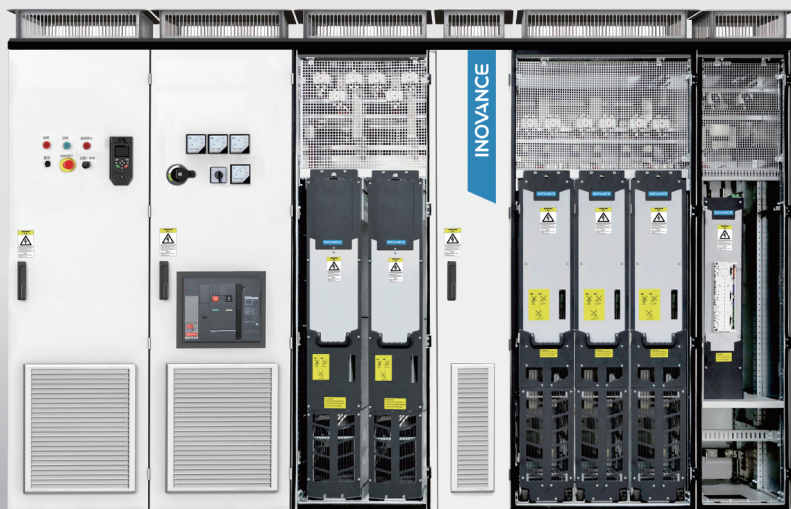




MD880 Series Multi-drive Cabinet Design and Maintenance Guide



Industrial
Automation



Intelligent
Elevator



New Energy
Vehicle



Industrial
Robot



Rail
Transit



Data code 19012267B00

Preface

Introduction

This user guide describes the design of the auxiliary cabinet, inlet cabinet, basic power supply cabinet, active/regenerative line cabinet, and drive cabinet, as well as maintenance and inspection. Read through this user guide especially the safety instructions before designing the cabinet.

This user guide is intended for designers of the cabinet layout of MD880 series products.

Precaution

- The drawings in the user guide are sometimes shown without covers or protective guards. Remember to install the covers or protective guards as specified first, and then perform operations in accordance with the instructions.
- Drawings in the user guide are for reference only and may vary with the product you purchased.
- The instructions are subject to change without notice due to product upgrade, specification modification as well as efforts to increase the accuracy and convenience of the user guide.
- Contact our agents or customer service center if you have problems during use.

More Document

Name	Data Code	Description
MD880 Series Multi-drive Cabinet Installation Guide	19012266	Describes the installation dimensions, space design, installation procedure, wiring requirements, routing requirements, option installation requirements, and troubleshooting of common EMC-related problems.

Revision History

Date of Revision	Version	Revision
July 2023	B00	• Updated environmental requirements, installation site requirements, fixation mode, thermal design, structure layout and dimensions, storage and maintenance, and disposal and recycling of the cabinets. • Updated some chapter names. • Made minor corrections.
November 2020	A02	Made minor corrections.

Date of Revision	Version	Revision
April 2019	A01	The QR code is added to the cover.
June 2018	A00	First release

Document Acquisition

This guide is not delivered with the product. You can obtain the PDF version by visiting <http://www.inovance.com>.

Warranty

Inovance provides warranty service to the equipment within the warranty period (as specified in the order) for failure or damage that occurs under normal use. When the warranty period expires, reasonable maintenance fee will be charged.

Within the warranty period, maintenance fee will be charged for the following damage:

- Damage caused by operations not following the instructions in the user guide
- Damage caused by fire, flood, or abnormal voltage
- Damage caused by unintended use of the product
- Damage caused by use beyond the specified scope of application of the product
- Damage or secondary damage caused by force majeure (natural disaster, earthquake, and lightning strike)

The maintenance fee is charged according to the latest Price List of Inovance. If otherwise agreed upon, the terms and conditions in the agreement shall prevail.

Table of Contents

Preface	1
Fundamental Safety Instructions	5
1 Cabinet System Structure	11
1.1 Single-Cabinet Type	11
1.1.1 Cabinet Type and Width.	11
1.1.2 Cabinet Model.	12
1.1.3 Cable Inlet/Outlet Load Interfaces of the Power Cabinet	13
1.2 Overview of the cabinet	13
2 General Cabinet Design Instructions	15
2.1 Installation Environment	15
2.2 Installation site	16
2.3 Cabinet Structure.....	17
2.4 Fixation Mode	17
2.5 Thermal Design.	17
2.5.1 Air Duct Design	18
2.5.2 Air Inlet and Outlet Specifications	20
2.5.3 Preventing Recirculation of Hot Air	21
2.5.4 Requirement for Space Inside the Cabinet	21
2.6 Derating Data	22
2.7 Grounding the Mounting Frame	23
2.8 Material and Connection of Busbar	23
2.9 Cabinet Heater	23
2.10 EMC Requirements	23
3 Common Kit for Cabinets	25
4 Layout and Dimensions of Cabinet Frame	27
4.1 Auxiliary Cabinet	27
4.2 Inlet Cabinet	28
4.3 Basic Power Supply Cabinet	30
4.4 Regenerative power supply cabinet	32
4.5 Active power supply cabinet	35
4.6 Drive Cabinet.	36
4.7 Braking Cabinet	42
4.8 Connection Cabinet.....	45
5 Maintenance and Inspection	48

5.1 Safety Instructions for Maintenance 48

5.2 Precautions on Cleaning..... 48

5.3 Precautions on Inspection 49

5.4 Maintenance of Components 51

 5.4.1 Maintenance of the Filter Screen 51

 5.4.2 Replacing DC Fan of the Active Line Module 52

 5.4.3 Replacing DC Fan of the Active Line Filter Module 53

 5.4.4 Replacing the Frame Accessory Kit..... 55

 5.4.5 Replacing the Power Supply of the Fan 56

 5.4.6 Replacing HSVM-10..... 57

 5.4.7 Replacing HSVM-20..... 58

 5.4.8 Replacing the Lightning Protection Board 59

 5.4.9 Replacing the Fuse 60

 5.4.10 Replacing the Module..... 61

5.5 Storage and Warranty 61

5.6 Disposal 61

Fundamental Safety Instructions

Safety Disclaimer

- This chapter provides essential safety instructions for proper use of the equipment. Before operating the equipment, read through the guide and comprehend all the safety instructions. Failure to comply with the safety instructions may result in death, severe personal injuries, or equipment damage.
- "CAUTION", "WARNING", and "DANGER" items in the guide only indicate some of the precautions that need to be followed; they just supplement the safety precautions.
- Use this equipment according to the designated environment requirements. Damage caused by improper use is not covered by warranty.
- Inovance shall take no responsibility for any personal injuries or property damage caused by improper use.

Safety Levels and Definitions



DANGER

Indicates that failure to comply with the notice will result in death or severe personal injuries.



WARNING

Indicates that failure to comply with the notice may result in death or severe personal injuries.



CAUTION

Indicates that failure to comply with the notice may result in minor or moderate personal injuries or equipment damage.

General Safety Instructions

- Drawings in the guide are sometimes shown without covers or protective guards. Remember to install the covers or protective guards as specified first, and then perform operations in accordance with the instructions.
- The drawings in the guide are shown for illustration only and may be different from the product you purchased.

Unpacking



WARNING

- Do not install the equipment if you find damage, rust, or signs of use on the equipment or accessories upon unpacking.
- Do not install the equipment if you find water seepage or missing or damaged components upon unpacking.
- Do not install the equipment if you find the packing list does not conform to the equipment you received.

 CAUTION

- Check whether the packing is intact and whether there is damage, water seepage, dampness, and deformation before unpacking.
- Unpack the package by following the unpacking sequence. Do not strike the package violently.
- Check whether there is damage, rust, or injuries on the surface of the equipment and equipment accessories before unpacking.
- Check whether the package contents are consistent with the packing list before unpacking.

Storage and Transportation

 WARNING

- Large-scale or heavy equipment must be transported by qualified professionals using specialized hoisting equipment. Failure to comply may result in personal injuries or equipment damage.
- Before hoisting the equipment, ensure the equipment components such as the front cover and terminal blocks are secured firmly with screws. Loosely-connected components may fall off and result in personal injuries or equipment damage.
- Never stand or stay below the equipment when the equipment is being hoisted by the hoisting equipment.
- When hoisting the equipment with a steel rope, ensure the equipment is hoisted at a constant speed without suffering from vibration or shock. Do not turn the equipment over or let the equipment stay hanging in the air. Failure to comply may result in personal injuries or equipment damage.

 CAUTION

- Handle the equipment with care during transportation and mind your steps to prevent personal injuries or equipment damage.
- When carrying the equipment with bare hands, hold the equipment casing firmly with care to prevent parts from falling. Failure to comply may result in personal injuries.
- Store and transport the equipment based on the storage and transportation requirements. Failure to comply will result in equipment damage.
- Avoid storing or transporting the equipment in environments with water splash, rain, direct sunlight, strong electric field, strong magnetic field, and strong vibration.
- Avoid storing the equipment for more than three months. Long-term storage requires stricter protection and necessary inspections.
- Pack the equipment strictly before transportation. Use a sealed box for long-distance transportation.
- Never transport the equipment with other equipment or materials that may harm or have negative impacts on this equipment.

Installation

 DANGER

- The equipment must be operated only by professionals with electrical knowledge.

 WARNING

- Read through the guide and safety instructions before installation.
- Do not install this equipment in places with strong electric or magnetic fields.
- Before installation, check that the mechanical strength of the installation site can bear the weight of the equipment. Failure to comply will result in mechanical hazards.
- Do not wear loose clothes or accessories during installation. Failure to comply may result in an electric shock.
- When installing the equipment in a closed environment (such as a cabinet or casing), use a cooling device (such as a fan or air conditioner) to cool the environment down to the required temperature. Failure to comply may result in equipment over-temperature or a fire.
- Do not retrofit the equipment.
- Do not fiddle with the bolts used to fix equipment components or the bolts marked in red.
- When the equipment is installed in a cabinet or final assembly, a fireproof enclosure providing both electrical and mechanical protections must be provided. The IP rating must meet IEC standards and local laws and regulations.
- Before installing equipments with strong electromagnetic interference, such as a transformer, install a shielding equipment for the equipment to prevent malfunction.
- Install the equipment onto an incombustible object such as a metal. Keep the equipment away from combustible objects. Failure to comply will result in a fire.

 CAUTION

- Cover the top of the equipment with a piece of cloth or paper during installation. This is to prevent unwanted objects such as metal chippings, oil, and water from falling into the equipment and causing faults. After installation, remove the cloth or paper on the top of the equipment to prevent over-temperature caused by poor ventilation due to blocked ventilation holes.
- Resonance may occur when the equipment operating at a constant speed executes variable speed operations. In this case, install the vibration-proof rubber under the motor frame or use the vibration suppression function to reduce resonance.

Wiring

 DANGER

- Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed only by professionals.
- Before wiring, cut off all the power supplies of the equipment, and wait for at least the time designated on the equipment warning label before further operations because residual voltage still exists after power-off. After waiting for the designated time, measure the DC voltage in the main circuit to ensure the DC voltage is within the safe voltage range. Failure to comply will result in an electric shock.
- Do not perform wiring, remove the equipment cover, or touch the circuit board with power ON. Failure to comply will result in an electric shock.
- Check that the equipment is grounded properly. Failure to comply can result in electric shock.

 WARNING

- Do not connect the input power supply to the output end of the equipment. Failure to comply can result in equipment damage or even a fire.
- When connecting a drive to the motor, check that the phase sequences of the drive and motor terminals are consistent to prevent reverse motor rotation.
- Cables used for wiring must meet cross sectional area and shielding requirements. The shield of the cable must be reliably grounded at one end.
- Fix the terminal screws with the tightening torque specified in the user guide. Improper tightening torque may overheat or damage the connecting part, resulting in a fire.
- After wiring is done, check that all cables are connected properly and no screws, washers or exposed cables are left inside the equipment. Failure to comply may result in an electric shock or equipment damage.

 CAUTION

- Follow the proper electrostatic discharge (ESD) procedure and wear an anti-static wrist strap to perform wiring. Failure to comply may result in damage to the equipment or to the internal circuit of the product.
- Use shielded twisted pairs for the control circuit. Connect the shield to the grounding terminal of the equipment for grounding purpose. Failure to comply will result in equipment malfunction.

Power-on

 DANGER

- Before power-on, check that the equipment is installed properly with reliable wiring and the motor can be restarted.
- Check that the power supply meets equipment requirements before power-on to prevent equipment damage or a fire.
- After power-on, do not open the cabinet door or protective cover of the equipment, touch any terminal, or disassemble any unit or component of the equipment. Failure to comply will result in an electric shock.

