



## MD810 Series Standard Drive (Multidrive System) Installation Guide



Industrial  
Automation



Intelligent  
Elevator



New Energy  
Vehicle



Industrial  
Robot



Rail  
Transit



Data code 19011961 A00

# Preface

## About This Guide

The MD810 series is a new-generation low-voltage multidrive system. It is also a common DC bus drive system consisting of the power supply unit and the drive unit, which can meet requirements of a single mechanical device with multiple drive points and continuous production line system. It is widely used in metal products, printing and packaging, textile printing and dyeing, chemical fiber and plastics, small-sized papermaking, hoisting and other industries.

This guide introduces the installation and wiring of the drive, including pre-installation preparations, unpacking and transportation, mechanical installation, and electrical installation.

## More Data

Data Name	Data Code	Description
MD810 Series Standard Drive (Multidrive System) Hardware Guide	19011960	Describes the product information, mechanical design, electrical design, options, EMC FAQs, and certifications.
MD810 Series Standard Drive (Multidrive System) Installation Guide	19011961	Describes the installation and wiring of the drive, including pre-installation preparations, unpacking and transportation, mechanical installation, and electrical installation.
MD810 Series Standard Drive (Multidrive System) Maintenance Guide	19011962	Describes the routine product maintenance, component replacement, and troubleshooting.
MD810 Series Standard Drive (Multidrive System) Commissioning Guide	19011964	Describes the quick commissioning procedure, commissioning parameter list, and commissioning troubleshooting.
MD810 Series Standard Drive (Multidrive System) Communication Guide	19011965	Describes the communication mode, communication networking, and communication configuration.
MD810 Series Standard Drive (Multidrive System) Function Guide	19011963	Describes the commissioning tools, system commissioning steps, parameters, fault codes, and product functions and applications.

## Revision History

Date	Version	Revision
May 2022	A00	First release

## How to Obtain

This guide is not delivered with the product. You can obtain the PDF version by the following method:

Log in to Inovance's website (<http://en.inovance.cn/>), choose **Support > Download**, search by keyword, and then download the PDF file.

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# Fundamental Safety Instructions

## Safety Precautions

1. This chapter presents essential safety instructions for a 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.
2. "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.
3. Use this equipment according to the designated environment requirements. Damage caused by improper use is not covered by warranty.
4. Inovance shall take no responsibility for any personal injuries or property damage caused by improper use.

## Safety Levels and Definitions



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



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



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



- 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.



- 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



- 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.



- 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



- 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 devices with strong electromagnetic interference, such as a transformer, install a shielding device 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 shavings, 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 will result in an electric shock.

 WARNING

- Do not connect the input power supply to the output end of the equipment. Failure to comply will 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

- During wiring, follow the proper electrostatic discharge (ESD) procedure, and wear an antistatic wrist strap. Failure to comply will damage the equipment or the internal circuits of the equipment.
- 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



- 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.



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

#### Repair



- 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.



- 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 Labels**

For safe equipment operation and maintenance, comply with the safety labels on the equipment. Do not damage or remove the safety labels. See the following table for descriptions of the safety labels.

Safety Label	Description
	<ul style="list-style-type: none"> <li>• Read through the safety instructions before operating the equipment. Failure to comply may result in death, personal injuries, or equipment damage.</li> <li>• Do not touch the terminals or remove the cover with power ON or within 10 min after power-off. Failure to comply will result in an electric shock.</li> </ul>

# Installation Flowchart

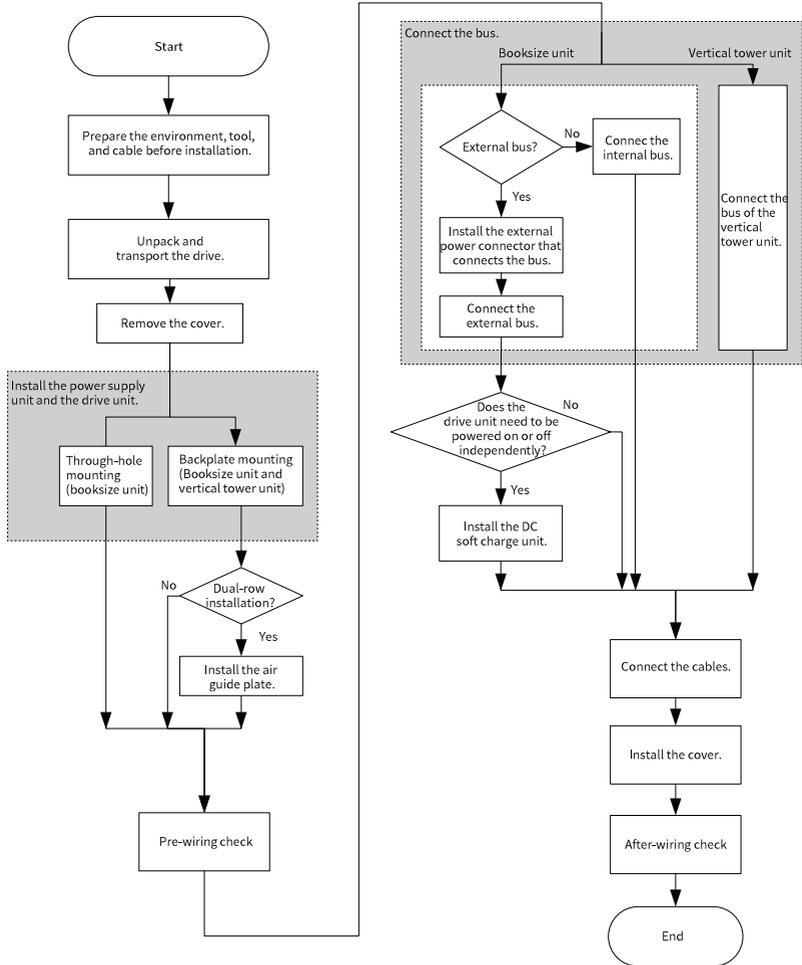


Figure -1 Installation flowchart

# 1 Preparation Before Installation

## 1.1 Installation Environment

To fully utilize the product performance and ensure long-term use, install the drive in an environment meeting the following requirements.

Table 1-1 Installation environment requirements

Item	Requirement
Installation location	Indoors
Grid overvoltage	Overvoltage category (OVC) III
Temperature	<p>Installation/Operating temperature:</p> <ul style="list-style-type: none"> <li>• 1) -10°C to +40°C: derating not required; 2) 40°C &lt; temperature ≤ 50°C: derated by 1.5% for every additional 1°C; 3) &gt; 50°C: not recommended for use</li> <li>• Storage/Transportation temperature: -25°C to +70°C (no freezing)</li> <li>• To improve the reliability of the drive, use the drive in places without sharp temperature change.</li> <li>• When installing the drive in an enclosed cabinet, use the cooling fan or air conditioner to keep the incoming air temperature below 50°C. Failure to comply will result in over-temperature of the drive or even fire.</li> <li>• Install the drive on a flame-retardant surface, and reserve sufficient space around it for efficient heat dissipation.</li> <li>• Avoid freezing the drive.</li> </ul>
Relative humidity	< 95% RH, without condensation
Environment	<p>Pollution degree (PD): PD2 or below</p> <p>Install the drive in a location that meets the following descriptions.</p> <ul style="list-style-type: none"> <li>• Install the drive in a place free of direct sunlight, dust, corrosive gas, combustible or explosive gas, oil mist, water vapor, drip, or salt.</li> <li>• Install the drive in a place away from vibration. Keep the drive away from equipment such as punch presses.</li> <li>• Do not install any device generating electromagnetic waves or interference, such as transformers, around the drive. If such a device is required, install a shielding plate between the device and the drive. Otherwise, the drive will malfunction.</li> <li>• The drive serves as a part of a final system. Install the drive as the system component in a fireproof cabinet that provides effective electrical and mechanical protection, and install it in accordance with local laws and regulations and relevant IEC standards.</li> </ul>
Altitude	Star power grid: maximum 3000 m (9843 ft)

Item	Requirement
	<ul style="list-style-type: none"> <li>• <math>\leq 1000</math> m (3281 ft): derating not required</li> <li>• <math>&gt; 1000</math> m (3281 ft): derated by 1% for every additional 100 m (328.1 ft)</li> </ul>
Vibration	<ul style="list-style-type: none"> <li>• <math>\leq 0.6</math> g</li> <li>• For transportation in the package: compliant with class 2M3 in EN 60721-3-2</li> <li>• For installation with the package removed: compliant with ISTA 1H</li> </ul>
Dust	Compliant with class 3S2 in IEC60721-3 (non-conductive dust)
Chemically active substance	Compliant with class 3C2 in IEC60721-3
Impact	$< 19.6$ m/s <sup>2</sup>
IP rating	<ul style="list-style-type: none"> <li>• Power supply unit: IP20</li> <li>• Drive unit (single-axis): 1) 1.5 kW to 75 kW: IP20; 2) 90 kW to 160 kW: IP20; 3) 200 kW to 355 kW: IP00</li> <li>• Drive unit (dual-axis) with the power of 1.5 kW to 18.5 kW: IP20</li> </ul>

## 1.2 Installation Clearance

The power supply unit and drive unit of the MD810 series are classified into booksize and vertical tower structures. The booksize unit features the width of 50 mm, 100 mm, 200 mm, and 300 mm, and the vertical tower unit features the width of 180 mm (power supply unit only) and 230 mm (drive unit only). The recommended installation methods include single-rack installation and dual-rack installation. For dual-rack installation, install the air guide plate for the units on the lower rack. The following table describes the minimum clearance between two racks.

