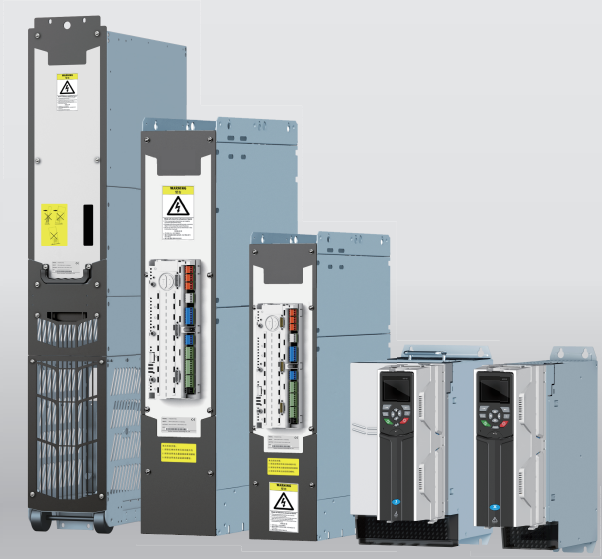
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MD880-50 Series Inverter

Hardware Guide

Industrial Automation | Intelligent Elevator | New Energy Vehicle | Industrial Robot | Rail Transit

Data code 19012698B04

Preface

Introduction

The MD880-50 series is a low-voltage general-purpose inverter product that provides a power range of 3.7 kW to 710 kW per unit and a drive capacity of up to 5600 kW in parallel connection. The inverter module adopts the booksize structure, offering high power density and high reliability with a compact design. It supports V/f control, sensorless vector control (SVC), and feedback vector control (FVC) of motors. The booksize structure makes assembly and maintenance easy while enhancing the cabinet utilization to reduce the required number of cabinets and footprint.

This guide describes the safety precautions, product information, mechanical and electrical installation, as well as maintenance and inspection.

Note

- The drawings in this guide are shown for illustration only and may be different from the product. Actual products may vary.
- The user guide is subject to change due to product upgrade, specification modification as well as efforts to the accuracy and convenience of the guide.

More Data

Name	Data Code	Description
MD880-50 Series Inverter Module Hardware User Guide (this guide)	19012698	Describes the safety precautions, product information, mechanical and electrical installation, as well as maintenance and inspection.
MD880 Series AC Drive Function Guide (HCU-50S, HCU-50S-CS, HCU-51S, and HCU-51S-CS)	19012581	Describes the function application and troubleshooting methods of the product.
MD880 Series AC Drive Commissioning Guide (HCU-50S, HCU-50S-CS, HCU-51S, and HCU-51S-CS)	19012580	Describes the commissioning tool, commissioning flow, specific commissioning procedure, and parameters of the product.
MD880 Series AC Drive Parameter Guide (HCU-50S, HCU-50S-CS, HCU-51S, and HCU-51S-CS)	19012699	Describes the parameters and fault codes of the product.
HPCU Parallel Control Module User Guide	19012536	Describes the production information, installation, bus connection, and parameter settings.

Revision History

Date	Version	Description
December 2024	B04	Minor error corrections.
December 2023	B03	• Updated the "Model Number and Nameplate" section (*"1.1 Model Number and Nameplate" on page 16*). • Updated the "Voltage and Power Rating" section (*"1.2 Voltage and Power Rating" on page 18*). • Updated the "Specifications and Model Selection" section (*"1.3 Specifications and Model Selection" on page 19*). • Updated the "Technical Data" section (*"1.4 Technical Data" on page 22*). • Updated the "Structural Configuration of the H8 and H8A Inverter Modules and Parallel Connection" section (*"1.5.3 Structural Configuration of the H8 and H8A Inverter Modules and Parallel Connection" on page 31*). • Updated the "Derating" section (*"1.8 Derating" on page 42*). • Updated the "Fuse Selection" section (*"1.11 Fuse Selection" on page 49*). • Updated the "Cable Specifications and Recommendations" section (*"3.6.5 Cable Specifications and Recommendations" on page 100*). • Updated the "Function Modules" section (*"4.1.6.1 Function Modules" on page 121*). • Updated the "Precautions Before Maintenance and Inspection" section (*"5.2 Precautions Before Maintenance and Inspection" on page 129*). • Updated the "Ordering Guide" section. • Minor error corrections.
September 2022	B02	1.12 Disconnector Selection: Updated all the Siemens DA10 models to DA20 in the tables of fuse switch and built-in fuse models.
January 2022	B01	• Added the 0062, 0082, and 0125-7 models in the "Ordering Guide" section. • Revised for improvement.

Date	Version	Description
October 2020	B00	• Modified Section 5.5.6 on pages 112 to 114. • Revised the cable specifications in Section 3.4.5 on page 81 for improvement. • Added content in Section 4.4.5 on page 90. • Modified the header. • Modified the function description and cable specification for the xCOMM terminal on page 94. • Deleted the customer service number. • Added the 690 V/630 kW and 690 V/710 kW models. • Added descriptions of H8A.
May 2020	A03	• Revised the parameters on page 15 for improvement. • Added fuse selection description on page 39.
May 2020	A02	• Corrected the terminal wiring path illustration in Figure e on page 121. • Corrected jumper reference from J11 to J16 on page 92. • Updated the layout style.
January 2020	A01	Updated the logo.
April 2019	A00	First release.

Access to the Guide

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

- Visit *www.inovance.com*, go to Support > Download, search by keyword, and then download the PDF file.
- Scan the QR code on the product with your smart phone.
- Scan the QR code below to install the My Inovance app, and search for the file in the app.

Warranty

Inovance provides warranty service within the warranty period (as specified in your order) for any fault or damage that is not caused by improper operation of the user. A maintenance fee will be charged beyond the warranty period.

Even in the warranty period, a maintenance fee will be charged for repair of the following damage:

- Damage caused by operations not following the instructions in the 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 (such as natural disaster, earthquake, and lightning strike)

The maintenance fee will be charged according to our latest Price List if not otherwise agreed upon.

For details, see the Product Warranty Card.

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Safety Precautions

Safety Disclaimer

- This chapter provides essential safety instructions for proper use of the product. Before using this product, read through the user guide, especially the safety instructions. Failure to observe the safety instructions may result in equipment damage, personal injuries, or even death.
- "DANGER", "WARNING", and "CAUTION" items in this guide do not indicate all safety precautions that need to be followed; instead, they just supplement the safety precautions.
- Use this product 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 usage.

Safety Categories and Definitions



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



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



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

Safety Precautions

- Some drawings in the guide show the product without covers or protective guards to display more details. Remember to install the covers or protective guards as specified first, and then perform operations in accordance with the instructions.
- Product illustrations in this guide are for reference only. Actual products may vary.
- Operators must take mechanical precautions to protect personal safety and wear protective equipment, such as anti-smashing shoes, safety clothing, safety glasses, protective gloves, and protective sleeves.

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 product if you find water seepage or any components being missing or damaged 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 in accordance with the package sequence. Do not hit the package with force.
- Check whether there is damage, rust, or signs of bumping 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 that 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.
- 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 product for more than three months. When the product needs to be stored for an extended period, take more strict protection and necessary inspection.
- Pack the equipment strictly before transportation. Use a sealed box for long-distance transportation.
- Never transport the product with devices or materials that may damage or negatively impact the product.

Installation



- The equipment must be operated only by professionals with electrical knowledge. Non-professionals are not allowed to perform operations on the equipment.



- 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 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 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, 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 product on an incombustible object, such as metal, and do not touch or attach the product to combustibles. Failure to comply may result in fire accidents.



- 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
 • Equipment installation, wiring, maintenance, inspection, and component replacement must be performed only by professionals. • Before wiring, cut off all the power supplies of the equipment. Wait for at least the time designated on the equipment warning label before further operations because residual voltage still exists after power-off. Measure the DC voltage in the main circuit and ensure the DC voltage is in the safe range. Failure to comply will result in electric shock. • Do not perform wiring, remove the equipment cover, or touch the circuit board while power is on. Failure to comply will result in electric shock. • Check that the equipment is grounded properly. Failure to comply can result in electric shock.
 • Do not connect the input power supply to the output end of the equipment. Failure to comply can result in equipment damage or even fire. • When connecting a drive to a 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 guide. Improper tightening torque may overheat or damage the connecting part, resulting in fire. • After wiring, 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 electric shock or equipment damage.
 • During wiring, follow proper electrostatic discharge (ESD) procedures and wear an anti-static wrist strap. Failure to comply can result in damage to the equipment or internal product circuits. • 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



- Before power-on, check that the equipment is installed properly with reliable wiring and the motor can be restarted.
- Before power-on, make sure that the power supply meets product requirements to prevent product damage or even 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 electric shock.



- 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 fire accidents.
- Before power-on, check that no one is near the equipment, motor, or machine. Failure to comply may result in personal injuries or even death.

Operation



- The equipment must be operated only by professionals. Failure to comply can result in personal injuries or even death.
- Do not touch any terminal of the device or remove any part of the device during operation. Failure to comply will result in electric shock.



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

Maintenance



- Equipment installation, wiring, maintenance, inspection, and component replacement must be performed only by professionals.
- Do not maintain the equipment while power is on. Failure to comply can result in 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 even after power-off because there is still induced voltage generated during rotation. Failure to comply will result in 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, and component replacement must be performed only by professionals.
- Do not repair the equipment while power is on. Failure to comply can result in 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.



- Submit the repair request according to the warranty agreement.
- 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 equipment damage, personal injuries, or even death.
- When the equipment is faulty or damaged, require professionals to perform troubleshooting and repair by following repair instructions and keep a repair record.
- Replace quick-wear parts of the equipment in according with the replacement instructions.
- Do not perform operations on damaged equipment. Failure to comply may result in severe equipment damage, personal injuries, or even death.
- 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 Signs

To ensure safe operations, comply with safety signs on the device and do not damage or remove the safety signs. See the following table for descriptions of the safety signs.

To ensure safe operation, comply with equipment-related safety signs. See the following table for descriptions of the safety signs.

Safety Sign	Description
	• Read through the safety instructions before operating the equipment. Failure to comply may result in equipment damage, personal injuries, or even death. • Do not touch the terminals or remove the cover while power is on or within 10 minutes after power-off. Failure to comply will result in electric shock.

1 Product Information

1.1 Model Number and Nameplate

MD880 - 50M - 0721 - 7 - SG
① ② ③ ④ ⑤

① **Product series** MD880: MD880 AC drive series	③ **Rated current** 0721: 721 A	⑤ **Nature** SG: Second-generation controller CS: Supports STO SG-N: H8A module
② **Product type** 50M: Inverter module	④ **Voltage class** 4: 400 VAC system 7: 690 VAC system 5: 500 VAC system	

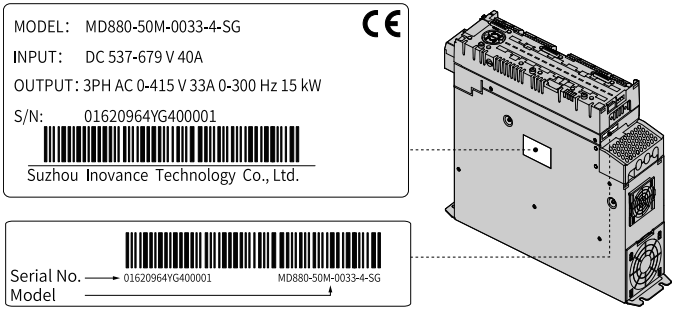


Figure 1-1 Nameplate of the H1 to H4 inverter modules

Note

For the H1 to H4 inverter modules, the nameplate is affixed to the left side of the module, and a model identification label is affixed next to the output terminal at the bottom of the module.

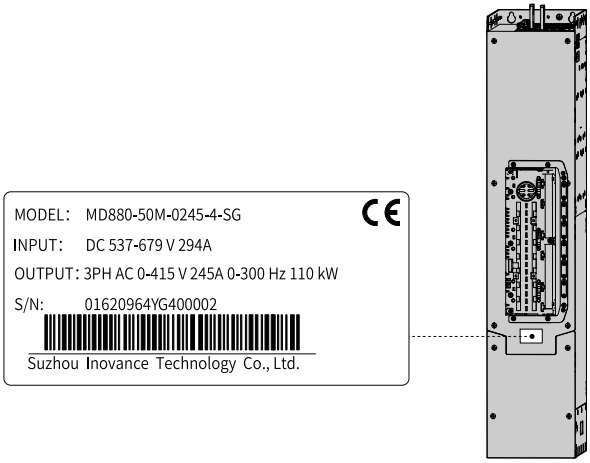


Figure 1-2 Nameplate of the H6 and H7 inverter modules

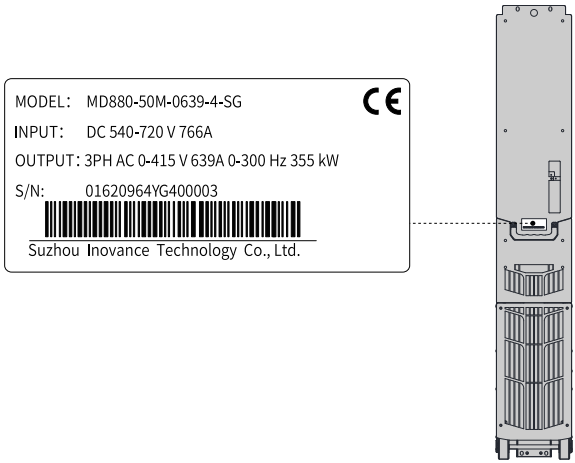


Figure 1-3 Nameplate of the H8 inverter module

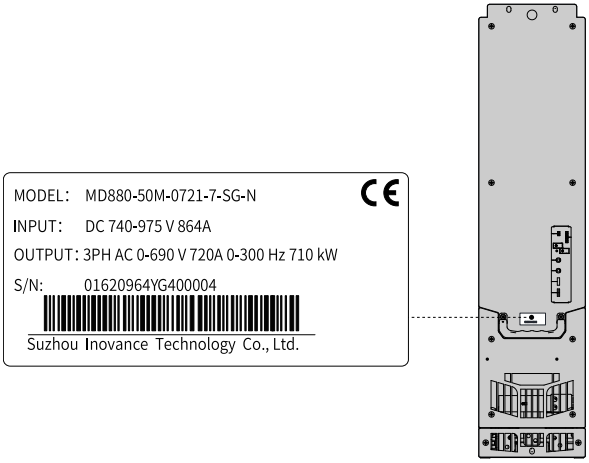


Figure 1-4 Nameplate of the H8A inverter module

Note

For the H6 to H8 and H8A inverter modules, the nameplate is affixed to the front of the module.

1.2 Voltage and Power Rating

Table 1–1 Voltage and power rating of the inverter module

Grid Voltage	DC Bus Voltage	Output Current	Power Range	Structure
400 V system: 380 VAC to 415 VAC	537 VDC to 679 VDC	9 A to 23 A	3.7 kW to 11 kW	H1
400 V system: 380 VAC to 415 VAC	537 VDC to 679 VDC	33 A to 60 A	15 kW to 22 kW	H2
400 V system: 380 VAC to 415 VAC	537 VDC to 679 VDC	78 A to 94 A	30 kW to 45 kW	H3
400 V system: 380 VAC to 415 VAC	537 VDC to 679 VDC	116 A to 183 A	55 kW to 90 kW	H4
400 V system: 380 VAC to 415 VAC	540 VDC to 720 VDC	245 A to 299 A	110 kW to 132 kW	H6
400 V system: 380 VAC to 415 VAC	540 VDC to 720 VDC	349 A to 395 A	160 kW to 200 kW	H7
400 V system: 380 VAC to 415 VAC	540 VDC to 720 VDC	516 A to 900 A	250 kW to 500 kW	H8/H8A
500 V system: 380 VAC to 500 VAC	540 VDC to 750 VDC	349 A	250 kW	H7
500 V system: 380 VAC to 500 VAC	540 VDC to 750 VDC	590 A	400 kW	H8A
500 V system: 380 VAC to 500 VAC	540 VDC to 750 VDC	810 A	560 kW	H8A
690 V system: 525 VAC to 690 VAC	740 VDC to 975 VDC	62 A to 192 A	55 kW to 160 kW	H6
690 V system: 525 VAC to 690 VAC	740 VDC to 975 VDC	217 A to 270 A	200 kW to 250 kW	H7
690 V system: 525 VAC to 690 VAC	740 VDC to 975 VDC	340 A to 721 A	315 kW to 710 kW	H8/H8A

1.3 Specifications and Model Selection

Note

The SG and CS versions have identical specifications, but only the CS version supports STO, while the SG version does not.

Table 1–2 MD880-50M series inverter module models

Structure	Model	No Overload		Light Overload		Heavy Overload		Mass (kg)	Loss (W)	Cooling Air Volume (m^3/h)	Outline Dimensions (W x D x H) (mm)
		Current (A)	Power (kW)	Current (A)	Power (kW)	Current (A)	Power (kW)				
UN: Three-phase 400 VAC (range: 380 V to 415 V)											
H1	MD880-50M-0009-4	9	3.7	9	3.7	5.1	2.2	⩽ 9	100	76	100 x 413 x 415
H1	MD880-50M-0013-4	13	5.5	13	5.5	9	3.7		136	76	
H1	MD880-50M-0017-4	17	7.5	17	7.5	13	5.5		168	76	
H1	MD880-50M-0023-4	23	11	22	11	17	7.5		190	76	
H2	MD880-50M-0033-4	33	15	32	15	25	11	⩽ 10	290	76	
H2	MD880-50M-0038-4	38	18.5	37	18.5	32	15		308	76	
H2	MD880-50M-0048-4	48	22	45	22	37	18.5		401	123	
H3	MD880-50M-0060-4	60	30	58	30	45	22		502	112	
H3	MD880-50M-0078-4	78	37	75	37	60	30	⩽ 11	592	112	
H3	MD880-50M-0094-4	94	45	91	45	75	37		735	182	
H4	MD880-50M-0116-4	116	55	112	55	91	45	⩽ 20	762	223	200 x 413 x 415
H4	MD880-50M-0149-4	149	75	143	75	112	55		1150	364	
H4	MD880-50M-0183-4	183	90	176	90	150	75		1468	364	
H6	MD880-50M-0245-4	245	110	236	110	184	90	⩽ 35	1758	442	180 x 438 x 770
H6	MD880-50M-0299-4	299	132	287	132	224	110		2104	544	

Structure	Model	No Overload		Light Overload		Heavy Overload		Mass (kg)	Loss (W)	Cooling Air Volume (m^3/h)	Outline Dimensions (W x D x H) (mm)
		Current (A)	Power (kW)	Current (A)	Power (kW)	Current (A)	Power (kW)				
H7	MD880-50M-0349-4	349	160	335	160	262	132	⩽ 45	2587	1088	180 x 463 x 920
H7	MD880-50M-0395-4	395	200	380	200	296	160		3203	1270	
H8 (H8A)	MD880-50M-0516-4	516	250	495	250	387	200	⩽ 130	4921	663	230 x 582 x 1394
H8 (H8A)	MD880-50M-0639-4	639	355	613	315	479	250		6701	964	
H8 (H8A)	MD880-50M-0757-4	757	400	727	400	568	315		7960	1632	
H8 (H8A)	MD880-50M-0900-4	900	500	864	450	675	355		10133	1632	
UN: Three-phase 500 VAC (range: 380 V to 500 V)											
H7	MD880-50M-0349-5	349	250	335	200	262	160	⩽ 45	2911	1088	180 x 463 x 920
H8A	MD880-50M-0590-5	590	400	566	355	443	250	⩽ 80	7960	964	230 x 582 x 939
H8A	MD880-50M-0810-5	810	560	778	500	608	400		11350	1632	
UN: Three-phase 690 VAC (range: 525 V to 690 V)											
H6	MD880-50M-0062-7	62	55	60	55	46	45	⩽ 35	798	442	180 x 438 x 770
H6	MD880-50M-0082-7	82	75	79	75	61	55		1163	442	
H6	MD880-50M-0099-7	99	90	95	90	74	75		1321	442	
H6	MD880-50M-0125-7	125	110	120	110	94	90		1494	442	
H6	MD880-50M-0144-7	144	132	138	132	108	110		1788	442	
H6	MD880-50M-0192-7	192	160	184	160	144	132		2436	544	
H7	MD880-50M-0217-7	217	200	215	200	162	160	⩽ 45	2724	442	180 x 463 x 920
H7	MD880-50M-0270-7	270	250	260	250	202	200		3342	1088	

Structure	Model	No Overload		Light Overload		Heavy Overload		Mass (kg)	Loss (W)	Cooling Air Volume (m^3/h)	Outline Dimensions (W x D x H) (mm)
		Current (A)	Power (kW)	Current (A)	Power (kW)	Current (A)	Power (kW)				
H8	MD880-50M-0340-7	340	315	326	315	255	250	⩽ 130	5109	663	230 x 582 x 1394
H8	MD880-50M-0410-7	410	400	394	355	308	315		6143	964	
H8	MD880-50M-0530-7	530	500	509	450	398	355		7912	1632	
H8	MD880-50M-0600-7	600	560	576	560	450	400		9086	1905	
H8	MD880-50M-0650-7	650	630	624	560	488	450		10080	2024	
H8	MD880-50M-0721-7	721	710	692	630	541	560		11000	2024	
H8A	MD880-50M-0340-7	340	315	326	315	255	250	⩽ 80	5109	663	230 x 582 x 939
H8A	MD880-50M-0410-7	410	400	394	355	308	315		6143	964	
H8A	MD880-50M-0530-7	530	500	509	450	398	355		7912	1632	
H8A	MD880-50M-0600-7	600	560	576	560	450	400		9086	1905	
H8A	MD880-50M-0650-7	650	630	624	560	488	450		10080	2024	
H8A	MD880-50M-0721-7	721	710	692	630	541	560		11000	2024	

1.4 Technical Data

Table 1–3 Technical data of the inverter module

Item		Specification
Basic performance	DC input voltage	400 V system: 540 VDC to 720 VDC 500 V system: 540 VDC to 750 VDC 690 V system: 740 VDC to 975 VDC
	Output voltage	400 V system: 0 VAC to 415 VAC 500 V system: 0 VAC to 500 VAC 690 V system: 0 VAC to 690 VAC
	Output frequency	0 Hz to 300 Hz
	Overload capacity	Light overload: 110% I_{LD}, 1 minute of continuous overload allowed every 5 minutes Heavy overload: 150% I_{HD}, 1 minute of continuous overload allowed every 5 minutes
	Operating efficiency	> 98%
Control features	Motor control mode	V/f control Sensorless vector control (SVC) Feedback vector control (FVC)
	Carrier frequency	400 V system: • 3.7 kW to 90 kW: 3.2 kHz default • 110 kW to 500 kW, 2 kHz default 500 V system: 2 kHz default 690 V system: 55 kW to 710 kW: 1.5 kHz default Derate when the carrier frequency is increased.
	Speed range	V/f control: 1:50
		SVC: 1:200
		FVC: 1:1000
	Speed control accuracy	SVC: ±10% Fsl
		FVC: ±0.01%
	Speed fluctuation	SVC: ±0.2%
		FVC: ±0.1%
	Torque response	SVC: 3 ms FVC: 3 ms
	Torque accuracy	SVC: 5% FVC: 5%
	Torque control accuracy	SVC: ±5% (above 5 Hz) FVC: ±3%
	Starting torque	SVC: 0.5 Hz/150%
		FVC: 0 Hz/200%

Item		Specification
Mechanical data	Shock and vibration resistance	Class 3M4 in GB/T4798.3 Steady-state sinusoidal vibration: • 3 mm at 2 Hz to 9 Hz • 10 m/s^2 at 9 Hz to 200 Hz Shock: 100 m/s^2 for 11 ms
	Safety performance	EN 61800-5-1
	Cooling method	Forced air cooling (AF) compliant with EN 60146
Protection functions	Protection functions	Protection against short circuit, overcurrent, overvoltage, undervoltage, phase loss, encoder disconnection, and overtemperature
Environment requirements	Operating place	Indoors without direct sunlight, dust, corrosive gas, combustible gas, oil mist, water vapor, drip, or salt
	Altitude	⩽ 1000 m; derate by 1% per 100 m increase above 1000 m; maximum altitude 4000 m (For application above 4000 m, contact Inovance for technical support.)
	Ambient temperature	−10°C to +40°C; derate by 1% per 1°C increase from 40°C to 50°C; maximum ambient temperature 50°C
	Ambient humidity	5% to 95% RH, non-condensing
	Storage temperature	–40°C to +70°C
	Storage humidity	5% to 95% RH, non-condensing
	Pollution degree	PD2
	Overvoltage category	OVC III
	Protection rating	H1 to H4 inverter modules: IP20 H6 to H8 and H8A inverter modules: IP00

1.5 Components

1.5.1 Structural Configuration of the H1 to H4 and H6 Inverter Modules

Overview

The DC input terminal is on the top of the module. The AC output terminal is at the bottom of the module. The HCU control module is installed to the front of the module. The inverter control system is comprised of standard I/O terminals and optional function modules. For details of the standard I/O terminals for the HCU control module, see *"4.1.1 HCU control module composition" on page 106*. Other optional function modules are installed on the HCU control module. The fan operates automatically once the inverter module starts operating. The fan is powered by the internal DC power supply.

DC bus connection and DC bus pre-charge module

For the H1 to H4 inverter modules, the positive bus is provided with an internal quick fuse as standard. For the H6 inverter modules, an external quick fuse can be configured. For specific models, see *"1.11 Fuse Selection" on page 49*. You can also configure an external DC

bus pre-charge module as needed. For specific models, see Chapter 6 "Options". To isolate the inverter module from the DC bus quickly to perform maintenance, you need to install a switch disconnector. For specific models, see *"1.12 Disconnector Selection" on page 52*. The DC bus pre-charge module is required in the following cases:

- The inverter module is connected to the DC bus through a switch disconnector.
- The inverter module is connected to the DC bus directly, but the rectifier module of the system does not support pre-charge upon power-on.

External power supply

- The HCU control module on H1 to H4 and H6 inverter modules requires an external 24 VDC/2 A power supply, which needs to be connected to the power input terminal (24VI-GND) of the HCU control module.
- Before the main power supply is established, the internal auxiliary source of the inverter module can be powered by an external 24 VDC/1 A power supply. After the main power supply is established, the internal auxiliary source is powered by the DC bus, and the external 24 VDC/1 A power supply provides redundancy.

Structural configuration of the H1 to H4 and H6 inverter modules

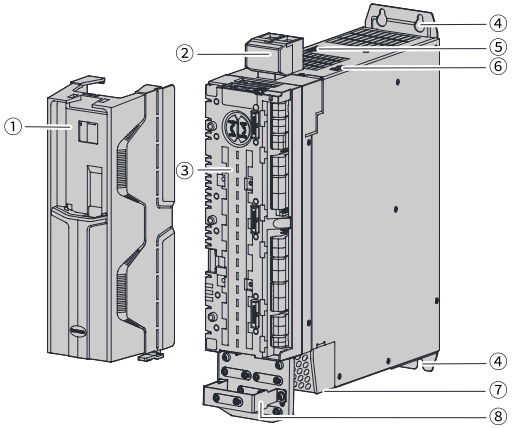


Figure 1-5 Structural configuration of the H1 to H3 inverter modules

No.	Name
①	Recess for the SOP-20-880 operating panel
②	DC bus input terminal
③	HCU control module
④	Rear mounting hole
⑤	External 24 VDC auxiliary power terminal
⑥	DC bus pre-charge module control terminal

No.	Name
⑦	U/V/W output terminal (covered)
⑧	Control cable ground plate

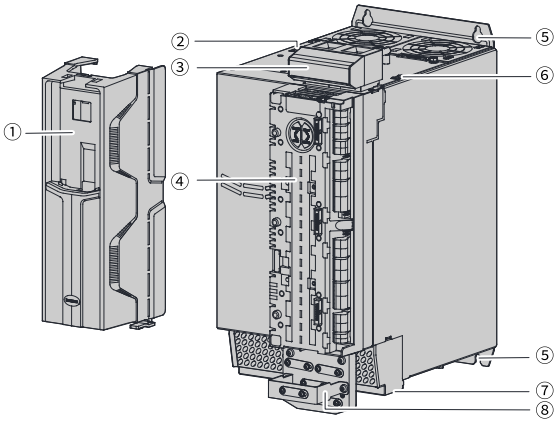


Figure 1-6 Structural configuration of the H4 inverter module

No.	Name
①	Recess for the SOP-20-880 operating panel
②	External 24 VDC auxiliary power terminal
③	DC bus input terminal
④	HCU control module
⑤	Rear mounting hole
⑥	DC bus pre-charge module control terminal
⑦	U/V/W output terminal (covered)
⑧	Control cable ground plate

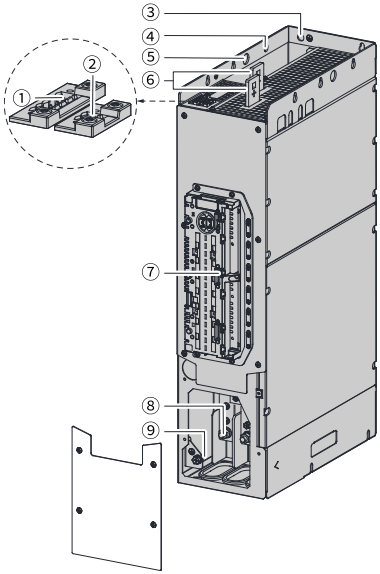
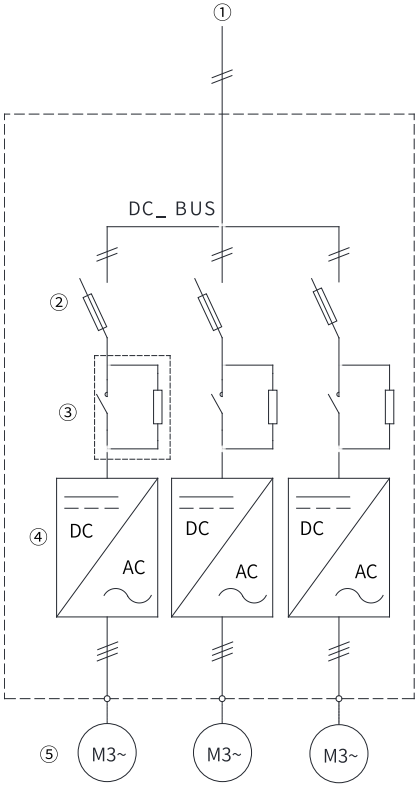


Figure 1-7 Structural configuration of the H6 inverter module

No.	Name
①	External I/O terminal
②	External 24 VDC auxiliary power terminal
③	Rear mounting hole
④	Side mounting hole
⑤	Eyebolt
⑥	DC bus input terminal
⑦	HCU control module
⑧	AC output terminal
⑨	Grounding (PE) terminal

Electrical connection of the inverter cabinet comprised of H1 to H4 or H6 inverter modules



No.	Name
①	DC power supply
②	Fuse switch
③	DC bus pre-charge module
④	Inverter module
⑤	Motor

1.5.2 Structural Configuration of the H7 Inverter Modules

Overview

The DC input terminal is on the top of the module. The AC output terminal is at the bottom of the module. The HCU control module is installed to the front of the module. The inverter control system is comprised of standard I/O and optional function modules. For details of the standard I/O terminals for the HCU control module, see *"4.1.1 HCU control module*

composition" on page 106. Other optional function modules are installed on the HCU control module. The control circuit board of the H7 inverter module can be powered by an external source or by the DC bus that provides auxiliary voltage. The fan operates automatically once the inverter module starts operating. The fan is powered by the internal DC power supply.

DC bus connection and DC bus pre-charge module

The H7 inverter module can use an external fast acting fuse. For specific models, see *"1.11 Fuse Selection" on page 49*. You can also configure an external DC bus pre-charge module as needed. For specific models, see *"6.1 Function Expansion Module" on page 149*. To isolate the inverter module from the DC bus quickly to perform maintenance, you need to install a switch disconnector. For specific models, see *"1.12 Disconnector Selection" on page 52*. The DC bus pre-charge module is required in the following cases:

- The inverter module is connected to the DC bus through a switch disconnector.
- The inverter module is connected to the DC bus directly, but the rectifier module of the system does not support pre-charge upon power-on.

External power supply

- The HCU control module on the H7 inverter module requires an external 24 VDC/2 A power supply, which needs to be connected to the power input terminal (24VI-GND) of the HCU control module.
- Before the main power supply is established, the internal auxiliary source of the inverter module can be powered by an external 24 VDC/1 A power supply. After the main power supply is established, the internal auxiliary source is powered by the DC bus, and the external 24 VDC/1 A power supply provides redundancy.

Structural configuration of the H7 inverter module

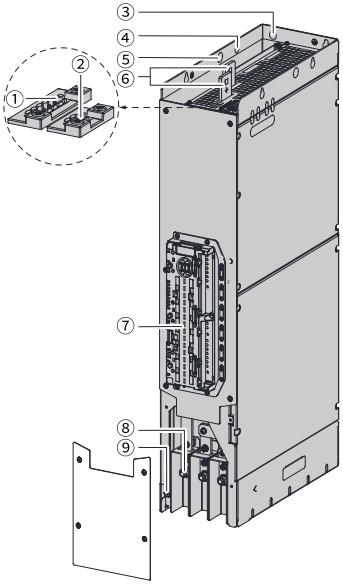
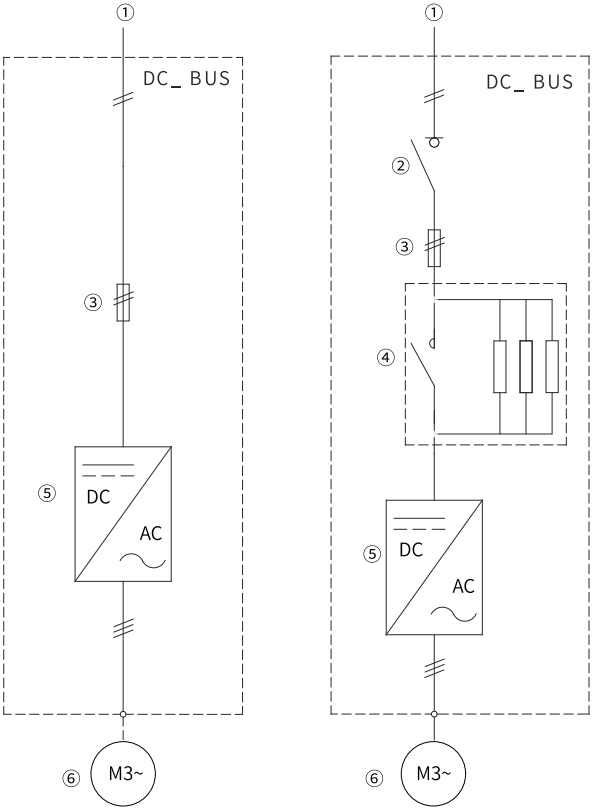


Figure 1-8 Structural configuration of H7

No.	Name
①	External I/O terminal
②	External 24 VDC auxiliary power terminal
③	Rear mounting hole
④	Side mounting hole
⑤	Eyebolt
⑥	DC bus input terminal
⑦	HCU control module
⑧	AC output terminal
⑨	Grounding (PE) terminal

Electrical connection of the H7 inverter module cabinet



Note

- Connect the cabinet according to the diagram on the left if the DC input (①) supports pre-charge upon power-on.
- Connect the cabinet according to the diagram on the right if the DC input (①) does not support pre-charge upon power-on.

No.	Name
①	DC power supply
②	Switch disconnector
③	Fuse
④	DC bus pre-charge module (option)
⑤	Inverter module
⑥	Motor

1.5.3 Structural Configuration of the H8 and H8A Inverter Modules and Parallel Connection

Overview

The H8 inverter modules can be used in separate or parallel systems. H8 inverter modules in the 400 V voltage class provides a power range of 250 kW to 500 kW. H8A inverter modules in the 500 V voltage class provides a power range of 400 kW to 560 kW. H8 inverter modules in the 690 V voltage class provides a power range of 315 kW to 710 kW. A maximum of ten H8 inverter modules can be connected in parallel.

The H8 inverter modules have bottom casters for easy installation and maintenance. The H8 and H8A inverter modules come standard with a quick connector on the AC output side. The connector mates with the quick connector in the cabinet when the module is inserted into the cabinet. In parallel connection, AC outputs of the inverter modules can be connected to motors separately. Alternatively, the AC outputs can be paralleled through the AC bus and then connected to a motor.

The control circuit board of the H8 and H8A inverter modules can be powered by an external source or the DC bus that provides auxiliary voltage. The fan operates automatically once the inverter module starts operating. The fan is powered by the internal DC power supply.

The H8 inverter module is configured with an output reactor by default. The inverter module must be configured with an external HCU control module. For parallel connection, an external HPCU parallel control module must also be configured. The inverter control system is comprised of standard I/O terminals and optional function modules. For details of the I/O terminals for the HCU control module, see *"4.1.1 HCU control module composition" on page 106*. Other optional function modules are installed on the HCU control module.

