
ABB INDUSTRIAL DRIVES

DCS880-A enclosed converters

Installation manual

18 A ... 9800 A/19600 A



DCS880 Drive Manuals


General	Publication number	EN	DE	IT	ES	FR	PL	ZH	RU
DCS880 Quick guide	3ADW000545	EN	DE	IT	ES	FR			
Safety instructions all languages	3ADW000481	EN	DE	IT	ES	FR	PL	ZH	RU
DCS880 Manual set 	DCS880 Manual set	EN							
DCS880 Units									
DCS880 Flyer	3ADW000475	EN	DE	IT	ES	FR		ZH	RU
DCS880 Technical catalog	3ADW000465	EN	DE	IT	ES	FR	PL	ZH	RU
DCS880 Hardware manual	3ADW000462	EN	DE	IT	ES	FR	PL		RU
DCS880 Firmware manual	3ADW000474	EN	DE	IT	ES	FR	PL		RU
DCS880 Service manual	3ADW000488	EN							
DCS880 Hardparallel manual (on request only)	3ADW000530	EN							
DCS880 12-pulse manual	3ADW000533	EN							
Instructions for mounting the SDCS-CMA-2	3ADW000396	EN							
ACS-AP-x assistant control panels user's manual	3AUA0000085685	EN							
DCS Thyristor power converter – Technical guide	3ADW000163	EN							
Functional safety									
Supplement for functional safety	3ADW000452	EN		IT	ES	FR	PL		RU
Functional safety for enclosed converter									
+Q957 Prevention of unexpected Start Up	3ADW000504	EN							
+Q951 Emergency stop, category 0 with MC opening	3ADW000505	EN							
+Q952 Emergency stop, category 1 with MC opening	3ADW000506	EN							
+Q963 Emergency stop, category 0 without MC opening	3ADW000507	EN							
+Q964 Emergency stop, category 1 without MC opening	3ADW000508	EN							
Enclosed converter									
DCS880-A Installation manual	3ADW000627	EN							
DCS800-A +S880 Enclosed converters, flyer	3ADW000523	EN							
Rebuild system									
DCS880-R Selection, Installation and Start-Up Manual for Rebuild kits	3ADW000599	EN							
Door mounting kits									
DPMP-01 mounting platform for ACS-AP control panel	3AUA0000100140	EN							
DPMP-02 mounting platform for ACS-AP control panel	3AUA0000136205	EN							
Serial communication									
FCAN-01 CANopen adapter module	3AFE68615500	EN	DE						
FDNA-01 DeviceNet™ adapter module	3AFE68573360	EN							
FECA-01 EtherCAT adapter module	3AUA0000068940	EN	DE		ES				
FENA-11/-21 Ethernet adapter module	3AUA0000093568	EN						ZH	
FEPL-02 Ethernet POWERLINK adapter module	3AUA0000123527	EN	DE						
FPBA-01 PROFIBUS DP adapter module	3AFE68573271	EN	DE				PL	ZH	
FSCA-01 RS-485 adapter module	3AUA0000109533	EN						ZH	
FDCO-01/02 DDCS communication modules	3AUA0000114058	EN							
FSPS-21 PROFI-safe safety functions module	3AXD50000158638	EN							
FSO-21 Safety functions module	3AXD50000015614	EN							
Tool and maintenance manuals and guides									
Drive composer PC tool	3AUA0000094606	EN							
Drive application programming (IEC61131-3) manual	3AUA0000127808	EN							
Adaptive programming, Application guide	3AXD50000028574	EN							
NETA-21 remote monitoring tool	3AUA0000096939	EN							
NETA-21 remote monitoring tool guide	3AUA0000096881	EN							
DDCS branching unit NDBU-95 user's manual	3BFE64285513	EN							
Extension modules									
FIO-11 Analog extension module	3AFE68784930	EN	DE	IT					
FIO-01 Digital extension module	3AFE68784921	EN	DE	IT					
FAIO-01 Analog extension module	3AUA0000124968	EN	DE						
FDIO-01 Digital extension module	3AUA0000124966	EN							
FEN-01 TTL encoder interface	3AFE68784603	EN	DE	IT				ZH	
FEN-31 HTL encoder interface	3AUA0000031044	EN						ZH	
FEA-03 F series extension adapter	3AUA0000115811	EN							
Ethernet tool network for ACS880 drives appl. guide	3AUA0000125635	EN							
Status 04.2021									

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Safety instructions

What this chapter contains

This chapter contains the safety instructions you must follow when installing, operating and servicing the drive.

If ignored, physical injury or death may follow, or damage may occur to the drive, the motor or driven equipment. Read the safety instructions before you work on the unit.

To which products this chapter applies

The information is valid for the whole range of the product DCS880, the converter modules DCS880-S0x size H1 ... H8, field exciter units DCF80x, etc. like the Rebuild Kit DCS880-R00.

Usage of warnings and notes

There are two types of safety instructions throughout this manual: warnings and notes. Warnings caution you about conditions which can result in serious injury or death and/or damage to the equipment, and advice on how to avoid the danger. Notes draw attention to a particular condition or fact or give information on a subject.

The warning symbols are used as follows:



Dangerous voltage warning warns of high voltage which can cause physical injury or death and/or damage to the equipment.



General danger warning warns about conditions, other than those caused by electricity, which can result in physical injury or death and/or damage to the equipment.



Electrostatic sensitive devices warning warns of electrostatic discharge which can damage the equipment.

Installation and maintenance work

These warnings are intended for all who work on the drive, motor cable or motor. Ignoring the instructions can cause physical injury or death and/or damage to the equipment.



WARNING

- **Only qualified electricians are allowed to install and maintain the drive!**
- Never work on the drive, motor cable or motor when main power is applied.
- Always ensure by measuring with a multimeter (impedance at least 1 MΩ) that:
 - 1. Voltage between drive input phases U1, V1 and W1 and the frame is close to 0 V.
 - 2. Voltage between terminals C+ and D- and the frame is close to 0 V.
- Do not work on the control cables when power is applied to the drive or to the external control circuits. Externally supplied control circuits may cause dangerous voltages inside the drive even when the main power on the drive is switched off.
- Do not make any insulation resistance or voltage withstand tests on the drive or drive modules.
- Isolate the motor cables from the drive when testing the insulation resistance or voltage withstand of the cables or the motor.
- When reconnecting the motor cable, always check that the C+ and D- cables are connected with the proper terminal.

Notes:

- The motor cable terminals on the drive are at a dangerously high voltage when the main power is on, regardless of whether the motor is running or not.

- Depending on the external wiring, dangerous voltages (115 V, 220 V or 230 V) may be present on the relay outputs of the drive system (e.g. XRO1 ... XRO3).
- DCS880 with enclosure extension: Before working on the drive, isolate the whole drive system from the supply.

Grounding

These instructions are intended for all who are responsible for the grounding of the drive. Incorrect grounding can cause physical injury, death and/or equipment malfunction and increase electromagnetic interference.



WARNING

- Ground the drive, motor and adjoining equipment to ensure personnel safety in all circumstances, and to reduce electromagnetic emission and pick-up.
- Make sure that grounding conductors are adequately sized and marked as required by safety regulations.
- In a multiple-drive installation, connect each drive separately to protective earth (PE).
- Minimize EMC emission and make a 360° high frequency grounding (e.g. conductive sleeves) of screened cable entries at the cabinet lead-through plate.
- Do not install a drive equipped with an EMC filter to an ungrounded power system or a high resistance-grounded ($> 30 \Omega$) power system.

Notes:

- Power cable shields are suitable as equipment grounding conductors only when adequately sized to meet safety regulations.
- As the normal leakage current of the drive is higher than 3.5 mA_{AC} or 10 mA_{DC} a fixed protective earth connection is required.
- This product can cause a DC current in the protective earthing conductor. Where a residual current-operated protective (RCD) or monitoring (RCM) device is used for protection in case of direct or indirect contact, only an RCD or RCM of Type B is allowed on the supply side of this product.

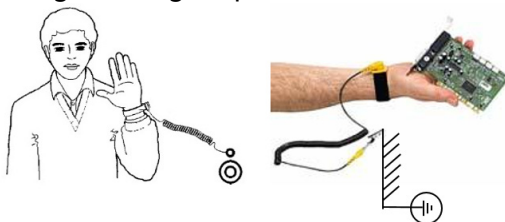
Printed circuit boards and fiber optic cables

These instructions are intended for all who handle the circuit boards and fiber optic cables. Ignoring the following instructions can cause damage to the equipment.



WARNING

- The printed circuit boards contain components sensitive to electrostatic discharge. Wear a grounding wrist band when handling the boards. Do not touch the boards unnecessarily.
- Use grounding strip:



- ABB order no.: 3ADV050035P0001



WARNING

- Handle the fiber optic cables with care.
- When unplugging optic cables, always grab the connector, not the cable itself.
- Do not touch the ends of the fibers with bare hands as the fiber is extremely sensitive to dirt.
- The minimum allowed bend radius is 35 mm (1.38 in.).

Mechanical installation

These notes are intended for all who install the drive. Handle the unit carefully to avoid damage and injury.



WARNING



- DCS880 sizes H4 ... H8:
 - The drive is heavy. Lift the drive by lifting lugs only.
 - The drive's center of gravity is high. Do not tilt the drive. The drive will overturn from a tilt of about 6 degrees. An overturning drive can cause physical injury.
 - Do not lift the drive by the front cover.
 - Place drives H4 ... H6 only on their back.
- Make sure that dust from drilling does not enter the drive when installing. Electrically conductive dust inside the unit may cause damage or lead to malfunction.
- Ensure sufficient cooling.
- Do not fasten the drive by riveting or welding.

Operation


These warnings are intended for all who plan the operation of the drive or operate the drive. Ignoring the instructions can cause physical injury or death and/or damage to the equipment.



WARNING

- Before adjusting the drive and putting it into service, make sure that the motor and all driven equipment are suitable for operation throughout the speed range provided by the drive. The drive can be adjusted to operate the motor at speeds above and below the base speed.
- Do not control the motor with the disconnecting device (disconnecting mains); instead, use the control panel keys  and , or commands via the I/O board of the drive.
- Mains connection:
You can use a disconnect switch (with fuses) to disconnect the electrical components of the drive from the mains for installation and maintenance work. The type of disconnect switch used must be as per EN 60947-3, Class B, so as to comply with EU regulations, or a circuit-breaker type which switches off the load circuit by means of an auxiliary contact causing the breaker's main contacts to open. The mains disconnect must be locked in its "OPEN" position during any installation and maintenance work.
- EMERGENCY STOP buttons must be installed at each control desk and at all other control panels requiring an emergency stop function. Pressing the STOP button on the control panel of the drive will neither cause an emergency stop of the motor, nor will the drive be disconnected from any dangerous potential.
- To avoid unintentional operating states, or to shut the unit down in case of any imminent danger according to the standards in the safety instructions it is not sufficient to merely shut down the drive via signals "RUN", "drive OFF" or "Emergency Stop" respectively "control panel" or "PC tool".
- Intended use:
The operating instructions cannot take into consideration every possible case of configuration, operation or maintenance. Thus, they mainly give such advice only, which is required by qualified personnel for normal operation of the machines and devices in industrial installations.
If in special cases the electrical machines and devices are intended for use in non-industrial installations - which may require stricter safety regulations (e.g. protection against contact by children or similar) - these additional safety measures for the installation must be provided by the customer during assembly.

Note:

- When the control location is not set to Local (Local not shown in the status row of the display), the stop key on the control panel will not stop the drive. To stop the drive using the control panel, press the Loc/Rem key and then the stop key .

EMC Standards

MC requirements for plants and machines in the EU

The following standard must be complied with to meet the EMC requirements for plants and machines in the EU.

Product Standard EN 61800-3

EMC standard for drive systems (**PowerDriveSystem**), interference immunity and emissions in residential areas, enterprise zones with light industry and in industrial facilities. This standard must be complied with in the EU for satisfying the EMC requirements for systems and machines!

In cases where the product standard is not applied, the generic standards EN 50081 and EN 50082 are sometimes adduced. For emitted interference, the following applies:

EN 50081-1

Specialized basic standard for emissions in **light industry** can be satisfied with special features (mains filters, screened power cables) in the lower rating range.

EN 50081-2

Specialized basic standard for emissions in **industry**.

For emitted interference, the following applies:

EN 50082-1

Specialized basic standard for interference immunity in **residential areas**.

EN 50082-2

Specialized basic standard for interference **immunity** in **industry**. The EN 61000-6-2 standard replaces EN 50082-2. If this standard is satisfied, then the EN 50082-1 standard is automatically satisfied as well.

For more information see the [DCS880 Hardware manual \(3ADW000462\)](#).

Conformity Procedure



The conformity procedure is a matter of responsibility of the machine manufacturers or the plant builders and of ABB Automation Products corresponding to their share of the extension of the electrical equipment!

Important instructions for plants with mains filters



Mains filter in a grounded line (earthed TN or TT network)

The mains filters are suitable for grounded lines only, for example in public European 400 V lines. According to EN 61800-3 mains filters are not needed in insulated industrial lines with own supply transformers. Furthermore they could cause safety risks in such floating lines (IT networks).

Residual current detection

Together mains filters (with internal discharging resistors), cables, converter and motor have a considerable capacity to ground which can cause an increased capacitive residual current. The tripping threshold of a residual current detector which measures this current must be adapted to this higher value.

High voltage test

Because of the capacitors of the mains filter the high voltage test has to be done with DC voltage to protect the components.

Introduction to this manual

How to use this manual

This DCS800-A Installation manual is to be used together with the associated publications.

Note: If it is not mentioned explicitly all details given in this manual will be valid for DCS880-A enclosed converters (cabinets).

Study the [Safety Instructions](#) and [EMC Standards](#) at the beginning of this manual carefully before installing the cabinets.

Note: For additional information, a list of related manuals is shown on the inside of the front cover under [DCS880 Drive Manuals](#).

We expect that you have a basic knowledge of physical and electrical fundamentals, electrical wiring practices, electrical components and electrical schematic symbols.

What this manual contains

The [Safety instructions](#) and [EMC Standards](#) can be found at the beginning of this manual.

[Introduction to this manual](#), the chapter you are currently reading, introduces you to this manual.

[Mechanical installation](#), this chapter gives all mechanical information concerning the installation of the cabinets. Details such as moving the shipping splits, joining the units together, joining the busbars and fastening the cabinets to the floor are given.

[Electrical installation](#), this chapter discusses the electrical installation.

[Installation checklist](#), this chapter contains the installation checklist.

[Preventive maintenance](#), this chapter introduces the preventive maintenance.

Inquiries

For inquiries about the product please address your local ABB representative, quoting type code and serial number of the cabinet. If the local ABB representative is not available, inquiries should be addressed to ABB Automation Products GmbH, Ladenburg in Germany.

Mechanical installation

This chapter provides instructions for moving shipping splits (= complete cabinets divided into parts before shipping), fastening them to the floor and joining them together.

See [DCS880 Technical catalogue \(3ADW000465\)](#) and [DCS880 Hardware manual \(3ADW000462\)](#) for allowed operating conditions of the DCS880 converters. For sufficient room around the cabinets see chapter. [Working order of the mechanical installation](#). Room around the cabinets is required to enable cooling air flow, service and maintenance. Proper mechanical installation is an important element for a trouble free installation and should be followed closely.

The cabinets should be installed in an upright vertical position.

The floor, the cabinets are installed on should be of non-flammable material, as smooth as possible, and strong enough to support the weight of the cabinets. The floor flatness must be checked with a water level before fastening the cabinets into their final position. The maximum allowed deviation of the surface level must be < 5 mm for every 3 m of length. The installation area should be leveled, since the cabinets are not equipped with adjustable feet.

The wall behind the cabinets should be of non-flammable material.

Required Tools

The tools required for moving the shipping splits to their final position, fastening to the floor and tightening the connections are listed below:

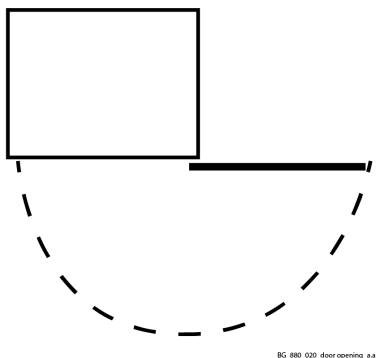
1. Iron bar and roller tubes or similar tools to move the shipping splits.
2. Torx (2.5 ... 6 mm) screwdrivers for the tightening of the frame screws.
3. A torque wrench.
4. A 17 ... 19 mm wrench set for tightening the AC horizontal busbars between the shipping splits.
5. A 17 mm wrench set for tightening the PE busbars between shipping splits.

Cabinet Construction

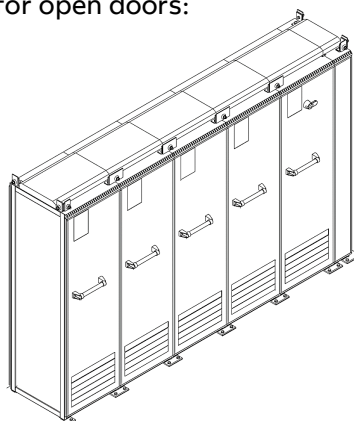
A cabinet:



Cabinet door opening angle:

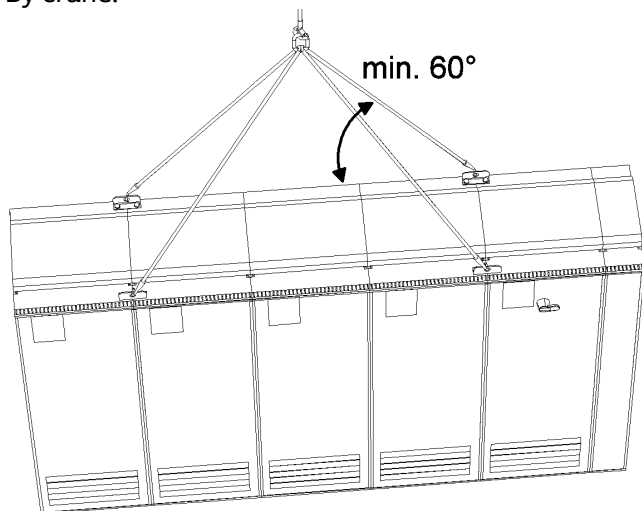


Marine applications including handles and locking devices for open doors:



Moving of the Shipping Splits

By crane:

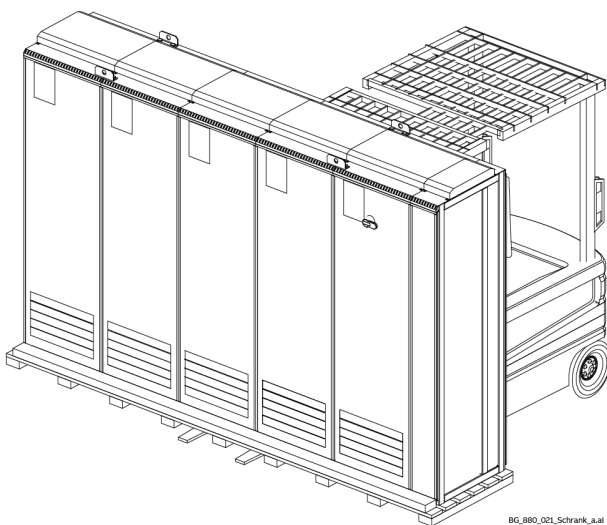


Use the steel lifting lugs attached to the top of the cabinets. Insert the lifting ropes or slings into the holes of the lifting lugs.

The cabinets are delivered with the roof disassembled. Thus, the lifting lugs must be removed once the cabinets are in their final position. Afterwards the roofs need to be assembled to maintain the degree of protection of the cabinet.

Note: The Maximum length of one shipping split is 3.4 m. If required, the double roofs of all cabinets can be removed while placing the shipping split on its final position. See chapter [Working order of mechanical installation](#).

By forklift:

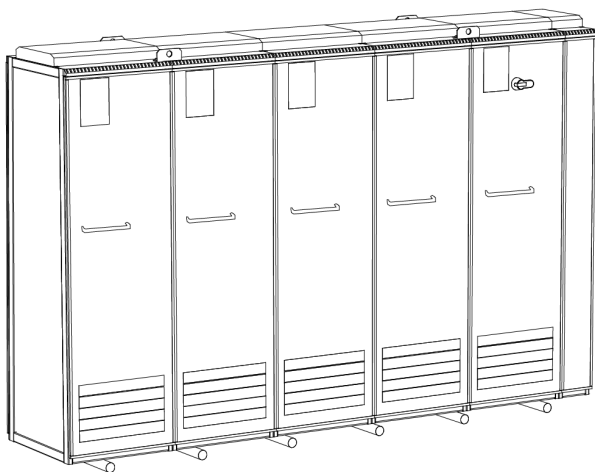


The center of gravity may be quite high, therefore caution should be used when transporting the shipping splits. Tilting of the cabinets must be avoided.

Moving of the shipping splits only with the cabinets in upright position.

Note: The shipping split has to be placed on a suitable pallet for transportation by forklift.

By rollers (not allowed for marine versions):



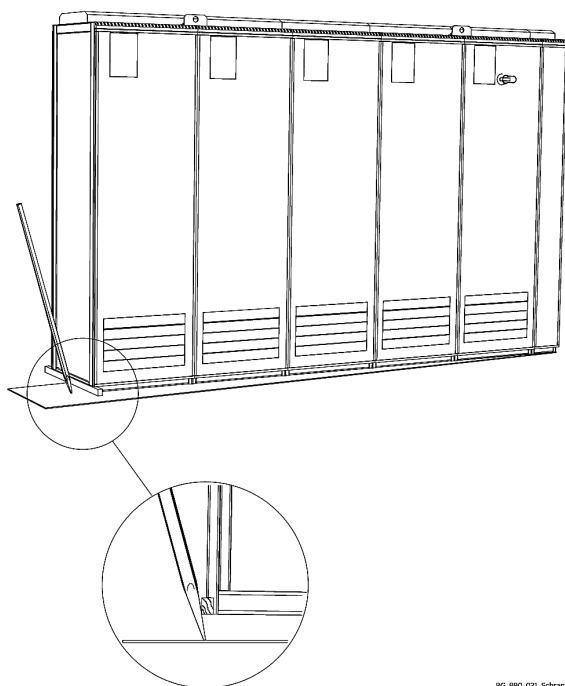
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Remove the bottom wooden frame which is part of the shipment.

Place the shipping split on the rollers and move the unit carefully until it is close to its final position.

Remove the rollers by lifting the shipping split using a crane or forklift as described above.

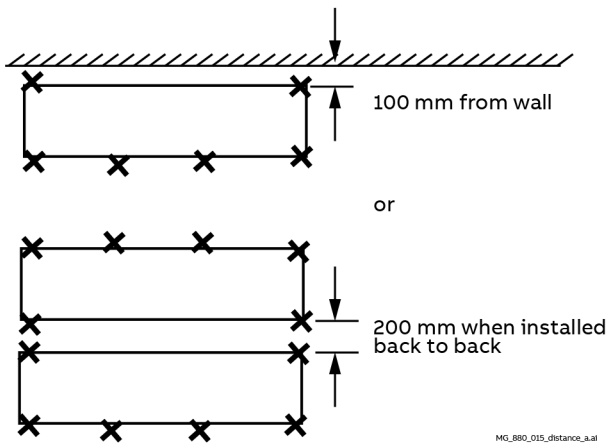
Final placement of shipping split (not allowed for marine versions):



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The cabinets can be moved to their final position by using an iron bar and a piece of wood at the bottom edge of the cabinet. Take care and place the piece of wood properly to prevent damage the cabinet frame.

Working order of the mechanical installation

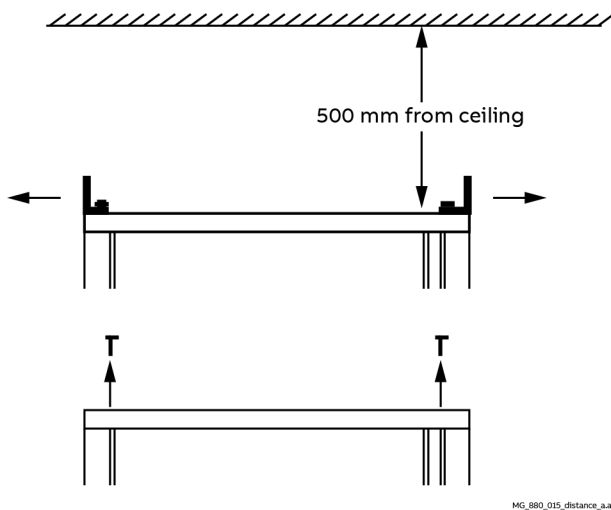


① Fasten the first shipping split to the floor with fastening clamps or through the holes inside the cabinet. See chapter [Fastening the shipping split to the floor](#).