Table 1-2 Minimum clearance between units

Item	Unit with Width of 50 mm	Unit with Width of 100 mm	Unit with Width of 200 mm	Unit with Width of 300 mm	Unit with Width of 180 mm	Unit with Width of 230 mm (Drive Unit Only)
	Booksize Unit				Vertical Tower Unit	
S1	$\geq 300$ mm	$\geq 300$ mm	$\geq 300$ mm	$\geq 300$ mm	$\geq 300$ mm	$\geq 300$ mm
S2	$\geq 300$ mm	$\geq 300$ mm	$\geq 300$ mm	$\geq 300$ mm	$\geq 500$ mm	$\geq 500$ mm
S3	$\geq 300$ mm	$\geq 300$ mm	$\geq 300$ mm	$\geq 300$ mm	-	-

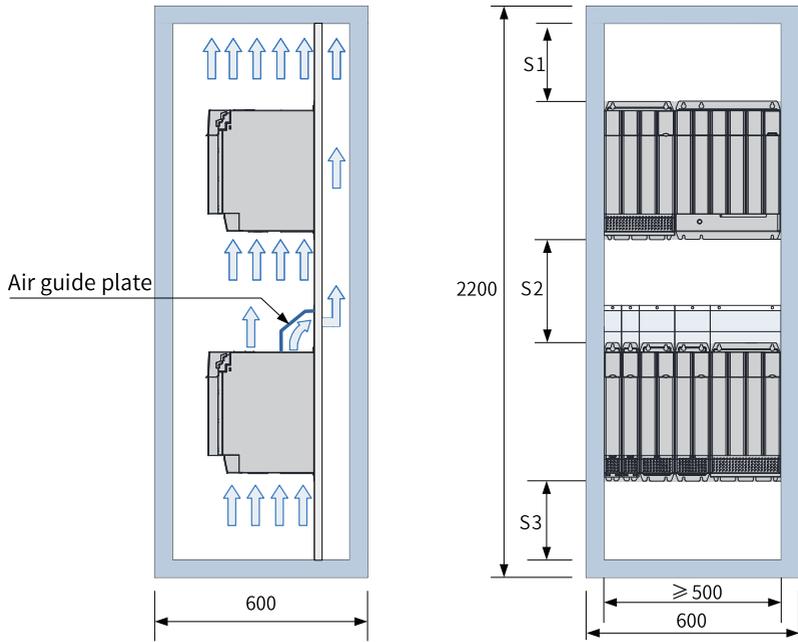


Figure 1-1 Clearance for installing the booksized unit in dual-rack mode

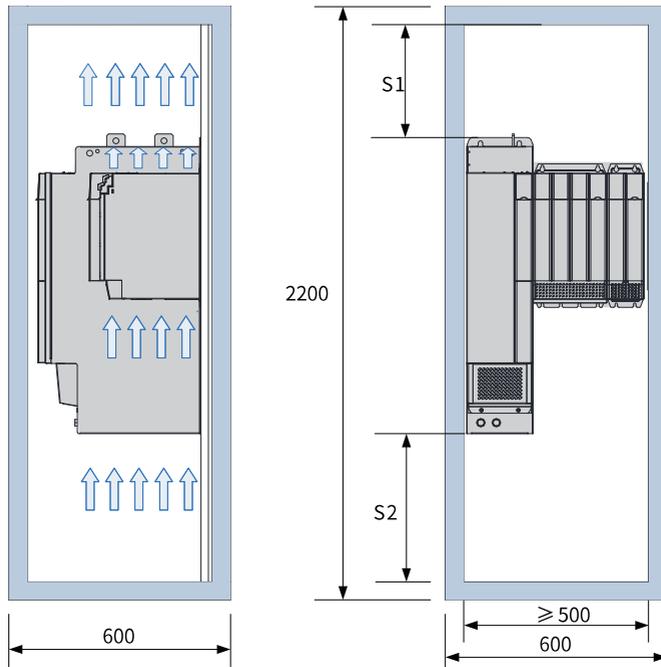


Figure 1-2 Clearance for installing the vertical tower unit

### Note

It is recommend that the power supply unit and drive unit be installed vertically.

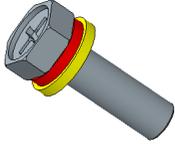
## 1.3 Installation Tools

### 1.3.1 Mechanical Installation Tools

Table 1-3 Mechanical installation tools

No.	Tool	Specification	Usage Scenario	Appearance
1	Straight screwdriver	2.5 mm	Used to pry the plastic buckle and tighten or loosen the screw of the terminal block cable.	
2	Phillips screwdriver	Recommended model: PH2	Used in various scenarios.	

No.	Tool	Specification	Usage Scenario	Appearance
		(rod diameter: 6 mm) Rod length: $\geq$ 190 mm		
3	Torque wrench	Torque range #1: 1.0-5.0 N·m	Used to install the module, and tighten or loosen the input/output terminal and the grounding screw.	
		Torque range #2: 10-35 N·m	Used to tighten or loosen the input/output terminal and the grounding screw.	
		Recommended torque #3: 85 N·m	Used to tighten or loosen the screw of the input/output copper bar.	
4	Socket wrench	Socket wrench crosshead model: PH2	Used to tighten or loosen the M5, M6, and M8 outer hexagon screw.	
		Outer hexagon socket wrench specification: 16 mm	Used to tighten or loosen the M10 outer hexagonal screw/nut.	
		Outer hexagon socket wrench specification: 18 mm	Used to tighten or loosen the M12 outer hexagonal screw/nut.	
		Outer hexagon socket wrench specification: 24 mm	Used to tighten or loosen the M16 outer hexagonal screw/nut.	
5	Socket wrench extension rod	100 mm	Used to tighten or loosen the module installation screw.	
6	Needle-nose pliers	-	Used to remove the threaded hole or closure plate of the plastic item.	

No.	Tool	Specification	Usage Scenario	Appearance
7	Gloves	-	Used to prevent static electricity during mechanical installation.	
8	Nylon tie	100 mm	Cable	-
9	Outer hexagon combination screw with flat washer	M6x20	Used to install the power supply unit, drive unit, and DC soft charge unit. <ul style="list-style-type: none"> <li>• Number of screws for the power supply unit with the width of 50 mm, the drive unit, and the DC soft charge unit: 2 per unit</li> <li>• Number of screws for the power supply unit with the width of 100 mm and 200 mm, the drive unit, and the DC soft charge unit: 4 per unit</li> <li>• Number of screws for the power supply unit with the width of 300 mm and the drive unit: 8 per unit</li> </ul>	

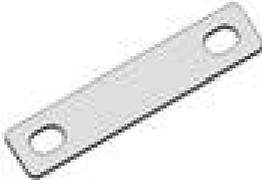
Unless otherwise specified, the tightening torque of the screws is as follows.

Table 1-4 Tightening torque of the screws

Screw/ Nut Specifi- cation	M3	M4	M5	M6	M8	M10	M12	M16
Tighten- ing Torque (N·m)	0.55	1.2	2.8	4.8 (The tightening torque of the R, S, and T terminals on the 22 kW power supply unit is 3 N·m.)	13	20	35	85

### 1.3.2 Accessory Kit

Table 1-5 Items in the accessory kit

Name	Appearance	Quantity
Network cable		1
Grounding aluminum bar		1
Overlapping copper bar (for models with the width of 50 mm)		2

### 1.4 Cables

Table 1-6 Cables

Category	Cable Name	Appearance	Category	Cable Name	Appearance
Main circuit cable	Power cable		Control circuit cable	Signal cable	

## Preparation Before Installation

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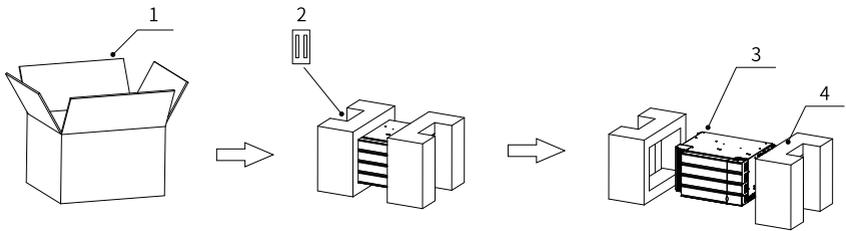
Category	Cable Name	Appearance	Category	Cable Name	Appearance
	Grounding cable			Network cable	

## 2 Unpacking and Handling

### 2.1 Inspection upon Unpacking

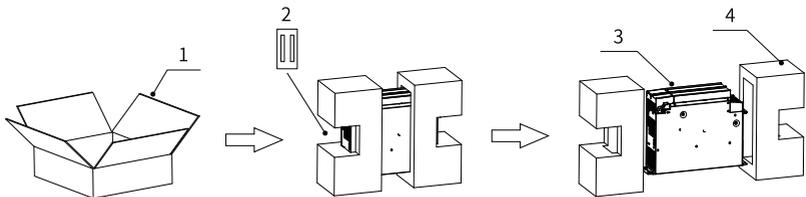
When receiving goods from the shipping company, check that you have received all the items specified on the delivery note. Notify the shipping company immediately of any missing components or damage. If necessary, seek support from the Invoice office or your local agent.

After unpacking, check the item lists carefully and confirm that the terminals have been locked firmly to prevent them from falling off during transportation.



1. Carton; 2. Accessory kit; 3. Power supply unit; 4. Expanded polyethylene (EPE)

Figure 2-1 Item list of the power supply unit



1. Carton; 2. Accessory kit; 3. Drive unit; 4. EPE

Figure 2-2 Item list of the drive unit



**Caution**

If the equipment is damaged during transportation, its electrical safety can no longer be ensured. Do not connect the equipment until a thorough high-voltage test has been performed.

## 2.2 Storage Requirements

Requirements for storage with package:

- When the drive is placed near the wall, reserve the clearance of at least 200 mm between the drive and the wall.
- Never occupy the fire exit and block the emergency exit when storing the drive.
- Reserve a passage with the width of about 1 meter in front of the fire hydrant, and do not place the drive within one meter in front of the power distribution cabinet.
- When the drive packed in a carton is stored outdoors, place the carton on a pallet and fully cover it with rain-proof cloth.
- The drive that has been stored for more than 24 hours or underwent severe weather must pass the risk assessment by relevant departments before transshipment and delivery.
- Store the drive with care. Never throw it, drag it on the ground, or step on the package and operate it.
- During storage, place the large and heavy drive at the bottom. The total stack height cannot exceed 1.8 m.
- Place the drive delivered with the pallet within the pallet. When there are more than two stacking layers and the overlapping stacking is used, fix the drive with the stretch film. Do not use the box-sealing tape to fix the drive.

Requirements for storage without package:

- Store the drive in a clean and dry room, with the temperature range from -25°C and +70°C and the temperature change rate no larger than 20°C/hour.
- 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 influences.
- For storage, pack the drive with the original packing box provided by Inovance.
- Do not expose the drive to the environment with moisture or high temperature, or place it outdoors in direct sunlight for an extended period.
- If the drive is not switched on for more than one year, repair the electrolytic capacitor before powering on the drive. Otherwise, the electrolytic capacitor might be damaged. For details on how to repair the electrolytic capacitor, see the storage and warranty section in the *MD810 Series Standard Drive (Multidrive System) Maintenance Guide*.

## 2.3 Transportation Requirements

Due to the small size and light weight, you can manually transport the drive. Be careful during transportation. Never throw the drive, drag the drive on the ground, or step on the package and operate the drive.

Cartons are used for transportation. When packing and transporting the drive, ensure that the stacking height is no higher than 1.8 m.

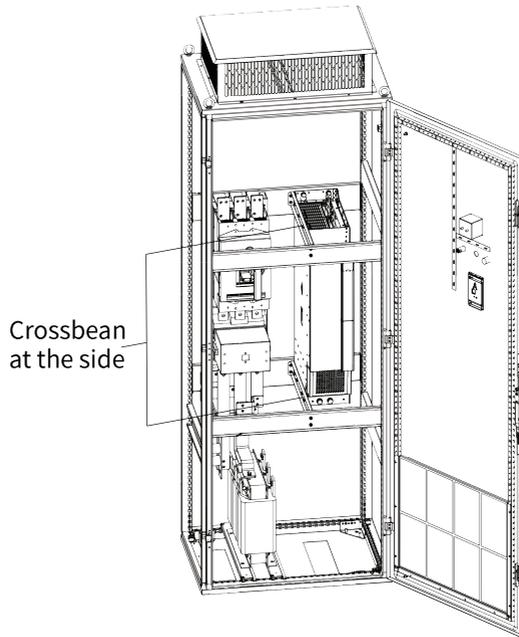
## 2.4 Transportation Precautions

### Transportation loss precautions

1. When receiving goods from the shipping company, check the MD810 series drive carefully.
2. Check that you have received all the items specified on the delivery note.
3. Notify the shipping company immediately of any missing or damaged components.
4. If you find any invisible loss or damage, notify the shipping company immediately and ask it to perform equipment qualification.
5. If you do not notify the shipping company immediately, you might lose the right to claim compensation for goods loss or damage.
6. If necessary, contact local Inovance technical office for support.