DC bus connection and power-on pre-charge circuit

The inverter module must be configured with an external DC fuse. For specific models, see *"1.11 Fuse Selection" on page 49*. To isolate the inverter module from the DC bus quickly to perform maintenance, you can install a switch disconnector. For specific models, see *"1.12 Disconnector Selection" on page 52*. The power-on pre-charge circuit is required in the following cases:

- The inverter module is connected to the DC bus through a switch disconnector.
- The inverter module is connected to the DC bus directly, but the rectifier module of the system does not support pre-charge upon power-on.

External power supply

- The H8/H8A inverter module needs an external 24 VDC/2 A power supply to power the HCU control module. Such a power supply must be connected to the power input terminal (24VI-GND) of the HCU control module.

- Before the main power supply is established, the internal auxiliary source of the inverter module can be powered by an external 24 VDC/1 A power supply. After the main power supply is established, the internal auxiliary source is powered by the DC bus, and the external 24 VDC/1 A power supply provides redundancy.

Structural configuration of the H8 inverter module

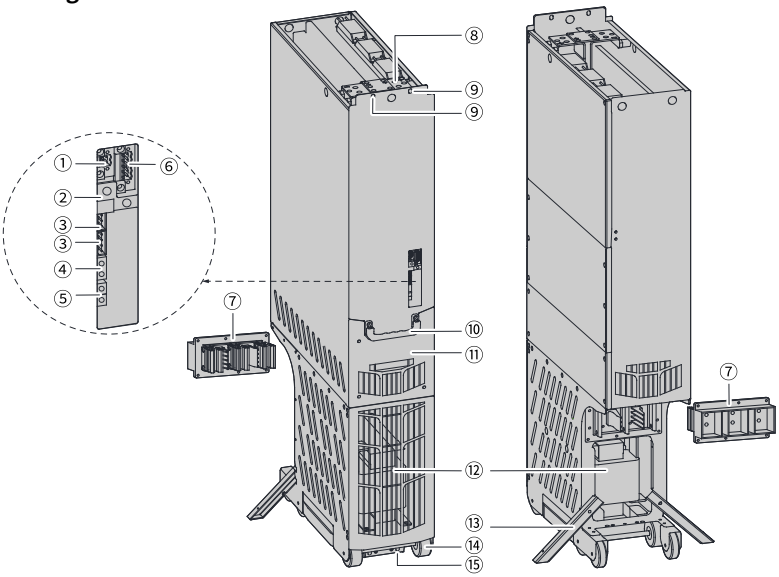


Figure 1-9 Structural configuration of H8

No.	Name
①	External 24 VDC auxiliary power terminal
②	Shield clip
③	STO terminal (reserved)
④	Optical fiber port 1
⑤	Optical fiber port 2 (reserved)
⑥	External I/O terminal
⑦	Quick connector (secured to the cabinet behind the module)
⑧	DC bus input terminal
⑨	Top spray-coated fixing hole, the ground point (PE) between the inverter module frame and the cabinet frame
⑩	Handle
⑪	Cooling fan
⑫	Output reactor

No.	Name
⑬	Anti-toppling bracket See (*"5.4.6 Replacing the H8 Inverter Module" on page 139* for use instructions.)
⑭	Caster
⑮	Bottom spray-coated fixing hole, the ground point (PE) between the inverter module frame and the cabinet frame

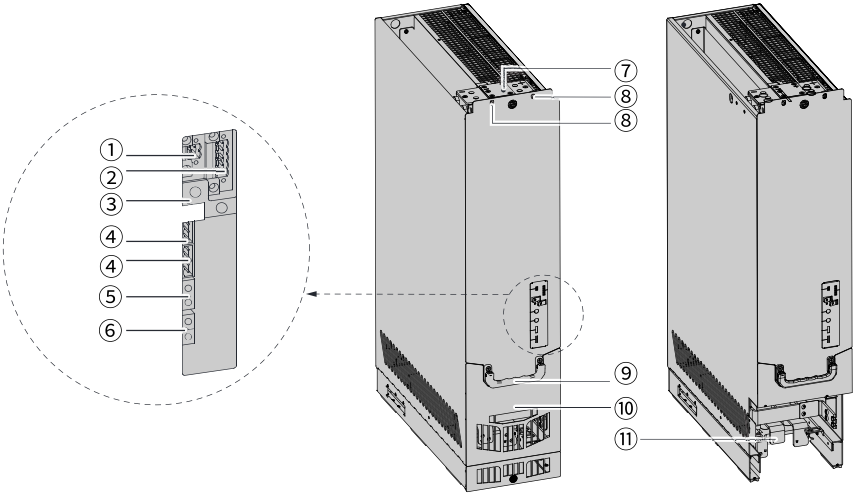


Figure 1-10 Structural configuration of the H8A inverter module

No.	Name
①	External 24 VDC auxiliary power terminal
②	External I/O terminal
③	Shield clip
④	STO terminal (reserved)
⑤	Optical fiber port 1
⑥	Optical fiber port 2 (reserved)
⑦	DC bus input terminal
⑧	Top spray-coated fixing hole, the ground point (PE) between the inverter module frame and the cabinet frame
⑨	Handle
⑩	Cooling fan
⑪	AC output terminal

Electrical connection of the inverter cabinet comprised of one H8 inverter module

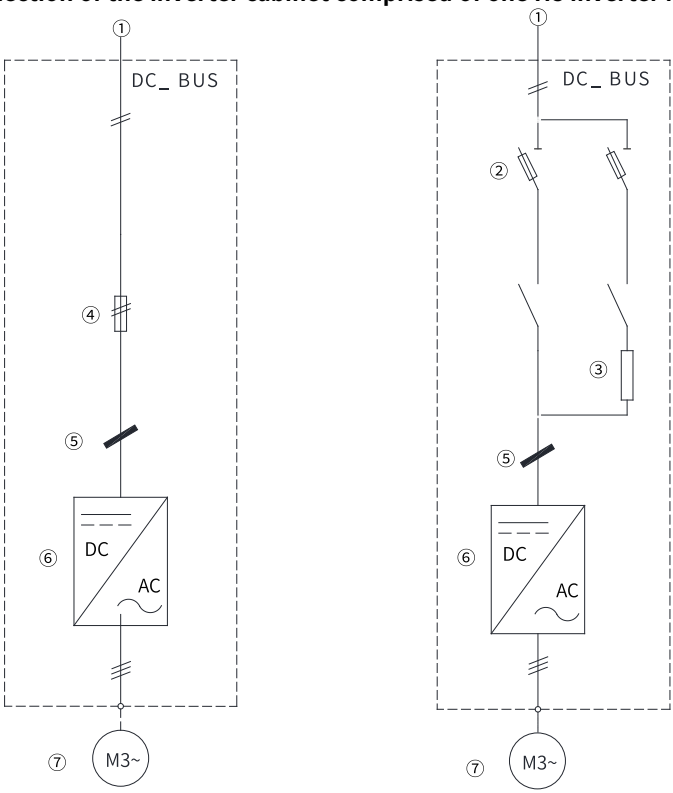


Figure 1-11 1 x H8 electrical connection

Note

- Connect the cabinet according to the diagram on the left if the DC input (①) supports pre-charge upon power-on.
- Connect the cabinet according to the diagram on the right if the DC input (①) does not support pre-charge upon power-on.

No.	Name
①	DC power supply
②	Fuse switch for DC
③	Pre-charge resistor
④	Fuse
⑤	Common-mode filter

No.	Name
⑥	Inverter module
⑦	Motor

Electrical connection of the inverter cabinet comprised of two H8 inverter modules

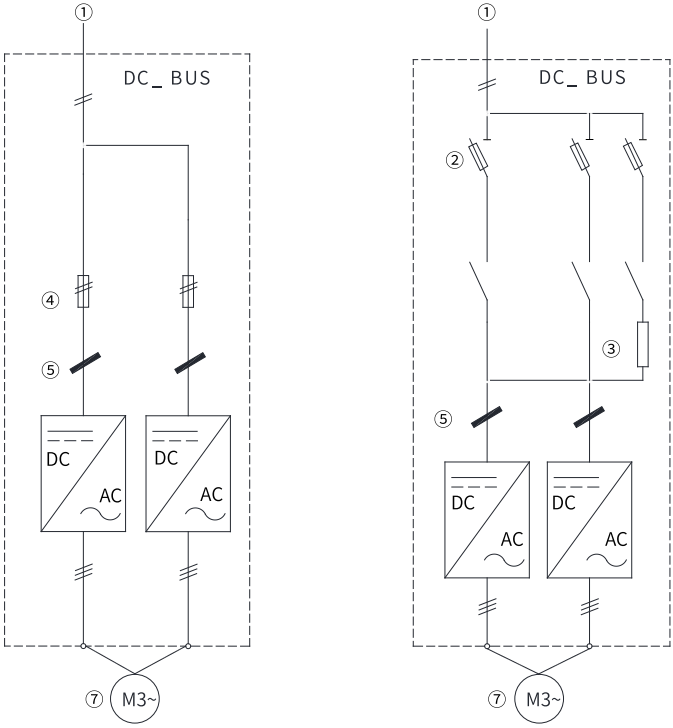


Figure 1-12 2 x H8 electrical connection

Note

- Connect the cabinet according to the diagram on the left if the DC input (①) supports pre-charge upon power-on.
- Connect the cabinet according to the diagram on the right if the DC input (①) does not support pre-charge upon power-on.

No.	Name
①	DC power supply
②	Fuse switch for DC
③	Pre-charge resistor

No.	Name
④	Fuse
⑤	Common-mode filter
⑥	Inverter module
⑦	Motor

Electrical connection of the inverter cabinet comprised of three H8 inverter modules

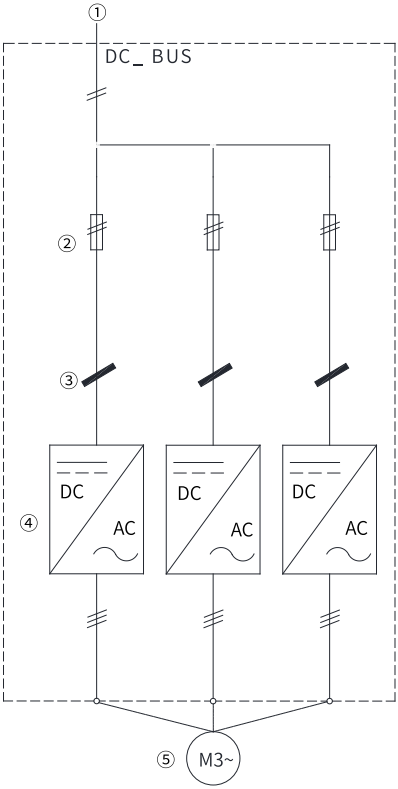


Figure 1-13 3 x H8 electrical connection

Note

The DC-side operating switch with a pre-charge circuit does not support parallel connection of three H8 inverter modules in a cabinet with a width of 800 mm.

No.	Name
①	DC power supply
②	Fuse
③	Common-mode filter
④	Inverter module
⑤	Motor

Electrical connection of the inverter cabinet comprised of one H8A inverter module

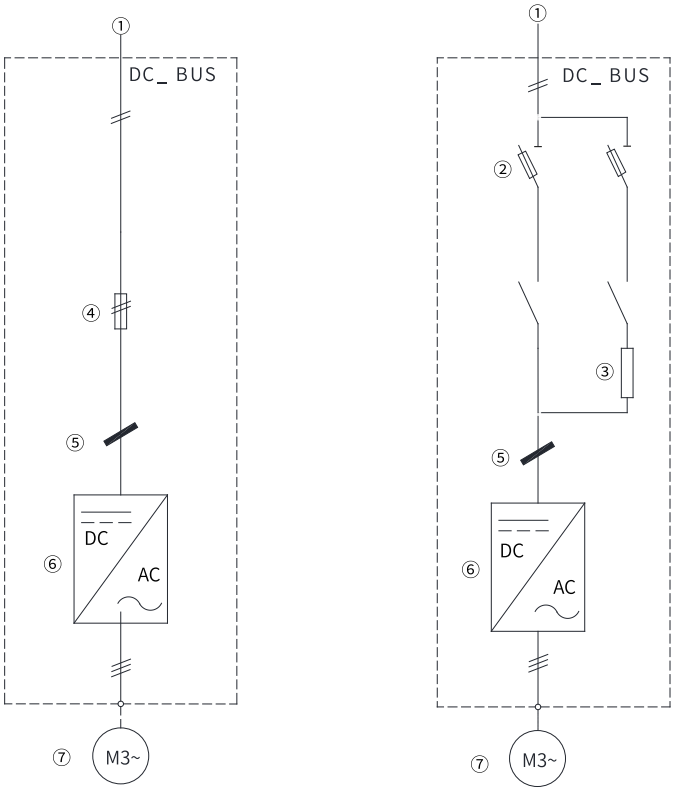


Figure 1-14 1 x H8A electrical connection

Note

- Connect the cabinet according to the diagram on the left if the DC input (①) supports pre-charge upon power-on.
- Connect the cabinet according to the diagram on the right if the DC input (①) does not support pre-charge upon power-on.

No.	Name
①	DC power supply
②	Fuse switch for DC
③	Pre-charge resistor
④	Fuse
⑤	Common-mode filter
⑥	Inverter module
⑦	Motor

1.6 Electrical Diagram of Typical Drive System

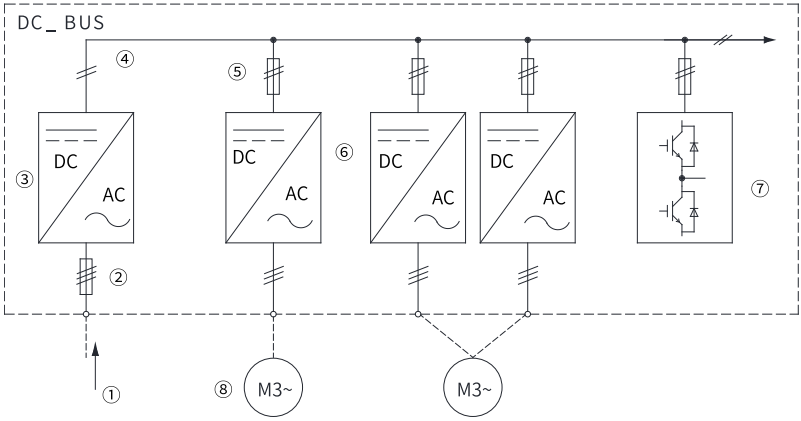


Figure 1-15 Electrical diagram of typical drive system

No.	Description
①	AC power supply
②	Three-phase input fuse
③	Rectifier module
④	DC bus
⑤	Inverter module DC fuse (with or without DC bus pre-charge)
⑥	Inverter module (In this example, one of the two installations consists of two inverter modules connected in parallel.)
⑦	Braking module (resistor not shown)
⑧	Motor

Note

The rectifier module converts alternating voltage into direct voltage, which is then distributed to all inverter modules through the DC bus. Then, the inverter modules convert the direct voltage into alternating voltage to drive the motor. Each inverter module requires an external DC fuse when connected to the DC bus.

1.7 Outline Dimensions

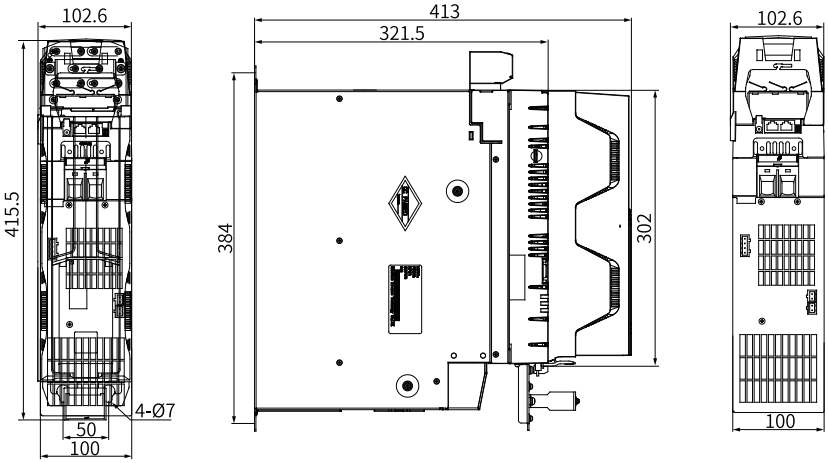


Figure 1-16 Outline dimensions of the H1 to H3 inverter module (mm)

Note

It is recommended to use the M6 bolts to secure the inverter module (H1 to H3) and connect the DC input copper busbar.

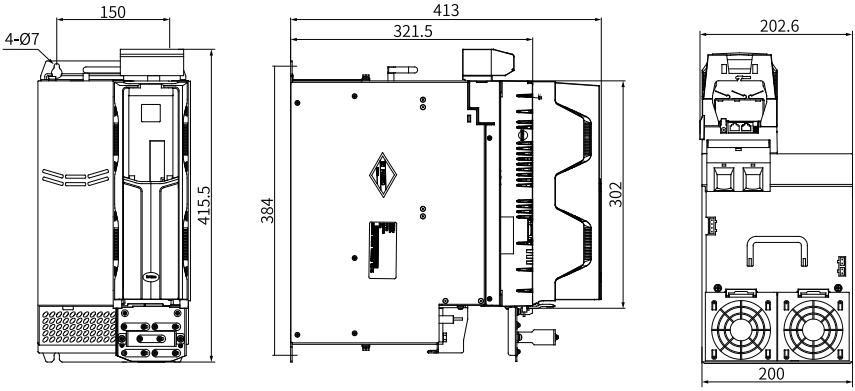


Figure 1-17 Outline Dimensions of the H4 inverter module (mm)

Note

It is recommended to use the M6 bolts to secure the inverter module (H4) and the M8 bolts to connect the DC input copper busbar.

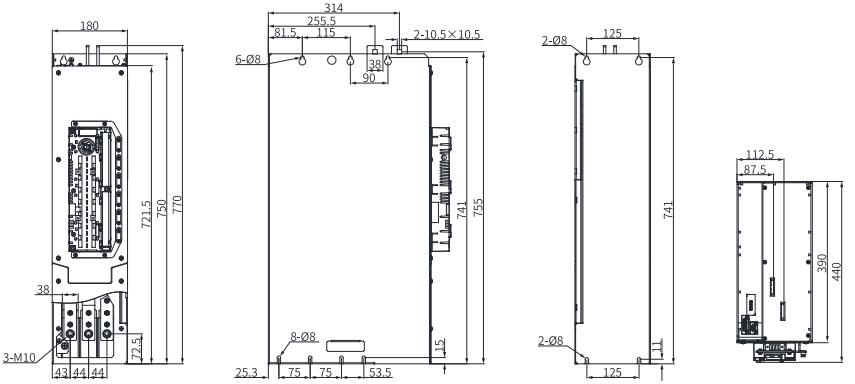


Figure 1-18 Outline Dimensions of the H6 inverter module (mm)

Note

It is recommended to use the M6 bolts to secure the inverter module (H6) and the M10 bolts to connect the DC input copper busbar.

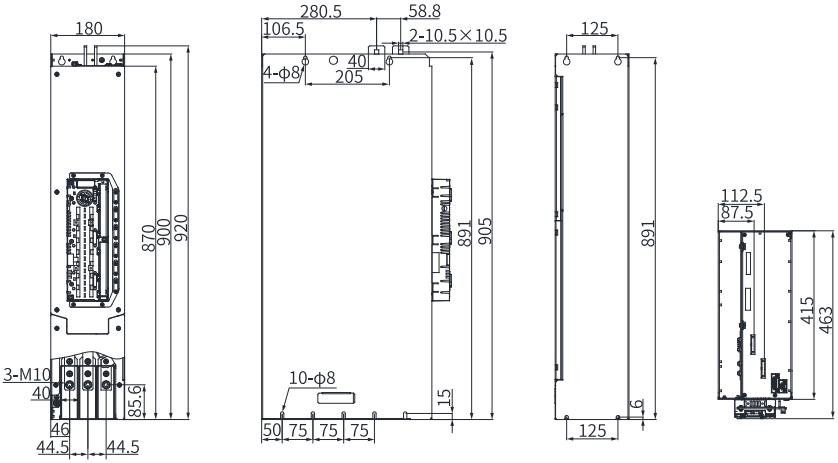


Figure 1-19 Outline Dimensions of the H7 inverter module (mm)

Note

It is recommended to use the M6 bolts to secure the inverter module (H7) and the M10 bolts to connect the DC input copper busbar.

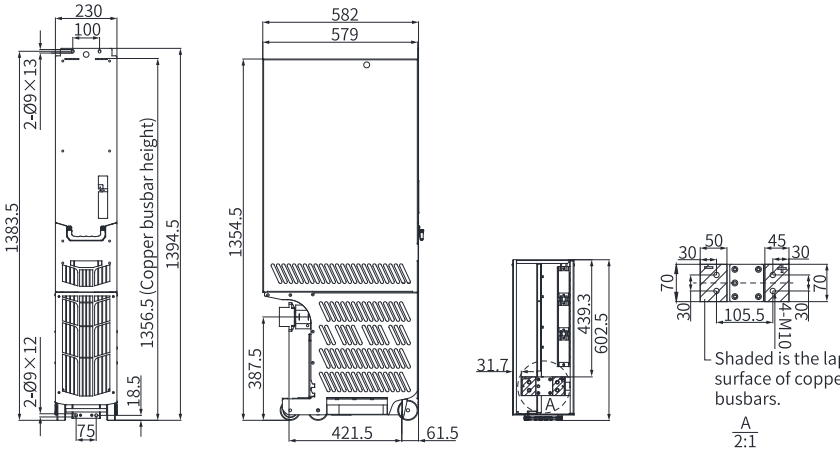


Figure 1-20 Outline Dimensions of the H8 inverter module (mm)

Note

It is recommended to use the M8 bolts to secure the inverter module (H8) and the M10 bolts to connect the input copper busbar.

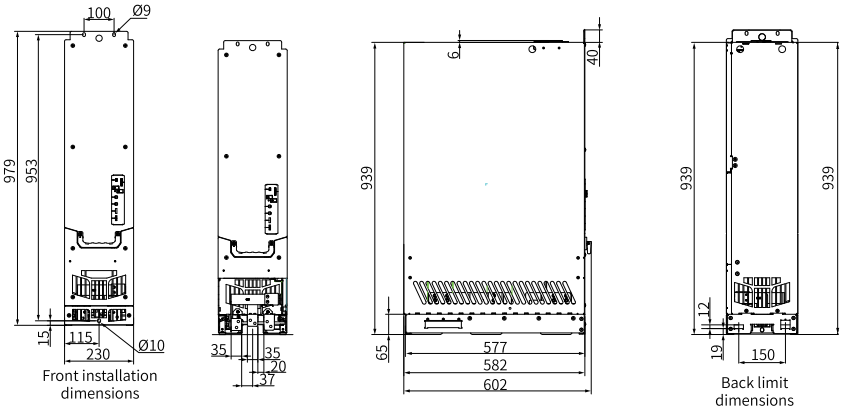


Figure 1-21 Outline Dimensions of the H8A inverter module (mm)

Note

It is recommended to use the M8 bolts to secure the inverter module (H8A) and the M10 bolts to connect the input copper busbar.

1.8 Derating

Ambient temperature-based derating

When the temperature is 40°C to 50°C, the output current of the inverter module must be derated by 1% per 1°C increase. Output current = Rated current x Derating coefficient (k).

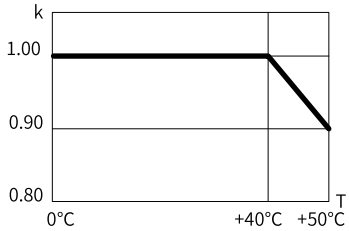


Figure 1-22 Ambient temperature-based derating

Altitude-based derating

When the altitude is 1000 m to 4000 m, the output current of the inverter module must be derated by 1% per 100 m increase. For applications above 4000 m, contact Inovance technical personnel for support.

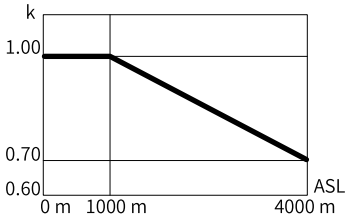


Figure 1-23 Altitude-based derating

Derating due to low frequency

- Non-overloaded conditions
  - Non-overloaded conditions with low-frequency operation time proportion being < 2%

    Under non-overloaded conditions with occasional low-frequency operation, where the operation time below 10 Hz is less than 2%, it is only necessary to ensure that the maximum junction temperature of the IGBT module does not exceed the allowable limit. The impact of junction temperature fluctuations on IGBT lifespan does not need to be considered.

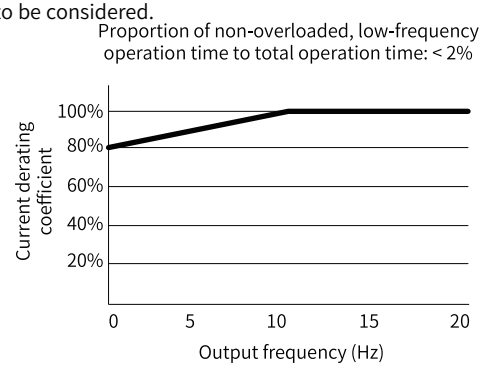


Figure 1-24 Current derating curve for non-overloaded conditions with low-frequency operation time accounting for < 2%

  - Non-overloaded conditions with low-frequency operation time proportion being 2% to 10%

    Under non-overloaded conditions with short-term low-frequency operation, where the operation time below 10 Hz is between 2% and 10%, it is necessary to ensure

that the maximum junction temperature of the IGBT module does not exceed the allowable limit, while also considering the impact of junction temperature fluctuations on IGBT lifespan.

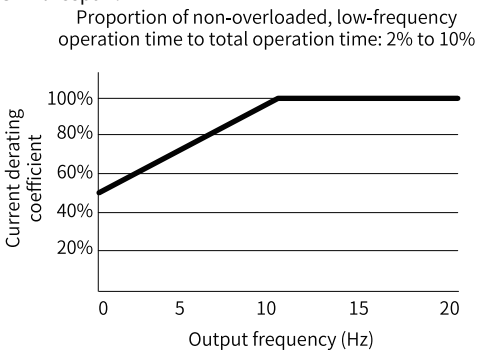


Figure 1-25 Current derating curve for non-overloaded conditions with low-frequency operation time accounting for 2% to 10%

- Non-overloaded conditions with low-frequency operation time proportion being > 10%

  Under non-overloaded conditions with frequent low-frequency operation, where the operation time below 10 Hz is over 10%, it is necessary to ensure that the maximum junction temperature of the IGBT module does not exceed the allowable limit, while also considering the impact of junction temperature fluctuations on IGBT lifespan.

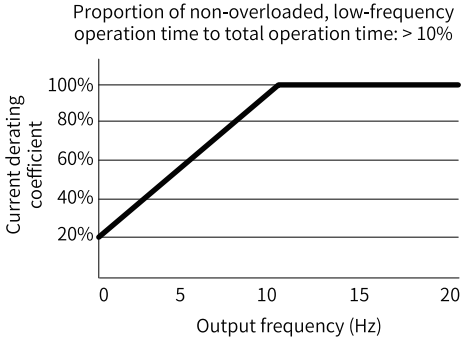


Figure 1-26 Current derating curve for non-overloaded conditions with low-frequency operation time accounting for > 10%

- Overloaded conditions
  - Overloaded conditions with low-frequency operation time proportion being < 2%

    Under overloaded conditions with occasional low-frequency operation, where the operation time below 10 Hz is less than 2%, it is only necessary to ensure that the

maximum junction temperature of the IGBT module does not exceed the allowable limit. The impact of junction temperature fluctuations on IGBT lifespan does not need to be considered. The current derating curve varies with the duration of heavy-overload operation, as shown in the following figure.

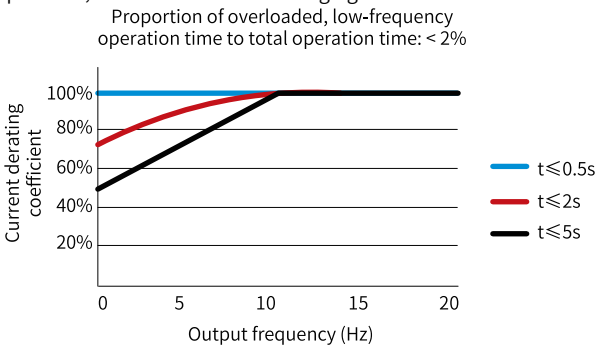


Figure 1-27 Current derating curve for overloaded conditions with low-frequency operation time accounting for < 2%

- Overloaded conditions with low-frequency operation time proportion being 2% to 10%

  Under overloaded conditions with short-term low-frequency operation, where the operation time below 10 Hz is between 2% and 10%, it is necessary to ensure that the maximum junction temperature of the IGBT module does not exceed the allowable limit, while also considering the impact of junction temperature fluctuations on IGBT lifespan.

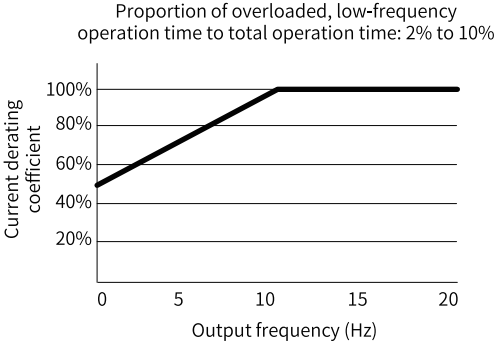


Figure 1-28 Current derating curve for overloaded conditions with low-frequency operation time accounting for 2% to 10%

- Overloaded conditions with low-frequency operation time proportion being > 10%

Under overloaded conditions with frequent low-frequency operation, where the operation time below 10 Hz is over 10%, it is necessary to ensure that the maximum junction temperature of the IGBT module does not exceed the allowable limit, while also considering the impact of junction temperature fluctuations on IGBT lifespan.

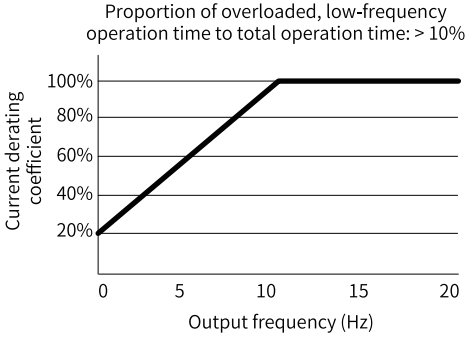


Figure 1-29 Current derating curve for overloaded conditions with low-frequency operation time accounting for > 10%

Carrier frequency-based derating

Note

The SG and CS versions have identical specifications, but only the CS version supports STO, while the SG version does not.

Model	Rated Power	Carrier Frequency (kHz)									
	P (kW)	1.2	1.5	2	2.5	3.2	4	5	6	7	8
Three-phase 400 V (7-segment SVPWM)											
MD880-50M-0009-4	3.7	100%	100%	100%	100%	100%	100%	92%	86%	81%	77%
MD880-50M-0013-4	5.5	100%	100%	100%	100%	100%	100%	92%	83%	74%	66%
MD880-50M-0017-4	7.5	100%	100%	100%	100%	100%	100%	92%	84%	75%	67%
MD880-50M-0023-4	11	100%	100%	100%	100%	100%	100%	91%	82%	75%	68%
MD880-50M-0033-4	15	100%	100%	100%	100%	100%	100%	93%	86%	80%	74%
MD880-50M-0038-4	18.5	100%	100%	100%	100%	100%	100%	94%	87%	81%	75%
MD880-50M-0048-4	22	100%	100%	100%	100%	100%	100%	94%	88%	83%	78%
MD880-50M-0060-4	30	100%	100%	100%	100%	100%	100%	94%	88%	82%	77%
MD880-50M-0078-4	37	100%	100%	100%	100%	100%	100%	91%	82%	75%	68%
MD880-50M-0094-4	45	100%	100%	100%	100%	100%	100%	92%	84%	78%	71%
MD880-50M-0116-4	55	100%	100%	100%	100%	100%	100%	92%	84%	77%	71%
MD880-50M-0149-4	75	100%	100%	100%	100%	100%	100%	92%	84%	78%	72%
MD880-50M-0183-4	90	100%	100%	100%	100%	100%	92%	84%	78%	70%	66%
MD880-50M-0245-4	110	100%	100%	100%	96%	94%	86%	75%	68%	63%	58%

Model	Rated Power	Carrier Frequency (kHz)									
	P (kW)	1.2	1.5	2	2.5	3.2	4	5	6	7	8
MD880-50M-0299-4	132	100%	100%	100%	95%	90%	84%	78%	71%	65%	59%
MD880-50M-0349-4	160	100%	100%	100%	96%	94%	86%	75%	68%	63%	58%
MD880-50M-0395-4	200	100%	100%	100%	96%	92%	84%	72%	65%	60%	55%
MD880-50M-0516-4	250	100%	100%	100%	94%	92%	82%	71%	63%	57%	51%
MD880-50M-0639-4	355	100%	100%	100%	93%	90%	78%	70%	63%	56%	51%
MD880-50M-0757-4	400	100%	100%	100%	93%	91%	80%	70%	63%	56%	50%
MD880-50M-0900-4	500	100%	100%	100%	92%	89%	79%	68%	61%	54%	49%
Three-phase 500 V (7-segment SVPWM)											
MD880-50M-0349-5	3.7	100%	100%	100%	95%	88%	80%	72%	65%	55%	50%
MD880-50M-0590-5	5.5	100%	100%	100%	92%	83%	75%	65%	58%	51%	46%
MD880-50M-0810-5	7.5	100%	100%	100%	94%	82%	77%	69%	62%	56%	50%
Three-phase 690 V (7-segment SVPWM)											
MD880-50M-0062-7	55	100%	100%	87%	73%	59%	49%	39%	30%	24%	20%
MD880-50M-0082-7	75	100%	100%	87%	73%	59%	49%	39%	30%	24%	20%
MD880-50M-0099-7	90	100%	100%	87%	73%	59%	49%	39%	30%	24%	20%
MD880-50M-0125-7-	110	100%	100%	87%	73%	59%	49%	39%	30%	24%	20%
MD880-50M-0144-7	132	100%	100%	87%	73%	59%	49%	39%	30%	24%	20%
MD880-50M-0192-7	160	100%	100%	87%	73%	59%	49%	39%	30%	24%	20%
MD880-50M-0217-7	200	100%	100%	87%	73%	59%	49%	39%	30%	24%	20%
MD880-50M-0270-7	250	100%	100%	86%	78%	66%	54%	43%	32%	26%	22%
MD880-50M-0340-7	315	100%	100%	87%	73%	59%	49%	39%	30%	24%	20%
MD880-50M-0410-7	400	100%	100%	87%	75%	63%	49%	37%	30%	24%	20%
MD880-50M-0530-7	500	100%	100%	85%	73%	58%	44%	34%	27%	21%	17%
MD880-50M-0600-7	560	100%	100%	87%	73%	60%	48%	40%	33%	27%	22%
MD880-50M-0650-7	630	100%	100%	87%	73%	60%	48%	40%	33%	27%	22%
MD880-50M-0721-7	710	100%	100%	88%	77%	64%	52%	41%	32%	26%	21%

Note

The derating coefficient between two carrier frequencies can be linearly interpolated.

1.9 Overload Capacity

When the MD880-50 series inverter module is used in a drive system where overload may occur, an appropriate reference load current must be set. The criterion for determining overload is that the drive system operates at the reference load current before and after an overload event, within a cycle duration of 300 seconds.

Curve of light overload mode

I_{LD} indicates the reference load current for light overload mode. In this mode, the system operates at 110% of the reference load current for 60 consecutive seconds.

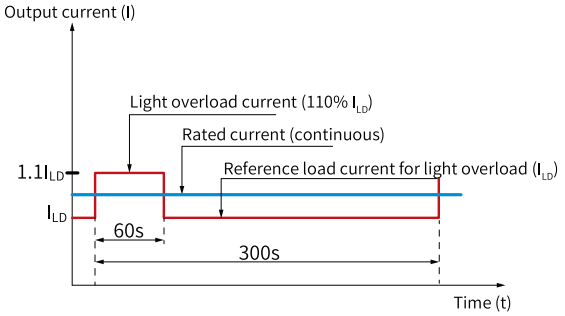


Figure 1-30 Curve of light overload mode

Curve of heavy overload mode

I_{HD} indicates the reference load current for heavy overload mode. In this mode, the system operates at 150% of the reference load current for 60 consecutive seconds.

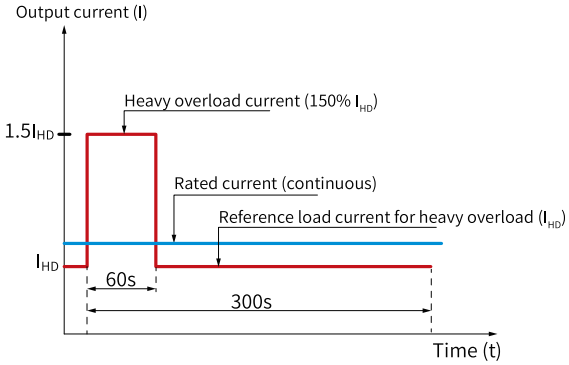


Figure 1-31 Curve of heavy overload mode

1.10 Power Consumption of Auxiliary Source

Table 1–4 Power consumption of auxiliary source

Structure	HCU Power Input	External Auxiliary Source Input for Inverter Module	Remarks
H1 to H8	24 VDC/2 A	24 VDC/1 A	Before the main power supply is established, the internal auxiliary source can be powered by an external 24 VDC power supply. After the main power supply is established, the internal auxiliary source is powered by the DC bus, and the external 24 VDC power supply provides redundancy.