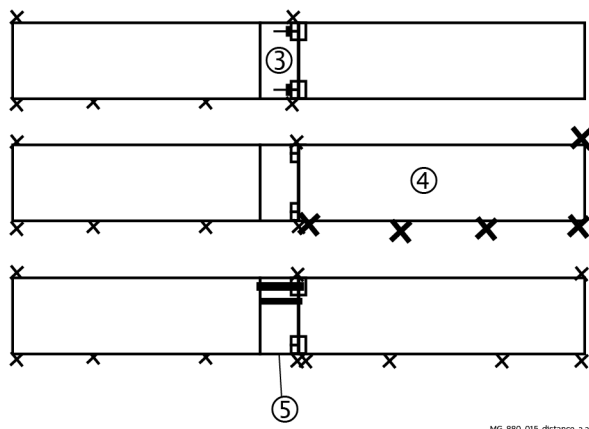
In marine versions, fasten the first shipping split to the floor and roof/wall as described in chapter [Vibration dampers \(marine version\)](#).

Attention: Keep the distance of 100 mm from the wall or 200 mm when the cabinets are installed back to back.

Note: Any height adjustment of the cabinets must be done before fastening the cabinets together. Height adjustment can be done by using metal shims between the bottom of the frame and the floor.



② Remove the lifting bars and/or the lifting lugs.

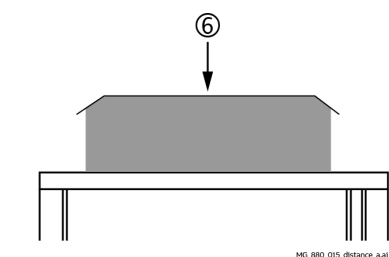


③ Fasten the first shipping split to the next shipping split. See chapter [Joining the shipping splits](#). Each shipping split includes a 200 mm joining cabinet.

④ Fasten the second shipping split to the floor.

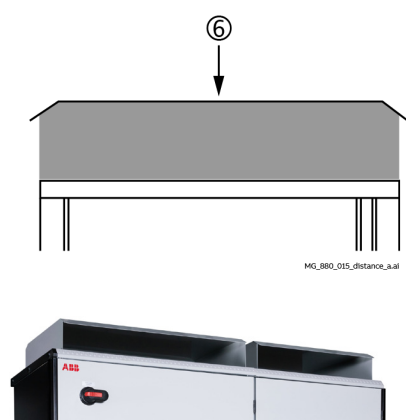
⑤ Connect the AC busbars and the PE busbar. See chapter [Connecting the AC busbar and the PE busbar](#).

Roof for IP20:

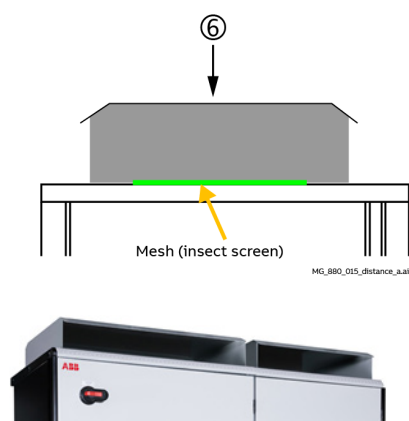


⑥ To maintain the degree of protection of the cabinet. Install the roof, by attaching each roof with 4 screws M6 or use the upper vibration dampers (only marine version).

Roof for IP21:



Roof for IP42:



Roof cooling fan box for IP54:

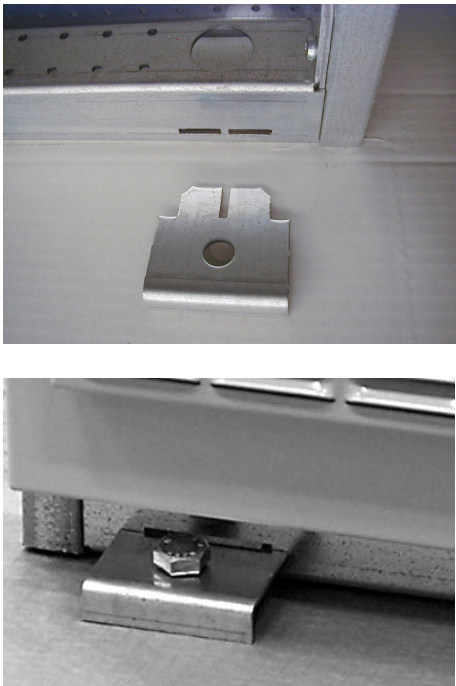


Fastening the shipping split to the floor

Fastening the shipping split to the floor is especially important in installations subject to vibration or other movement.

Using fastening clamps

Fastening clamp 3AFE64347683:

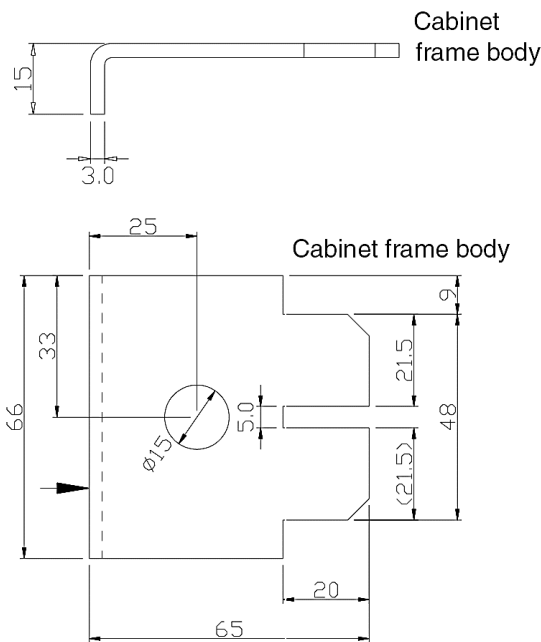


Insert the clamp into the longitudinal hole in the edge of the cabinet's frame body and fasten it with a bolt to the floor. Allowed maximum distance between the fastening clamps is 800 mm. Fastening hole distances for the cabinet are given in the table blow. The fastening bolt size is M10 ... M12 (3/8" ... 1/2").

Cabinet width (mm)	Hole distance (mm)
200	
400	a: 250
600	a: 450
800	a: 650
1000	a: 350, b: 150
1200	a: 350, b: 150

Note: The fastening clamp is included in the accessories kit.

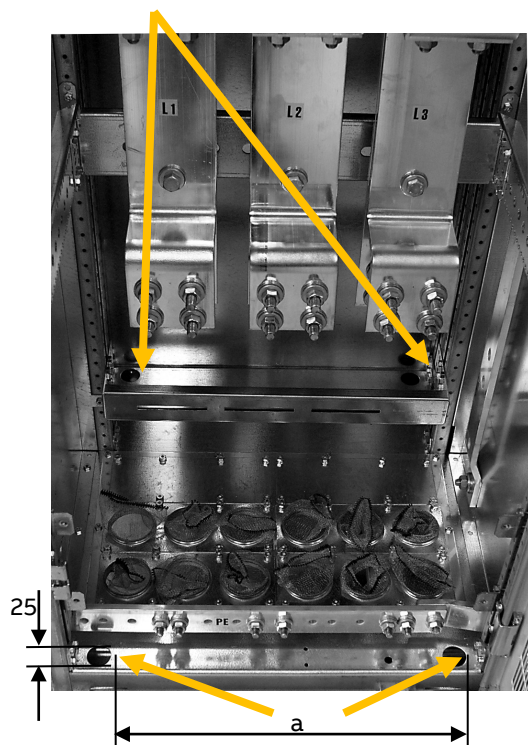
Dimensions of a fastening clamp:



Using the fastening holes inside the cabinet

The cabinet can be fastened to the floor using the fastening holes inside the cabinet, if they are available and accessible. Allowed maximum distance between the fastening points is 800 mm.

Fastening holes:



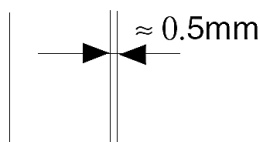
Fastening holes inside the cabinet:

- Side plates of the cabinet: 15 mm.
- Back plate of the cabinet: 10 mm.

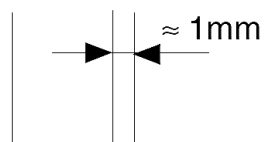
Gap between cabinets:

- Small gap between the 200 mm, 400 mm, 600 mm, 800 mm, 1000 mm and 1200 mm cabinets:

IP 20...42



IP 54

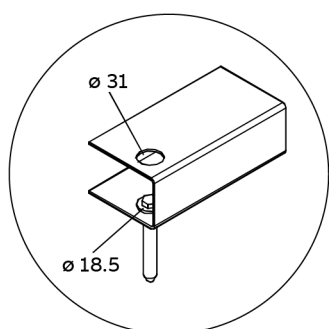


Fastening hole distances for the cabinet are given in the table blow.

The fastening bolt size is M10 ... M12 (3/8" ... 1/2").

Cabinet width (mm)	Hole distance (mm)	
200	A: 50	
400	a: 250	
600	a: 450	
800	a: 650	
1000	a: 350, b: 150	
1200	a: 350, b: 150	

Mounting and through holes:



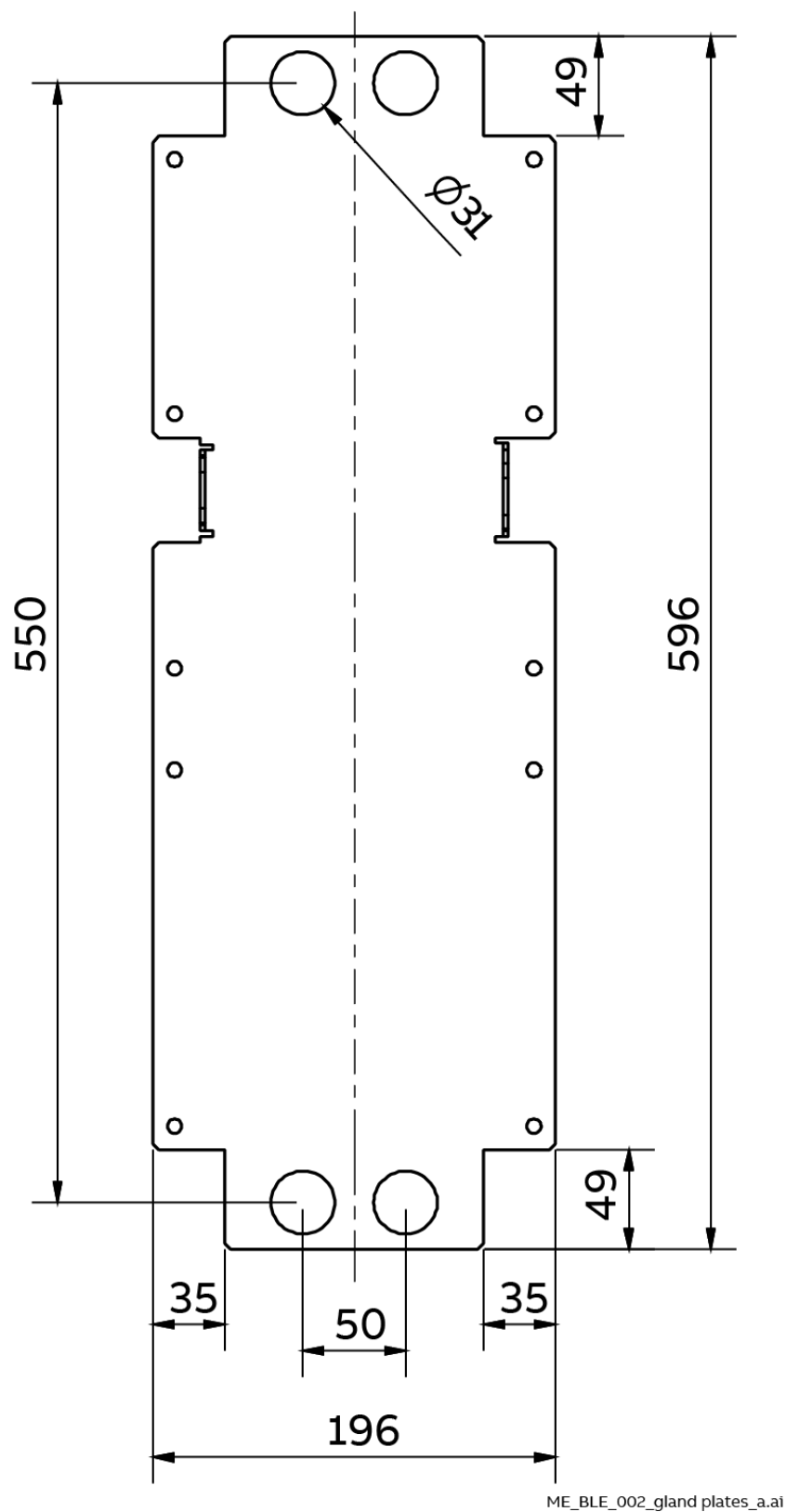
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The bottom plate subassemblies/frames of most cabinets, layout see next pages, are equipped with mounting holes (Ø 18.5 mm) together with trough holes (Ø 31 mm).

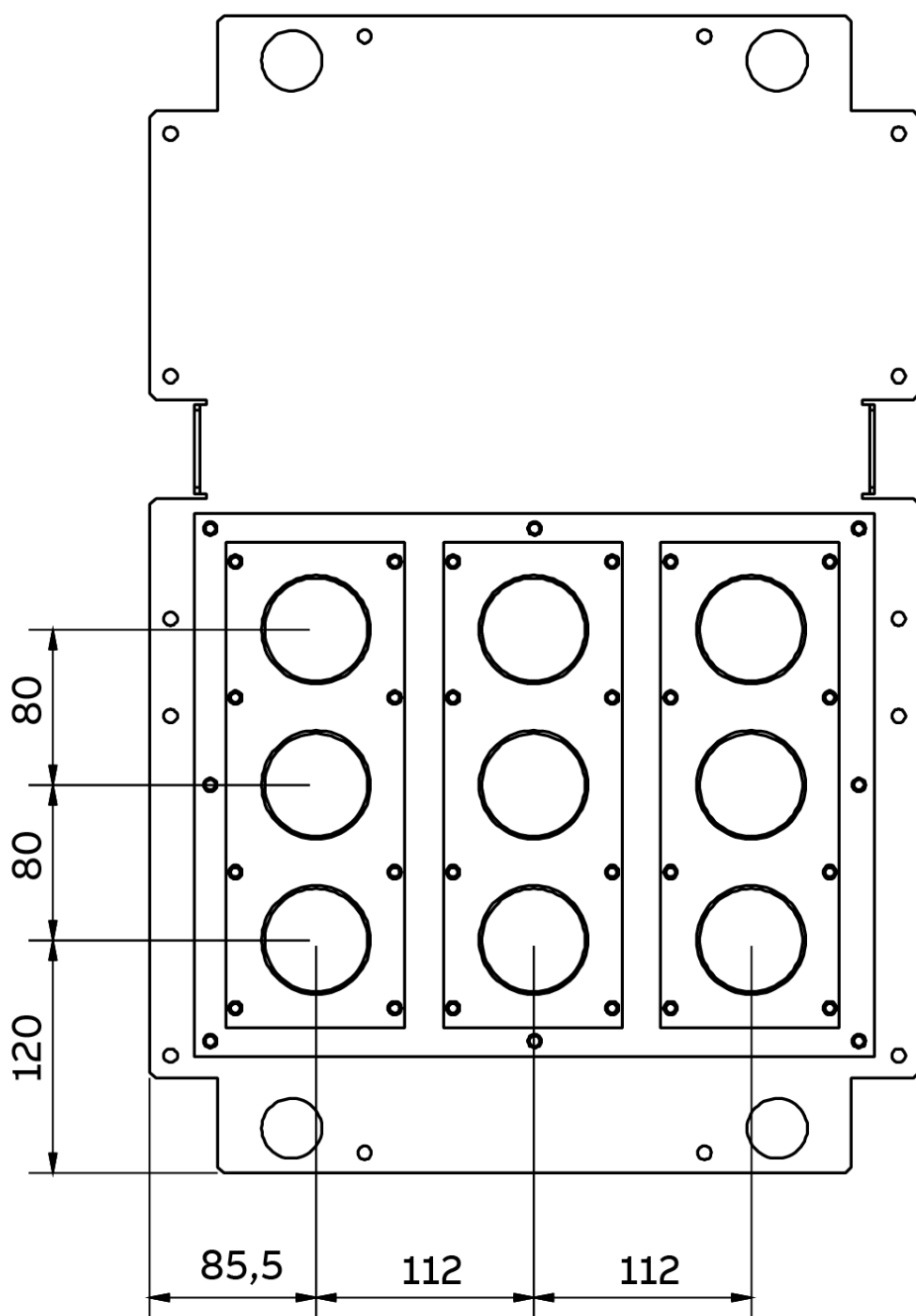
Layout of the bottom plates

Cabinet, 200 mm width, 600 mm depth

Plain:



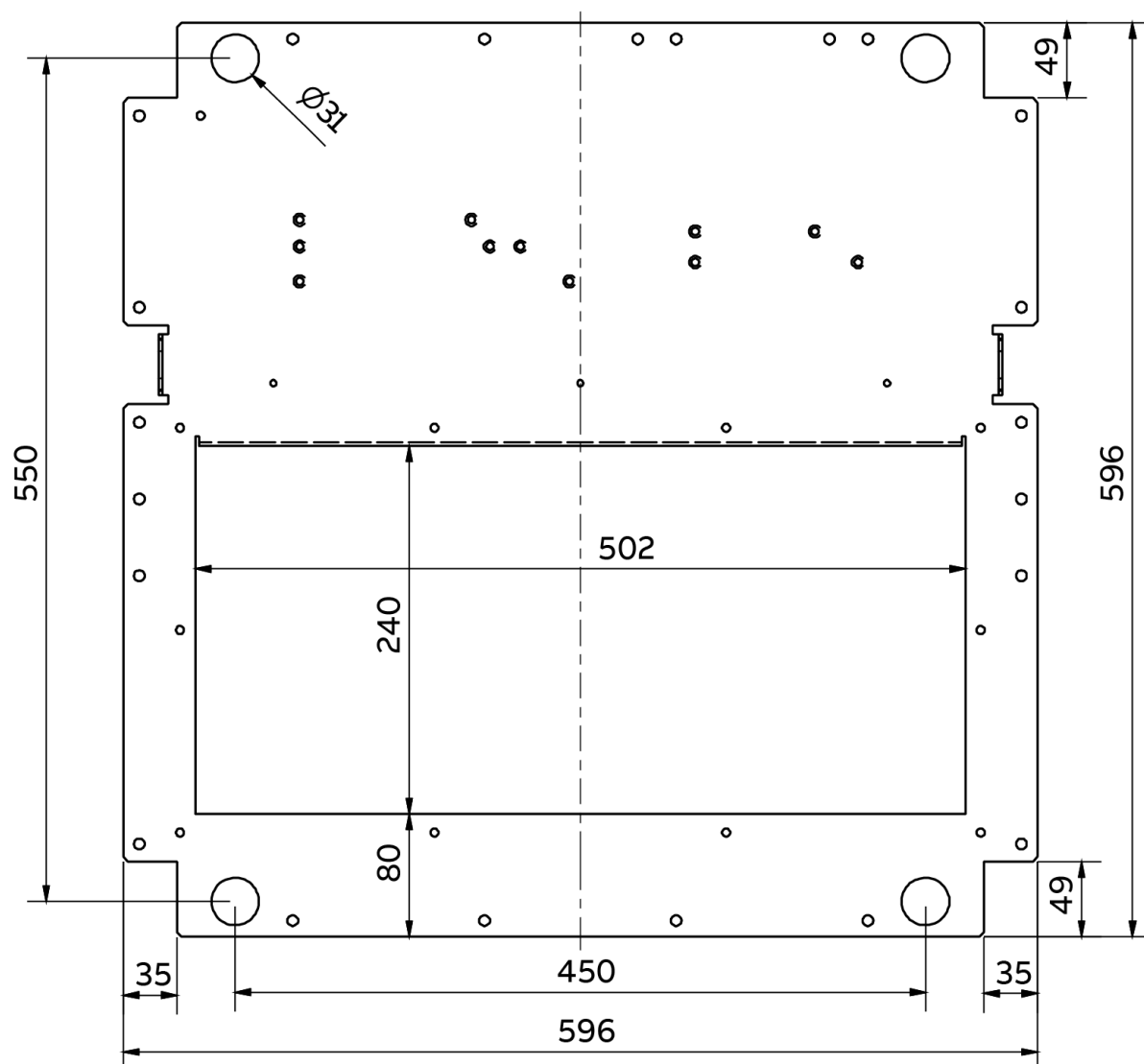
With gland plates:



ME_BLE_002_gland plates_a.ai

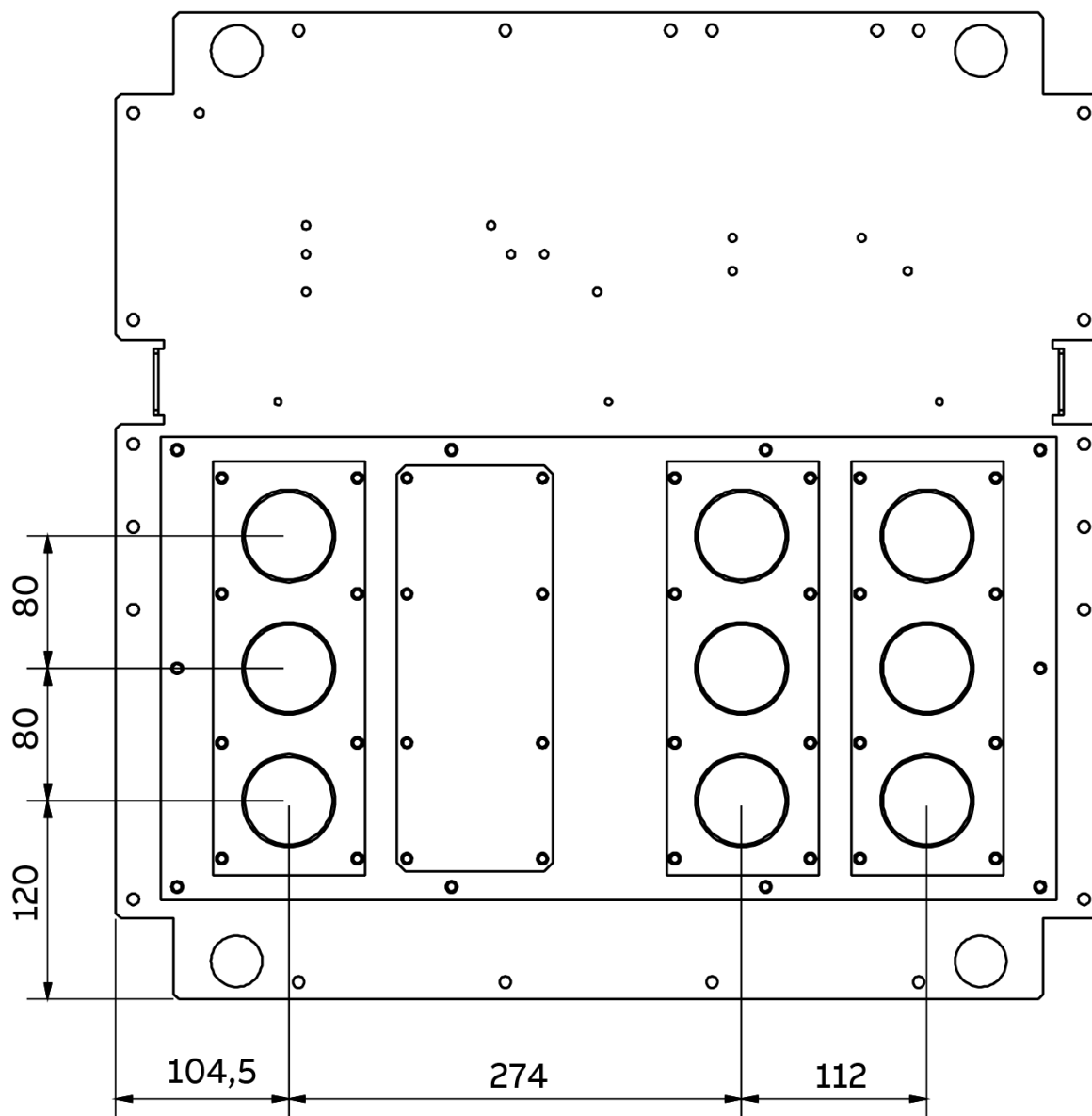
Cabinet, 600 mm width, 600 mm depth

Plain:



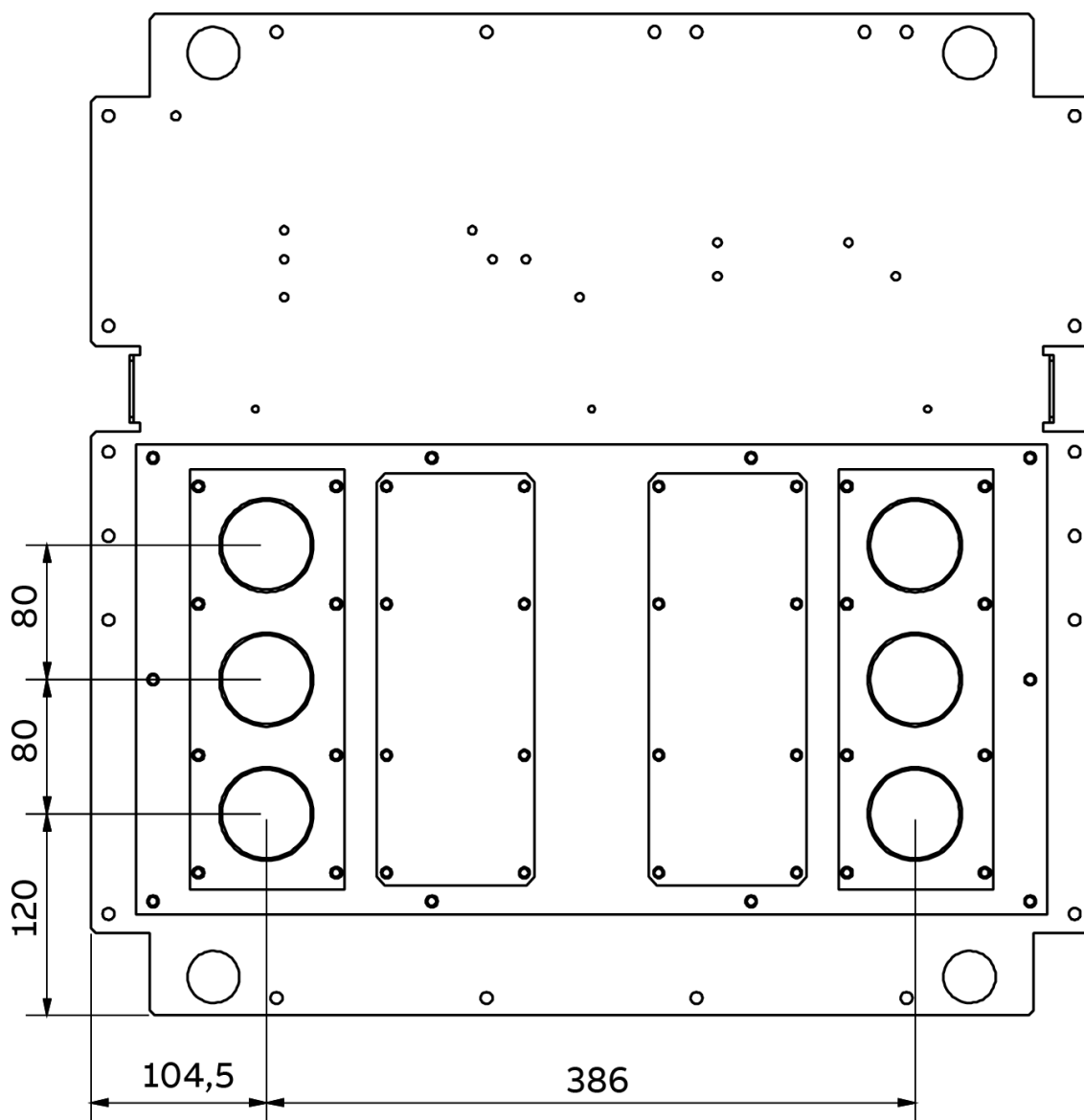
ME_BLE_002_gland plates_a.ai

With gland plates for H1 ... H3:



ME_BLE_002_gland plates_a.ai

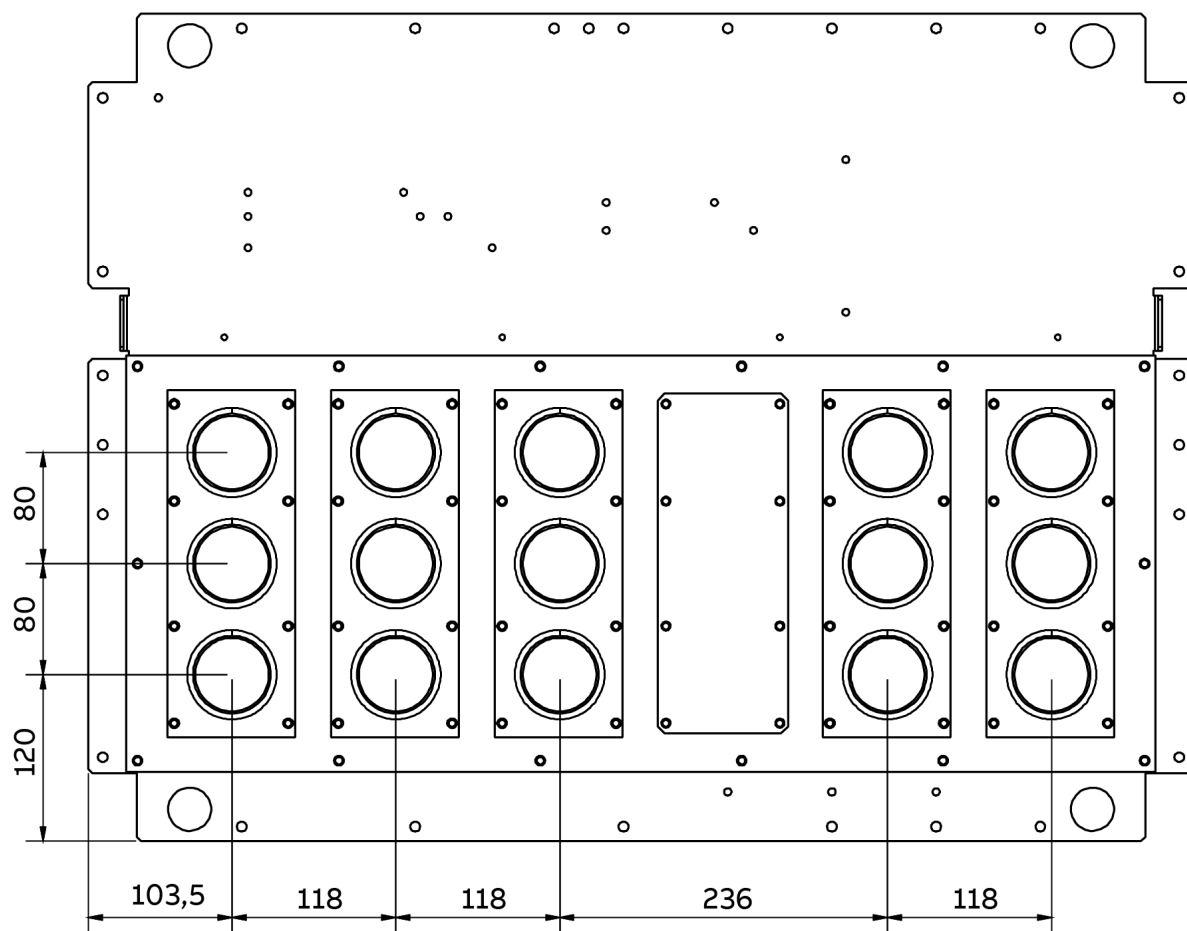
With gland plates for D6 (DC side):



ME_BLE_002_gland plates_a.ai

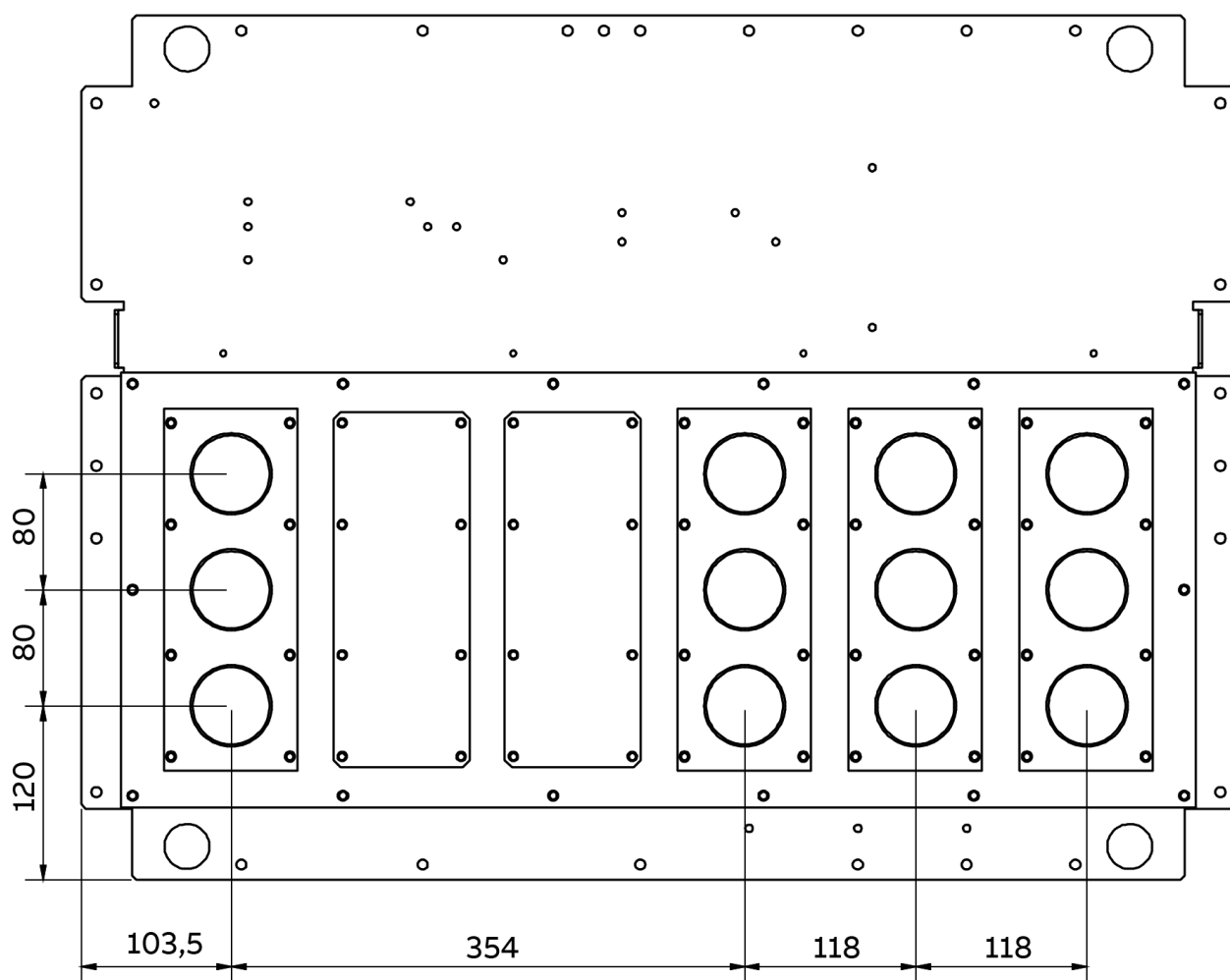


With gland plates for H3, H4:



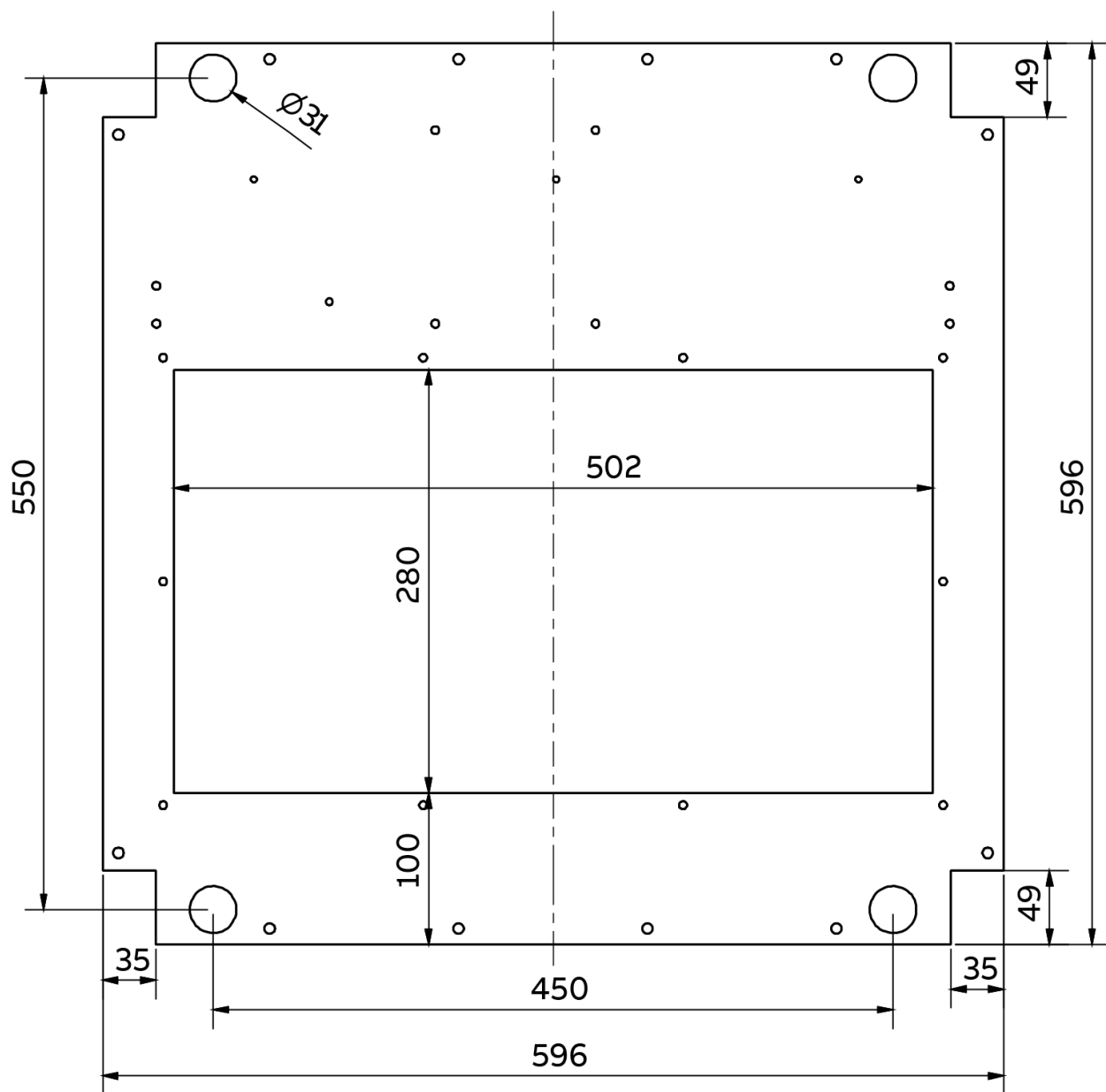
ME_BLE_002_gland plates_a.ai

With gland plates for D6 (AC side):



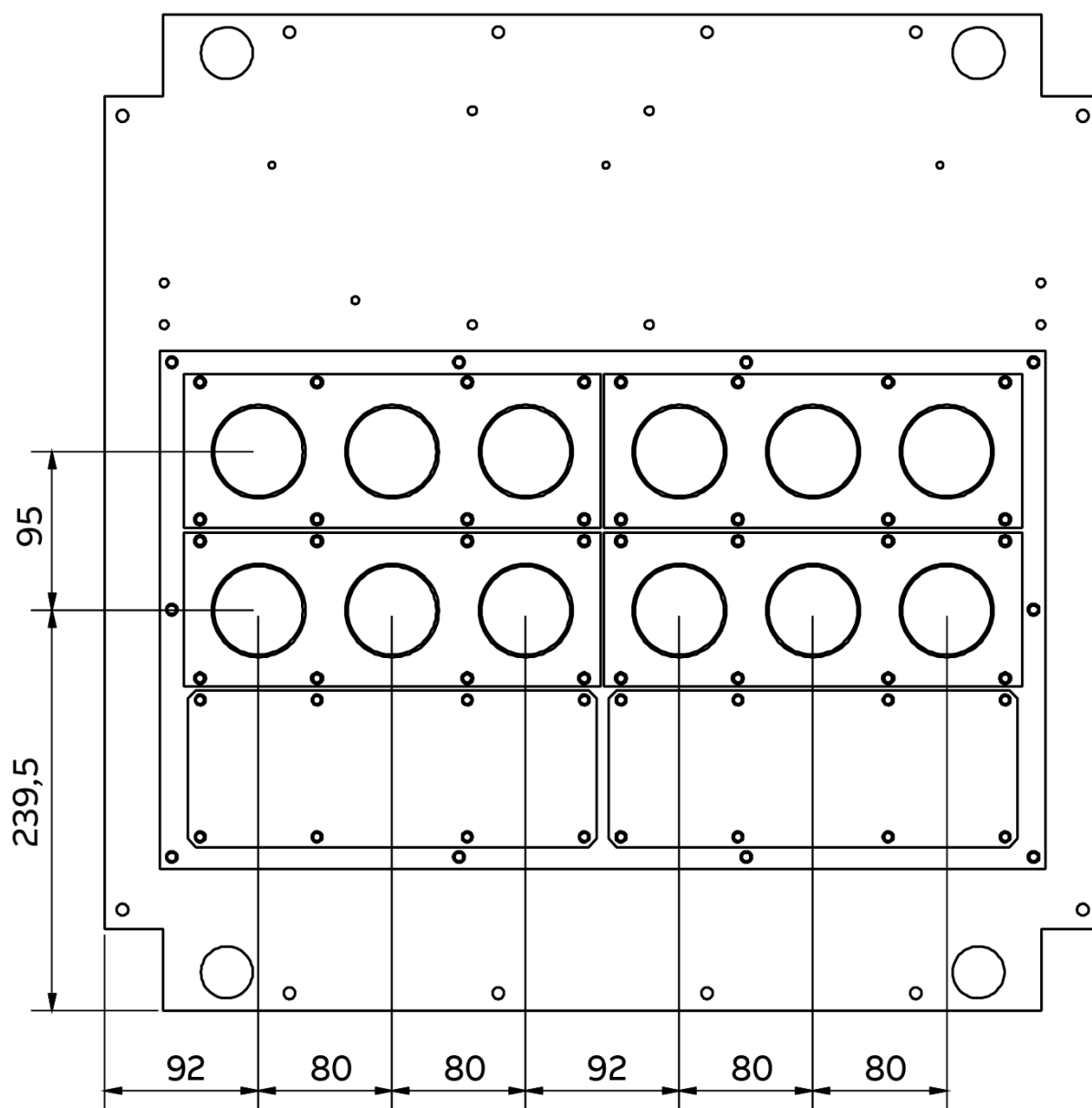
ME_BLE_002_gland plates_a.ai

Plain for H7 (DC side, mains breaker):



ME_BLE_002_gland plates_a.ai

With gland plates for H7 (DC side, mains breaker):

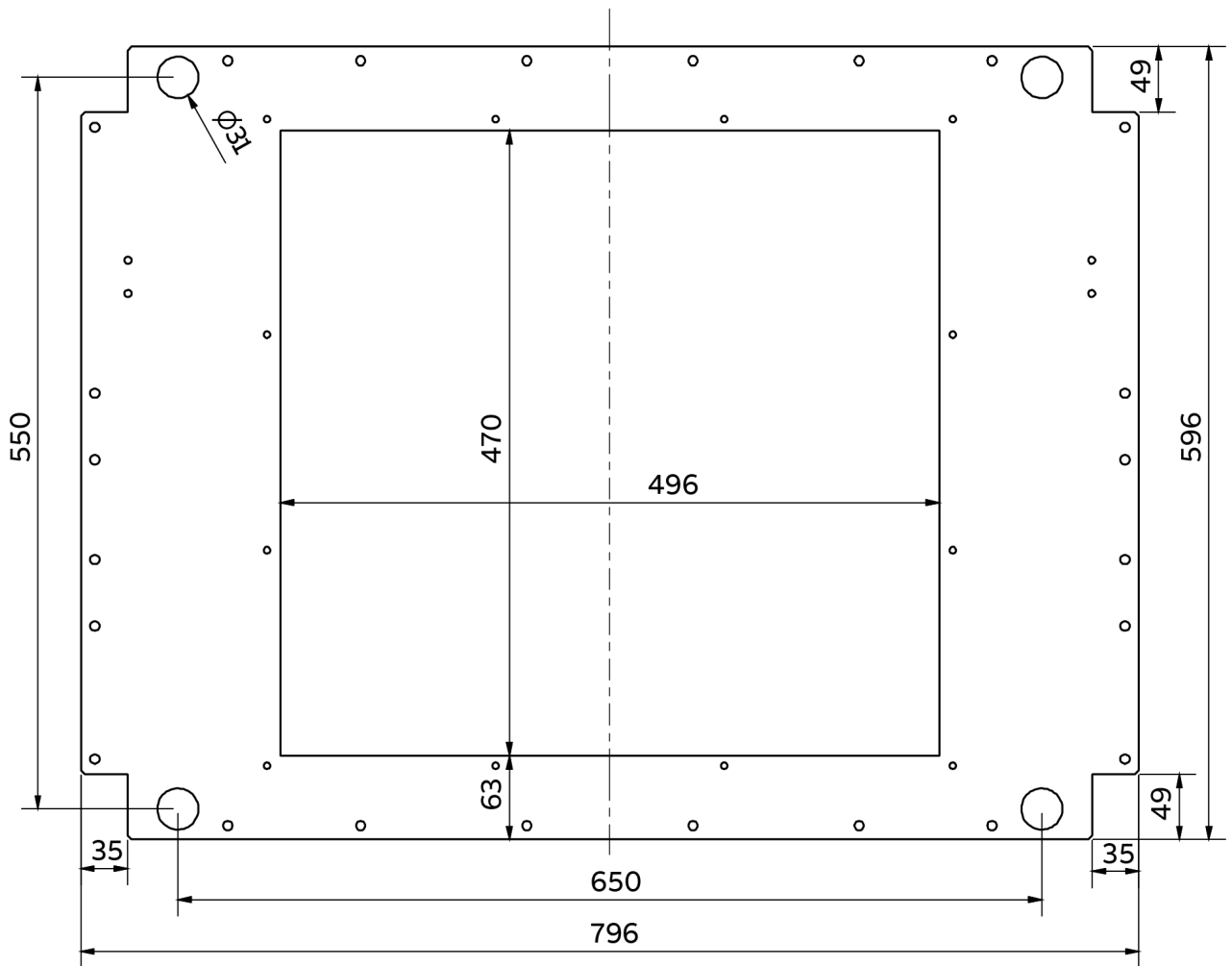


ME_BLE_002_gland plates_a.ai

Cabinet, 800 mm width, 600 mm depth:

Plain for H7 (AC side and DC side, no mains breaker).

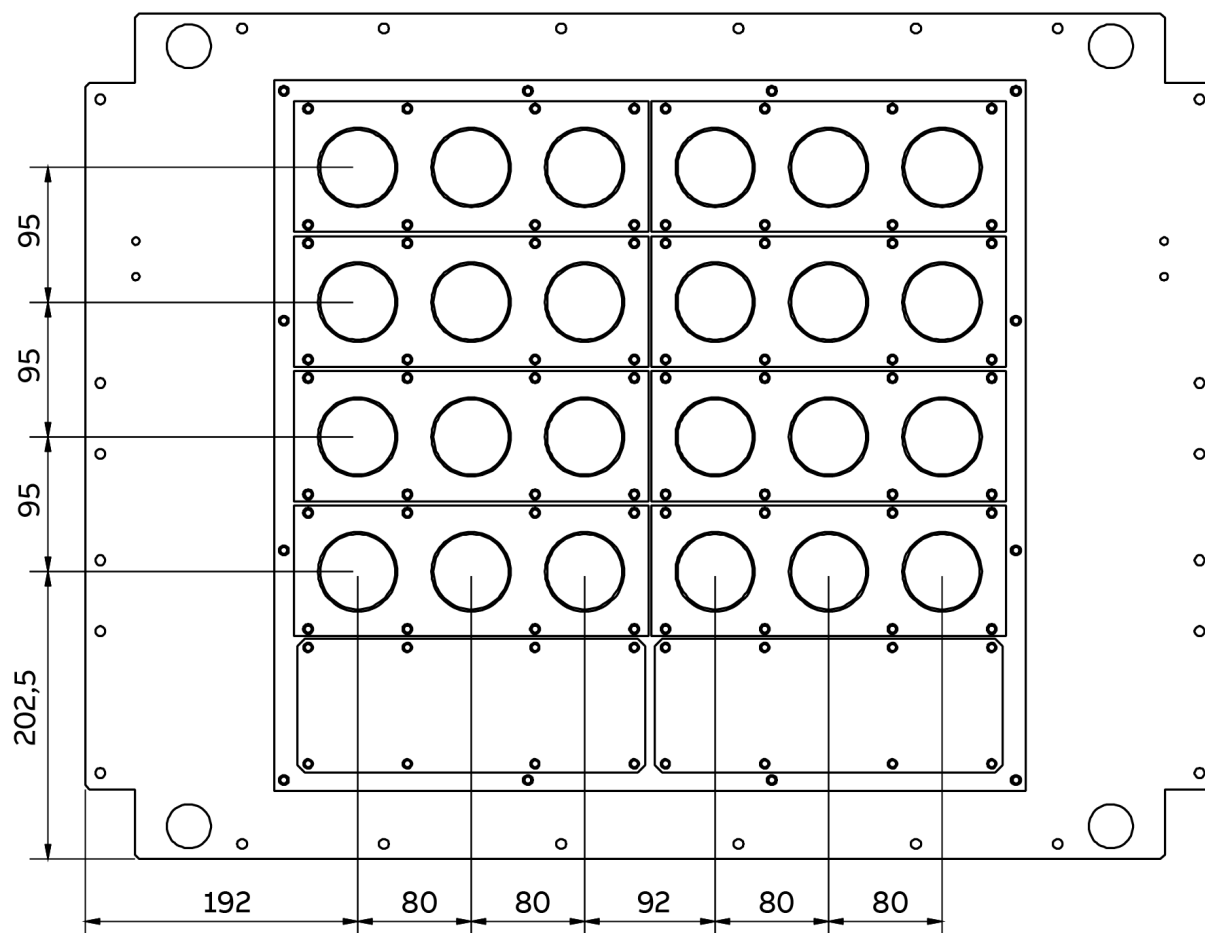
Plain for H8 (AC side, mains breaker):



ME_BLE_002_gland plates_a.ai

With gland plates for H7 (AC side and DC side, no mains breaker).