 WARNING

- Perform a trial run after wiring and parameter setting to ensure the equipment operates safely. Failure to comply may result in personal injuries or equipment damage.
- Before power-on, check that the rated voltage of the equipment is consistent with that of the power supply. Failure to comply may result in a fire.
- Before power-on, check that no one is near the equipment, motor, or machine. Failure to comply may result in death or personal injuries.

Operation

 DANGER

- The equipment must be operated only by professionals. Failure to comply will result in death or personal injuries.
- Do not touch any connecting terminals or disassemble any unit or component of the equipment during operation. Failure to comply will result in an electric shock.

 WARNING

- Do not touch the equipment casing, fan, or resistor with bare hands to feel the temperature. Failure to comply may result in personal injuries.
- Prevent metal or other objects from falling into the equipment during operation. Failure to comply may result in a fire or equipment damage.

Maintenance **DANGER**

- Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed only by professionals.
- Do not maintain the equipment with power ON. Failure to comply will result in an electric shock.
- Before maintenance, cut off all the power supplies of the equipment and wait for at least the time designated on the equipment warning label.
- In case of a permanent magnet motor, do not touch the motor terminals immediately after power-off because the motor terminals will generate induced voltage during rotation even after the equipment power supply is off. Failure to comply will result in an electric shock.

 WARNING

- Perform routine and periodic inspection and maintenance on the equipment according to maintenance requirements and keep a maintenance record.

Repair **DANGER**

- Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed only by professionals.
- Do not repair the equipment with power ON. Failure to comply will result in an electric shock.
- Before inspection and repair, cut off all the power supplies of the equipment and wait for at least the time designated on the equipment warning label.

 WARNING

- When the fuse is blown or the circuit breaker or earth leakage current breaker (ELCB) trips, wait for at least the time designated on the equipment warning label before power-on or further operations. Failure to comply may result in death, personal injuries or equipment damage.
- When the equipment is faulty or damaged, the troubleshooting and repair work must be performed by professionals that follow the repair instructions, with repair records kept properly.
- Replace quick-wear parts of the equipment according to the replacement instructions.
- Do not use damaged equipment. Failure to comply may result in death, personal injuries, or severe equipment damage.
- After the equipment is replaced, check the wiring and set parameters again.

Disposal
 WARNING • Dispose of retired equipment in accordance with local regulations and standards. Failure to comply may result in property damage, personal injuries, or even death. • Recycle retired equipment by observing industry waste disposal standards to avoid environmental pollution.

Safety Label

For safe equipment operation and maintenance, comply with the safety labels on the equipment. Do not damage or remove the safety labels. The following table describes the meaning of the safety labels.

Safety Label	Description
WARNING 警告  · This equipment should be serviced by qualified personnel only · Locate and disconnect all energy sources. Wait 15 minutes then operate · Observe the instructions described in the instruction manual · 只有专业人士才能维护。 · 维护前确保切断所有电源，15分钟后方可操作。 · 维护前请阅读维护说明书。	• Read through the safety instructions before operating the equipment. Failure to comply may result in death, personal injuries, or equipment damage. • Do not touch the terminals or remove the cover with power ON or within 15 min after power-off. Failure to comply will result in an electric shock.

1 Cabinet System Structure

1.1 Single-Cabinet Type

1.1.1 Cabinet Type and Width

Name	300-mm wide	400 mm wide	600-mm wide	800-mm wide
Auxiliary cabinet	-	400-mm wide (2 x HCU)	600-mm wide (4 x HCU)	800-mm wide (6 x HCU)
Inlet cabinet	-	400-mm wide 6-pulse (630–1600 A)	600 mm 6-pulse (2000–2500 A) 12-pulse (2x630–2x1000 A)	800 mm 6-pulse (3200 A)
basic power supply cabinet	-	400-mm wide (1 x T2)	600-mm wide (2 x T2)	800-mm wide (3 x T2)
Active power supply cabinet	-	-	600-mm wide (BLCL+H8)	800-mm wide (BLCL+2xH8)
Regenerative power supply cabinet	-	-	600-mm wide (L+H8)	800 mm wide (L+2xH8)
H8 drive cabinet	-	400-mm wide (1 x H8)	600-mm wide (2 x H8)	800-mm wide (3 x H8)
H7 drive cabinet	-	400-mm wide (1 x H7)	600-mm wide (2 x H7)	800-mm wide (3 x H7)
H6 drive cabinet	-	400-mm wide (1 x H6)	600-mm wide (2 x H6)	800-mm wide (3 x H6)
H1 to H6 multi-function cabinet	-	400-mm wide (1 x H6) 400-mm wide (1 x H4) 400-mm wide (2 x H1 to H3)	600-mm wide (H6) 600-mm wide (H6+2 x H1 to H3) 600-mm wide (H4+2 x H1 to H3) 600-mm wide (2 x H4) 600-mm wide (4 x H1 to H3)	600-mm wide (2 x H6) 600-mm wide (H6+H4) 600-mm wide (H6+3 x H1 to H3) 600-mm wide (H4+3 x H1 to H3) 600-mm wide (5 x H1 to H3) 600-mm wide (3 x H4)
Braking cabinet	-	-	600-mm wide	-
Connection cabinet	300-mm wide	-	-	-

Note

H8, L, T2, and BLCL: The buffer or reactor is not included in H6/H7 drive cabinet with a width of 600 mm or 800 mm.

1.1.2 Cabinet Model

MD880-50C-800-0800

① ② ③ ④

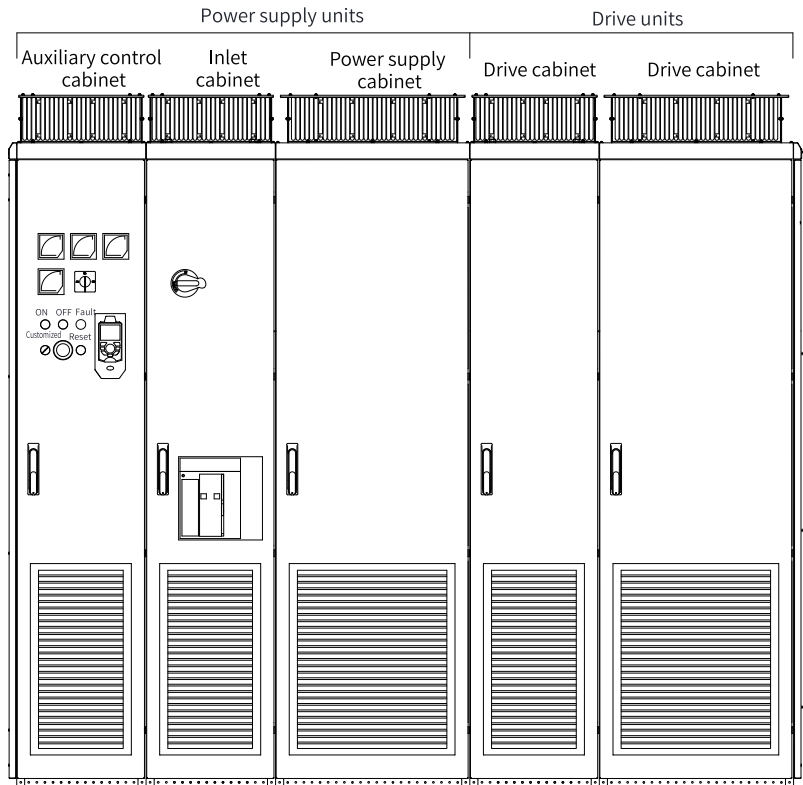
① Product platform MD880: MD880 series	③ Cabinet width 300: 300 mm 400: 400 mm 600: 600 mm 800: 800 mm
② Product type 01C: Auxiliary cabinet 11C: 6-pulse basic line inlet cabinet 12C: 12-pulse basic line inlet cabinet 13C: Regenerative/Active line inlet cabinet 20C: basic power supply cabinet 30C: Regenerative power supply cabinet 40C: Active power supply cabinet 50C: Drive cabinet 60C: Braking cabinet 70C: Connection cabinet	④ Rated current of the inlet cabinet 0630: 630 A 0800: 800 A 1000: 1000 A 1250: 1250 A 1600: 1600 A 2500: 2500 A 3200: 3200 A

1.1.3 Cable Inlet/Outlet Load Interfaces of the Power Cabinet

Specifications of cable inlet/output copper busbar and number of wiring holes						
Item	Cabinet type	Name	Current	Copper busbar (mm x mm)	Wiring holes (mm)	Recommended cable specification (mm x mm)
1	Inlet cabinet	LCU1-0630 x 6-pulse 400 mm in width	630 A	60 x 8	Ø13 x 4	4 x 150
2		LCU1-0800 x 6-pulse 400 mm in width	800 A			
3		LCU1-1000 x 6-pulse 400 mm in width	1000 A	60 x 10		6 x 150
4		LCU1-1250 x 6-pulse 400 mm in width	1250 A			4 x 240
5		LCU1-1600 x 6-pulse 400 mm in width	1600 A	(60 x 6) x 2	Ø17 x 4	6 x 240
6		LCU2-2000 x 6-pulse 600 mm in width	2000 A	(80 x 8) x 2	Ø17 x 5	8 x 240
7	Drive cabinet	LCU2-2500 x 6-pulse 600 mm in width	2500 A	(80 x 10) x 2		10 x 240
8		LCU3-3200 x 6-pulse 800 mm in width	3200 A	(100 x 8) x 3	Ø17 x 6	10 x 300
9		LCU2-0630 x 12-pulse 600 mm in width	630 A	50 x 6	Ø17	2 x 240
10		LCU2-0800 x 12-pulse 600 mm in width	800 A	(50 x 6) x 2	Ø17 x 2	4 x 240
11		LCU2-1000 x 12-pulse 600 mm in width	1000 A	(50 x 6) x 2	Ø17 x 2	4 x 240
12		H8 400-mm wide cabinet	H8	40 x 8	Ø13 x 2	See MD880-50 Series Drive Module Hardware Guide
13		2 x H8-600-mm wide cabinet	2×H8	(40 x 8) x 2	Ø13 x 4	See MD880-50 Series Drive Module Hardware Guide
14		3 x H8 800-mm cabinet	3×H8	(40 x 8) x 3	Ø13 x 6	See MD880-50 Series Drive Module Hardware Guide
15	Braking cabinet	Three-phase braking cabinet	H8	40 x 8	Ø13 x 2	See MD880-50 Series Drive Module Hardware Guide

1.2 Overview of the cabinet

The following figure shows an example of the cabinet with line module and drive unit. The cable enters the cabinet through the bottom.



Name	Description
Auxiliary control cabinet	Used for centralized control of the system, which is comprised of customer DI/DO interfaces, control power supply, HCU control module, instrument display, and panel control.
Inlet cabinet	Used for connection between the power grid of the factory and the power supply cabinet, which includes the power input cable terminals and the switching devices.
Power supply cabinet	Used as the power supply for the whole drive system, including the line filter module, basic line module or active line module, and AC fuse.
Drive cabinet	Used to drive the motor, which is comprised of drive power modules of different models, DC bus fuse, and DC disconnecter (optional).

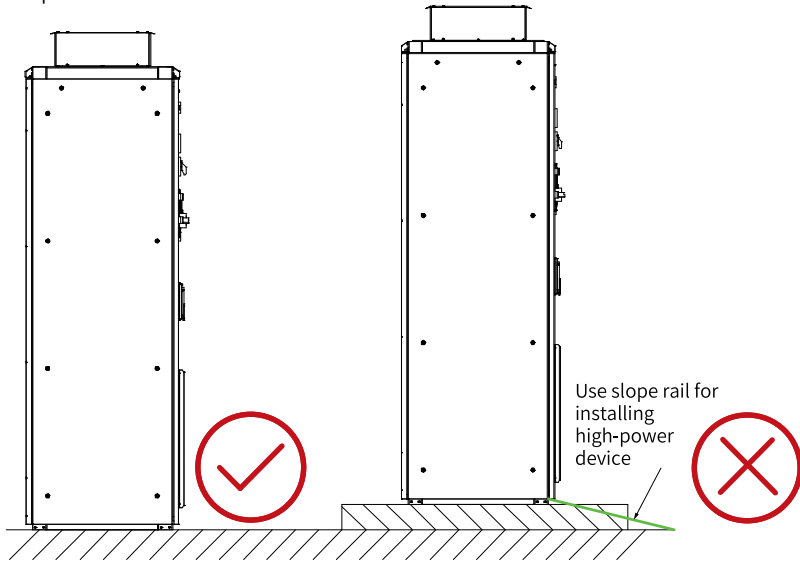
2 General Cabinet Design Instructions

2.1 Installation Environment

No.	Requirement
1	The installation site must be well ventilated or cooled to ensure proper heat dissipation.
2	The environment in which the drive cabinet is installed must meet the specifications.
3	The wall behind the drive cabinet must be made of non-flammable material.
4	Reserve enough space above the drive cabinet to allow the cooling air to circulate.
5	The floor that the drive cabinet is installed on is of non-flammable material, as smooth as possible, and strong enough to support the weight of the cabinet. Check the floor flatness with a spirit level. The maximum allowed deviation from the surface level is 5 mm (0.2 in) in every 3 meters (10 ft). Level the installation site, if necessary, as the cabinet is not equipped with adjustable feet. Level the installation site, if necessary, as the cabinet is not equipped with adjustable feet.