1.11 Fuse Selection

Installing a bus fuse between the rectifier module and inverter module effectively prevents the inverter module from causing accidents due to short circuit, protects the semiconductor devices of the front-stage rectifier module, and prevents system damage from cascading. The 400 V, 3.7 kW to 90 kW inverter modules from Inovance come with a built-in bus fuse, and no additional fuse is needed. For other modules, it is recommended to install a fuse.

Note

The SG and CS versions have identical specifications, but only the CS version supports STO, while the SG version does not.

Table 1–5 Fuse models (BUSSMANN)

Module Model	Recommended DC Fuse		
	Model (BUSSMANN)	Specification	Quantity
UN: Three-phase 400 VAC (range: 380 V to 415 V)			
MD880-50M-0009-4	170M1559	16 A, 690 V, size: 000	2
MD880-50M-0013-4	170M1561	25 A, 690 V, size: 000	2
MD880-50M-0017-4	170M1562	32 A, 690 V, size: 000	2
MD880-50M-0023-4	170M1563	40 A, 690 V, size: 000	2
MD880-50M-0033-4	170M1565	63 A, 690 V, size: 000	2
MD880-50M-0038-4	170M1566	80 A, 690 V, size: 000	2
MD880-50M-0048-4	170M1567	100 A, 690 V, size: 000	2

Module Model	Recommended DC Fuse		
	Model (BUSSMANN)	Specification	Quantity
MD880-50M-0060-4	170M1568	125 A, 690 V, size: 000	2
MD880-50M-0078-4	170M1569	160 A, 690 V, size: 000	2
MD880-50M-0094-4	170M1569	160 A, 690 V, size: 000	2
MD880-50M-0116-4	170M1570	200 A, 690 V, size: 000	2
MD880-50M-0149-4	170M1571	250 A, 690 V, size: 000	2
MD880-50M-0183-4	170M1572	315 A, 690 V, size: 000	2
MD880-50M-0245-4	170M4413	450 A, 690 V, size: 1	2
MD880-50M-0299-4	170M4413	450 A, 690 V, size: 1	2
MD880-50M-0349-4	170M4416	630 A, 690 V, size: 1	2
MD880-50M-0516-4	170M6413	900 A, 690 V, size: 3	2
MD880-50M-0639-4	170M6415	1100 A, 690 V, size: 3	2
MD880-50M-0757-4	170M6416	1250 A, 690 V, size: 3	2
MD880-50M-0900-4	170M6418	1500 A, 690 V, size: 3	2
UN: Three-phase 500 VAC (range: 380 V to 500 V)			
MD880-50M-0349-5	170M4416	630 A, 690 V, size: 1	2
MD880-50M-0590-5	170M6415	1100 A, 690 V, size: 3	2
MD880-50M-0810-5	170M6418	1500 A, 690 V, size: 3	2
UN: Three-phase 690 VAC (range: 525 V to 690 V)			
MD880-50M-0062-7	170M4437	125 A, 1250 V, size: 1	2
MD880-50M-0082-7	170M4438	160 A, 1250 V, size: 1	2
MD880-50M-0099-7	170M4438	160 A, 1250 V, size: 1	2
MD880-50M-0125-7	170M4440	250 A, 1250 V, size: 1	2
MD880-50M-0144-7	170M4441	315 A, 1250 V, size: 1	2
MD880-50M-0192-7	170M4441	315 A, 1250 V, size: 1	2
MD880-50M-0217-7	170M4444	450 A, 1250 V, size: 1	2
MD880-50M-0270-7	170M4444	450 A, 1250 V, size: 1	2
MD880-50M-0340-7	170M6543	550 A, 1250 V, size: 3	2
MD880-50M-0410-7	170M6545	700 A, 1250 V, size: 3	2
MD880-50M-0530-7	170M6547	900 A, 1250 V, size: 3	2
MD880-50M-0600-7	170M6548	1000 A, 1250 V, size: 3	2
MD880-50M-0650-7	170M6549	1100 A, 1250 V, size: 3	2
MD880-50M-0721-7	170M6500	1250 A, 1100 V, size: 3	2

Table 1–6 Fuse models (SINOFUSE)

Module Model	Recommended DC Fuse		
	Model	Specification	Quantity
UN: Three-phase 400 VAC (range: 380 V to 415 V)			
MD880-50M-0009-4	RS306-00-C1Z-16A-690V	16 A, 690 V, size: 000	2
MD880-50M-0013-4	RS306-00-C1Z-25A-690V	25 A, 690 V, size: 000	2
MD880-50M-0017-4	RS306-00-C1Z-32A-690V	32 A, 690 V, size: 000	2
MD880-50M-0023-4	RS306-00-C1Z-40A-690V	40 A, 690 V, size: 000	2
MD880-50M-0033-4	RS306-00-C1Z-63A-690V	63 A, 690 V, size: 000	2
MD880-50M-0038-4	RS306-00-C1Z-80A-690V	80 A, 690 V, size: 000	2
MD880-50M-0048-4	RS306-00-C1Z-100A-690V	100 A, 690 V, size: 000	2
MD880-50M-0060-4	RS306-00-C1Z-125A-690V	125 A, 690 V, size: 000	2
MD880-50M-0078-4	RS306-00-C1Z-160A-690V	160 A, 690 V, size: 000	2
MD880-50M-0094	RS306-00-C1Z-160A-690V	160 A, 690 V, size: 000	2
MD880-50M-0116-4	RS306-00-C1Z-200A-690V	200 A, 690 V, size: 000	2
MD880-50M-0149-4	RS306-00-C1Z-250A-690V	250 A, 690 V, size: 000	2
MD880-50M-0183-4	RS306-00-C1Z-315A-690V	315 A, 690 V, size: 000	2
MD880-50M-0245-4	RS306-1-S1P-450A690V	450 A, 690 V, size: 1	2
MD880-50M-0299-4	RS306-1-S1P-450A690V	450 A, 690 V, size: 1	2
MD880-50M-0349-4	RS306-1-S1P-630A690V	630 A, 690 V, size: 1	2
MD880-50M-0405-4	RS306-1-S1P-630A690V	630 A, 690 V, size: 1	2
MD880-50M-0516-4	RS306-3-S1P-900A690V	900 A, 690 V, size: 3	2
MD880-50M-0639-4	RS306-3-S1P-1100A690V	1100 A, 690 V, size: 3	2
MD880-50M-0757-4	RS306-3-S1P-1250A690V	1250 A, 690 V, size: 3	2
MD880-50M-0900-4	RS306-3-S1P-1500A690V	1500 A, 690 V, size: 3	2
UN: Three-phase 690 VAC (range: 525 V to 690 V)			
MD880-50M-0062-7	RS306-1-S5P-125A1250V-D	125 A, 1250 V, size: 1	2
MD880-50M-0082-7	RS306-1-S5P-160A1250V-D	160 A, 1250 V, size: 1	2
MD880-50M-0099-7-	RS306-1-S5P-160A1250V-D	160 A, 1250 V, size: 1	2
MD880-50M-0125-7	RS306-1-S5P-250A1250V-D	250 A, 1250 V, size: 1	2
MD880-50M-0144-7	RS306-1-S5P-315A1250V-D	315 A, 1250 V, size: 1	2
MD880-50M-0192-7	RS306-1-S5P-315A1250V-D	315 A, 1250 V, size: 1	2
MD880-50M-0217-7	RS306-1-S5P-450A1250V-D	450 A, 1250 V, size: 1	2
MD880-50M-0270-7	RS306-1-S5P-450A1250V-D	450 A, 1250 V, size: 1	2
MD880-50M-0340-7	RS306-3-S5P-550A1250V-D	550 A, 1250 V, size: 3	2
MD880-50M-0410-7	RS306-3-S5P-700A1250V-D	700 A, 1250 V, size: 3	2
MD880-50M-0530-7	RS306-3-S5P-900A1250V-D	900 A, 1250 V, size: 3	2
MD880-50M-0600-7	RS306-3-S5P-1000A1250V-D	1000 A, 1250 V, size: 3	2

Module Model	Recommended DC Fuse		
	Model	Specification	Quantity
MD880-50M-0650-7	RS306-3-S5P-1100A1250V-D	1100 A, 1250 V, size: 3	2
MD880-50M-0721-7	RS306-3-J5P-1250A1100V-D	1250 A, 1100 V, size: 3	2

1.12 Disconnector Selection

Note

The SG and CS versions have identical specifications, but only the CS version supports STO, while the SG version does not.

Table 1–7 Fuse switch and built-in fuse models (H1 to H4)

Module Model	Recommended Fuse Switch	Recommended Built-in Fuse				
	Model (Siemens)	Spec.	Quantity	Model (BUSSMANN)	Spec.	Quantity
UN: Three-phase 400 VAC (range: 380 V to 415 V)						
MD880-50M-0009-4	3NP1 133-1CA10	250 A	1	16NHG000B	16 A	2
MD880-50M-0013-4	3NP1 133-1CA10	250 A	1	25NHG000B	25 A	2
MD880-50M-0017-4	3NP1 133-1CA10	250 A	1	32NHG000B	32 A	2
MD880-50M-0023-4	3NP1 133-1CA10	250 A	1	50NHG000B	50 A	2
MD880-50M-0033-4	3NP1 133-1CA10	250 A	1	63NHG000B	63 A	2
MD880-50M-0038-4	3NP1 133-1CA10	250 A	1	80NHG000B	80 A	2
MD880-50M-0048-4	3NP1 133-1CA10	250 A	1	100NHG000B	100 A	2
MD880-50M-0060-4	3NP1 133-1CA10	250 A	1	125NHG000B	125 A	2
MD880-50M-0078-4	3NP1 133-1CA10	250 A	1	160NHG00B	160 A	2
MD880-50M-0094-4	3NP1 133-1CA10	250 A	1	160NHG00B	160 A	2
MD880-50M-0116-4	3NP1 143-1DA20	250 A	1	170M4182	200 A	2
MD880-50M-0149-4	3NP1 143-1DA20	250 A	1	170M4184	315 A	2
MD880-50M-0183-4	3NP1 143-1DA20	250 A	1	170M4185	350 A	2

Table 1–8 Fuse switch and built-in fuse models (H6)

Module Model	Recommended Fuse Switch	Recommended Built-in Fuse				
	Model (Siemens)	Spec.	Quantity	Model (BUSSMANN)	Spec.	Quantity
UN: Three-phase 400 VAC (range: 380 V to 415 V)						
MD880-50M-0245-4	3NP1 153-1DA20	400 A	1	170M5886	450 A	2
MD880-50M-0299-4	3NP1 153-1DA20	400 A	1	170M5888	550 A	2

Module Model	Recommended Fuse Switch	Recommended Built-in Fuse				
	Model (Siemens)	Spec.	Quantity	Model (BUSSMANN)	Spec.	Quantity
UN: Three-phase 400 VAC (range: 380 V to 415 V)						
UN: Three-phase 690 VAC (range: 525 V to 690 V)						
MD880-50M-0062-7	3NP1 153-1DA20	400 A	1	170M4238	160 A	2
MD880-50M-0082-7	3NP1 153-1DA20	400 A	1	170M4238	160 A	2
MD880-50M-0099-7	3NP1 153-1DA20	400 A	1	170M4239	200 A	2
MD880-50M-0125-7	3NP1 153-1DA20	400 A	1	170M4240	250 A	2
MD880-50M-0144-7	3NP1 153-1DA20	400 A	1	170M4241	315 A	2
MD880-50M-0192-7	3NP1 153-1DA20	400 A	1	170M4242	350 A	2

Table 1–9 Fuse switch and built-in fuse models (H7)

Module Model	Recommended Fuse Switch	Recommended Built-in Fuse				
	Model (Siemens)	Spec.	Quantity	Model (BUSSMANN)	Spec.	Quantity
UN: Three-phase 400 VAC (range: 380 V to 415 V)						
MD880-50M-0349-4	3NP1 163-1DA20	630 A	1	170M5812	630 A	2
MD880-50M-0395-4	3NP1 163-1DA20	630 A	1	170M5813	700 A	2
UN: Three-phase 500 VAC (range: 380 V to 500 V)						
MD880-50M-0349-5	3NP1 163-1DA10	630 A	1	170M5812	630 A	2
UN: Three-phase 690 VAC (range: 525 V to 690 V)						
MD880-50M-0217-7	3NP1 163-1DA20	630 A	1	170M6240	400 A	2
MD880-50M-0270-7	3NP1 163-1DA20	630 A	1	170M6242	500 A	2

Table 1–10 Recommended fuse switches for DC (H8)

Module Model	Recommended Fuse Switch	Recommended Built-in Fuse				
	Model (Siemens)	Spec.	Quantity	Model (BUSSMANN)	Spec.	Quantity
UN: Three-phase 400 VAC (range: 380 V to 415 V)						
MD880-50M-0516-4	Body: 38S1 2080 Lever: 1433 3111 Extension rod: 1403 1240	800 A 1250 VDC	1	RS306-3-C4Z-900A-1000V	900 A	2
MD880-50M-0639-4	Body: 38S1 2080 Lever: 1433 3111 Extension rod: 1403 1240	800 A 1250 VDC	1	RS306-3-C4Z-1100A-1000V	1000 A	2
MD880-50M-0757-4	Body: 38S1 4100 Lever: 1433 3111 Extension rod: 1403 1240	1200 A 1250 VDC	1	RS306-2-C4Z-630A-1000V	630	4

Module Model	Recommended Fuse Switch	Recommended Built-in Fuse				
	Model (Siemens)	Spec.	Quantity	Model (BUSSMANN)	Spec.	Quantity
UN: Three-phase 400 VAC (range: 380 V to 415 V)						
MD880-50M-0900-4	Body: 38S1 4160 Lever: 1433 3111 Extension rod: 1403 1240	1600 A 1250 VDC	1	RS306-3-C4Z-800A-1000V	800 A	4
UN: Three-phase 500 VAC (range: 380 V to 500 V)						
MD880-50M-0590-5	Body: 38S1 208 Lever: 1433 3111 Extension rod: 1403 1240	800 A 1250 VDC	1	170M6814	1000 A	2
MD880-50M-0810-5	Body: 38S1 4160 Lever: 1433 3111 Extension rod: 1403 1240	1600 A 1250 VDC	1	170M6812	800 A	4
UN: Three-phase 690 VAC (range: 525 V to 690 V)						
MD880-50M-0340-7	Body: 38S1 2060 Lever: 1433 3111 Extension rod: 1403 1240	600 A 1250 VDC	1	RS306-2-C4Z-630A-1000V	630 A	2
MD880-50M-0410-7	Body: 38S1 2060 Lever: 1433 3111 Extension rod: 1403 1240	600 A 1250 VDC	1	RS306-3-C4Z-700A-1000V	700 A	2
MD880-50M-0530-7	Body: 38S1 2080 Lever: 1433 3111 Extension rod: 1403 1240	800 A 1250 VDC	1	RS306-3-C4Z-900A-1000V	900 A	2
MD880-50M-0600-7	Body: 38S1 2080 Lever: 1433 3111 Extension rod: 1403 1240	800 A 1250 VDC	1	RS306-3-C4Z-1000A-1000V	1000 A	2
MD880-50M-0650-7	Body: 38S1 2080 Lever: 1433 3111 Extension rod: 1403 1240	800 A 1250 VDC	1	RS306-3-C4Z-1100A-1000V	1100	2
MD880-50M-0721-7	Body: 38S1 4100 Lever: 1433 3111 Extension rod: 1403 1240	1200 A 1250 VDC	1	RS306-2-C4Z-630A-1000V	630 A	4

1.13 Output Reactor Selection

Due to the distributed capacitance in motor cables, the high dV/dt during high-speed switching of the IGBT can result in significant peak currents when the cable is long. This may cause the inverter module to report an overcurrent fault. Additionally, when electromagnetic waves travel through a long cable for an extended time, they can cause total voltage reflection, leading to high voltage spikes at the motor end, which can adversely affect motor insulation. Therefore, the inverter module imposes certain restrictions on the length of the output cable.

To mitigate the negative impact of long motor cables on the inverter module and the motor, an output reactor is required for applications with long motor cables. The maximum

motor cable length supported by the inverter module and the number of reactors needed are detailed in the MD880 Inverter Module Output Cable Length Selection Guide.

Note

The SG and CS versions have identical specifications, but only the CS version supports STO, while the SG version does not.

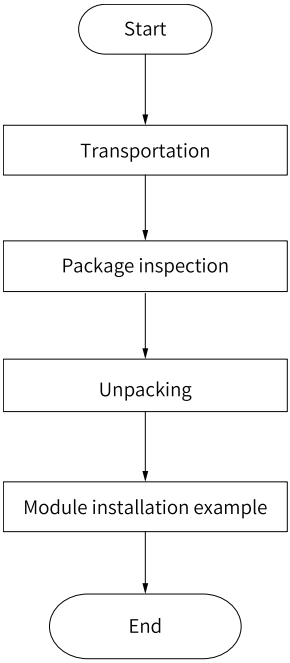
The recommended reactor models and inductance parameters are listed in the following table.

Module Model	Rated Current	Reactor Model	Inductance	Remarks
Three-phase 400 VAC				
MD880-50M-0009-4	9.0	MD-OCL-10-0.7-4T-1%	0.7	Inovance models
MD880-50M-0013-4	13	MD-OCL-15-0.47-4T-1%	0.47	
MD880-50M-0017-4	17	MD-OCL-20-0.35-4T-1%	0.35	
MD880-50M-0023-4	23	MD-OCL-30-0.23-4T-1%	0.23	
MD880-50M-0033-4	33	MD-OCL-40-0.18-4T-1%	0.18	
MD880-50M-0038-4	38	MD-OCL-40-0.18-4T-1%	0.18	
MD880-50M-0048-4	48	MD-OCL-50-0.14-4T-1%	0.14	
MD880-50M-0060-4	60	MD-OCL-60-0.12-4T-1%	0.12	
MD880-50M-0078-4	78	MD-OCL-80-0.087-4T-1%	0.087	
MD880-50M-0094-4	94	MD-OCL-120-0.058-4T-1%	0.058	
MD880-50M-0116-4	116	MD-OCL-120-0.058-4T-1%	0.058	
MD880-50M-0149-4	149	MD-OCL-150-0.047-4T-1%	0.047	
MD880-50M-0183-4	183	MD-OCL-200-0.035-4T-1%	0.035	
MD880-50M-0245-4	245	MD-OCL-250-0.028-4T-1%	0.028	
MD880-50M-0299-4	299	MD-OCL-330-0.021-4T-1%	0.021	
MD880-50M-0349-4	349	MD-OCL-490-0.014-4T-1%	0.014	
MD880-50M-0395-4	395	MD-OCL-490-0.014-4T-1%	0.014	
MD880-50M-0516-4	516	MD-OCL-660-0.011-4T-1%	0.011	
MD880-50M-0639-4	639	MD-OCL-660-0.011-4T-1%	0.011	
MD880-50M-0757-4	757	MD-OCL-800-0.0087-4T-1%	0.0087	
MD880-50M-0900-4	900	MD-OCL-1000-0.007-4T-1%	0.007	
Three-phase 500 VAC				
MD880-50M-0349-5	349	MD-OCL-490-0.014-4T-1%	0.014	Inovance models
MD880-50M-0590-5	590	MD-OCL-660-0.011-4T-1%	0.011	
MD880-50M-0810-5	810	MD-OCL-1000-0.007-4T-1%	0.007	
Three-phase 690 VAC				

Module Model	Rated Current	Reactor Model	Inductance	Remarks
MD880-50M-0062-7	62	OCL-0070-EISA-EM18	0.182	EAGTOP standard products
MD880-50M-0082-7	82	OCL-0090-EISA-EM14	0.142	
MD880-50M-0099-7	99	OCL-0125-EISA-EM10	0.1	
MD880-50M-0125-7	125	OCL-0125-EISA-EM10	0.1	
MD880-50M-0144-7	144	OCL-0160-EISA-E80U	0.08	
MD880-50M-0192-7	192	OCL-0200-EISA-E64U	0.064	
MD880-50M-0217-7	217	OCL-0250-EISA-E50U	0.05	
MD880-50M-0270-7	270	OCL-0300-EISA-E42U	0.042	
MD880-50M-0340-7	340	OCL-0400-EISA-E32U	0.032	
MD880-50M-0410-7	410	OCL-0500-EISA-E25U	0.025	
MD880-50M-0530-7	530	OCL-0650-EISA-E20U	0.02	
MD880-50M-0600-7	600	OCL-0650-EISA-E20U	0.02	
MD880-50M-0650-7	650	OCL-0650-EISA-E20U	0.02	
MD880-50M-0721-7	721	OCL-0800-EISA-E16U	0.016	

2 Mechanical Installation

2.1 Installation Process



2.2 Installation Precautions

Storage

Keep the equipment in a clean and dry room, with temperatures between –40°C and +70°C and temperature variations smaller than 1°C/min. For long-term storage, cover the module or take other appropriate measures to protect it against contamination and environmental influences.

For temporary and long-term storage, observe the following requirements:

- Pack the equipment with the original packing box provided by Inovance whenever possible.
- Do not expose the equipment to environments with moisture, high temperatures, or direct sunlight for a long time.
- If the storage temperature is lower than 0°C, empty the coolant inside the AC drive.

Handling before unpacking

- Packed H1 to H4 inverter modules are small and light, allowing for manual handling.
- Packed H6 to H8/H8A inverter modules should be handled by trained personnel using a forklift or crane through the pallet beneath the packaging. When using a forklift, secure the equipment onto the wooden pallet. When using a crane, lift the equipment with the pallet it is secured to.
- The load capacity of the handling equipment must exceed the weight of the inverter module.

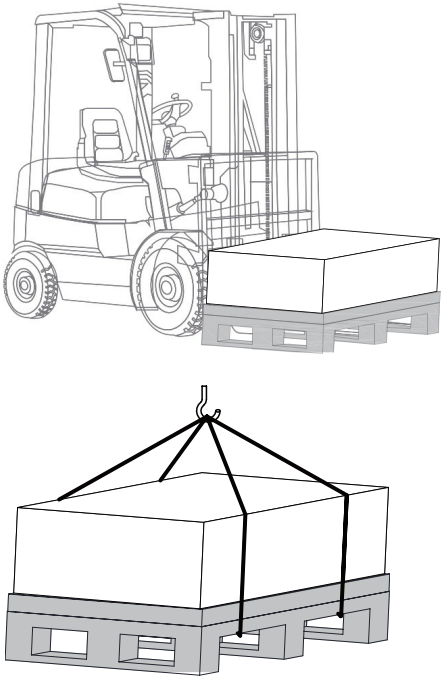


Figure 2-1 Handling before unpacking

- Place the equipment on a flat surface that is firm enough to bear the weight of the equipment.
- The H6 to H8/H8A inverter modules are tall and heavy. Do not place them on surfaces with an angle of slope larger than 5°.
- During transportation, keep the equipment upright as indicated on the packaging. Never place it upside down or on its side.

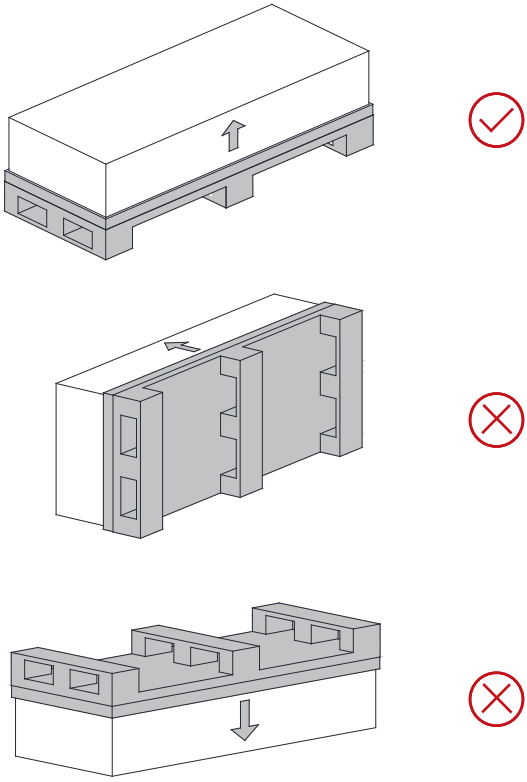


Figure 2-2 Placement during transportation

Package inspection

Inspect the MD880-50 series inverter module carefully before accepting the delivery from the forwarder. Check every item received against the delivery list. In case of any missing components or damage, notify the forwarder immediately. When necessary, contact Inovance or the local agent for support.

Danger

- If the equipment is damaged during transportation, the electrical safety of the equipment can no longer be guaranteed. Do not connect the equipment before a professional high-voltage test is performed.
- Failure to comply may result in great property loss, physical injuries, or even death.

The H1 to H4 inverter modules are packed in corrugated carton boxes, whereas the H6 to H8/H8A inverter modules are packed in corrugated carton boxes and fixed onto the wooden pallets with PET straps. Related documents and accessories are placed in different partitions in the carton.

Unpack the module in the following steps:

1. Remove all the straps and ties and open the cover of the carton.
2. Remove all filling materials.
3. Take out the inverter module and accessories.
4. Cut the stretch wrap film on the inverter module.
5. Check the module for any damage.
6. Dispose of or recycle the packing materials according to local regulations.

Installation checklist



- To ensure safety and reliable operation, the inverter module must be properly installed and commissioned by qualified personnel, taking into account all the warning notices provided.
- Failure to comply may result in great property loss, physical injuries, or even death.

After installation is done, check each item step by step and fill in the "OK" column.

Table 2–1 Inverter module installation checklist

No.	Check Item	OK
1	The packing box is intact and dry.	☐
2	The inverter module housing is free of deformation, paint loss, rupture, or water stain.	☐
3	All accessories and options ordered are delivered.	☐
4	The clearance around the inverter module (for unblocked air exhaust) meets requirements, and sufficient space is reserved for the air inlet and outlet.	☐
5	The surroundings of the inverter module has been protected properly before commissioning.	☐

2.3 Installation Environment

Environment requirements

Item	Requirement
Heat dissipation and ventilation	Put the AC drive onto a flame-retardant surface and mount the drive vertically to the mounting bracket with screws. The AC drive generates a large amount of heat during operation, so reserve sufficient space around the drive for heat dissipation.
Installation location	Install the module in a place meeting the following requirements: • Free from direct sunlight • Free from over 95% humidity and condensation • Free from corrosive, explosive, and combustible gas • Free from oil dirt, dust, and, metal powder
Vibration	Install the module in a place that is not prone to vibration. For vibration resistance, see *"1.4 Technical Data" on page 22*.
Ambient temperature	For ambient temperatures higher than 50°C, derate the power. When the drive is installed in a location with altitude higher than 1000 m, derate the power. For derating coefficients, see *"1.8 Derating" on page 42*
Protective enclosure	The module must be installed in a cabinet that is used in a final system. The final system must be equipped with a fireproof enclosure providing both electrical and mechanical protection. The installation must conform to local and regional laws and regulations, and relevant IEC standards.

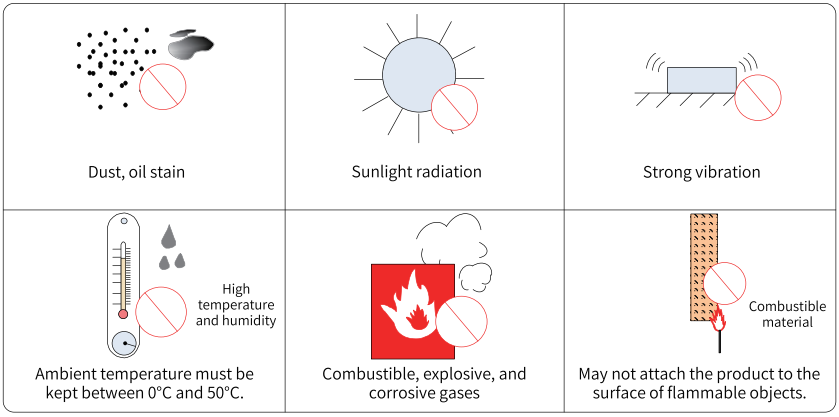


Figure 2-3 Environment requirements

2.4 Installation Space

Installation space for the H1 to H4 inverter modules

The installation space and clearance requirements vary with power ratings of the H1 to H4 inverter modules, as shown in the following figure.

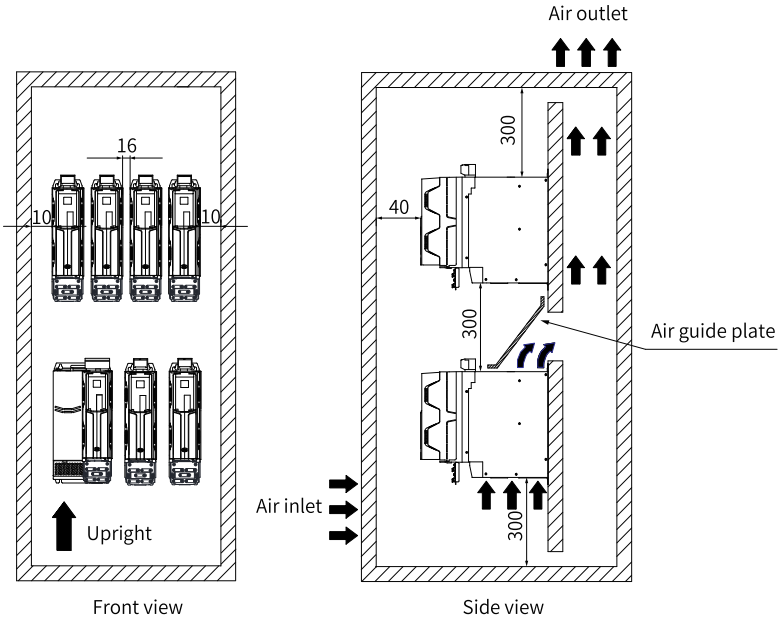


Figure 2-4 H1 to H4 clearance requirements

Note

The dimensions in the preceding figure represent the minimum space requirements (unit: mm).

Installation space for the H6 and H7 inverter modules

The installation space and clearance requirements vary with power ratings of the H6 and H7 inverter modules, as shown in the following figure.

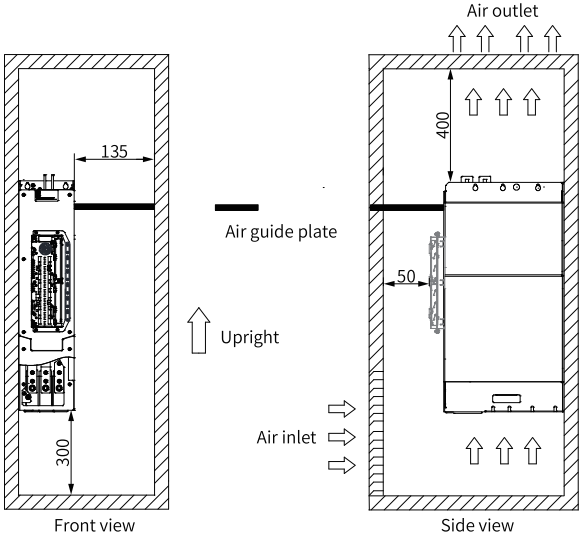


Figure 2-5 H6 and H7 clearance requirements

Note

The dimensions in the preceding figure represent the minimum space requirements (unit: mm).

Installation space for the H8 and H8A inverter modules

The installation space and clearance requirements vary with power ratings of the H8 inverter modules, as shown in the following figure.

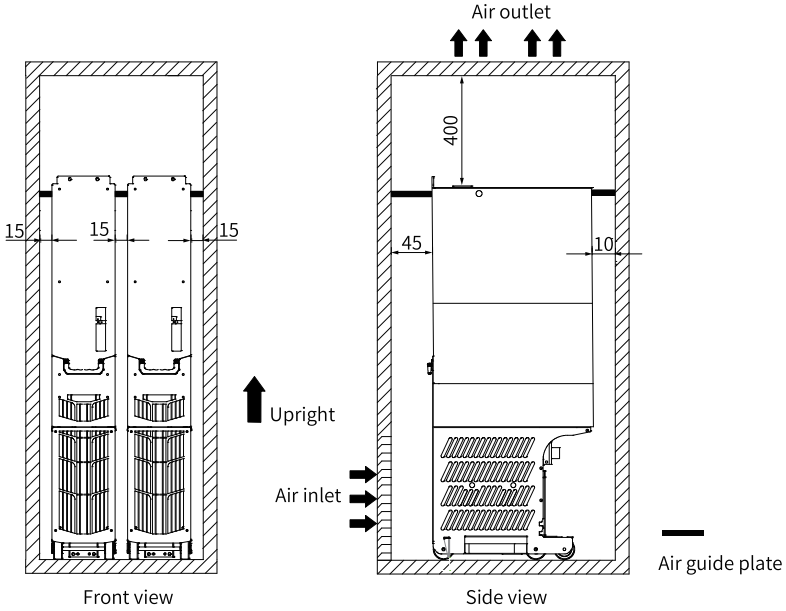


Figure 2-6 H8/H8A clearance requirements

Note

The dimensions in the preceding figure represent the minimum space requirements (unit: mm).

Cabinet air inlet/outlet area

Reserve sufficient ventilation clearance above and below the inverter module to ensure heat dissipation. Do not route any cables or install any components in the ventilation clearance, especially when cable ducts are used.

In applications requiring inverter modules to be installed in rows, install an air guide plate to prevent overtemperature or overload faults that may occur due to heat dissipated from the lower row to the upper row. For inverter modules installed in two rows, observe the following requirements when setting the air inlet and outlet.

Air inlet area: S_{Inlet} = (1.5 to 2.0) x ($S_{Module1}$ + $S_{Module2}$ + $S_{Module3}$ +...+ $S_{ModuleN}$)

- S_{Inlet} : Air inlet area of the system
- S_{Module} : Air inlet area of each module
- Air outlet area: S_{Outlet} = (1.2 to 1.5) x S_{Inlet}

See the following table for the air inlet area of the MD880 inverter modules.

Table 2–2 Air inlet area

Structure	Air Inlet Area S_{Module} (cm^2)
H1 and H2	60
H3	70
H4	120
H6	710
H7	750
H8/H8A	1400

Note

Failure to comply with the installation requirements of the inverter module will significantly shorten its service life and may result in faults or premature failure of the module.

2.5 Cabinet Layout

Inovance can provide the following cabinet assemblies.

Note

The following cabinet layout examples do not include the DC bus pre-charge module.