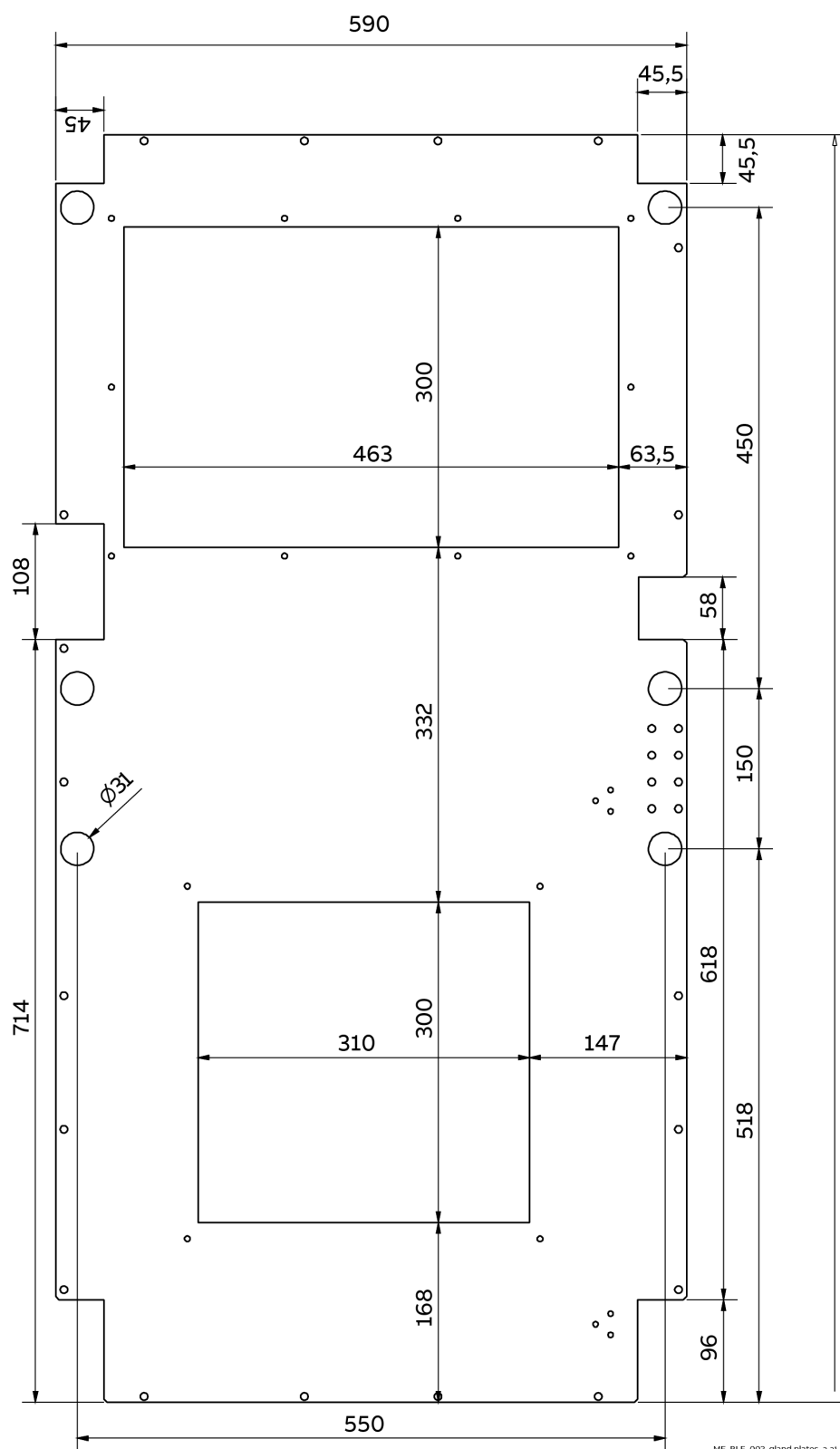
With gland plates for H8 (AC side, mains breaker):



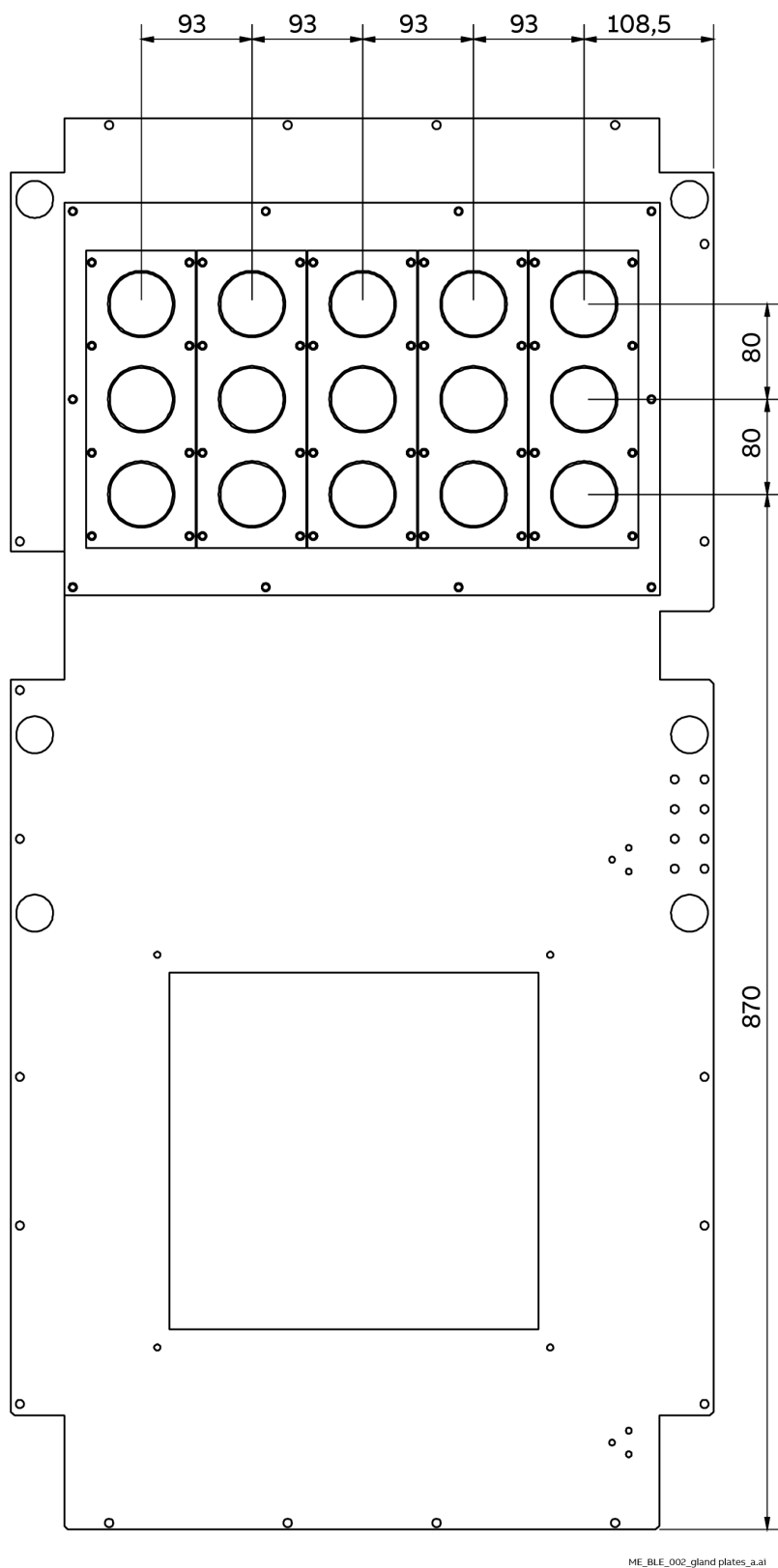
ME_BLE_002_gland plates_a.ai

Cabinet, 1200 mm width, 600 mm depth

Plain for H8 (module, DC side):

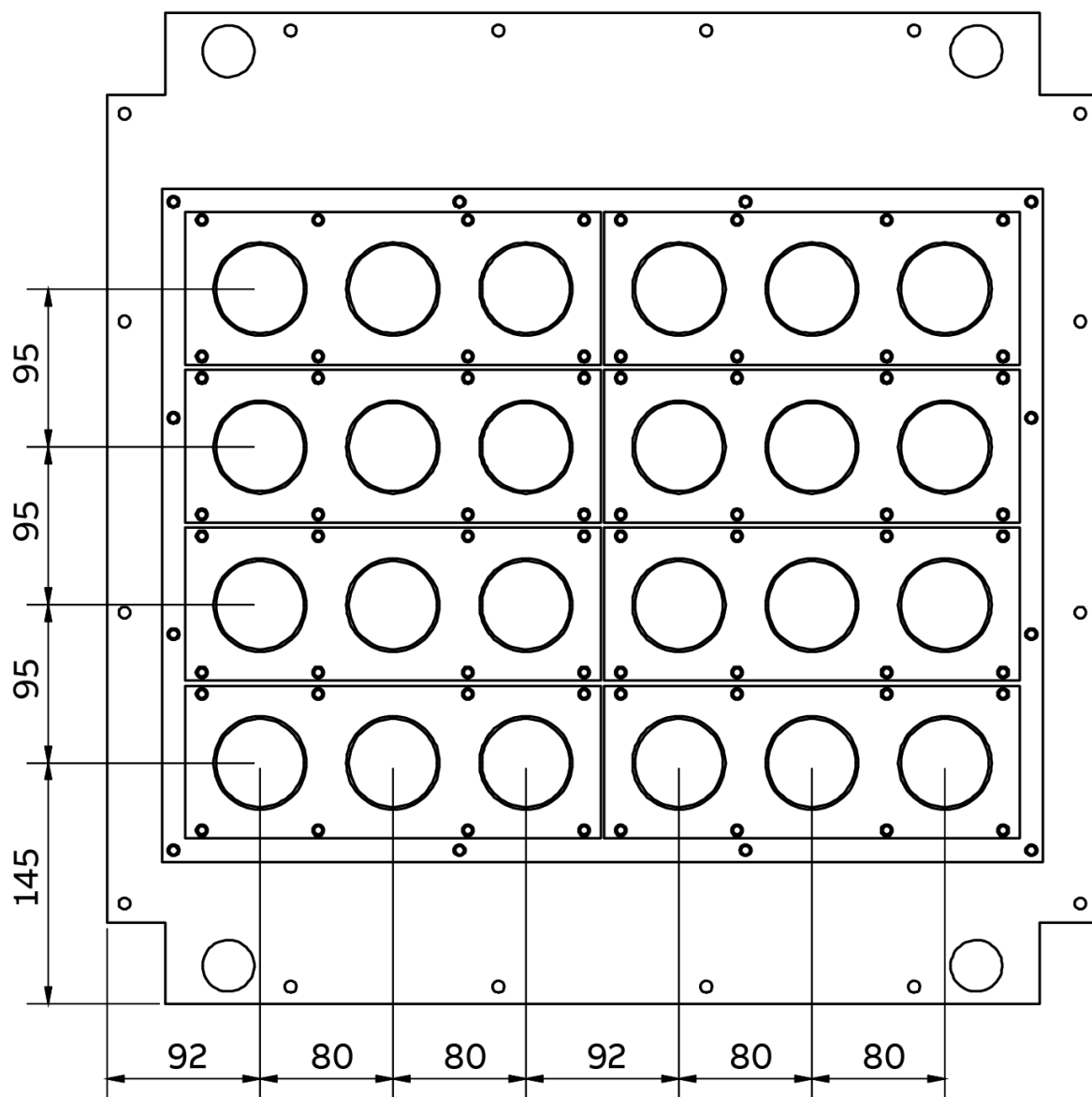


With gland plates for H8 (module, DC side):





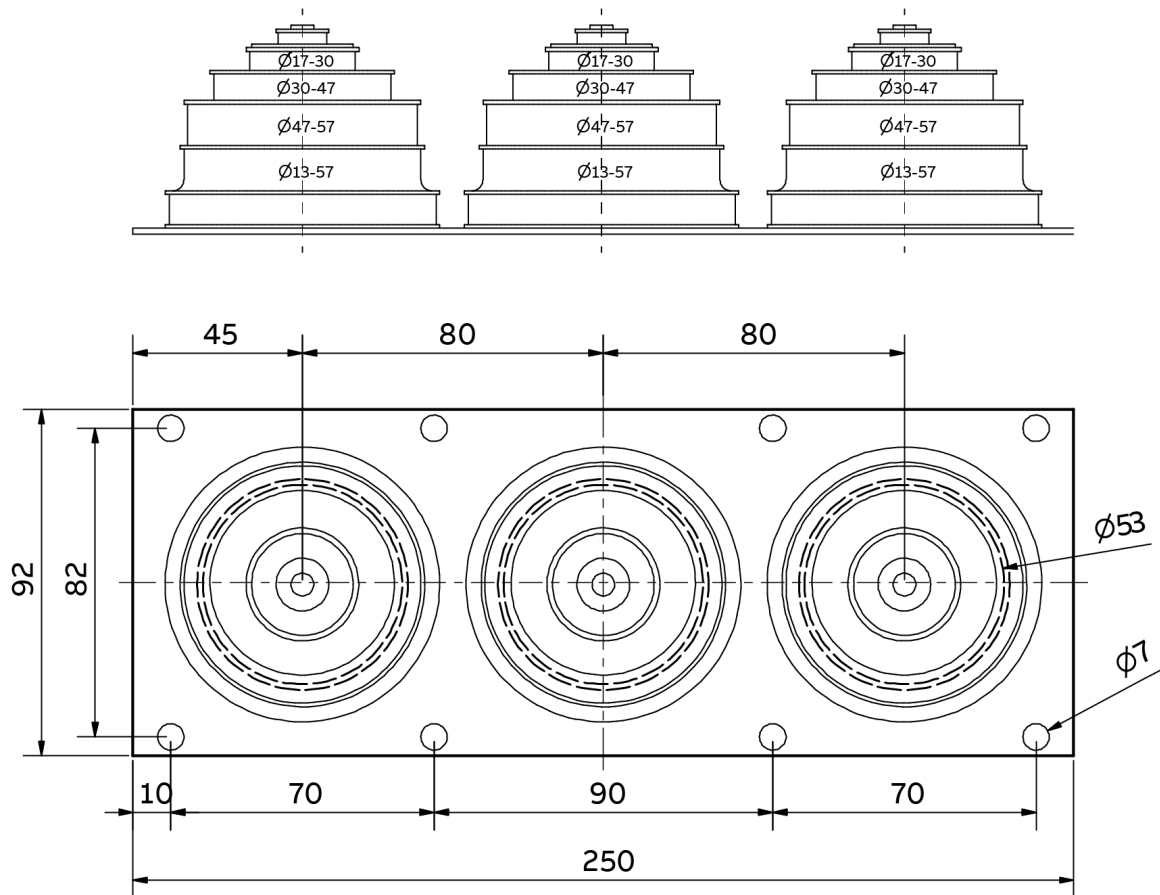
With gland plates for H8 (AC side, no mains breaker):



ME_BLE_002_gland plates_a.ai

Gland plates

Depending on the amount of cables several gland plates can be fastened over the cutout of the bottom plates. See also chapters [Layout of the bottom plates](#) and [Cable connections](#).

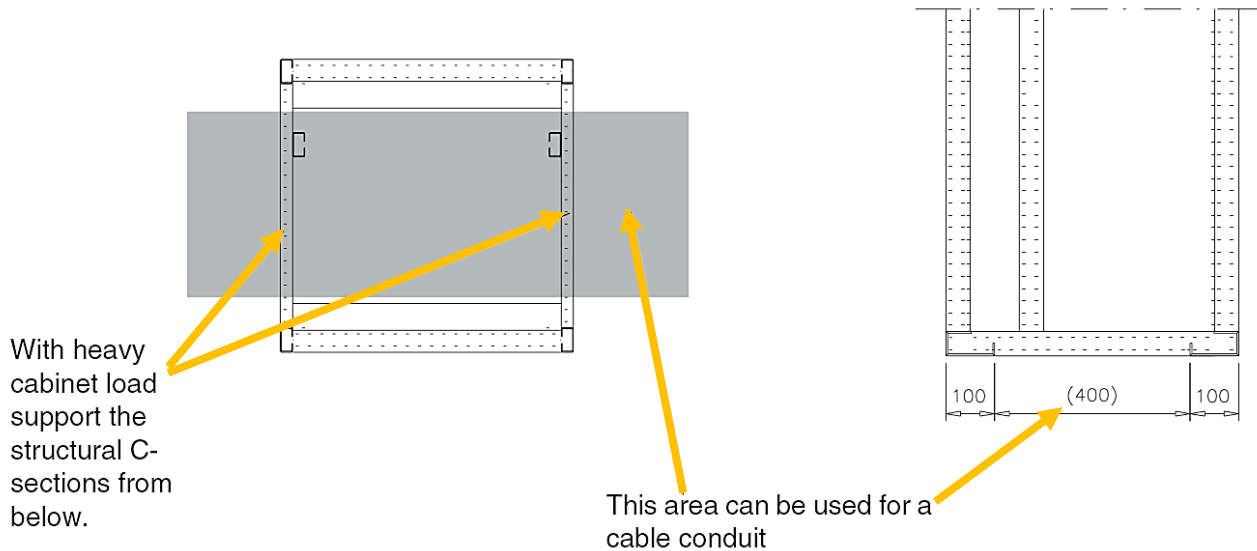


ME_BLE_003_gland plate_a.ai



Cable conduit below the cabinet

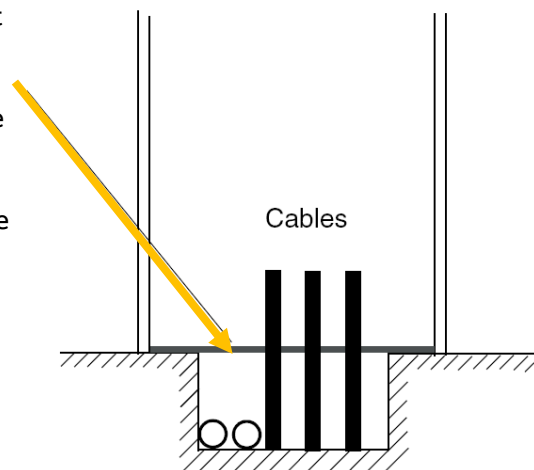
A cable conduit can be constructed below the 400 mm wide middle part of the cabinet. The cabinet weight has to be carried by the two 100 mm wide transverse sections of the floor. Top and side view below:



Prevent the cooling air flow from the cable conduit to the cabinet by using bottom plates.

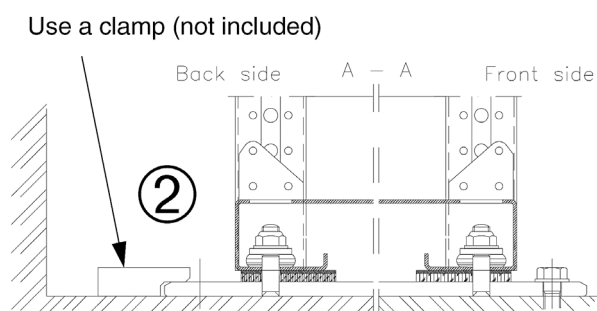
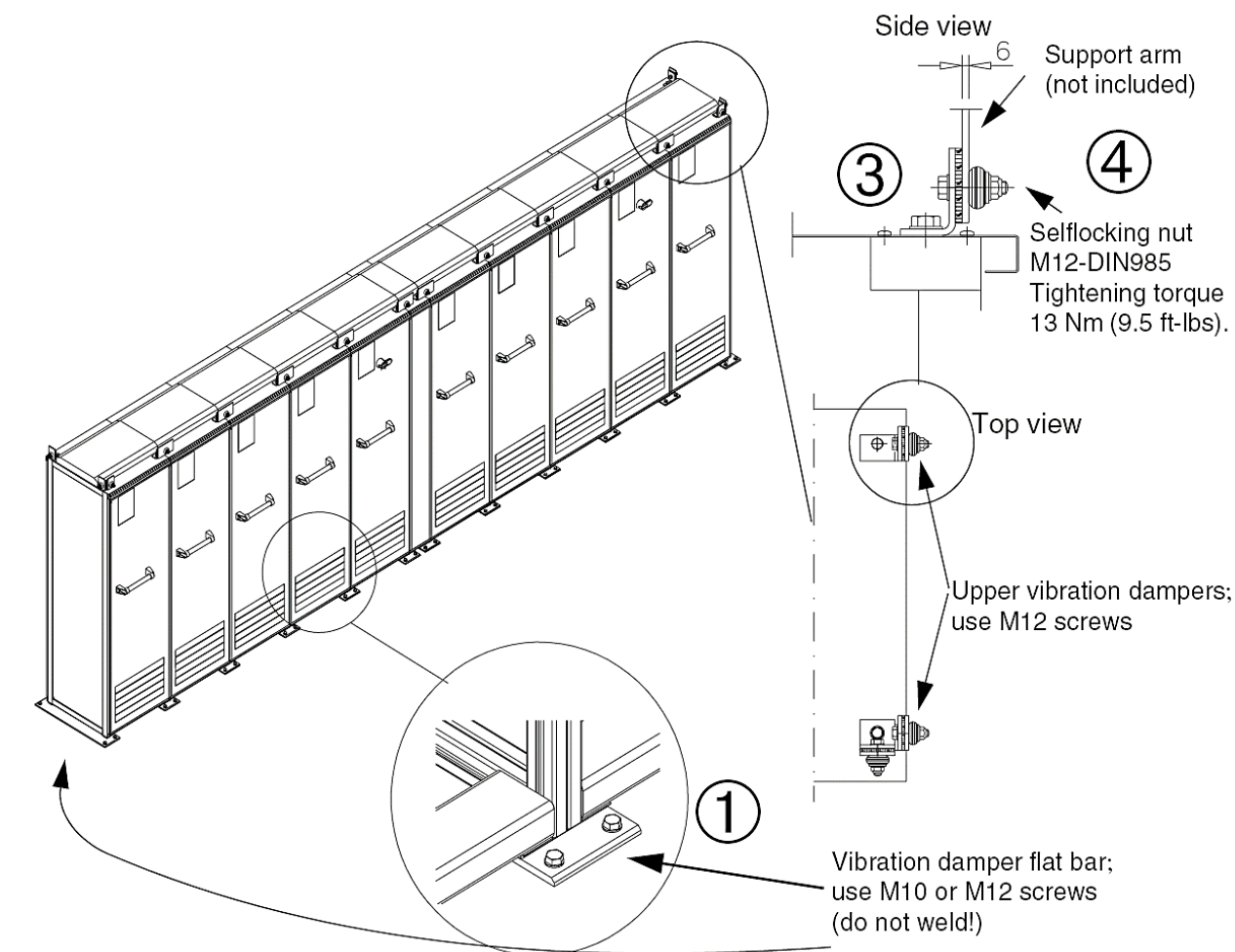
To ensure the degree of protection for the cabinet use the original bottom plates if delivered with the unit.

For user-defined cable entries extra care must be taken to maintain the degree of protection and fire protection.



Vibration dampers (marine version)

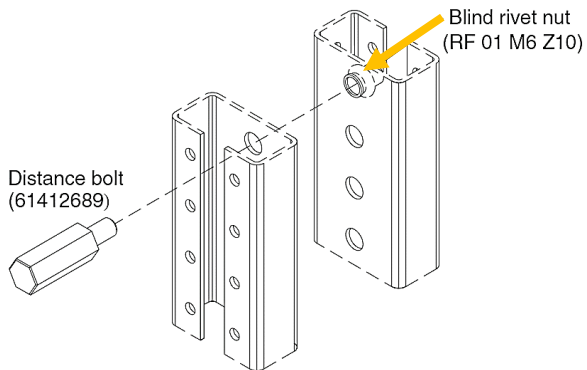
The shipping split must be fastened to the floor and roof/wall in marine versions as follows.



