

ABB INDUSTRIAL DRIVES

ACS880-7207LC and -7307LC DC incoming units

Hardware manual



ACS880-7207LC and -7307LC DC incoming units

Hardware manual

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6. Start-up



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Further information



1

Introduction to the manual

Contents of this chapter

This chapter contains information on the manual.

Applicability

This manual is applicable with the DC incoming units, ACS880-7207LC and ACS880-7307LC.

Safety instructions

Obey all safety instructions of the drive.

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

Target audience

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

Read the manual before you work on the drive. You are expected to know the fundamentals of electricity, wiring, electrical components and electrical schematic symbols.

Categorization by option code

The option code (option +A123) identifies information which concerns only a certain optional selection. The options included in the unit are listed on the type designation label.

Use of component designations

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

Terms and abbreviations

Term	Description
DC incoming unit	Unit for isolating the drive DC link from another DC system, or unit for both isolating the drive DC link from another DC system and also breaking and making current between the drive DC link and another DC system.
Drive	Frequency converter for controlling AC motors
Inverter unit	Inverter module(s) under control of one control unit, and related components. One inverter unit typically controls one motor.
Multidrive	Drive for controlling several motors which are typically coupled to the same machinery. Includes one supply unit, and one or several inverter units.
Supply unit	Supply module(s) under control of one control unit, and related components.

Related manuals

■ Related drive manuals

You can find manuals on the Internet. See below for the relevant code/link. For more documentation, go to www.abb.com/drives/documents.



[Manuals for ACS880 multidrives cabinets](#)

■ Related DC isolator/breaker and protection relay manuals

SACE Emax DC Installation and service instructions (1SDH000635R0002 (English)): [Link to manual](#).

SACE Emax DC catalogue (1SDC200012D0202 (English)): [Link to manual](#).

REG615 protection and control relay: [Link to ABB product page](#).

REF615 protection and control relay: [Link to ABB product page](#).

2

Operation principle and hardware description

Contents of this chapter

This chapter describes the intended use and construction of DC incoming units ACS880-7207LC and ACS880-7307LC. The chapter also presents the type designation label and the type code.

Operation principle

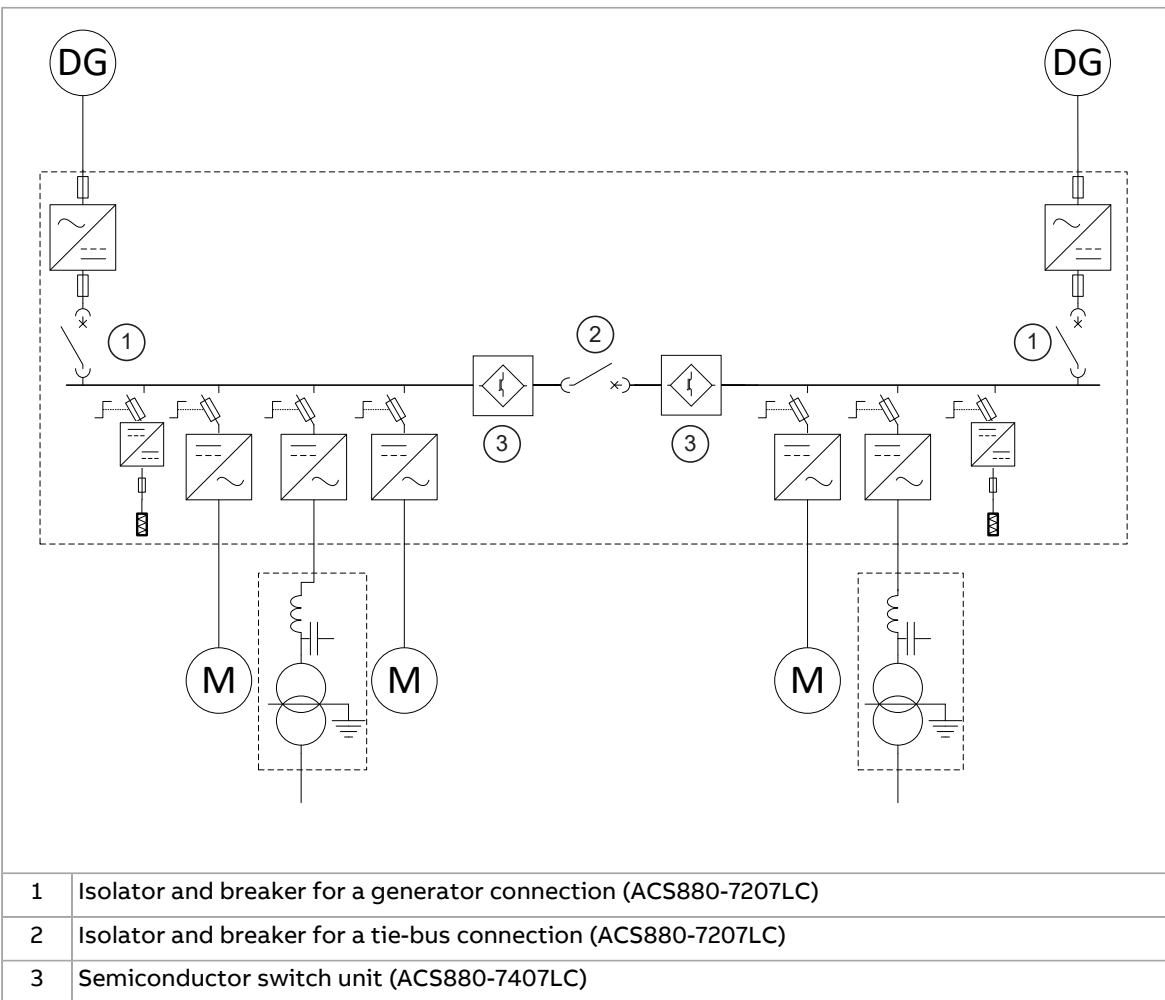
The DC incoming unit provides connection between two DC systems. The two most common applications are:

- connection of an external DC system to the drive DC bus (for example a connection point for a generator)
- tie-bus connection, that is, division of the drive DC bus system in two or more parts.

For both applications, it is possible to use either ACS880-7207LC or ACS880-7307LC incoming DC unit:

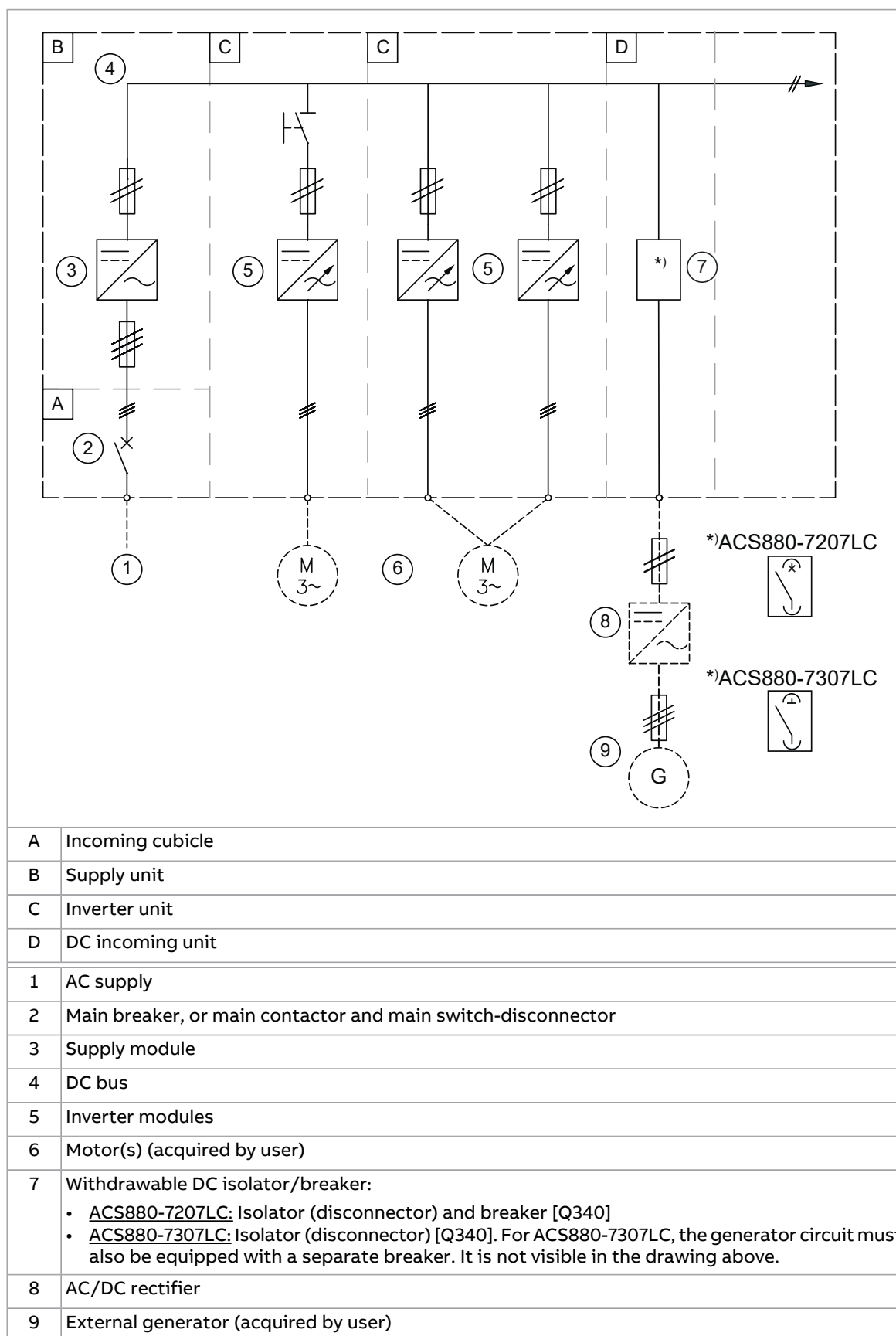
- ACS880-7207LC can isolate (disconnect) the two DC systems, and make and break load currents. It can also break fault currents at certain extent.
- ACS880-7307LC can only isolate (disconnect) the two DC systems. It cannot make or break load current or break fault current.

The main component both in the ACS880-7207LC and ACS880-7307LC units is a DC isolator/breaker. The size and the connection of the DC isolator/breaker vary depending on it's intended use.