H1 to H4 inverter module in a 400 mm-wide cabinet

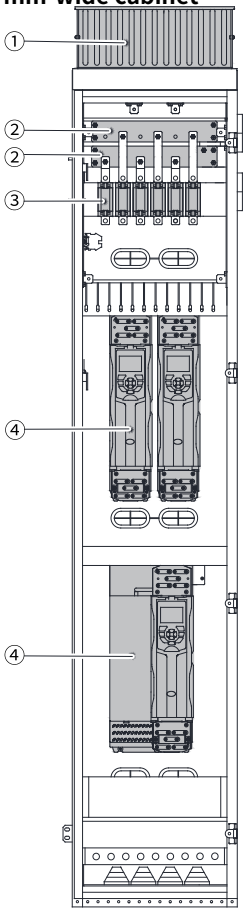


Figure 2-7 H1 to H4—400 mm-wide cabinet

No.	Name
①	Top cover (IP21)
②	DC input copper busbar
③	Fuse
④	Inverter module

H1 to H4 inverter module in a 600 mm-wide cabinet

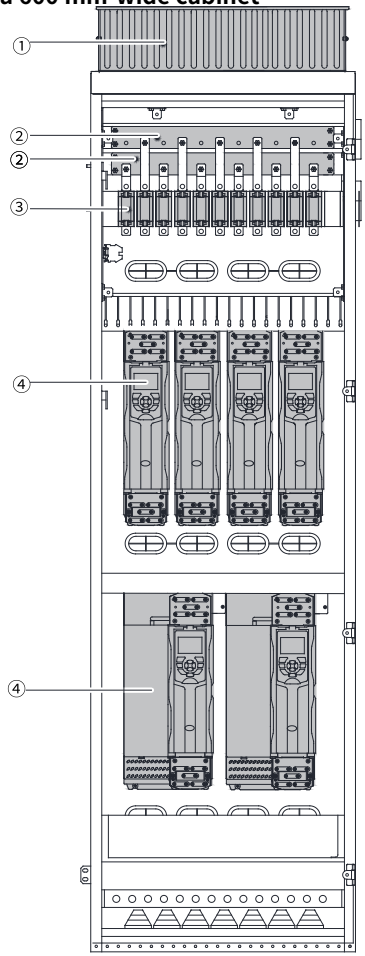


Figure 2-8 H1 to H4—600 mm-wide cabinet

No.	Name
①	Top cover (IP21)
②	DC input copper busbar
③	Fuse
④	Inverter module

H1 to H4 inverter module in a 800 mm-wide cabinet

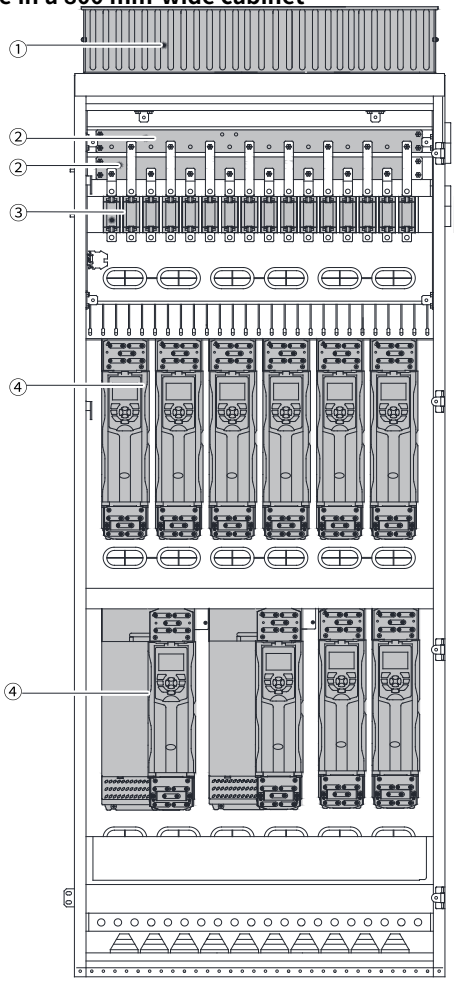


Figure 2-9 H1 to H4—800 mm-wide cabinet

No.	Name
①	Top cover (IP21)
②	DC input copper busbar
③	Fuse
④	Inverter module

Example of installing the H1 to H4 inverter module in a 800 mm-wide cabinet

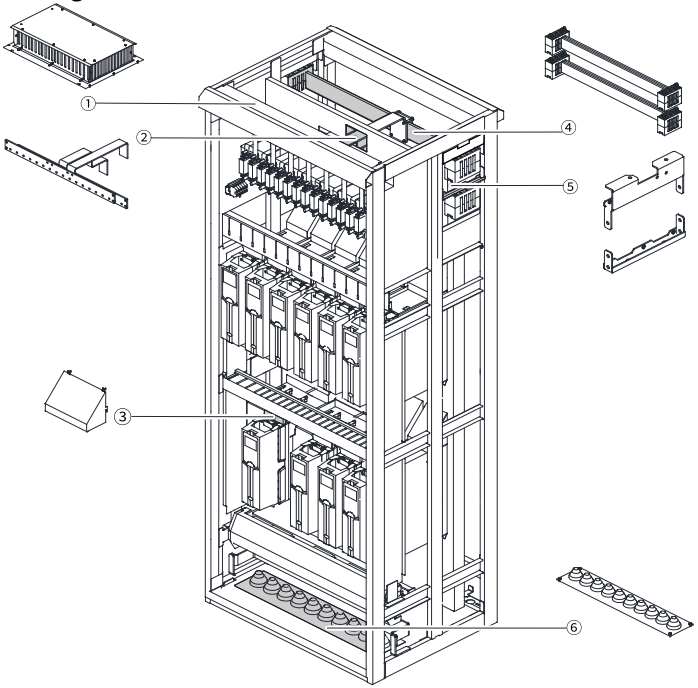
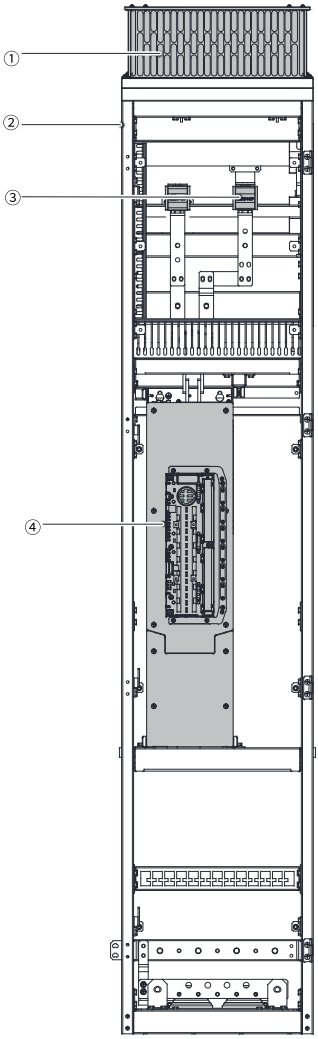


Figure 2-10 H1 to H4—800 mm-wide cabinet composition

No.	Name
①	Top cover (IP21)
②	DC input copper busbar
③	Air director
④	Bus and bus clamp
⑤	Bus clamp fixing bracket
⑥	Bottom cable outlet hole

H6 or H7 inverter module in a 400 mm-wide cabinet

Example of installing the H6 or H7 inverter module in a 400 mm-wide cabinet



No.	Name
①	Top cover (IP21)
②	DC input copper busbar (covered)
③	Fuse
④	Inverter module

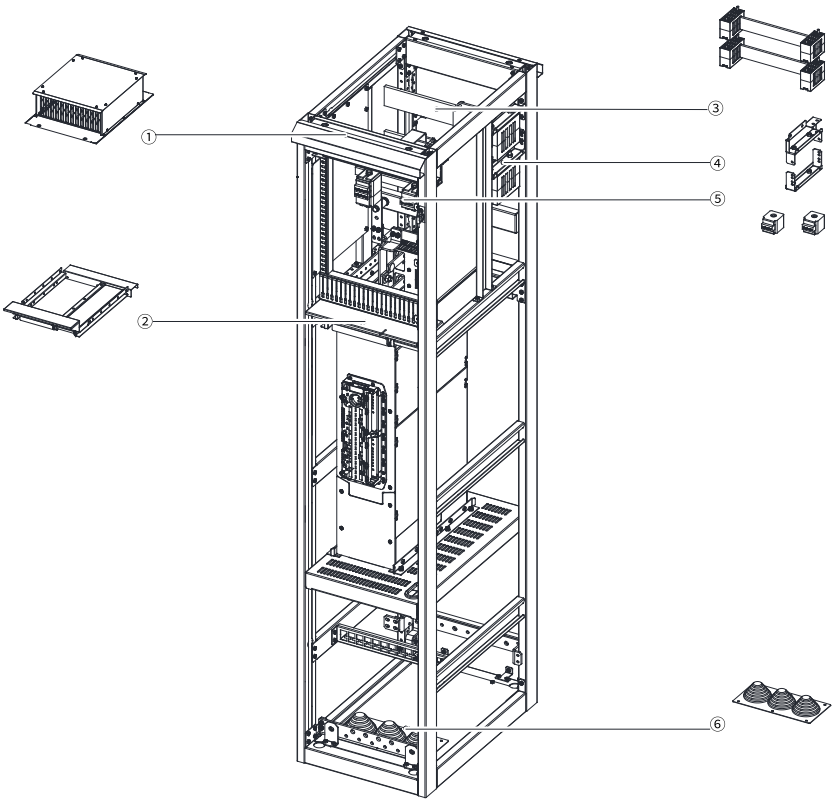


Figure 2-11 H6 or H7—400 mm-wide cabinet composition

No.	Name
①	Top cover (IP21)
②	Mounting parts
③	Bus and bus clamp
④	Bus clamp fixing bracket
⑤	Fuse
⑥	Bottom cable outlet hole

H8 inverter module in a 400 mm-wide cabinet

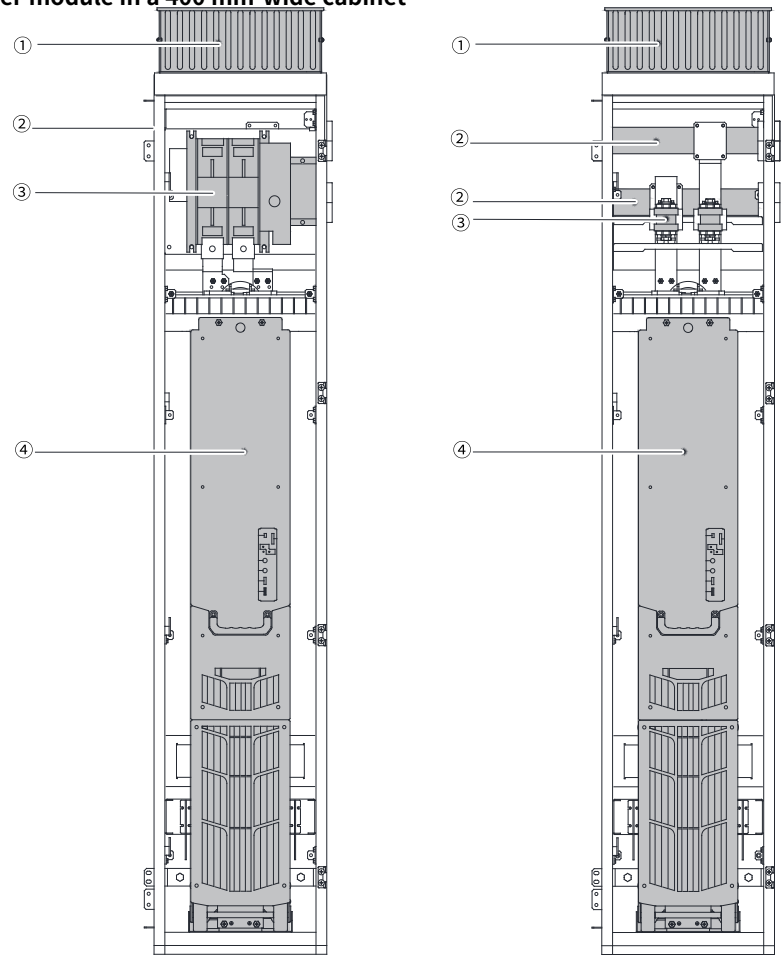


Figure 2-12 H8—400 mm-wide cabinet

Note

- The figure on the left shows the module cabinet that carries a DC-side operating switch with a pre-charge circuit.
- The figure on the right shows the module cabinet that carries only the fuse.

No.	Name
①	Top cover (IP21)
②	DC input copper busbar (covered)

No.	Name
③	Fuse
④	Inverter module

Example of installing the H8 inverter module in a 400 mm-wide cabinet

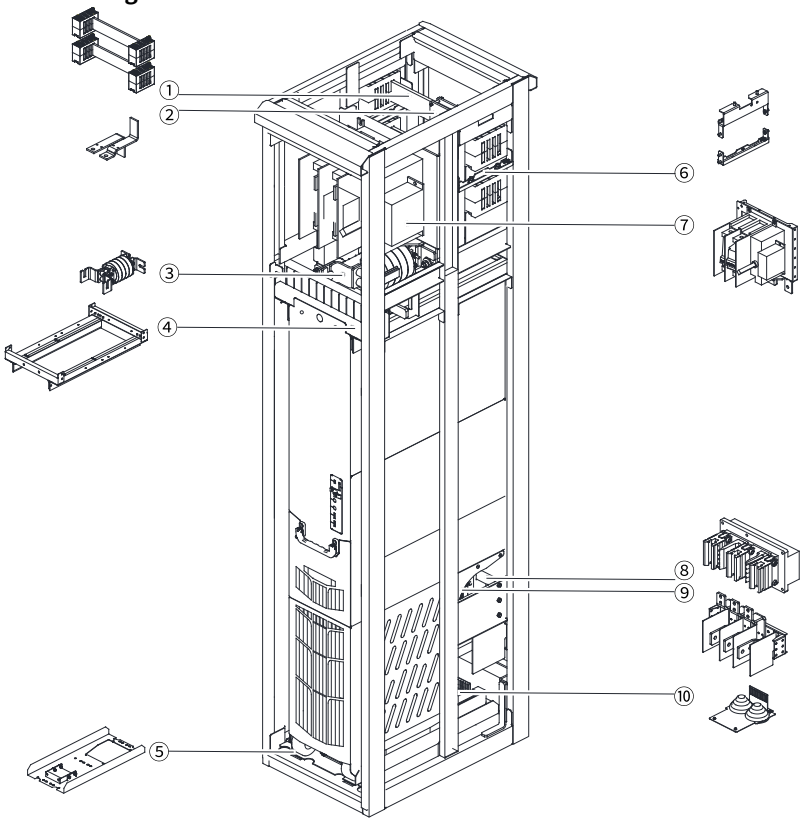


Figure 2-13 H8—400 mm-wide cabinet composition (including a DC-side operating switch with a pre-charge circuit)

No.	Name
①	Bus and bus clamp
②	DC input copper busbar
③	Filter magnetic ring
④	Upper mounting parts
⑤	Lower mounting parts
⑥	Bus clamp fixing bracket
⑦	Fuse switch for DC

No.	Name
⑧	Quick connector
⑨	AC output copper busbar
⑩	Bottom cable outlet hole

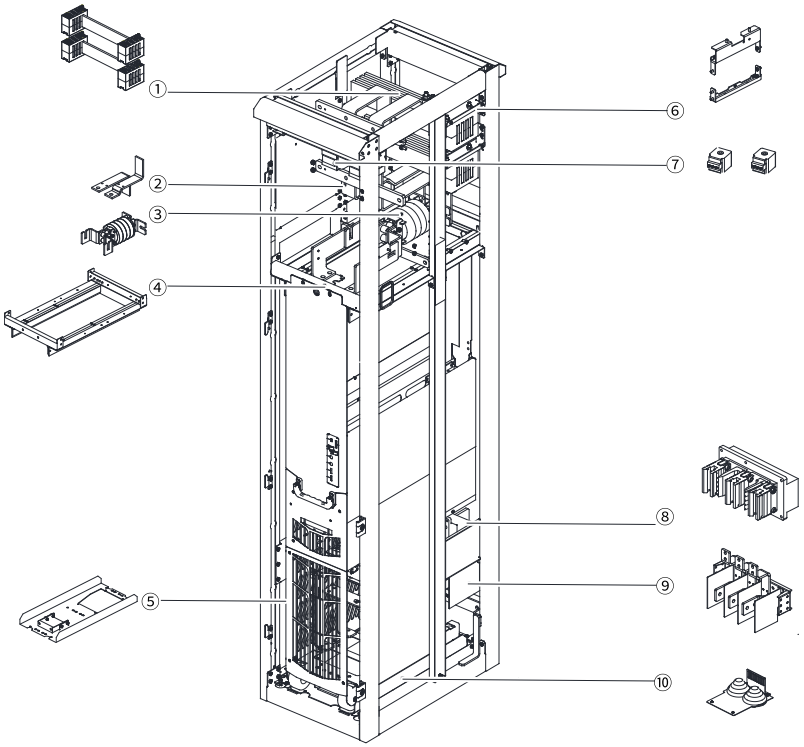


Figure 2-14 H8—400 mm-wide cabinet composition (including the fuse only)

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

2 x H8 inverter modules in a 600 mm-wide cabinet

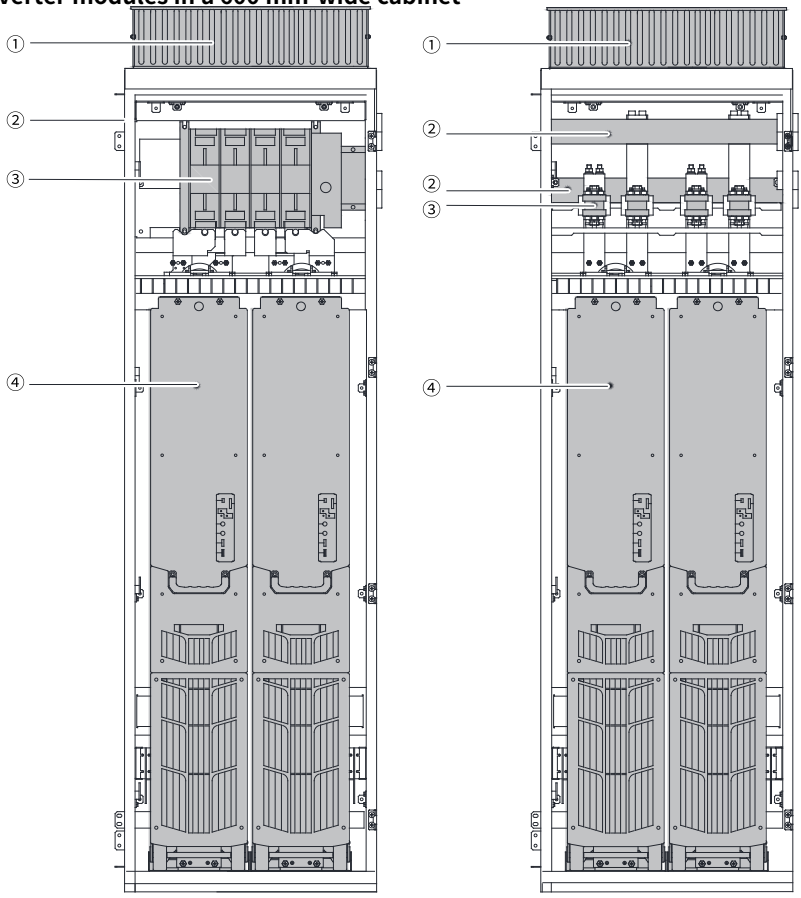


Figure 2-15 2 x H8—600 mm-wide cabinet

Note

- The figure on the left shows the module cabinet that carries a DC-side operating switch with a pre-charge circuit.
- The figure on the right shows the module cabinet that carries only the fuse.

No.	Name
①	Top cover (IP21)
②	DC input copper busbar (covered)
③	Fuse
④	Inverter module

Example of installing two H8 inverter modules in a 600 mm-wide cabinet

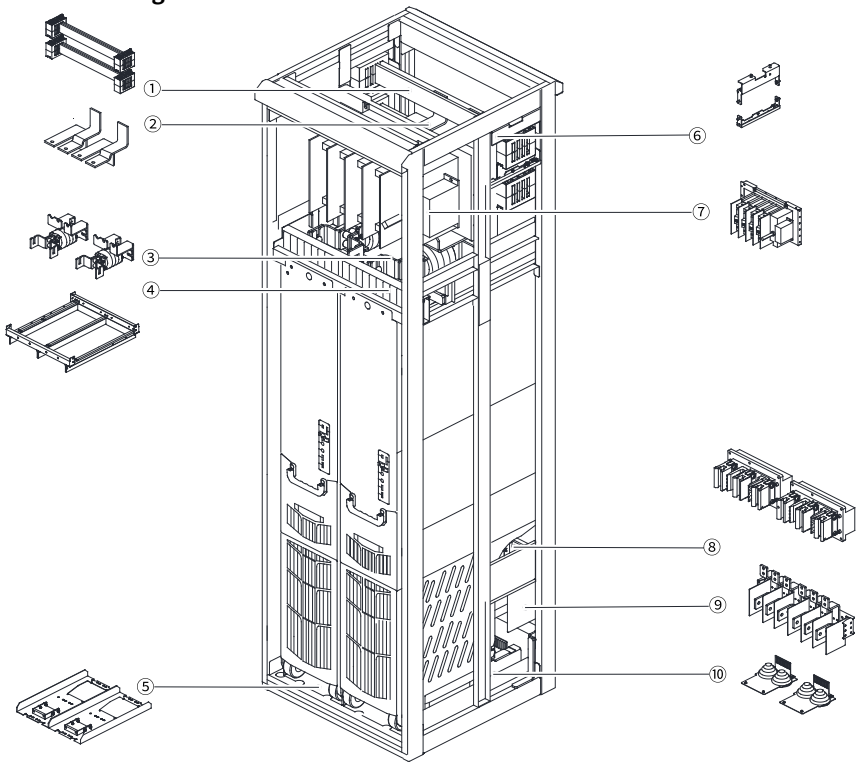


Figure 2-16 2 x H8—600 mm-wide cabinet composition (including a DC-side operating switch with a pre-charge circuit)

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

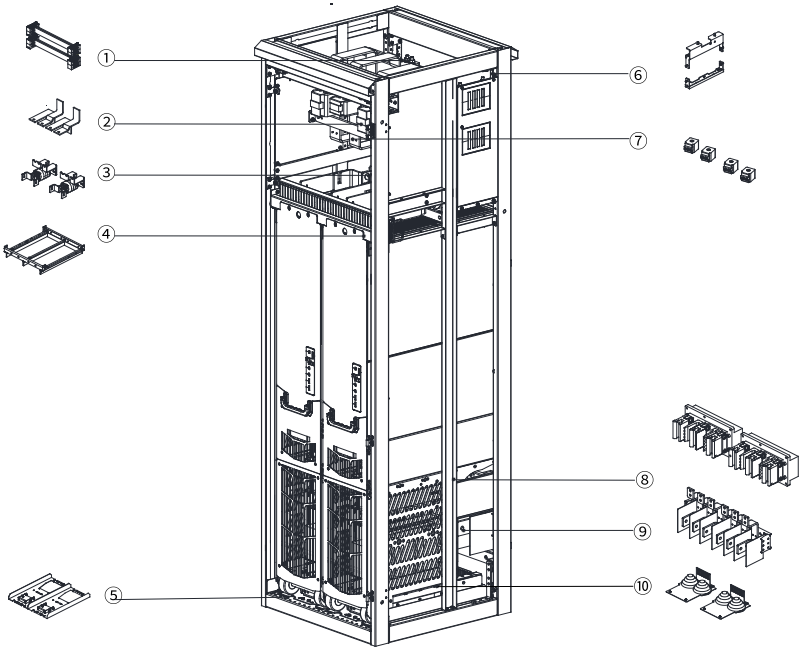


Figure 2-17 2 x H8—600 mm-wide cabinet composition (including the fuse only)

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

3 x H8 inverter modules in a 800 mm-wide cabinet

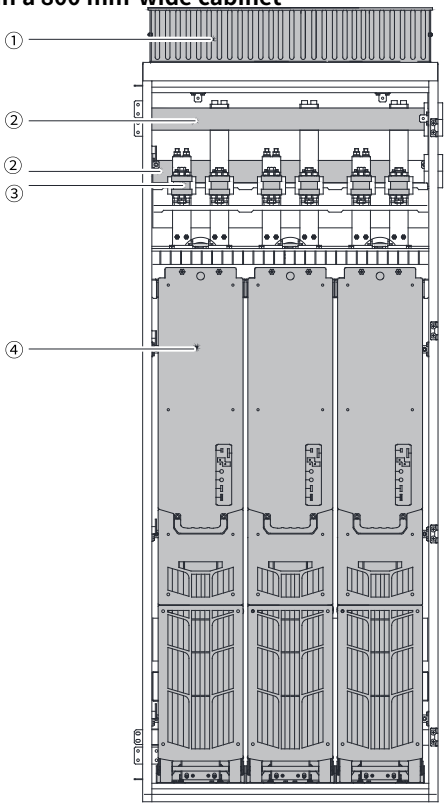


Figure 2-18 3 x H8—800 mm-wide cabinet

Note

The DC-side operating switch with a pre-charge circuit does not support parallel connection of three H8 inverter modules in a cabinet with a width of 800 mm.

No.	Name
①	Top cover (IP21)
②	DC input copper busbar
③	Fuse
④	Inverter module

Example of installing three H8 inverter modules in a 800 mm-wide cabinet

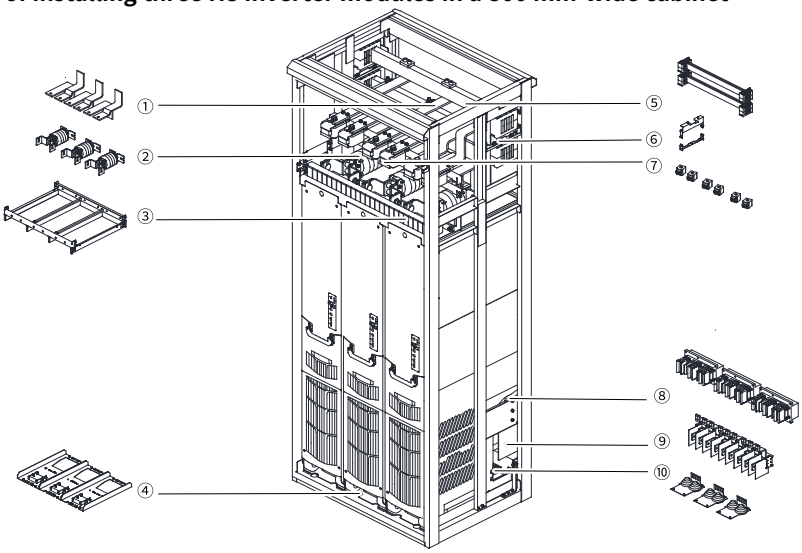


Figure 2-19 3 x H8—800 mm-wide cabinet composition

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	Bus clamp fixing bracket
⑦	Fuse
⑧	Quick connector
⑨	AC output copper busbar
⑩	Bottom cable outlet hole

3 Electrical Installation

3.1 Safety Precautions

3.1.1 Protective Measures Before Installation



- This equipment is typically used in industrial applications involving high voltage. Its parts become live or rotate during operation. Therefore, unauthorized removal of required covers, improper use or operation, or poor maintenance can lead to substantial property loss, severe physical injuries, or even death.
- This equipment shall only be operated by professional technicians who have read and comply with the safety instructions in this guide.
- The following five safety rules must always be observed during any kind of work on electrical equipment:
  - Power off the equipment.
  - Make sure that the equipment cannot be energized again.
  - Make sure that the equipment is free of residual voltage.
  - Make sure that the equipment is grounded properly.
  - Cover or isolate adjacent live parts.

3.1.2 Electrical Installation Check



- The equipment runs with high voltage. The wiring work must be carried out only after the cabinet is powered off without any residual voltage left.
- Only qualified professionals are allowed to work on the equipment.
- Take caution when working on the equipment even after it is disconnected from power supply, as there may still be external supply voltage. The power and control terminals may be live even when the equipment is in the stop state.
- The equipment may still be live even 15 minutes after power-off due to the DC bus capacitors inside. Therefore, ensure that the voltage is below 36 VDC before opening the equipment.
- The user is responsible for ensuring that the motor, cabinet units, and other components are installed and connected in accordance with the recognized technical rules in the country of installation and with other applicable regional regulations. Pay special attention to provisions on cable dimensions, safety devices, grounding, disconnection, isolation, and over-current protection.
- Tripping of a safety device on a branch circuit may cut off the fault current. To reduce the risk of fire or electric shock, check the conductive parts and other components and replace the damaged parts. After a safety device trips, identify and rectify the cause of the tripping.

3.1.3 General Statements

Static electricity



The circuit board contains components that are sensitive to static electricity. Wear a grounded wrist strap when working on the circuit board. Do not touch the circuit board unless necessary.

Optical components

Handle the optical fiber carefully. When removing the optical fiber, hold and pull the connector rather than the fiber itself. As the optical fiber is extremely susceptible to dirt, do not touch the ends of the fiber with bare hands.

3.1.4 Component Insulation Check

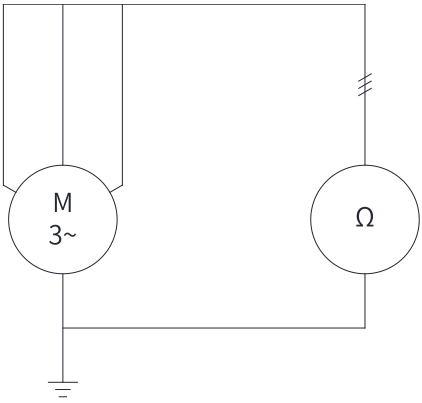
The MD880 series AC drive has been tested for insulation between the main circuit and the housing at the factory. Therefore, do not perform any withstand voltage or insulation resistance tests on the AC drive again. Check insulation of the motor and motor cables according to the following steps.

Danger

- When checking insulation before connecting the system to the main power supply, make sure that the drive system is disconnected from the main power supply (input power).
- Check that the motor cables are connected to the motor and they are disconnected from the drive output terminals (U, V, W).
- Measure the insulation resistance between the conductor of each phase and PE conductor with 500 VDC applied. For details about the insulation resistance of the motor, see the motor manufacturer's user guide.

Note

The insulation resistance may decrease due to ambient humidity. If the insulation resistance does not meet requirements, reduce the ambient humidity and then measure the insulation resistance again.



3.2 Routing



- Re-install all covers removed during cable routing before putting the inverter module into operation.
- Secure the power cable shield to the shielding plate and the PE cable to the PE bus.

3.2.1 Routing Requirements

Routing signal cables and power cables separately

When analog signals are used to remotely control the active rectifier module, route the signal cables and high-voltage circuit cables (power supply input, AC-DC output, and braking resistor connection cables) through different routes with a distance larger than 30 cm. This is to reduce interference generated by the active rectifier and other devices on the analog signal. This requirement must be met even inside the control cabinet.

Requirements on analog control signal cables

Use shielded twisted pair cables as the analog control signal cables. When stripping the sheath of the cable, keep the stripped part as short as possible (5 mm to 7 mm), and wrap the stripped shield with the insulating tape to prevent the shielded cable from contacting other devices which causes interference.

Power cable requirements

Use shielded cables as the power cables, or shield all the cables with cable ducts.

Requirements on control cables and power supply cables

If the power supply cables and control cables must be intersected, make the intersection angle 90 degrees.

3.2.2 Routing Suggestions

Interference cables

Route cables that transmit different types of signals through different routes. Separate interference cables from sensitive cables with a minimum clearance of 30 cm wherever possible. When the two types of cables must cross, make sure they intersect at a right angle to avoid causing interference.

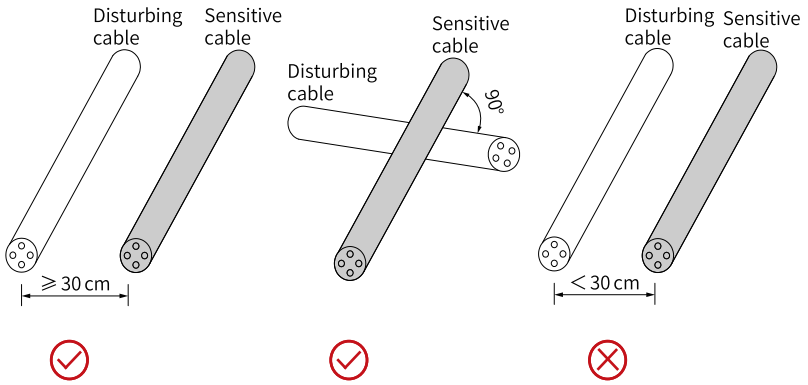


Figure 3-1 Routing interference cables and sensitive cables

Signal cables

Route cables that transmit different types of signals separately and isolate them with potential equalization cables. When routing cables that transmit the same type of signals, lay potential equalization cables to the outer layers and lay potential equalization bonding points as many as possible in the middle, as shown below.

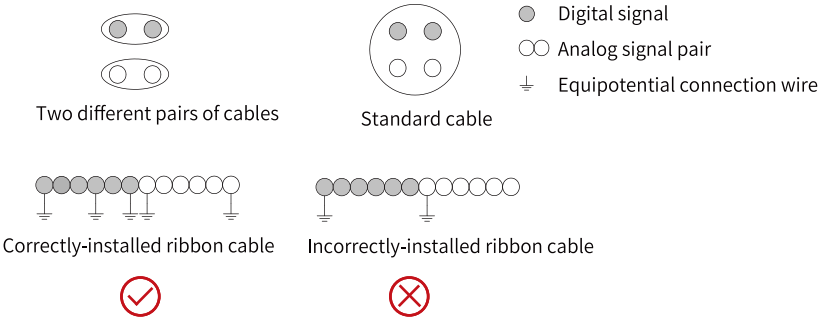


Figure 3-2 Routing cables that transmit different types of signals

Multi-conductor cables

For multi-conductor cables, it is recommended that one cable transmits one type of signals. If one cable is used to transmit different types of signals, use the cable with conductors shielded, as shown in the following figure.

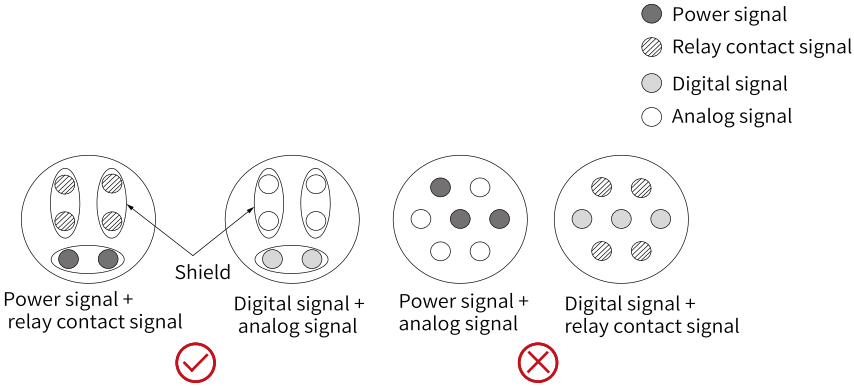


Figure 3-3 Routing multi-conductor cables

For unused (or reserved) conductors in a multi-conductor cable, connect them to the equipotential bonding point.

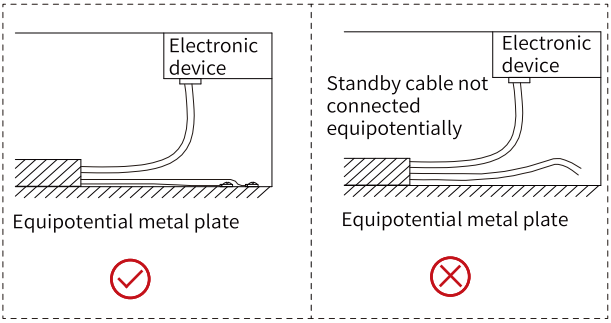


Figure 3-4 Handling reserved or unused conductors in a multi-conductor cable

Routing loops

For cables that transmit low-level sensor signals and shared cables that transmit relay signals, lay them close to each other to avoid a large loop area. Use twisted pair cables for analog signals. Lay digital signal cables close to each other.

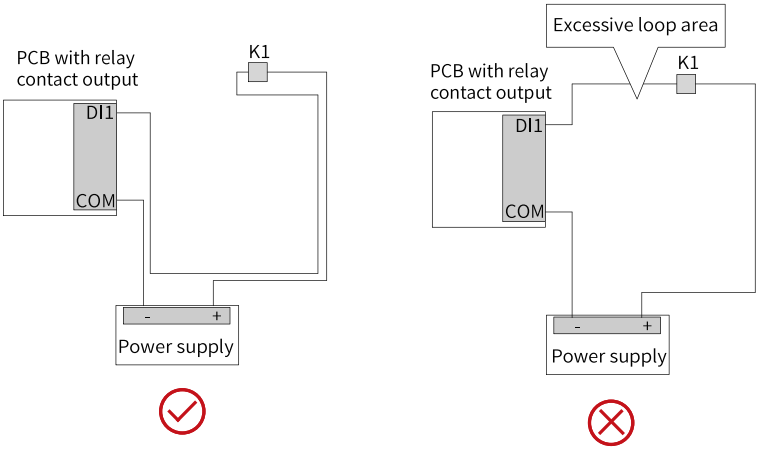


Figure 3-5 Avoiding large routing loop area

Multiple types of cables

For cables of different types, route them along the equipotential bonding metal plate. To enhance the internal EMC performance, separate different types of cables with metal separators (recommended) in the same metal (zinc-iron or stainless steel) duct.

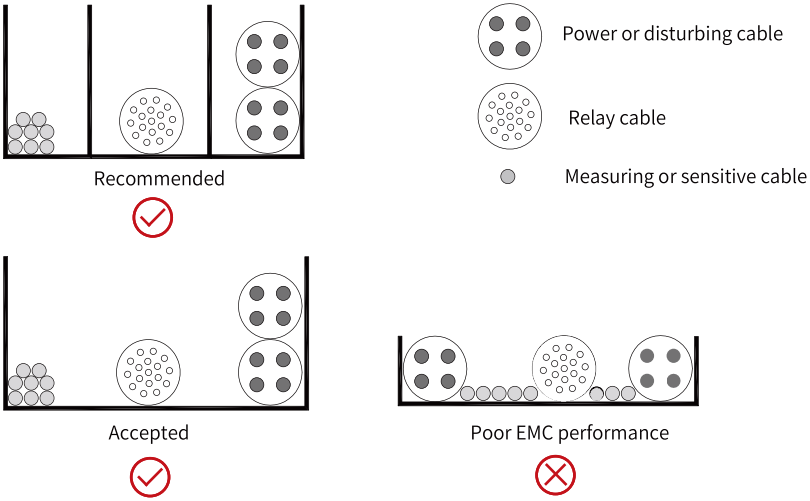


Figure 3-6 Routing multiple types of cables

Handing shielded cables

Minimize the unshielded part of the shielded cable, and connect the shield to the nearest PE terminal. If the unshielded part is too long, the conductor may be prone to signal interference, especially the encoder signals.