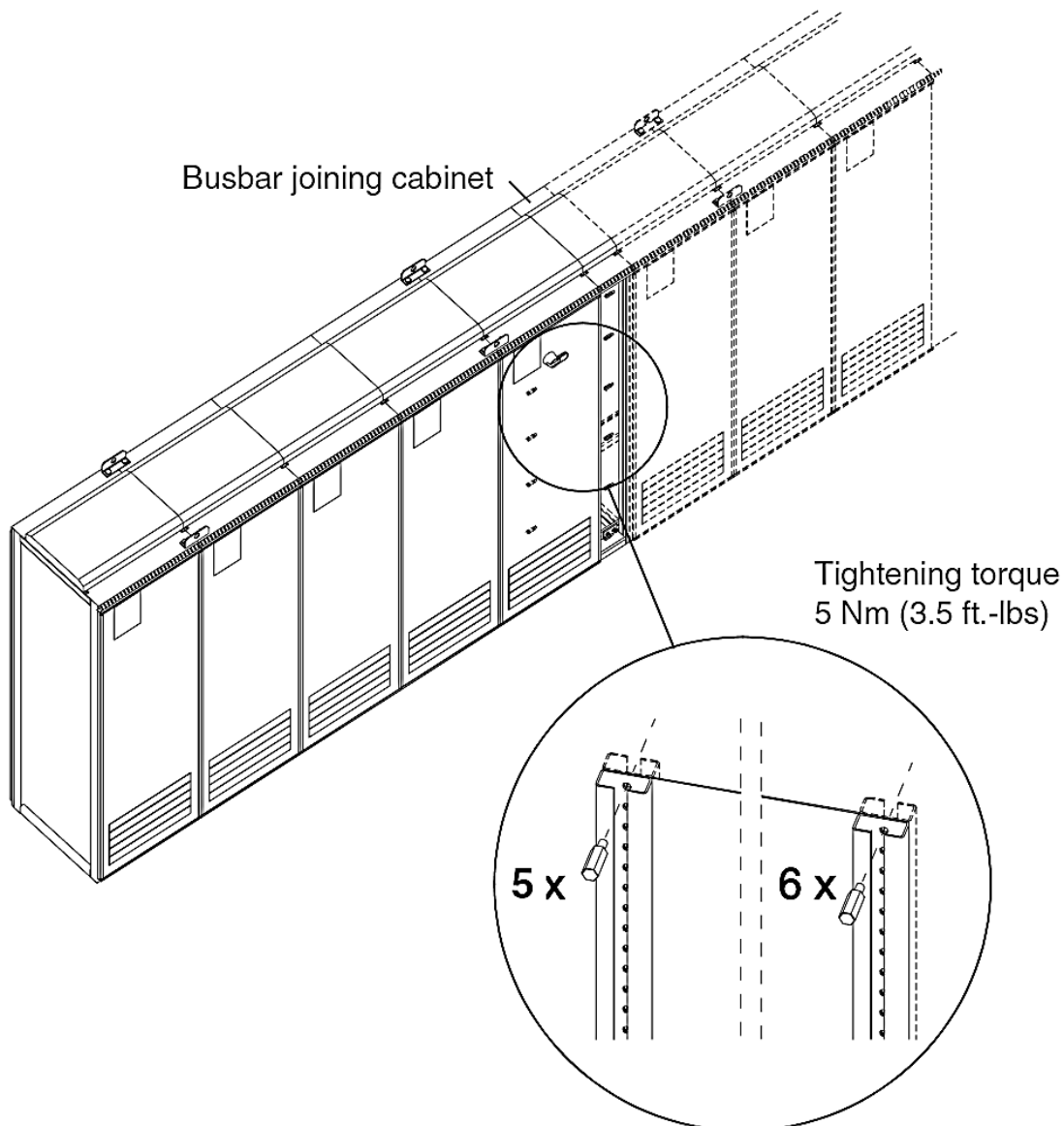
- ① Fasten the shipping split to the floor with M10 or M12 bolts through the holes in the vibration damper flat bar.
- ② If there is not enough room behind the cabinets for installation, use the fastening method shown in the picture to the left.
- ③ Fasten of the upper vibration dampers. For the positions of the upper vibration dampers, see the accompanying dimension drawing of the shipping split!
- ④ Fasten the support arms to the upper vibration dampers and roof/wall. Use a clamp (not included).

Joining the shipping splits

Shipping splits are joined in the busbar joining cabinet. Special distance bolts (M6) for fastening the cabinets together are enclosed in a plastic bag inside a cabinet of the shipping split. The blind rivet nuts are already installed in the post.



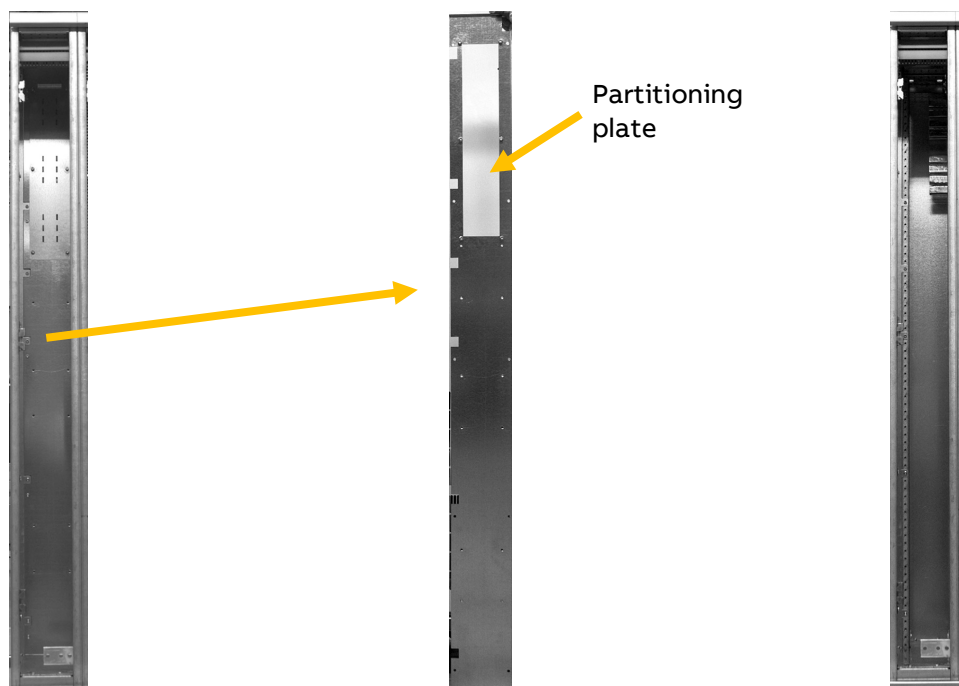
Working order



1. Fasten the front post of the joining section with six distance bolts to the front frame post of the next cabinet.
2. In the 200 mm wide joining cabinet remove the intermediate plate, hiding the back posts in the joining section.

Busbar joining cabinet (**Attention:** Intermediate plate (**Attention:** Draft only):

Back posts accessible (**Attention:** Draft only):



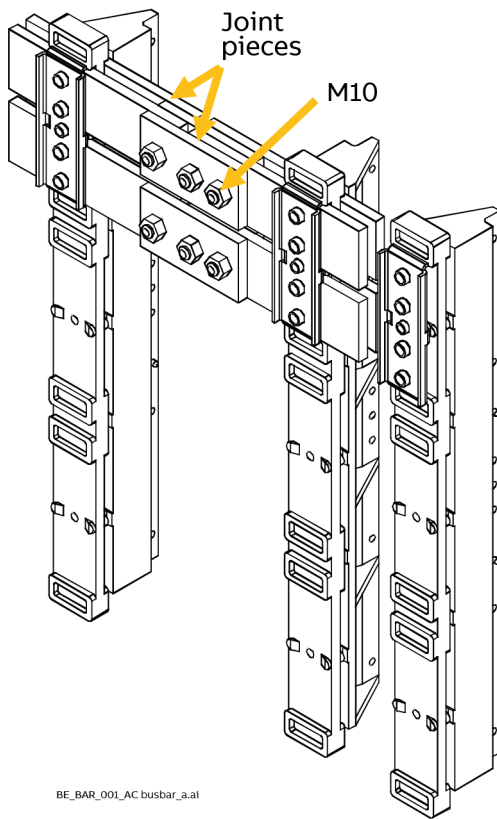
3. Fasten the back post of the joining cabinet with five screws below the horizontal busbar joining part to the post of the next cabinet.
4. Remount the intermediate plate and the partitioning plates in the upper part after connecting the AC busbars. Instruction to connect the AC busbars see the chapter below.

Connecting the AC busbar and the PE busbar

The horizontal main AC busbars and the PE busbar are connected by access from the front of the 200 mm wide busbar joining cabinet. All necessary materials are located in the joining cabinet.

Connecting the AC busbar

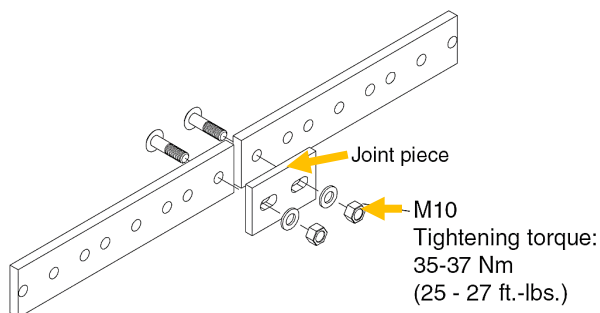
1. Remove the intermediate plate located in the busbar joining cabinet. See chapter above.
2. Unscrew the bolts of the joint pieces.
3. Connect the AC busbars with the joint pieces.



Tightening torque:
35 ... 37 Nm (25 ... - 27 ft.-lbs.)

4. Remount the intermediate plate into its original position due to safety of the personnel.

Connecting the PE busbar



Door filters and ventilation

IP class description

IP20:

- Air entry: Only a grid in the doors.
- Air exit: A short roof.

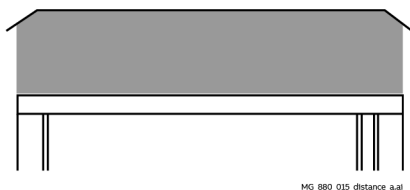


Attention: Keep the distance of 100 mm from the wall or 200 mm when the cabinets are installed back to back.



IP21:

- Air entry: Only a grid in the doors.
- Air exit: A long roof, from front to rear.

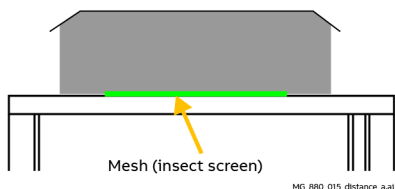


Attention: Keep the distance of 100 mm from the wall or 200 mm when the cabinets are installed back to back.



IP42:

- Air entry: A cover with water protective louvers in front of the doors. Inside the cover an IP42 mesh (insect screen). Click in and screw fixture design.
- Air exit: A short roof. Underneath an IP42 mesh (insect screen).

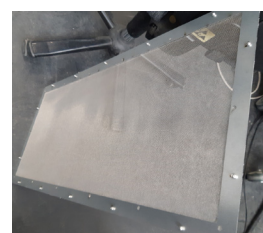


Attention: Keep the distance of 100 mm from the wall or 200 mm when the cabinets are installed back to back.

Cover with water protective louvers:



IP42 mesh (insect screen):



Note: To clean, vacuum it.

IP54:

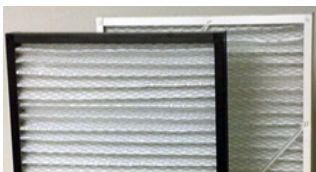
- Air entry: A cover with water protective louvers in front of the doors. Inside the cover an IP54 S folded filter. Screw fixture design.
- Air exit: A roof cooling fan box. Including a cover with water protective louvers. Inside the cover a filter.



Cover with water protective louvers:



IP54 S folded filter:



Roof cooling fan box:



Roof cooling fan box filter:



Attention: Keep the distance of 100 mm from the wall or 200 mm when the cabinets are installed back to back.

Note: The height of the roof cooling fan box is 300 mm instead of 120 mm for the roof.

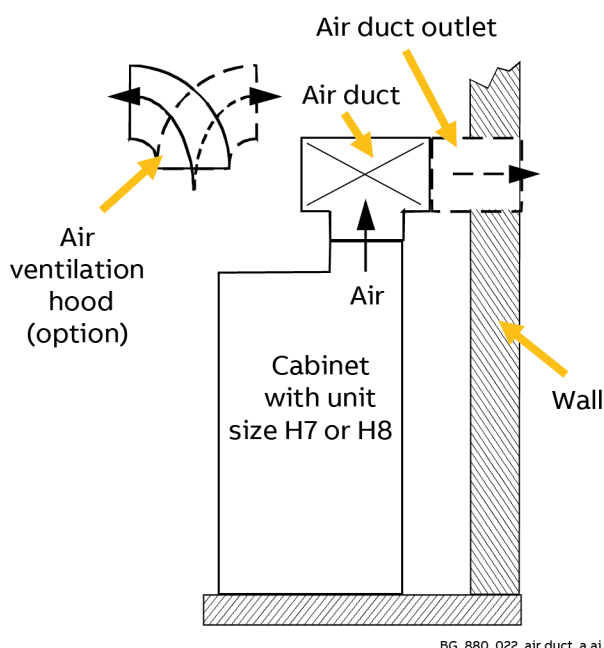
Replacement IP54 S folded door filters can be ordered from ABB:

Cabinet width (mm)	Order number for IP54 S folded door filters
600	3AFE64640437
800	3AFE64640194
1000	

Replacement roof cooling fan box filters can be ordered from ABB:

Order number for a roof cooling fan box filter
3AFE64722174

Air duct outlet for cabinets with unit size H7 or H8



Unit size H7 or H8 produce a considerable amount of power loss to be removed by air conditioning. In most cases the switch room is not capable to absorb the heated air. That is why cabinets with unit size H7 or H8 are provided with an adapter for connection to an air duct (air duct to be supplied for by the customer).

In case there is no air duct, the option Air Ventilation Hood is required to meet protection class IP 21.

This option can also be used for connection to an existing air duct outlet. This solution indicated by the dashed lines.

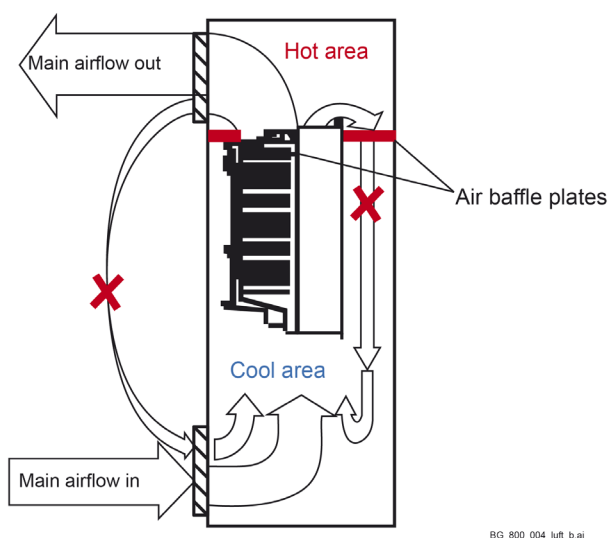
Air baffle plates

To keep the converter module as cool as possible cooling air re-circulation outside and inside the cabinet has to be prevented.

To prevent outside cooling air re-circulation external measures have to be made.

To prevent inside cooling air re-circulation air baffle plates are used.

Examples for air baffle plates:



Attention: The air baffle plates of the units have to be mounted properly before starting!

Electrical installation

Chapter overview

This chapter describes the electrical installation procedure of the cabinet.



WARNING

A qualified electrician may only carry out the work described in this chapter. Follow the [Safety instructions](#) on the first pages of this manual. Ignoring the [Safety instructions](#) can cause injury or death.

Make sure that the cabinet is disconnected from the mains (input power) during installation. If the cabinet was already connected to the mains, wait for 5 min. after disconnecting mains power.

Further information is available in the [Technical Guide \(3ADW000163\)](#).

Checking the insulation of the cabinet

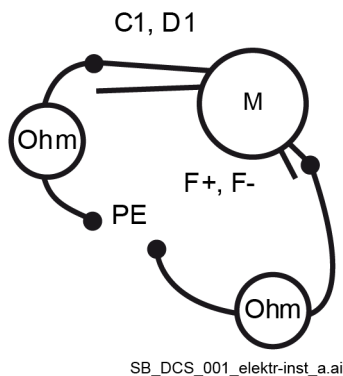


Every cabinet has been tested for insulation between the main circuit and the chassis (2500 V rms 50 Hz for 60 seconds) at the factory. Therefore, do not make any voltage tolerance or insulation resistance tests (e.g. hi-pot or megger) on any part of the cabinet. Check the insulation of the cabinet as follows.

WARNING

Check the insulation before connecting the cabinet to the mains. Make sure that the cabinet is disconnected from the mains (input power).

1. Check that the motor cables are disconnected from the cabinet output terminals C1, D1, F+ and F-.
2. Measure the insulation resistances of the motor cable and the motor between each circuit (C1, D1)/(F+, F-) and the Protective Earth (PE) by using a measuring voltage of 1 kV DC. The insulation resistance must be higher than 1 MOhm.



Mains Fuses

Fuses are needed to protect the drive in case of an internal short circuit. The cabinet is equipped with internal mains fuses. For more information see [DCS880 Technical catalogue \(3ADW000465\)](#) and [DCS880 Hardware manual \(3ADW000462\)](#). If a fuse is blown, it must be replaced with the proper ultra-rapid fuse.

Cabinet cooling fans

IP54 roof cooling fan box for sizes H3 and H4



Fan assignment

Converter type	Size	Connection	Fan type	Airflow built in [m³/h]
DCS880-A01-0290-06 DCS880-A02-0320-06 DCS880-A0b-0315-04/05 ... DCS880-A0b-0520-04/05	H3		2 x W2E250 230 V; 1~	2 x 425
DCS880-A01-0590-06 DCS880-A02-0650-06 DCS880-A0b-0610-04/05 ... DCS880-A0b-1000-04/05	H4			

b = Bridge type

Fan cable sizes and tightening torque connected at the fan terminals

Fan terminals are 2 x X31.

Converter type	Flexible cable		Solid cable	
	max [mm²]	torque [Nm]	max [mm²]	torque [Nm]
DCS880-A01-0290-06... DCS880-A02-0650-06 DCS880-A0b-0315-04/05 ... DCS880-A0b-1000-04/05	0.5 ... 2.5	Push-in	0.5 ... 2.5	Push-in

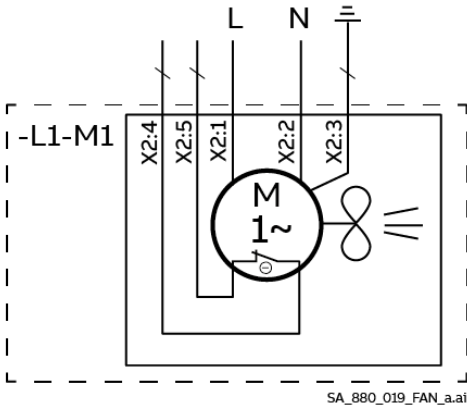
b = Bridge type

Fan Data

Fan	W2E250	
Rated voltage [V _{AC}]	230; 1~	
Tolerance [%]	+6 / -10	
Frequency [Hz]	50	60
Power consumption [W]	135	185
Current consumption [A]	0.59	0.82
Blocking current [A]	< 0.9	< 0.9
Air flow [m ³ /h] freely blowing	1835	1910
Max. ambient temperature [°C]	60	
Useful lifetime of grease	appr. 40,000 h	
Protection	Internal temperature detectors	

Line reactor cooling fan for sizes H3 and H4

Fan assignment

Converter type	Size	Connection	Fan type	Airflow built in [m³/h]
DCS880-A01-0290-06 DCS880-A02-0320-06 DCS880-A0b-0315-04/05 ... DCS880-A0b-0520-04/05	H3		W2E143 230 V; 1~	375
DCS880-A01-0590-06 DCS880-A02-0650-06 DCS880-A0b-0610-04/05 ... DCS880-A0b-1000-04/05	H4			

b = Bridge type

Fan cable sizes and tightening torque connected at the fan terminals

Fan terminals are X2.

Converter type	Flexible cable		Solid cable	
	max [mm²]	torque [Nm]	max [mm²]	torque [Nm]
DCS880-A01-0290-06... DCS880-A02-0650-06 DCS880-A0b-0315-04/05 ... DCS880-A0b-1000-04/05	0.5 ... 2.5	Push-in	0.5 ... 2.5	Push-in

b = Bridge type

Fan Data

Fan	W2E143	
Rated voltage [V _{AC}]	230; 1~	
Tolerance [%]	+6 / -10	
Frequency [Hz]	50	60
Power consumption [W]	24	26
Current consumption [A]	0.12	0.11
Air flow [m³/h] freely blowing	375	440
Max. ambient temperature [°C]	70	
Useful lifetime of grease	appr. 40,000 h	
Protection	Internal temperature detectors	

Cabling instructions

Selecting the power cables

General rules

Select the input power and motor cables according to local regulations.

- **Current:**
Select a cable capable of carrying the cabinets/drives nominal current.
- **Temperature:**
For an IEC installation, select a cable rated for at least 70°C (158°F) maximum permissible temperature of conductor in continuous use.
Exception: For cabinets/drives with enclosure class IP42 and higher, select a 90°C (194°F) cable.
- The inductance and impedance of the PE conductor/cable (grounding wire) must be rated according to permissible touch voltage appearing under fault conditions (so that the fault point voltage will not rise excessively when a ground fault occurs).
- **Note:** AC and DC busbar terminals are designed to withstand an operation temperature of up to 90°C (194°F).
- **Voltage:**
 - A 600 V_{AC} cable is accepted for up to 500 V_{AC}.
 - A 750 V_{AC} cable is accepted for up to 600 V_{AC}.
 - For 690 V_{AC} rated equipment, the rated voltage between the conductors (L1, L2, L3) of the cable should be at least 1 kV.
 - For mains voltages exceeding 690 V_{AC} and DC voltages exceeding 850 V_{DC} select power cables which comply with local regulations.

It is recommended to select following cables:

 - UL: 2 kV voltage class.
 - EN: Rated voltage conductor to earth 1000 V_{AC}/1500 V_{DC} and rated voltage conductor to conductor 1600 V_{AC}/3000 V_{DC}.
- The protective conductor must always have an adequate conductivity.
Unless local wiring regulations state otherwise, the cross-sectional area of the protective conductor must agree with the conditions that require automatic disconnection of the supply required in 411.3.2. of IEC 60364-4-41:2005 and be capable of withstanding the prospective fault current during the disconnection time of the protective device. The cross-sectional area of the protective conductor can either be selected from the table below or calculated according to 543.1 of IEC 60364-5-54. The table below shows the minimum cross-sectional area related to the phase conductor size according to IEC 61800-5-1 when the phase conductor and the protective conductor are made of the same metal. If this is not so, the cross-sectional area of the protective earthing conductor shall be determined in a manner which produces a conductance equivalent to that which results from the application of this table.

Cross-sectional area of the phase conductors S (mm ²)	Minimum cross-sectional area of the corresponding protective conductor Sp (mm ²)
$S \leq 16$	S
$16 < S \leq 35$	16
$35 < S$	S/2

Additional US requirements

Use type MC continuous corrugated aluminum armor cable with symmetrical grounds or shielded power cable for the motor cables if metallic conduit is not used. For the North American market, 600 V_{AC} cable is accepted for up to 500 V_{AC}. 1000 V_{AC} cable is required above 500 V_{AC} (below 600 V_{AC}). For cabinets/drives rated over 100 amperes, the power cables must be rated for at least 75°C (167°F).

Exception: For cabinets/drives with enclosure class UL Type 12 or higher, select a 90 °C (194 °F) cable.

Conduit

Couple separate parts of a conduit together. Bridge the joints with a ground conductor bonded to the conduit on each side of the joint. Also bond the conduits to the cabinet and motor frame. Use separate conduits for input power, motor, brake resistor and control wiring. When a conduit is employed, type MC continuous corrugated aluminum armor cable or shielded cable is not required. A dedicated ground cable is always required.

Note: Do not run motor wiring from more than one cabinet/drive in the same conduit.

Armored cable/shielded power cable

Six conductor (3 phases and 3 ground) type MC continuous corrugated aluminum armor cable with symmetrical grounds is for example available from the following suppliers (trade names in parentheses):

- Anixter Wire & Cable (Philsheath).
- BICC General Corp (Philsheath).
- Rockbestos Co. (Gardex).
- Oaknite (CLX).

Shielded power cables are for example available from Belden, LAPPKABEL (ÖLFLEX) and Pirelli.

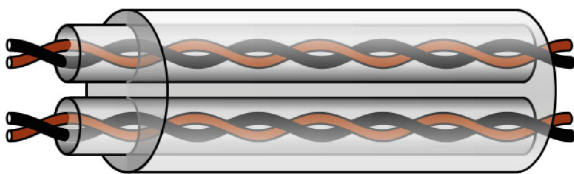
Selecting the control/signal cables

Shielding

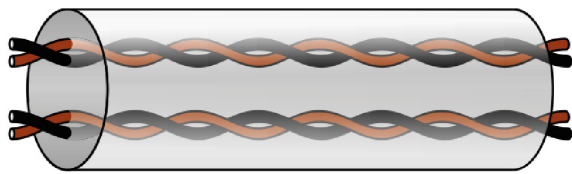
All control cables must be shielded.