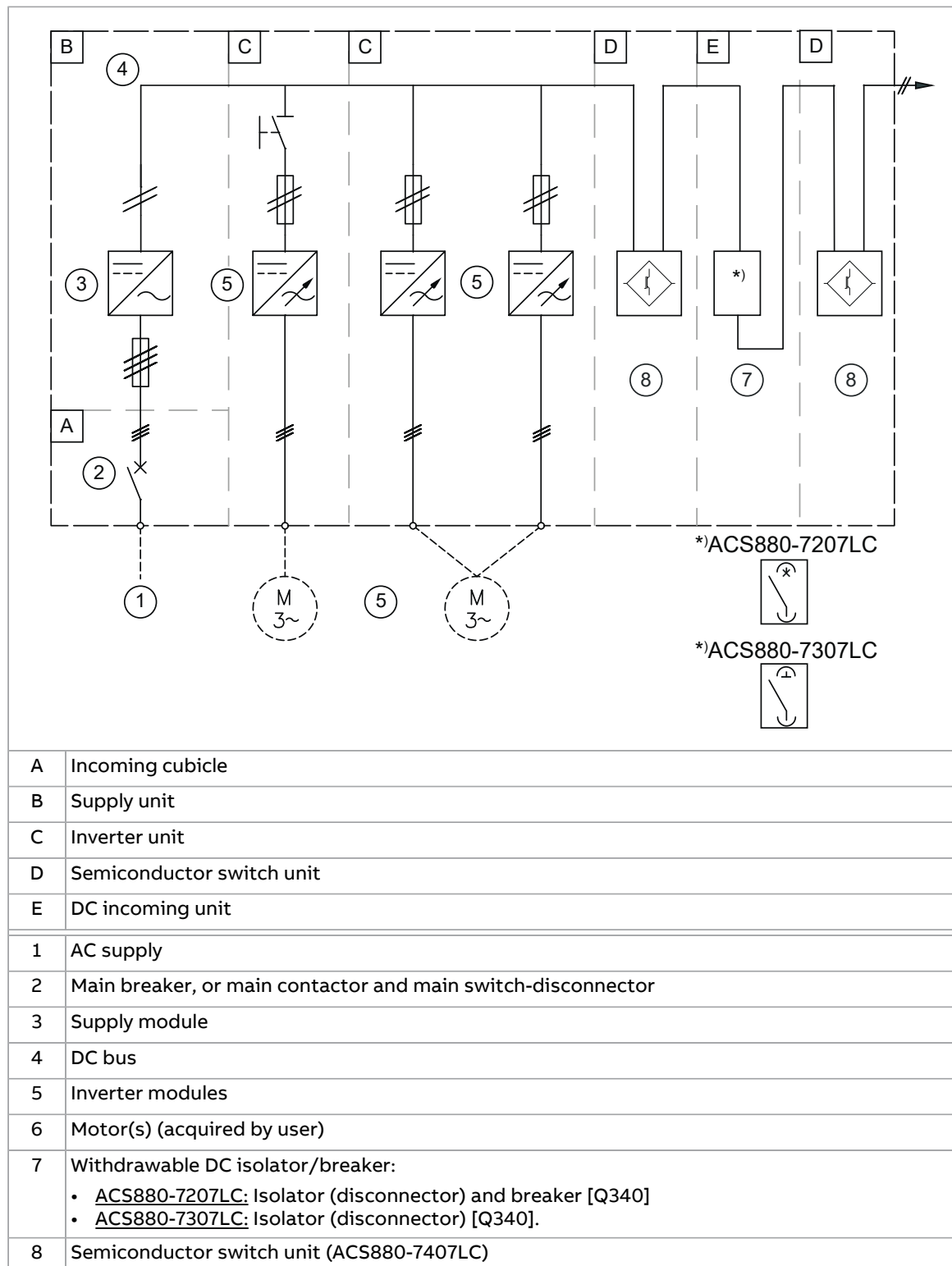


Overview diagram of the drive system

■ Drive with a generator connection

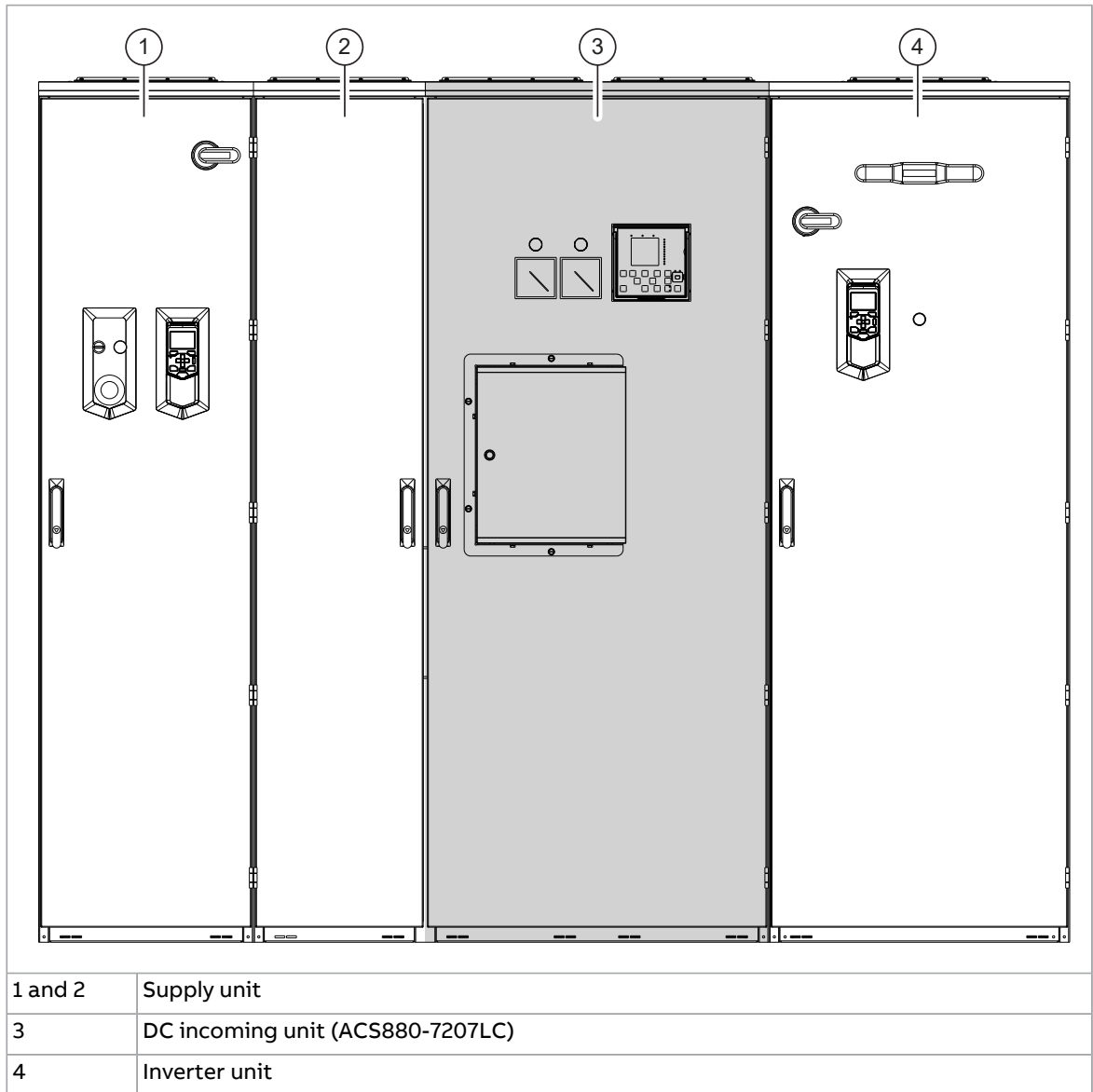


■ Drive with a tie-bus connection

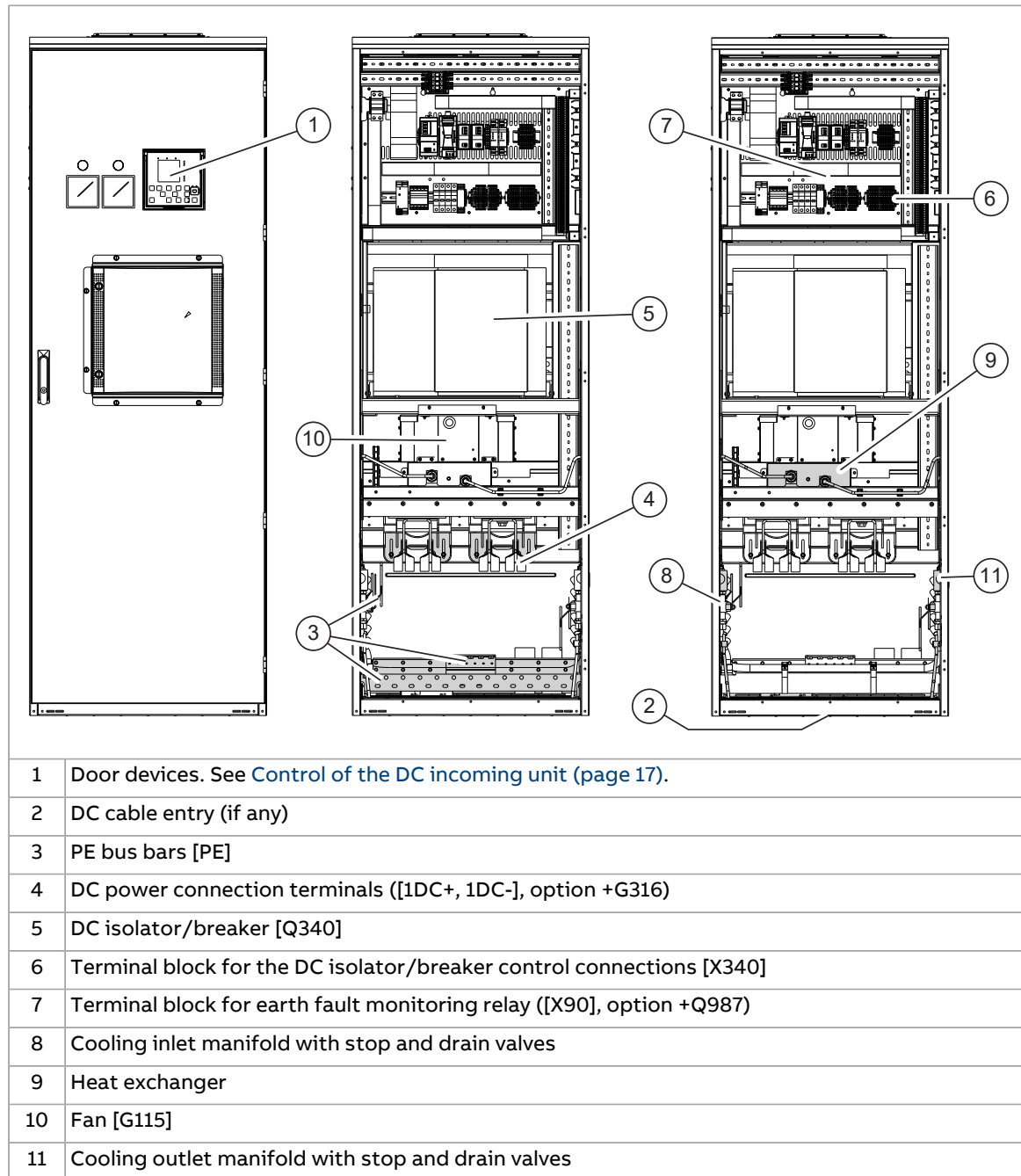


Layout drawings

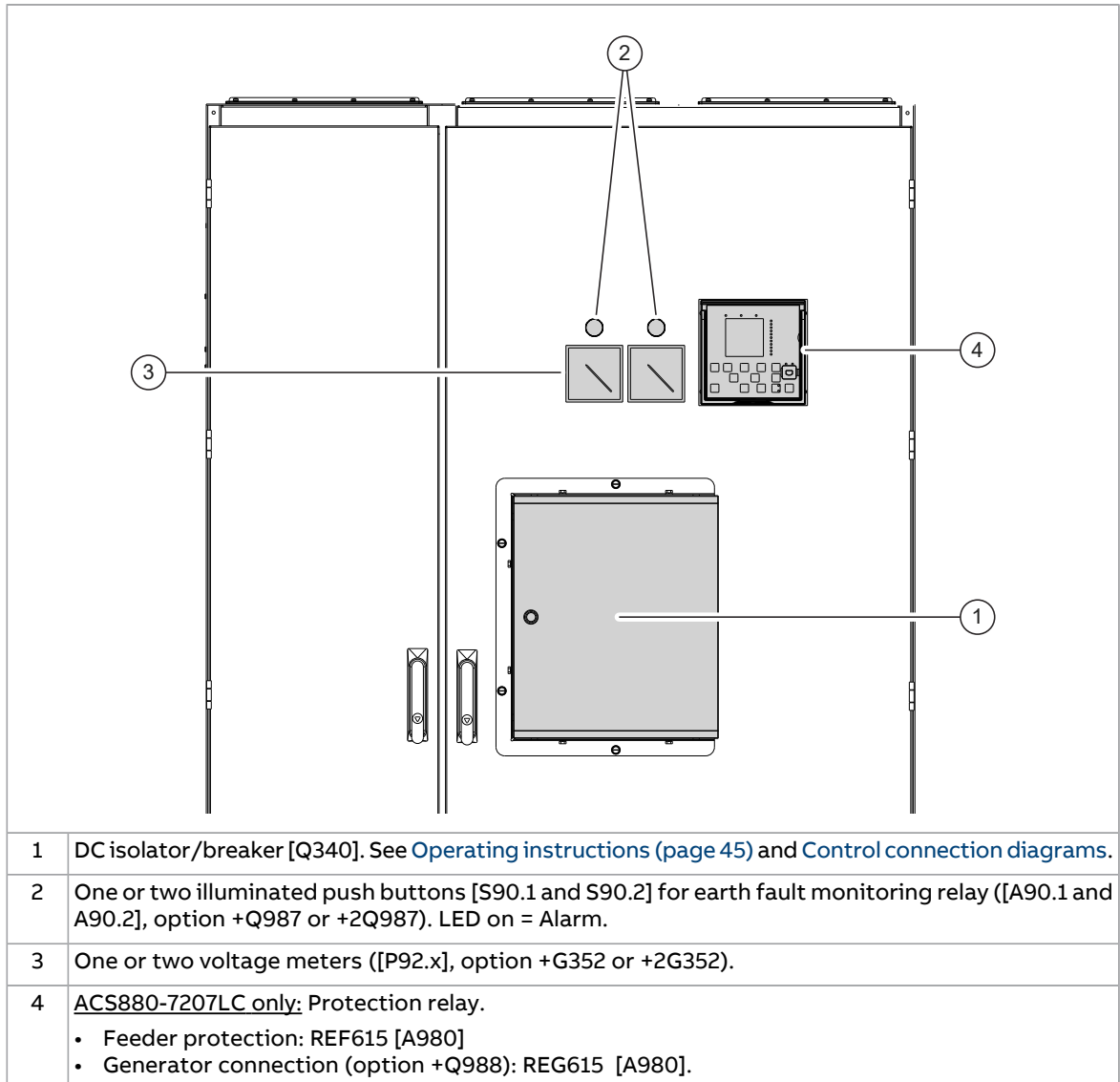
■ Layout of a drive system with a DC incoming unit



■ Layout of a DC incoming unit



Control of the DC incoming unit



Type designation label

ABB

MADE IN FINLAND

ABB Oy
Hiomotie 13
00380 Helsinki
Finland

FRAME

DICU6

Liquid cooling

IP42

1

ACS880-7207LC-1600A-7+A012+C164
G300+G301+G316+H350+Q987

Input

U1 976 VDC
I1 1600 A
f -

Output

U2 976 VDC
I2 1600 A
f -

5

CE

EAC

UK
CA

6

20

7

S/N: 1190403889

1	Type designation
2	Frame size
3	Cooling system and other additional data
4	Degree of protection
5	Ratings
6	Valid markings. See <i>ACS880 liquid-cooled multidrive cabinets and modules electrical planning instructions</i> (3AXD50000048634 [English]).
7	Serial number. The first digit of the serial number refers to the manufacturing plant. The next four digits refer to the unit's manufacturing year and week, respectively. The remaining digits complete the serial number so that there are no two units with the same number.

Type designation key

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

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

■ Basic code

The basic code is described in the table below for an example code ACS880-7207LC-1600A-7.

CODE	DESCRIPTION
ACS880	Product series
7207LC (or 7307LC)	Product type. Liquid-cooled DC incoming unit: <ul style="list-style-type: none"> • ACS880-7207LC: isolator and breaker • ACS880-7307LC: isolator.
1600A	Size. See technical data
7	Voltage rating. 709...976 V DC.

■ Option codes

The table below lists the option codes.