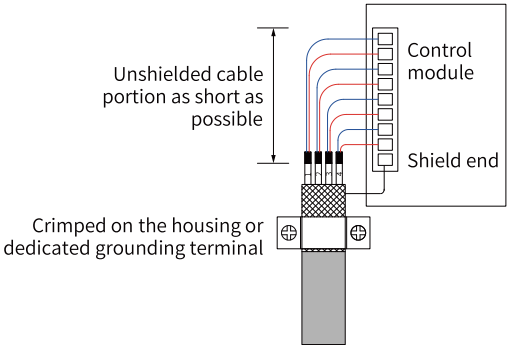


Figure 3-7 Requirements on handing shielded cables

Connecting shielded power cables

The shield of the shielded power input/output cables inside the cabinet modules must be in large-area contact with the shielding plate in the cabinet modules to achieve good EMC effect. See the figure below for the connection method.

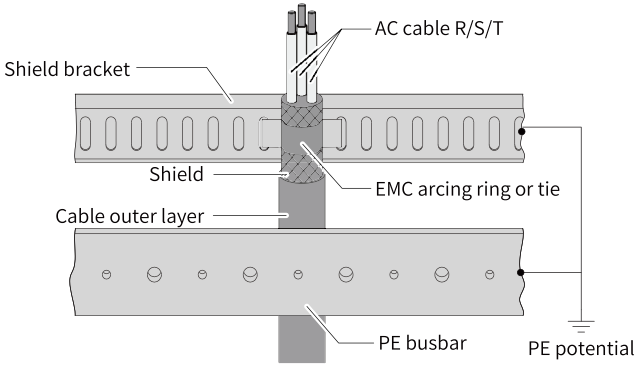


Figure 3-8 Requirements on connecting shielded power cables

3.3 DC Bus Capacitor Pre-charging

The inverter module has several electrolytic capacitors on the DC side. Their service life depends on the operating hours, load, and ambient temperature. Their service life can be extended by lowering the ambient temperature.

Capacitor failures are often accompanied by equipment damage and input fuse failure or fault trip. If you suspect a capacitor failure, contact Inovance. You can acquire spare parts from Inovance. Do not use spare parts not specified by Inovance.

Danger

The equipment cannot be stored for more than one year. If the equipment is stored for more than one year, the DC bus capacitors in the equipment must be charged again before commissioning. The storage period is calculated from the date of manufacturing rather than the date of delivery.

Charging requirements:

Apply the rated voltage to the DC bus capacitor without load for at least 30 minutes. During this period, no charging module is allowed to be enabled.

Recommended components for the charging circuit:

- One three-phase 10 A/400 V or 10 A/690 V fuse switch
- Three 100 W/230 V incandescent lamps or three 1 kΩ/100 W resistors for the inverter module of a 400 V system
- Six 100 W/230 V incandescent lamps for the inverter module of a 690 V system. Two incandescent lamps must be connected in series in every power phase.
- Various small components, such as lamp holders and 1.5 mm^2 cables.

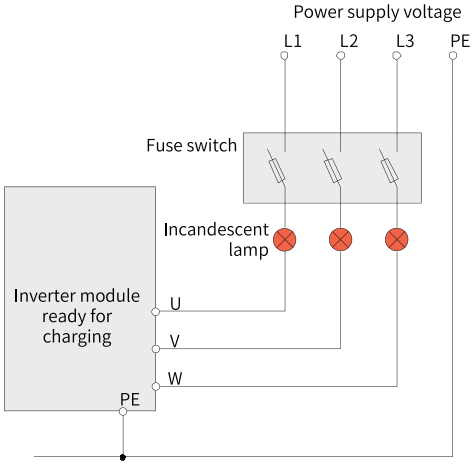


Figure 3-9 Charging connection

3.4 Tightening Torque of Common Screws and Bolts

Table 3–1 Electrical connection

Screw/Bolt	Strength Grade	Max. Torque (N·m)
M3	4.8	0.55
M4	4.8	1.2
M5	4.8	2.8
M6	4.8	4.8
M8	4.8	13
M10	4.8	20
M12	4.8	35
M16	4.8	85

Table 3–2 Mechanical connection

Screw/Bolt	Strength Grade	Max. Torque (N·m)
M5	4.8	2.8
M6	4.8	4.8
M8	4.8	13

Table 3–3 Insulator connection

Screw/Bolt	Strength Grade	Max. Torque (N·m)
M6	4.8	4.8
M8	4.8	13
M10	4.8	20
M12	4.8	35

Table 3–4 Cable connectors

Screw/Bolt	Strength Grade	Max. Torque (N·m)
M8	4.8	13
M10	4.8	20
M12	4.8	35

3.5 Installation Check

After electrical installation of the inverter module is completed, check the following items. Read *" Safety Precautions" on page 8* before operating the equipment.

Table 3–5 Inverter module installation checklist

No.	Check Item	OK
1	The input power supply is connected to the motor cable properly, with correct voltage supplied.	☐
2	The auxiliary source provides the correct voltage.	☐
3	Input/Output power cables are secured to the cable bracket for strain relief.	☐
4	Cables are properly connected with the required tightening torque to the terminals provided.	☐
5	For EMC shielded cables, threaded sleeve joints are provided on the motor terminal box and the joints are grounded and in contact with a large area of the shield. The cable shield is fixed to the shielding plate to ensure EMC compliance.	☐
6	Parallel outputs of the inverter module are correctly connected to the motor.	☐
7	The date of manufacturing can be found on the nameplate of the inverter module. If the period from the production date to the initial commissioning date or the downtime of the power components is shorter than one year, the DC bus capacitors do not need to be pre-charged. If the downtime is longer than one year, pre-charge the capacitor as described in *"3.3 DC Bus Capacitor Pre-charging" on page 88*.	☐
8	The control cables are connected in accordance with the terminal layout and by shield. The control cables are routed separately from the power supply cables to prevent interference. Cable routing and connections comply with the relevant EMC directives.	☐

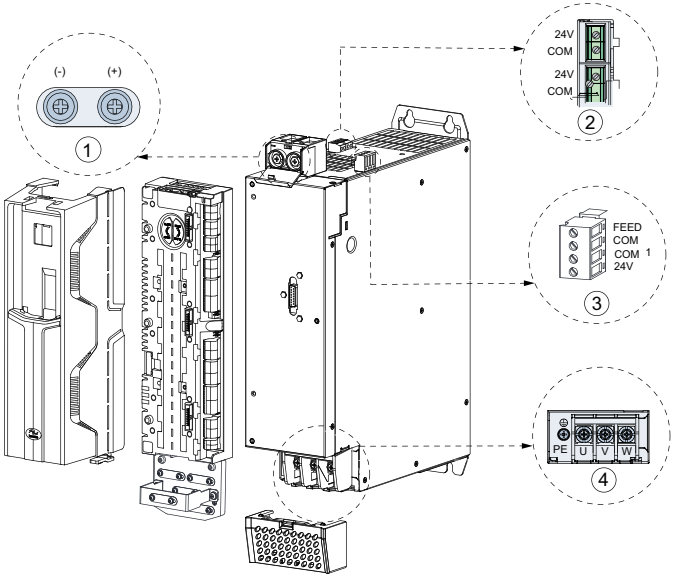
3.6 Connection



When connecting the inverter module, tighten the screws with the torque specified in *"3.4 Tightening Torque of Common Screws and Bolts" on page 90*. Otherwise, the connectors will overheat during operation.

3.6.1 Connecting the H1 to H4 Inverter Modules

Terminal layout of the H1 to H4 inverter modules



Note

For details about the terminals of the HCU inverter control module, see *"4.1.1 HCU control module composition" on page 106*.

Table 3–6 Terminal connection specifications of the H1 to H4 inverter modules

No.	Terminal	Description
①	(+) and (–) DC input	Voltage: 537 VDC to 679 VDC Connection: • H1 to H3: Cable terminal of M6/4.8 N·m • H4: Cable terminal of M8/13 N·m
②	External 24 VDC auxiliary power terminal	Dual-conductor twisted pair or single-conductor cable; cross-sectional area: 0.5 mm^2 to 2.5 mm^2

No.	Terminal	Description
③	DC bus pre-charge module control terminal	Single-conductor cable; cross-sectional area: 0.5 mm^2 to 2.5 mm^2
④	U/V/W AC output	• U/V/W terminal: Voltage: 0 VAC to 415 VAC Connection: H1: Cable terminal of M5/2.8 N · m H2 and H3: Cable terminal of M6/4.8 N · m H4: Cable terminal of M10/20 N · m • PE terminal: Connection: H1: Cable terminal of M4/1.2 N · m H2 and H3: Cable terminal of M6/4.8 N · m H4: Cable terminal of M10/20 N · m

Wiring procedure of the H1 to H4 inverter modules

1. Remove the protective cover of the wiring terminal area.
2. Connect the cables to the output terminals in this sequence: U, V, and W, or (+) and (–).
3. Secure the power cables to the cable bracket to prevent terminals from being subject to tension.
4. For shielded power cables, fix the shield to the shielding plate according to EMC requirements.

3.6.2 Connecting the H6 and H7 Inverter Modules

Terminal layout of the H6 and H7 inverter modules

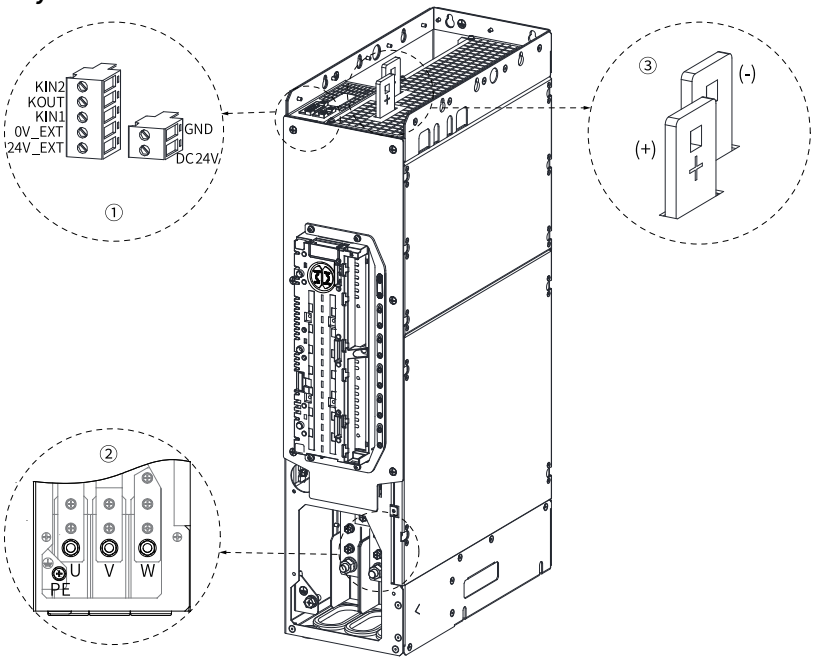


Figure 3-10 Terminal connection specifications of the H6 and H7 inverter modules

Table 3–7 Terminal connection specifications of the H6 and H7 inverter modules

No.	Terminal	Description
①	(+) and (–) DC input	Voltage: • 400 V system: 540 VDC to 720 VDC • 690 V system: 740 VDC to 975 VDC Connection: Copper busbar terminal of M10/20 N·m
②	2-pin internal 24 VDC auxiliary power terminal 5-pin DI/DO terminal	2-pin internal 24 VDC auxiliary power terminal: Dual-conductor twisted pair or single-conductor cable; cross-sectional area: 0.5 mm^2 to 2.5 mm^2 5-pin DI/DO terminal: Single-conductor cable; cross-sectional area: 0.5 mm^2 to 2.5 mm^2
③	U/V/W AC output	Voltage: • 400 V system: 0 VAC to 415 VAC • 690 V system: 0 VAC to 690 VAC Connection: Cable terminal of M10/20 N·m PE terminal: Connection: Cable terminal of M6/4.8 N·m

Wiring procedure of the H6 and H7 inverter modules

1. Remove the protective cover of the wiring terminal area.
2. Connect the cables to the output terminals in this sequence: U, V, and W, or (+) and (–).
3. Secure the power cables to the cable bracket to prevent terminals from being subject to tension.
4. For shielded power cables, fix the shield to the shielding plate according to EMC requirements.

3.6.3 Connecting the H8 and H8A Inverter Modules

Terminal layout of the H8 inverter modules

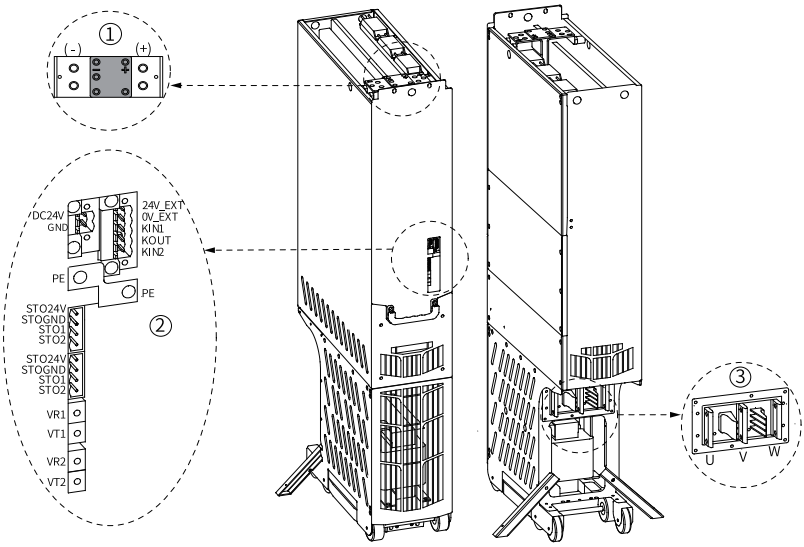


Table 3–8 Terminal connection specifications of the H8 inverter modules

No.	Terminal	Description
①	(+) and (–) DC input	400 V system: 540 VDC to 720 VDC 690 V system: 740 VDC to 975 VDC Connection: Copper busbar terminal of M10/20 N·m
②	2-pin power terminal 5-pin DI/DO terminal 4-pin STO1 terminal 4-pin STO2 terminal Optical fiber terminal 1 Optical fiber terminal 2 (for shore power supply)	2-pin power terminal: Dual-conductor twisted pair or single-conductor cable; cross-sectional area: 0.5 mm^2 to 2.5 mm^2 5-pin DI/DO terminal: Single-conductor cable; cross-sectional area: 0.5 mm^2 to 2.5 mm^2 4-pin STO1 terminal: Four-conductor shielded cable; cross-sectional area: 0.5 mm^2 to 2.5 mm^2 4-pin STO2 terminal: Four-conductor shielded cable; cross-sectional area: 0.5 mm^2 to 2.5 mm^2 Optical fiber terminal 1: Optical fiber connection Optical fiber terminal 2: Optical fiber connection (for shore power supply)
③	U/V/W AC output	Quick connector

Terminal layout of the H8A inverter modules

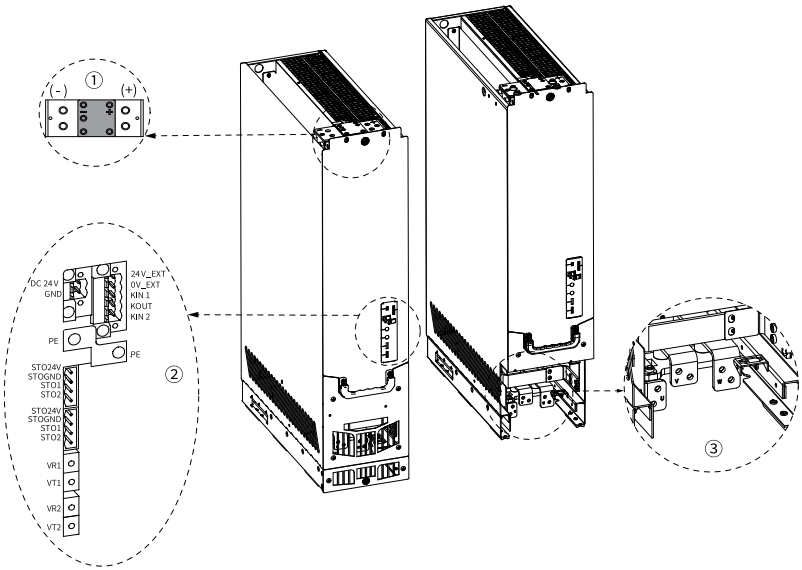


Table 3–9 Terminal connection specifications of the H8A inverter modules

No.	Terminal	Description
①	(+) and (–) DC input	400 V system: 540 VDC to 720 VDC 690 V system: 740 VDC to 975 VDC Connection: Copper busbar terminal of M10/20 N·m
②	2-pin power terminal 5-pin DI/DO terminal 4-pin STO1 terminal 4-pin STO2 terminal Optical fiber terminal 1 Optical fiber terminal 2 (for shore power supply)	2-pin power terminal: Dual-conductor twisted pair or single-conductor cable; cross-sectional area: 0.5 mm^2 to 2.5 mm^2 5-pin DI/DO terminal: Single-conductor cable; cross-sectional area: 0.5 mm^2 to 2.5 mm^2 4-pin STO1 terminal: Four-conductor shielded cable; cross-sectional area: 0.5 mm^2 to 2.5 mm^2 4-pin STO2 terminal: Four-conductor shielded cable; cross-sectional area: 0.5 mm^2 to 2.5 mm^2 Optical fiber terminal 1: Optical fiber connection Optical fiber terminal 2: Optical fiber connection (for shore power supply)
③	U/V/W AC output	Connection: Cable terminal of M8/13 N·m

Wiring procedure of the H8/H8A inverter modules

1. Make sure that all input and output terminals are connected properly.
2. Secure the power cables to the cable bracket to prevent terminals from being subject to tension.
3. For shielded power cables, fix the shield to the shielding plate according to EMC requirements.

3.6.4 Connecting the Disconnector

The DC-side operating switch with pre-charge circuit for the H8 inverter module is a switch group comprised of a fuse and a disconnector. The disconnector complies with the IEC 60947-3 standard and provides position indication and double breaking at each stage. The following figure shows the specific electrical connection of the switch in the H8 inverter module.

Electrical connection

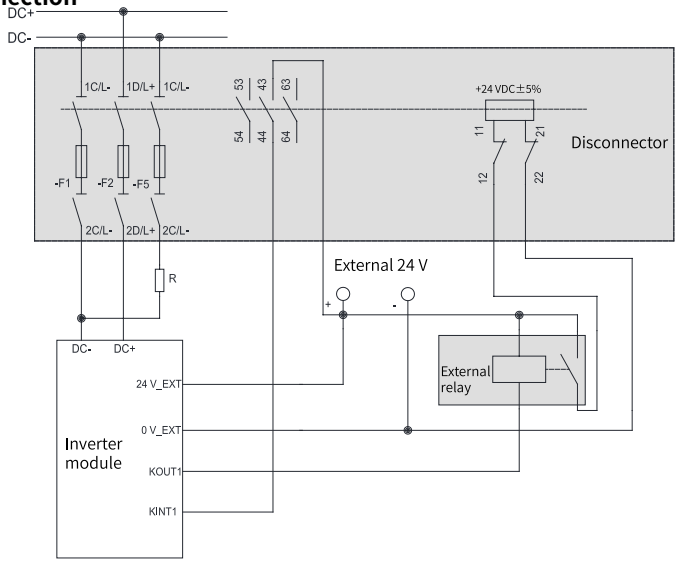


Figure 3-11 Connection of the disconnector

Remarks:

- F1 and F2 are at the main circuit stage, whereas F5 is at the pre-charge circuit stage.
- 53-54 is the feedback signal switch of F5.
- 43-44 and 63-64 are the feedback signal switches of F1 and F2, respectively.
- 12-22 is the feedback signal switch of the 24 VDC coil.
- F1 is connected to the negative terminal of the main circuit, whereas F2 is connected to the positive terminal of the main circuit. F5 is connected in series to the pre-charge resistor and then connected in parallel to F1.

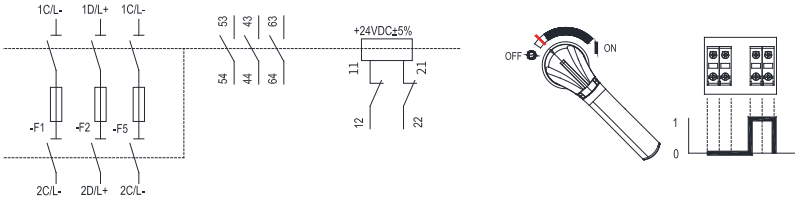
Note

- The relay must have pre-actuated closing contacts, a coil voltage of 24 VDC, a contact voltage of 24 V, and a maximum starting current of 10 A. It is recommended to use Phoenix relays 2903334 and 2902647 (pre-actuated closing contact mode, 500 ms delay).
- R is the pre-charge resistor. It is recommended to use a 40 Ω, 200 W resistor. The RXLG-200W-40R provided by LAIF is recommended.
- The 24 VDC coil is normally closed and cannot be powered for a long time; otherwise, the closing coil will be damaged. The 24 VDC coil needs a surge current of 10 A for 10 ms at the moment of coil activation.

Procedure

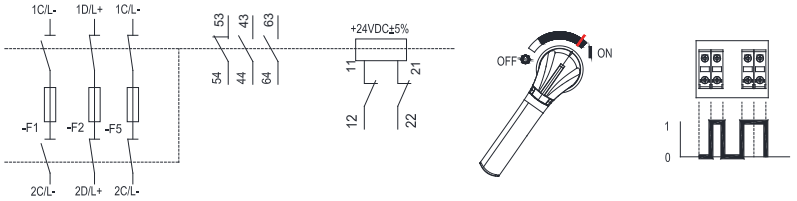
1. **Initial state**

   The lever is in the "0" position and the switch is not activated. F1, F2, and F5 are open. 21-22 and 11-12 are in NC state, whereas 43-44 and 63-64 are in NO state.



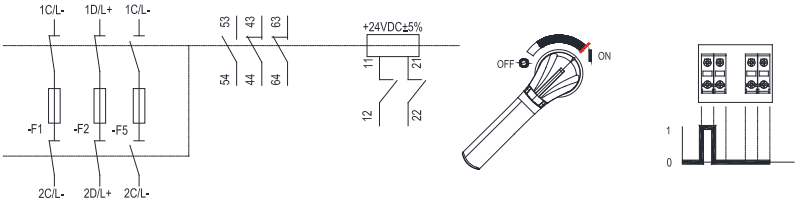
2. **Pre-charge state**

   Manually turn the lever to the "I" position. F2 and F5 are closed, whereas F1 is open. The pre-charge circuit is enabled through F2 and F5. 21-22 and 11-12 are in NC state, whereas 43-44 and 63-64 are in NO state.



3. **Operation state**

   The lever remains in the "I" position. When the HCU sends a signal, the 24 VDC coil is charged. Close F1 and open F5. F2 remains closed. 43-44 and 63-64 are in NC state, whereas 11-12 and 21-22 are open.



Do not exceed the pre-charging position when manually set the lever to "1". Failure to comply may cause physical damage to the switch.

For details about the usage and operating procedure, see the switch specifications provided by Socomec. The preceding information is for reference only.

3.6.5 Cable Specifications and Recommendations

Table 3–10 Recommended main circuit cables

Model	Rated Output Current (A)	Recommended Cable Quantity and Cross-sectional Area (mm^2)	Terminal
UN: Three-phase 400 VAC (range: 380 V to 415 V)			
MD880-50M-0009-4	9	1 x 2.5	OT/2.5-5
MD880-50M-0013-4	13	1 x 4	OT/4-5
MD880-50M-0017-4	17	1 x 6	OT/6-5
MD880-50M-0023-4	23	1 x 6	OT/6-5
MD880-50M-0033-4	33	1 x 10	OT/10-6
MD880-50M-0038-4	38	1 x 10	OT/10-6
MD880-50M-0048-4	48	1 x 10	OT/10-6
MD880-50M-0060-4	60	1 x 16	OT/16-6
MD880-50M-0078-4	78	1 x 16	OT/16-6
MD880-50M-0094-4	94	1 x 25	OT/25-6
MD880-50M-0116-4	116	1 x 35	OT/35-10
MD880-50M-0149-4	149	1 x 50	OT/50-10
MD880-50M-0183-4	183	1 x 70	OT/70-10
MD880-50M-0245-4	245	2 x 50	OT/50-10
MD880-50M-0299-4	299	2 x 70	OT/70-10
MD880-50M-0349-4	349	2 x 70	OT/70-10
MD880-50M-0395-4	395	2 x 95	OT/95-10
MD880-50M-0516-4	516	3 x 95	OT/95-12
MD880-50M-0639-4	639	3 x 120	OT/120-12
MD880-50M-0757-4	757	4 x 120	OT/120-12
MD880-50M-0900-4-SG	900	4 x 120	OT/120-12
UN: Three-phase 500 VAC (range: 380 V to 500 V)			
MD880-50M-0349-5	349	3 x 50	OT/50-10
MD880-50M-0590-5	590	3 x 120	OT/120-12
MD880-50M-0810-5	810	4 x 120	OT/120-12
UN: Three-phase 690 VAC (range: 525 V to 690 V)			
MD880-50M-0062-7	62	1 x 16	OT/16-10
MD880-50M-0082-7	82	1 x 25	OT/25-10
MD880-50M-0099-7	99	1 x 35	OT/35-10
MD880-50M-0125-7	125	1 x 50	OT/50-10
MD880-50M-0144-7	144	1 x 50	OT/50-10

Model	Rated Output Current (A)	Recommended Cable Quantity and Cross-sectional Area (mm^2)	Terminal
UN: Three-phase 400 VAC (range: 380 V to 415 V)			
MD880-50M-0192-7	192	1 x 95	OT/95-10
MD880-50M-0217-7	217	2 x 50	OT/50-10
MD880-50M-0270-7	270	2 x 70	OT/70-10
MD880-50M-0340-7	340	5 x 50	OT/50-10
MD880-50M-0410-7	410	3 x 70	OT/70-10
MD880-50M-0530-7	530	3 x 95	OT/95-12
MD880-50M-0600-7	600	3 x 120	OT/120-12
MD880-50M-0721-7	721	2 x 150	OT/150-12

Remarks:

- Cables recommended in the table are symmetric three-conductor shielded cables, with each conductor connected to each phase of the AC output copper busbar. The PE wire must be connected separately. The PE wire's cross-sectional area must meet the following requirements (where "S" represents the cross-sectional area of the phase wire):
  - When $S \leqslant 16\ mm^2$, PE wire's cross-sectional area = S
  - When $16\ mm^2 < S \leqslant 35\ mm^2$, PE wire's cross-sectional area = $16\ mm^2$
  - When $S > 35\ mm^2$, PE wire's cross-sectional area = S/2
- Remarks for recommended cables: "3 x 120 mm^2" indicates three cables are needed for each phase, and the cross-sectional area of the cable is 120 mm^2.
- Remarks for terminals: "OT/120-12" indicates an OT-type crimping terminal for the cable, with the terminal matching a wire size of 120 mm^2 and a terminal screw hole size of M12.
- Observe the upper limits of the terminal sizes listed in the following table. Using terminals beyond these limits may compromise the mechanical stability and required electrical clearance.
- Derating calculation is required when multiple cables of the same specification are connected in parallel.

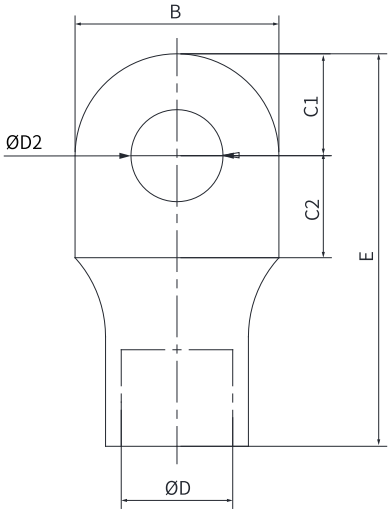


Table 3–11 Terminal size limits

Screw/Bolt	Cross-Sectional Area (mm2)	D2 (mm)	B (mm)	E (mm)	C1 (mm)	C2 (mm)
M5	6	5.3	10	23.8	5.5	6
M6	10	6.4	12.4	27.5	7	8
M6	16	6.4	12.4	31	7	8
M6	25	6.4	14	32	7	8
M10	35	10.5	17.5	40.5	10	10.5
M10	50	10.5	18	43.5	10.5	11
M10	70	10.5	21.8	50	13	13
M10	95	10.5	25	55	13	13
M12	70	13	21.8	50	13	13
M12	95	13	25	55	13	13
M12	120	13	28.4	60	14	14

3.6.6 Connecting the HCU Control Module

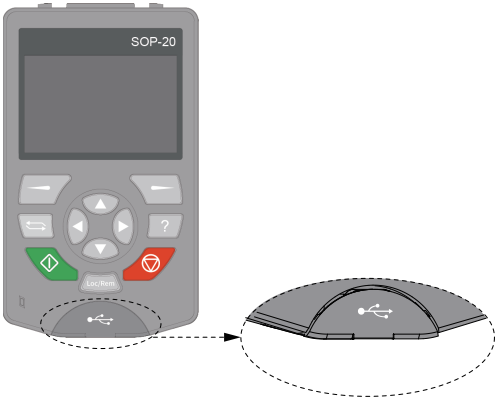
For details about how to install the HCU control module and connect the control cable, see *"4.1.4.4 Installation Procedure" on page 111*.

3.6.7 Connecting SOP-20-880 to the PC

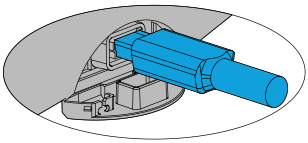
The type-B mini USB port on SOP-20-880 is used to connect to PC. The connection cable cannot exceed 3 m.

Communication between SOP-20-880 and PC is implemented using the USB 2.0 communication protocol.

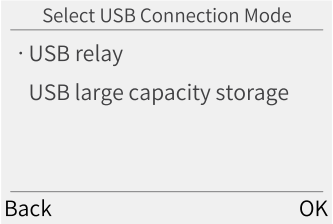
1. Open the cover of the USB port.



2. Plug in a USB shielded cable. It is recommended to use a cable with a ferrite core, as shown in the following figure.



3. Connect the cable to the PC.
   USB relay mode and USB mass storage mode are available when the USB cable is connected to the PC.



Note

- In the USB relay mode, SOP-20-880 is used for interaction between the PC tool and the drive.
- In the USB mass storage mode, SOP-20-880 can be used as a memory.

3.6.8 Connecting SOP-20-880 to the Drive

SOP-20-880 is provided with an RJ45 port on the back for connection to the drive control board (such as the HCU; for details, see the HCU Control Module Hardware Guide (data code: 19010339)) through a network cable that meets the EIA/TIA/568A or 568B standards. On the control board at the end of a communication network, set the jumper to connect the termination resistor. It is recommended to use a shielded twisted pair cable as the SOP-20-880 bus cable. The total maximum length is 100 m.

Table 3–12 Transmission distance, node quantity, and baud rate of SOP-20-880 bus

Distance (m)	Baud Rate (kbps)	Number of Nodes	Cable Gauge	Remarks
100	1000	32	⩾ 0.5 mm^2	When there are repeaters, the maximum number of nodes is 128. When there is no repeater, the maximum number of nodes is 32. When there is polarity offset, the maximum number of nodes is reduced by 4.
50	2000	32	⩾ 0.5 mm^2	
25	4000	32	⩾ 0.5 mm^2	

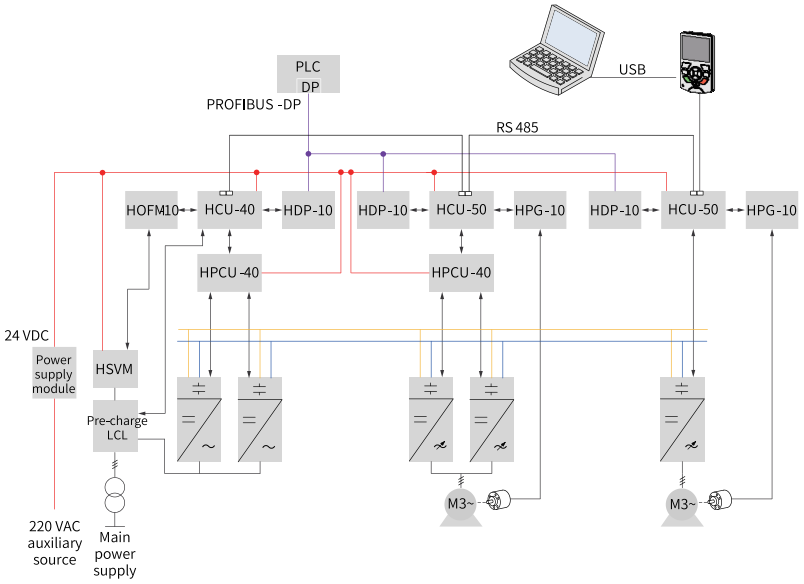


Figure 3-12 SOP-20-880 networking example

3.6.9 Post-Wiring Check

After electrical installation is done, check the following items. Read *" Safety Precautions" on page 8* thoroughly before operating the equipment.

No.	Check Item	OK
1	The input power supply is connected to the motor cable properly, with correct voltage supplied.	☐
2	The auxiliary source provides the correct voltage.	☐
3	Input/Output power cables are secured to the cable bracket for strain relief.	☐
4	Cables are properly connected with the required tightening torque to the terminals provided.	☐
5	For EMC shielded cables, threaded sleeve joints are provided on the motor terminal box and the joints are grounded and in contact with a large area of the shield. In the AC drive module, the cable shield is fixed to the shielding plate to meet the EMC requirement.	☐
6	Parallel outputs of the AC drive are correctly connected to the motor.	☐
7	The date of manufacturing can be found on the nameplate of the AC drive. If the period from the production date to the initial commissioning date or the downtime of the power components is shorter than one year, the DC bus capacitors do not need to be pre-charged. If the downtime is longer than one year, pre-charge the capacitors first.	☐
8	The control cables are connected in accordance with the terminal layout and by shield. The control cables are routed separately from the power supply cables to prevent interference. Cable routing and connections comply with the relevant EMC directives.	☐

4 Control Module

4.1 HCU Control Module

4.1.1 HCU control module composition

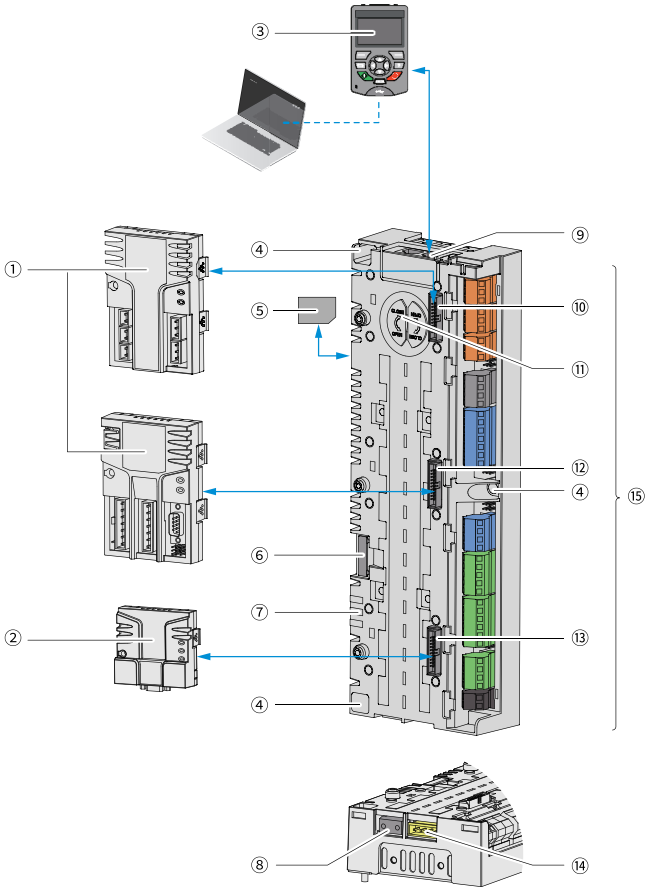


Figure 4-1 HCU control module composition

Table 4–1 HCU control module composition

No.	Name	Function
①	Function module SIZE1	105 mm x 73 mm x 24 mm function module
②	Function module SIZE2	75 mm x 73 mm x 24 mm function module
③	Smart operating panel	Smart operating panel SOP-20-880
④	Fixing hole	Three holes for fixing the HCU
⑤	SD card	Pluggable 8 GB microSD memory card in standard HCU configuration
⑥	Functional safety slot	Terminal for connection to functional safety modules
⑦	Indicator	Power, operation, and fault indicators
⑧	Optical fiber communication port	Optical fiber communication interface between the HCU and the power unit
⑨	Smart operating panel terminal	Two RJ45 terminals with identical assignment, used to connect the HCU module to the SOP-20-880 panel to facilitate cascading
⑩	SLOT1	Function module ports: SLOT1_1, SLOT1_2, and SLOT1_3
⑪	Battery cover	Cover of the spare RTC battery, which is a non-rechargeable lithium battery that must be replaced regularly
⑫	SLOT2	Function module ports: SLOT2_1, SLOT2_2, and SLOT2_3
⑬	SLOT3	Function module port: SLOT3_1
⑭	STO terminal	Reserved
⑮	User terminal	HCU standard user I/O terminals

Note

The RJ45 terminal of the HCU controller cannot be connected directly to the computer; otherwise, the computer may be damaged.