### Transportation precautions

1. Pack the equipment according to the requirements (such as climatic conditions) during the transportation and of the destination before the equipment leaves the factory.
2. Follow precautions for transportation, storage, and operation indicated on the package.
3. Place the equipment on a wooden chassis or pallet when transporting it with a forklift.
4. Do not disassemble the equipment when it is placed on the wooden chassis for further transportation.
5. Allowable ambient temperature during transportation: -25°C to +70°C, class 2K3 according to IEC 60721-3-2, maximum 24 hours at -40°C
6. To avoid damage to the drive, observe the following precautions during auxiliary installation for cabinet-based transportation.
  - Install the booksize units closely in rows.
  - Install the crossbeam at the side for auxiliary fixing during the installation of the vertical tower unit, as shown in the following figure.

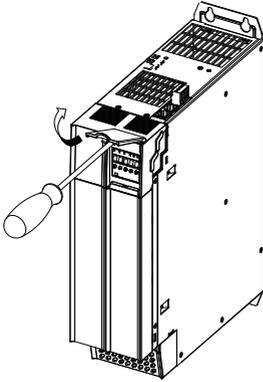


- Tap the screw on the installation backplate, and then use self-clinching nuts or independent nuts on the back of the backplate to enhance screw-thread fitting and fastening effect.
- Ensure that the installation backplate has excellent stiffness and the thickness of not less than 2 mm. Reinforce the backplate at the top and bottom installation location.

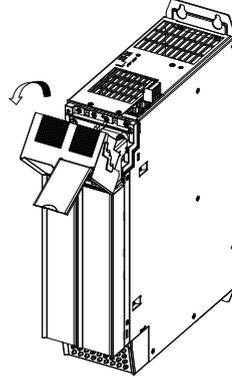
## 3 Installation Instructions

### 3.1 Removing the Cover

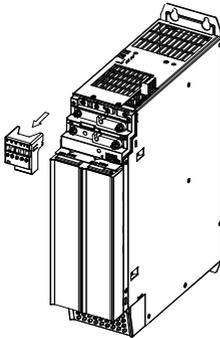
① Open the translucent operating panel cover upward and loosen the screws on the upper cover by using a screwdriver.



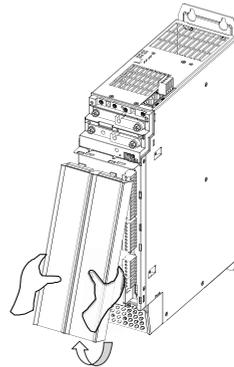
② Pull the upper part of the upper cover and then the lower part to remove it.



③ Pull out the operating panel box.

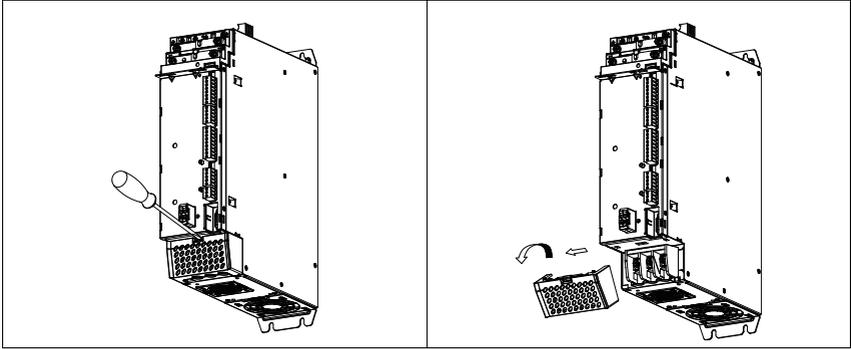


④ Hold the bottom of the lower cover with your hands, and pull the lower part and then the upper part to remove the lower cover.



⑤ Insert the screwdriver into the clasp of the power terminal cover, and then pry the clasp.

⑥ Pull the upper part of the power terminal cover and then the lower part to remove it.

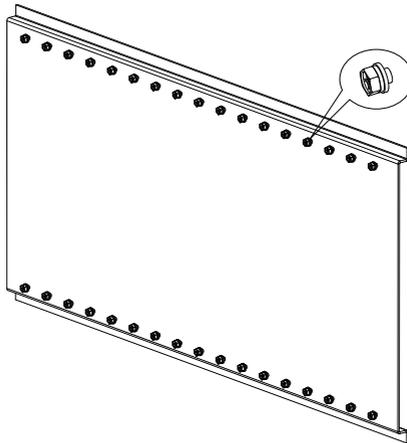


## 3.2 Installation of the Power Supply Unit and the Drive Unit

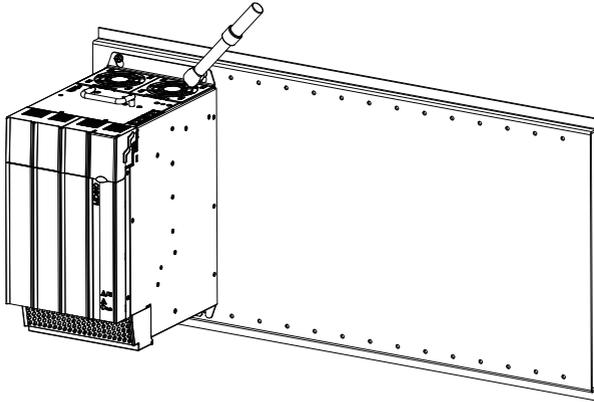
### 3.2.1 Installing the Booksize Power Supply Unit and Drive Unit

#### Backplate Mounting

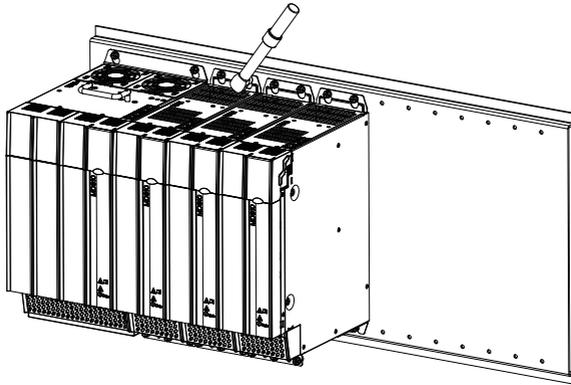
1. Pre-lock the M6x20 cross-recessed hexagon head combination screws on the installation backplane with the clearance of about 5 mm between the screws and the backplane.



2. Mount the power supply unit to the installation backplane, and then tighten the screw by using a torque wrench.



3. Mount the drive unit to the installation backplane, and then tighten the screw by using a torque wrench.

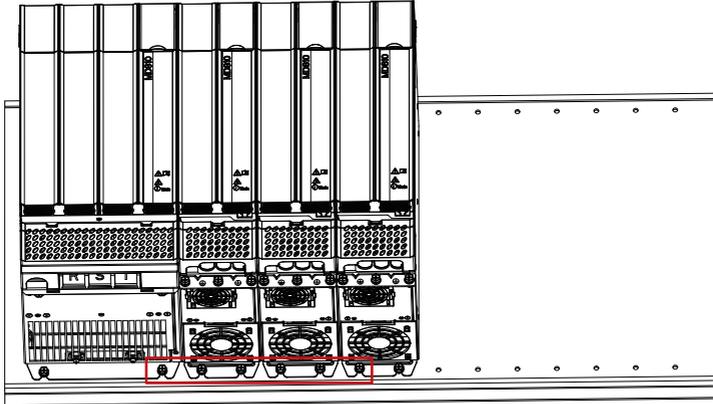


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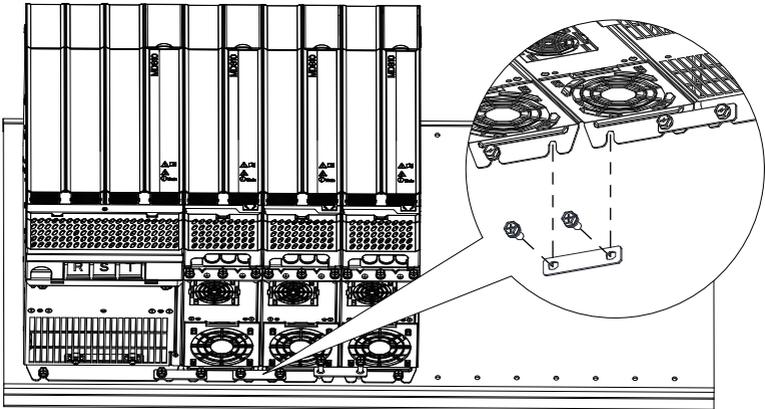
## Note

The screws on the lower side of the adjacent units are not locked (as shown in the figure below) for installing the grounding aluminum bar.

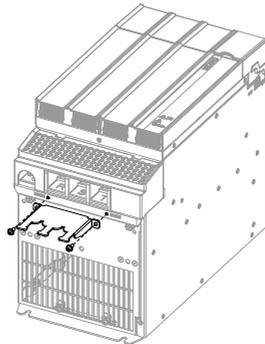
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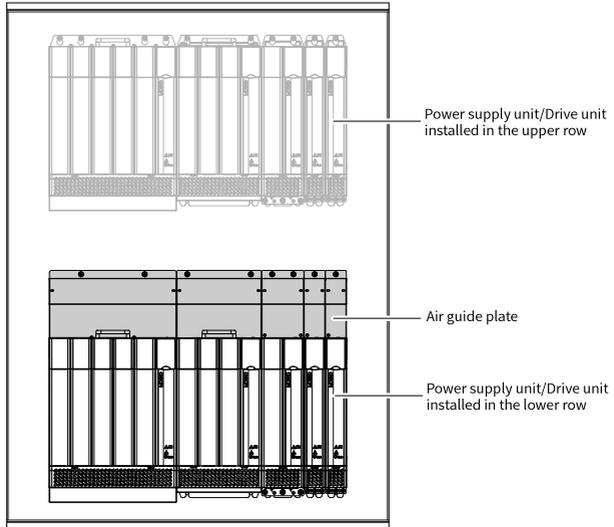
4. Install the grounding aluminum bar between adjacent units.



5. (Optional) Install the option shield bracket.



6. If units are installed in two rows, install the option air guide plate for the units installed in the lower row.



The following figure describes the installation of the air guide plate for the power supply unit and drive unit.

