M-LC-07-1640-A1-E00-F4	4750	4 x (2 x gG 800 A)	4 x (2 x gR 900 A)	PC73GB69V900TF	2 x E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10%, t ≤ 30 ms | L: 0,9 x IN = 2880 A, t = 3 s
4xOF7Z5-M-LC-07-1640-A1-E00-F4	5040	4 x (2 x gG 800 A)	4 x (2 x gR 1000 A)	PC73GB69V10CTF	2 x E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10%, t ≤ 30 ms | L: 0,9 x IN = 2880 A, t = 3 s
4xOF7Z5-M-LC-07-1640-A1-E00-F4	5400	4 x (2 x gG 800 A)	4 x (2 x gR 1000 A)	PC73GB69V10CTF	2 x E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10%, t ≤ 30 ms | L: 1,0 x IN = 3200 A, t = 3 s
4xOF7Z5-M-LC-07-1640-A1-E00-F4	5750	4 x (2 x gG 1000 A)	4 x (3 x gR 800 A))	PC73GB69V800TF	2 x E4.2 4000 LI	I: 1,5 x IN = 6000 A ±10%, t ≤ 30 ms | L: 0,9 x IN = 3600 A, t = 3 s

7.3.17 AC Fuses and Circuit Breakers for L Filter, Voltage Class G7

The system modules with a mains contactor or a main switch, and a net-side L filter must be protected with branch circuit fuses or a circuit breaker. Check the coordination type in the contactor datasheet with the corresponding gG fuse. The fuse ratings are based on a maximum ambient temperature of 60 °C (140 °F) , and when using gR fuses, a minimum airflow of 3 m/s is required. gG fuses do not require additional cooling. Check the selectivity with upstream protective devices. Select the circuit breaker I_{cu}/I_{cw} value according to the supply short-circuit current capability.

Table 64: AC Fuses and Circuit Breakers for L Filter +AEZ3, Voltage Class G7

Model code	System module: Rated current IL [A]	IEC gG fuses (at 60 °C (140 °F) ambient, no cooling)	gR fuses (at 60 °C (140 °F) ambient)	Mersen gR fuse type TTF	Recommended circuit breaker type ABB Emax2 (at 60 °C (140 °F) ambient)	Circuit breaker trip unit settings: Ekip DIP/Touch/Hi-Touch LI
OF7Z5-M-LC-07-1000-A1-E00-F4	760	gG 1000 A	2 x gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-1000-A1-E00-F4	970	gG 1250 A	3 x gR 1000 A	PC73GB69V10CTF	–	–
OF7Z5-M-LC-07-1640-A1-E00-F4	1500	2 x gG 1000 A	3 x gR 800 A	PC73GB69V800TF	–	–
OF7Z5-M-LC-07-2300-A1-E00-F4	1700	2 x gG 1000 A	3 x gR 1000 A	PC73GB69V10CTF	–	–

Table 64: AC Fuses and Circuit Breakers for L Filter +AEZ3, Voltage Class G7 - (continued)