To facilitate maintenance, place the cabinet in a low position. If the cabinet is installed to a high position, the slope rail that comes with the module cannot be used when you replace the power module inside the cabinet.



2.2 Installation site

During foundation design, take the following factors into consideration:

Inspection space in front of the cabinet;

Cabling of power cables, motor cables, and system control cables Design the cable trench or cable duct below cabinet. Route power cables and signal cables through different routes. The wiring diagram is shown below.

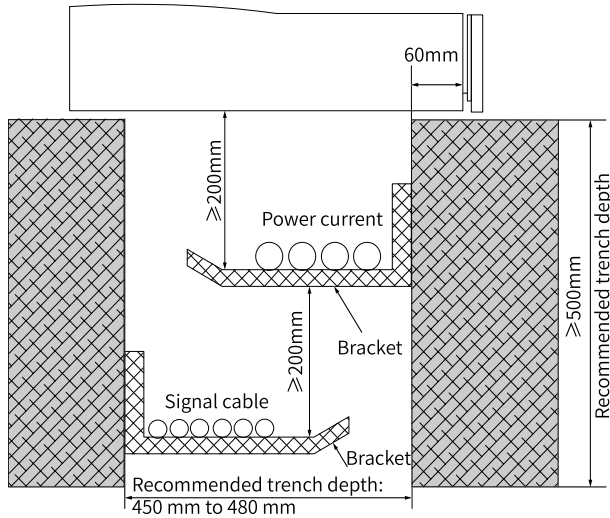


Figure 2-1 Installation site

2.3 Cabinet Structure

- The cabinet frame must be sturdy enough to carry the weight of the drive components, control circuit and other equipment installed in it.
- The cabinet must protect the power module against contact and meet the requirements for dust and humidity.

2.4 Fixation Mode

- Fixing the cabinet
The drive cabinet must be mounted vertically and upright. The cabinet can be bolted to the ground through the inner hole.
- Fixing each cabinet section
Wide cabinet line-ups are delivered in multiple sections. Attach the adjacent sections to the joining cubicle at the end of each cabinet section. A plastic bag inside the cabinet contains special bolts used to fix the cabinet sections.

2.5 Thermal Design

- The cabinet must be well ventilated to comply with the cooling air flow and ambient temperature requirements. The internal fan of the drive module can rotate at the set speed, ensuring a constant air flow surrounding the module. The

amount of heat that must be dissipated inside the cabinet determines the amount of air that must be refreshed.

- Reserve sufficient space surrounding the parts to allow heat dissipation. The space reserved must meet the minimum clearance required by each part.
- Ventilation is also needed for cables and other additional devices..
- Ensure that the air inlet and outlet are large enough to ensure sufficient air flow from and to the cabinet. This requirement is essential for proper cooling of the drive module.

2.5.1 Air Duct Design

Requirements for cooling ducts of cabinets comprised of H1 to H6 frames

Mounting spaces and clearances of drive units with H1 to H6 frames are different based on the power rating. The following figure shows the mounting space and clearance diagram of units with H1 to H6 frames.

Note

The following dimensions are the minimum values.

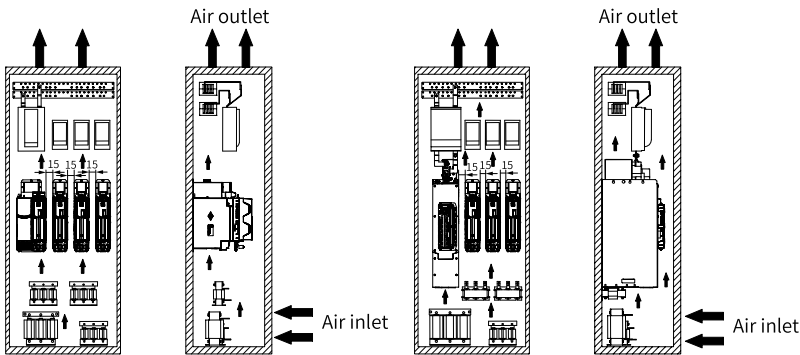


Figure 2-2 Air duct requirements (in mm)

Requirements for cooling ducts of single-module cabinets comprised of H1 to H6 frames

Mounting spaces and clearances of drive units with H6 to H7 frames are different based on the power rating. The following figure shows the mounting space and clearance diagram of single-module cabinets.

Note

The following dimensions are the minimum values.

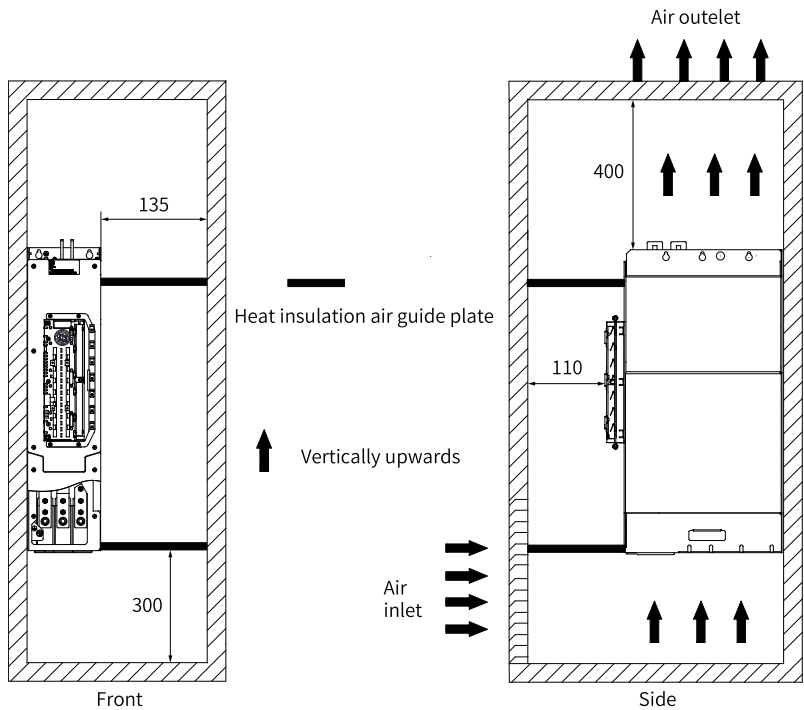


Figure 2-3 Air duct requirements (in mm)

Requirements for cooling ducts of single-module cabinets comprised of H8 drive module, T2 line module, and BLCL filter module

The following figure shows the mounting space and clearance diagram of the cabinet with H8 drive module, T2 line module, and BLCL filter module. The cabinet depth is 600 mm (frame size). The module is 40 mm away from the front door plate to facilitate routing of cables and optical fibers, and 30 mm away from the rear door.

Note

The following dimensions are the minimum values.

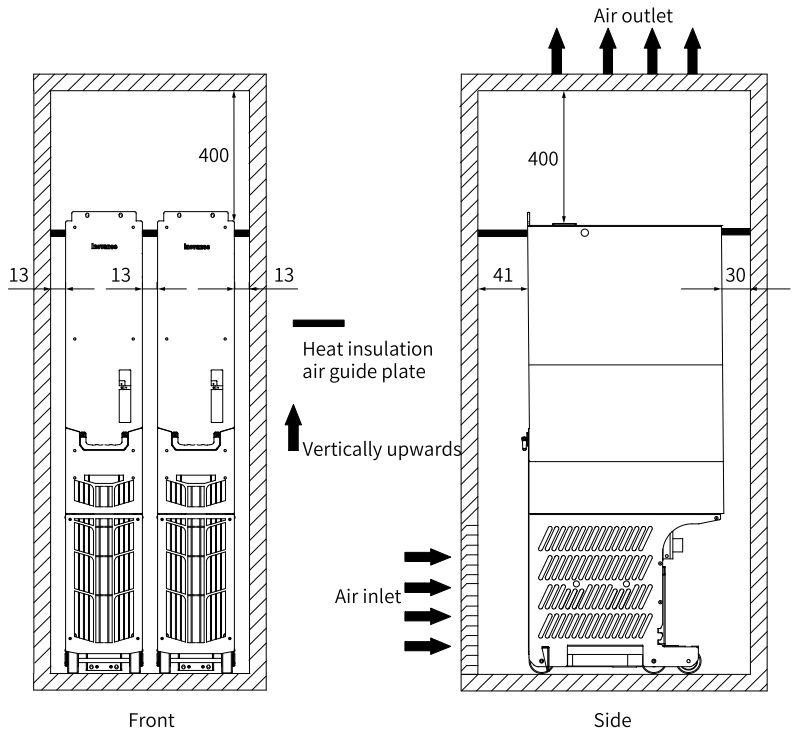


Figure 2-4 Air duct requirements (in mm)

2.5.2 Air Inlet and Outlet Specifications

- Reserve minimum ventilation clearance above and below the drive module to ensure heat dissipation. Do not route cables or install any components in the cable duct (if present).
- Reserve minimum ventilation clearance above and below the drive module to ensure heat dissipation. Do not route cables or install any components in the cable duct (if present). Observe the following requirements for setting air inlets and air outlets.
 - Air inlet area: $S = (1.5-2.0) \times (S_{\text{unit 1}} + S_{\text{unit 2}} + S_{\text{unit 3}} + \dots + S_{\text{unit N}})$
 - S: Ventilation area of the system in m^2 ; S_{unit} : Ventilation area of each unit in cm^2
 - Air outlet area: $S = (1.2-1.5) \times \text{Air inlet area}$

The ventilation area of each MD880 drive unit is shown in the following table:

Frame	Ventilation area of the drive unit (cm ²)
H1 to H3	13
H4	70
H6	710
H7	750
H8	1400

2.5.3 Preventing Recirculation of Hot Air

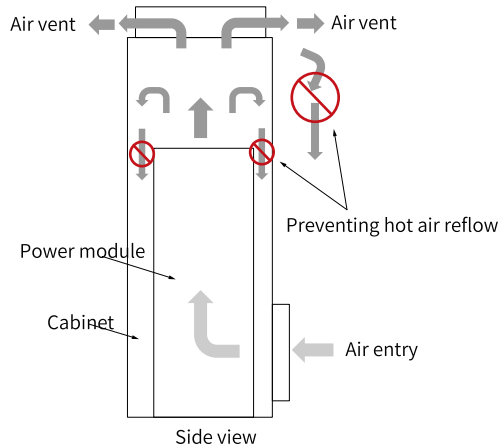


Figure 2-5 Air exhaust

Exterior of cabinet

Prevent the hot air outside the cabinet from entering air flow circulation by guiding the hot air away from the air inlet area. Some possible solutions include:

- Set grids for airflow guidance at the air inlet and outlet.
- Position the air inlet and outlet on different sides of the cabinet.
- Position the cooling air inlet below the front door and install additional blowers on top of the cabinet.

Interior of cabinet

Prevent the hot air from circulating inside the cabinet using a leak-proof air baffle at the location shown in the appropriate power module manual. Seal the baffle to the inner wall using a neoprene gasket or equivalent.

2.5.4 Requirement for Space Inside the Cabinet

To facilitate installation and maintenance, it is recommended to leave enough space around the equipment to allow adequate cooling air flow, necessary clearance, and

space required for holding cables and cable supports. Do not install the control board near the main circuit or high-temperature parts.

For the interior space requirements of drive cabinets of different frames, see ["2.5.1 Air Duct Design" on page 18](#).

2.6 Derating Data

- The MD880 series cabinet and its system components are suitable for operation at an ambient temperature of up to 40°C and below 2000 m above sea level. When operating at ambient temperatures above 40°C, the output current must be reduced. The ambient temperature cannot exceed 50°C.
- When installed above 2000 m, the reduction of air pressure and density can result in the reduction of cooling capacity and insulation capacity.
- For reduced cooling capacity, you can reduce the heat generated from the cabinet by lowering the ambient temperature or reducing the output current.