Code	Description
A012	50 Hz supply frequency
A013	60 Hz supply frequency
B054	IP42 (UL Type 1 Filtered)
B055	IP54 (UL Type 12)
C121	Marine construction
C164	Plinth height 100 mm
C176	Door hinges on left
C179	Plinth height 200 mm
C205	Marine product certification issued by DNV GL
C206	Marine product certification issued by the American Bureau of Shipping (ABS)
C207	Marine product certification issued by Lloyd's Register (LR)
C209	Marine product certification issued by Bureau Veritas
C228	Marine product certification issued by China Classification Society (CCS)
C229	Marine product certification issued by Russian Maritime Register of Shipping (RS)
E210	EMC/RFI filter for 2nd environment TN (grounded) or IT (ungrounded) system, category C3
F276	Capability of ride-through in voltage break max. 3 s. without tripping
G300	Cabinet and module heating elements (external supply)
G301	Cabinet lighting
G304	Control (auxiliary) voltage 115 V AC

20 Operation principle and hardware description

Code	Description
G307	Terminals for connecting external control voltage (230 V AC or 115 V AC, eg. UPS)
G315	Tin-plated copper DC busbars
G316	Cable supply conductors
G317	Supply connection by busbars
G320	Control (auxiliary) voltage 230 V AC
G330	Halogen-free wiring and materials
G338	Wire marking class A1
G339	Wire marking class A2
G340	Wire marking class A3
G341	Wire marking class B1
G342	Wire marking class C1
G344	Auxiliary voltage transformer
G352	DC voltmeter
G353	Current transducers
H352	Power cabling exit from bottom
H353	Power cabling exit from top
H358	Cable gland plates (3 mm steel, undrilled)
H364	Cable gland plates (3 mm aluminum, undrilled)
H365	Cable gland plates (6 mm brass, undrilled)
H367	Control cabling through floor of cabinet
H368	Control cabling through roof of cabinet
H390	Cable entry, 72 mm diameter
H394	Cable entry, Rextec frame without sealing components
P913	Special color (RAL Classic)
P966	Special color (other than RAL Classic)
Q987	Earth fault monitoring, DC system
Q988	Generator protection
R700	Printed manuals in English

3

Guidelines for planning the electrical installation

Contents of this chapter

This chapter contains electrical planning guidelines for the DC incoming units ACS880-7207LC and ACS880-7307LC.

Limitation of liability

The installation must always be designed and made according to applicable local laws and regulations. ABB does not assume any liability whatsoever for any installation which breaches the local laws and/or other regulations. Furthermore, if the recommendations given by ABB are not followed, the drive may experience problems that the warranty does not cover.

■ North America

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

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

Generic guidelines

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

Selecting and routing the DC cables

This section is valid only for a DC incoming unit which is equipped with terminals for external supply cabling (option +G316).

■ Recommended cables

The customer (or the system integrator) must acquire and connect the energy storage cables. It is possible to use shielded cables with 2, 3 or 4 conductors. ABB recommends to use shielded cables with 4 conductors.

Refer to the table below for the cables and possible configurations.

Cable type	Positive	Negative	PE (ground)
2-conductor shielded cable	1 conductor	1 conductor	Shield ¹⁾
3-conductor shielded cable	1 conductor	1 conductor	1 conductor + shield
4-conductor shielded cable	2 conductors	2 conductors	Shield ¹⁾

¹⁾ The shield must meet the requirements of IEC 61439-1. If the shield does not meet the requirements, an additional PE conductor or cable is required.

ABB does not recommend to use single core cables. If it necessary to use single core cables, obey these guidelines:

- Use shielded cables. Ground the cable shields only at one end.
- Put the cables in groups of 2 or 4.
- Attach the cables according to the requirements to withstand the apparent short circuit forces.

■ Typical cable sizes

See the technical data.

■ Minimizing electromagnetic interference

The customer (or the system integrator) must obey these rules in order to minimize the electromagnetic interference caused by rapid current changes in the energy storage cables:

- Shield the energy storage cabling completely, either by using shielded cable or a metallic enclosure. Unshielded single-core cable can only be used if it is routed inside a cabinet that efficiently suppresses radiated emissions.
- Install the cables away from other cable routes.
- Avoid long parallel runs with other cables. The minimum recommended separation distance for parallel cabling is 0.3 m (1 ft).
- Cross other cables at right angles.

Keep the cable as short as possible in order to minimize the radiated emissions and stress on converter IGBT semiconductors. The longer the cable, the higher the radiated emissions, inductive load and voltage peaks over the IGBTs of the DC/DC converter.

■ EMC compliance of the complete installation

ABB has not verified that the EMC requirements are fulfilled with external DC cabling. The EMC compliance of the complete installation must be considered by the customer (or the system integrator).

4

Electrical installation

Contents of this chapter

This chapter contains electrical safety precautions, instructions for measuring the insulation of the external power cabling, connection diagrams and instructions for connecting the external power cabling and control cabling.



Electrical safety precautions

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



WARNING!

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

If you are not a qualified electrical professional, do not do installation or maintenance work.

Do these steps before you begin any installation or maintenance work.

1. Clearly identify the work location and equipment.
2. Disconnect all possible voltage sources. Make sure that re-connection is not possible. Lock out and tag out.
 - Open the main disconnecting device of the drive.
 - Open the charging switch if present.
 - Open the disconnecter of the supply transformer. (The main disconnecting device in the drive cabinet does not disconnect the voltage from the AC input power busbars of the drive cabinet.)
 - If the drive is equipped with a DC/DC converter unit (optional) or a DC feeder unit (optional): Open the DC switch-disconnector ([Q11], option +F286 or +F290) of the unit. Open the disconnecting device of the energy storage connected to the unit (outside the drive cabinet).
 - Open the auxiliary voltage switch-disconnector (if present), and all other possible disconnecting devices that isolate the drive from dangerous voltage sources.
 - In the liquid cooling unit (if present), open the switch-disconnector of the cooling pumps.
 - If you have a permanent magnet motor connected to the drive, disconnect the motor from the drive with a safety switch or by other means.
 - Disconnect all dangerous external voltages from the control circuits.
 - After you disconnect power from the drive, always wait 5 minutes to let the intermediate circuit capacitors discharge before you continue.
3. Protect any other energized parts in the work location against contact.
4. Take special precautions when close to bare conductors.
5. Measure that the installation is de-energized. Use a quality voltage tester. If the measurement requires removal or disassembly of shrouding or other cabinet structures, obey the local laws and regulations applicable to live working (including – but not limited to – electric shock and arc protection).
 - Before and after you measure the installation, verify the operation of the voltage tester on a known voltage source.
 - Make sure that the voltage between the drive input power terminals (L1, L2, L3) and the grounding (PE) busbar is zero.
 - Make sure that the voltage between the drive output terminals (T1/U, T2/V, T3/W) and the grounding (PE) busbar is zero.

Important! Repeat the measurement also with the DC voltage setting of the tester. Measure between each phase and ground. There is a risk of dangerous DC voltage charging due to leakage capacitances of the motor circuit. This

voltage can remain charged for a long time after the drive power-off. The measurement discharges the voltage.

- Make sure that the voltage between the drive DC terminals (UDC+ and UDC-) and the grounding (PE) terminal is zero. In cabinet-built drives, measure between the drive DC busbars (+ and -) and the grounding (PE) busbar.

**WARNING!**

The busbars inside the cabinet of liquid-cooled drives are partially coated. Measurements made through the coating are potentially unreliable, so only measure at uncoated portions. Note that the coating does not constitute a safe or touch-proof insulation.

6. Install temporary grounding as required by the local regulations.
7. Ask for a permit to work from the person in control of the electrical installation work.



Measuring the insulation resistance of the DC cabling



WARNING!

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

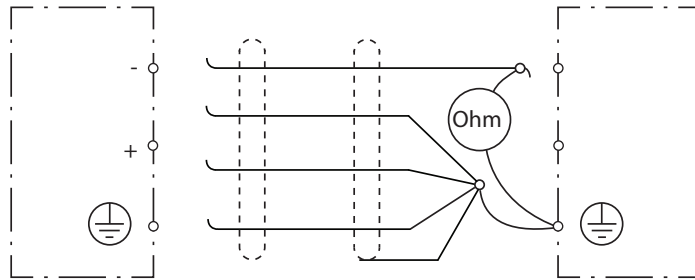


WARNING!

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

Measure the insulation resistance of the DC cabling as follows:

1. Make sure that the cable is disconnected both at the drive end and at the other end: all conductors (including the grounding conductor) and the cable shield.
2. At the drive end, connect all conductors and shield of the cable together and to the grounding busbar (PE).
3. Disconnect one conductor and measure the insulation resistance between the conductor and the grounding busbar (PE) by using a measuring voltage of 1 kV DC. The insulation resistance must be higher than 1 Mohm.
4. Disconnect another conductor and measure its insulation resistance. Repeat this for all remaining conductors (including the cable shield).



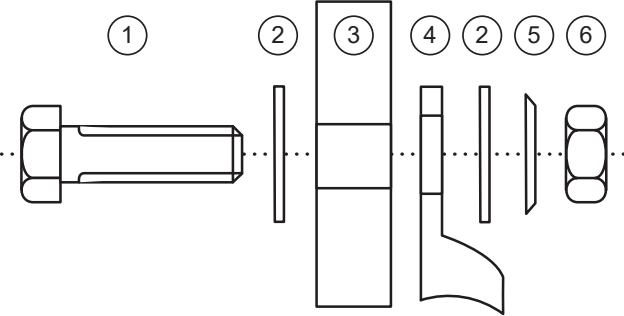
Connecting the DC power cables

This section is valid only for a DC incoming unit which is equipped with terminals for external supply cabling (option +G316).

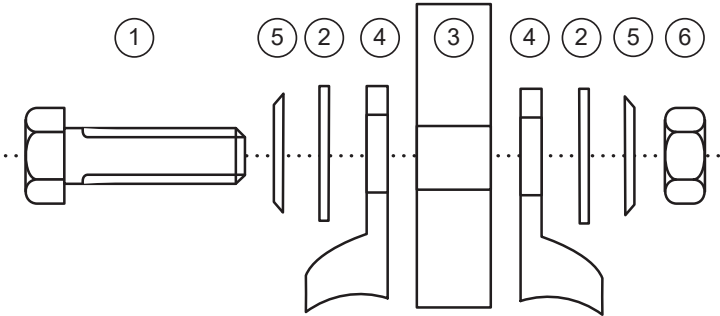
■ Use of fasteners in cable lug connections

Use the bolts, nuts and washers delivered with the drive. Install all the fasteners in the correct order. See the figure below. Tighten the cable lug to the torque specified for the connection.

Cable lug on one side of the busbar



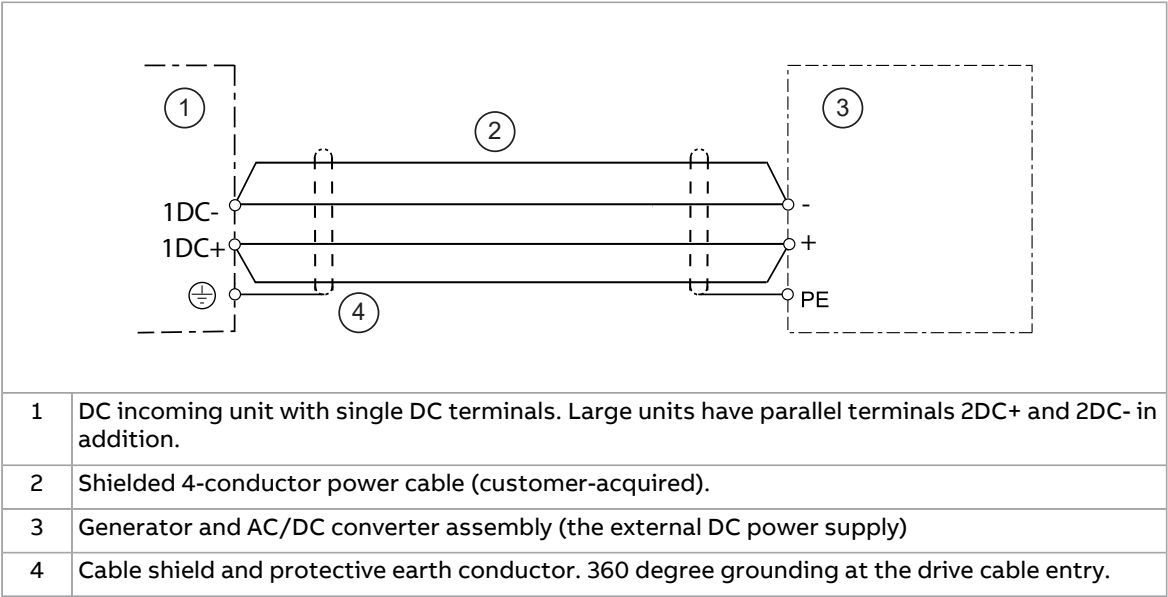
Cable lugs on both sides of the busbar



1	Bolt	4	Cable lug
2	Plain washer	5	Spring washer
3	Busbar	6	Nut



■ Connection diagram



■ Connection procedure

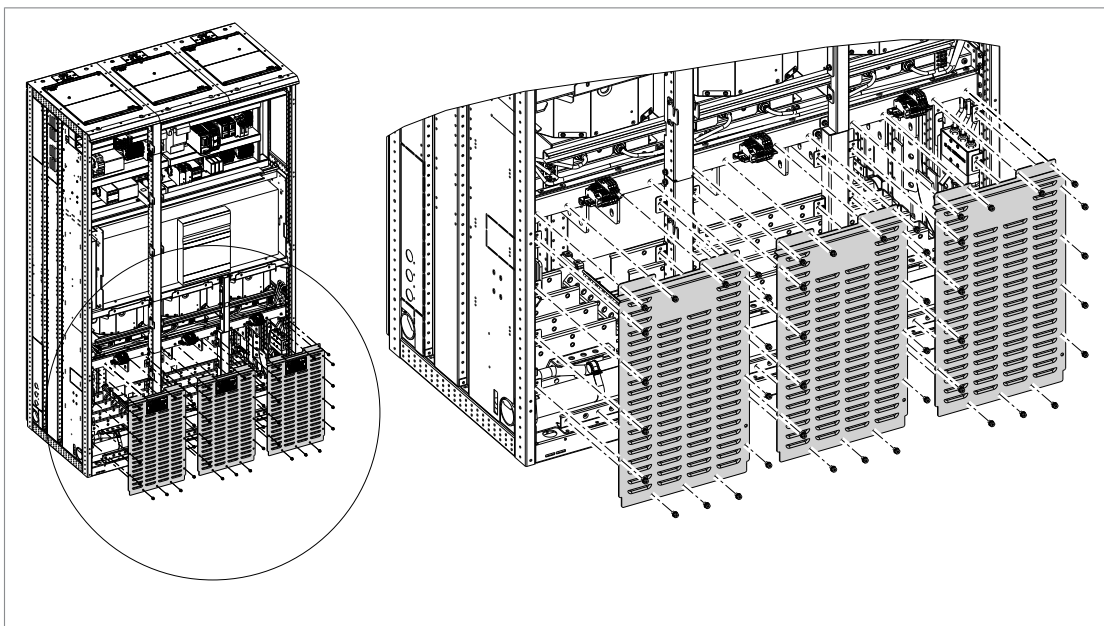


WARNING!
Obey the safety instructions of the drive. If you ignore them, injury or death, or damage to the equipment can occur. If you are not a qualified electrical professional, do not do installation, commissioning or maintenance work.