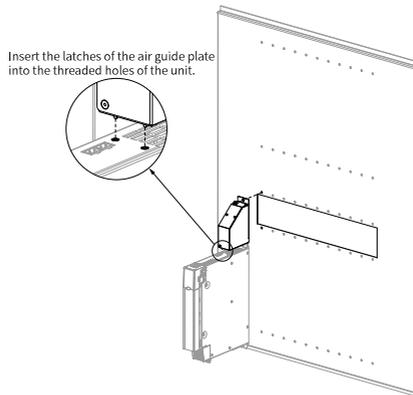


Figure 3-1 Installation of the air guide plate for the unit with the width of 50 mm

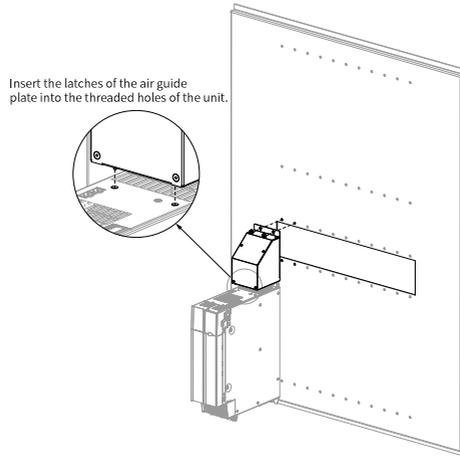


Figure 3-2 Installation of the air guide plate for the unit with the width of 100 mm

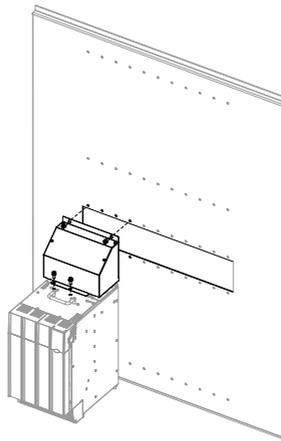


Figure 3-3 Installation of the air guide plate for the power supply unit with the width of  
200 mm

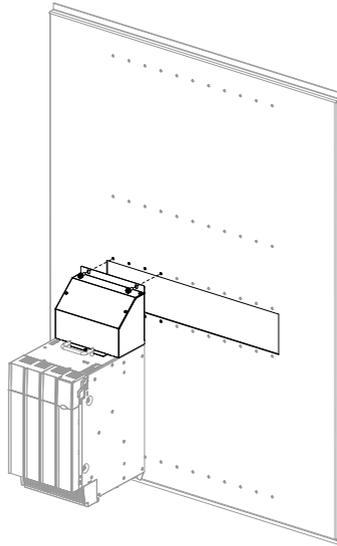


Figure 3-4 Installation of the air guide plate for the drive unit with the width of 200 mm

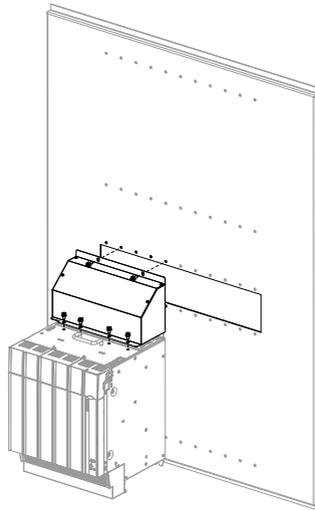
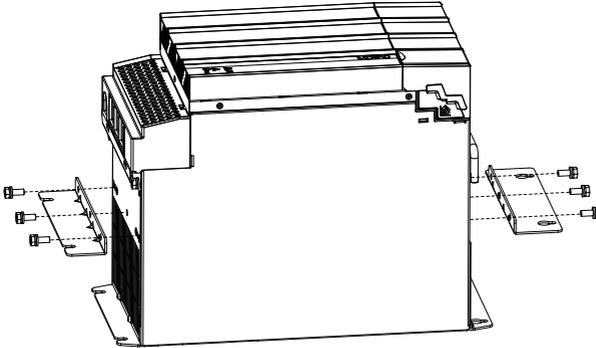


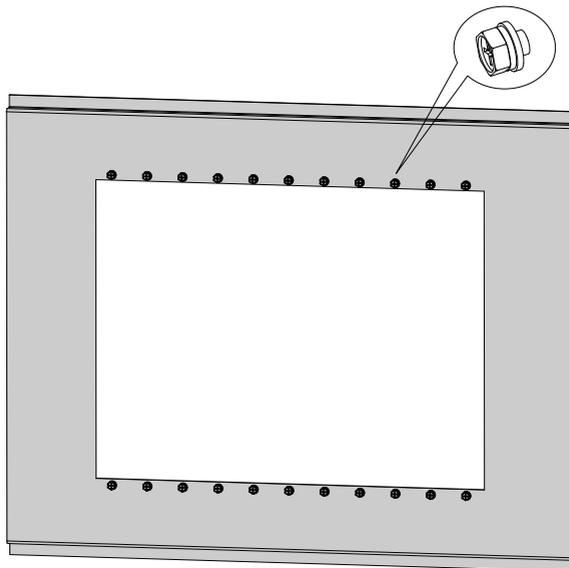
Figure 3-5 Installation of the air guide plate for the unit with the width of 300 mm

## Through-hole Mounting

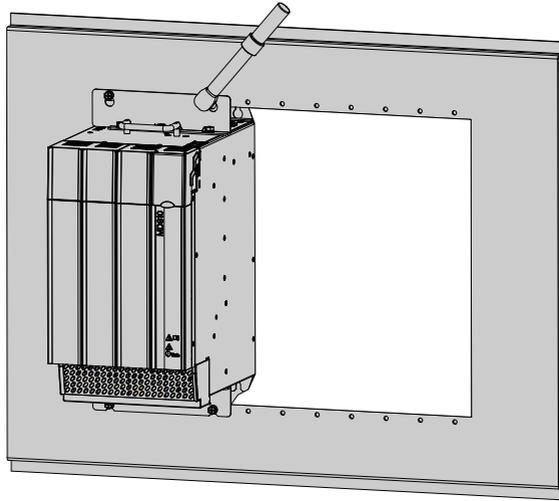
1. Install the option through-hole mounting bracket.



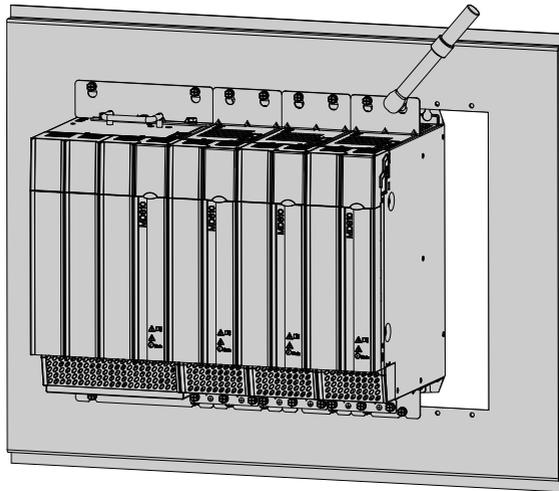
2. Pre-lock the M6x20 cross-recessed, external hexagon combination screws on the installation backplane with the clearance of about 5 mm between the screws and the backplane.



3. Mount the power supply unit to the installation backplane, and then tighten the screw by using a torque wrench.



4. Mount the drive unit to the installation backplane, and then tighten the screw by using a torque wrench.

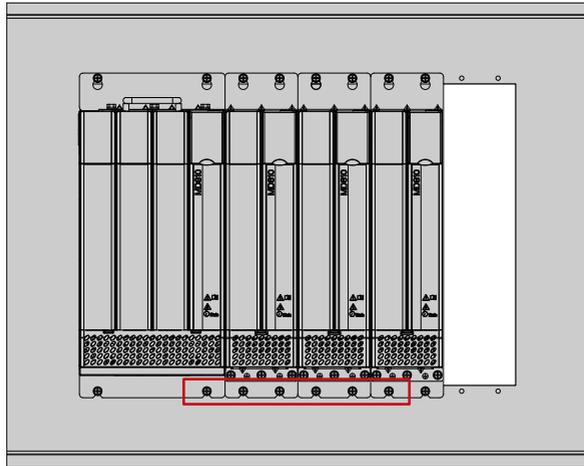


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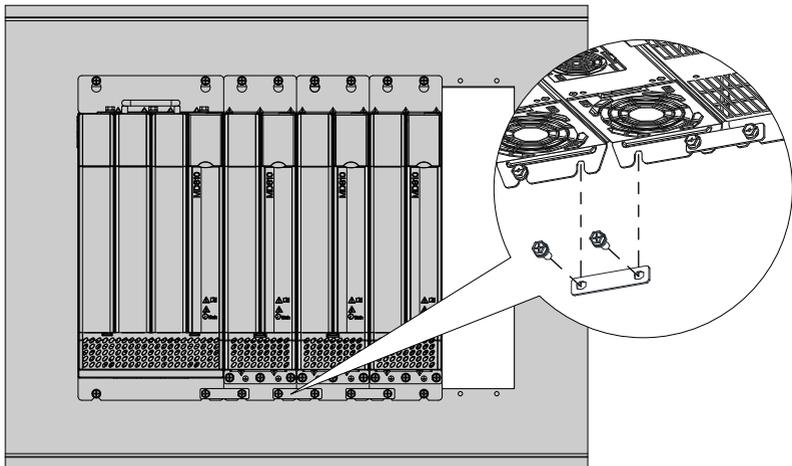
### **Note**

The screws on the lower side of the adjacent units are not locked (as shown in the figure below) for installing the grounding aluminum bar.

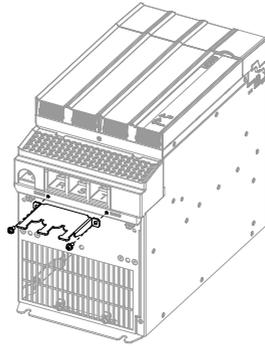
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5. Install the grounding aluminum bar between adjacent units.



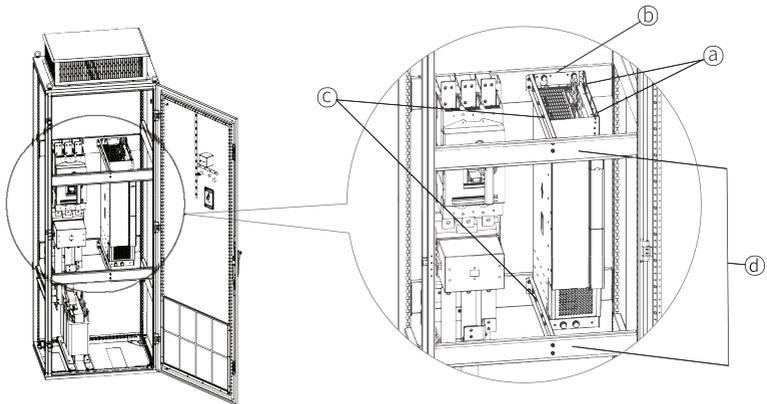
6. (Optional) Install the option shield bracket.



### 3.2.2 Installing the Vertical Tower Power Supply Unit

The 355 kW power supply unit (width of 180 mm) of the MD810 series is a vertical tower unit. Due to its large size, the vertical tower unit needs to be installed in a cabinet separately.

The following figure shows the installation of the vertical tower power supply unit.