IP rating	Derating coefficient for different ambient temperatures				
	Altitude	20°C	30°C	40°C	50°C
IP21/IP23	1000 m	100%	100%	100%	90.00%
	2000 m	100%	100%	93.20%	83.20%
	3000 m	100%	97.10%	87.10%	77.10%
	4000 m	100%	92.00%	82.00%	72.00%

IP rating	Derating coefficient for different ambient temperatures				
	Altitude	20°C	30°C	40°C	50°C
IP43	1000 m	100%	100%	94.60%	84.60%
	2000 m	100%	99.40%	89.40%	79.40%
	3000 m	100%	94.20%	84.20%	74.20%
	4000 m	99.00%	89.00%	79.00%	69.00%

IP rating	Derating coefficient for different ambient temperatures				
	Altitude	20°C	30°C	40°C	50°C
IP54	1000 m	100%	100.00%	92.00%	82.00%
	2000 m	100%	96.70%	86.70%	76.70%
	3000 m	100%	91.40%	81.40%	71.40%
	4000 m	96.00%	86.00%	76.00%	66.00%

The current derating coefficient of the cabinet is related to the ambient temperature, mounting altitude, and IP rating.

Note

Failure to comply with the installation requirements can shorten the service life, leading to faults or premature failure of the equipment.

2.7 Grounding the Mounting Frame

Make sure any cross-devices or frames on which components are mounted are properly grounded and the connecting surfaces are left unpainted.



Ensure that the module is grounded properly through the fixing points on the mounting baseplate.

2.8 Material and Connection of Busbar

- It is recommended to use nickel plated copper or aluminum materials for the busbar.
- Before connecting the aluminum busbar, remove the oxide coating on the busbar and apply proper antioxidant joint compound.

2.9 Cabinet Heater

If there is a risk of condensation in the cabinet, use a cabinet heater. Although the heater is mainly used to keep the air dry, it can also be used for heating in low temperatures. When placing the heater, follow the instructions provided by the manufacturer.

Recommended: Siv HDJR-100L.

2.10 EMC Requirements

- The fewer and smaller the holes in the cabinet, the better the anti-interference and anti-attenuation performance will be. The maximum diameter of the hole in galvanic metal contact in the cabinet structure covered is 100 mm. Pay special attention to the size of the grid holes at the cold air inlet and air outlet.
- Weld the steel panels together without holes to achieve the optimal electrical connection. If welding is not possible, do not paint the gap between panels. In this

case, install special conductive EMC bars to realize galvanic connection. Generally, reliable conductive bars are made of flexible silicon with the surface covered by a metal mesh. Additional conductive gaskets are needed between metal surfaces to enhance the contact between them. The maximum distance between assembly screws is 100 mm.

- Make sure that a high-frequency multi-point grounding system has been established in the cabinet. This is to prevent voltage difference and to form structures that can shield against radiation. Use short and flat low-inductance copper braids to improve the performance of high-frequency grounding system. Do not use high-frequency one-point grounding due to the long distances in the cabinet.
- Conductive EMC shielding gaskets are not sufficient for protective grounding. A sturdy low-frequency grounding structure is required for electrical safety of the parts. Follow local regulations to design protective grounding.
- Routing
 - To enable the drive to comply with EMC requirements, a 360° high frequency grounding must be performed at the cable inlet of the motor and control cable shield. (360° grounding is recommended for the power supply cable.)
 - The shield of the shielded power input/output cables inside the cabinet must be in large-area contact with the shield plate in the cabinet to achieve good EMC effect. The following figure shows the mounting mode.

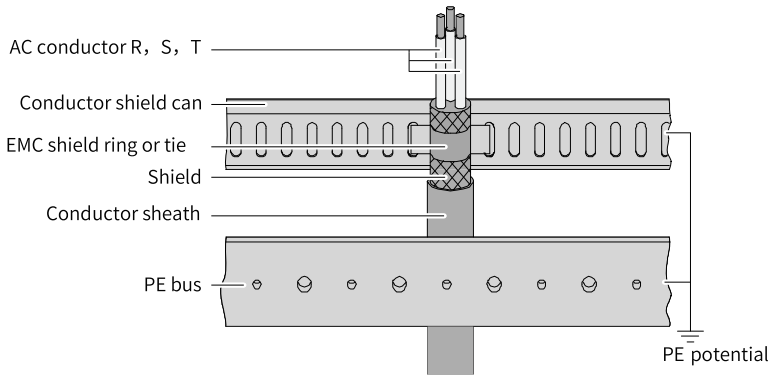


Figure 2-6 Connection of shielded power cables

3 Common Kit for Cabinets

The MD80 cabinets are assembled from common sets and special sheet metal parts. The common set includes the cabinet frame, front and back door panels, and top cover. The special sheet metal parts are used to hold power modules and components together in the frame.

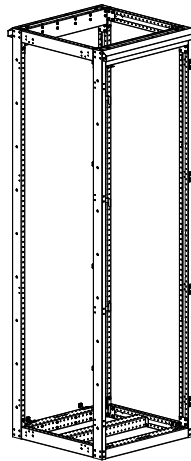
- Thermoplastic urethanes coating (80–120 μm in thickness) is applied on visible surface of the hot-galvanized steel plate of the cabinet. The thickness of the hot-galvanized coating is 20 μm . Color: RAL 7035 (light beige, matt) Copper busbar, tin-plating or nickel-plating
- Drive module: Color RAL 433U, hot-galvanized steel plate 1.5–2 mm
- Fire-resistant materials (IEC 60332-1) are non-metal insulation materials, most of which can be self-extinguished.
- The packing box is made of wooden or plywood plates.

Note

The relationship between frame and top cover can be defined by users.

Cabinet frame

The cabinet frames, depending on the cabinet width, can be divided into four widths, which are 300 mm, 400mm, 600 mm, and 800 mm.



Cabinet top cover

The cabinet frames, depending on the cabinet width, can be divided into four widths, which are 300 mm, 400 mm, 600 mm, and 800 mm.



4 Layout and Dimensions of Cabinet Frame

4.1 Auxiliary Cabinet

Layout of auxiliary cabinet

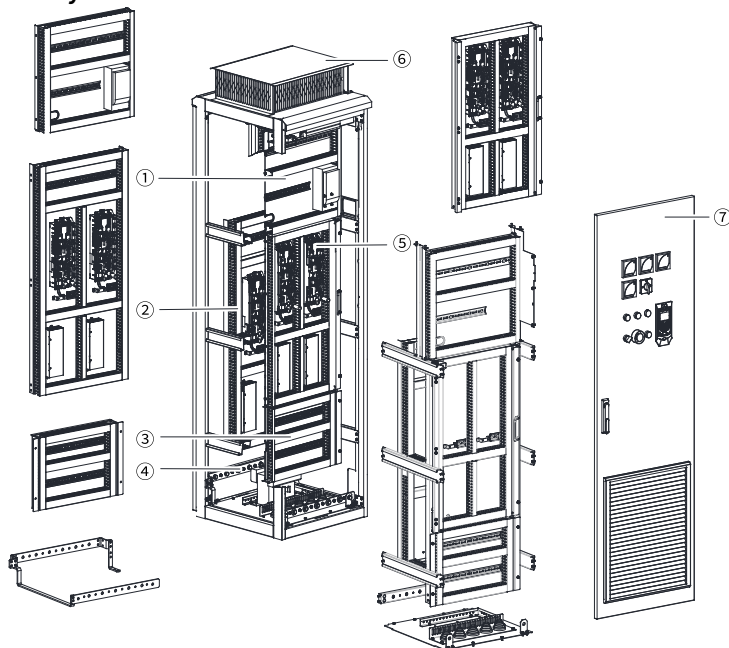


Figure 4-1 Layout of auxiliary cabinet

No.	Name
1	Terminal mounting plate on top of cabinet, which is used for installation of terminals, air switches, and fuse switches
2	Front cabinet HCU mounting plate for installation of HCU and HPCU
③	Control terminal mounting plate
④	Copper busbar kit of auxiliary cabinet
⑤	HCU mounting plate on back of the cabinet, which is used for installation of HCU and HPCU
⑥	IP rating: IP21
⑦	Door plate of auxiliary cabinet, which is installed with electricity meter and smart operating panel SOP-20-880

Auxiliary cabinet size

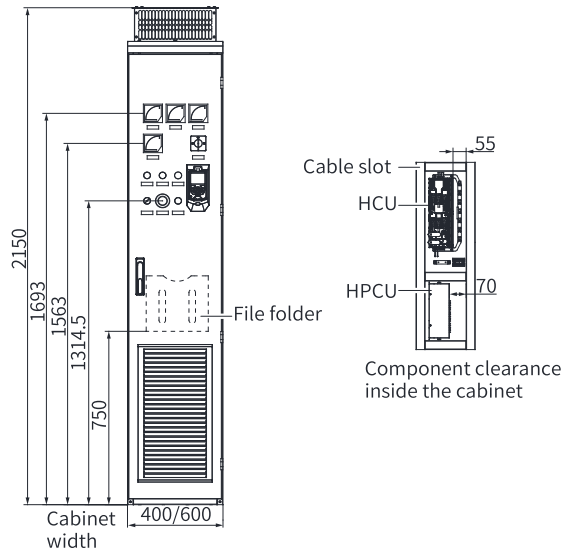


Figure 4-2 Dimensions of auxiliary cabinet (mm)

4.2 Inlet Cabinet

Layout of inlet cabinet

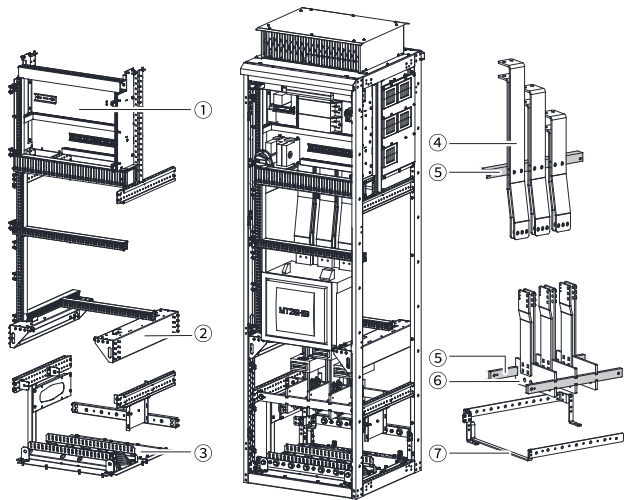


Figure 4-3 Layout of inlet cabinet

No.	Name
①	Mounting plate on top of the cabinet, used for installation of terminals, air switches, and fuse switches (not available in basic power supply cabinets)
②	Circuit breaker mounting plate
③	Bottom plate of the cabinet, which is set with cable inlet holes
④	Wiring copper busbar of the circuit breaker
⑤	Insulating beam for fixing the copper busbar
⑥	Wiring copper busbar of circuit breaker
⑦	PE bus of the inlet cabinet

Inlet cabinet dimensions

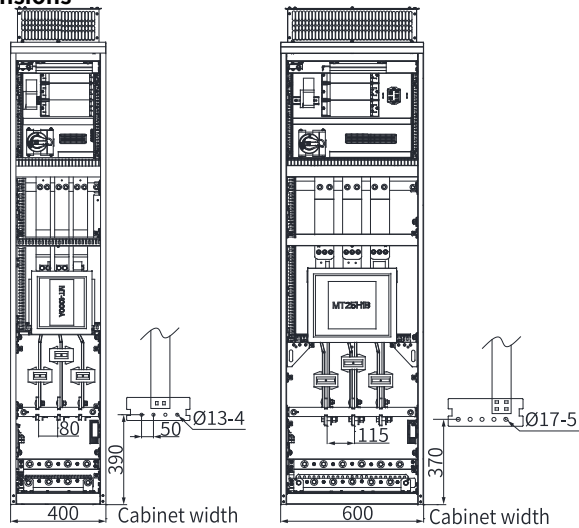


Figure 4-4 Dimensions of the inlet cabinet (mm)

4.3 Basic Power Supply Cabinet

Layout of the basic power supply cabinet

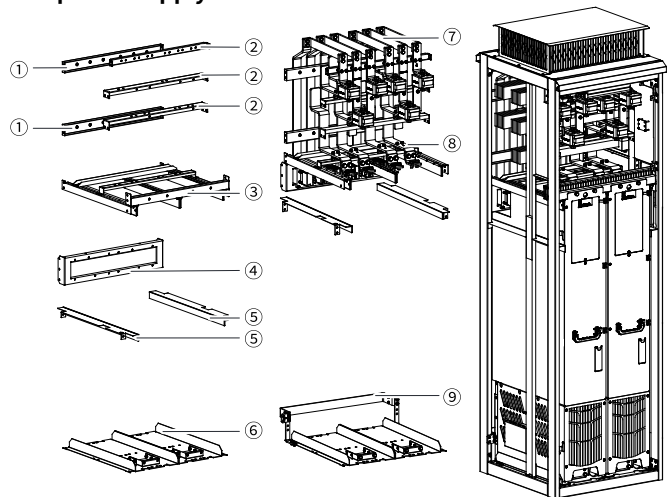


Figure 4-5 Layout of the basic power supply cabinet

No.	Name
①	Beam for installing copper busbar on back of the cabinet
②	Beam for fixing the copper busbar in front of the cabinet
③	Module mounting bracket
④	Quick connection terminal
⑤	Mounting bracket
⑥	Module mounting baseplate
⑦	T2 basic line module input copper busbar
⑧	T2 basic line module output copper busbar
⑨	PE copper busbar of the power supply cabinet