Use a double-shielded twisted pair cable (figure A below) for analog signals. This type of cable is also recommended for the pulse encoder signals. Employ one individually shielded pair for each signal. Do not use common return for different analog signals.

A double-shielded twisted pair cable (figure A below) is the best alternative for low-voltage digital signals but a single-shielded twisted pair cable (figure B below) is also acceptable.



GE_KAB_001_shielded_a.ai



GE_KAB_001_shielded_b.ai

A: Double-shielded twisted pair cable.

B: Single-shielded twisted multi pair cable

The pairs should be twisted as close to the terminals as possible.

Signals in separate cables

Run analog and digital signals in separate, shielded cables. Never mix 24 V_{DC} and 115/230 V_{AC} signals in the same cable.

Signals allowed to be run in the same cable

Relay-controlled signals, providing their voltage does not exceed 48 V, can be run in the same cables as digital input signals. The relay-controlled signals should be run as twisted pairs too.

Relay cable type

The cable type with braided metallic screen (for example ÖLFLEX by LAPPKABEL, Germany) has been tested and approved by ABB.

Control panel cable length and type

In remote use, the cable connecting the control panel to the drive must not exceed three meters (10 ft).

Cable type: Shielded CAT 5e or better Ethernet patch cable with RJ-45 ends.

Optical Cables

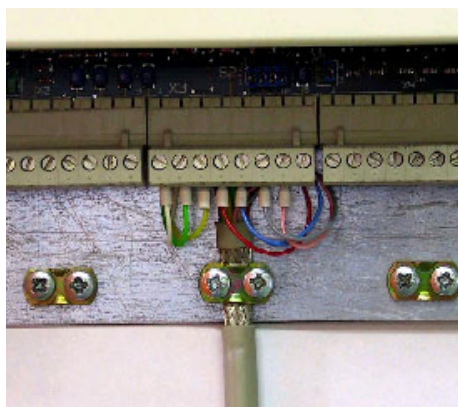
The max. cable length for optical cables depends on the type of optical cable selected (plastic fiber optic or HCS); for details please refer to the [DCS880 Hardware manual \(3ADW000462\)](#). Moreover follow the instructions concerning the use of optical cables given by the cable suppliers.

Fieldbus Cables

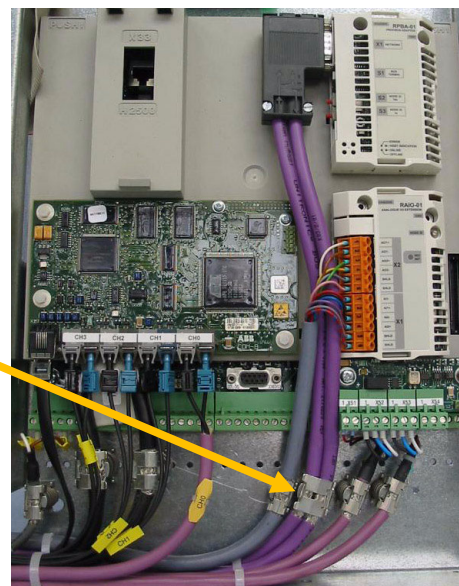
Fieldbus cables can be quite different, depending on the fieldbus type. Please refer to the instructions given by the fieldbus supplier.

Connecting the signal and control cables

Used screened cables for digital signals, which are longer than 3 m and for all analog signals. Connect each screen at both ends by metal clamps or comparable means directly on clean metal surfaces, if both earthing points belong to the same earth line. Otherwise, connect a capacitor (e.g. 3.3 nF/ 3000 V) to earth on one end. In the cabinet this kind of connection must be made directly on the sheet metal close to the terminals and if the cable comes from outside also on the PE bar. At the other end of the cable, connect the screen well with the housing of the signal emitter or receiver.



Connection of cable screens with metal clamps to the metal surface of the electronic tray.
Size H7, H8 screen connection.



Routing the cables

Run the motor cable away from other cable routes. Motor cables of several cabinets/drives can be run in parallel installed next to each other. Motor cables, input power cables and control cables should be installed on separate trays.

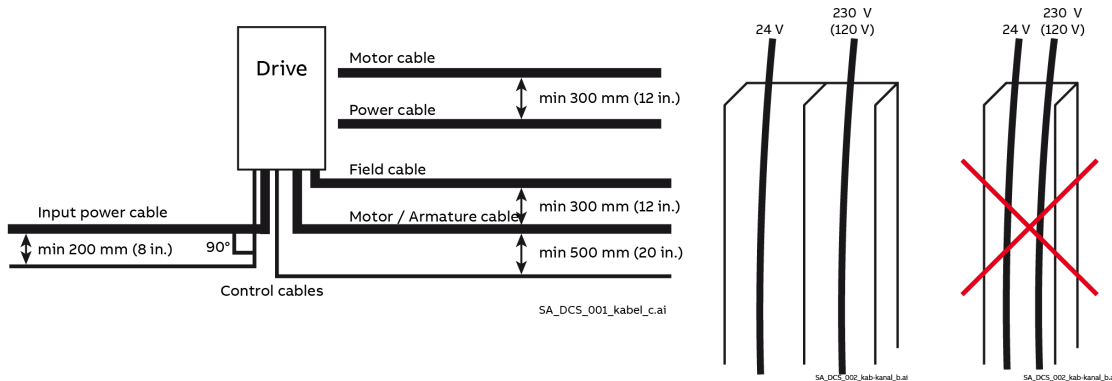
Avoid long parallel runs of motor cables with other cables to decrease electromagnetic interference caused by the rapid changes in the drive output voltage.

Where control cables must cross power cables, ensure they are arranged at an angle as close to 90 degrees as possible. Do not run spare cables through the cabinet/drive.

The cable trays must have good electrical bonding to each other and to the grounding electrodes.

Aluminum tray systems can be used to improve local equalizing of potential.

The following diagrams show the proper routing of cables.



Route 24 V_{DC} and 120/230 V_{AC} control cables in separate ducts inside the cabinet

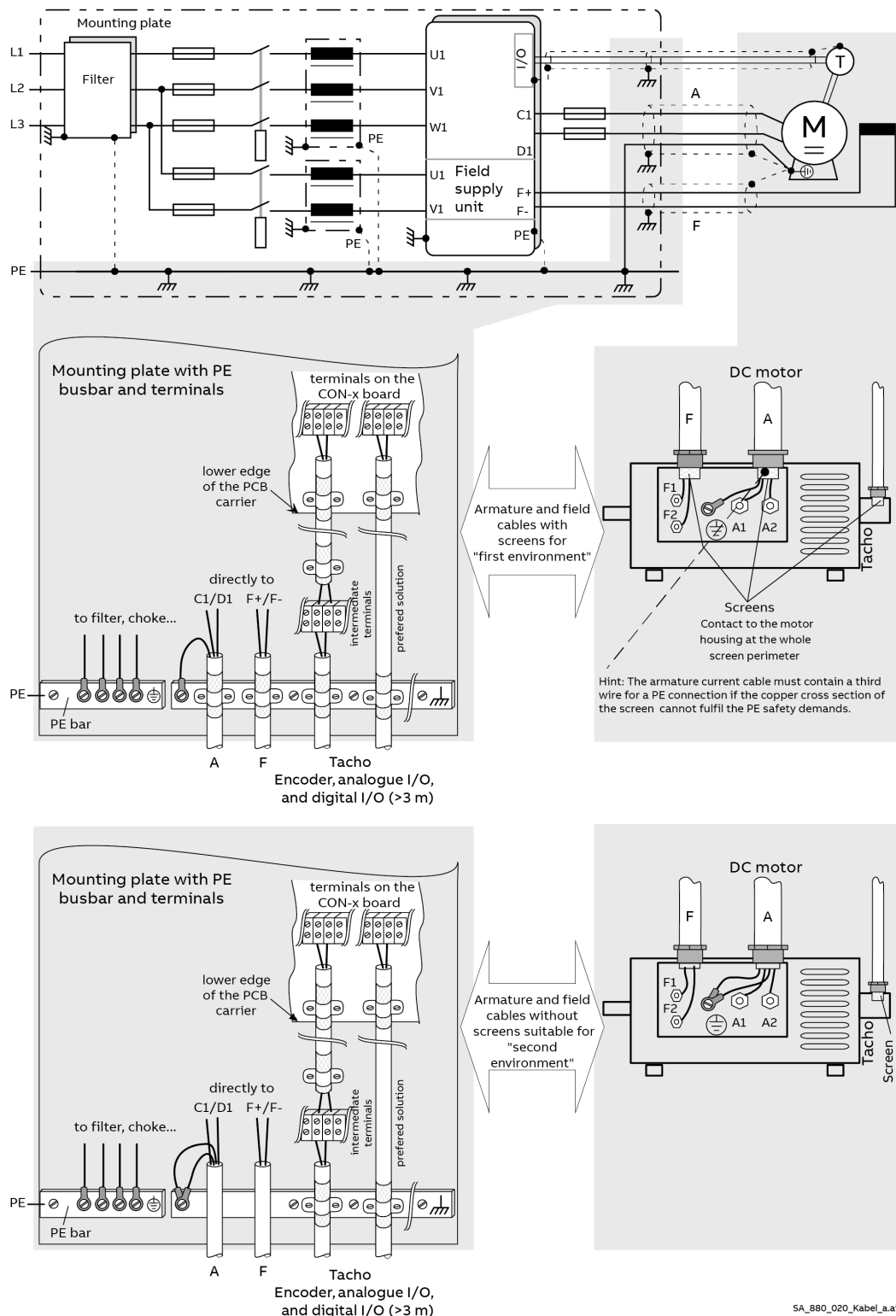
Not allowed unless the 24 V_{DC} cable is insulated for 120/230 V_{AC} or insulated with an insulation sleeving for 120/230 V_{AC}.

Continuous motor cable shield or enclosure for equipment on the motor cable

To minimize the emission level when safety switches, contactors, connection boxes or similar equipment are installed on the motor cable between the cabinet/drive and the motor:

- European Union: Install the equipment in a metal enclosure with 360 degree grounding for the shields of both the incoming and outgoing cable or connect the shields of the cables otherwise together.
- US: Install the equipment in a metal enclosure in a way that the conduit or motor cable shielding runs consistently without breaks from the cabinet/drive to the motor.

Connection example in accordance with EMC



Important hint: The example shows the principle structure of a DC cabinet/drive and its connections. It is not a binding recommendation, and it cannot respect all conditions of a plant. Therefore each cabinet/drive must be considered separately and with respect to the special application. Additionally the general installation and safety rules must be considered.

Cross-sectional areas - Tightening torques

Recommended cross-sectional area to **DINVDE 0276-1000** and **DINVDE 0100-540 (PE)** trefoil arrangement, up to 50°C ambient temperature. The necessary wire torque at 60°C wire temperature is the same as recommended in the following table.

Recommended cross-sectional areas for the AC-connections

Cabinet type	AC-connection (U, V, W) + PE					Size	
		Amount of single cores and cross - sectional area connected per phase/PE (1*)	Amount of holes per phase for single drives ; group drives are connected via incoming supply units; for sizes H1 ... H3 (350 A) terminals are used	Size of screws (2*); not for UL	UL as per Nema 2 (3*): Amount of holes per phase for single drives ; group drives are connected via incoming supply units; for sizes H1 ... H3 (350 A) terminals are used		
	I _{AC} [A~]	[mm²]					
400 V / 500 V (IEC) / 525 V (UL)							
DCS880-A01-0090-04/05	66	1 x 25	1 terminal (16 ...95 mm²)		1 terminal (16 ...95 mm²)	H1	
DCS880-A02-0100-04/05	74	1 x 25	1 terminal (16 ...95 mm²)		1 terminal (16 ...95 mm²)		
DCS880-A01-0270-04/05	197	1 x 95	1 terminal (16 ...95 mm²)		1 terminal (16 ...95 mm²)	H2	
DCS880-A02-0300-04/05	222	1 x 95	1 terminal (16 ...95 mm²)		1 terminal (16 ...95 mm²)		
DCS880-A01-0315-04/05	234	1 x 120	1 terminal (16 ...95 mm²)		1 terminal (16 ...95 mm²)	H3	
DCS880-A02-0350-04/05	246	1 x 120	1 terminal (16 ...95 mm²)		1 terminal (16 ...95 mm²)		
DCS880-A01-0405-04/05	296	1 x 120	2	M12	2		
DCS880-A02-0450-04/05	333	1 x 185	2	M12	2		
DCS880-A01-0470-04/05	328	1 x 185	2	M12	2		
DCS880-A02-0520-04/05	369	1 x 185	2	M12	2		
DCS880-A01-0610-04/05	443	2 x 150	2	M12	4	H4	
DCS880-A02-0680-04/05	492	2 x 150	2	M12	4		
DCS880-A01-0740-04/05	558	2 x 185	2	M12	4		
DCS880-A02-0820-04/05	615	2 x 185	2	M12	4		
DCS880-A01-0900-04/05	665	2 x 240	2	M12	4		
DCS880-A02-1000-04/05	738	2 x 240	2	M12	4		
DCS880-A0b-1200-04/05	935	4 x 150	4	M12	on request	H6	
DCS880-A0b-1500-04/05	1169	4 x 185	4	M12			
DCS880-A0b-2000-04/05	1517	6 x 150	4	M12			
DCS880-A0b-2050-05	1599	6 x 185	8	M12		H7	
DCS880-A0b-2500-04/05	2009	8 x 185	8	M12			
DCS880-A0b-3000-04/05	2460	10 x 185	12	M12			
DCS880-A0b-3300-04/05	2706	10 x 185	16	M12		H8	
DCS880-A0b-4000-04/05	3280	10 x 240	16	M12			
DCS880-A0b-5200-04/05	4182	14 x 240	16	M12			
DCS880-A0b-6600-04/05P	5084	2 x (10 x 185)	request on			H8P	
DCS880-A0b-8000-04/05P	6232	2 x (10 x 240)					
DCS880-A0b-9999-04/05P	8036	2 x (14 x 240)					
600 V / 690 V							
DCS880-A01-0290-06	181	1 x 95	1 terminal (16 ...95 mm²)		1 terminal (16 ...95 mm²)	H3	
DCS880-A02-0320-06	197	1 x 95	1 terminal (16 ...95 mm²)		1 terminal (16 ...95 mm²)		
DCS880-A01-0590-06	304	1 x 120	2	M12	2	H4	
DCS880-A02-0650-06	328	1 x 185	2	M12	2		
DCS880-A0b-0900-06/07	702	4 x 95	4	M12	on request	H6	
DCS880-A0b-1500-06/07	1169	4 x 185	4	M12			
DCS880-A01-2000-06/07	1517	6 x 150	4	M12			
DCS880-A0b-2050-06/07	1599	6 x 185	8	M12		H7	
DCS880-A0b-2500-06/07	2009	8 x 185	8	M12			
DCS880-A0b-3000-06/07	2460	10 x 185	12	M12			
DCS880-A0b-3300-06/07	2706	10 x 185	16	M12		H8	
DCS880-A0b-4000-06/07	3280	10 x 240	16	M12			
DCS880-A0b-4800-06/07	3854	12 x 240	16	M12			
DCS880-A0b-6600-06/07P	5084	2 x (10 x 185)	request on			H8P	
DCS880-A0b-8000-06/07P	6232	2 x (10 x 240)					
DCS880-A0b-9600-06/07P	7380	2 x (12 x 240)					

Cabinet type	AC-connection (U, V, W) + PE					Size
		Amount of single cores and cross - sectional area connected per phase/PE (1*)	Amount of holes per phase for single drives ; group drives are connected via incoming supply units; for sizes H1 ... H3 (350 A) terminals are used	Size of screws (2*); not for UL	UL as per Nema 2 (3*): Amount of holes per phase for single drives ; group drives are connected via incoming supply units; for sizes H1 ... H3 (350 A) terminals are used	
	I _{AC} [A~]	[mm²]				
800 V						
DCS880-A0b-1900-08	1558	6 x 185	8	M12	on request	H7
DCS880-A0b-2500-08	2050	8 x 185	8	M12		
DCS880-A0b-3000-08	2460	10 x 185	12	M12		
DCS880-A0b-3300-08	2706	10 x 185	16	M12		H8
DCS880-A0b-4000-08	3280	10 x 240	16	M12		
DCS880-A0b-4800-08	3854	12 x 240	16	M12		
DCS880-A0b-6600-08P	5084	2 x (10 x 185)	request on			H8P
DCS880-A0b-8000-08P	6232	2 x (10 x 240)				
DCS880-A0b-9600-08P	7380	2 x (12 x 240)				
990 V						
DCS880-A0b-2050-10	1681	6 x 185	16	M12	on request	H8
DCS880-A0b-2600-10	2132	8 x 185	16	M12		
DCS880-A0b-3300-10	2706	10 x 185	16	M12		
DCS880-A0b-4000-10	3280	10 x 240	16	M12		
DCS880-A0b-5200-10P	4018	2 x (8 x 185)	request on			H8P
DCS880-A0b-6600-10P	5084	2 x (10 x 185)				
DCS880-A0b-8000-10P	6232	2 x (10 x 240)				
1200 V						
DCS880-A0b-2600-12	2132	8 x 185	request on		request on	H8
DCS880-A0b-3300-12	2706	10 x 185				
DCS880-A0b-4000-12	3116	10 x 240				
Incoming Supply Sections						
DCS880-A50-1000-07	1000	3 x 120	8	M12	on request	
DCS880-A50-2000-07	2000	7 x 185	8	M12		
DCS880-A50-3000-07 for IEC	3000	9 x 240	8	M12		
DCS880-A50-3000-07 for UL	3000	9 x 240	8	M12		
DCS880-A50-4000-07	4000	12 x 240	8	M12		
(1*) Recommended by ABB: - Use cable type VPE (90°C; 194°F) with 4 cores - AC - connection: U, V, W and PE - DC - connection: L+, L- and 2 x PE - Ambient temperature: 40°C; 104°F - Load: 100 %			(2*) Tightening torque: M10 = 25 Nm; 18.5 ft.-lbs. M12 = 50 Nm; 37 ft.-lbs.		(3*) Diameter of all holes: 14 mm	

Recommended cross-sectional areas for the DC-connections

Cabinet type	DC-connection (U+, U-) + 2 x PE							Size
			With DC-fuses		Without DC-fuses			
		Amount of single cores and cross - sectional area connected per phase/PE (1°)	Amount of holes for connection per phase	Size of screws (2°)	Amount of holes for connection per phase for single drives; for sizes H1 ... H3 (350 A) the terminals are used	Size of screws (2°); not for UL	UL as per Nema 2 (3°): Amount of holes per phase for single drives; for size H1 ... H3 (350 A) the terminals are used	
	I _{DCI} [A-]	[mm²]						
400 V / 500 V (IEC) / 525 V (UL)								
DCS880-A01-0090-04/05	80	1 x 35	2	M10	1 terminal (16 ... 95 mm²)		1 terminal (16 ... 95 mm²)	H1
DCS880-A02-0100-04/05	90	1 x 35	2	M10	1 terminal (16 ... 95 mm²)		1 terminal (16 ... 95 mm²)	
DCS880-A01-0270-04/05	240	1 x 95	2	M10	1 terminal (16 ... 95 mm²)		1 terminal (16 ... 95 mm²)	H2
DCS880-A02-0300-04/05	270	1 x 120	2	M10	1 terminal (16 ... 95 mm²)		1 terminal (16 ... 95 mm²)	
DCS880-A01-0315-04/05	285	1 x 120	2	M10	1 terminal (16 ... 95 mm²)		1 terminal (16 ... 95 mm²)	H3
DCS880-A02-0350-04/05	300	1 x 120	2	M10	1 terminal (16 ... 95 mm²)		1 terminal (16 ... 95 mm²)	
DCS880-A01-0405-04/05	360	1 x 185	2	M10	2	M12	2	
DCS880-A02-0450-04/05	405	1 x 185	2	M10	2	M12	2	
DCS880-A01-0470-04/05	400	1 x 185	2	M10	2	M12	2	
DCS880-A02-0520-04/05	450	1 x 185	2	M10	2	M12	2	
DCS880-A01-0610-04/05	540	2 x 150	2	M10	4	M12	4	H4
DCS880-A02-0680-04/05	600	2 x 150	2	M10	4	M12	4	
DCS880-A01-0740-04/05	680	2 x 185	2	M10	4	M12	4	
DCS880-A02-0820-04/05	750	2 x 185	2	M10	4	M12	4	
DCS880-A01-0900-04/05	810	2 x 240	2	M10	4	M12	4	
DCS880-A02-1000-04/05	900	2 x 240	2	M10	4	M12	4	
DCS880-A0b-1200-04/05	1140	4 x 150			8	M12	8	H6
DCS880-A0b-1500-04/05	1425	5 x 185			8	M12	8	
DCS880-A0b-2000-04/05	1850	6 x 185			8	M12	8	
DCS880-A0b-2050-05	1950	7 x 185			8	M12		H7
DCS880-A0b-2500-04/05	2450	8 x 185			8	M12		
DCS880-A0b-3000-04/05	3000	11 x 185			8	M12		
DCS880-A0b-3300-04/05	3300	11 x 185			16	M12		H8
DCS880-A0b-4000-04/05	4000	12 x 240			16	M12		
DCS880-A0b-5200-04/05	5100	15 x 240			16	M12		
DCS880-A0b-6600-04/05P	6200	2 x (11 x 185)			request on			H8P
DCS880-A0b-8000-04/05P	7600	2 x (12 x 240)						
DCS880-A0b-9999-04/05P	9800	2 x (15 x 240)						
600 V / 690 V								
DCS880-A01-0290-06	220	1 x 95	2	M10	1 terminal (16 ... 95 mm²)		1 terminal (16 ... 95 mm²)	H3
DCS880-A02-0320-06	240	1 x 95	2	M10	1 terminal (16 ... 95 mm²)		1 terminal (16 ... 95 mm²)	
DCS880-A01-0590-06	370	1 x 185	2	M10	4	M12	4	H4
DCS880-A02-0650-06	400	1 x 185	2	M10	4	M12	4	
DCS880-A0b-0900-06/07	855	4 x 95			8	M12	8	H6
DCS880-A0b-1500-06/07	1425	5 x 185			8	M12	8	
DCS880-A01-2000-06/07	1850	6 x 185			8	M12	8	
DCS880-A0b-2050-06/07	1950	7 x 185			8	M12		H7
DCS880-A0b-2500-06/07	2450	8 x 185			8	M12		
DCS880-A0b-3000-06/07	3000	11 x 185			8	M12		
DCS880-A0b-3300-06/07	3300	11 x 185			16	M12		H8
DCS880-A0b-4000-06/07	4000	12 x 240			16	M12		
DCS880-A0b-4800-06/07	4700	14 x 240			16	M12		
DCS880-A0b-6600-06/07P	6200	2 x (11 x 185)			request on			H8P
DCS880-A0b-8000-06/07P	7600	2 x (12 x 240)						
DCS880-A0b-9600-06/07P	9000	2 x (14 x 240)						

Cabinet type	DC-connection (U+, U-) + 2 x PE							Size	
			With DC-fuses		Without DC-fuses				
		Amount of single cores and cross-sectional area connected per phase/PE (1°)	Amount of holes for connection per phase	Size of screws (2°)	Amount of holes for connection per phase for single drives; for sizes H1 ... H3 (350 A) the terminals are used	Size of screws (2°); not for UL	UL as per Nema 2 (3°): Amount of holes per phase for single drives; for size H1 ... H3 (350 A) the terminals are used		
	I _{DCI} [A-]	[mm²]							
800 V									
DCS880-A0b-1900-08	1900	7 x 185			8	M12	on request	H7	
DCS880-A0b-2500-08	2500	8 x 185			8	M12			
DCS880-A0b-3000-08	3000	11 x 185			8	M12			
DCS880-A0b-3300-08	3300	11 x 185			16	M12			
DCS880-A0b-4000-08	4000	12 x 240			16	M12			
DCS880-A0b-4800-08	4700	14 x 240			16	M12			
DCS880-A0b-6600-08P	6200	2 x (11 x 185)			request on				
DCS880-A0b-8000-08P	7600	2 x (12 x 240)							
DCS880-A0b-9600-08P	9000	2 x (14 x 240)						H8P	
990 V									
DCS880-A0b-2050-10	2050	7 x 185			16	M12	on request	H8	
DCS880-A0b-2600-10	2600	9 x 185			16	M12			
DCS880-A0b-3300-10	3300	11 x 185			16	M12			
DCS880-A0b-4000-10	4000	12 x 240			16	M12			
DCS880-A0b-5200-10P	4900	2 x (9 x 185)			request on				
DCS880-A0b-6600-10P	6200	2 x (11 x 185)							
DCS880-A0b-8000-10P	7600	2 x (12 x 240)						H8P	
1190 V									
DCS880-A0b-2600-12	2600	9 x 185			request on		request on	H8	
DCS880-A0b-3300-12	3300	11 x 185							
DCS880-A0b-4000-12	3800	12 x 240							
(1°) Recommendation by ABB: - Use cable type VPE (90°C; 194°F) with 4 cores - AC - connection: U, V, W and PE - DC - connection: L+, L- and 2 x PE - Ambient temperature: 40°C; 104°F - Load: 100 %			(2°) Tightening torque: M10 = 25 Nm; 18.5 ft.-lbs. M12 = 50 Nm; 37 ft.-lbs.			(3°) Diameter of all holes: 14 mm			

Instructions on how to calculate the PE conductor's cross-sectional area can be found in VDE 0100 or in equivalent national standards. Keep in mind, that power converters may have a current-limiting effect.