To install the power supply unit, do the following:

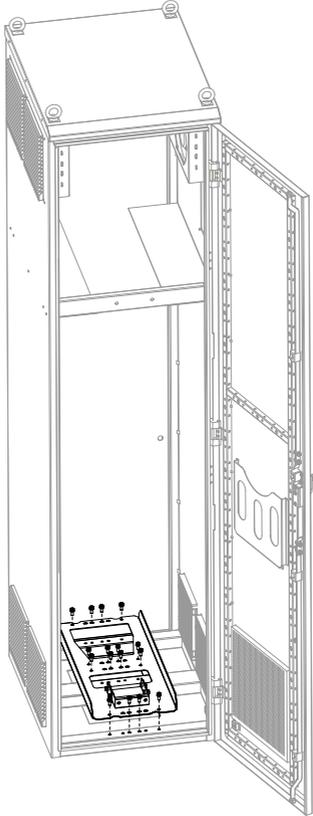
1. Lift the power supply unit through the lifting holes (a) at the top of the unit with the hoisting equipment (such as the crane), and then install the unit into the cabinet.
2. Fix the power supply unit to the rear beam of the cabinet or the rear installation panel (b) with the M10x25 outer hexagonal screw, spring washer, and flat washer.
3. Fix the left installation beam (c) and front beam (d) of the drive unit with the M6x16 cross-recessed outer hexagon combination screw.
4. Tighten the screws with the standard torque to complete the installation.

### 3.2.3 Installing the Vertical Tower Drive Unit

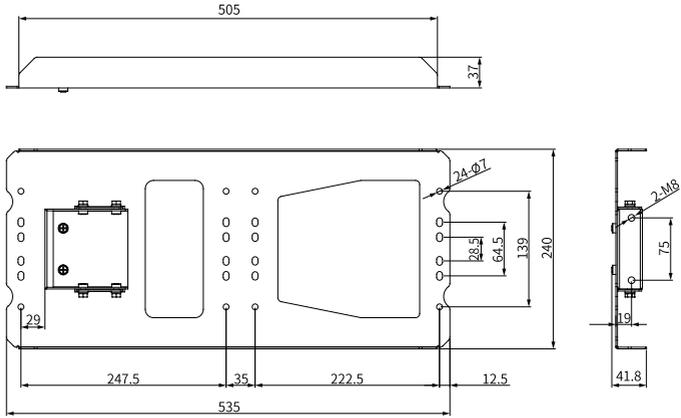
The 200 kW to 355 kW drive unit (with the width of 230 mm) of the MD810 series is a vertical tower unit. Due to its large size and heavy weight, install the vertical tower unit in a cabinet separately.

To install the drive unit, do the following:

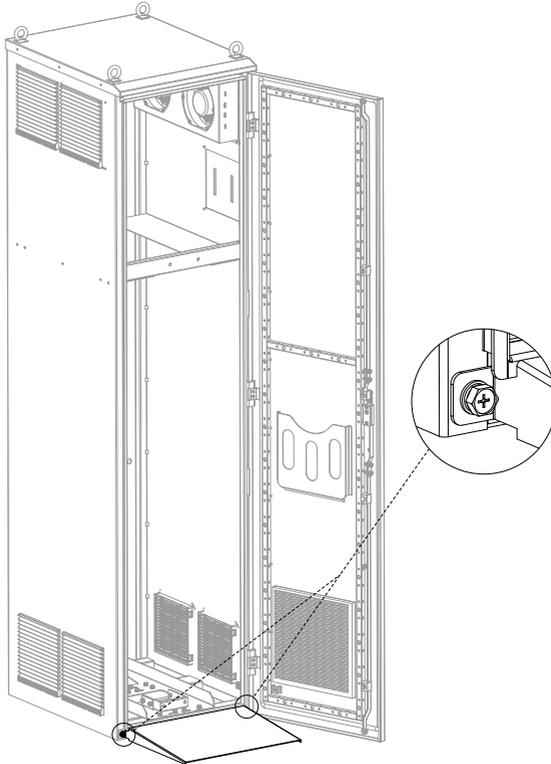
1. Fix the installation bracket to the crossbeam at the bottom of the cabinet.



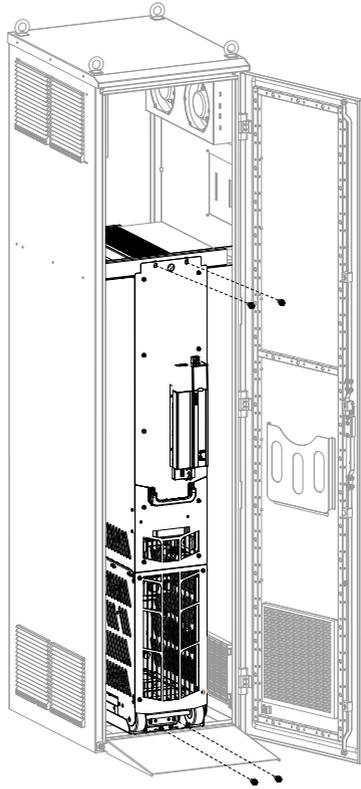
The installation bracket is used to install the drive unit into the cabinet. As a standard accessory for the drive, design the installation crossbeam according to the size of the installation bracket. The following figure describes the dimensions of the installation bracket.



2. Install a slope.



3. Push the drive unit into the cabinet along the slope, and fix it to the cabinet with the M8x20 combination screw.



### 3.3 Inspection Before Wiring

- Never wire the drive when the power is on, and keep all circuit breakers in the OFF state. Failure to comply will result in electric shock.
- After disconnecting the power supplies on the input and output sides, wait for at least the time designated on the product warning label before further operations (such as wiring).
- Install and connect the motor, cabinet units, and other components in accordance with the recognized technical rules in the country and other applicable regional regulations. Comply with regulations related to the cable dimensions, fuses, grounding, disconnection, isolation, and overcurrent protection.
- If the safety device trips in a branch circuit, a faulty current may have been disconnected. To reduce the risk of fire or an electric shock, inspect the conductive parts and other components in the drive and replace the damaged parts. If the safety device trips in a branch circuit, identify the cause of the trip and rectify the problem.

## 3.4 Bus Connection

### 3.4.1 Connecting the Booksize Unit Bus

#### Connection method

The booksize unit can be connected through external buses or internal buses. The following table describes the two connection methods.

Connection Method	Scenario	Remarks
Internal bus	The bus is used to connect adjacent units, and no DC soft charge unit is installed for the drive unit.	-
External bus	<ul style="list-style-type: none"> <li>The bus is used to connect adjacent units, and a DC soft charge unit is installed for each drive unit.</li> <li>The bus is used to connect non-adjacent units.</li> </ul>	The co-bus external power terminal must be installed.

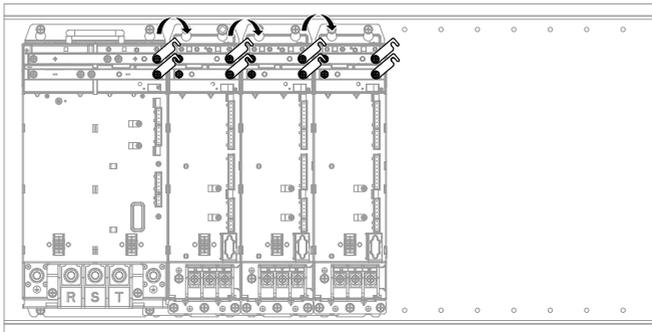
#### Internal bus

To connect units through the internal bus, do the following:

1. Loosen the screws of all busbars and the positive and negative bus terminals of all adjacent units.
2. Rotate the busbar to the positive and negative bus terminals of the adjacent unit.
3. Tighten the screws on the ends of the busbar.

When a row of units are installed, the left bus protective baffle of the leftmost unit and the right bus protective baffle of the rightmost unit must be reserved to prevent electric shock.

Before connecting the internal busbar, remove the left and right bus protective baffles of the top cover with tools such as needle-nose pliers or diagonal pliers.



## External bus

To connect units through the external bus, do the following:

### 1. Install the co-bus external power terminal.

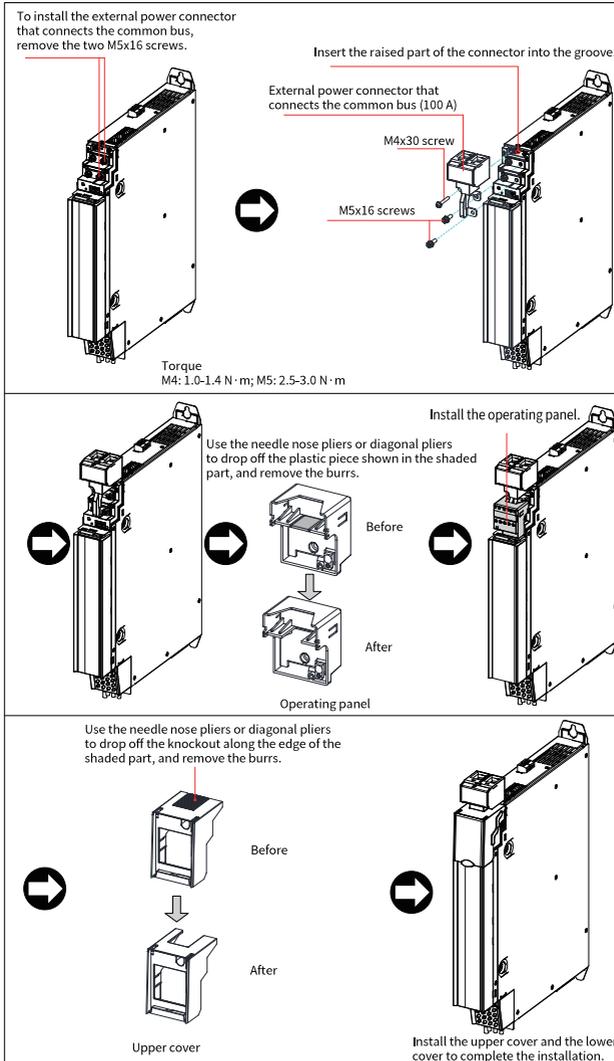


Figure 3-6 Installation of 100 A co-bus external power terminal (for the unit with the width of 50 mm)

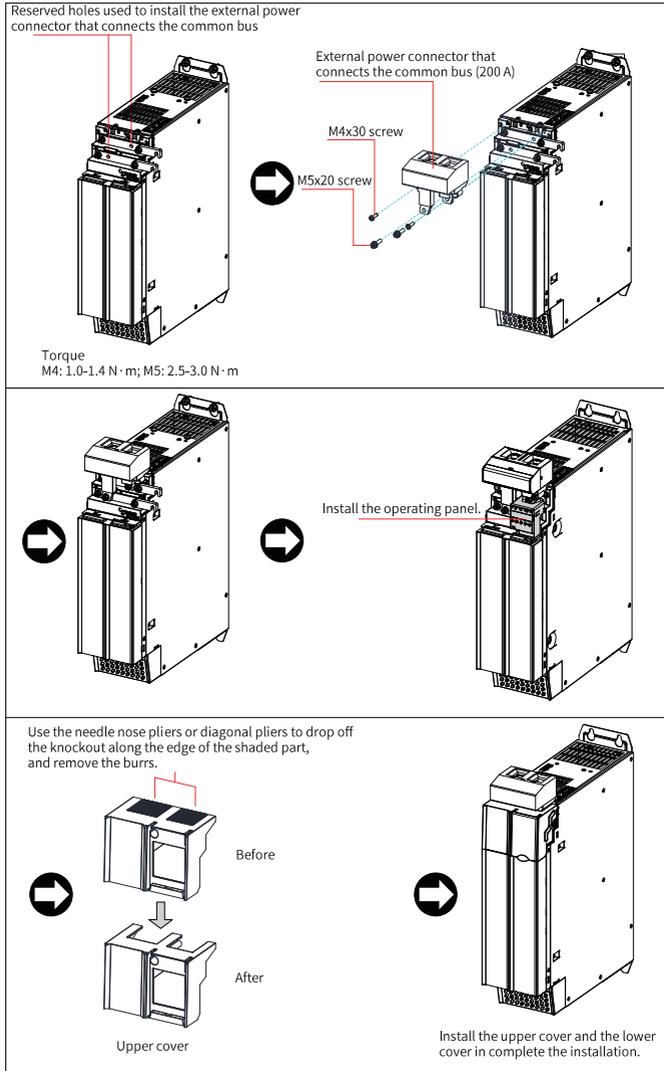


Figure 3-7 Installation of 200 A co-bus external power terminal (for the unit with the width of 100 mm)

The installation procedure of the unit with the width of 200 mm is the same as that of the unit with the width of 100 mm. The following figure shows the position after the installation is completed.