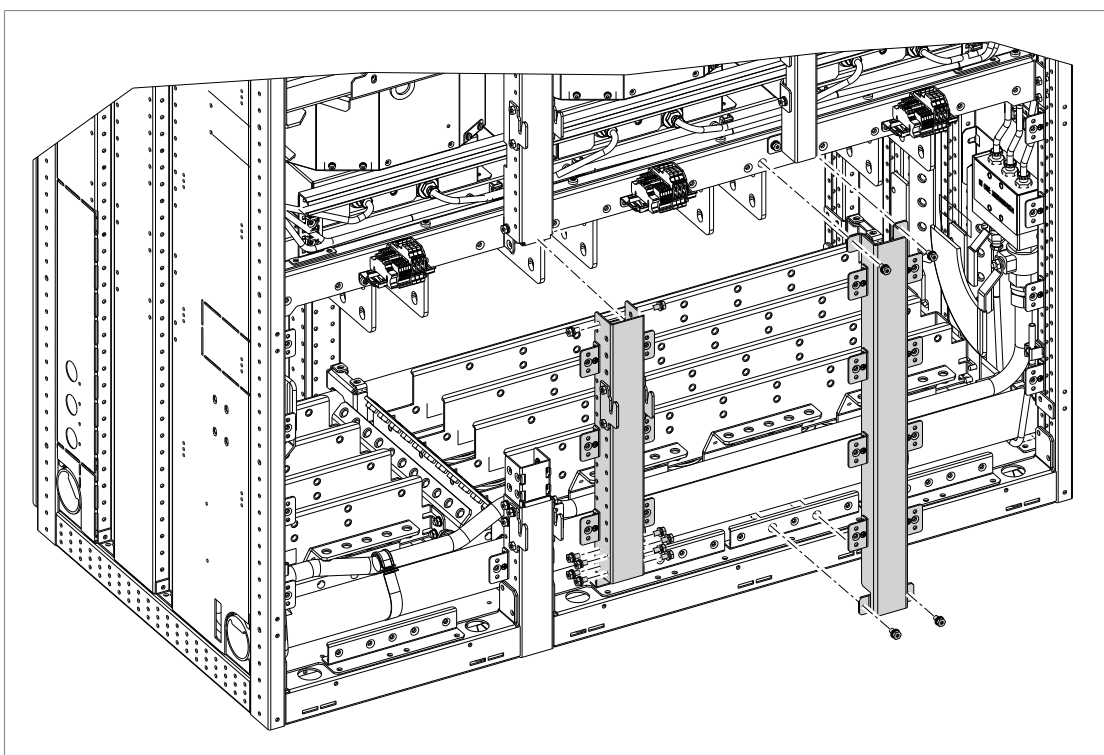
Stop the drive and do the steps in section [Electrical safety precautions \(page 24\)](#) before you start the work.

Removing shrouds

1. Open the door of the DC incoming unit.
2. Remove the shrouding.



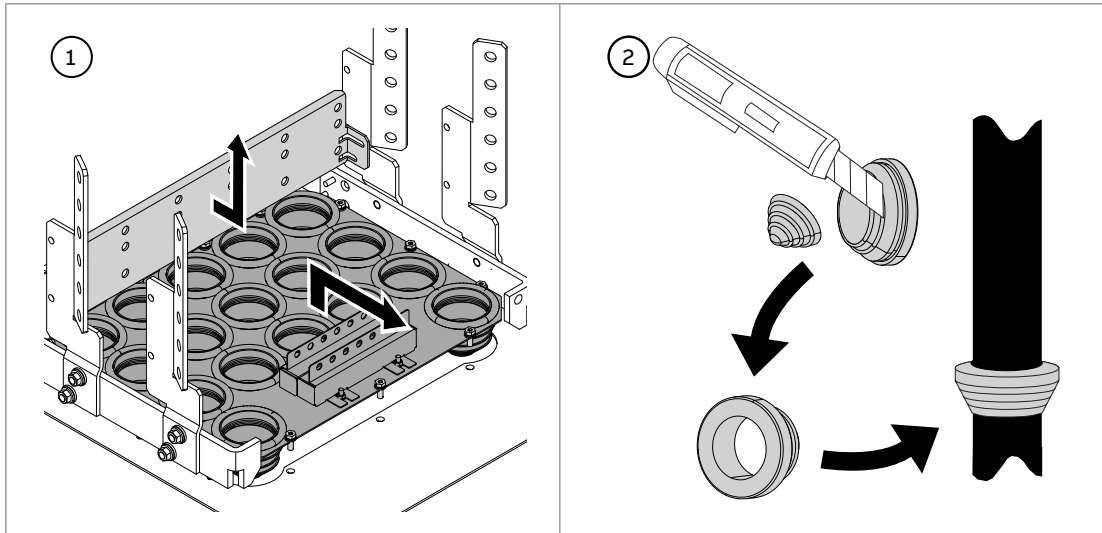
3. Large units only: Remove the two vertical bars in the middle.



Connecting the cables

This section describes the power cable connecting procedure for a bottom cable entry with the standard cable entry plate. The standard cable entry plate has conductive sleeves for the 360 degree grounding of the cable shields. If the drive or unit has another type of cable entry plate, such as a Roxtec cable entry plate (option +H394), or cable gland plate (option +H358), refer also to the instruction of the related non-ABB installation accessories. For example, refer to the Roxtec instructions or the instructions by the cable gland manufacturer.

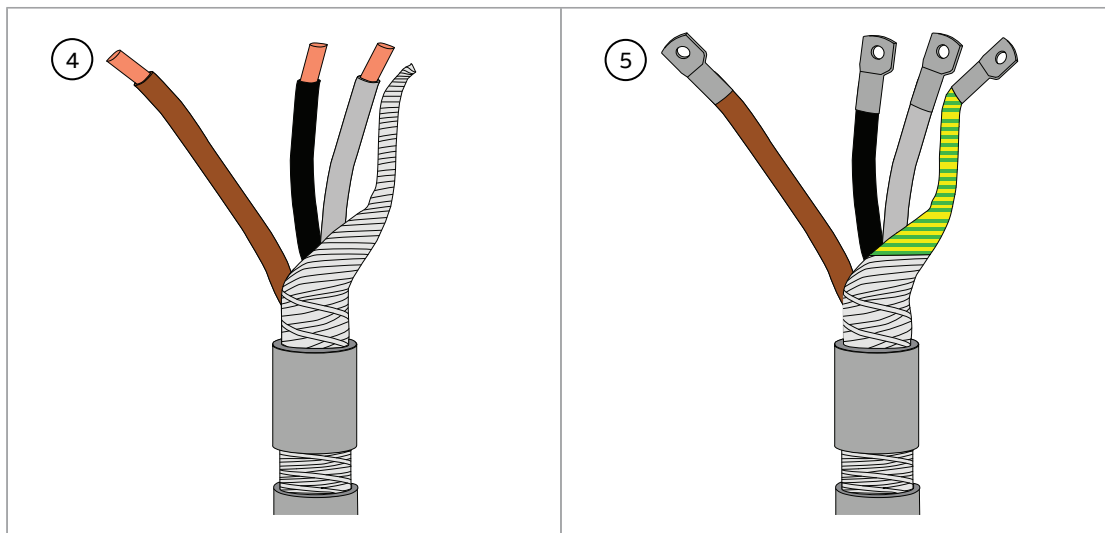
1. IP54 cabinet: Remove the rear horizontal cable support bracket and the cable entry plate.
2. IP54 cabinet: Remove a sealing grommet from the cable entry plate for each cable. Cut hole into the rubber grommet and slide it onto the cable.



3. Lead the cables inside the cabinet through the cable entry plate. If there are several cables, use the rear 3 holes first.
IP54 cabinet: Attach the sealing grommets to the cable entry plate. Attach also the cable entry plate, and the cable support.
4. For each cable, strip off 3...5 cm (1.2 ... 2 inches) of the outer insulation above the cable entry plate. Strip also the end of the cable and the end of the conductors.

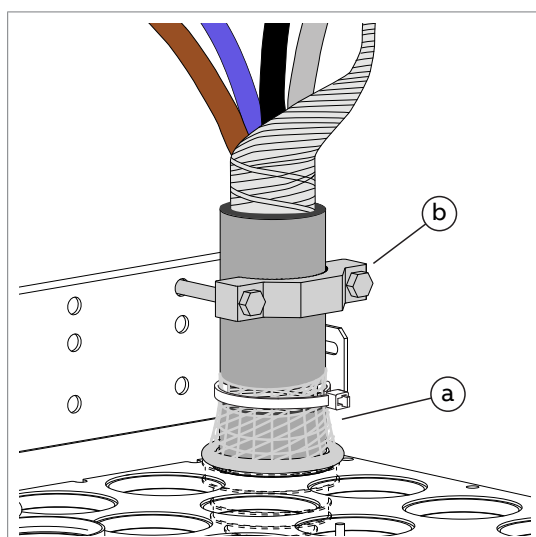
Twist the shield to form a PE conductor, and mark it with yellow-green tape or heat-shrink tubing.

5. For each cable, attach cable lugs at the end of the PE conductor (twisted shield) and current conductors.

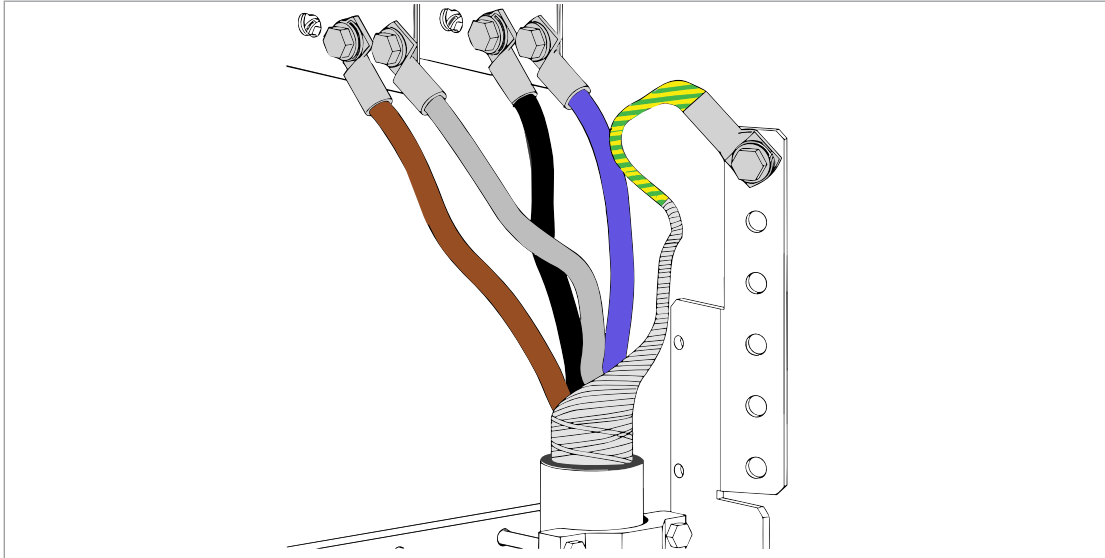
**WARNING!**

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

6. For each cable, attach the conductive sleeve (a) to the bare cable shield with a cable tie. Attach the cable to the support bracket with a clamp (b).



7. For each cable, connect the DC+ and DC- conductors to the applicable DC terminals. Connect the cable shield to the PE busbar. Use the bolts, nuts, and washers included in the delivery, and the connection method specified in [Use of fasteners in cable lug connections \(page 27\)](#). For the DC terminal connections, use M12 fasteners and a tightening torque of 70 N·m (52 lbf·ft). For the PE connection(s), use M10 fasteners and a tightening torque of 42 N·m (31 lbf·ft).