Cable connections



WARNING

Make sure that the cabinet is disconnected from the mains/auxiliary voltages during installation and that the capacitors of the mains filters are discharged.

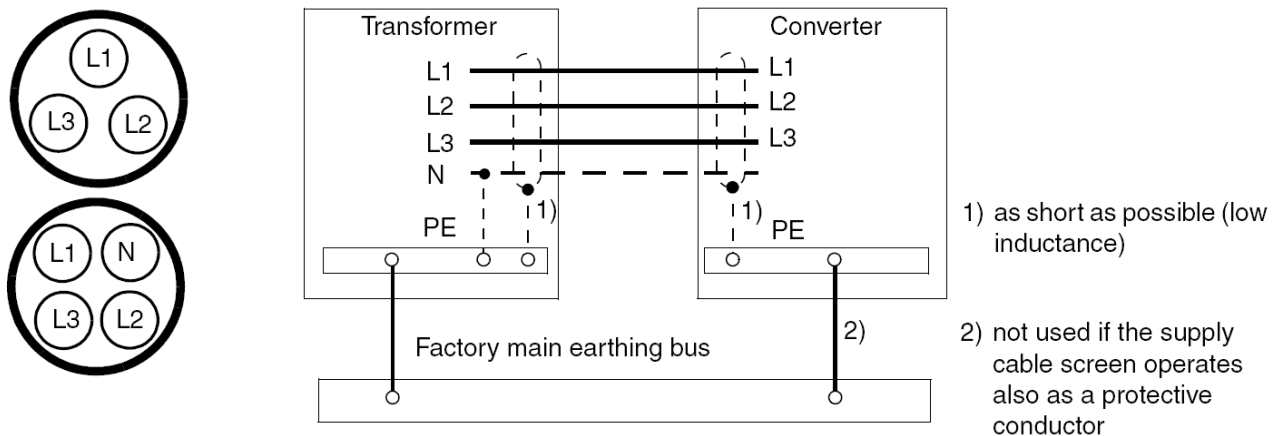
Mains cable connection

This section describes the mains connections of the cabinets.

The N conductor is not usually used although it is visible in the following diagrams.

Low power supply

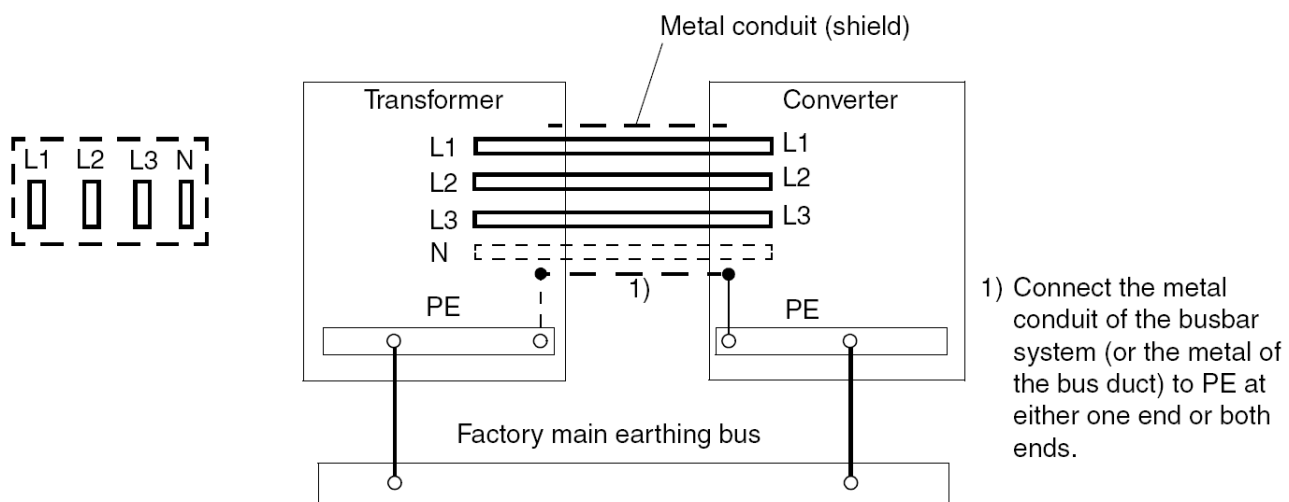
Low current (< 300 A) cable connection, when one cable is sufficient.



High power supply

Busbar connection

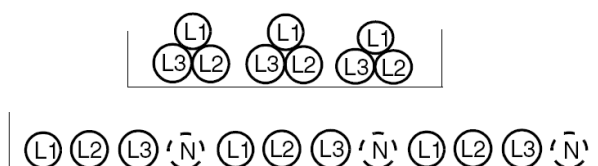
High current (> 300 A) busbar connection.



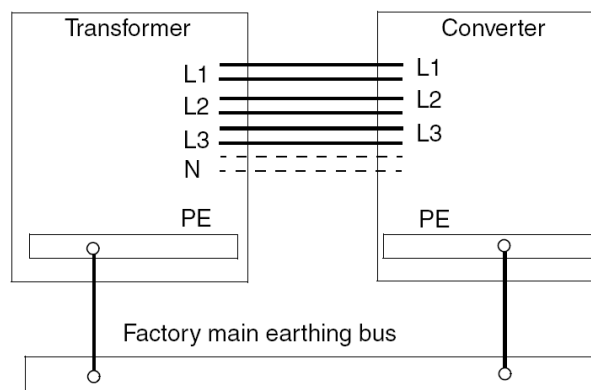
Note: The paint should be removed to allow a good connection to the cabinet frames throughout the whole perimeter of the metal conduit (or a bus duct). The metal conduit (or the bus duct metal) should be electrically continuous throughout its complete length.

Cable bus system

High current (> 300 A) cable bus system, consisting of several cables.



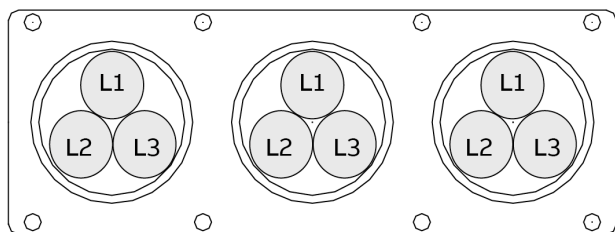
Note: It is recommended to arrange the cables alongside as shown to achieve a current distribution as accurate as possible. Air between cables is required for cooling.



Note: De-rating of the cables current capabilities is required when installing the cables in a cable tray. This de-rating factor must be considered as per the local electrical safety codes.

Correct cabling through metal cable entries

In case metallic cable entries (e.g. EMC-cable entry) are used all three phases (L1, L2, L3) have to be routed together through one single drilling hole.



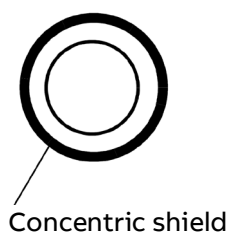
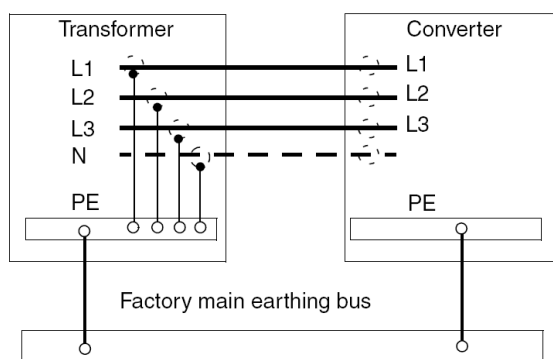
ME_BLE_003_gland plate_a.ai

If the phases are routed separately, means each phase uses its own drilling hole, then the metal will be heated due to circulating currents.

Single-core cables with concentric protective shields

High current (> 300 A) cable system, consisting of single-core cables.

When single-core cables equipped with concentric protective shields (metal) are used, the phase current will induce voltage to the cable shield. If the shields are connected to each other at both ends of the cable, current will flow in the cable shield. In order to prevent this and to ensure personal safety, the cable shield must be connected only to PE at the transformer side and insulated on the converter side.



Motor cable connection

Motor cable connection should be performed as indicated in the [Technical Guide \(3ADW000163\)](#).

Cable tray or bus duct

De-rating of the cables current capabilities is required when installing the cables in a cable tray. This de-rating factor must be considered as per the local electrical safety codes.

For some market areas and some large power applications, a bus duct may be used to supply the cabinets. The metal of the bus duct should be grounded at both ends of the complete system. The paint should be removed to allow a good connection to the cabinet frames throughout the whole perimeter of the bus duct. The bus duct should be electrically continuous throughout its complete length.

Mechanical cable connection

The mechanical cable connections are basically the same for mains cable connection and motor cable connection. What changes between the various types are the cabinet dimension and the location of the terminals for the cables. The cabling direction may also vary, e.g. from top or bottom.

If necessary, the same screw can be used to connect two cable lugs at the busbar. In some cases not allowed because of local regulations, e.g. in USA. Always use a torque wrench for tightening the cable connections.

Location of cable connection within the cabinet

DCS880 converters are used in the cabinets. The standard version is equipped with a bottom entry for power cables and control cables. Basically all control cable connections are located on the left side of the cabinet.

Motor Cable Connection

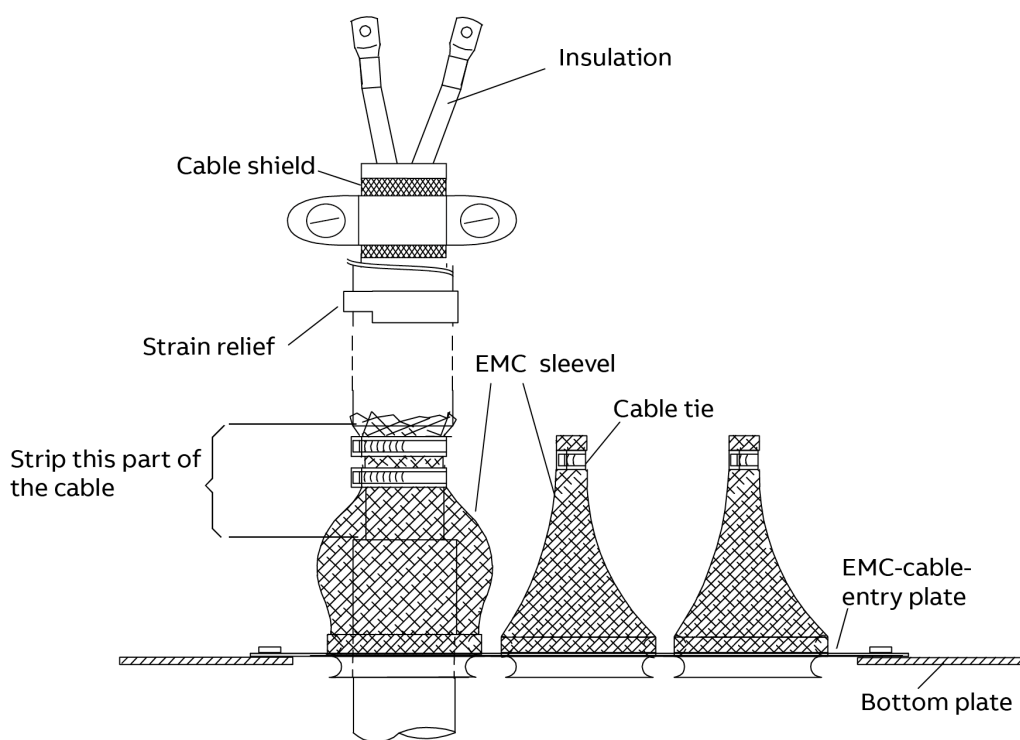
Conductive Sleeves

Conductive sleeves are supplied by ABB as option to provide 360° high frequency grounding for motor cables. To assemble, follow these instructions:

- Pull the cable into the cabinet through the conductive sleeve.
- If a rubber grommet is used, slide it over the cable.
- Connect the phase conductors to the terminals.
- Twist the shield wires of the cable together and connect them to the ground terminal or the PE busbar.
- Peel off 3 ... 5 cm of the outer cable cover located above the entry plate for the 360° high frequency grounding.
- Fasten the conductive sleeve to the cable shield with cable ties.
- Tie up the unused conductive sleeves with cable ties.

Cable Entry


The drawing below shows a bottom cable entry for power cables of a cabinet. Tighten the conductive sleeve on the stripped part of the cable with cable ties. For IP 54 units, add a rubber grommet on the cable under the EMC-cable entry plate.



BG_880_024_conductive sleeves_a.ai

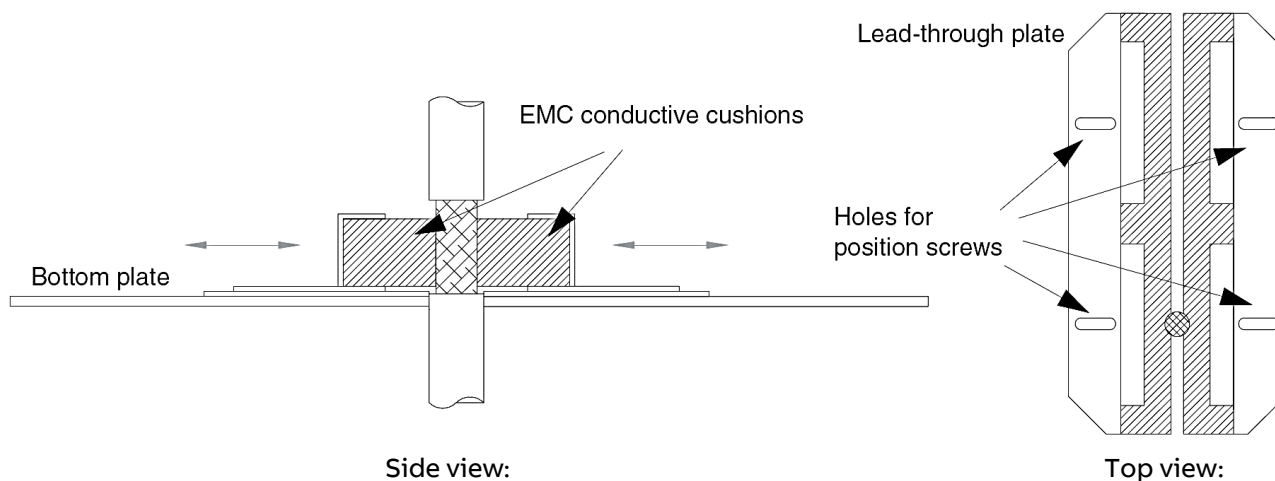
Control Cable Connection

Connect the control cables to the appropriate terminal block (or optional terminal block and other options on the DIN rail at the left side of the cabinet). Tighten the screw to secure the connection.

Connect the twisted screen (as short as possible) to the earthing rail  of the terminal. See also [Connecting the signal and control cables](#) and [Connection example in accordance with EMC](#).

EMC Grounding at the Cable Entry

Lead-through plates with conductive cushions are used as 360° high frequency grounding for control cable screens at the cable entry. They are available as an option from ABB.



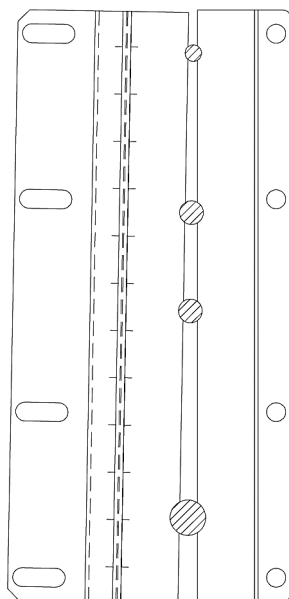
Special for top entry

When each cable has its own rubber grommet, sufficient IP and EMC protection can be achieved. However, if lots of control cables are connected to one cabinet, plan the installation beforehand as follows:

- Make a list of the cables to be connected to the cabinet.
- Sort the cables connected to the left into one group and the cables connected to the right into another group. This avoids unnecessary cable crossings inside the cabinet.
- Sort the cables in each group according to size.
- Group the cables for each grommet as follows:

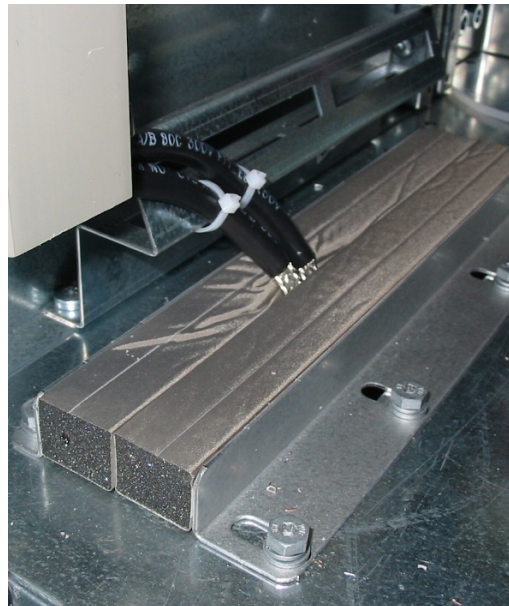
Cable diameter [mm]	Max. number of cables per grommet
≤ 13	4
≤ 17	3
< 25	2
≥ 25	1

- Divide the bunches so that cables will be arranged according to size between the conductive cushions.



Thinnest cable

Thickest cable



View from below

Bottom and Top Entry

- Loosen the lead-through plate position screws. Pull the two parts apart.
- For bottom entry:
Lead the cable inside the cabinet through the conductive cushions.
- For top entry:
Lead the cable inside the cabinet through the grommet and the conductive cushions. If you have several cables, bunch them together at the grommet, but ensure that each cable has a proper contact to the cushions on both sides.
- Strip off the cable plastic sheath above the base plate (just enough to ensure proper connection of the bare screen and the conductive cushions).

- Earth the screen by means of the conductive cushions.

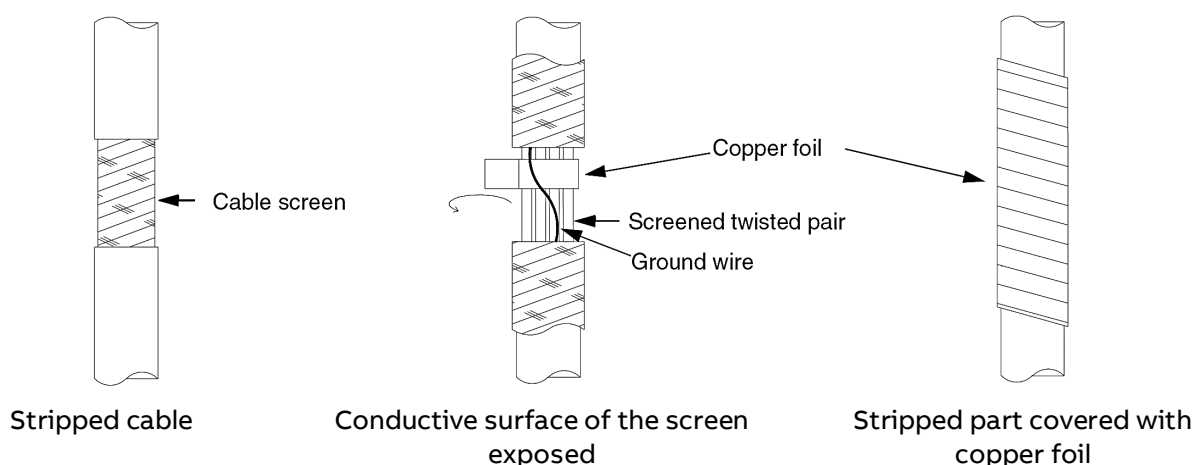
If the outer surface of the screen is conductive, push the two parts of the lead-through plate together so that the conductive cushions presses tightly around the bare screen.

If the outer surface of the screen is covered with non-conductive material, do the following:

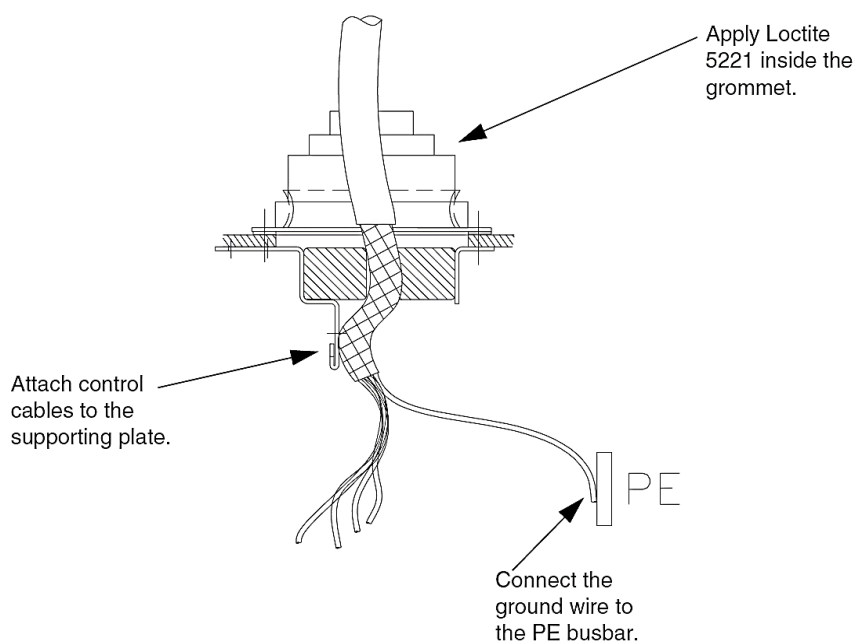
- Cut the screen at the midpoint of the bare part. Be careful not to cut the conductors.
- Turn the screen inside out to expose its conductive surface.
- Cover the turned screen and the stripped cable with copper foil to keep the shielding continuous.

Note: The ground wire (if present) must not be cut.

- Push the two parts of the lead-through plate together so that the conductive cushions press tightly round the foil covered screen.



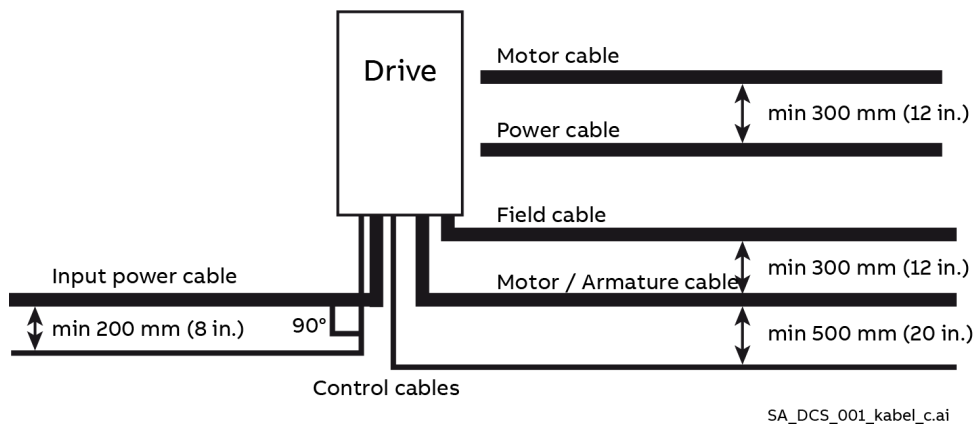
- Lock the two parts of the lead-through plate by tightening the positioning screws.
- For top entry:
If more than one cable go through a single grommet, the grommet must be sealed by Loctite 5221, catalogue number 25551.



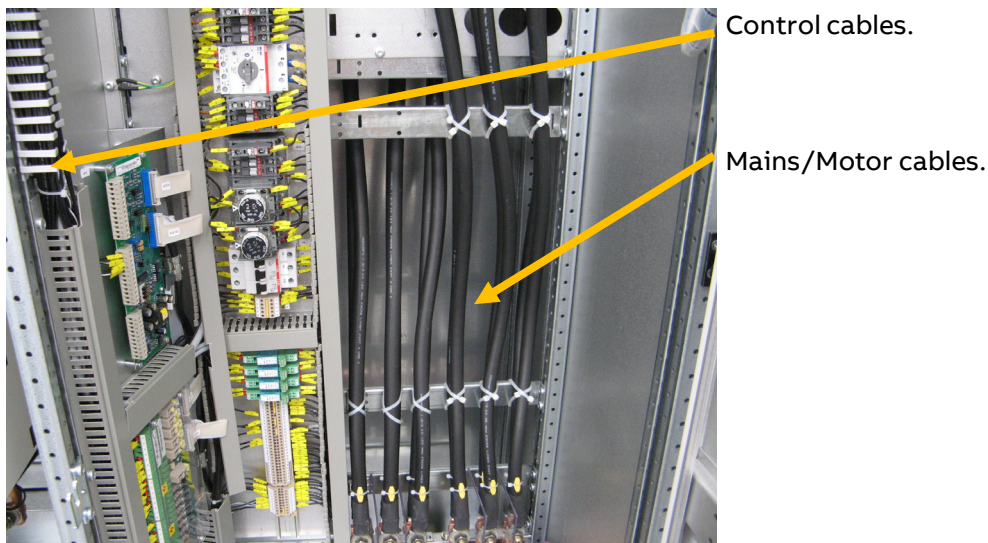
Side view

Routing the Cables

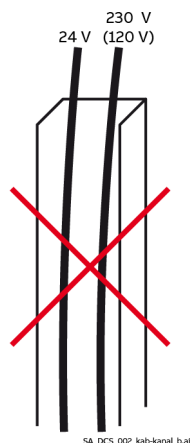
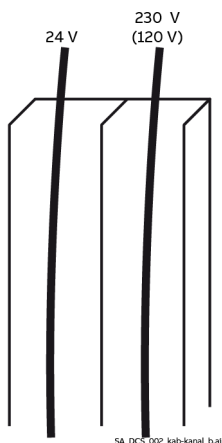
Cables that are sources of interference have to be separated from the cables that are sensitive to interference, thus follows:



- Route the motor cables (DC) away from all other cables.
- It is recommended that following cables be installed on separate trays:
 - Mains cables (AC).
 - Motor cables (DC).
 - Control cables.
- Motor cables of several drives can be run in parallel on the same tray next to each other.