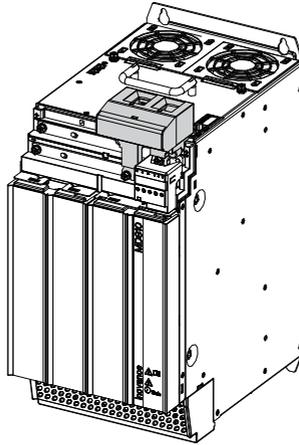


Figure 3-8 Installation of 200 A co-bus external power terminal (for the unit with the width of 200 mm)

The installation procedure of the unit with the width of 300 mm is the same as that of the unit with the width of 100 mm. The following figure shows the position after the installation is completed.

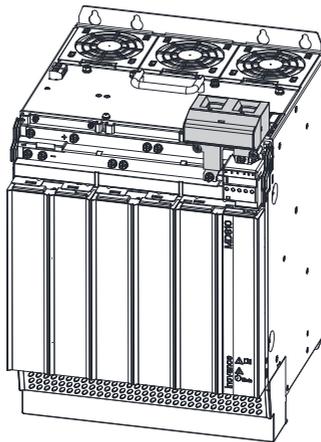
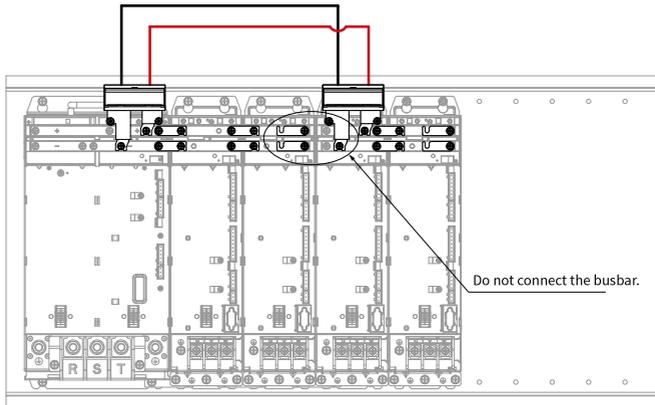


Figure 3-9 Installation of 200 A co-bus external power terminal (for the unit with the width of 300 mm)

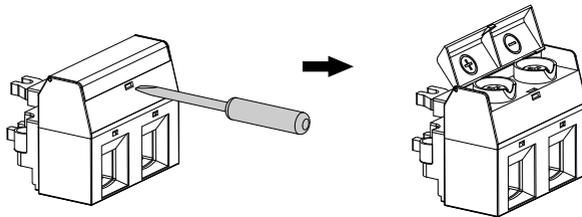
2. Connect the buses of two units through the co-bus external power terminal.

When the co-bus external power terminal is installed for the drive unit and it is connected to the power supply unit through the terminal, do not connect the busbar of the drive unit to the positive and negative busbar terminals of the adjacent unit.

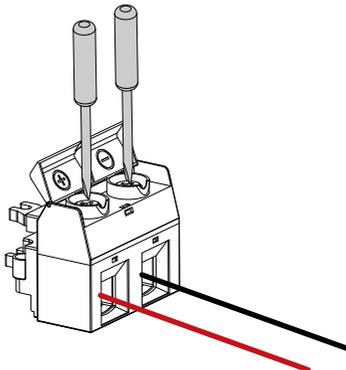


To connect the co-bus external power terminal, do the following:

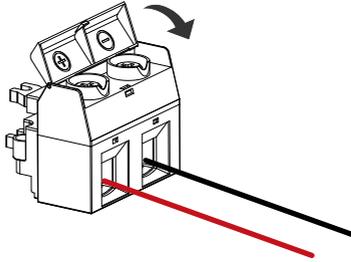
- a. Insert a Phillips screwdriver into the slot, push the buckle inward, and then open the cover of the co-bus external power terminal.



- b. Loosen the screws, insert the cables without the insulation into the co-bus external power terminal, and then tighten the screws.

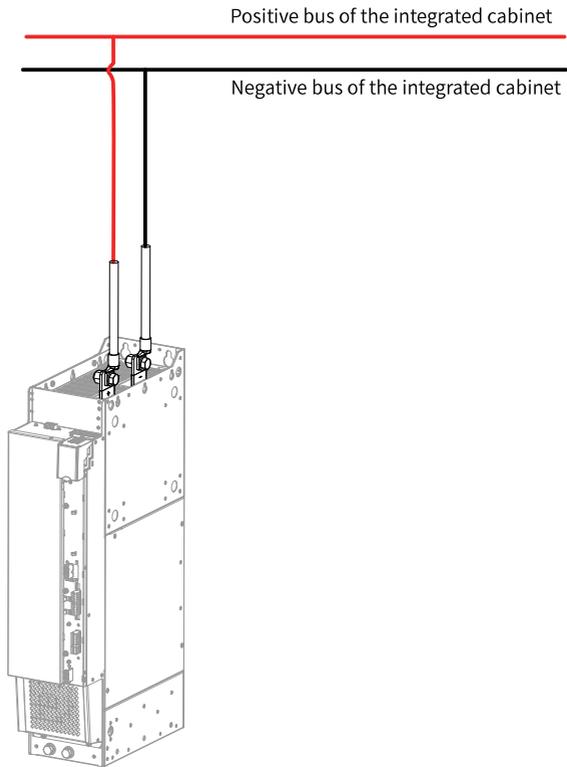


c. Close the cover.



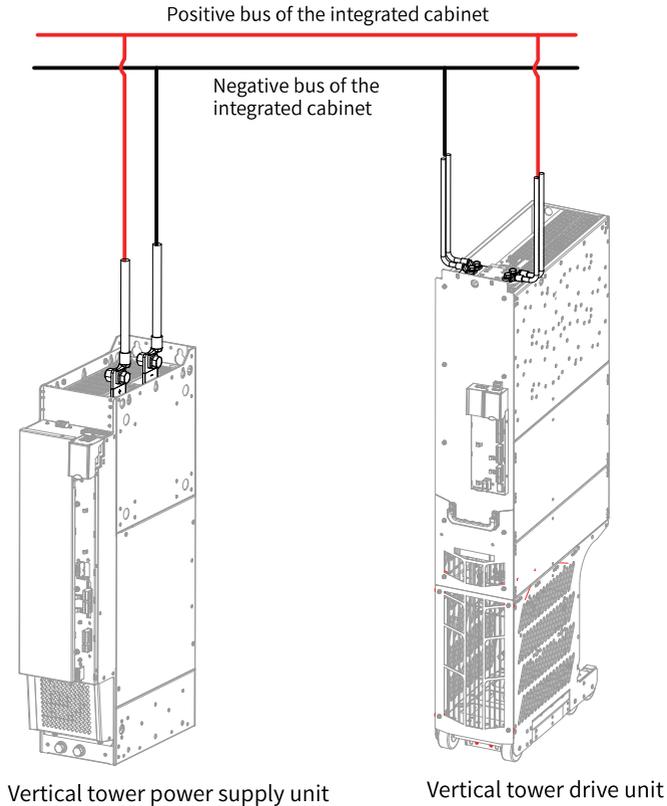
### 3.4.2 Connecting the Vertical Tower Unit

1. Connect the cables to the positive and negative busbar terminals of the vertical tower power supply unit, and then connect the cables to the positive and negative buses of the user's integrated cabinet.



Vertical tower power supply unit

2. Connect the cables to the positive and negative busbar terminals of the vertical tower drive unit, and then connect the cables to the positive and negative buses of the user's integrated cabinet.



### 3.5 Installing the DC Soft Charge Unit (Optional)

If a drive unit fails, you need to power off the faulty drive unit and the power supply unit, replace with a new drive unit, and then power on the power supply unit and the new drive unit. To ensure that the power supply unit can operate without power-off during this case, you can install a DC soft charge unit for each drive unit.

The following figure shows the installation of the DC soft charge unit.

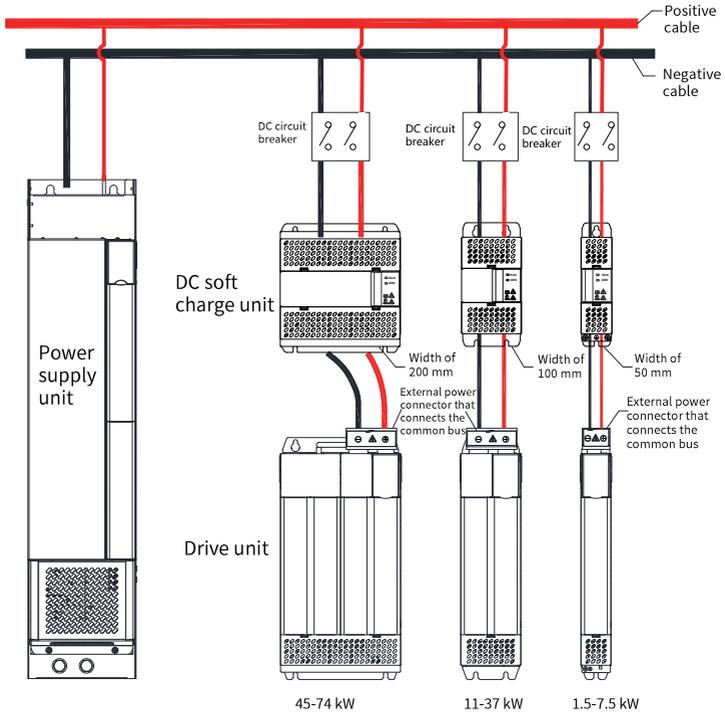


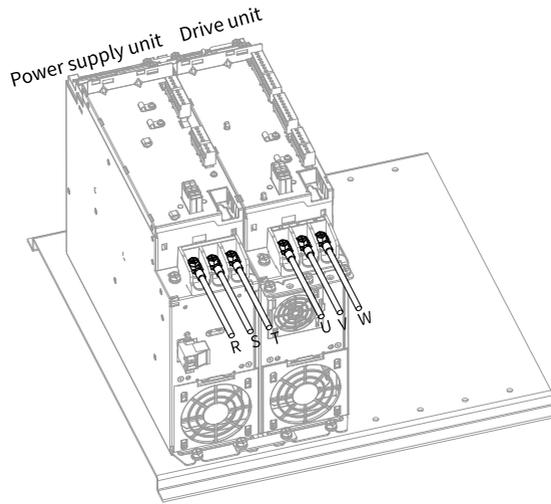
Figure 3-10 Installing the DC soft charge unit

## 3.6 Wiring

### 3.6.1 Wiring Booksize Units

1. Connect the power cable.

Connect the input cable to the R, S, and T terminals on the power supply unit, and connect the output cable to the U, V, and W terminals on the drive unit.