8. If there are more than 3 cables, attach additional cable support brackets for them.

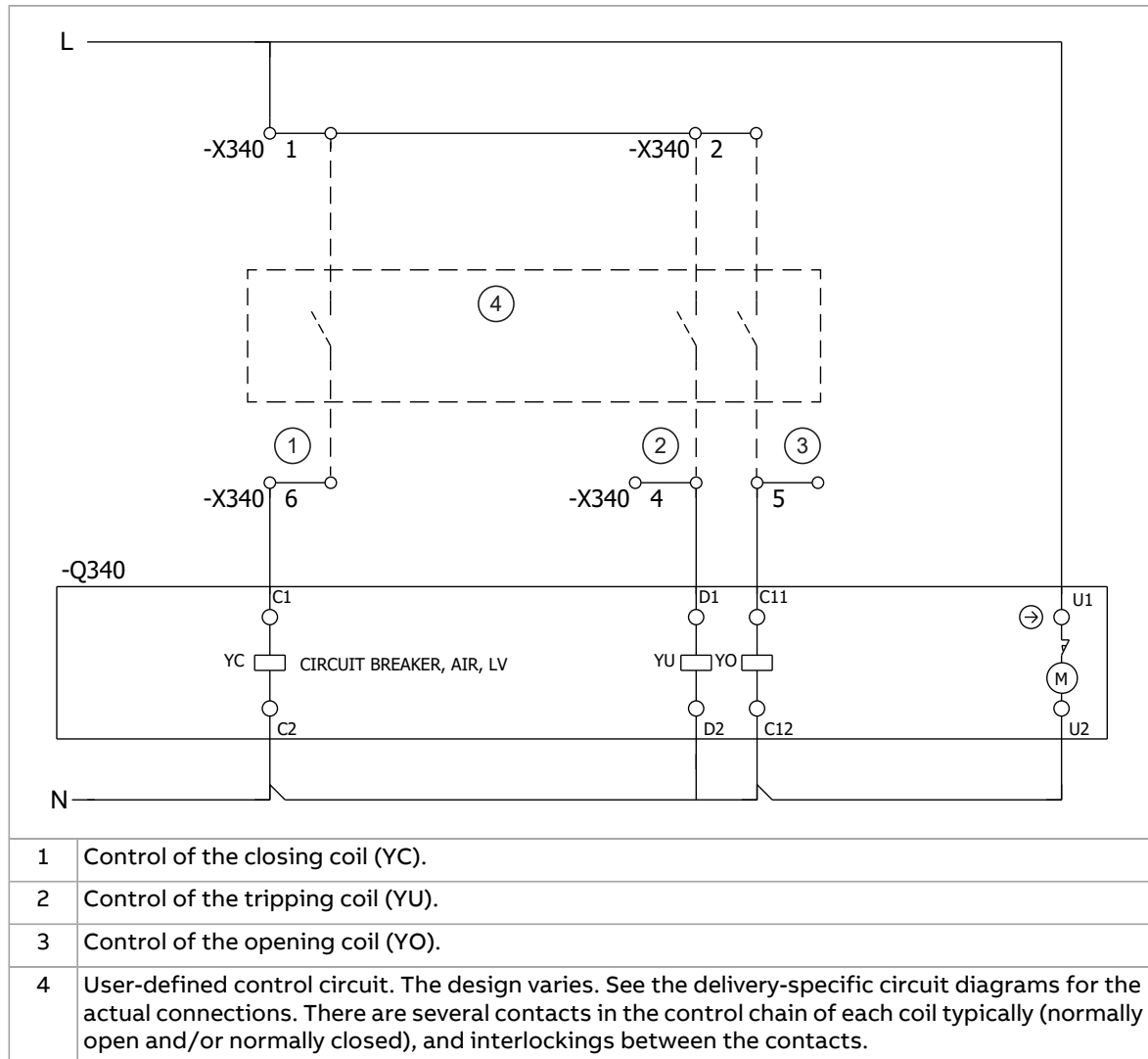
Installing shrouds

1. Install the vertical bars and shrouding removed earlier.
2. Close the door of the unit.

Connecting the control cables

■ Control connection diagrams

Default control signals of the DC isolator/breaker [Q340]



The rising edge of the closing and opening control signals trigger the DC isolator/breaker operations:

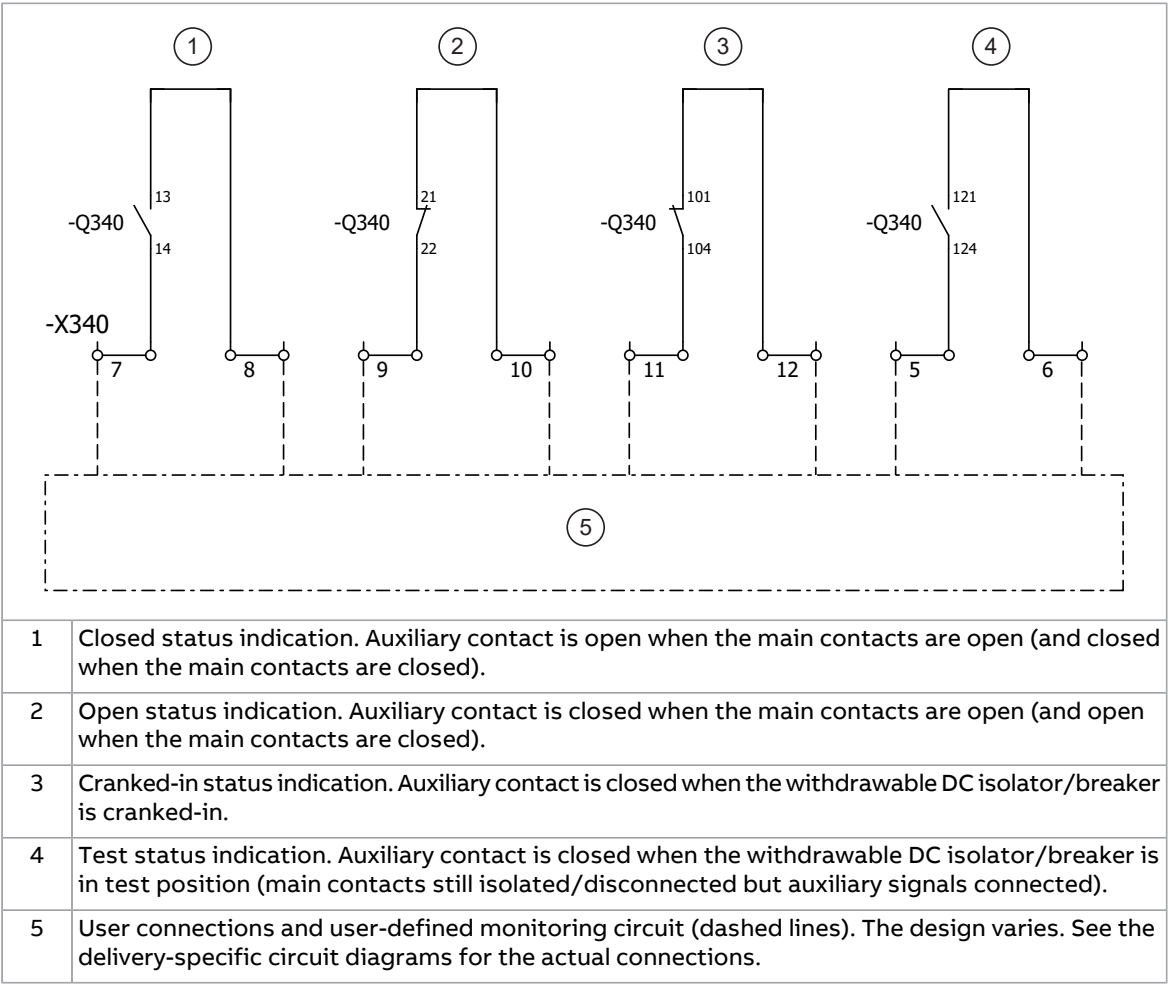
- Closing: When the control circuit energizes the YC coil (rising edge of the signal), the DC isolator/breaker [Q340] closes.
- Opening: When the control circuit energizes the YO coil (rising edge of the signal), the DC isolator/breaker [Q340] opens.

The DC isolator/breaker [Q340] can be closed only when the YU coil is energized (level signal). Closing is mechanically locked. If the YU coil is not energized, the YO and YC coils cannot open or close the DC isolator/breaker. The YU coil is used for tripping due to lost control voltage or too low control voltage. The YU coil can also be used for switching off the DC isolator/breaker by an emergency stop circuit, etc.

In case of the ride-through function (option +F276), an additional buffer power supply is added to the YU coil control circuit. It keeps the coil powered (and the DC isolator/breaker closed) during max 3 s. break of the control voltage.

Default monitoring signals of the DC isolator/breaker [Q340]

These auxiliary contacts of the DC isolator/breaker are wired to terminal block [X340] at the factory as default.

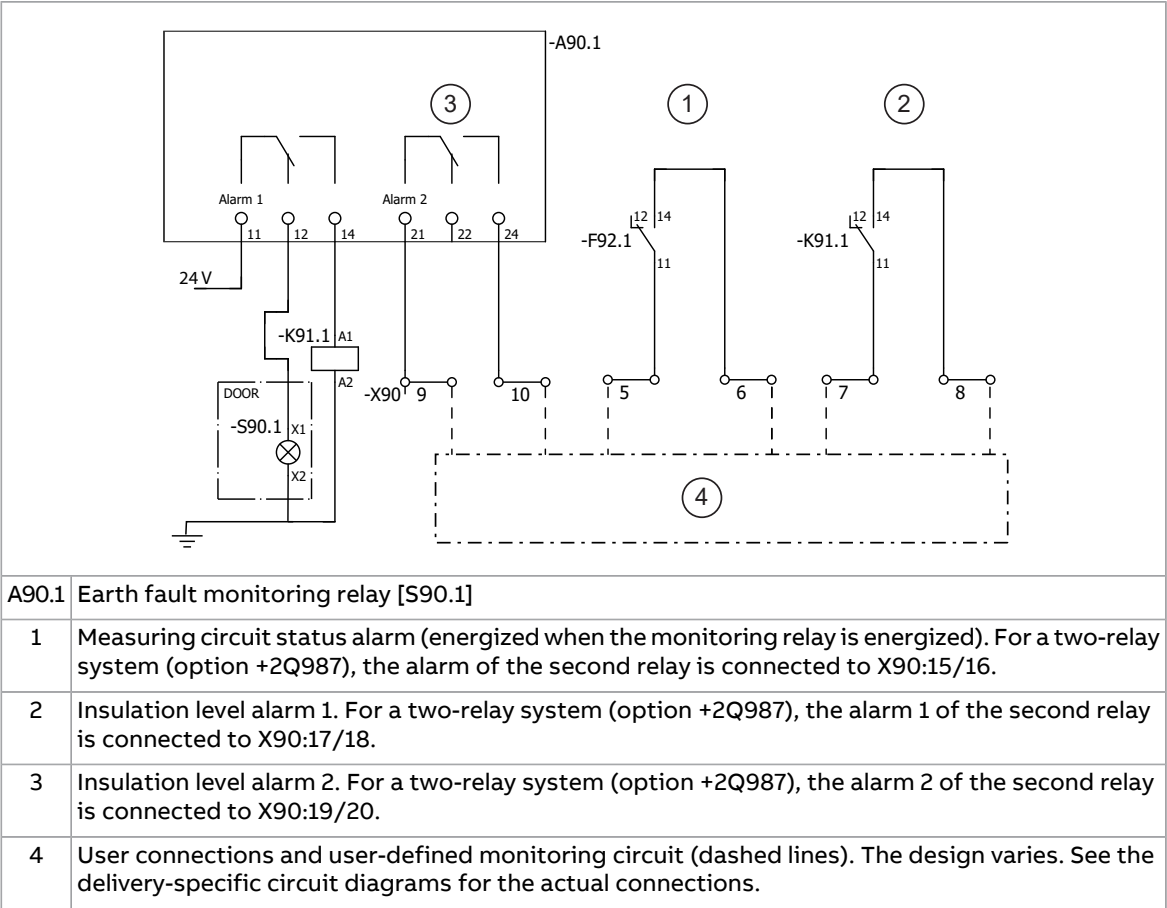


Control and monitoring signals of REF615 feeder protection relay [A980] or REG615 generator protection relay ([A980], option +Q988)

See the delivery-specific circuit diagrams.

Default monitoring signals of earth fault monitoring relay ([S90.1 and S90.2], options +Q987 and +2Q987)

The diagram below shows the monitoring signals for a one relay system (option +Q988). The table below contains the descriptions. It also lists the terminal markings for the second relay in a two-relay system (option +2Q988).



Monitoring signals of current transducer relays ([B353.11] ... [B353.14], options +G353 and +2G353)

See the delivery-specific circuit diagrams. ([B353.11], etc. option +G353, +2G353)

■ Control cable connection procedure



WARNING!

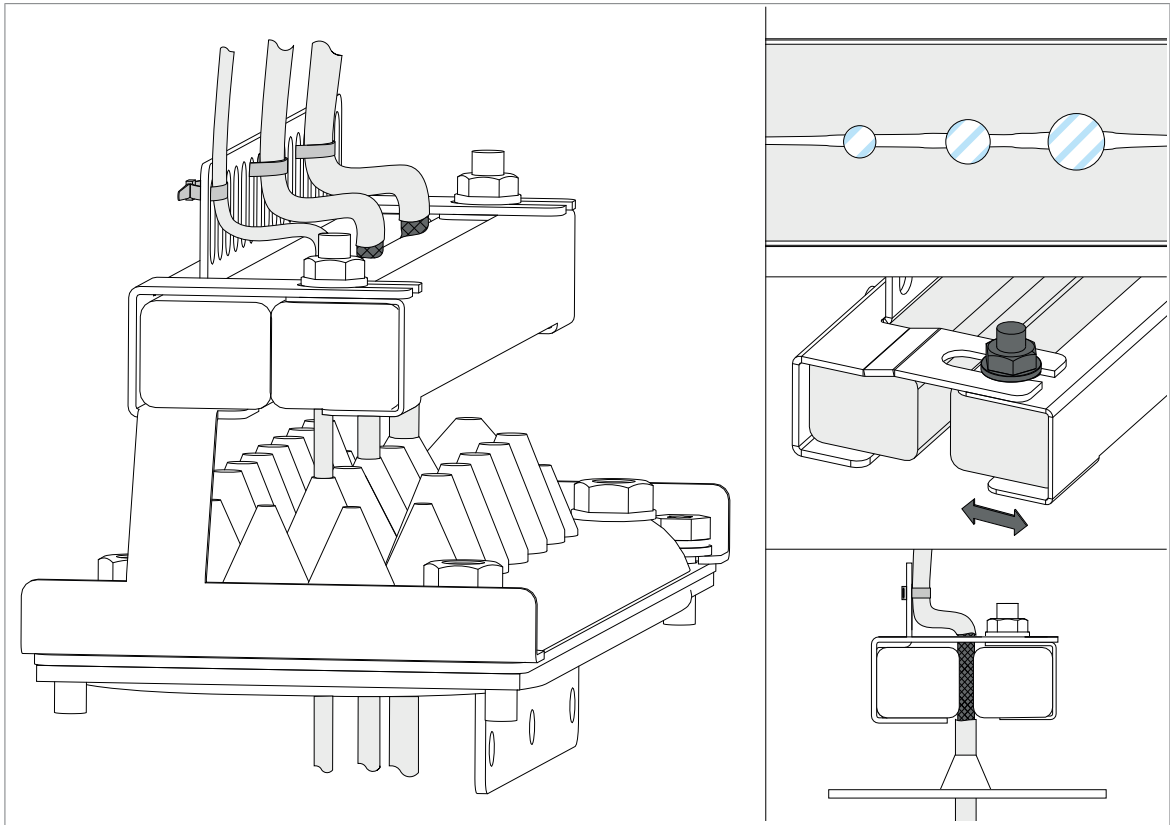
Obey the safety instructions of the drive. If you ignore them, injury or death, or damage to the equipment can occur. If you are not a qualified electrical professional, do not do installation, commissioning or maintenance work.