4.1.2 LED Indicator

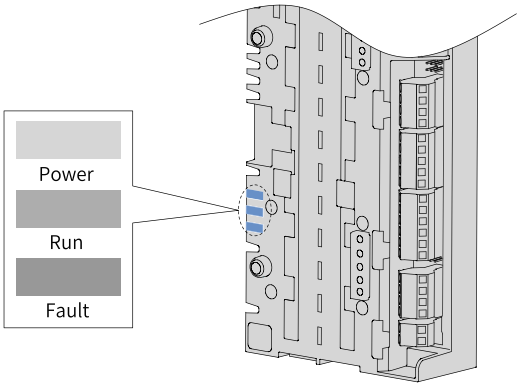


Figure 4-2 LED indicator positions and meanings

Table 4–2 LED indicator meanings

No.	Name	State	Description
1	Power	Steady ON	The HCU is powered normally.
		OFF	The HCU is not powered or the power supply has failed.
2	Run	Steady ON	The power module is running.
		OFF	The power module is not running.
3	Fault	Red light steady ON	The system is faulty.
		Yellow light steady ON	A system alarm is reported.
		OFF	The system is normal.
		Red light flashing	The HCU auxiliary source is faulty. Check whether 24 V power supply is short-circuited or overloaded.
4	Fault and Run	Fault (yellow) and Run (green) flashing simultaneously	The HCU is selected on the PC or SOP-20-880. The flashing will end after 10 seconds.
		Fault (red) and Run (green) flashing alternately	The FPGA of the HCU is abnormal or the external expansion RAM is abnormal.

4.1.3 SD Memory Card

The HCU is internally equipped with an SD card for storing the black box data and parameters to facilitate monitoring and analysis on the power module. The data is saved on the microSD memory card for analysis by qualified service technicians.

4.1.4 HCU Dimensions and Installation Instructions

4.1.4.1 Preparation Before Installation



- Before installing or removing the HCU, make sure that the cabinet has been powered off for more than 15 minutes and the HCU input power is disconnected. Failure to comply will cause damage to the HCU control module.
- When installing or removing a function module on the HCU, make sure that the HCU input power is disconnected. Failure to comply will cause damage to the HCU or function module.
- Do not drop or impact the HCU module to avoid damage.
- Do not disassemble the HCU module; otherwise, the module may be damaged.
- Do not tighten terminals with excessive torque to avoid damage.

Installation tools

You may need the following tools during installation:

- Phillips screwdrivers, sizes 1# and 2#
- Straight screwdrivers, sizes 1# and 2#

Screw and fastener tightening torque

The following tightening torque should be applied to the screws during HCU installation.

Screw	Tightening Torque
M3	0.55 N·m
M4	1.2 N·m

4.1.4.2 Outline Dimensions

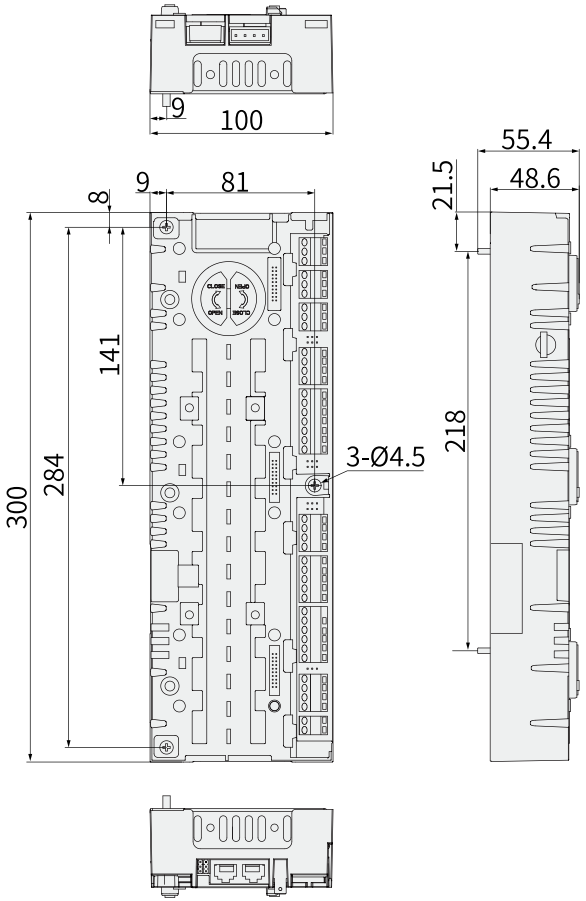


Figure 4-3 Outline dimensions of the HCU control module (unit: mm)

4.1.4.3 Installation Space Requirements

To facilitate installation, reserve certain clearance between the HCU and its surrounding structures and devices, as shown in the following figure. The HCU must be mounted on a conductive metal surface with its entire conductive back in good contact with the mounting surface.

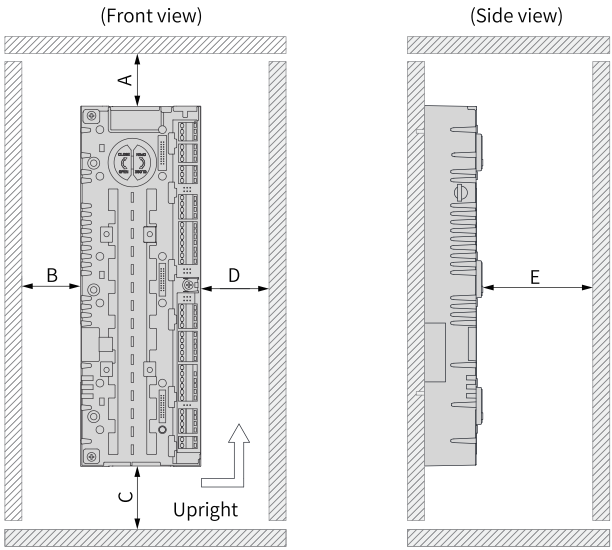


Figure 4-4 HCU installation space

Table 4–3 HCU installation space (unit: mm)

A	B	C	D	E
⩾ 100	⩾ 30	⩾ 100	⩾ 50	⩾ 100

4.1.4.4 Installation Procedure

1. Align the HCU vertically with the two positioning holes on the metal mounting plate.
2. Tighten the HCU mounting screws (three M4 screws) with a #2 Phillips screwdriver as shown below.

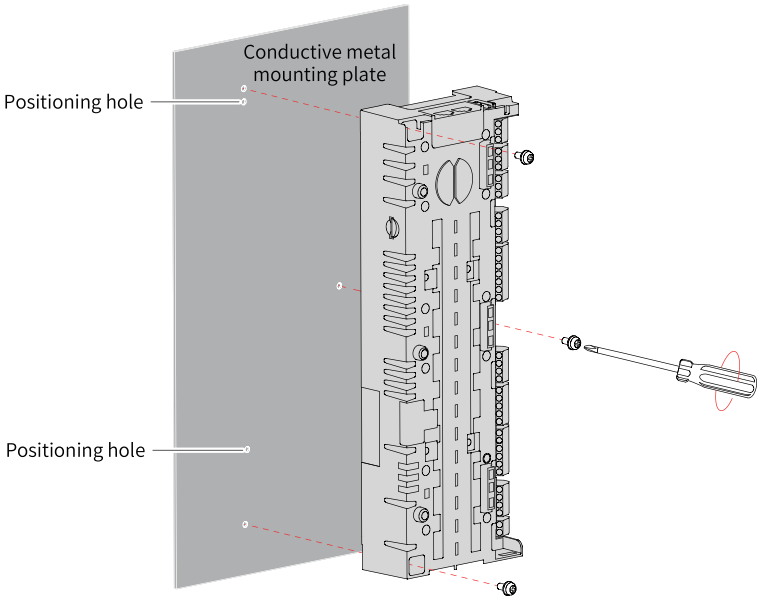


Figure 4-5 Installing the HCU

3. Connect the optical fiber between the HCU and the AC drive module.

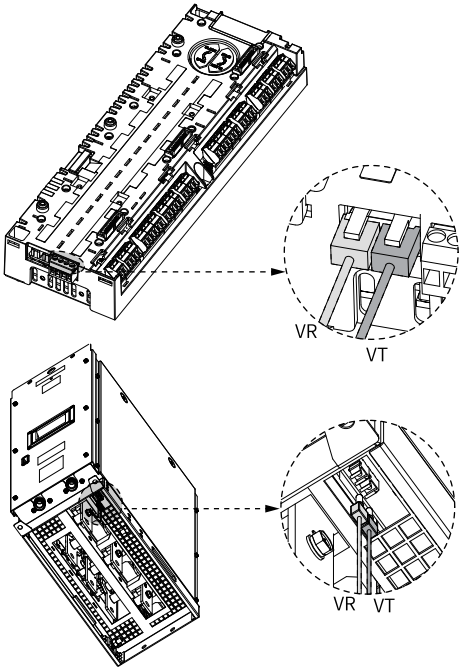


Figure 4-6 Connecting the optical fiber between the HCU and the AC drive module

Grounding inside the cabinet

The mounting plate of the HCU must be a bare metal plate and reliably grounded.

The HCU housing shall be grounded by connecting to the cabinet housing through the screws on the mounting surface.

4.1.4.5 Removing the HCU Cover

The AC drive is provided with an HCU cover as standard. To configure the HCU interfaces externally, you need to knock off the cover, as shown in the following figure.

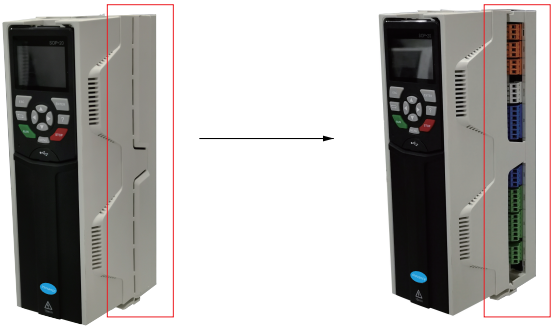


Figure 4-7 Removing the HCU cover

4.1.5 Overview of HCU Control Module Interfaces

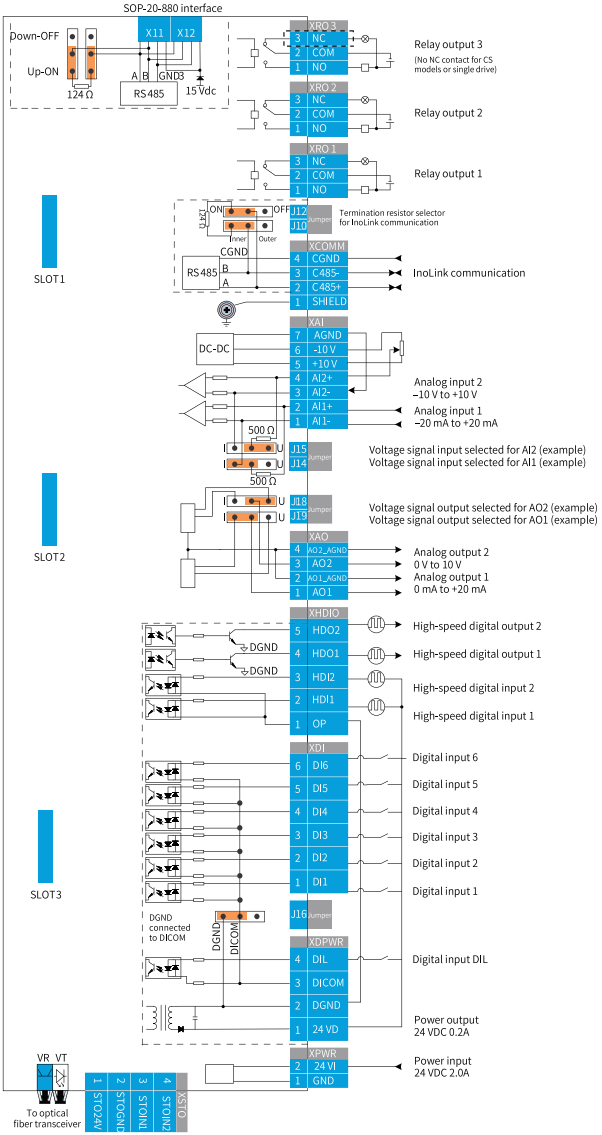


Figure 4-8 General diagram of HCU interface circuit

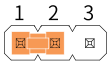
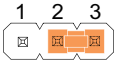
4.1.5.1 Standard Interfaces

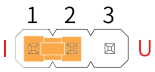
Table 4–4 Standard ports of the HCU

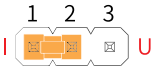
Name	Terminal	Description
Input power supply	XPWR: 24VI	HCU power supply
Digital power output	XDPWR: 24VD	Digital output power supply that is isolated from XPWR
Digital input	XDI: DI1 to DI6 and DIL	Input type: Relay contact, NPN, or PNP
High-speed digital input	XHDIO: HDI1 and HDI2	Input type: NPN or PNP
High-speed digital output	XHDIO: HDO1 and HDO2	Output type: Open collector
Analog output	XAO: AO1 and AO2	Output type: Current or voltage, selected by jumper
Analog input	XAI: AI1 and AI2	Input type: Current or voltage, selected by jumper
Relay output	XRO1, XRO2, and XRO3	Relay output: NO, NC, and COM No NC contact for the CS model or single-drive XRO3
InoLink communication	XCOMM	High-speed RS485, with termination resistor selected by jumper
RJ45 terminal	X11 and X12	For communication with SOP-20-880 (terminals with identical assignment to cascade multiple HCUs; connection cable < 3 m)
Safe Torque Off (STO)	XSTO	Provides 24 V power supply for the functional safety contact, with two functional safety contact inputs Products that support STO: CS model (multi-drive), 690 V air-cooled (single-drive), and water-cooled inverter products
Inodrive communication	Optical fiber or DB15	Optical interface: Optical fiber; electrical interface: DB15
SD CARD	SD	Push-push type card holder; SD card capacity: 8 GB
RTC battery	BAT	Non-rechargeable lithium battery that must be replaced regularly

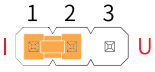
4.1.5.2 Details of HCU Control Module Interfaces

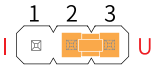
Table 4–5 Details of HCU control module interfaces

Terminal	Name	Function	Cable Specification
XPWR: Power input terminal			
1	GND	24.0 VDC±10%, 2.0 A	Recommended to use dual-conductor twisted pair cables with a cross-sectional area of 0.5 mm^2 to 2.5 mm^2
2	24VI		
XDPWR: DIL terminal			
1	24VD	Provides power supply for DI, HDI, and HDO 24.0 VDC±10%, 0.2 A	Twisted pair cable or single-conductor cable Cross-sectional area: 0.5 mm^2 to 2.5 mm^2 Note: The load of the 24VD terminal must not exceed 0.2 A.
2	DGND	24VD ground	
3	DICOM	DI common output, which can be connected to DGND through jumper J16	
4	DIL	Digital interlock or common DI with identical technical parameters as common DIs	
Jumper J16: Power supply selection			
 DGND DICOM Shorting DGND and DICOM allows DIs to be powered by the 24 VDC internal power supply.			
 DGND DICOM Disconnecting DGND from DICOM allows DIs to be powered by an external power supply.			
XDI: DI terminal			
1	DI1	24 V logic level: "0": < 5 V; "1": > 15 V Rin: 2.0 kΩ Input type: NPN/PNP, relay contact Hardware filter: 0.04 ms Imax: 15 mA	Single-conductor cable Cross-sectional area: 0.5 mm^2 to 2.5 mm^2
2	DI2		
3	DI3		
4	DI4		
5	DI5		
6	DI6		
XHDIO: HDIO input terminal			

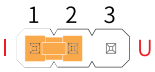
<table>
<tr><th>Terminal</th><th>Name</th><th>Function</th><th>Cable Specification</th></tr>
<tr><td>1</td><td>OP</td><td>HDI common terminal</td><td rowspan="5">Cross-sectional area: 0.5 mm^2 to 2.5 mm^2
Recommended to use shielded twisted pair cables
HDO and DGND twisted pair
HDI and OP twisted pair</td></tr>
<tr><td>2</td><td>HDI1</td><td rowspan="2">Input type: NPN, PNP
24 V logic level: "0": < 5 V; "1": > 15 V
Rin: 2.0 kΩ
Input voltage range: 0 VDC to 30 VDC
Input frequency range: 0 kHz to 100 kHz
HDI maximum load (Imax): 15 mA</td></tr>
<tr><td>3</td><td>HDI2</td></tr>
<tr><td>4</td><td>HDO1</td><td rowspan="2">Output type: OC
Output frequency: 0 kHz to 100 kHz
HDO maximum load (Imax): 20 mA
Output voltage range: 0 VDC to 26.4 VDC</td></tr>
<tr><td>5</td><td>HDO2</td></tr>
<tr><td colspan="4">XAO: AO terminal</td></tr>
<tr><td>1</td><td>AO1</td><td rowspan="4">AO1 output range:
0 mA to 20 mA; Rload: ⩽ 500 Ω
0 V to 10 V; Rload: ⩾ 10 kΩ
AO2 output range:
0 mA to 20 mA; Rload: ⩽ 500 Ω
0 V to 10 V; Rload: ⩾ 10 kΩ
Resolution: 11 bits + sign bit
Accuracy: 2% of the full range</td><td rowspan="4">Cross-sectional area: 0.5 mm^2 to 2.5 mm^2
Recommended to use shielded twisted pair cables
AO1 and AO1_AGND twisted pair
AO2 and AO2_AGND twisted pair</td></tr>
<tr><td>2</td><td>AO1_AGND</td></tr>
<tr><td>3</td><td>AO2</td></tr>
<tr><td>4</td><td>AO2_AGND</td></tr>
<tr><td colspan="4">Jumper J19: Current or voltage signal selection for AO1</td></tr>
<tr><td colspan="4">

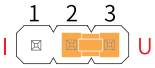
Shorting 1 and 2 selects current signal output for AO1.</td></tr>
<tr><td colspan="4">

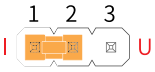
Shorting 2 and 3 selects voltage signal output for AO1.</td></tr>
<tr><td colspan="4">Jumper J18: Current or voltage signal selection for AO2</td></tr>
<tr><td colspan="4">

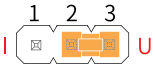
Shorting 1 and 2 selects current signal output for AO2.</td></tr>
<tr><td colspan="4">

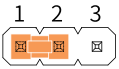
Shorting 2 and 3 selects voltage signal output for AO2.</td></tr>
<tr><td colspan="4">XAI: AI terminal</td></tr>
</table>

<table>
<tr><th>Terminal</th><th>Name</th><th>Function</th><th>Cable Specification</th></tr>
<tr><td>1</td><td>AI1–</td><td rowspan="4">Current input: –20 mA to +20 mA; Rin: 500 Ω
Voltage input: –10 V to +10 V; Rin: 200 kΩ
Differential input; input range: ±30 V
Sampling interval per channel: 0.25 ms
Hardware filter: 0.25 ms
Resolution: 11 bits + sign bit
Error: 1% of full range</td><td rowspan="7">Cross-sectional area: 0.5 mm^2 to 2.5 mm^2
Use two dual-conductor shielded twisted pair cables when using two AIs.
Use one four-conductor shielded twisted pair cable for one AI under the reference voltage.</td></tr>
<tr><td>2</td><td>AI1+</td></tr>
<tr><td>3</td><td>AI2–</td></tr>
<tr><td>4</td><td>AI2+</td></tr>
<tr><td>5</td><td>+10V</td><td rowspan="3">+10V: +10 V±1%
–10V: –10 V±1%
Rload: 1 kΩ to 10 kΩ</td></tr>
<tr><td>6</td><td>–10V</td></tr>
<tr><td>7</td><td>AGND</td></tr>
<tr><td colspan="4">Jumper J14: Current or voltage signal selection for AI1</td></tr>
<tr><td colspan="4">

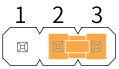
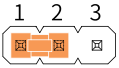
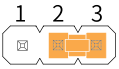
Shorting 1 and 2 selects current signal input for AI1.</td></tr>
<tr><td colspan="4">

Shorting 2 and 3 selects voltage signal input for AI1.</td></tr>
<tr><td colspan="4">Jumper J15: Current or voltage signal selection for AI2</td></tr>
<tr><td colspan="4">

Shorting 1 and 2 selects current signal input for AI2.</td></tr>
<tr><td colspan="4">

Shorting 2 and 3 selects voltage signal input for AI2.</td></tr>
<tr><td colspan="4">XCOMM: InoLink RS485 terminal</td></tr>
<tr><td>1</td><td>SHIELD</td><td rowspan="4">RS485 bus, 5 V standard level
Bus termination resistor: 124 Ω
Max. communication rate: 5 Mbps
Max. number of nodes: 16 (without repeater)
Max. transmission distance: 40 m</td><td rowspan="4">Four-conductor shielded twisted pair cable
Cross-sectional area: 0.5 mm^2 to 2.5 mm^2</td></tr>
<tr><td>2</td><td>C485+</td></tr>
<tr><td>3</td><td>C485–</td></tr>
<tr><td>4</td><td>CGND</td></tr>
<tr><td colspan="4">Jumpers J10 and J12: RS485 bus termination resistor selector (To connect the termination resistor, J10 and J12 must be in the same state.)</td></tr>
<tr><td colspan="4">

Shorting 1 and 2 connects the termination resistor.</td></tr>
</table>

Terminal	Name	Function	Cable Specification
 Shorting 2 and 3 disconnects the termination resistor.			
XRO1: Output terminal of relay 1			
1	RO1_NO	Output type: Passive NO and NC contacts Contact specifications: 250 VAC/30 VDC, 2 A	Single-conductor cable Cross-sectional area: 0.5 mm^2 to 2.5 mm^2
2	RO1_COM		
3	RO1_NC		
XRO2: Output terminal of relay 2			
1	RO2_NO	Output type: Passive NO and NC contacts Contact specifications: 250 VAC/30 VDC, 2 A	Single-conductor cable Cross-sectional area: 0.5 mm^2 to 2.5 mm^2
2	RO2_COM		
3	RO2_NC		
XRO3: Output terminal of relay 3			
1	RO3_NO	Output type: Passive NO and NC contacts Contact specifications: 250 VAC/30 VDC, 2 A	Single-conductor cable Cross-sectional area: 0.5 mm^2 to 2.5 mm^2
2	RO3_COM		
3	RO3_NC		
X11 and X12: SOP-20-880 RS485 terminals			
1, 2, and 7	NC	RS485 bus, 5 V standard level Bus termination resistor: 124 Ω Max. communication rate: 4 Mbps Max. number of nodes: 32 (without repeater) Max. transmission distance: 100 m	Standard network cable
3 and 8	GND3		
4	A		
5	B		
6	15V3	15V3: 15 V±15%	
Jumpers J12 and J15: Bus termination resistor selector (J12 and J15 take effect only when they are in the same state.)			
 Shorting 1 and 2 connects the termination resistor.			
 Shorting 2 and 3 disconnects the termination resistor.			
VR and VT: Optical fiber transceiver			
1	VR	Receive optical fiber communication	Optical fiber type: Plastic optical fiber (POF)
2	VT	Transmit optical fiber communication	

4.1.6 HCU Function Application

4.1.6.1 Function Modules

The HCU can work with other function modules to expand its functions. See the following for details.

Table 4–6 Function modules used with the HCU

No.	Name	Model	Function	Connection with HCU	Dimensions (L x W x H) (mm)
1	I/O module	HIO-10	Two AIs Two AOs Two DIOs One relay output	Slot	105 x 73 x 24
2	PROFIBUS DP module	HDP-10	PROFIBUS DP bus adapter	Slot	75 x 73 x 24
3	CAN bus module	HCAN-10	CANopen bus adapter	Slot	75 x 73 x 24
		HCAN-30	CAN 2.0 bus adapter	Slot	75 x 73 x 24
4	Optical fiber expansion module	HOFM-10	One pair of 50 M optical fiber interfaces	Slot	75 x 73 x 24
		HOFM-30	Three pairs of 50 M optical fiber interfaces	Slot	75 x 73 x 24
5	Modbus RTU module	HMBA-10	Modbus RTU bus adapter	Slot	75 x 73 x 24
6	EtherCAT module	HETC-10	EtherCAT bus adapter	Slot	75 x 73 x 24
7	Ethernet module	HETN-10	Ethernet commissioning module	Slot	75 x 73 x 24
8	PROFINET IO module	HPFN-10	PROFINET IO industrial Ethernet adapter	Slot	75 x 73 x 24
		HPFN-20	PROFINET IRT industrial Ethernet adapter	Slot	75 x 73 x 24
9	Modbus TCP module	HMBT-10	Modbus TCP industrial Ethernet adapter	Slot	75 x 73 x 24
10	Parallel control module	HPCU-40	Supports parallel connection of 2 to 4 modules	Optical fiber	232 x 86 x 40
		HPCU-60	Supports parallel connection of 2 to 6 modules	Optical fiber	232 x 86 x 40
		HPCU-A0	Supports parallel connection of 2 to 10 modules	Optical fiber	232 x 86 x 40
11	Function expansion module	HESD-10	Expands one slot	Optical fiber	105 x 75 x 70

No.	Name	Model	Function	Connection with HCU	Dimensions (L x W x H) (mm)
12	Sync voltage detection module	HSVM-10	Three-phase AC input voltage detection	Optical fiber	150 x 100 x 30
		HSVM-20	DC voltage detection module (supports one voltage channel and two current channels)	Optical fiber	150 x 100 x 30
13	Digital gateway commissioning and monitoring module	HGW-10	Supports centralized commissioning and operation data collection	Network cable	180 x 100 x 50
14	Smart operating panel	SOP-20-880	Human-machine interaction panel	RS485	150 x 100 x 30
15	Optical fiber router module	HOFR-50	Data exchange between two to five HCUs (master-slave communication through optical fiber)	Optical fiber	232 x 86 x 40
16	Pulse-by-pulse current limit module	HCBC-A0	Pulse-by-pulse current limit control for parallel power modules	Optical fiber	232 x 86 x 40

Note

- The HOFM-30 can be installed only in SLOT1 or SLOT2.
- The HDP-10 is recommended to be installed in SLOT3.

4.1.6.2 Slot Expansion Application

- Different function modules are available in the HCU application. The function modules are installed directly in the slots of the HCU.
- The HCU only has three slots. When more modules are needed, install HOFM and HESD expansion modules. Each HESD can connect to one function module.

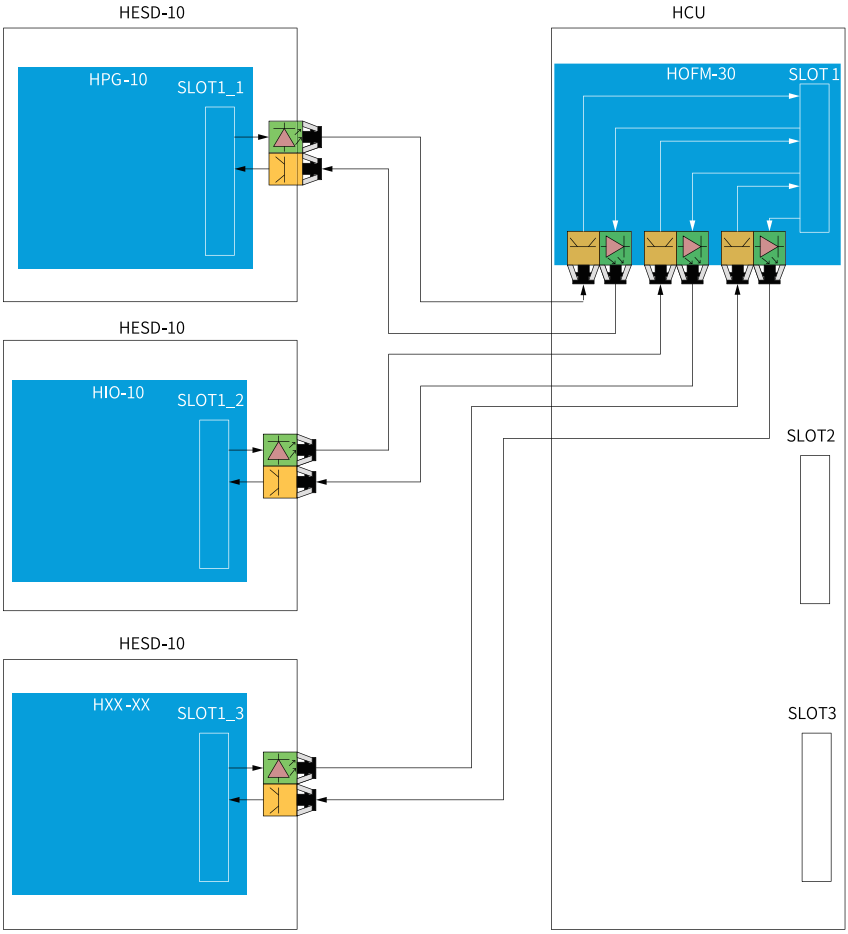


Figure 4-9 HESD wiring example

When installing function modules to the three slots, observe the following principles.

- Function modules can be directly installed in SLOT1, SLOT2, and SLOT3, with the addresses being SLOT1_1, SLOT2_1, and SLOT3_1.
- SLOT1 and SLOT2 each can be used with an HOFM-30 module to be expanded to three slots, with the addresses being SLOT1_1, SLOT1_2, SLOT1_3 and SLOT2_1, SLOT2_2, SLOT2_3, respectively.
- SLOT3 does not support slot expansion.
- In this case, the HESD module is not allowed to be further expanded by another HOFM optical fiber expansion module.

4.1.6.3 Temperature Detection with AI and AO

AI and AO can work together to detect temperature sensor signals. This method is generally used for motor temperature detection and supports a single sensor or one to three sensors connected in series.

In this case, select constant current output for the AO and voltage signal input for the AI. Temperature sensors PT100, PT1000, and KTY84 are supported.

Do not directly ground both ends of the cable shield. Ground one end and keep the other end unconnected, or ground one end directly and ground the other end through a capacitor in series.

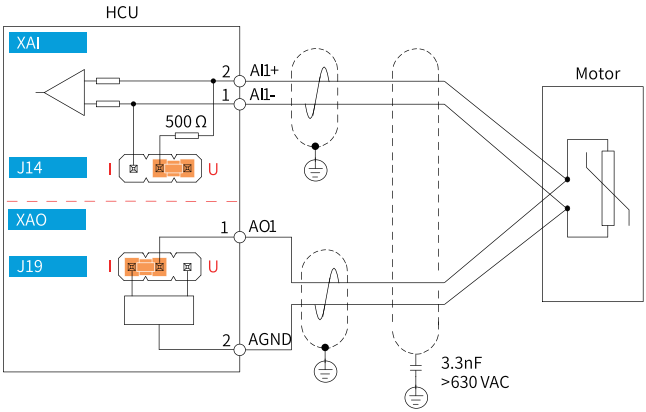


Figure 4-10 Wiring for temperature detection with AI and AO

4.1.6.4 InoLink Communication Bus Application

When information exchange is required between several AC drives in the system, use an InoLink bus.

The parameters of the InoLink bus are as follows:

- Communication baud rate: 5 Mbps
- Maximum number of nodes: 16

Shielded twisted pair cables must be used for wiring. To achieve the best communication quality and prevent electromagnetic interference, it is recommended to use high quality cables, such as PROFIBUS cables. The cable should be as short as possible, and the link length cannot exceed 40 m. Keep the cables from entangling and away from power cables.

If an HCU is at the end of the InoLink link, it must be equipped with a termination resistor, and the J10 and J12 jumpers must be set to the ON position.

The RS485 link topology of the InoLink bus is as follows:

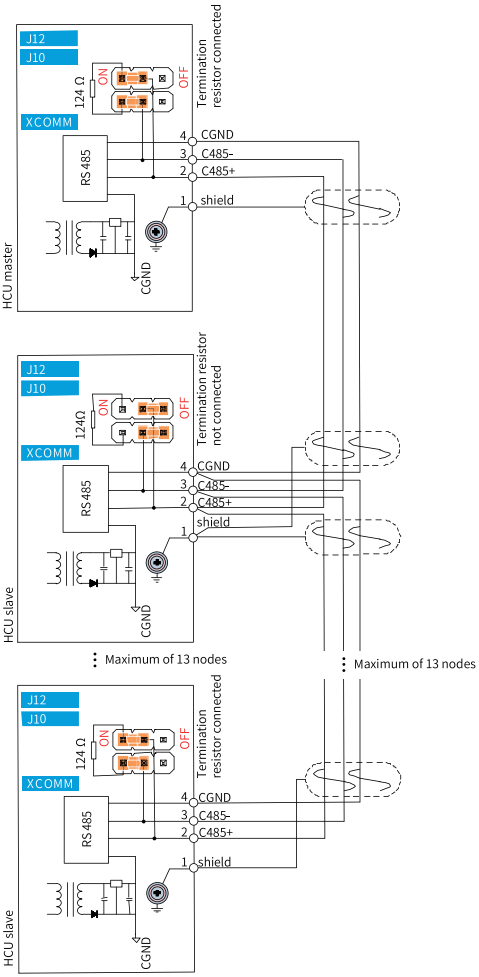


Figure 4-11 Example of connection application

4.2 HPCU Parallel Control Module

HPCU is a parallel control module. It receives drive signals and control signals from HCUs and synchronously transmits them to power modules. Meanwhile, it rapidly collects information, such as current, voltage, and module status, from the power modules and uploads the information to the HCUs. It also controls the synchronization, current equalization, reset, and start/stop of parallel power modules.

You can select HPCU-40 (four units in parallel), HPCU-60 (six units in parallel), or HPCU-A0 (10 units in parallel) as needed.

4.2.1 HPCU Standard Ports

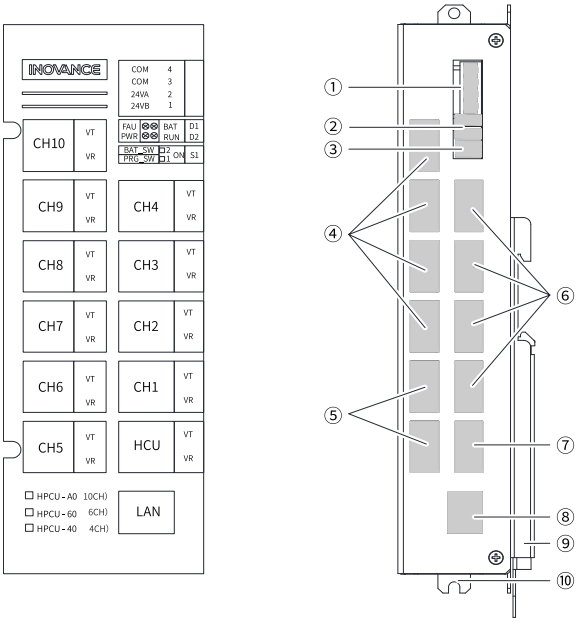


Figure 4-12 Diagram of HPCU

Table 4–7 HPCU terminal functions

No.	Name	Port	Description	Remarks
①	Power supply X1	COM 4	GND	External power supply of the HPCU X1 terminal: 5.08 mm pitch, 4-pin black pluggable terminal Twisted pair Cross-sectional area: 0.5 mm^2 to 2.5 mm^2
		COM 3	GND	
		24VA 2	24 VDC	
		24VB 1	24 VDC	
②	LED indicator	PWR	Green light steady ON	The HPCU is powered normally.
			OFF	The HPCU is not powered or the power supply has failed.
		RUN	Green light steady ON	The power module is running.
			OFF	The power module is not running.
		FAU	Red light steady ON	The system is faulty.
			OFF	The system is normal.
		BAT	Reserved	-
			Reserved	-
③	DIP switch S1	BAT_SW	Reserved	-
		PRG_SW	Reserved	-

No.	Name	Port	Description	Remarks
④	Optical fiber transceiver	CH7 to CH10	Parallel module channels 7 to 10	VT: 50 M transmit optical fiber communication VR: 50 M receive optical fiber communication Optical fiber type: Plastic optical fiber (POF) HPCU-40 provides channels CH1 to CH4. HPCU-60 provides channels CH1 to CH6. HPCU-A0 provides channels CH1 to CH10.
⑤		CH5 and CH6	Parallel module channels 5 and 6	
⑥		CH1 to CH4	Parallel module channels 1 to 4	
⑦		HCU	Communication between HPCU and HCU	
⑧	-	LAN	Commissioning port	Connected to PC
⑨	Guide rail groove	-	For guide rail mounting	-
⑩	Mounting hole	-	Four holes for securing installation	-

4.2.2 LED Indicator

Table 4–8 LED indicator meanings

No.	Name	State	Description
1	PWR	Green light steady ON	The HPCU is powered normally.
		OFF	The HPCU is not powered or the power supply has failed.
2	RUN	Green light steady ON	The power module is running.
		OFF	The power module is not running.
3	FAU	Red light flashing	The system is faulty.
		OFF	The system is normal.
4	BAT	Reserved	-
		Reserved	-

4.2.3 HPCU Electrical Connection

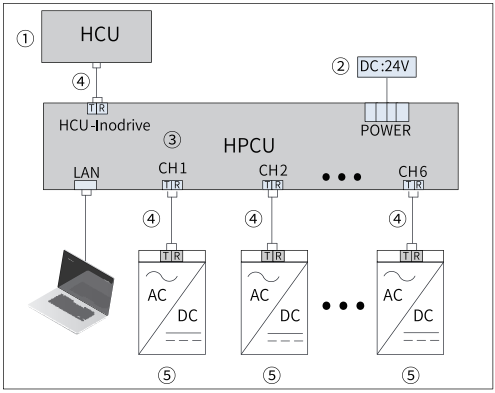


Figure 4-13 HPCU electrical connection

Table 4–9 HPCU electrical connection

No.	Name
①	HCU control module
②	External 24 VDC power supply
③	HPCU parallel control module
④	Optical fiber communication port
⑤	Inverter module

5 Maintenance

5.1 Cleaning Precautions

The inverter module comprises mostly electronic components. Except the cooling fan, no other components are subject to wear and require maintenance or inspection. Clean the dust and pollutants regularly to keep the module in a proper state.