## Note

When the drive is equipped with a shielding bracket (an option), the shielding layer of the power cable needs to be fixed on the shielding bracket, as shown in the figure below.

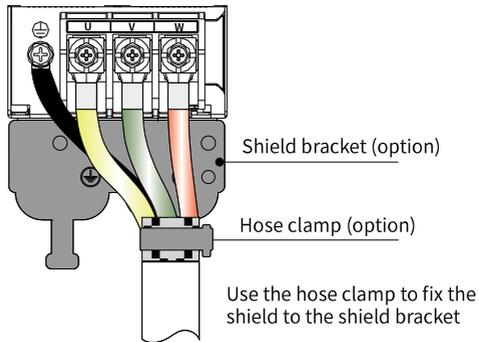
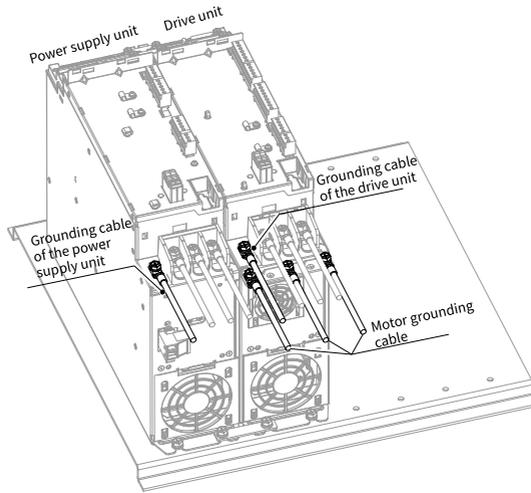
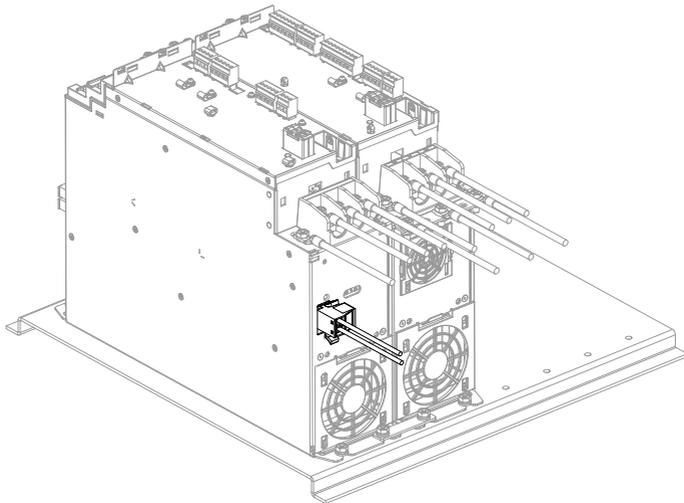


Figure 3-11

2. Connect the grounding cables of the power supply unit, drive unit, and motor.



3. (Optional) For 22 kW and 45 kW power supply unit, connect the braking resistor cable.



4. Connect the network cable.

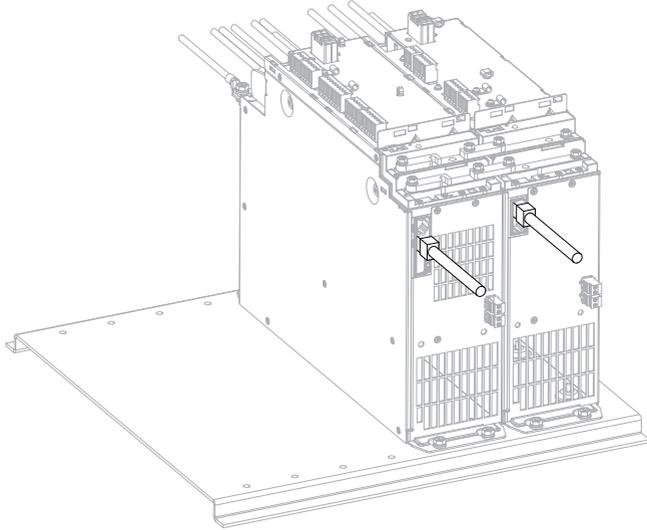


Figure 3-12 Connecting the network cable

5. Connect the input cable of the external 24 V power supply.

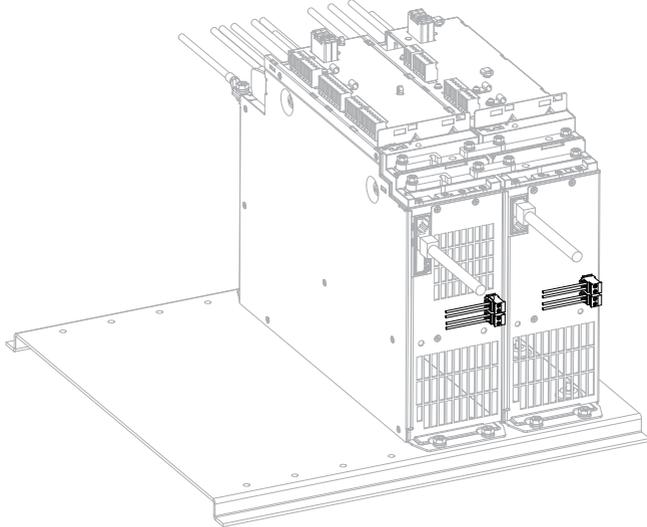


Figure 3-13 Connecting the input cable of the external 24 V power supply

6. Connect the control cable.

Connect the control cable to the control terminal, ground the control cable shield through the crimping and grounding plate, and use the cable tie to fix the control cable and shield to the cable clip.

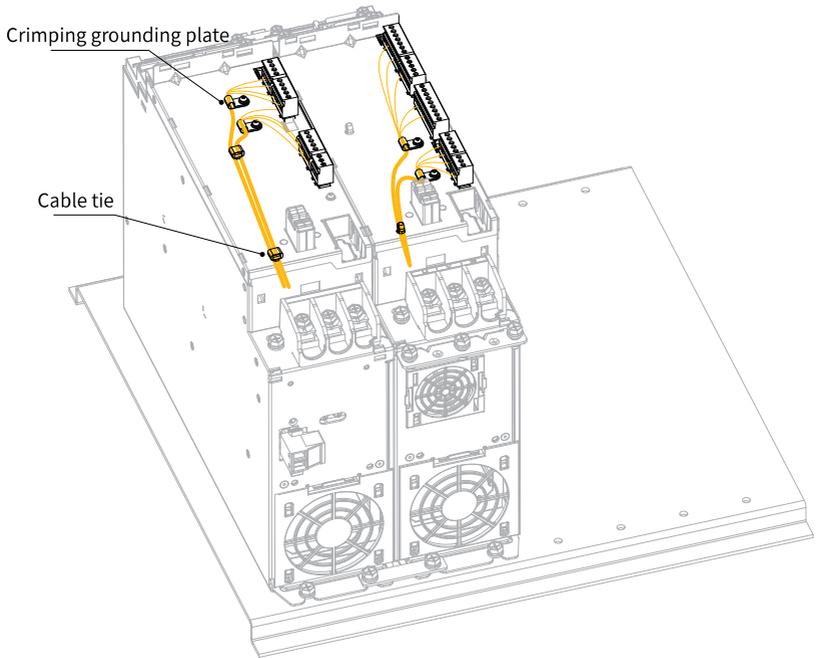
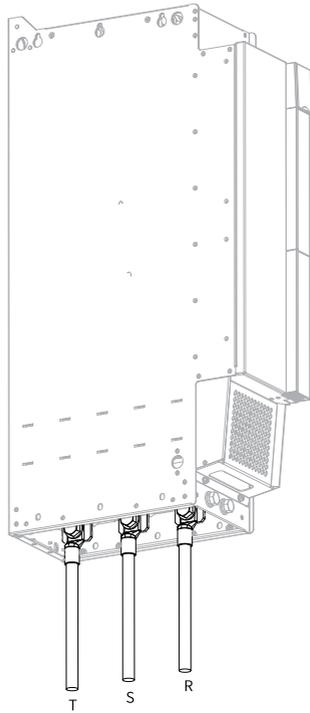


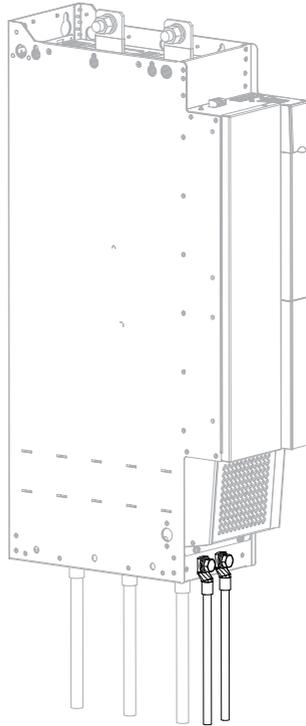
Figure 3-14 Connecting the control cable

### 3.6.2 Wiring the Vertical Tower Power Supply Unit

1. Connect the input cable to the R, S, and T terminals on the unit.



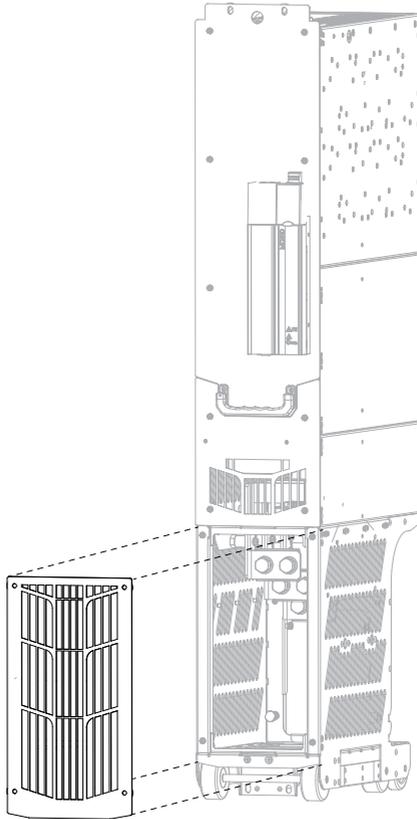
2. Connect the grounding cable.