Basic power supply cabinet dimensions

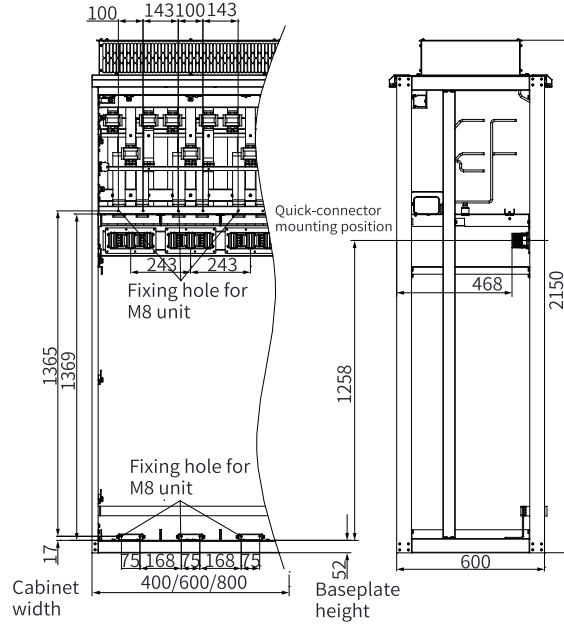


Figure 4-6 Dimensions of basic power supply cabinets (mm)

4.4 Regenerative power supply cabinet

Layout of the regenerative rectifier cabinet (L+H8)

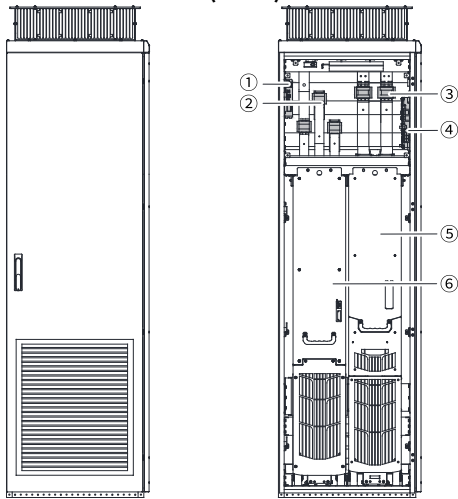


Figure 4-7 Layout of regenerative rectifier cabinet (L+H8)

No.	Name
1	HSVM Synchronous voltage detection module
2	AC side fuse
③	DC side fuse
④	Fan power supply
⑤	Regenerative line filter module
⑥	Regenerative line filter module

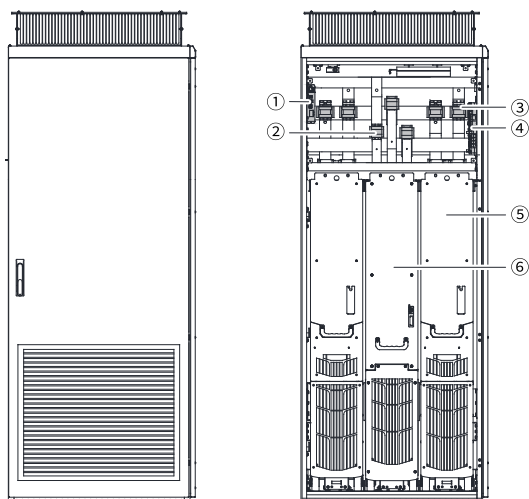


Figure 4-8 Layout of regenerative rectifier cabinet (L+2H8)

No.	Name
1	HSVM Synchronous voltage detection module
2	AC side fuse
③	DC side fuse
④	Fan power supply
⑤	Regenerative line filter module
⑥	Regenerative line filter module

Dimensions of regenerative power supply cabinets

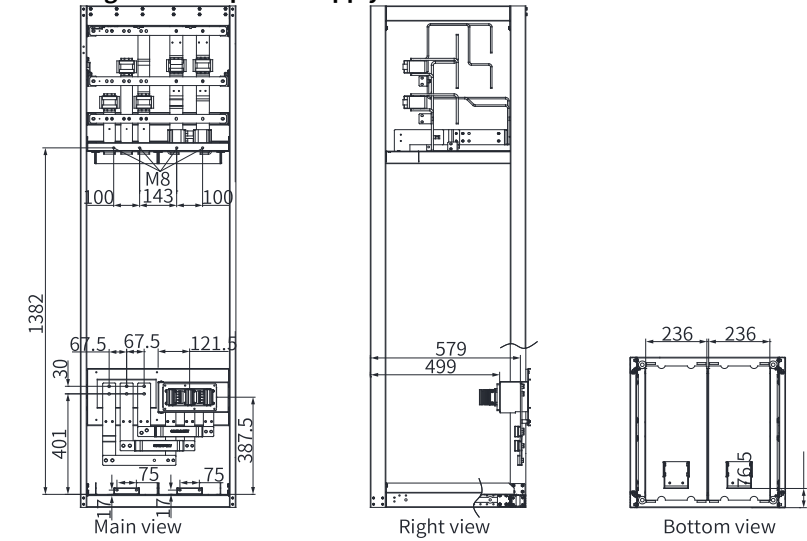


Figure 4-9 Dimensions of regenerative power supply cabinet with a width of 800 mm

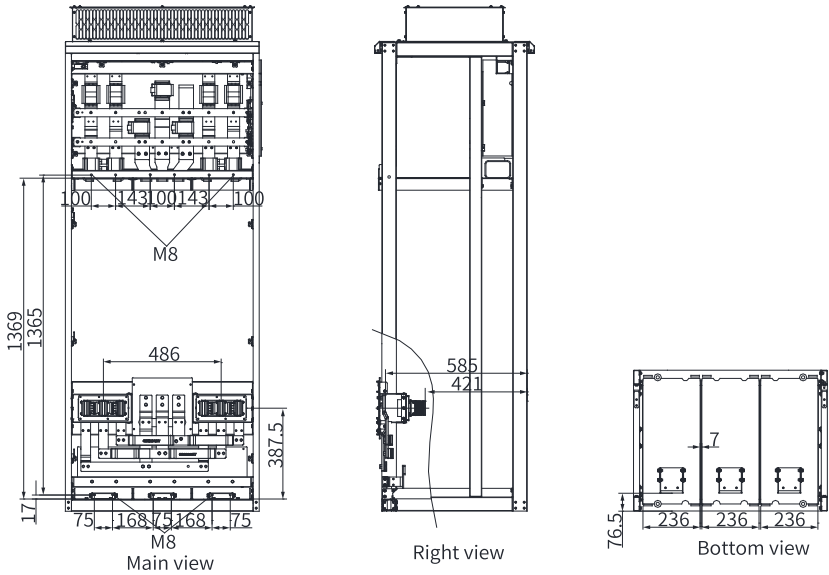


Figure 4-10 Dimensions of regenerative power supply cabinet with a width of 600 mm

4.5 Active power supply cabinet

Layout of active power supply cabinet

Figure 4-11 Figure 2-23 Structural layout of the active power supply cabinet

No.	Name
①	Mounting plate on both sides of the cabinet, which is used for installation of the SVM card and LCL fan power supply
②	Frame for fixing the module
③	Copper busbar and quick-connector mounting beam
④	Module mounting baseplate
⑤	BLCL input copper busbar and H8 output copper busbar
⑥	Copper busbar used to connect H8 and BLCL
⑦	PE copper busbar of active power supply cabinet with a width of 600 mm

Active power supply cabinet

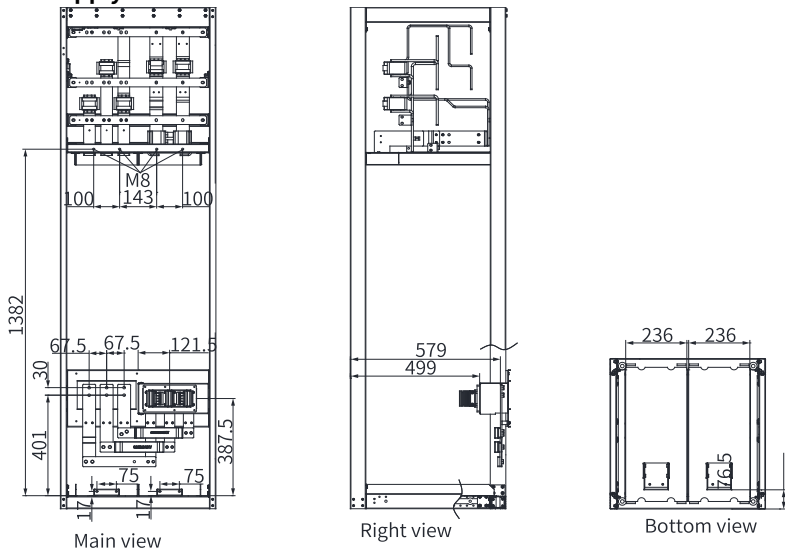
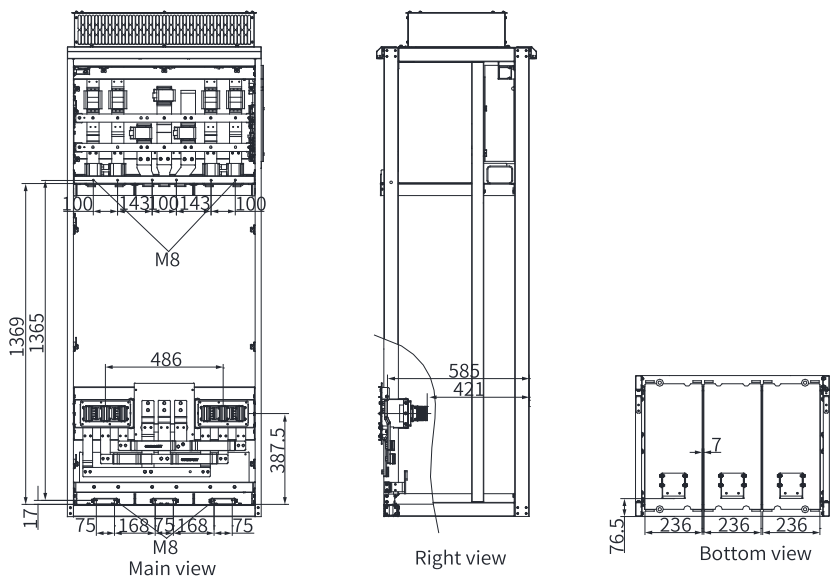


Figure 4-12 Dimensions of active power supply cabinet with a width of 600 mm



4.6 Drive Cabinet

Layout of the drive cabinet

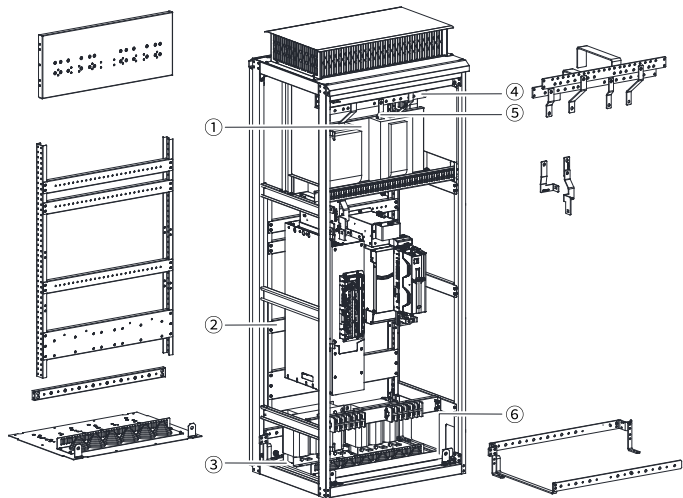


Figure 4-14 Layout of H1 to H6 drive cabinets

No.	Name
①	Mounting plate for fuse switch on top of cabinet
②	Mounting beam for H1 to H6 modules
③	Cabinet bottom plate
④	Positive/Negative adapter bus
⑤	Module input copper busbar and copper busbar for connecting the fuse switch
⑥	PE copper busbar for 800-mm wide cabinets