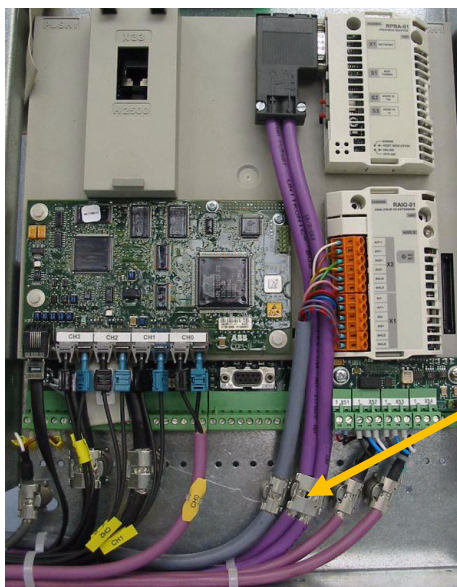


- Separate 24 V_{DC} and 115 / 230 V_{AC} control cables.



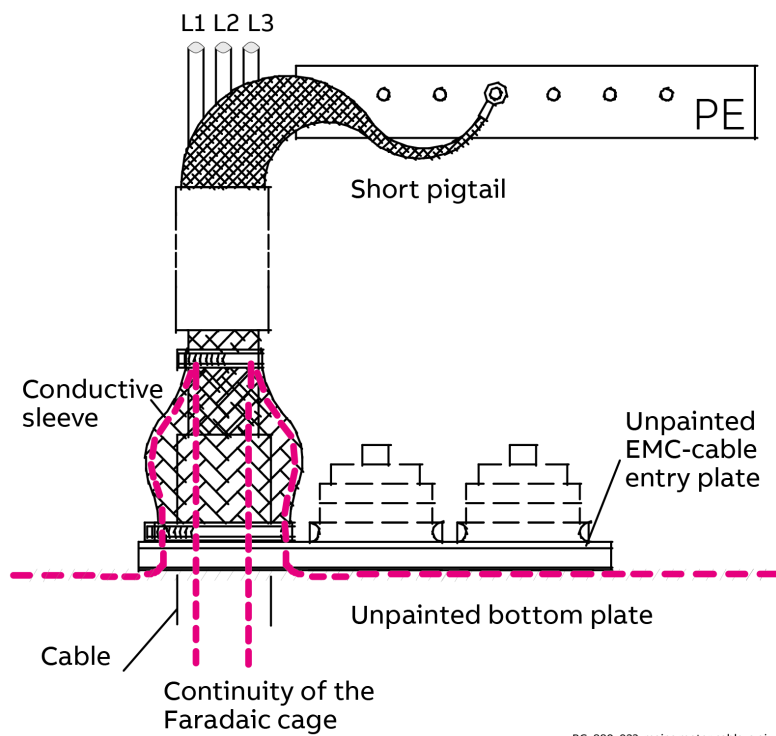
Route 24 V_{DC} and 120/230 V_{AC} control cables in separate ducts inside the cabinet

Not allowed unless the 24 V_{DC} cable is insulated for 120/230 V_{AC} or insulated with an insulation sleeving for 120/230 V_{AC}.

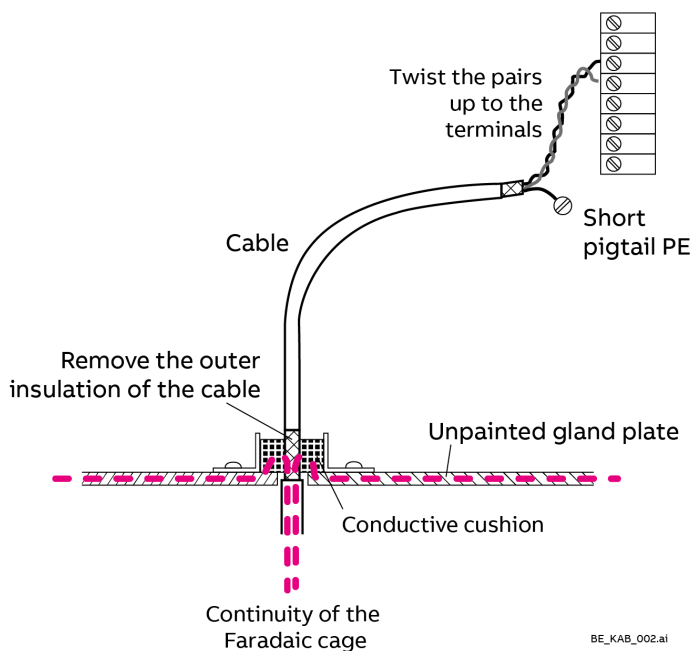


Connection of cable screens with metal clamps to the metal surface of the electronic tray.
Size H7, H8 screen connection.

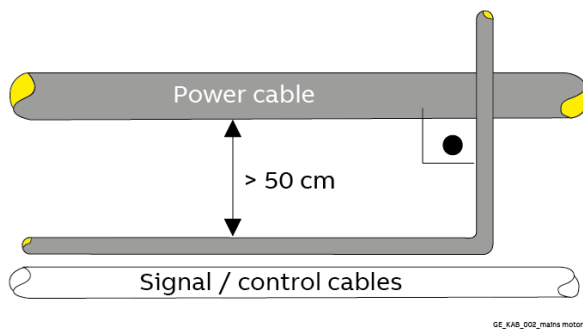
- Ground the cable screens also at the cable entry.
Mains/Motor cables.



Control cables.



- Avoid long parallel runs of motor cables with other cables in order to decrease electromagnetic interference caused by the rapid changes in the drive output current.
- Where control cables must cross mains/motor cables make sure they are arranged at an angle as near to 90 degrees as possible.



- Route control cables and other sensitive cables between different cubicles as close to the grounding busbar as possible.



Control cables.

- Do not run extra cables through the cabinet.
- The cable trays must have good electrical connection with each other and to ground (PE).
- Aluminum tray systems can be used to improve local equalizing of potential.

Finger protection

The finger protection is needed to prevent commissioning and service personnel from touching high voltage parts of the drives by mistake.

Finger protection.



WARNING

The finger protection covers of the cabinet have to be mounted properly before starting.

Installation checklist

Check the mechanical and electrical installation of the cabinet before start-up. Go through the checklist below together with another person. Read the [Safety instructions](#) on the first pages of this manual before you work on the cabinet.

MECHANICAL INSTALLATION

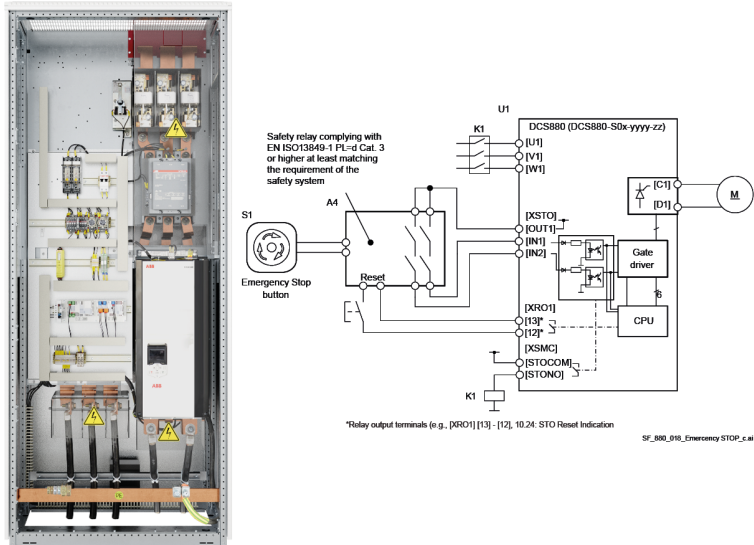
- ☐ The ambient operating conditions are acceptable, see Environmental Conditions and Current ratings in the [DCS880 Hardware manual \(3ADW000462\)](#).
- ☐ The cabinet is mounted properly, see [Mechanical installation](#).
 - The lifting bars (if used) are removed.
 - The cabinet roof is attached properly.
- ☐ The free space requirements are acceptable, see [Working order of the mechanical installation](#).
- ☐ The cooling air will flow freely, see [Door filters and ventilation](#).
 - The door filters (if used) are mounted properly.
 - The H7/H8 modules (if used) air outlet is connected properly.
 - The air baffle plates of the converter modules are mounted properly.
- ☐ The AC busbars and PE busbars are properly connected, see [Joining of the shipping splits](#).
- ☐ The internal control cables are properly connected, see [Joining of the shipping splits](#).
- ☐ The motor and the driven equipment is ready for start.
- ☐ All screen terminals are checked for tightness, see [Connecting the signal and control cables](#).
- ☐ All cable connections are seated properly, see [Connecting the signal and control cables](#).

ELECTRICAL INSTALLATION

- ☐ The converter modules are grounded properly.
- ☐ The mains voltage matches the converter module's nominal input voltage.
- ☐ The setting of the internal 220 V_{AC}/115 V_{AC} transformer T2 corresponds to the supply voltage.
- ☐ The mains (input power) connections at U1, V1 and W1 (L1, L2 and L3) and their tightening torques are OK.
- ☐ The appropriate mains fuses for units H1 ... H4, see [DCS880 Hardware manual \(3ADW000462\)](#), and the disconnectors are installed.
- ☐ The drive connections at C1, D1 and F+, F- and their tightening torques are OK.
- ☐ Motor cable routing (armature and excitation) is OK.
- ☐ Check that the screens are properly installed at the motor and in the cabinet.
- ☐ The motor connections L+, L-, F+ and F- and their tightening torques are OK.
- ☐ The control connections are OK.
- ☐ If a pulse encoder is used, check the encoder cables and correct direction of rotation, see [DCS880 Hardware manual \(3ADW000462\)](#).
- ☐ PT100, PTC, klaxon cables: Check that the connections are appropriate for the type of sensor used in the motor.
- ☐ Check the Safe Torque Off (STO) circuit for proper function.
- ☐ Check the prevention of unexpected start-up (on inhibit, coast stop) circuit for proper function.
- ☐ Check the E-stop circuit and relay for proper function.
- ☐ Cooling fan power wiring connected.
- ☐ The external control connections inside the cabinet are OK. Make sure that both ends of the cables are connected and the cables do not cause any damage or danger when power is being switched on.
- ☐ Cleanliness of the cabinets and surroundings. Check, that:
 - There are no tools, foreign objects or drill cuttings inside the cabinets.
 - There is no waste left from the installation, e.g. cable trimmings.
 - There is no garbage under the cabinets. The cooling air fan will draw the garbage inside the cabinets.
 - Use a vacuum cleaner to remove any dirt. **Do not use compressed air!**
- ☐ Before start-up close all doors, covers, air baffle plates, the motor connection box and check that the finger protection covers are mounted properly.

Functional safety

Cabinet based safety functions



Integrated safety simplifies configuration

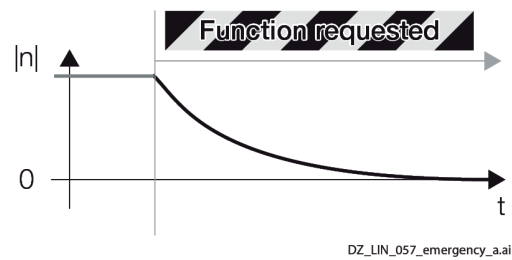
Integrated safety reduces the need for external safety components, simplifying configuration and reducing installation space. The safety functionality is built on the DCS880 safe torque off (STO) feature. The drives' functional safety is designed in accordance with EN/UL/IEC 61800-5-2 and complies with the requirements of the European Union Machinery Directive 2006/42/EC.

01 DCS880 + S880
Enclosed converter
02 + 03 Sample
E-Stop schematic

Safety functions available for DCS880

Safe torque off as standard

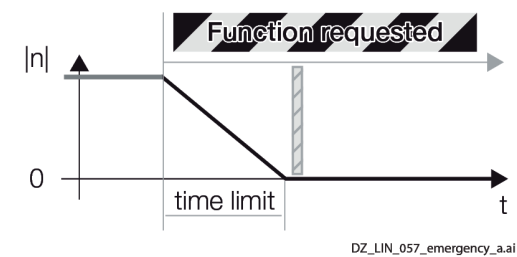
Safe torque off (STO) is used to prevent unexpected startup and in stopping-related functions, e.g. E-Stop, enabling safe machine maintenance and operation. With safe torque off activated, the drive will not provide current. This prevents the motor from generating torque on the shaft. This function corresponds to an uncontrolled stop in accordance with stop category 0 of EN 60204-1.



Emergency Stop (E-Stop) cat. 0 (option)

Stopping by immediate removal of power to the machine actuators (i.e. an uncontrolled stop – stopping of machine motion by removing electrical power to the machine actuators)

Emergency Stop (E-Stop) cat. 1 (option)



A controlled stop (ramping down speed) with power available to the machine actuators to achieve the stop and then removal of power when the stop is achieved

Prevention of unexpected start-up (POUS) (option)

The Prevention of unexpected start-up (POUS) function prevents the drive from generating torque. The POUS function activates the Safe torque off (STO) function of the drive. By using this function, short-time operations (like cleaning) and/or maintenance work on the non-electrical parts of the machinery can be performed without switching off and disconnecting the drive.

Configurations for Functional safety

The following table shows, where the safety relays and the X25 safety bus terminals are located and which options need to be chosen for typical configurations:

	Figure	Incoming	Drive	Drive	Drive	POUS	One option applicable					Group drives		
							Q957	Q951	Q952	Q963	Q964	S925	S926	S927
Single drive, each drive one E-Stop each drive one POUS	1		E-Stop POUS	E-Stop POUS	E-Stop POUS	n	n	n	n	n				
Group drive, one E-Stop for all each drive one POUS	2	E-Stop	X25 POUS	X25 POUS	X25 POUS	n	x	x	x	x		n		
Group drive, one E-Stop for all, one POUS for all	3	E-Stop POUS	X25 X25	X25 X25	X25 X25	x	x	x	x	x		n		
Two line-ups, one E-Stop for all, one POUS for all	4	Line-up 1	E-Stop POUS	X25 X25	X25 X25	x	X	X	X	X		n		
		Line-up 2	Transmitter Receiver	X25 X25	X25 X25	*	*	*	*	*		n	x	x

n: needed n times, n = number of drives.

x: needed once

* Logic for feature in line-up 1

Number of drives: ☐

One figure selectable ☐

Figure 1

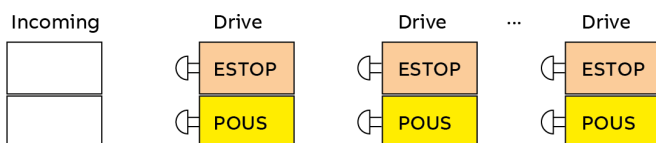
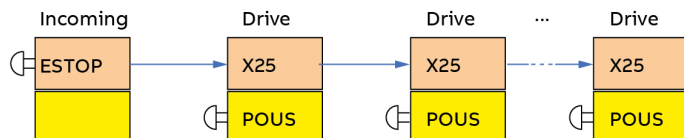
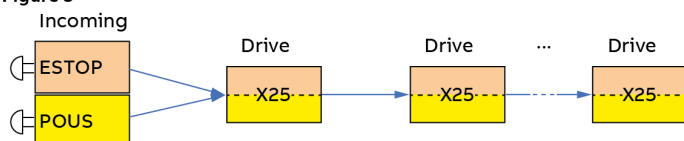


Figure 2



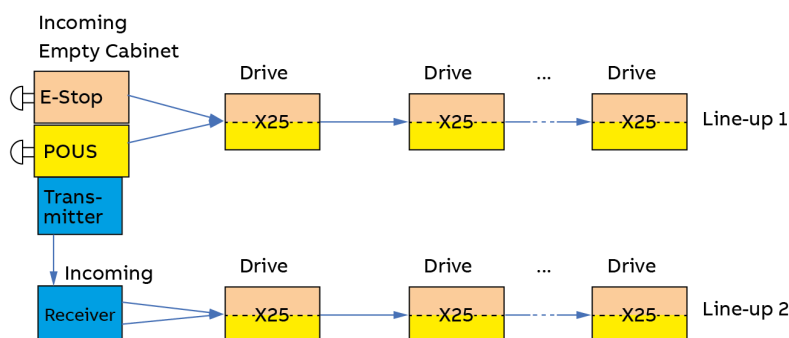
☐ (incl. 1 x option S925 per drive)

Figure 3



☐ (incl. 1 x option S925 per drive)

Figure 4



☐ (incl. 1 x option S925 per drive,
1 x option S926,
1 x option S927)

<input type="checkbox"/>	Classic Electrical Stop non safety related using delayed opening contactor	
<input type="checkbox"/> +Q951	Emergency Stop cat. 0 with opening the Main contactor Description: Emergency Stop with Stop category 0 according EN60204-1 The mains contactor is switched by default. Response time:	520 ms or less (from input to the safety relay to Safe Torque OFF)
	Safety integrity level (SIL): Performance level (PL): Category:	3 e 3
<input type="checkbox"/> +Q952	Emergency Stop cat. 1 with opening the Main contactor Description: Emergency Stop with Stop category 1 according EN60204-1 The mains contactor is switched by default. Setable ramp time: Response time:	0 to 999s 30 ms or less from input to the safety relay to trigger the 0 to 999 s (as set by Safety timer relay) for ramped stop and additionally 520 ms or less (from input to the safety relay to Safe Torque OFF)
	Safety integrity level (SIL): Performance level (PL): Category:	3 e 3
<input type="checkbox"/> +Q963	Emergency Stop cat. 0 without opening the Main contactor Description: Emergency Stop with Stop category 0 according EN60204-1 The mains contactor is not switched by default. Response time:	520 ms or less (from input to the safety relay to Safe Torque OFF)
	Safety integrity level (SIL): Performance level (PL): Category:	3 e 3
<input type="checkbox"/> +Q964	Emergency Stop cat. 1 without opening the Main contactor Description: Emergency Stop with Stop category 1 according EN60204-1 The mains contactor is not switched by default. Setable ramp time: Response time:	0 to 999s 30 ms or less from input to the safety relay to trigger the 0 to 999 s (as set by Safety timer relay) for ramped stop and additionally 520 ms or less (from input to the safety relay to Safe Torque OFF)
	Safety integrity level (SIL): Performance level (PL): Category:	3 e 3
<input type="checkbox"/> +Q957	Prevention of unexpected start-up Description: Stop category 0 according EN60204-1 The mains contactor is not switched by default. Response time:	520 ms or less (from input to the safety relay to Safe Torque OFF)
	Safety integrity level (SIL): Performance level (PL): Category:	3 e 3
<input type="checkbox"/> S925 (1 x per drive)	Terminal X25 for safety options in group drive incl. engineering fee. Description: used as an interface to the drive for common SS1-t, STO, MC open command and feedback loops.	
<input type="checkbox"/> S926 (1 x)	Safety transmitter - group drive Description: Transmitting interface to up to 2 other line-ups with same E-Stop / POUS group Additional response time:	+S926 and +S927 together increase the response time of any cabinet safety function +Q9xx (thus the SS1-t, STO and MC open command) by 40 ms
	Safety integrity level (SIL): 3 Performance level (PL):	3 e
<input type="checkbox"/> S927 (1 x)	Safety receiver - group drive Description: Receiving interface with same E-Stop / POUS group; provides information for next terminal X25. Additional response time:	+S926 and +S927 together increase the response time of any cabinet safety function +Q9xx (thus the SS1-t, STO and MC open command) by 40 ms
	Safety integrity level (SIL): Performance level (PL): Category:	3 e 3

Detailed instructions

Manual	Contents
Supplement for functional safety (3ADW000452)	Safety information on DCS880 (drive STO acceptance test).
+Q957 Prevention of unexpected Start Up (3ADW000504)	Specific manual for the function, incl. function acceptance test.
+Q951 Emergency stop, category 0 with MC opening (3ADW000505)	Specific manual for the function, incl. function acceptance test.
+Q952 Emergency stop, category 1 with MC opening (3ADW000506)	Specific manual for the function, incl. function acceptance test.
+Q963 Emergency stop, category 0 without MC opening (3ADW000507)	Specific manual for the function, incl. function acceptance test.
+Q964 Emergency stop, category 1 without MC opening (3ADW000508)	Specific manual for the function, incl. function acceptance test.
DCS880 Service manual (3ADW000488)	STO Revalidation test and repetitive function test.

Preventive maintenance

Recommended regular maintenance

The cabinet requires very little maintenance if installed in an appropriate environment. Regular inspection according to the maintenance schedule is strongly recommended. Preventive maintenance prevents unexpected production stop and production loss. It also increases availability of the cabinet. The environmental and operating conditions of the cabinet are also to be considered.

Maintenance schedule

	Years from start-up																					
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Start-up	P																					
Cooling																						
DCS880-S, cooling fan (H7, H8)		I	I	R	I	I	R	I	I	R	I	I	R	I	I	R	I	I	R	I	I	R
DCS880-S, cooling fan (H1 > 25 A ... H6)		I	I	I	I	I	R	I	I	I	I	I	R	I	I	I	I	I	R	I	I	I
DCS880-A, IP54 roof cooling fan box (H3, H4)		I	I	I	I	I	R	I	I	I	I	I	R	I	I	I	I	I	R	I	I	I
DCS880-A, line reactor cooling fan (H3, H4)		I	I	I	I	I	R	I	I	I	I	I	R	I	I	I	I	I	R	I	I	I
Aging																						
Power interface board SDCS-PIN-H01 (H1 ... H5)							(R)			R			(R)						R			
Power supply board SDCS-POW-H01 (H6 ... H8)							(R)			R			(R)						R			
Snubber Capacitor (H8 only)										R									R			
Connections & Surroundings																						
Flat cables							(R)			R			(R)						R			
Tightness of terminals				I			I			I			I			I			I			I
Tightness of terminals, H8 heatsink		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Door filters		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Condition of contactors				I			I			I			I			I			I			I
Fiber optic cables (connections)				I			I			I			I			I			I			I
Dustiness, corrosion and temperature		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Quality of supply voltage		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Improvements																						
Based on product notes		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Measurements																						
Basic measurements with supply voltage		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Spare Parts																						
Spare Parts		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I

The service intervals and component replacements are based on the operational environment specified by ABB.

Legend:

- R** = Replacement of component
- I** = Inspection (visual inspection, correction and replacement if needed)
- P** = Performance of on-site work (commissioning, tests, measurements, etc.)
- (R)** = Replacement if high ambient temperature or cyclic heavy duty

For more information consult the [DCS880 Service manual \(3ADW000488\)](#).

DCS Family



DCS550-S modules The compact drive for machinery application

20 ... 1,000 A_{DC}
0 ... 610 V_{DC}
230 ... 525 V_{AC}
IP00

- Compact
- Robust design
- Adaptive and winder program
- High field exciter current



DCS880 modules For safe productivity

20 ... 5,200 A_{DC}
0 ... 1,600 V_{DC}
230 ... 1,000 V_{AC}
IP00

- Safe torque off (STO) built in as standard
- Compact and robust
- Single drives, 20 A to 5,200 A, up to 1,600 V_{DC}
- IEC 61131 programmable
- Intuitive control panel and PC tool with USB connection and start up assistant
- Wide range of options to serve any DC motor application



DCS880-A enclosed converters Complete drive solutions

20 ... 20,000 A_{DC}
0 ... 1,500 V_{DC}
230 ... 1,200 V_{AC}
IP21 – IP54

- Individually adaptable to customer requirements
- User-defined accessories like external PLC or automation systems can be included
- High power solutions in 6- and 12-pulse up to 20,000 A, 1,500 V
- In accordance to usual standards
- Individually factory load tested
- Detailed documentation



DCT880 modules Thyristor power controller

20 ... 4,200 A_{AC}
110 ... 990 V_{AC}
IP00

- Precise power control in industrial heating applications
- Two or three phase devices
- Power optimizer for peak load reduction
- Built on ABB's all-compatible drives architecture
- Intuitive control panel and PC tool with USB connection and start up assistant
- Application control programs and drive application programming with IEC 61131 programming



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