1. Stop the drive and do the steps in section [Electrical safety precautions \(page 24\)](#) before you start the work.
2. Open the door of the DC incoming unit and remove the shrouding. See [Connecting the DC power cables \(page 27\)](#).
3. Run the control cables inside the cubicle. Ground the cable shields 360° at the cable entry. See subsection [Grounding the outer shields of the control cables 360° at the cabinet entry \(page 36\)](#).
4. Run the cables to the control connection terminals and connect. See [Control connection diagrams \(page 33\)](#) and the delivery-specific circuit diagrams.

Grounding the outer shields of the control cables 360° at the cabinet entry

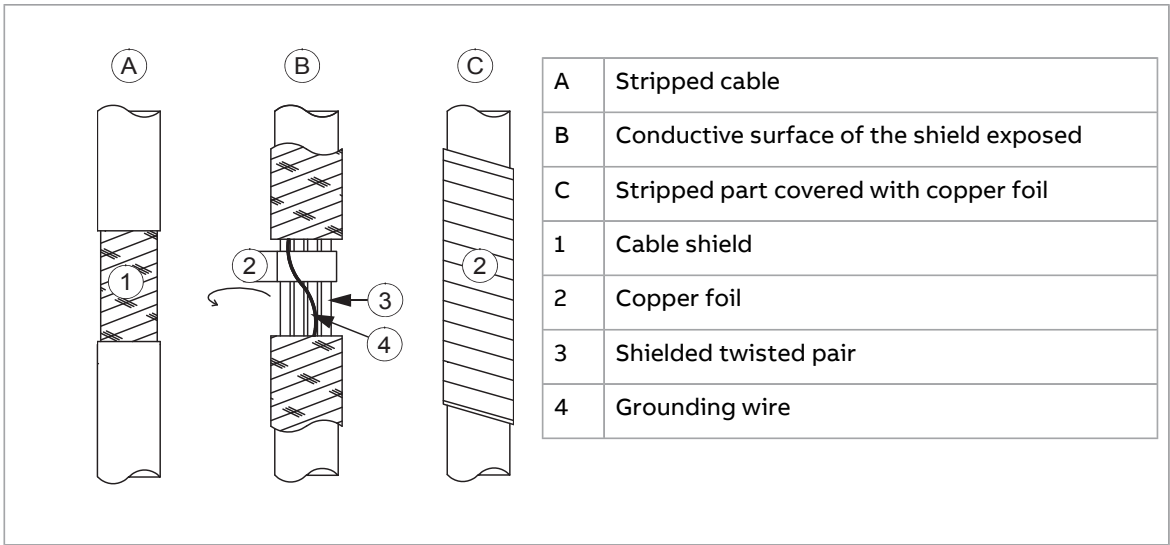
Ground the outer shields of all control cables 360° with the EMI conductive cushions at the cabinet entry. The grounding principle is the same for top and bottom entry cables. The illustrations show the bottom entry. The actual design details can vary.

1. If necessary, remove the shrouding in front of the cable entry.
2. Put the cables in sequence from the smallest to the largest. This will help to achieve a good contact with the cushions.
3. Loosen the tightening bolts of the EMI conductive cushions and pull them apart.
4. Cut holes in the grommets and put the cables through the grommets.
5. Peel the insulation from the part of the cable that will be in contact with the EMI conductive cushion.
6. Put the cables between the cushions and attach them with cable ties for strain relief.
7. Move the cushions back together.
8. Tighten the bolts to make sure that the EMI conductive cushions press tightly around the peeled part of the cables.



If the outer surface of the shield is non-conductive:

- Cut the shield at the midpoint of the peeled part. Be careful not to cut the conductors or the grounding wire.
- Turn the conductive side of the shield inside out over the insulation.
- Cover the exposed shield and the peeled cable with copper foil to keep the shielding continuous.



5

Installation checklist

Contents of this chapter

This chapter contains a checklist of the mechanical and electrical installation of the DC incoming unit. For the complete drive checklist, see *ACS880-107LC inverter units hardware manual* (3AXD50000196111 (English)).

Make sure that ...	<input checked="" type="checkbox"/>
<u>If external DC power cables are connected to DC incoming unit:</u> The insulation resistance has been measured and documented. The external DC cabling (if any) has been connected to the correct terminals, and the terminals have been tightened to the torque specified.	<input type="checkbox"/>
<u>If external DC power cables are connected to DC incoming unit:</u> There is an adequately sized protective earth (ground) conductor between the external DC system and the drive, the conductor has been connected to the appropriate terminal, and the terminal has been tightened to the torque specified. The grounding connection has also been measured according to the regulations.	<input type="checkbox"/>
The user control connections have been done. See the delivery-specific circuit diagrams.	<input type="checkbox"/>




Start-up

Contents of this chapter


This chapter contains the start up instructions for the DC incoming units ACS880-7207LC and ACS880-7307LC.



Start-up procedure

Tasks	<input checked="" type="checkbox"/>
Safety	
 WARNING! Obey the safety instructions of the drive. If you ignore them, injury or death, or damage to the equipment can occur. If you are not a qualified electrical professional, do not do installation, commissioning or maintenance work.	<input type="checkbox"/>
Checks/Settings with no voltage connected	
Make sure that the disconnecter of the supply transformer is locked to the off (0) position, that means no voltage is, or cannot be connected to drive inadvertently.	<input type="checkbox"/>
Make sure that all external auxiliary circuits are switched off and disconnected. See the start-up instructions in the supply unit hardware manual.	<input type="checkbox"/>
Make sure that the supply unit is switched off, and the drive system has been isolated from the supply network.	<input type="checkbox"/>
Make sure that the DC switch/disconnectors [Q11] in inverter units and other units of the drive are open and locked. Open and lock also the charging switches [Q10] (if any).	
If the drive is equipped with a unit for an external energy storage connection (ACS880-1607LC or ACS880-7107LC): Make sure that the disconnecting device of the energy storage (outside the drive) is open and locked.	

Tasks	<input checked="" type="checkbox"/>
<u>DC incoming unit:</u> Make sure that the DC isolator/breaker [Q340] is open, and isolated (cranked-out).	<input type="checkbox"/>
<u>If the DC incoming unit is connected to an external DC system:</u> Make sure that the external system is disconnected or de-energized (it cannot energize the DC incoming unit).	<input type="checkbox"/>
Make sure that the mechanical and electrical installation of the unit has been inspected and is OK. See the installation checklist.	<input type="checkbox"/>
Make sure that the other units of the drive are ready for the power up: <ul style="list-style-type: none"> The supply and inverter units (and other units, if any) have been installed according to the instructions given in their hardware manuals. The supply and inverter units (and other units, if any) have been commissioned and are ready for use. See the appropriate unit-specific manuals. 	<input type="checkbox"/>
Close the auxiliary voltage circuit breaker of the DC incoming unit [F22]. Close also other circuit breakers of auxiliary circuit of the DC incoming unit if any, for example circuit breaker for the cooling fans [F115.10] (vary depending on the delivery). See the circuit diagrams delivered with the drive.	<input type="checkbox"/>
Make sure that it is safe to start the work. Do the steps in section Electrical safety precautions (page 24) .	<input type="checkbox"/>
Starting and checking the cooling system	
Fill up and bleed the internal cooling circuit. Start the cooling unit up. See <i>ACS880-107LC inverter units hardware manual</i> (3AXD50000196111 (English)) and <i>ACS880-1007LC liquid cooling unit user's manual</i> (3AXD50000129607 (English)).	<input type="checkbox"/>
Check the cooling system for leaks. Make sure that cooling circuit joints at the shipping split joining cubicles are tight and that all drain valves have been closed.	<input type="checkbox"/>
Make sure that the coolant can flow freely in all cubicles.	<input type="checkbox"/>
Closing the cabinet doors	
Close all cabinet doors.	<input type="checkbox"/>
Connecting voltage to the drive and its auxiliary circuits	
Connect main AC voltage to the input terminals of the drive supply unit. (Close the main breaker of the supply transformer.)	<input type="checkbox"/>
Close the main disconnecting device of the drive: Crank in the main breaker ([Q1], option +F255), or close the main switch/disconnector (option +F253).	<input type="checkbox"/>
Close the auxiliary voltage switch [Q21] of the drive supply unit.	<input type="checkbox"/>
<u>ACS880-7207LC only:</u> Adjusting the settings of the protection and control relay REG615 or REF615 [A851]	
Adjust the settings of the protection relay when necessary. See the delivery-specific document-ation.	<input type="checkbox"/>
Adjusting the settings of optional devices	
<u>Drives with ground fault monitoring device for IT ungrounded systems (option +Q954):</u> If necessary, adjust the settings of the device. See the circuit diagrams of the delivery and the manual of the device.	<input type="checkbox"/>
Energizing the drive and DC incoming unit	

Tasks	<input checked="" type="checkbox"/>
<div><div></div><div>WARNING! When you start the supply unit, the drive DC bus will be energized, as will all the units connected to the DC bus. If you want to prevent this for any of the units, open its DC switch/disconnector (if available), or remove its DC fuses.</div></div> <div><div>1. Start the drive supply unit and energize the drive. See the delivery-specific circuit diagrams, and the supply unit hardware manual. If the drive is equipped with main breaker ([Q1], option +F255) or contactor ([Q2], option +F250), the operating switch [S21] on the door of the drive incoming cubicle starts the supply unit and triggers the drive power up sequence.</div><div>2. Make sure that the drive and the DC system to be connected to the drive are ready for the closing of the DC isolator/breaker [Q340] of the DC incoming unit.</div><div>3. Crank in the DC isolator/breaker [Q340] of the DC incoming unit if it is in the DISCONNECTED position. See De-isolating the DC isolator/breaker [Q340] (page 48)r.</div><div>4. Close the DC isolator/breaker [Q340] of the DC incoming unit [Q340]. See Closing the DC isolator/breaker [Q340] (page 46).</div></div>	<input type="checkbox"/>



7

Operating instructions

Contents of this chapter

This chapter contains the operating instructions for the DC incoming units ACS880-7207LC and ACS880-7307LC.

Opening the DC isolator/breaker [Q340]



WARNING! ACS880-7307LC: Do not open or close the DC isolator/breaker under load. It can cause serious damage. The DC isolator/breaker is rated and can be used only for the isolation, not for connection or disconnection the load current. Make sure that the necessary interlocking control connections have been implemented on site to prevent these operations.



WARNING! Do not open or close the DC isolator/breaker with the control buttons on the front panel of the breaker. There is a protective cover in front of the buttons to prevent the use. Do not remove it.

To open the breaker, energize the external 'open' signal of the breaker (YO coil). See the delivery-specific circuit diagrams and [Control connection diagrams \(page 33\)](#).

Closing the DC isolator/breaker [Q340]



WARNING! ACS880-7307LC: Do not open or close the DC isolator/breaker under load. It can cause serious damage. The DC isolator/breaker is rated and can be used only for the isolation, not for connection or disconnection the load current. Make sure that the necessary interlocking control connections have been implemented on site to prevent these operations.



WARNING! Do not open or close the DC isolator/breaker with the control buttons on the front panel of the breaker. There is a protective cover in front of the buttons to prevent the use. Do not remove it.

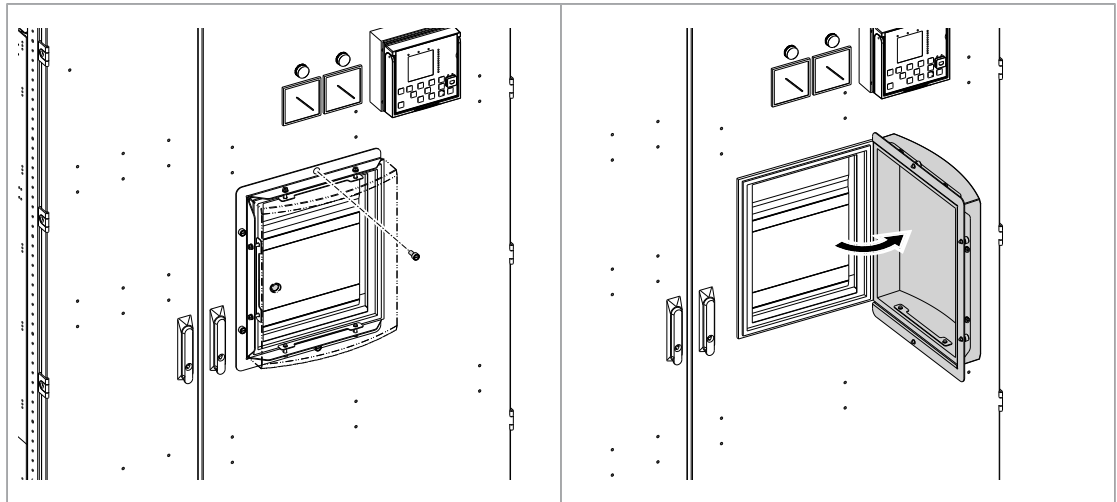
To close the breaker:

1. Make sure that it is safe to close the DC isolator/breaker.
2. If the DC isolator/breaker is in isolated (disconnected) position, de-isolate it. That is, crank in the withdrawn DC isolator/breaker. See [De-isolating the DC isolator/breaker \[Q340\] \(page 48\)](#).
3. Energize the external 'close' signal of the DC isolator/breaker (YC coil). Note that also the YU coil must be energized.