Model code	System module: Rated current IL [A]	IEC gG fuses (at 60 °C (140 °F) ambient, no cooling)	gR fuses (at 60 °C (140 °F) ambient)	Mersen gR fuse type TTF	Recommended circuit breaker type ABB Emax2 (at 60 °C (140 °F) ambient)	Circuit breaker trip unit settings: Ekip DIP/Touch/Hi-Touch LI
OF7Z5-M-LC-07-2300-A1-E00-F4	1900	2 x gG 1250 A	3 x gR 1000 A	PC73GB69V10CTF	E2.2 2500 LI	I: 1,5 x IN = 3750 A ±10%, t ≤ 30 ms | L: 0,9 x IN = 2250 A, t = 3 s
2xOF7Z5-M-LC-07-1640-A1-E00-F4	2450	2 x (2 x gG 800 A)	2 x (2 x gR 1000 A)	PC73GB69V10CTF	E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10%, t ≤ 30 ms | L: 0,9 x IN = 2880 A, t = 3 s
2xOF7Z5-M-LC-07-1640-A1-E00-F4	2800	2 x (2 x gG 1000 A)	2 x (3 x gR 800 A)	PC73GB69V800TF	E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10%, t ≤ 30 ms | L: 1,0 x IN = 3200 A, t = 3 s
2xOF7Z5-M-LC-07-2300-A1-E00-F4	3270	2 x (2 x gG 1000 A)	2 x (3 x gR 800 A)	PC73GB69V800TF	E4.2 4000 LI	I: 1,5 x IN = 6000 A ±10%, t ≤ 30 ms | L: 1,0 x IN = 4000 A, t = 3 s
2xOF7Z5-M-LC-07-2300-A1-E00-F4	3720	2 x (2 x gG 1250 A)	2 x (3 x gR 1000 A)	PC73GB69V10CTF	2 x E2.2 2500 LI	I: 1,5 x IN = 3750 A ±10%, t ≤ 30 ms | L: 0,9 x IN = 2250 A, t = 3 s
2xOF7Z5-M-LC-07-2300-A1-E00-F4	4160	2 x (2 x gG 1250 A)	2 x (4 x gR 800 A)	PC73GB69V800TF	2 x E2.2 2500 LI	I: 1,5 x IN = 3750 A ±10%, t ≤ 30 ms | L: 1,0 x IN = 2500 A, t = 3 s
3xOF7Z5-M-LC-07-2300-A1-E00-F4	4650	3 x (2 x gG 1000 A)	3 x (3 x gR 800 A)	PC73GB69V800TF	2 x E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10%, t ≤ 30 ms | L: 0,9 x IN = 2880 A, t = 3 s
3xOF7Z5-M-LC-07-2300-A1-E00-F4	5550	3 x (2 x gG 1250 A)	3 x (3 x gR 1000 A)	PC73GB69V10CTF	2 x E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10%, t ≤ 30 ms | L: 1,0 x IN = 3200 A, t = 3 s
3xOF7Z5-M-LC-07-2300-A1-E00-F4	6450	3 x (2 x gG 1250 A)	3 x (4 x gR 800 A)	PC73GB69V800TF	2 x E4.2 4000 LI	I: 1,5 x IN = 6000 A ±10%, t ≤ 30 ms | L: 1,0 x IN = 4000 A, t = 3 s
4xOF7Z5-M-LC-07-2300-A1-E00-F4	7370	4 x (2 x gG 1250 A)	4 x (3 x gR 1000 A)	PC73GB69V10CTF	3 x E4.2 3200 LI	I: 1,5 x IN = 4800 A ±10%, t ≤ 30 ms | L: 0,9 x IN = 2880 A, t = 3 s

7.3.18 DC Fuses for SISO Filters 640–1100 V DC, IP00/Open Type

Table 65: DC Fuses for SISO Filters 640–1100 V DC, IP00/Open Type (Eaton/Bussmann)

Model code	Frame	Rated current I_L [A]	Number of fuses	Fuse size	aR fuse part number	Fuse U_n [V]	Fuse I_n [A]
OF7SI2-M-LC-07-380-A1-E00-Fx	SILC10L	380	2	3	180D6349	900	1100
OF7SI2-M-LC-07-760-A1-E00-Fx	SILC12L	760	2	4	170M7636-UL	1000	1500

Table 65: DC Fuses for SISO Filters 640–1100 V DC, IP00/Open Type (Eaton/Bussmann) - (continued)

Model code	Frame	Rated current I_L [A]	Number of fuses	Fuse size	aR fuse part number	Fuse U_n [V]	Fuse I_n [A]
OF7SI2-M-LC-07-1500-A1-E00-Fx	SILC14L	1500	2	4	170M7962-UL	1000	3000
OF7SI4-M-LC-07-380-A1-E00-Fx	SILC10L	380	2	3	180D6349	900	1100
OF7SI4-M-LC-07-760-A1-E00-Fx	SILC12L	760	2	4	170M7636-UL	1000	1500
OF7SI4-M-LC-07-1500-A1-E00-Fx	SILC14L	1500	2	4	170M7962-UL	1000	3000
OF7S02-M-LC-07-730-A1-E00-F4	SOSIN12L	730	2	4	170M7636-UL	1000	1500
OF7SO2-M-LC-07-1400-A1-E00-F4	SOSIN14L	1400	2	4	170M7962-UL	1000	3000

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