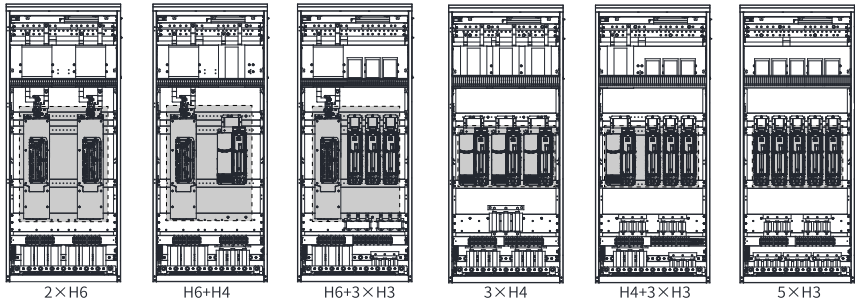


Figure 4-15 Mounting mode for H1 to H6 drive modules (800-mm wide)

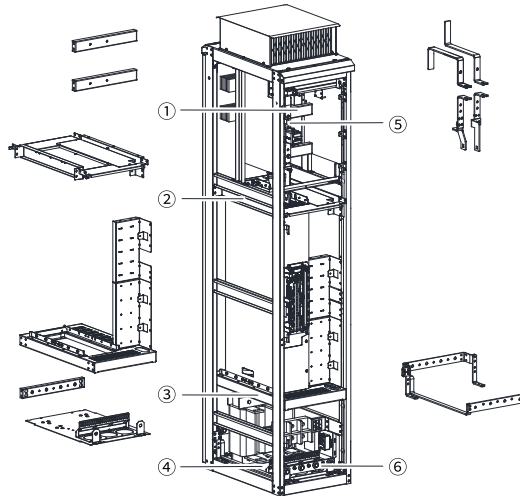


Figure 4-16 Layout of H6 and H7 drive cabinets

No.	Name
①	Beam for fixing the copper busbar
②	Module mounting bracket
③	Mounting pallet
④	Bottom plate for 400-mm wide cabinets

No.	Name
⑤	Module input copper busbar
⑥	PE copper busbar for 400-mm wide cabinets

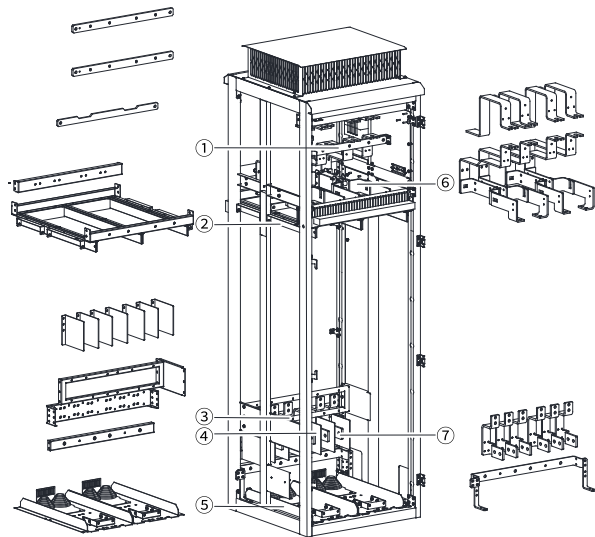


Figure 4-17 Layout of 2 x H8 drive cabinets

No.	Name
①	Copper busbar mounting beam
②	Module mounting frame
③	Phase-to-phase isolating partition
④	Quick-connector mounting beam
⑤	Module mounting baseplate
⑥	Module input copper busbar
⑦	Output copper busbar and PE copper busbar

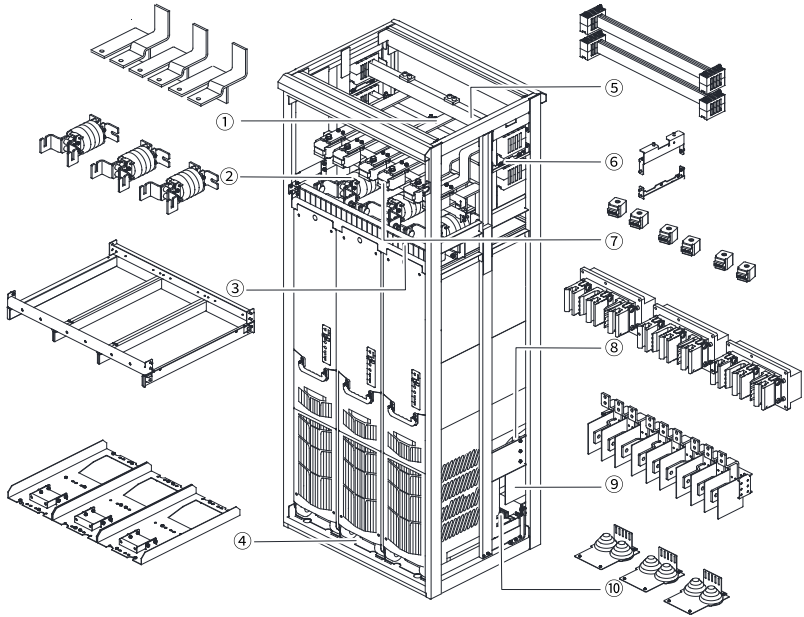


Figure 4-18 Layout of 3 x H8 drive cabinets

No.	Name
①	DC input copper busbar
②	Common mode magnetic ring (optional)
③	Upper mounting parts
④	Lower mounting parts
⑤	Bus and bus clamp
⑥	Fixing bracket of bus clamp
⑦	Fuse
⑧	Quick-connector socket
⑨	AC output copper busbar
⑩	Bottom outlet hole

Drive cabinet dimensions

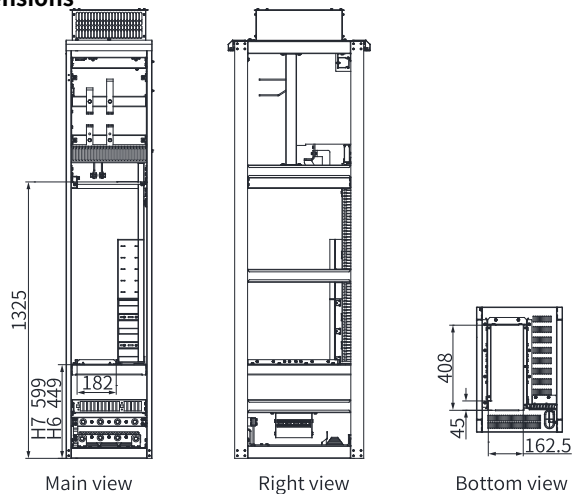


Figure 4-19 Dimensions of H6/H7 drive cabinets with a width of 400 mm

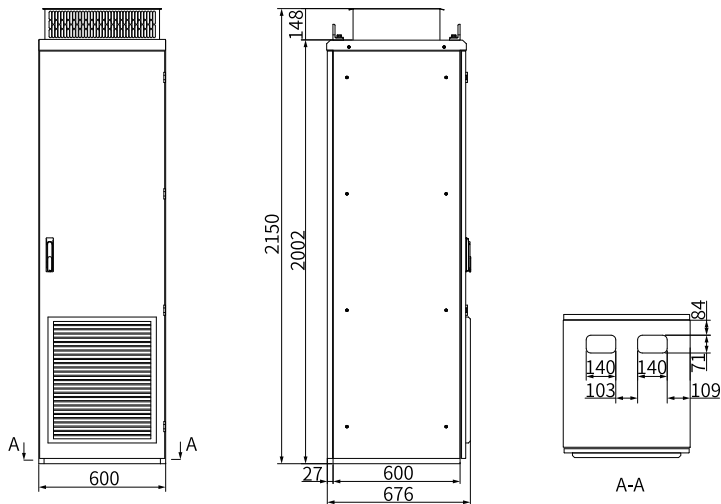


Figure 4-20 Dimensions of 2 x H8 drive cabinets (mm)

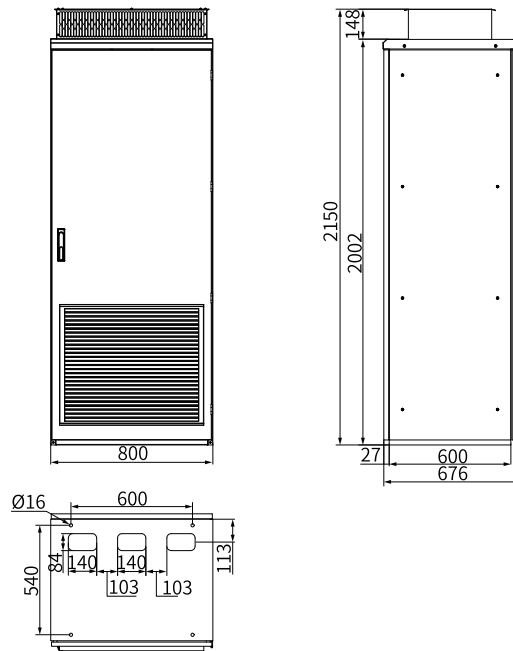


Figure 4-21 Dimensions of 3 x H8 drive cabinets (mm)

4.7 Braking Cabinet

Layout of the braking cabinet

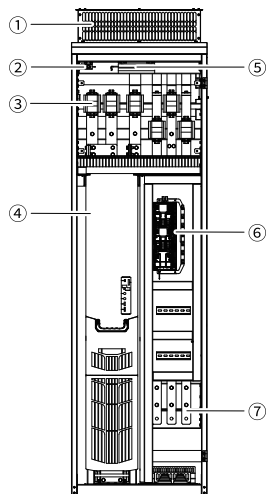


Figure 4-22 Layout of the braking cabinet_1

No.	Name
①	IP21 top cover
②	Limit switch
③	Fuse
④	Braking module
⑤	Lighting
⑥	HCU
⑦	Grounding copper busbar

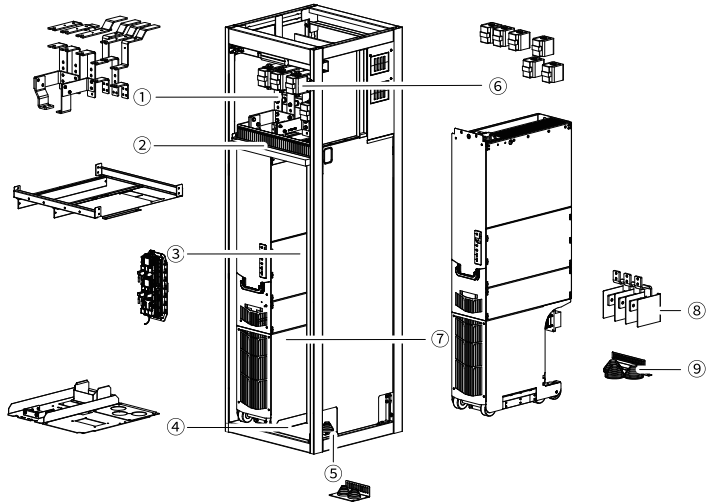


Figure 4-23 Layout of the braking cabinet_2

No.	Name
①	Branch copper busbar
②	Mounting rail
③	HCU
④	Bottom plate guide rail
⑤	Control cable outlet hole
⑥	Fuse
⑦	Braking module
⑧	Wiring copper busbar of the power cable
⑨	Power cable inlet/outlet hole

Braking cabinet dimensions

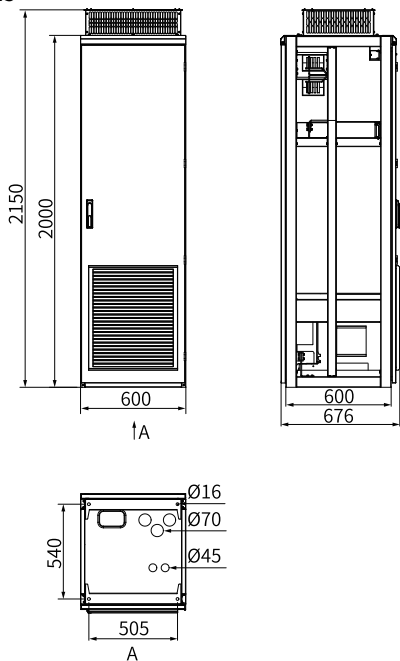


Figure 4-24 Dimensions of the braking cabinet (mm)

4.8 Connection Cabinet

Layout of the connection cabinet

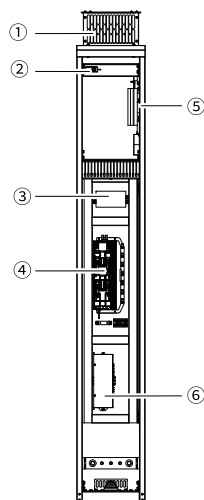


Figure 4-25 Layout of the connection cabinet_1

No.	Name
①	IP21 top cover
②	Limit switch
③	Control device
④	HCU
⑤	Lighting
⑥	HPCU