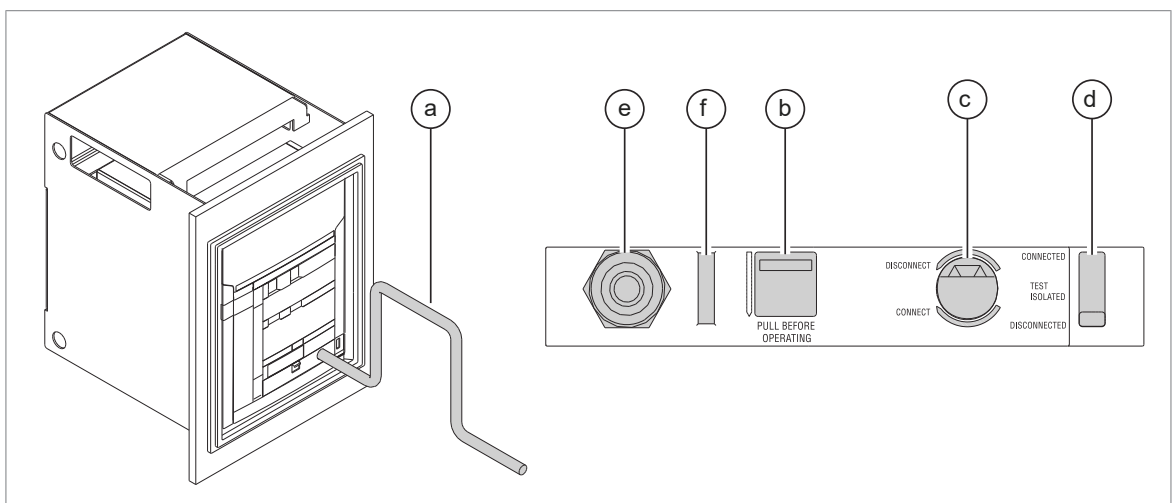
For more information, see the delivery-specific circuit diagrams and [Control connection diagrams \(page 33\)](#).

Isolating (disconnecting) the DC isolator/breaker [Q340]

1. Open the DC isolator/breaker. See [Opening the DC isolator/breaker \[Q340\] \(page 45\)](#).
2. Remove the screws around the cover of the DC isolator/breaker. Unlock the cover and turn it open.

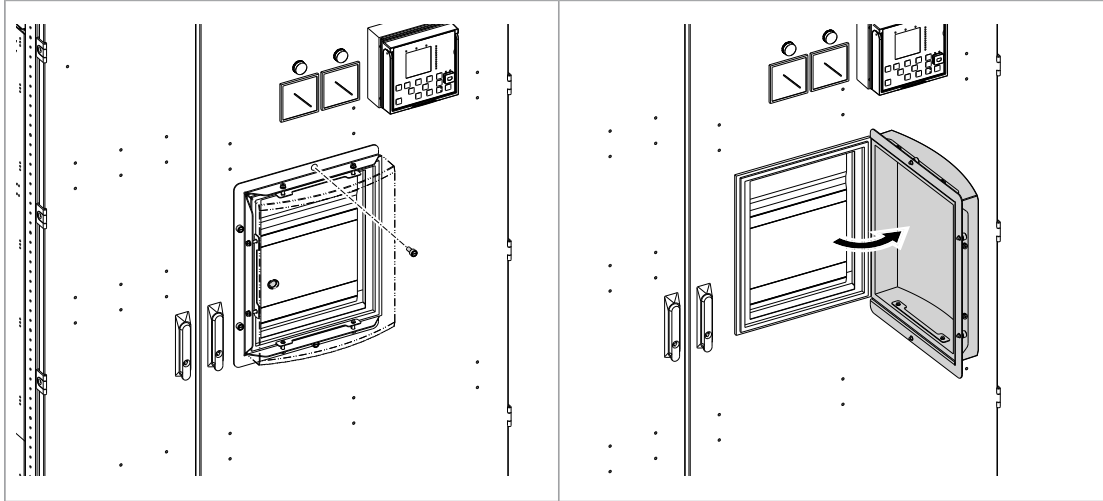


3. Make sure that the key (e) is in the correct position and/or the padlock (f), if any, has been removed.
4. Extract the disconnection crank (a) and insert the crank to the corresponding coupling (c).
5. Lower the releasing lever "PULL BEFORE OPERATING" (b).
6. Turn the crank anti-clockwise, until the indicator (d) is at position "TEST ISOLATED". Do not use force. Nothing should resist the handle rotation.
7. Lower the releasing lever "PULL BEFORE OPERATING" (b) again.
8. Turn the crank until the indicator is at position "DISCONNECTED". The body of the DC isolator/breaker is now fully withdrawn and the DC isolator/breaker is at isolated (disconnected) position.
9. Lock the DC isolator/breaker to "DISCONNECTED" position.

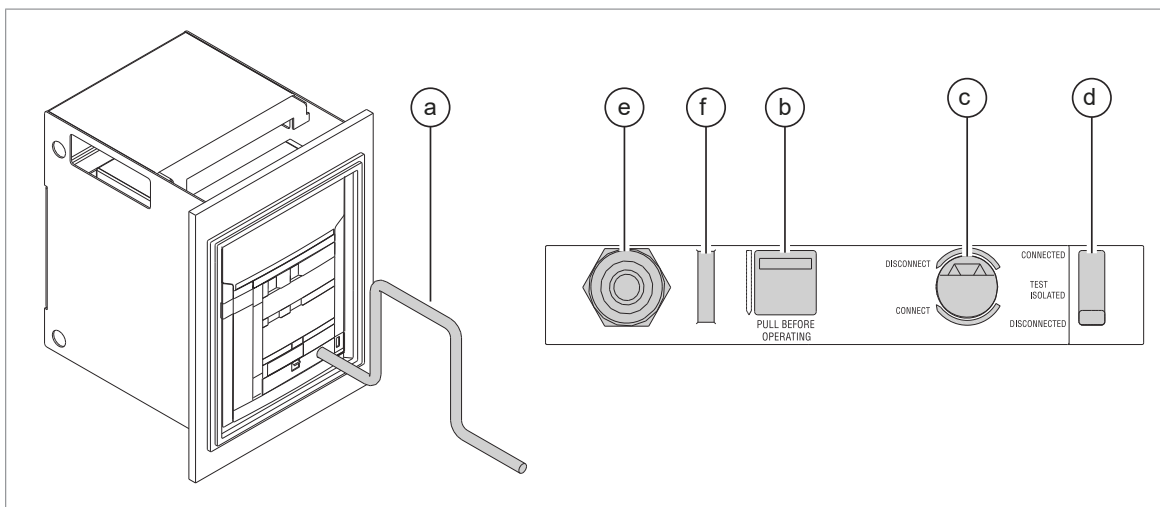


De-isolating the DC isolator/breaker [Q340]

1. Remove the screws around the cover of the DC isolator/breaker. Unlock the cover and turn it open.



2. Make sure that the key (e) is in the correct position and/or the padlock (f), if any, has been removed.
3. Extract the disconnection crank (a) and insert it to the corresponding coupling (c).
4. Lower the releasing lever "PULL BEFORE OPERATING" (b).
5. Turn the crank clockwise, until the indicator (d) is at position "TEST ISOLATED". Do not use force. Nothing should resist the handle rotation.
6. Lower the releasing lever "PULL BEFORE OPERATING" (b) again.
7. Turn the crank until the indicator is at position "CONNECTED". The body of the DC isolator/breaker is now cranked-in, that means, the breaker is in the de-isolated position.
8. Close the cover of the DC isolator/breaker on the cabinet door.



8

Fault tracing

Contents of this chapter

This chapter contains descriptions of indicators of the DC incoming unit.

Indicators on the cabinet door

Desig.	Name	Description (when illuminated)
S90.1	EARTH FAULT ALARM1	Earth fault detected by the earth fault monitoring relay 1 ([A90.1], option +Q987 or +2Q987). The relay monitors the earth fault in between the DC isolator/breaker and the drive DC link. The button illuminates, when the relay detects an earth fault, or there is an internal malfunction. The button remains illuminated until the relay does not detect the cause for the alarm anymore and the user resets the alarm indication by pushing the button.
S90.2	EARTH FAULT ALARM2	Earth fault detected by the earth fault monitoring relay 2 ([A90.2], option +2Q987). The relay monitors the earth fault in between the DC isolator/breaker and the external DC system. The button illuminates, when the relay detects an earth fault, or there is an internal malfunction. The button remains illuminated until the relay does not detect the cause for the alarm anymore and the user resets the alarm indication by pushing the button.

9

Maintenance

Contents of this chapter

This chapter specifies the user maintenance tasks and their intervals for the DC incoming units ACS880-7207LC and ACS880-7307LC. It also contains instructions for maintenance tasks.

Maintenance intervals

The tables below show the maintenance tasks which can be done by the end user. For ABB Service offering, refer to www.abb.com/driveservices or consult your local ABB Service representative (www.abb.com/searchchannels).

■ Description of symbols

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

■ Recommended maintenance intervals after start-up

Recommended annual actions by the user	
Connections and environment	
Quality of supply voltage	P
Spare parts	
Spare parts	I
Inspections by user	

Recommended annual actions by the user	
Tightness of terminals	I
Dustiness, corrosion and temperature	I
Cooling liquid pipe connections	I
Coolant antifreeze concentration	P
SACE DC MAX breaker	I

Recommended every 2nd year actions by the user	
Inspection of coolant quality	P

	Years from start-up						
	3	6	9	12	15	18	21
Coolant							
Coolant draining and refill		R		R		R	
Cabinet fans and fan control board							
Cooling fans 230 VAC 50/60Hz			R			R	
Cooling fans 115 VAC 50/60Hz		R		R		R	
Aging							
Cabinet auxiliary power supplies				R			

Note:

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

Cabinet

■ Cleaning the exterior of the drive

**WARNING!**

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

1. Stop the drive and do the steps in section [Electrical safety precautions \(page 24\)](#) before you start the work.
 2. Clean the exterior of the drive. Use:
 - vacuum cleaner with an antistatic hose and nozzle
 - soft brush
 - dry or damp (not wet) cleaning cloth. Moisten with clean water, or mild detergent (pH 5...9 for metal, pH 5...7 for plastic).
-

**WARNING!**

Prevent water from entering the drive. Never use excessive amount of water, a hose, steam, etc.

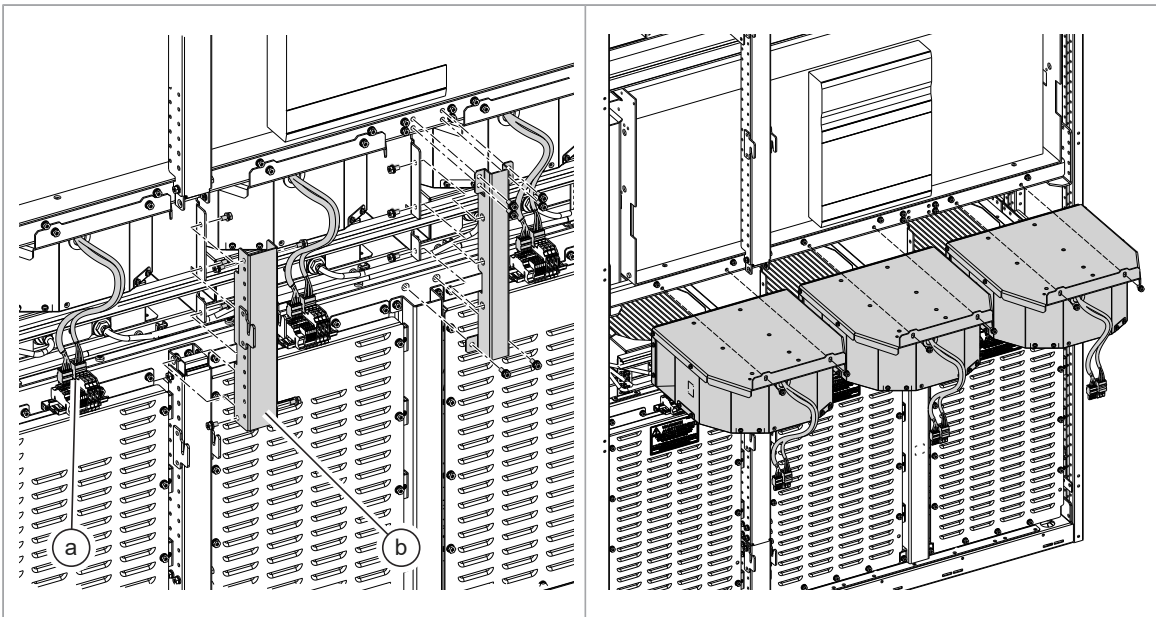
Fans

■ Replacing the cooling fan(s)

**WARNING!**

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

1. Stop the drive and do the steps in section [Electrical safety precautions \(page 24\)](#) before you start the work.
2. Disconnect the fan wiring (a).
3. Large units with parallel fans: Remove the vertical bar or bars (b) in the middle.
4. Undo the two screws that attach the fan housing to the cabinet frame and pull the fan housing out. The number of fans depends on the size of the unit.
5. Install the new fan in reverse order.



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Internal cooling circuit

See *ACS880-107LC inverter units hardware manual* (3AXD50000196111 (English)).

11

Technical data

Contents of this chapter

This chapter contains technical data for the DC incoming units ACS880-7207LC and ACS880-7307LC.

Electrical ratings

ACS880-7207LC-...	Frame size	Nominal ratings		Input data			Short circuit ratings		
		I_n	S_n	U_n	Allowed volt. tolerance	Max. voltage	I_p	$I_{cu}^{1)}$	I_{cw}
		A (DC)	kVA	V (DC)	%	V	kA	kA	kA/1s
1200A-7	DICU6	1200	1171	976	7	1050	80	25	25
1400A-7	DICU6	1400	1366	976	7	1050	80	25	25
1600A-7	DICU6	1600	1562	976	7	1050	80	25	25
2200A-7	DICU7	2200	2147	976	7	1050	180	40	40
2400A-7	DICU7	2400	2342	976	7	1050	180	40	40
2800A-7	DICU10	2800	2733	976	7	1050	143	65	65
3100A-7	DICU10	3100	3026	976	7	1050	143	65	65
3800A-7	DICU12	3800	3709	976	7	1050	200	65	65
4400A-7	DICU12	4400	4294	976	7	1050	200	65	65
5000A-7	DICU12	5000	4880	976	7	1050	200	65	65

¹⁾ With REF615 relay [A980] or REG615 relay ([A980], option +Q988).