Dust

Dust inside the inverter module must be removed by authorized personnel at a regular interval according to the using environment (at least once a year). The cleaning must comply with 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 and cooling air ducts of the cabinet unobstructed and ensure that the cooling fan functions properly.

5.2 Precautions Before Maintenance and Inspection



- Before maintaining or repairing the AC drive, power it off, wait for 15 minutes, and confirm that the bus voltage of the drive is lower than 36 VDC. Otherwise, the residual charge on the capacitors will cause physical injuries.
- When external power supply is connected, hazardous voltage is still present in the AC drive and cabinet even if the main circuit breaker is open.
- Be aware of the possible rotation of the cooling fan due to inertia.

5.3 Precautions on Maintenance and Inspection

Inspection involves a series of operations to ensure the normal functioning of the equipment.

Danger

- Strictly obey correct operating instructions before starting any maintenance or inspection.
- Maintain and inspect the AC drive only after verifying that it has been de-energized and cooled down.
- Install and wire the equipment according to national standards, industry standards, and local safety codes.
- Proceed with operations only after verifying that there is no voltage, because voltage exists in the cabinets for a period of time after the input circuit breaker is switched off.
- Use only instruments that comply with the voltage withstanding requirements and keep the housing of the instruments well grounded.
- Be careful when measuring components in the cabinets. Prevent meter leads from contacting each other or contacting other terminals.
- Only qualified personnel are allowed to install, inspect, and maintain the AC drive.

Required tools

- Wrench or socket wrench, opening size: 6
- Wrench or socket wrench, opening size: 8
- Wrench or socket wrench, opening size: 10
- Wrench or socket wrench, opening size: 12
- Torque wrench
- Phillips screwdrivers, sizes: PH1 and PH2
- Recommended: Socket wrench set with two extension rods

Service life of components

To ensure long-term proper functioning of the AC drive, regularly maintain the electronic components inside the drive based on their service life. The service life of the electronic components is dependent on the operating environment and conditions. The following table lists the replacement interval of these components for your reference.

Table 5–1 Component replacement interval

Component	Standard Replacement Interval
DC fan	5 years
Electrolytic capacitor	8 years
PCB	8 to 10 years

Cable terminals and fasteners

Check the cable terminals and screw terminals for looseness and re-tighten them as needed. Check the routing for faults and replace damaged components promptly.

Note

The actual maintenance interval shall be determined based on the installation environment and operating conditions of the equipment.

Tightening torques of screws

Observe the following tightening torque requirements when tightening common steel connectors or the connectors for conductive parts (DC bus terminals, motor terminals, and copper busbars) or non-conductive parts (grounding terminals and protective grounding terminals).

Table 5–2 Tightening torque for current-carrying components

Screw/Bolt	Grounding/Protective Grounding/Steel Connector (N·m) (Fault Current-Conducting)	Busbar with Plastic Housing (N·m) (Operating Current-Conducting)
M2.5	0.3	0.3
M3	0.55	0.55
M4	1.2	1.2
M5	2.8	2.8
M6	4.8	4.8
M8	13	13
M10	20	20
M12	35	35

5.4 Component Replacement

5.4.1 Overview

This section describes the components that need to be replaced at maintenance and inspection.

5.4.2 Safety Precautions

Take necessary safety measures before maintenance and inspection.



- Be aware that the inverter module is operated with high voltages.
- Do not conduct any connection work unless the inverter module is powered off.
- Before maintenance or repair, power off the module, wait for at least 15 minutes, and confirm that the voltage of the inverter module is lower than 36 VDC. Otherwise, the residual charge on the capacitors will cause physical injuries.
- Allow only trained personnel to perform maintenance and inspection on the inverter module. Failure to comply may result in substantial property loss, severe physical injuries, or even death.
- Exercise extreme caution when working on the equipment that is opened. The power supply and terminals may be live even when the motor is not running due to possible presence of external power voltages.
- Some equipment is very heavy or top-heavy and therefore must be handled by trained personnel with care. Improper hoisting or handling of such equipment may lead to substantial property loss, severe physical injuries, or even death.

5.4.3 Replacing the Filter Screen

Preparation



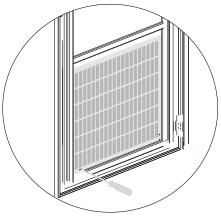
- Cut off the power to prevent the fan from drawing in contaminated air from outside. When using an externally powered fan, beware of the inertia of the fan or cut off the external power supply.
- Replace the dirty filter screen regularly; otherwise, devices in the cabinet may stop due to high temperature.

- Observe *"3.1.1 Protective Measures Before Installation" on page 81*.
- Disconnect the cabinet from the power supply (including external power supply).
- Check the window blind on the cabinet door for any damage.

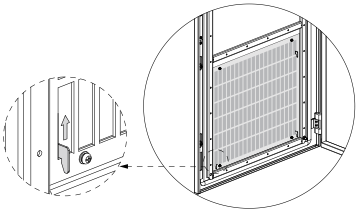
Removing the filter screen

If the IP42 air inlet kit is used for the cabinet, clean the air inlet based on the following procedure.

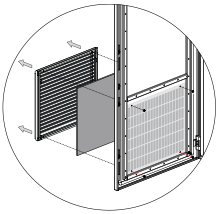
1. Open the cabinet front door and remove the four M4 screws from the window blind.



2. Lift up the window blind and remove it.



3. Remove the filter screen from the window blind and clean (or replace) it.



Installing the filter screen

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

Note

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

5.4.4 Replacing the DC Fan

Fan replacement for the H1 to H3 inverter modules

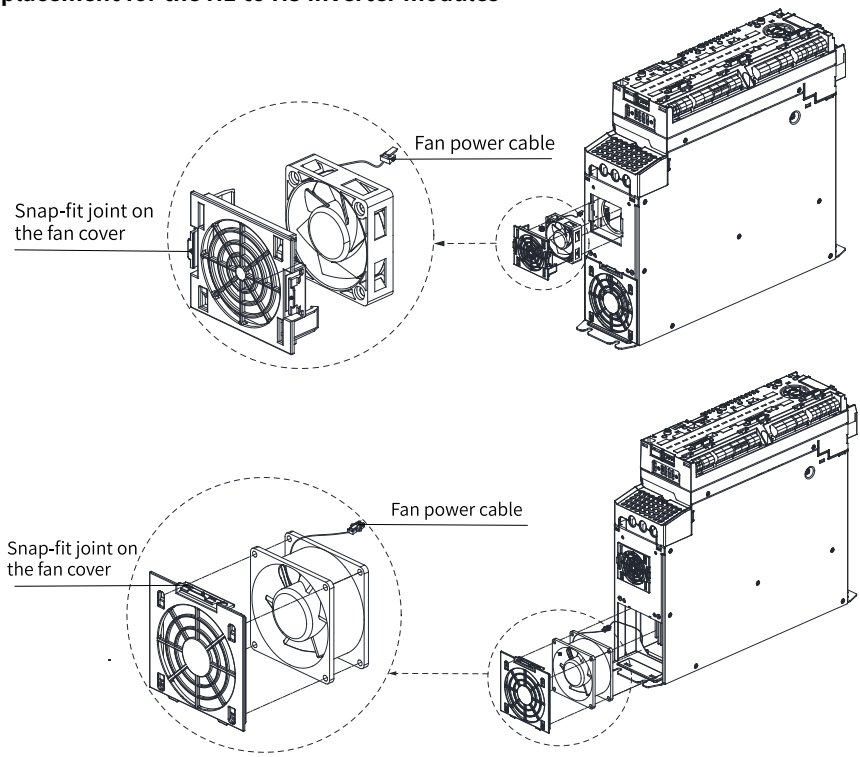


Figure 5-1 Fan replacement for the H1 to H3 inverter modules

1. Disconnect the DC power supply of the drive system. Measure and confirm there is no residual voltage.
2. Press the snap-fit joint on the fan cover to remove the cover.
3. Unplug the power cable of the fan when pulling the fan out.
4. Install the new fan in reverse order.

Note

- The air flows from bottom to top. Install the fan in the direction indicated by the arrow marked on the fan.
- Do not pinch the power cable of the fan during installation.

Fan replacement for the H4 inverter modules

1. Disconnect the DC power supply of the drive system. Measure and confirm there is no residual voltage.
2. Press the snap-fit joint on the fan cover to remove the cover.
3. Unplug the power cable of the fan when pulling the fan out.
4. Install the new fan in reverse order.

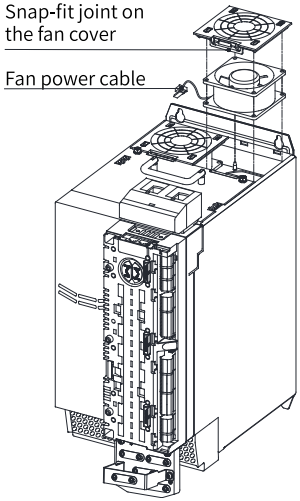


Figure 5-2 Fan replacement for the H4 inverter modules

Note

- The air flows from bottom to top. Install the fan in the direction indicated by the arrow marked on the fan.
- Do not pinch the power cable of the fan during installation.

Fan replacement for the H6 and H7 inverter modules

The H6 inverter module is equipped with one fan, whereas the H7 inverter module is equipped with two fans.

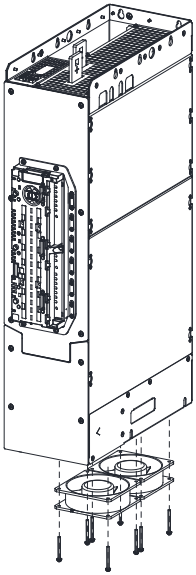


Figure 5-3 Fan replacement for the H6 and H7 inverter modules

Fans of the H6 and H7 inverter modules are divided into three types to match different power ratings. Replace the fans according to the following procedure.

1. Disconnect the DC power supply of the drive system. Measure and confirm there is no residual voltage.
2. Open the cabinet door to remove the eight M4 screws at the bottom of the module (four M4 screws for each fan).
3. Unplug the power cable of the fan when pulling the fan out.
4. Install the new fan in reverse order.

Note

- The air flows from bottom to top. Install the fan in the direction indicated by the arrow marked on the fan.
- Do not pinch the power cable of the fan during installation.

Fan replacement for the H8 and H8A inverter modules

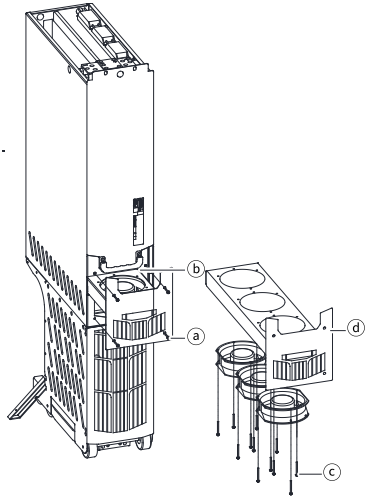


Figure 5-4 Fan replacement for the H8 inverter modules

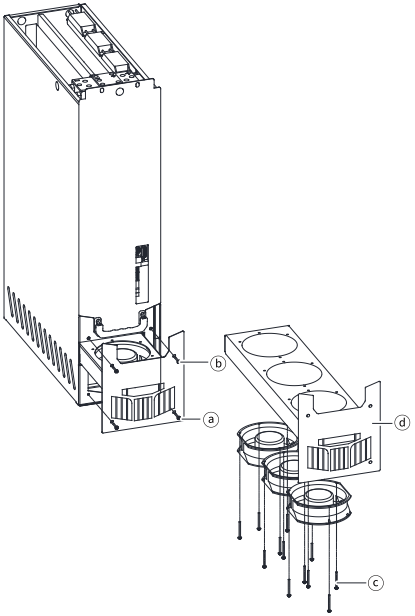


Figure 5-5 Fan replacement for the H8A inverter modules

Fans of the H8/H8A inverter modules are divided into five types to match different power ratings. Replace the fans according to the following procedure.

1. Disconnect the DC power supply of the drive system. Measure and confirm there is no residual voltage.
2. Remove the four M5 screws (ⓐ) from the fan assembly (ⓓ) by using a screwdriver.
3. Unplug the power supply cable (ⓑ) of the fan when pulling the fan assembly 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 specifications in the reverse order of the removal procedure.

Note

- The air flows from bottom to top. Install the fan in the direction indicated by the arrow marked on the fan.
- Do not pinch the power cable of the fan during installation.

5.4.5 Replacing the H6 and H7 Inverter Modules

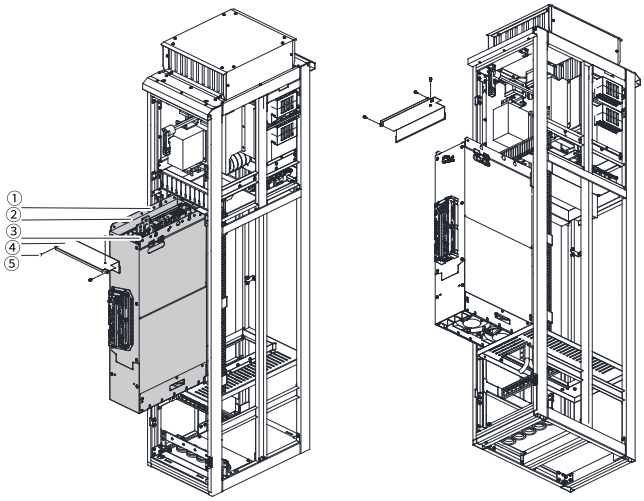


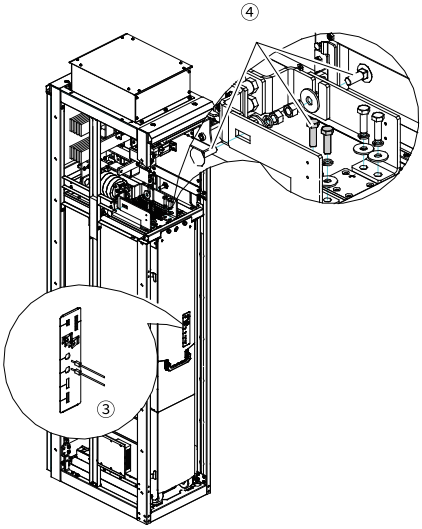
Figure 5-6 Replacing the H6 and H7 inverter modules

1. Disconnect the DC power supply of the drive system. Measure and confirm there is no residual voltage.
2. Open the cabinet door.
3. Remove the three mounting screws (⑤) on the front air separator (④) to remove the separator.
4. Disconnect all the control cables connected to the HCU control module at the front, move the cables to one side, and secure them to prevent obstruction

5. Unplug the external I/O terminals and control power terminal plug (③) of the inverter module.
6. Disconnect the input DC bus.
7. Disconnect the output AC cable.
8. Remove the fixing screws (②) of the inverter module.
9. Pull the inverter module out gradually until the eyebolts (①) on top of the inverter module can be connected to the hoisting device (or proper crane).
10. Make sure that the hoisting device has borne the weight of the inverter module and then pull the inverter module out completely.

Install the inverter module in reverse order.

5.4.6 Replacing the H8 Inverter Module



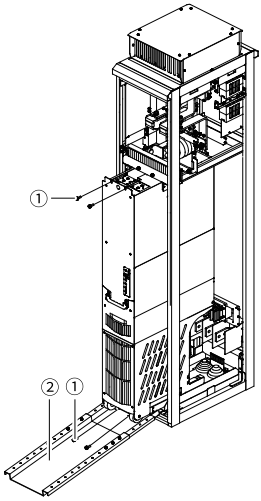


Figure 5-7 Replacing the H8 inverter module

1. Disconnect the DC power supply of the drive system. Measure and confirm there is no residual voltage.
2. Open the cabinet door to remove the top protective cover of the cabinet.
3. Remove the DC busbar (④) from the module and record the disassembly sequence and positions of the screws and washers.
4. Unplug the external I/O terminals and control power terminal plug (③) of the inverter module. Unplug the cable and put it aside.
5. Snap the guide rail (②) of the inverter module into the cabinet frame properly.
6. Remove the four M8 fixing screws (①) of the inverter module. Pull the module out along the inclined rail gently.
7. Hold the handle by right hand and press one foot against the base of the module to prevent the module from falling backward.
8. Move the module to a safe position outside the working area. Ensure that the module does not tip over, and unfold the anti-toppling bracket.

Install the inverter module in reverse order.

Note

It is recommended that the height of the cabinet base be lower than or equal to 10 mm to avoid an excessively large tilt angle of the guide rail.

Procedure of unfolding the anti-toppling bracket

1. Unscrew the two M3 screws (①).

2. Pull the support rods ② out toward the arrow directions and rotate them toward the outside of the trolley.
3. Release the support rods when one end of the rod comes into contact with the ground. Ensure that the rods are snapped into the limit slots.

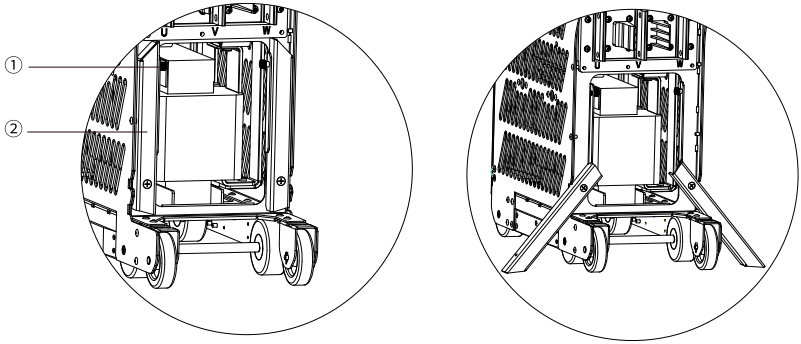


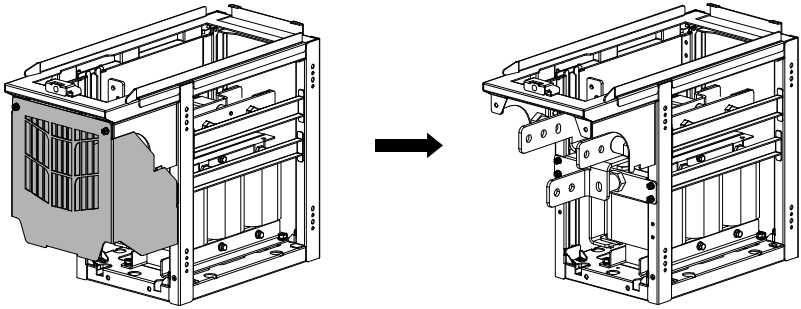
Figure 5-8 Anti-toppling bracket

Procedure of folding the anti-toppling bracket

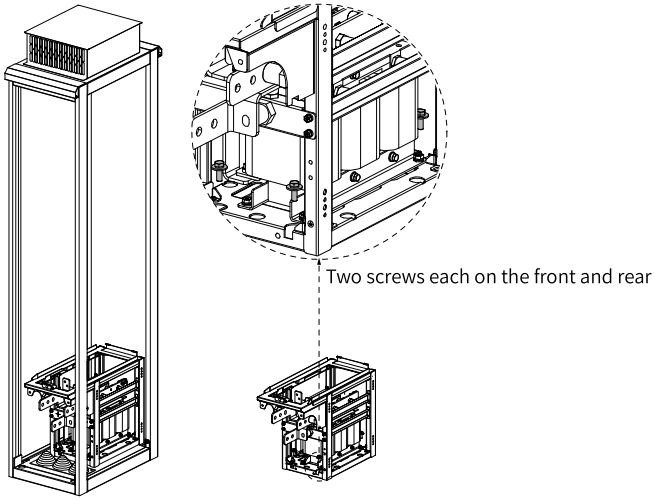
1. Pull the support rods (②) out from the limit slots and rotate the rods toward the inside of the trolley.
2. Release the support rods and snap them into the storage slots.
3. Fasten the two M3 screws (①).

5.4.7 Replacing the H8A Inverter Module

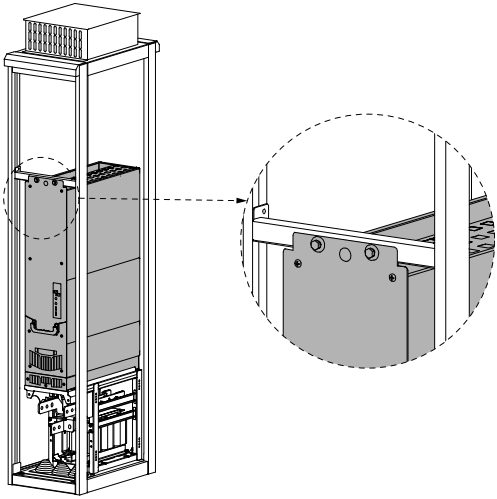
1. Remove the six M6 screws securing the front protective plate of the H8A-kit frame to remove the protective plate.



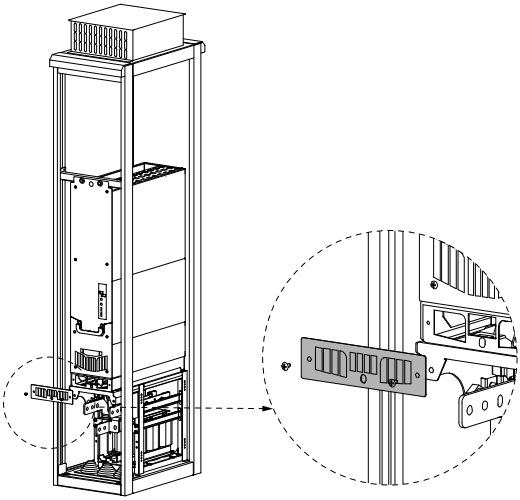
2. Fix the H8A-kit frame to the cabinet frame with four M8 screws. For details about the bottom fixing holes, see the H8A installation kit dimensions in *"6.6 Dimensions of Options" on page 157*.



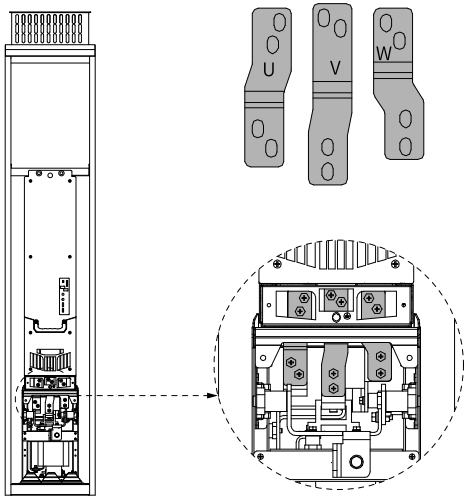
3. Install the H8A power module to the H8A-kit frame. Fix the top of the H8A power module to the cabinet beam (provided by the integrator) with two M8 screws.



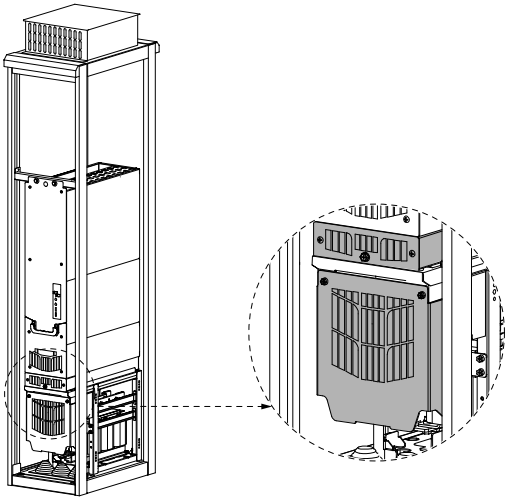
4. Remove the two M5 screws on the sheet-metal protective panel in the lower front of H8A to remove the sheet-metal protective panel.



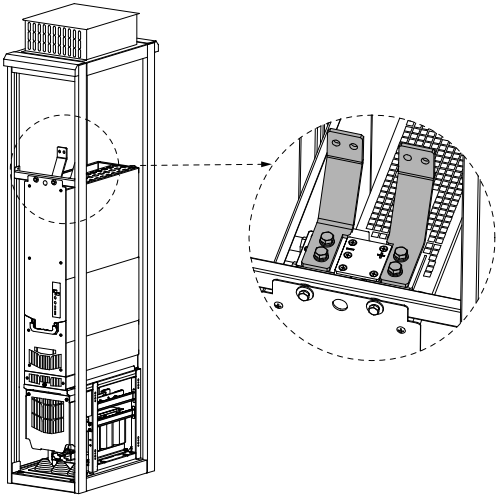
5. Secure the copper busbar (included in the H8A-kit) for U/V/W phase connection between H8A and H8A-kit with twelve M8 screws.



6. Install the protective plate removed in step 1 to the H8A-kit frame, install the sheet-metal protective plate removed in step 4, and then secure the H8A inverter module and H8A-kit frame with an M8 screw.



7. Use four M10 screws to install the positive and negative bus copper busbars (provided by the integrator) to the positive and negative bus terminals on the upper part of the module.



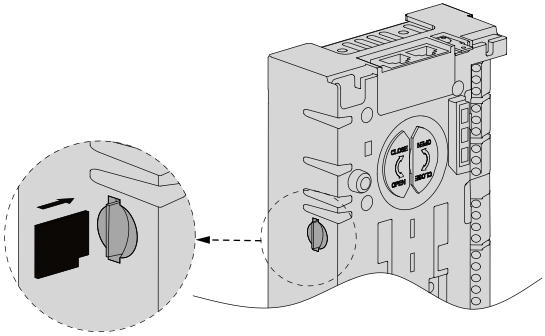
8. You can disassemble the module for maintenance in reverse order.

5.4.8 Replacing the SD Card and Battery of the HCU Control Module

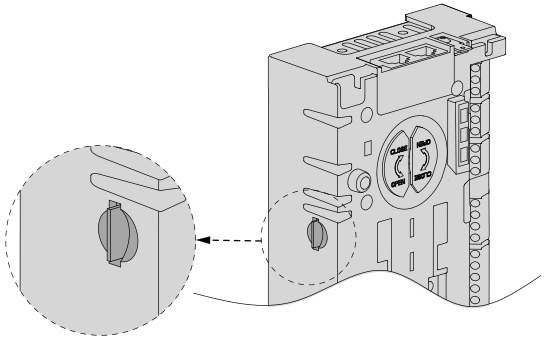
Replacing the memory card

After replacing the HCU control module, you can keep present parameter settings by inserting the original SD card from the fault module to the new module. To install and remove the SD card, do as follows.

1. Press the SD card to take it out straightly from the faulty module.
2. Push the SD card into the SD card base of the HCU control module, as shown below.



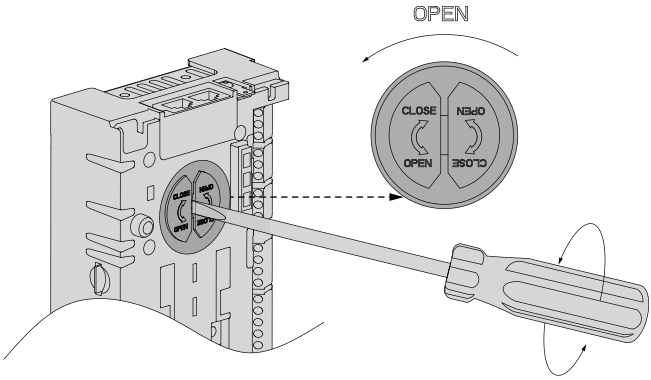
3. Ensure the SD card is inserted in place, and then check whether the SD card floats. Otherwise, an exception will occur due to poor contact.

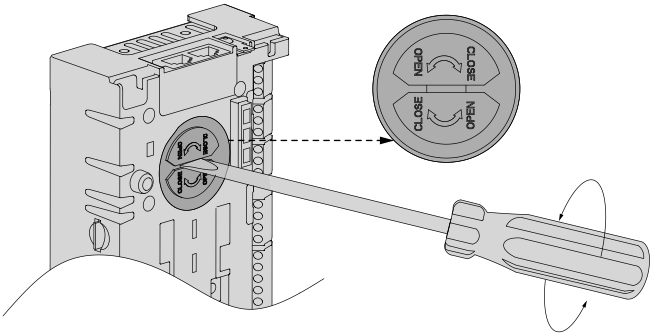


Replacing the battery

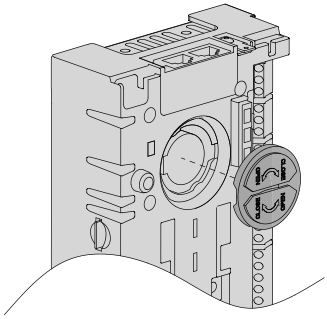
Steps:

1. Turn the battery cover 90° counterclockwise with a 2# straight screwdriver until the cover is released.

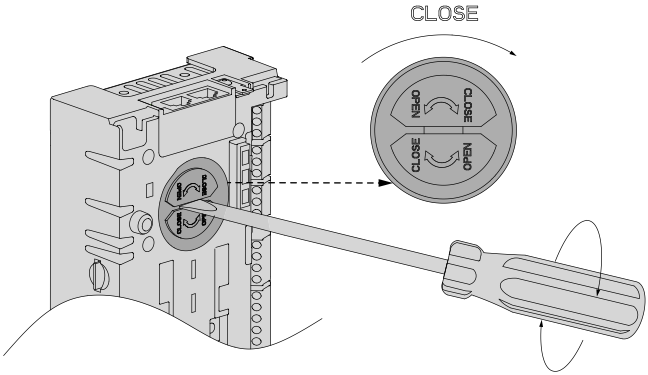


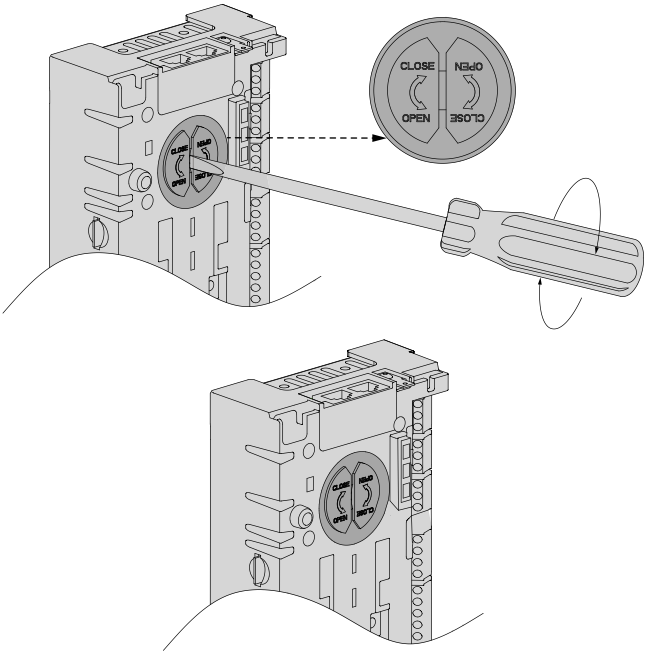


2. Remove the cover, press one side of the battery with the screwdriver, take the battery out and replace it with a new one.



3. Close the cover and rotate the cover 90° clockwise to fasten the cover.

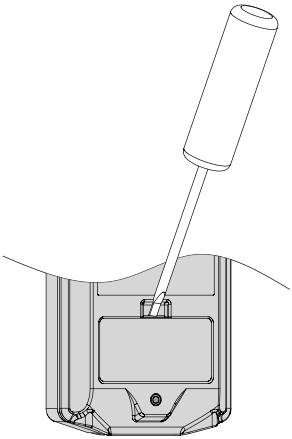




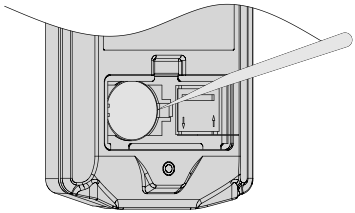
4. Dispose of the retired battery in accordance with local rules or applicable laws.

5.4.9 Replacing the SOP-20-880 Battery

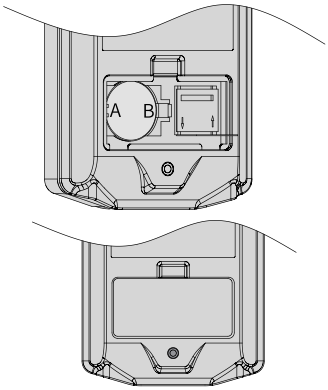
1. Remove the battery cover with a straight screwdriver or finger.



2. Pry the battery out with tweezers or a straight screwdriver, as shown below.



3. Insert the battery into the snap-fit joint on end A first, and then press down the battery on end B to install the battery in place.



4. Install the battery cover with a tool or your finger.

6 Options

6.1 Function Expansion Module

For details about the function expansion modules, see *"4.1.1 HCU control module composition" on page 106*. For their usage, see their user guides.

6.2 DC Bus Pre-charge Module

Inovance has developed a series of DC bus pre-charge modules based on different application requirements of the MD880 series inverter modules, which facilitates system troubleshooting and single-node maintenance.

Table 6–1 DC bus pre-charge module models

Applicable Model	DC Bus Pre-charge Module
MD880-50M-0009-4	HST-1001
MD880-50M-0013-4	
MD880-50M-0017-4	
MD880-50M-0023-4	
MD880-50M-0033-4	HST-1002
MD880-50M-0038-4	
MD880-50M-0048-4	
MD880-50M-0060-4	HST-1003
MD880-50M-0078-4	
MD880-50M-0094-4	
MD880-50M-0116-4	HST-20
MD880-50M-0149-4	
MD880-50M-0183-4	
MD880-50M-0245-4	HST-6004
MD880-50M-0299-4	
MD880-50M-0062-7	
MD880-50M-0082-7	
MD880-50M-0099-7	
MD880-50M-0125-7	
MD880-50M-0144-7	
MD880-50M-0192-7	
MD880-50M-0349-4	HST-7004
MD880-50M-0395-4	
MD880-50M-0217-7	
MD880-50M-0270-7	

The HST-1001, HST-1002, and HST-1003 DC bus pre-charge modules are identical in appearance and structural dimensions. The following figure shows how they work with the MD880-50 series inverter module.

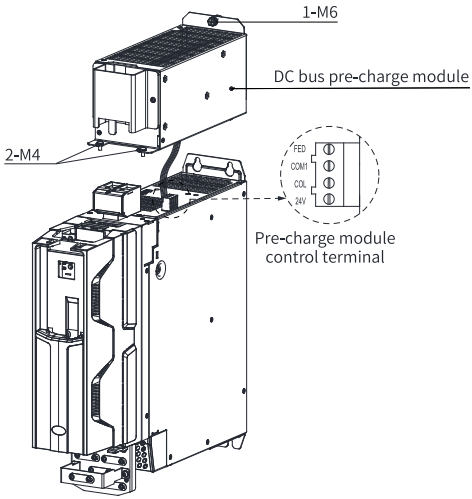


Figure 6-1 Installation of the HST-1001/HST-1002/HST-1003 DC bus pre-charge module

The following figure shows how the HST-20 DC bus pre-charge module works with the MD880-50 series inverter module.

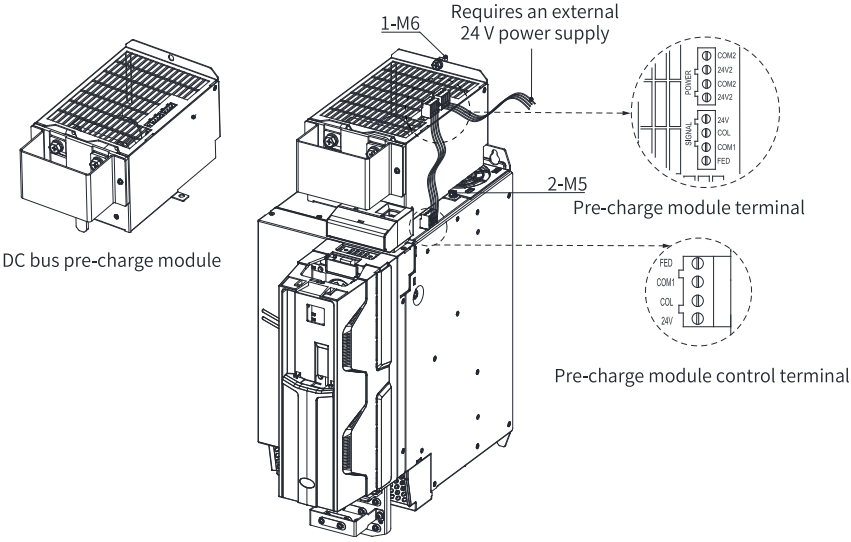


Figure 6-2 Installation of the HST-20 DC bus pre-charge module

Procedure of installing the HST-6004/HST-7004 module (HST-6004 in this example)

1. Remove the two M6 screws on the front of HST-6004, as shown in Figure a.

2. Rotate the upper assembly of HST-6004 upward, and then take it out, as shown in Figure b.
3. Disassemble HST-6004 into a function assembly (Figure c) and a base (Figure d).
4. Connect the cables to terminals of the pre-charge module, as shown in Figure e.
5. Remove the four M4 screws at the back top of the inverter module, as shown in Figure f.
6. Align the previously removed HST-6004 module base with the four M4 holes and secure it, as shown in Figure g.
7. Re-install the HST-6004 function module onto the base, and connect the pre-charge module terminals to the corresponding inverter terminals. Fix the copper busbar at the lower part of the HST-6004 module to the negative pole of the copper busbar of the H6 inverter module with M10x30 square-neck bolts (GB14), flat washers, spring washers, and nuts.