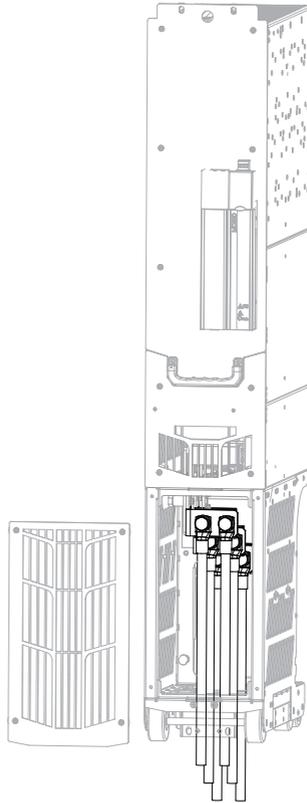
3. Connect the input cable of the external 24 V power supply and the network cable. The connection figure is similar to that of the booksized unit. For details, see "[Figure 3-11](#)" on page 47 and "[Figure 3-12](#)" on page 47.
4. Connect the control cable. The connection figure is similar to that of the booksized unit. For details, see "[Figure 3-13 Connecting the control cable](#)" on page 48.

### **3.6.3 Wiring the Vertical Tower Power Drive Unit**

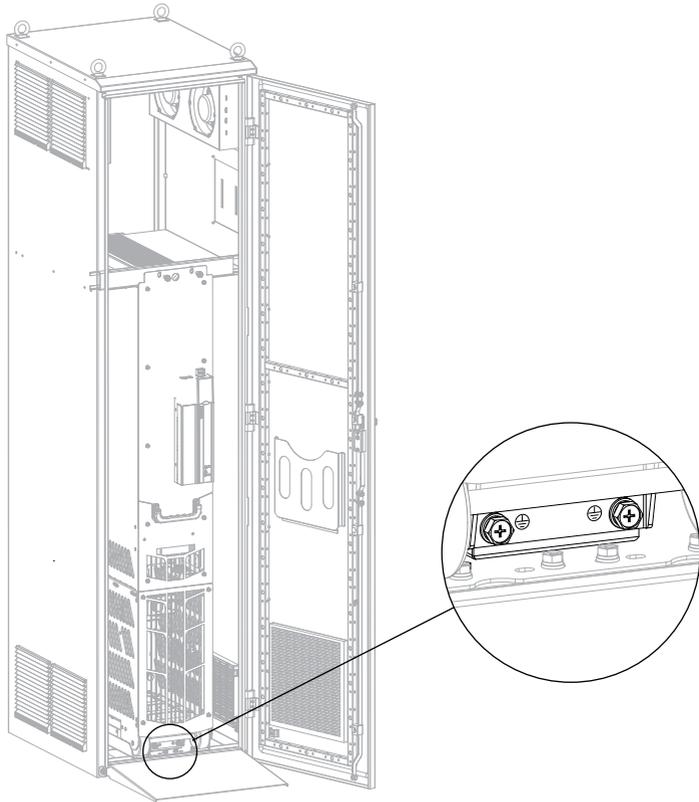
1. Remove the closure plate of the front door.



2. Connect two output cables to the U, V, and W terminals, respectively.



3. Install the closure plate of the front door.
4. Ground the fixing bracket of the drive unit. Because the fixing bracket at the bottom of the drive unit has the PE function, so there is no need to connect the grounding cable to the drive unit.



5. Connect the input cable of the external 24 V power supply and the network cable. The connection figure is similar to that of the booksize unit. For details, see ["Figure 3-11" on page 47](#) and ["Figure 3-12" on page 47](#).
6. Connect the control cable. The connection figure is similar to that of the booksize unit. For details, see ["Figure 3-13 Connecting the control cable" on page 48](#).

### 3.7 System Grounding Requirements

Connect the power supply unit, drive unit, and components such as the input reactor and filter to the PE copper bar by star connection, as shown in the following figure.

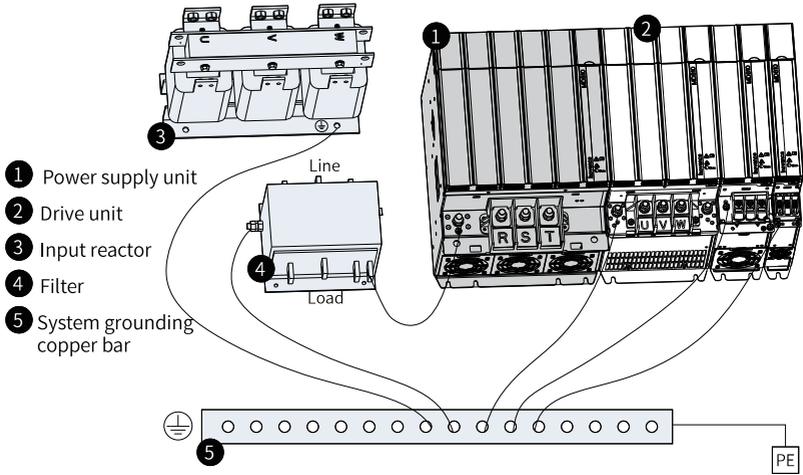


Figure 3-15 System grounding connection

### 3.8 Inspection After Wiring

After wiring has been completed, check the following items and ensure that each item has passed the inspection.

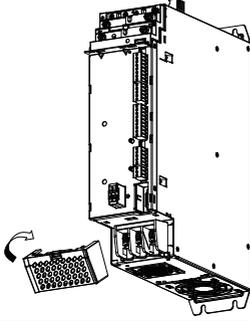
Table 3-1 Wiring checklist

No.	Item	Pass
1	The power input cables are connected to the R/L1, S, and T/L2 terminals.	
2	The motor input cables are connected to the U, V, and W terminals.	
3	The cross-sectional area of the main circuit cable meets the requirements.	
4	The heat-shrink tubes have been added to the conductors of the main circuit cables, and the tubes completely cover the cable conductors.	
5	Confirm whether the unshielded motor output cable is longer than 150 m or the shielded motor output cable is longer than 50 m. If yes, reduce the carrier frequency (F0-15) and add an output reactor (see the requirements for options).	
6	The grounding cables are connected correctly.	
7	The drive output terminals and control signal terminals are securely connected.	
8	The braking resistor and braking unit (if used) are connected correctly and have proper resistance.	

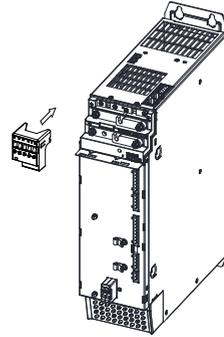
No.	Item	Pass
9	The control circuit cables are shielded twisted pairs (STPs).	
10	The optional cards are connected correctly.	
11	If the drive is an STO model, confirm that the external 24 V power supply is connected properly.	
12	The control circuit cables and main circuit cables are routed through different routes.	
13	The protective cover removed from the power supply unit is reinstalled on the connector of the rightmost drive unit.	

### 3.9 Installing the Cover

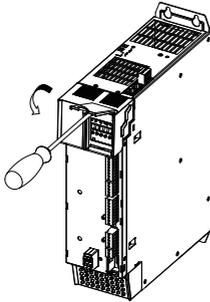
① Align the power terminal cover with the latch position of the bus base, and then push the cover into place.



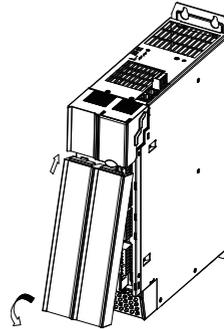
② Install the operating panel.



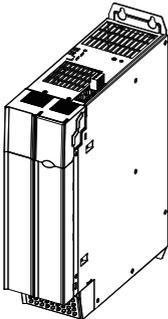
③ Align the upper cover to its latch position, push the cover into place, tighten the screw, and then close the operating panel cover.



④ Insert the upper part of the lower cover into the upper cover, and then press the lower part of the lower cover to clasp it.



⑤ The installation is completed.



## 4 Appendix

### 4.1 Electrical Wiring

If a drive unit fails, you need to power off the faulty drive unit and the power supply unit, replace with a new drive unit, and then power on the power supply unit and the new drive unit. To ensure that the power supply unit can operate without power-off during this case, you can install a DC soft charge unit for each drive unit. For details, see ["Figure 4-2" on page 58](#).



#### Warning

- The drive unit has a built-in fuse. Never power on the drive unit independently without a DC soft charge unit installed. Otherwise, the drive unit will be damaged. ["Figure 4-1" on page 57](#) describes the correct and incorrect wiring methods.
- In the application of common DC bus, never connect electrical switches, such as air switches or circuit breakers, in series in the bus to individually control the power-on and power-off of the drive unit. Otherwise, when the system is powered on, the drive unit will be powered on directly. This will damage the drive unit due to excessive inrush current.

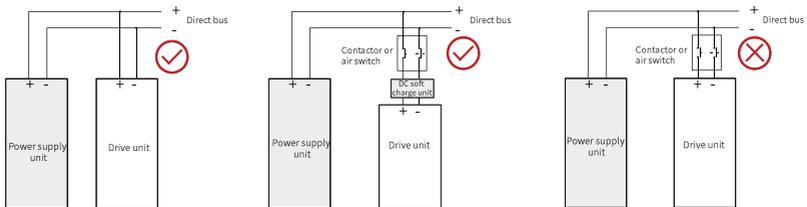


Figure 4-1 DC bus wiring

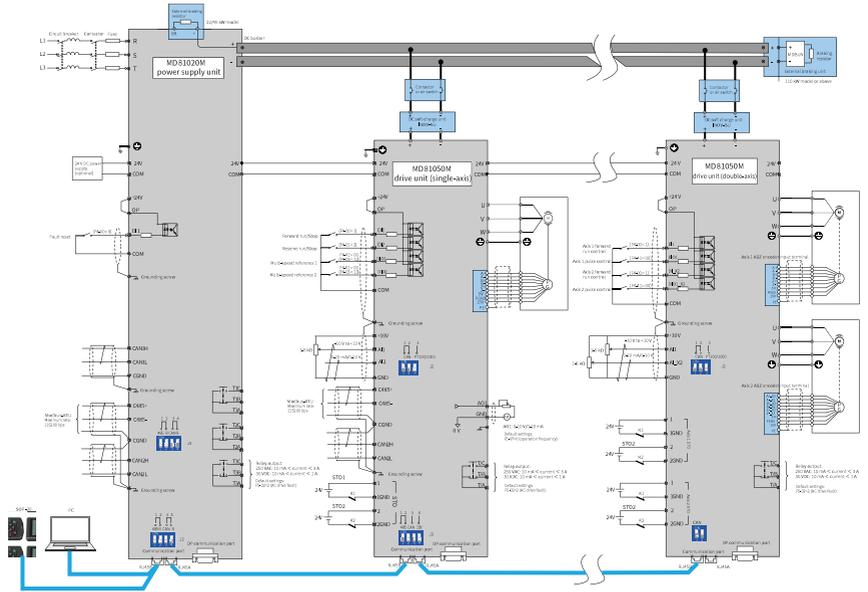


Figure 4-2 Electrical connection



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