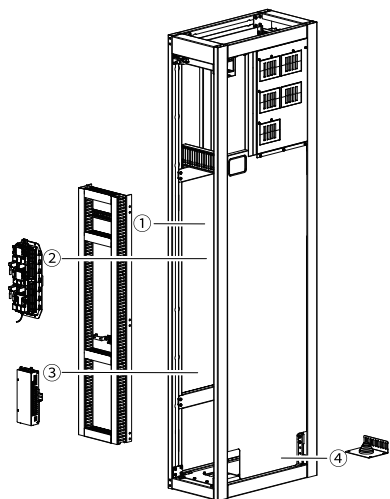


Figure 4-26 Layout of the connection cabinet_2

No.	Name
①	Device mounting plate
②	HCU
③	HPCU
④	Cable inlet/outlet hole

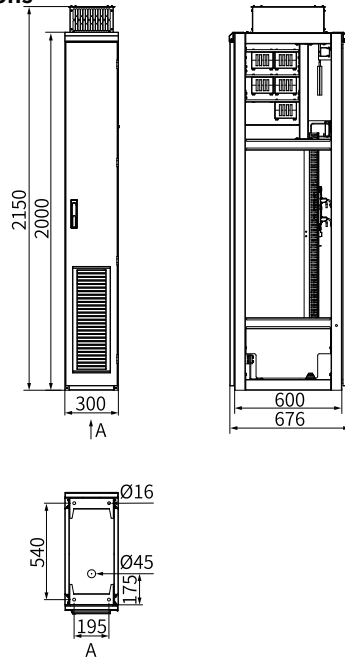
Connection cabinet dimensions

Figure 4-27 Dimensions of the connection cabinet (mm)

5 Maintenance and Inspection

5.1 Safety Instructions for Maintenance



Take necessary safety measures before maintenance and inspection.

- Note that the active line module is energized with high voltage, and all wiring work must be carried out with module de-energized.
 - Before maintenance, power off the module, wait for 15 minutes and confirm that the voltage of the module is lower than 36 VDC. Failure to comply can result in personal injury due to the residual voltage in the capacitor.
 - When external power supply is connected, hazardous voltage are still present in the cabinet and modules even if the main breaker is open. Ensure that no voltage is present before operation.
 - Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed only by professionals.
 - Mount and wire the equipment according to national standards, industry standards and local safety codes.
 - Handle heavy equipment or equipment with high center of gravity with care. Improper lifting or handling may result in death, serious personal injury or major property loss.
 - Be aware of the possibly residual rotation of the cooling fan.
-

5.2 Precautions on Cleaning

To keep stable operation of the equipment, remove the dust and contamination periodically.

Pay attention to the following:

- Dust accumulation
The dusts inside the cabinet and modules can only be removed by professionals regularly (at least once a year) according to relevant safety regulations. A brush and vacuum cleaner must be used to clean the dust. For positions that cannot be easily reached, use dry compressed air (max. 1 bar) for cleaning.
- Ventilation
Always keep the ventilation openings of the cabinet and modules unobstructed and ensure that the cooling fan is functioning properly.

5.3 Precautions on Inspection

Taking measures to keep normal operation of the equipment and eliminate the fault.

Tools needed

The following tools are needed to inspect and replace the components.

- Wrench or socket wrench with an opening angle of 8-M5
- Wrench or socket wrench with an opening angle of 10-M6
- Wrench or socket wrench with an opening angle of 13-M8
- Wrench or socket wrench with an opening angle of 16-M10
- Wrench or socket wrench with an opening angle of 18-M12
- Torque wrench
- Screwdriver of size 1/2
- It is recommended to use a socket wrench kit that carries two extension rods.

Service life of components

To ensure long-term operation of cabinets, perform regular maintenance and inspection on the electronic components according to their service life. The service life of the electronic components is affected by the operating environment and condition. The following tables lists the replacement interval of these components for your reference:

Table 5-1 Replacement interval of components

Name	Standard service life
DC fan	5 years
Electrolytic capacitor	8 years
Printed circuit board	10 years

Note

The operation conditions for keeping the standard service life are as follows:

- Ambient temperature: 30°C as annual average temperature
- Load coefficient: below 80%
- Operating time: 24 hours of continuous operation

Tightening torques of screw connectors

Observe the following tightening torque when tightening the connector of conductive parts (connection among DC bus interfaces, motor interfaces and busbar), non-conductive parts (grounding terminals and protective grounding terminals), and common steel parts.

Table 5-2 Tightening torque for current-carrying components

Screw/Bolt	Grounding terminals, protective grounding terminals, and steel connectors (N·m) (Conductive fault current)	Current busbar of plastic box (N·m) (Conductive operating current)
M2.5	0.3	0.3
M3	1	0.8
M4	1.2	1.2
M5	2.8	2.5
M6	4.8	4.8
M8	20	10.5
M10	40	20
M12	70	45

Cable terminals and fasteners

Check whether the cable terminals and screw terminals are secured properly. If not, re-tighten them. Check the cabling fault. If any component is damaged, replace it immediately.

Note

The actual maintenance cycle is determined by the mounting environment and operating conditions of the equipment.

5.4 Maintenance of Components

5.4.1 Maintenance of the Filter Screen



Warning

- Component replacement can be performed by professionals only. Before maintenance and inspection, read the safety instructions in "*Fundamental Safety Instructions*" on page 5 and "*5.1 Safety Instructions for Maintenance*" on page 48. Failure to comply may result in personal injury or equipment damage.
- Before replacement, power off the equipment first to prevent the fan from sucking in the external air that contains pollutants. When applying external power supply to the fan, be aware of the residual rotation of the fan or disconnect the power supply of the external fan.
- If the dirty air filter is not replaced timely, devices in the cabinet may stop due to high temperature.

Removing the air filter

Replace and clean the air inlet screen of the high-protection cabinet as shown in the following figure.

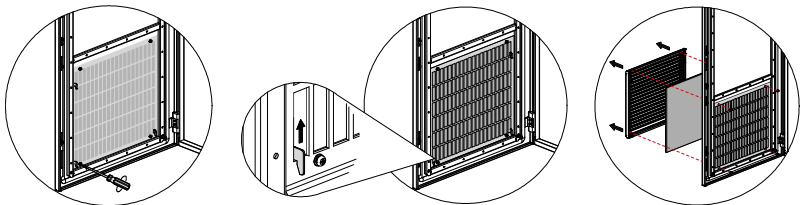


Figure 5-1 Removing the air filter

Steps to remove the filter:

1. Power off the cabinet and cut off the fan power supply.
2. Open the cabinet front door and remove the four M4 screws from the blind.
3. Lift up the window blind and remove it.
4. Remove the filter screen from the blinds and clean (or replace) it.

Installing the filter screen

And removal steps are reversed. The installation steps are as follows:

1. Install the filter screen (cleaned or new) into the blinds.
2. Insert the blinds into the reserved hole.
3. Use screws to fix the blinds again from the interior of the front door.

Repeat the preceding steps for all the filter screens that need to be replaced.

5.4.2 Replacing DC Fan of the Active Line Module



Component replacement can be performed by professionals only. Before maintenance and inspection, read the safety instructions in "[Fundamental Safety Instructions](#)" on page 5 and "[5.1 Safety Instructions for Maintenance](#)" on page 48. Failure to comply may result in personal injury or equipment damage.

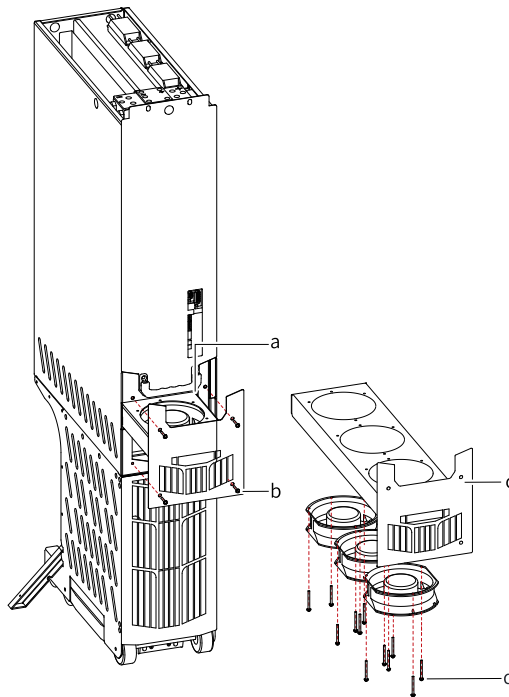


Figure 5-2 Replacing the fan of the active line module

Replacement steps:

1. Disconnect the DC power supply from the drive cabinet and ensure that the equipment carries no residual voltage.
2. Open the cabinet door and use a screwdriver to remove the four M5 screws (b) from the fan assembly (c).

3. Unplug the power cable (a) of the fan when pulling the fan units out from the front of the module.
 4. Remove the twelve M4 screws (four in case of one fan) from the fan assembly .
 5. Install a new fan of the same specification in the same procedure, but in the reverse order.
-

Note

- The air flows from bottom to top. When installing the fan, make the UP arrow face upwards.
 - Do not pinch the power cable of the fan during installation.
-

5.4.3 Replacing DC Fan of the Active Line Filter Module



Component replacement can be performed by professionals only. Before maintenance and inspection, read the safety instructions in "[Fundamental Safety Instructions](#)" on [page 5](#) and "[5.1 Safety Instructions for Maintenance](#)" on [page 48](#). Failure to comply may result in personal injury or equipment damage.

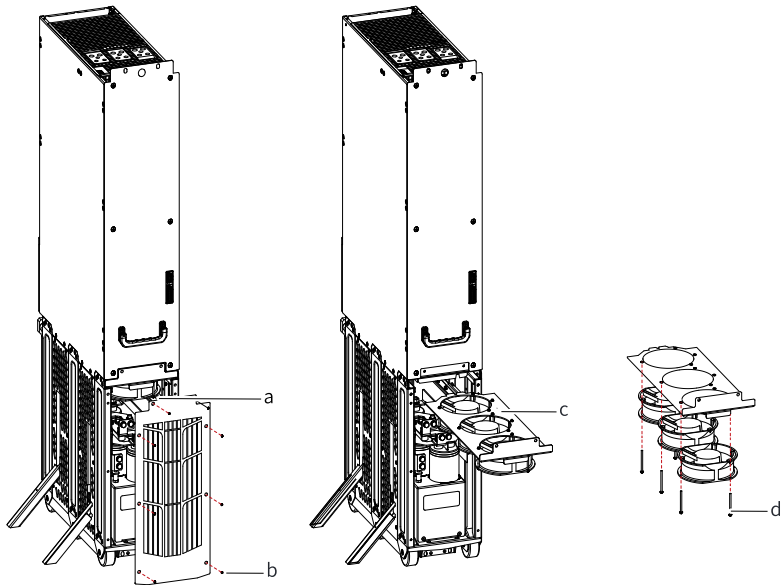


Figure 5-3 Replacing the fan of the active line filter module

Steps

1. Disconnect the AC power supply from the drive cabinet and ensure that the equipment carries no residual voltage.
2. Open the cabinet door and use a screwdriver to remove the eight M5 screws (b) from the panel and remove the panel.
3. Disconnect the fan from the module (a).
4. Pull out the fan assembly (c).
5. Unscrew the twelve M4 screws (d) from the fan and remove the fan.
6. Install a new fan and fan assemblies in the same procedure, but in the reverse order.
7. Wire the fan to the power supply module and install the panel.

Note

- The air flows from bottom to top. When installing the fan, make the UP arrow face upwards.
 - Do not pinch the power cable of the fan during installation.
-

5.4.4 Replacing the Frame Accessory Kit



Warning

Component replacement can be performed by professionals only. Before maintenance and inspection, read the safety instructions in ["Fundamental Safety Instructions" on page 5](#) and ["5.1 Safety Instructions for Maintenance" on page 48](#). Failure to comply may result in personal injury or equipment damage.