58 Technical data

ACS880-7307LC-...	Frame size	Nominal ratings		Input data			Short circuit ratings		
		I_n	S_n	U_n	Allowed volt. tolerance	Max. voltage	I_p	I_{cu}	I_{cw}
		A (DC)	kVA	V (DC)	%	V	kA	kA	kA/1s
2000A-7	DICU6	2000	1952	976	10	1073	143	N/A	25
2400A-7	DICU6	2400	2342	976	10	1073	143	N/A	25
2800A-7	DICU6	2800	2733	976	10	1073	143	N/A	25
3800A-7	DICU7	3800	3709	976	10	1073	250	N/A	40
4200A-7	DICU7	4200	4099	976	10	1073	250	N/A	40
5000A-7	DICU10	5000	4880	976	10	1073	143	N/A	65
7000A-7	DICU12	7000	6832	976	10	1073	250	N/A	65

I_n	nominal current
S_n	nominal apparent power
U_n	nominal DC supply voltage
I_p	peak short-circuit current
I_{cu}	ultimate breaking capacity
I_{cw}	short circuit withstand capacity

Dimensions and weights

ACS880-7207LC-...	Height	Width	Depth	Weight
	mm	mm	mm	kg
1200A-7	2013	600	737	415
1400A-7	2013	600	737	415
1600A-7	2013	600	737	415
2200A-7	2013	700	737	460
2400A-7	2013	700	737	460
2800A-7	2013	1000	737	758
3100A-7	2013	1000	737	785
3800A-7	2013	1200	737	1005
4400A-7	2013	1200	737	1005
5000A-7	2013	1200	737	1005

ACS880-7307LC-...	Height	Width	Depth	Weight
	mm	mm	mm	kg
2000A-7	2013	600	731	450
2400A-7	2013	600	731	450
2800A-7	2013	600	731	450
3800A-7	2013	700	731	540
4200A-7	2013	700	731	540
5000A-7	2013	1000	731	830
7000A-7	2013	1200	731	1130

Free space requirements

The values are as required by cooling, maintenance and/or operation of the pressure relief (if present). Also obey the general mechanical installation instructions.

Front		Sides		Above	
mm	in.	mm	in.	mm	in.
1000	39	0	0	250	9.85

Losses, internal cooling circuit data and noise

ACS880-7207LC-...	Losses			Liquid quantity		
	$P_{\text{loss total}}$	$P_{\text{loss coolant}}$	$P_{\text{loss air}}$	Total	Massflow	Pressure loss
	kW	kW	kW	l	l/min	kPa
1200A-7	0.64	0.63	0.02	3.4	8	120
1400A-7	0.79	0.77	0.02	3.4	8	120
1600A-7	0.95	0.93	0.02	3.4	8	120
2200A-7	1.25	1.22	0.03	3.9	8	120
2400A-7	1.44	1.40	0.04	3.9	8	120
2800A-7	1.36	1.33	0.03	5.8	16	120
3100A-7	1.62	1.57	0.04	5.8	16	120
3800A-7	1.54	1.50	0.04	7.5	24	120
4400A-7	2.22	2.16	0.06	7.5	24	120
5000A-7	2.49	2.42	0.06	7.5	24	120

ACS880-7307LC-...	Losses			Liquid quantity		
	$P_{\text{loss total}}$	$P_{\text{loss coolant}}$	$P_{\text{loss air}}$	Total	Massflow	Pressure loss
	kW	kW	kW	l	l	kPa
2000A-7	0.62	0.61	0.02	3.4	8	120
2400A-7	0.78	0.77	0.02	3.4	8	120
2800A-7	0.98	0.95	0.02	3.4	8	120
3800A-7	1.23	1.20	0.03	3.9	8	120
4200A-7	1.45	1.42	0.04	3.9	8	120
5000A-7	1.61	1.57	0.04	5.8	16	120
7000A-7	2.08	2.02	0.05	7.5	24	120

These losses are not calculated according to the ecodesign standard IEC 61800-9-2.

Terminal and cable entry data for the power cables

■ Terminal data for the motor cables

The maximum number of motor cables depends on the cable size, cable material, number of inverter modules and on the inverter unit cubicle width. Before you select motor cable sizes, check the inverter unit construction from the project-specific dimension drawings and use the tables below to determine the connection capability.

Frame sizes DICU6 and DICU7

Terminal						
max. space between terminal surfaces of same potential	space between terminal surface and adjacent isolation plate	amount of holes per terminal	holes next to each other	distance between adjacent holes - horizontal	holes on top of each other	distance between adjacent holes - vertical
mm	mm			mm		mm
72	42	20	2 x 5	2 x 5	2	45

Connection capability				
	Copper			Aluminium
Cable cross section	Copper , Compression cable lugs according to DIN 46235	Copper lug, Installation method	Aluminium , Compression cable lugs according to DIN 46329	Aluminum lug, Installation method
mm ²	pcs		pcs	
50	20	A,C	20	A,C
70	20	A,C	20	A,C
95	20	A,C	20	A,C
120	20	A,C	20	A,C
150	20	A,C	20	A,C
185	20	A,C	20	A,C
240	20	A,C	20	A,C
300	20	A,C	10	A,D

Frame sizes DICU10 and DICU12

Terminal						
max. space between terminal surfaces of same potential	space between terminal surface and adjacent isolation plate	amount of holes per terminal	holes next to each other	distance between adjacent holes - horizontal	holes on top of each other	distance between adjacent holes - vertical

mm	mm	pcs		mm		mm
72	42	30	3 x 5	50	2	45

Connection capability				
	Copper			Aluminium
Cable cross section	Copper , Compression cable lugs according to DIN 46235	Copper lug, Installation method	Aluminium , Compression cable lugs according to DIN 46329	Aluminum lug, Installation method
mm ²	pcs		pcs	
50	30	A,C	30	A,C
70	30	A,C	30	A,C
95	30	A,C	30	A,C
120	30	A,C	30	A,C
150	30	A,C	30	A,C
185	30	A,C	30	A,C
240	30	A,C	30	A,C
300	30	A,C	15	A,D

Typical power cable sizes

Example cable types in marine applications:

- Prysmian TEMA PHFX-A (LSM-HF)
- Nexans MPRXCX flexship.

These example cables are very flexible: stranded wire copper conductors and XLPE insulation allowing max. 90 °C conductor temperature.

Typical installation on cable tray, with overall de-rating factor of 0.7.

Cross sections are typically 4×95 mm², 4×120 mm² or 4×150 mm².

Control cable terminal data

Nom. voltage and current: 500 V, 17.5 A, connection method: spring-cage connection, cross section: 0.08 mm² - 1.5 mm² (AWG: 28 - 16)

Auxiliary circuit current consumption

Auxiliary circuit current consumption varies depending on the actual drive configuration and options. Contact ABB for the delivery-specific value.

Energy efficiency data (ecodesign)

Energy efficiency data is not provided for the drive/unit. Multidrives and multidrive modules are not in the scope of the EU ecodesign requirements (Regulation EU/2019/1781) or the UK ecodesign requirements (Regulation SI 2021 No. 745).

Protection classes

Degrees of protection (IEC/EN 60529)	IP42 (standard), IP54 (option +B055)
Enclosure types (UL50)	UL Type 1 (standard), UL Type 12 (option +B055). For indoor use only.
Arcing class (IEC TR 61641)	<p>B – ASSEMBLY providing personnel and ASSEMBLY protection under arcing conditions.</p> <p>Tested at the following voltage with an arcing current of 65 kA for 300 milliseconds:</p> <ul style="list-style-type: none"> • 400 V units (indicated by "-3" in drive type): 420 V • 500 V units (indicated by "-5" in drive type): 550 V • 690 V units (indicated by "-7" in drive type): 760 V
Overvoltage category (IEC/EN 60664-1)	III, except for auxiliary power connections (fan, control, heating, lighting, cooling unit pump etc) which are category II.
Protective class (IEC/EN 61800-5-1)	I

Ambient conditions

Environmental limits for the drive are given below. The drive is to be used in a heated, indoor, controlled environment.

	Operation installed for stationary use	Storage in the protective pack- age	Transportation in the protective pack- age
Installation site altitude	0...2000 m (0...6562 ft) above sea level. For altitudes over 2000 m, contact ABB. Output derated above 1000 m (3281 ft).	-	-
Air temperature	0 ... +45 °C (+32 ... +113 °F), no condensation allowed. Output derated in the range +45 ... +55 °C (+113 ... +131 °F).	-40 ... +70 °C (-40 ... +158 °F)	-40 ... +70 °C (-40 ... +158 °F)
Relative humidity	Max. 95%	Max. 95%	Max. 95%
	No condensation allowed. Maximum allowed relative humidity is 60% in the presence of corrosive gases.		
Contamination	IEC/EN 60721-3-3:2002 Chemical gases: Class 3C2 Solid particles: Class 3S2. No conductive dust allowed.	IEC 60721-3-1:1997 Chemical gases: Class 1C2 Solid particles: Class 1S3 (packing must support this, otherwise 1S2)	IEC 60721-3-2:1997 Chemical gases: Class 2C2 Solid particles: Class 2S2
Pollution degree IEC/EN 60664-1	2		

	Operation installed for stationary use	Storage in the protective pack- age	Transportation in the protective pack- age
Vibration IEC/EN 61800-5-1 IEC 60068-2-6:2007, EN 60068-2-6:2008	IEC/EN 60721-3-3:2002 10...57 Hz: max. 0.075 mm amplitude 57...150 Hz: 1 <i>g</i> Units with marine con- struction (option +C121): Max. 1 mm (0.04 in) (5 ... 13.2 Hz), max. 0.7 <i>g</i> (13.2 ... 100 Hz) sinusoid- al	IEC/EN 60721-3-1:1997 10...57 Hz: max. 0.075 mm amplitude 57...150 Hz: 1 <i>g</i>	IEC/EN 60721-3-2:1997 2...9 Hz: max. 3.5 mm amplitude 9...200 Hz: 10 m/s ² (32.8 ft/s ²)
Shock IEC 60068-2-27:2008, EN 60068-2-27:2009	Not allowed	With packing max. 100 m/s ² (328 ft/s ²) 11 ms	With packing max. 100 m/s ² (328 ft/s ²) 11 ms

Materials

See *ACS880 cabinet-installed drives recycling instructions and environmental information* (3AXD50000153909 [English]).

Color

RAL 7035 and RAL 9017.

Package

Standard package (Container package) Vertical	<p>Materials: Wood, PE (VCI film), VCI emitter, clay desiccant, PET strap, metal fixing clamps and screws, packing tape.</p> <p>Transport method: Road and air transport and sea transport in container.</p> <p>Storage conditions (IEC 60721-3-1): 1K20: Up to 24 months in enclosed conditions (full temperature and humidity control). 1K22: Up to 6 months in enclosed conditions (no temperature or humidity control). 1K23, 1K24: Up to 3 months in sheltered conditions (roof providing protection from direct rain and sun). 1K25...1K27: Up to 48 hours between loading operations in open-air conditions (no protection).</p>
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Seaworthy package (option +P912) Vertical	<p>Materials: Wood, plywood, PE (VCI film), VCI emitter, clay desiccant, metal fixing clamps and screws, packing tape.</p> <p>Transport method: Road and air transport and sea transport in container or deck.</p> <p>Storage conditions (IEC 60721-3-1): 1K20: Up to 24 months in enclosed conditions (full temperature and humidity control). 1K22: Up to 12 months in enclosed conditions (no temperature or humidity control). 1K23, 1K24: Up to 12 months in sheltered conditions (roof providing protection from direct rain and sun). 1K25...1K27: Up to 1 month in open-air conditions (no protection). Not recommended, but can be temporarily allowed.</p>
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Disposal

The main parts of the drive can be recycled to preserve natural resources and energy. Product parts and materials should be dismantled and separated.

Generally all metals, such as steel, aluminum, copper and its alloys, and precious metals can be recycled as material. Plastics, rubber, cardboard and other packaging material can be used in energy recovery.

Printed circuit boards and DC capacitors need selective treatment according to IEC 62635 guidelines.

To aid recycling, most plastic parts are marked with an appropriate identification code. In addition, components containing substances of very high concern (SVHCs) are listed in European Chemicals Agency's SCIP database. SCIP is the database for information on Substances of Concern in articles as such or in complex objects (Products) established under the Waste Framework Directive (2008/98/EC). For further information, contact your local ABB distributor or consult European Chemicals Agency's SCIP database to find out which SVHCs are used in the drive, and to find out where those components are located.

Contact your local ABB distributor for further information on environmental aspects. End of life treatment must follow international and national regulations.

For more information on ABB end of life services, see new.abb.com/service/end-of-lifeservices.

Applicable standards

See *ACS880 liquid-cooled multidrive cabinets and modules electrical planning (3AXD50000048634 [English])*.

Markings

See *ACS880 liquid-cooled multidrive cabinets and modules electrical planning (3AXD50000048634 [English])*.

Disclaimers

■ Generic disclaimer

The manufacturer shall have no obligation with respect to any product which (i) has been improperly repaired or altered; (ii) has been subjected to misuse, negligence or accident; (iii) has been used in a manner contrary to the manufacturer's instructions; or (iv) has failed as a result of ordinary wear and tear.

■ Cyber security disclaimer

This product is designed to be connected to and to communicate information and data via a network interface. It is Customer's sole responsibility to provide and continuously ensure a secure connection between the product and Customer network or any other network (as the case may be). Customer shall establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc.) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information.

ABB and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.



Further information

Product and service inquiries

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

Product training

For information on ABB product training, navigate to new.abb.com/service/training.

Providing feedback on ABB manuals

Your comments on our manuals are welcome. Navigate to new.abb.com/drives/manuals-feedback-form.

Document library on the Internet

You can find manuals and other product documents in PDF format on the Internet at www.abb.com/drives/documents.



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