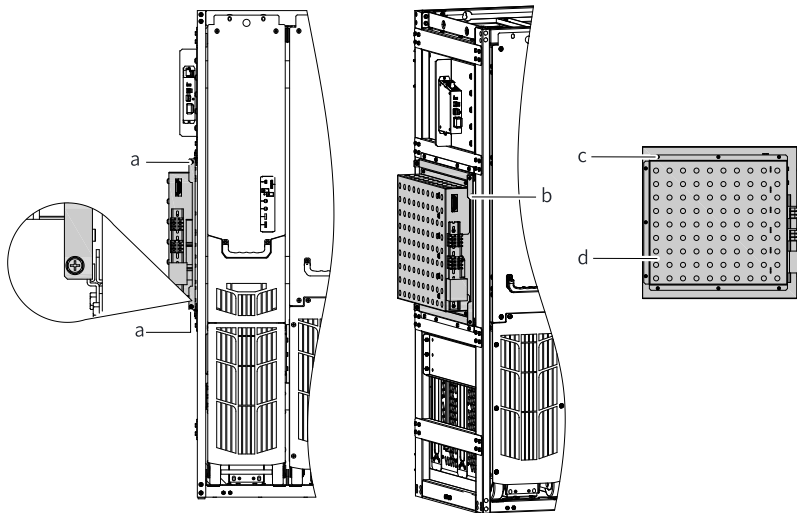


Figure 5-4 Replacing the frame accessory kit

Replacement steps:

1. Disconnect the AC power supply from the drive cabinet and ensure that the equipment carries no residual voltage.
2. Disconnect all terminals connected to the accessory kit.
3. Use a screwdriver to remove the two M6 screws (a) in the front.
4. Pull the bending edge of the sheet metal (b) to take out the accessory kit.
5. Use a screwdriver to remove the nine M4 screws (c) used to fix the accessory kit cover, remove the accessory kit cover (d), service internal components, and connect corresponding cables.
6. Install the accessory kit in the same procedure, but in the reverse order.
7. Wire cables properly.

5.4.5 Replacing the Power Supply of the Fan



Component replacement can be performed by professionals only. Before maintenance and inspection, read the safety instructions in "[Fundamental Safety Instructions](#)" on page 5 and "[5.1 Safety Instructions for Maintenance](#)" on page 48. Failure to comply may result in personal injury or equipment damage.

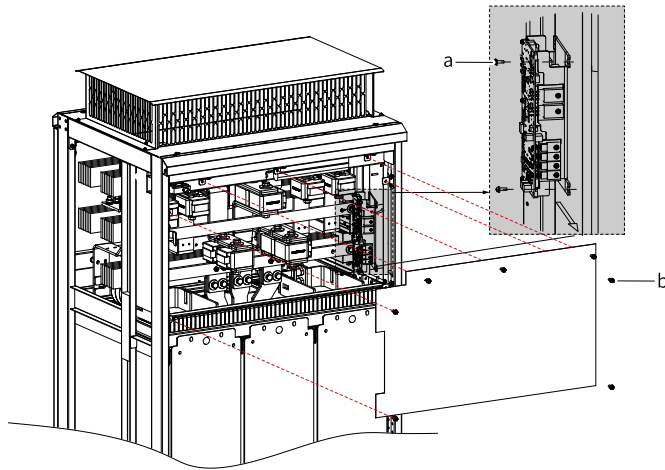


Figure 5-5 Replacing the power supply of the fan

Replacement steps:

1. Disconnect the AC power supply from the drive cabinet and ensure that the equipment carries no residual voltage.
2. Open the cabinet door.
3. Loosen the M6 screw (b) on the upper cover of the cabinet and remove the cover.
4. Pull out the terminal of the fan power supply.
5. Remove the two M5 screws (a) on the power supply and remove the power supply. Be careful not to drop the screws inside the module.
6. Install a new power supply in the same procedure, but in the reverse order.
7. Re-connect the power supply terminals.
8. Tighten the cover and close the cabinet door.

Note

Do not damage the fixing screws. Tighten the fixing screws of the power supply with a tightening torque of 1.2 N•m.

5.4.6 Replacing HSVM-10



Warning

Component replacement can be performed by professionals only. Before maintenance and inspection, read the safety instructions in ["Fundamental Safety Instructions" on page 5](#) and ["5.1 Safety Instructions for Maintenance" on page 48](#). Failure to comply may result in personal injury or equipment damage.

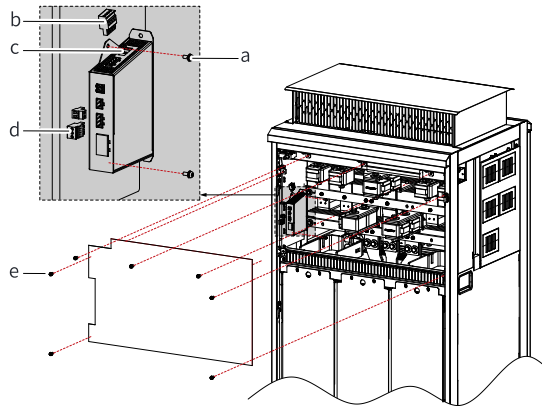


Figure 5-6 Replacing HSVM-10

Steps

1. Disconnect the AC power supply from the drive cabinet and ensure that the equipment carries no residual voltage.
2. Open the cabinet door.
3. Loosen the M6 screw (e) on the upper cover of the cabinet and remove the cover.
4. Pull out the optical fiber (c) on top of HSVM-10.
5. Pull out the 24 V power supply terminal (b) on the top of HSVM-10.
6. Pull out the three-phase AC voltage detection terminal (d) in the front of HSVM-10.

7. Remove the two M4 screws (a) on the HSVM-10 and take out the HSVM-10. Be careful not to drop the screws inside the module.
8. Replace with a new HSVM-10 in the same procedure, but in the reverse order.
9. Tighten the cover and close the cabinet door.

Note

Do not damage the fixing screws. Tighten the screws that used to fix the HSVM-10 module with a tightening torque of 1.2 N•m.

5.4.7 Replacing HSVM-20



Component replacement can be performed by professionals only. Before maintenance and inspection, read the safety instructions in "[Fundamental Safety Instructions](#)" on [page 5](#) and "[5.1 Safety Instructions for Maintenance](#)" on [page 48](#). Failure to comply may result in personal injury or equipment damage.

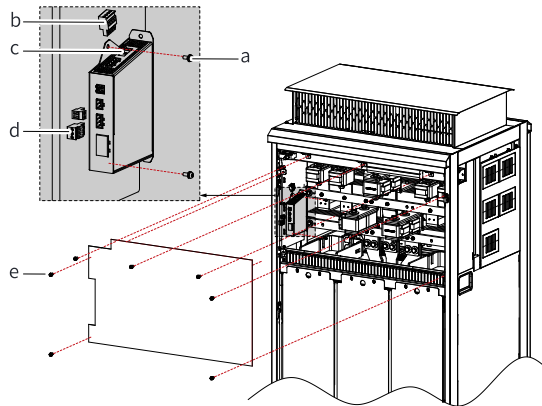


Figure 5-7 Replacing HSVM-20

Steps

1. Disconnect the AC power supply from the drive cabinet and ensure that the equipment carries no residual voltage.
2. Open the cabinet door.
3. Loosen the M6 screw (e) on the upper cover of the cabinet and remove the cover.

4. Pull out the optical fiber (c) on top of HSVM-20.
5. Pull out the 24 V power supply terminal (b) on the top of HSVM-20.
6. Pull out the three-phase AC voltage detection terminal (d) in the front of HSVM-20.
7. Remove the two M4 screws (a) on the HSVM-20 and take out the HSVM-20. Be careful not to drop the screws inside the module.
8. Replace with a new HSVM-20 in the same procedure, but in the reverse order.
9. Tighten the cover and close the cabinet door.

Note

Do not damage the fixing screws. Tighten the screws that used to fix the HSVM-20 module with a tightening torque of 1.2 N•m.

5.4.8 Replacing the Lightning Protection Board



Component replacement can be performed by professionals only. Before maintenance and inspection, read the safety instructions in "[Fundamental Safety Instructions](#)" on page 5 and "[5.1 Safety Instructions for Maintenance](#)" on page 48. Failure to comply may result in personal injury or equipment damage.

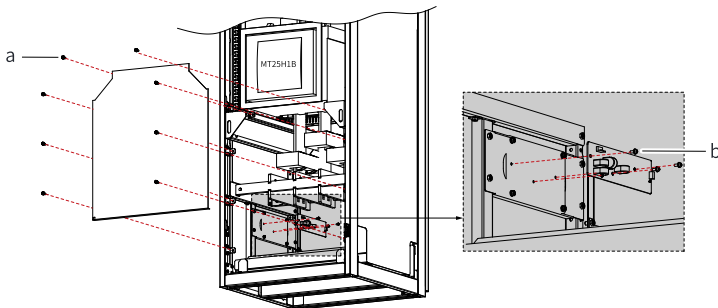


Figure 5-8 Replacing the lightning protection board

Replacement steps:

1. Disconnect the AC power supply from the drive cabinet and the disconnecter of the charging circuit. Ensure that the equipment carries no residual voltage.
2. Open the cabinet door.
3. Loosen the M6 screws (a) on the lower cover of the cabinet and remove the cover.

4. Disconnect the lightning protection board terminals and remove the M4 fixing screws (b).
5. Replace with a new lightning protection board in the same procedure, but in the reverse order.
6. Re-connect the terminals.
7. Tighten the cover and close the cabinet door.

Note

- Do not damage the fixing screws. Tighten the screws that used to fix the lightning protection board with a tightening torque of 1.2 N•m.
 - When the power supply cabinet operates in an IT system, remove the two M4 screws on the voltage dependent resistor board.
-

5.4.9 Replacing the Fuse



Component replacement can be performed by professionals only. Before maintenance and inspection, read the safety instructions in "[Fundamental Safety Instructions](#)" on page 5 and "[5.1 Safety Instructions for Maintenance](#)" on page 48. Failure to comply may result in personal injury or equipment damage.

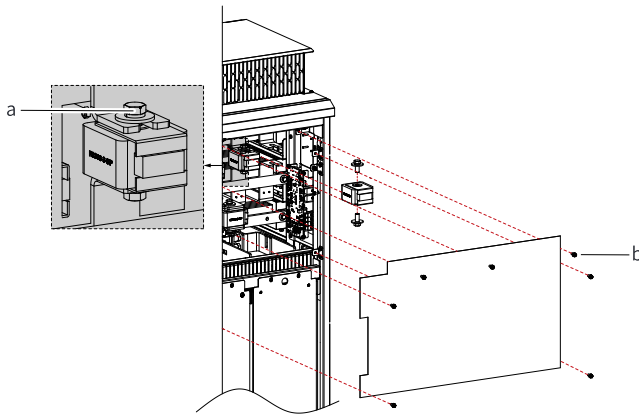


Figure 5-9 Replacing the fuse

Steps

1. Disconnect the AC power supply from the drive cabinet and the fuse switch of the pre-charge circuit. Ensure that the equipment carries no residual voltage.
2. Open the cabinet door.
3. Loosen the M6 screw (b) on the upper cover of the cabinet and remove the cover.
4. Loosen the M10/M12 screws (a) slightly and pull out the fuse together with the nut.
Note: do not loosen the nut completely to prevent the nut from falling into the module.
5. Remove the nut and check the condition of the fuse. If the fuse burns out, replace all the fuses and tighten the nut. The maximum tightening torque of the nut is 35 N•m.
6. Install the cover in the same procedure, but in the reverse order and close the cabinet door.

5.4.10 Replacing the Module

For detailed instructions on replacing a module, see the manual of MD880 series modules.

5.5 Storage and Warranty

Store the drive in a clean and dry room, with temperatures between -40°C and +70°C and temperature variation smaller than 1°C/min. If the drive is stored for a prolonged period once it has been unpacked, cover it or take other appropriate measures to keep it from contamination and environmental pollutants.



To store the equipment properly, observe the following:

- Pack the equipment into its original packing box provided by Inovance.
 - Do not expose the equipment to environments with moisture, high temperatures, or direct sunlight for a long time.
-

5.6 Disposal

The raw materials contained in the drive module can be recycled to achieve energy conservation and environmental protection.

Most recyclable parts are marked for recycling.

- Packaging materials can be degraded and recycled.
- All metal components can be recycled.

- All metal parts can be recycled; plastic parts can be recycled according to local regulations or burned under controlled conditions.

If not, most parts can be disposed of by landfill. However, DC capacitors (C1-1 to C1-x) contain electrolytes, which are classified as hazardous waste in the EU standard. They can be reprocessed as necessary according to local regulations.



19012267B00

Copyright © Shenzhen Inovance Technology Co., Ltd.

Shenzhen Inovance Technology Co., Ltd.

www.inovance.com

Add.: Inovance Headquarters Tower, High-tech Industrial Park,
Guanlan Street, Longhua New District, Shenzhen

Tel: (0755) 2979 9595

Fax: (0755) 2961 9897

Suzhou Inovance Technology Co., Ltd.

www.inovance.com

Add.: No. 16 Youxiang Road, Yuexi Town,
Wuzhong District, Suzhou 215104, P.R. China

Tel: (0512) 6637 6666

Fax: (0512) 6285 6720