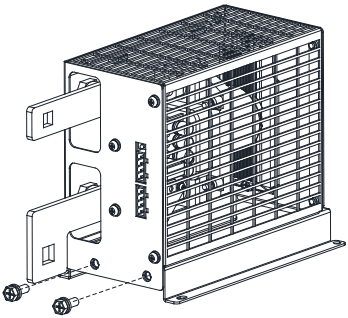


Figure a

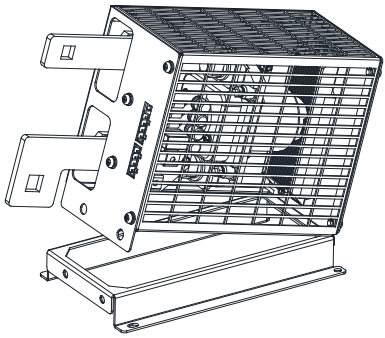


Figure b

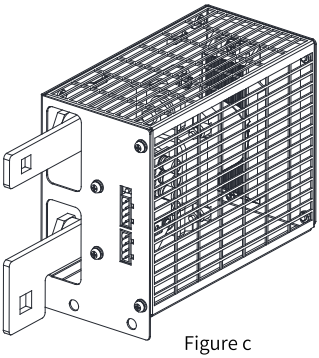


Figure c

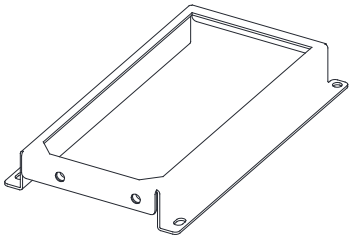


Figure d

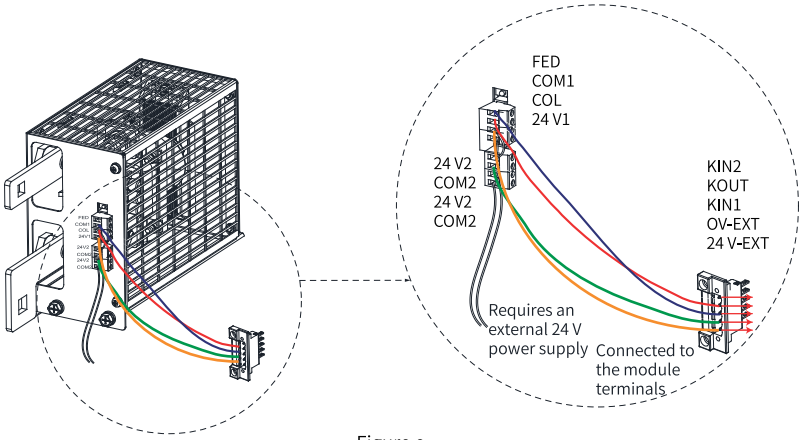


Figure e

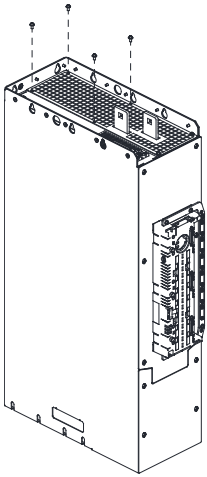


Figure f

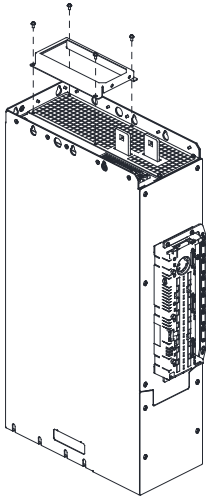
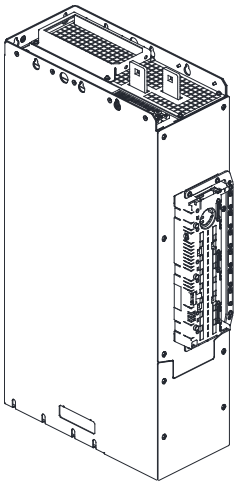
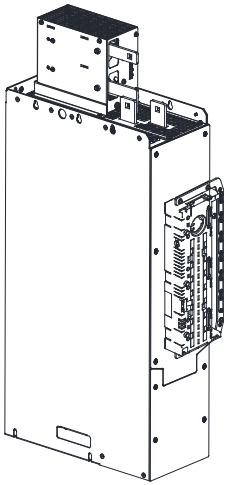


Figure g



图h



图I

6.3 Quick Installation Kit for the H8 Inverter Module

The H8 inverter module uses a quick connector as its AC output terminal by default. Therefore, a matching quick connector that fits into the inverter module is required during installation. Otherwise, the quick connector may overheat when the module is running with large current. If you purchase the H8 inverter module separately, it is recommended that you use the quick installation kit provided by Inovance. Follow these steps to install the module:

1. Secure the quick installation kit to the cabinet with four M8 screws at the bottom.
2. Push the module into the cabinet and secure the module with two M8 screws of the quick installation kit at the bottom and two M8 screws at the upper part of the cabinet.

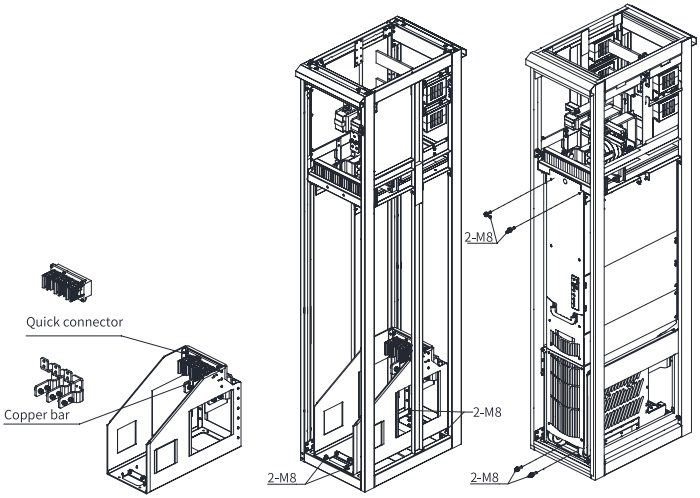


Figure 6-3 Installation with the H8 kit

Table 6–2 Quick installation kit models

Quick Installation Kit	Applicable Model
H8-quick-kit	All models with the H8 structure

6.4 Guide Rail for the H8 Inverter Module

During installation, replacement, and maintenance, guide rails can make it easy to push the H8 inverter module into the cabinet or pull it out from the cabinet.

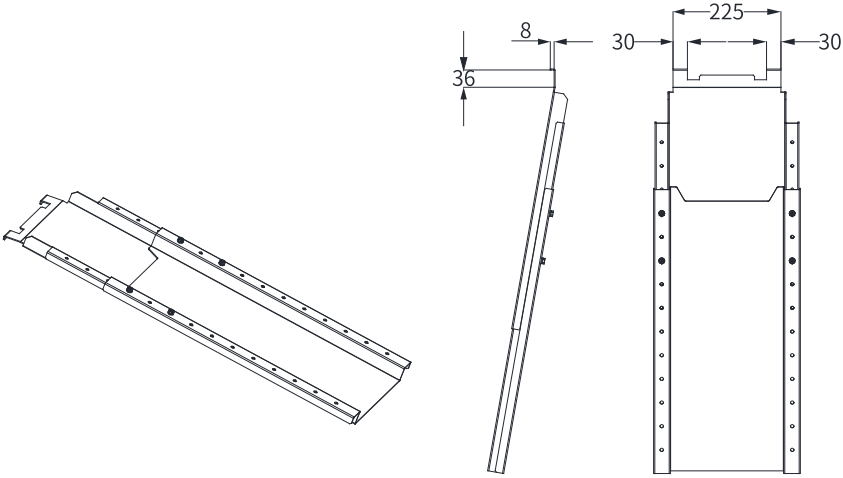


Figure 6-4 H8 guide rail (unit: mm)

Table 6–3 Guide rail models

Guide Rail	Applicable Model	Remarks
mounting-rail	All models with the H8 structure	Adjustable length range: 650 mm to 900 mm

6.5 DC Bus Protective Cover

To meet on-site safety protection requirements and improve customer satisfaction, Inovance equips the H6 and H7 inverter modules with DC bus protective covers as standard. This protective cover can be installed where safety protection is required during on-site applications. However, it is not suitable for applications where the installation space is limited. In this case, you need to take other protection measures.

Note

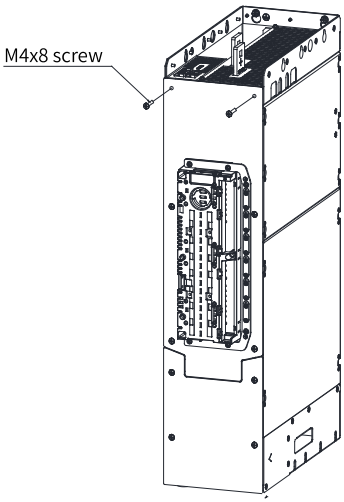
Installing the DC bus protective cover will increase the module height by 200 mm. Ensure sufficient installation space is reserved.

The DC bus protective cover should be installed after the module is securely fixed.

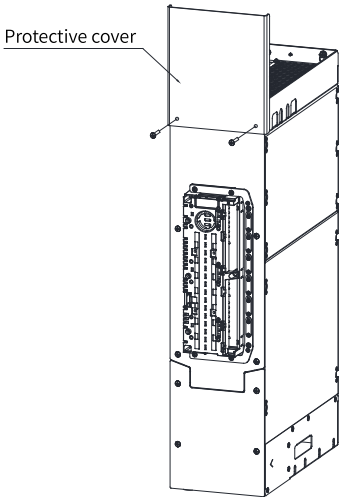
When the H6/H7 inverter module is equipped with a power-on pre-charge module, the method of installing the protective cover is the same as described in this section.

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1. Remove the two screws on the module.



2. Secure the protective cover with the two screws, as shown in the following figure.



3. Attach a high voltage warning label to the protective cover.

6.6 Dimensions of Options

DC bus pre-charge module

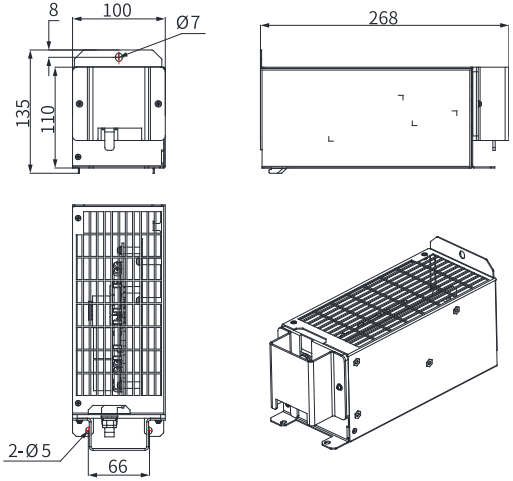


Figure 6-5 Dimensions of the HST-1001/HST-1002/HST-1003 DC bus pre-charge module

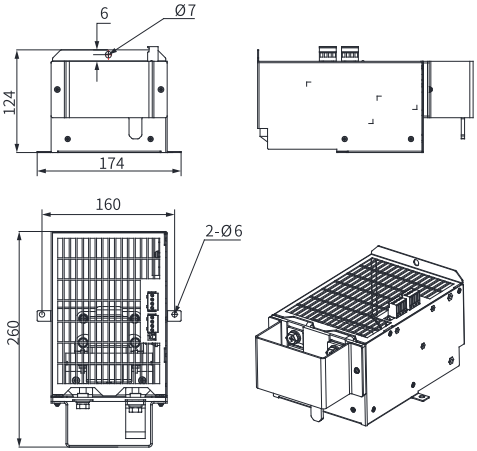


Figure 6-6 Dimensions of the HST-20 DC bus pre-charge module (unit: mm)

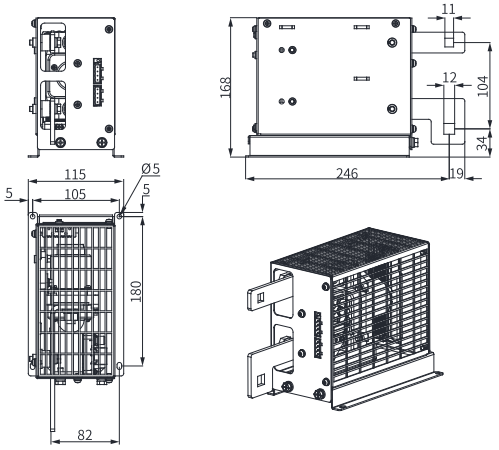


Figure 6-7 Dimensions of the HST-6004 DC bus pre-charge module (unit: mm)

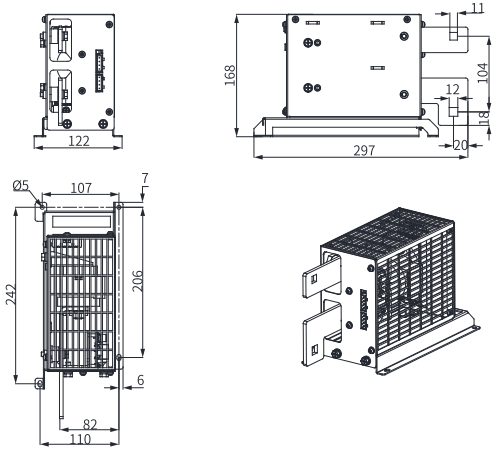


Figure 6-8 Dimensions of the HST-7004 DC bus pre-charge module (unit: mm)

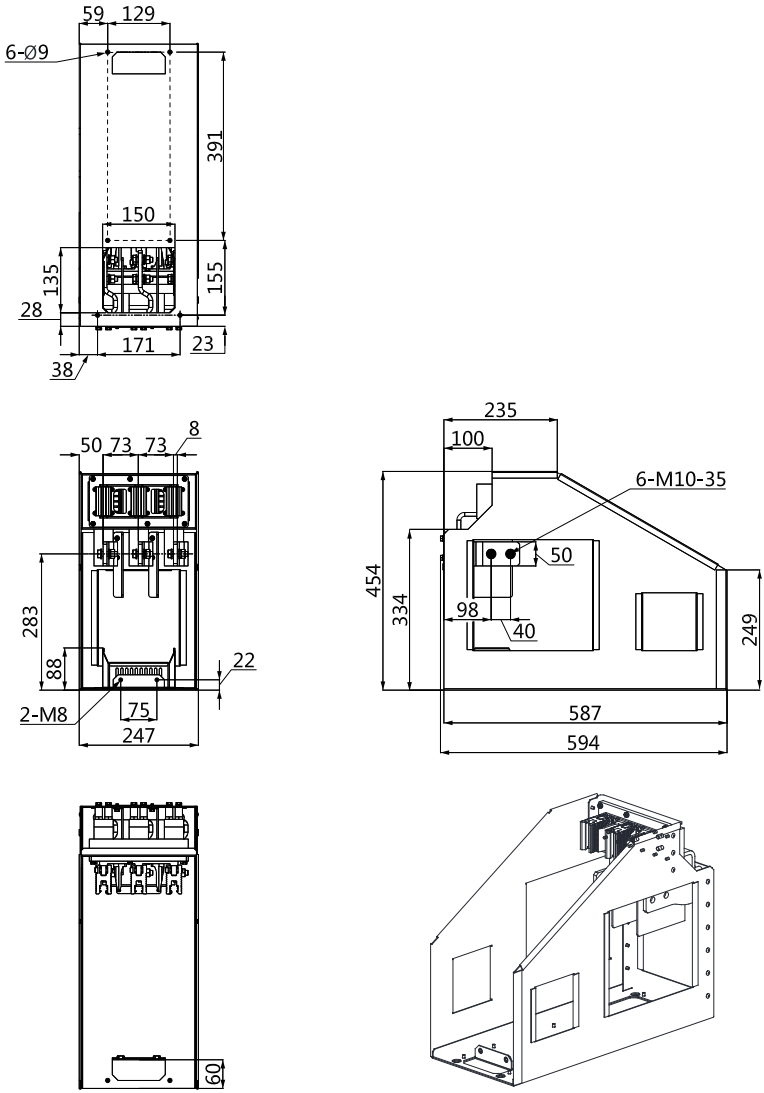


Figure 6-9 Dimensions of H8-quick-kit (unit: mm)

H8A installation kit

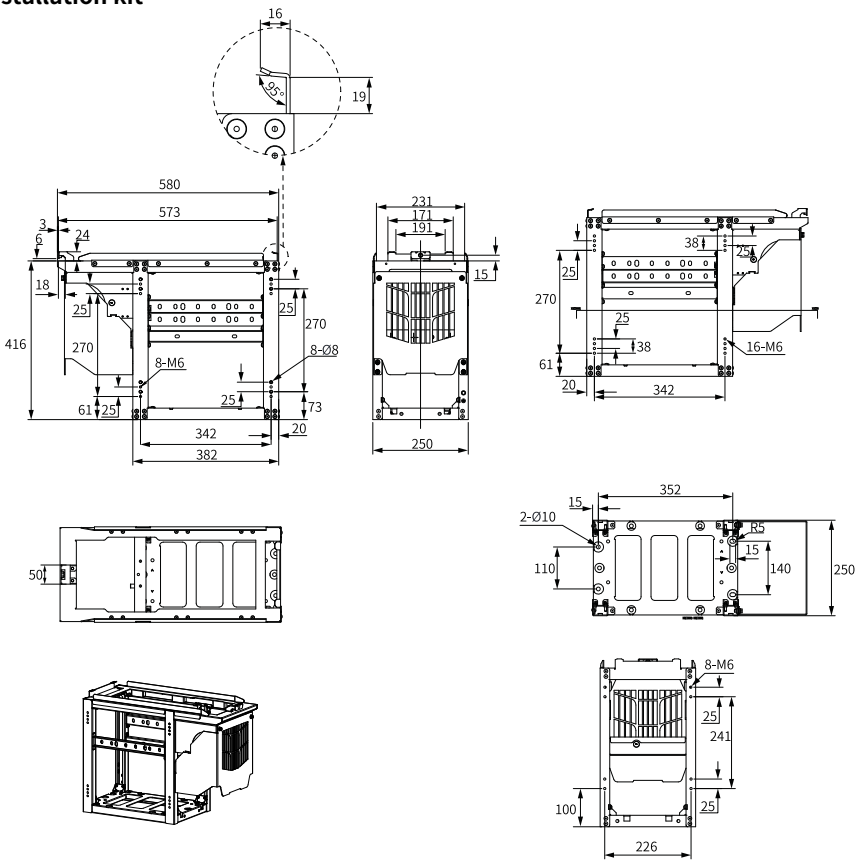


Figure 6-10 Dimensions of the H8A installation kit (unit: mm)

7 Ordering Guide

Note

- The SG and CS versions have identical specifications, but only the CS version supports STO, while the SG version does not.
- The H1 to H7 inverter modules come standard with an inverter control module. They can be configured with operating panels, communication modules, and encoder cards as needed.
- For H8 and H8A, due to their parallel application, the inverter control module is optional. They can be configured with operating panels, communication modules, and encoder cards as needed.
- The H8A mounting base is available in two specifications: H8A-kit-L (with output reactor) and H8A-kit (without output reactor). The reactor in the mounting base is mainly used for current equalizing. Therefore, H8A-kit-L must be selected for parallel applications. In single-unit applications, H8A-kit is selected by default. However, if the motor output cable is long, H8A-kit-L is recommended to reduce the dv/dt value of the output voltage, thereby reducing voltage stress at the motor end.
- If the H8 quick installation kit (option) is not selected, you need to fabricate copper bars for connection to the motor power cables. In this case, pay special attention to the safety clearance between the fabricated copper bars and the surrounding cabinet to avoid ground faults.

Table 7–1 Ordering guide for MD880-50 series inverter module (CS models)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
0009-4	H1	1. MD880-50M-0009-4-CS	1	Inverter module
0013-4	H1	1. MD880-50M-0013-4-CS	1	Inverter module
0017-4	H1	1. MD880-50M-0017-4-CS	1	Inverter module
0023-4	H1	1. MD880-50M-0023-4-CS	1	Inverter module
0033-4	H2	1. MD880-50M-0033-4-CS	1	Inverter module
0038-4	H2	1. MD880-50M-0038-4-CS	1	Inverter module
0048-4	H2	1. MD880-50M-0048-4-CS	1	Inverter module
0060-4	H2	1. MD880-50M-0060-4-CS	1	Inverter module
0078-4	H3	1. MD880-50M-0078-4-CS	1	Inverter module
0094-4	H3	1. MD880-50M-0094-4-CS	1	Inverter module
0116-4	H4	1. MD880-50M-0116-4-CS	1	Inverter module
0149-4	H4	1. MD880-50M-0149-4-CS	1	Inverter module
0183-4	H4	1. MD880-50M-0183-4-CS	1	Inverter module
0245-4	H6	1. MD880-50M-0245-4-CS	1	Inverter module
0299-4	H6	1. MD880-50M-0299-4-CS	1	Inverter module
0349-4	H7	1. MD880-50M-0349-4-CS	1	Inverter module
0395-4	H7	1. MD880-50M-0395-4-CS	1	Inverter module

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
0516-4	H8	1. MD880-50M-0516-4-L-CS 2. HCU-50S-CS 3. H8-quick-kit	1 1 1	Inverter module Inverter controller (for cranes) H8 quick installation base (option)
0639-4	H8	1. MD880-50M-0639-4-L-CS 2. HCU-50S-CS 3. H8-quick-kit	1 1 1	Inverter module Inverter controller (for cranes) H8 quick installation base (option)
0757-4	H8	1. MD880-50M-0757-4-L-CS 2. HCU-50S-CS 3. H8-quick-kit	1 1 1	Inverter module Inverter controller (for cranes) H8 quick installation base (option)
0900-4	H8	1. MD880-50M-0900-4-L-CS 2. HCU-50S-CS 3. H8-quick-kit	1 1 1	Inverter module Inverter controller (for cranes) H8 quick installation base (option)
1214-4	2 x H8	1. MD880-50M-0639-4-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
1439-4	2 x H8	1. MD880-50M-0757-4-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
1710-4	2 x H8	1. MD880-50M-0900-4-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
2158-4	3 x H8	1. MD880-50M-0757-4-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	3 1 1 3	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
2565-4	3 x H8	1. MD880-50M-0900-4-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	3 1 1 3	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
3420-4	4 x H8	1. MD880-50M-0900-4-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	4 1 1 3	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
4275-4	5 x H8	1. MD880-50M-0900-4-L-CS 2. HCU-50S-CS 3. HPCU-60 4. H8-quick-kit	5 1 1 5	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
5130-4	6 x H8	1. MD880-50M-0900-4-L-CS 2. HCU-50S-CS 3. HPCU-60 4. H8-quick-kit	6 1 1 6	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
0516-4	H8A	3. MD880-50M-0516-4-CS 2. HCU-50S-CS 3. H8A-kit	1 1 1	Inverter module Inverter controller (for cranes) H8A mounting base (option)
0639-4	H8A	1. MD880-50M-0516-4-CS 2. HCU-50S-CS 3. H8A-kit	1 1 1	Inverter module Inverter controller (for cranes) H8A mounting base (option)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
0757-4	H8A	1. MD880-50M-0516-4-CS 2. HCU-50S-CS 3. H8A-kit	1 1 1	Inverter module Inverter controller (for cranes) H8A mounting base (option)
0900-4	H8A	1. MD880-50M-0516-4-CS 2. HCU-50S-CS 3. H8A-kit	1 1 1	Inverter module Inverter controller (for cranes) H8A mounting base (option)
1214-4	2 x H8A	1. MD880-50M-0639-4-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
1439-4	2 x H8A	1. MD880-50M-0757-4-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
1710-4	2 x H8A	1. MD880-50M-0900-4-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
2158-4	3 x H8A	1. MD880-50M-0757-4-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	3 1 1 3	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
2565-4	3 x H8A	1. MD880-50M-0900-4-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	3 1 1 3	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
3420-4	4 x H8A	1. MD880-50M-0900-4-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	4 1 1 3	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
4275-4	5 x H8A	1. MD880-50M-0900-4-CS 2. HCU-50S-CS 3. HPCU-60 4. H8A-kit-L	5 1 1 5	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
5130-4	6 x H8A	1. MD880-50M-0900-4-CS 2. HCU-50S-CS 3. HPCU-60 4. H8A-kit-L	6 1 1 6	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
0349-5	H7	1. MD880-50M-0349-5-CS	1	Inverter module
0590-5	H8A	1. MD880-50M-0590-5-CS 2. HCU-50S-CS 3. H8A-kit-L	1 1 1	Inverter module Inverter controller (for cranes) H8A quick installation base (option)
0810-5	H8A	1. MD880-50M-0810-5-CS 2. HCU-50S-CS 3. H8A-kit-L	1 1 1	Inverter module Inverter controller (for cranes) H8A quick installation base (option)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
1121-5	2 x H8A	1. MD880-50M-0590-5-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel H8A quick installation base (option)
1539-5	2 x H8A	1. MD880-50M-0810-5-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel H8A quick installation base (option)
2309-5	3 x H8A	1. MD880-50M-0810-5-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	3 1 1 3	Inverter module Inverter controller (for cranes) Parallel H8A quick installation base (option)
3078-5	4 x H8A	1. MD880-50M-0810-5-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	4 1 1 4	Inverter module Inverter controller (for cranes) Parallel H8A quick installation base (option)
3848-5	5 x H8A	1. MD880-50M-0810-5-CS 2. HCU-50S-CS 3. HPCU-60 4. H8A-kit-L	5 1 1 5	Inverter module Inverter controller (for cranes) Parallel H8A quick installation base (option)
4617-5	6 x H8A	1. MD880-50M-0810-5-CS 2. HCU-50S-CS 3. HPCU-60 4. H8A-kit-L	6 1 1 6	Inverter module Inverter controller (for cranes) Parallel H8A quick installation base (option)
5387-5	7 x H8A	1. MD880-50M-0810-5-CS 2. HCU-50S-CS 3. HPCU-60 4. H8A-kit-L	7 1 1 7	Inverter module Inverter controller (for cranes) Parallel H8A quick installation base (option)
0062-7	H6	1. MD880-50M-0062-7-CS	1	Inverter module
0082-7	H6	1. MD880-50M-0082-7-CS	1	Inverter module
0099-7	H6	1. MD880-50M-0099-7-CS	1	Inverter module
0125-7	H6	1. MD880-50M-0125-7-CS	1	Inverter module
0144-7	H6	1. MD880-50M-0144-7-CS	1	Inverter module

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
0192-7	H6	1. MD880-50M-0192-7-CS	1	Inverter module
0217-7	H7	1. MD880-50M-0217-7-CS	1	Inverter module
0270-7	H7	1. MD880-50M-0270-7-CS	1	Inverter module
0340-7	H8	1. MD880-50M-0340-7-L-CS 2. HCU-50S-CS 3. H8-quick-kit	1 1 1	Inverter module Inverter controller (for cranes) H8 quick installation base (option)
0410-7	H8	1. MD880-50M-0410-7-L-CS 2. HCU-50S-CS 3. H8-quick-kit	1 1 1	Inverter module Inverter controller (for cranes) H8 quick installation base (option)
0530-7	H8	1. MD880-50M-0530-7-L-CS 2. HCU-50S-CS 3. H8-quick-kit	1 1 1	Inverter module Inverter controller (for cranes) H8 quick installation base (option)
0600-7	H8	1. MD880-50M-0650-7-L-CS 2. HCU-50S-CS 3. H8-quick-kit	1 1 1	Inverter module Inverter controller (for cranes) H8 quick installation base (option)
0650-7	H8	1. MD880-50M-0650-7-L-CS 2. HCU-50S-CS 3. H8-quick-kit	1 1 1	Inverter module Inverter controller (for cranes) H8 quick installation base (option)
0721-7	H8	1. MD880-50M-0721-7-L-CS 2. HCU-50S-CS 3. H8-quick-kit	1 1 1	Inverter module Inverter controller (for cranes) H8 quick installation base (option)
0779-7	2 x H8	1. MD880-50M-0410-7-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel H8 quick installation base (option)
1007-7	2 x H8	1. MD880-50M-0530-7-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
1140-7	2 x H8	1. MD880-50M-0600-7-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
1235-7	2 x H8	1. MD880-50M-0650-7-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
1370-7	2 x H8	1. MD880-50M-0721-7-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
1510-7	3 x H8	1. MD880-50M-0530-7-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	3 1 1 3	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
1710-7	3 x H8	1. MD880-50M-0600-7-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	3 1 1 3	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
1853-7	3 x H8	1. MD880-50M-0650-7-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	3 1 1 3	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
2055-7	3 x H8	1. MD880-50M-0721-7-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	3 1 1 3	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
2280-7	4 x H8	1. MD880-50M-0600-7-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	4 1 1 4	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
2470-7	4 x H8	1. MD880-50M-0650-7-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	4 1 1 4	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
2740-7	4 x H8	1. MD880-50M-0721-7-L-CS 2. HCU-50S-CS 3. HPCU-40 4. H8-quick-kit	4 1 1 4	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
3088-7	5 x H8	1. MD880-50M-0650-7-L-CS 2. HCU-50S-CS 3. HPCU-60 4. H8-quick-kit	5 1 1 5	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
3425-7	5 x H8	1. MD880-50M-0721-7-L-CS 2. HCU-50S-CS 3. HPCU-60 4. H8-quick-kit	5 1 1 5	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
3705-7	6 x H8	1. MD880-50M-0650-7-L-CS 2. HCU-50S-CS 3. HPCU-60 4. H8-quick-kit	6 1 1 6	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
4110-7	6 x H8	1. MD880-50M-0721-7-L-CS 2. HCU-50S-CS 3. HPCU-60 4. H8-quick-kit	6 1 1 6	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
4323-7	7 x H8	1. MD880-50M-0650-7-L-CS 2. HCU-50S-CS 3. HPCU-60 4. H8-quick-kit	7 1 1 7	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
4795-7	7 x H8	1. MD880-50M-0721-7-L-CS 2. HCU-50S-CS 3. HPCU-60 4. H8-quick-kit	7 1 1 7	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
4940-7	8 x H8	1. MD880-50M-0650-7-L-CS 2. HCU-50S-CS 3. HPCU-60 4. H8-quick-kit	8 1 1 8	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
5480-7	8 x H8	1. MD880-50M-0721-7-L-CS 2. HCU-50S-CS 3. HPCU-60 4. H8-quick-kit	8 1 1 8	Inverter module Inverter controller (for cranes) Parallel expansion module H8 quick installation base (option)
0340-7	H8A	1. MD880-50M-0340-7-CS 2. HCU-50S-CS 3. H8A-kit	1 1 1	Inverter module Inverter controller (for cranes) H8A mounting base (option)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
0410-7	H8A	1. MD880-50M-0410-7-CS 2. HCU-50S-CS 3. H8A-kit	1 1 1	Inverter module Inverter controller (for cranes) H8A mounting base (option)
0530-7	H8A	1. MD880-50M-0530-7-CS 2. HCU-50S-CS 3. H8A-kit	1 1 1	Inverter module Inverter controller (for cranes) H8A mounting base (option)
0600-7	H8A	1. MD880-50M-0650-7-CS 2. HCU-50S-CS 3. H8A-kit	1 1 1	Inverter module Inverter controller (for cranes) H8A mounting base (option)
0650-7	H8A	1. MD880-50M-0650-7-CS 2. HCU-50S-CS 3. H8A-kit	1 1 1	Inverter module Inverter controller (for cranes) H8A mounting base (option)
0721-7	H8A	1. MD880-50M-0721-7-CS 2. HCU-50S-CS 3. H8A-kit	1 1 1	Inverter module Inverter controller (for cranes) H8A mounting base (option)
0779-7	2 x H8A	1. MD880-50M-0410-7-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
1007-7	2 x H8A	1. MD880-50M-0530-7-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
1140-7	2 x H8A	1. MD880-50M-0600-7-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
1235-7	2 x H8A	1. MD880-50M-0650-7-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
1370-7	2 x H8A	1. MD880-50M-0721-7-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
1510-7	3 x H8A	1. MD880-50M-0530-7-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	3 1 1 3	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
1710-7	3 x H8A	1. MD880-50M-0600-7-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	3 1 1 3	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
1853-7	3 x H8A	1. MD880-50M-0650-7-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	3 1 1 3	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
2055-7	3 x H8A	1. MD880-50M-0721-7-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	3 1 1 3	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
2280-7	4 x H8A	1. MD880-50M-0600-7-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	4 1 1 4	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
2470-7	4 x H8A	1. MD880-50M-0650-7-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	4 1 1 4	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
2740-7	4 x H8A	1. MD880-50M-0721-7-CS 2. HCU-50S-CS 3. HPCU-40 4. H8A-kit-L	4 1 1 4	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
3088-7	5 x H8A	1. MD880-50M-0650-7-CS 2. HCU-50S-CS 3. HPCU-60 4. H8A-kit-L	5 1 1 5	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
3425-7	5 x H8A	1. MD880-50M-0721-7-CS 2. HCU-50S-CS 3. HPCU-60 4. H8A-kit-L	5 1 1 5	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)

Model MD880-50-...	Structure	Part No.	Quantity	Remarks
3705-7	6 x H8A	1. MD880-50M-0650-7-CS 2. HCU-50S-CS 3. HPCU-60 4. H8A-kit-L	6 1 1 6	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
4110-7	6 x H8A	1. MD880-50M-0721-7-CS 2. HCU-50S-CS 3. HPCU-60 4. H8A-kit-L	6 1 1 6	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
4323-7	7 x H8A	1. MD880-50M-0650-7-CS 2. HCU-50S-CS 3. HPCU-60 4. H8A-kit-L	7 1 1 7	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
4795-7	7 x H8A	1. MD880-50M-0721-7-CS 2. HCU-50S-CS 3. HPCU-60 4. H8A-kit-L	7 1 1 7	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
4940-7	8 x H8A	1. MD880-50M-0650-7-CS 2. HCU-50S-CS 3. HPCU-60 4. H8A-kit-L	8 1 1 8	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)
5480-7	8 x H8A	1. MD880-50M-0721-7-CS 2. HCU-50S-CS 3. HPCU-60 4. H8A-kit-L	8 1 1 8	Inverter module Inverter controller (for cranes) Parallel expansion module H8A quick installation base with reactor (option)

Note: When the H8 quick-plug installation kit (option) is not selected, you need to make a copper busbar to connect the motor power cables. Pay special attention to the safety distance between the copper busbar and the surrounding cabinet to avoid grounding faults.

Table 7–2 Ordering guide for MD880-50 series inverter module (SG models)

Model MD880-50-...	Frame	Part No.	Quantity	Remarks
0009-4	H1	1. MD880-50M-0009-4-SG	1	Inverter module
0013-4	H1	1. MD880-50M-0013-4-SG	1	Inverter module
0017-4	H1	1. MD880-50M-0017-4-SG	1	Inverter module
0023-4	H1	1. MD880-50M-0023-4-SG	1	Inverter module
0033-4	H2	1. MD880-50M-0033-4-SG	1	Inverter module
0038-4	H2	1. MD880-50M-0038-4-SG	1	Inverter module
0048-4	H2	1. MD880-50M-0048-4-SG	1	Inverter module
0060-4	H2	1. MD880-50M-0060-4-SG	1	Inverter module
0078-4	H3	1. MD880-50M-0078-4-SG	1	Inverter module
0094-4	H3	1. MD880-50M-0094-4-SG	1	Inverter module
0116-4	H4	1. MD880-50M-0116-4-SG	1	Inverter module
0149-4	H4	1. MD880-50M-0149-4-SG	1	Inverter module
0183-4	H4	1. MD880-50M-0183-4-SG	1	Inverter module
0245-4	H6	1. MD880-50M-0245-4-SG	1	Inverter module
0299-4	H6	1. MD880-50M-0299-4-SG	1	Inverter module
0349-4	H7	1. MD880-50M-0349-4-SG	1	Inverter module
0395-4	H7	1. MD880-50M-0395-4-SG	1	Inverter module
0516-4	H8	1. MD880-50M-0516-4-SG 2. HCU-50S 3. H8-quick-kit	1 1 1	Inverter module Inverter controller H8 quick installation kit (option)
0516-4	H8A	1. MD880-50M-0516-4-SG-N 2. HCU-50S 3. H8A-kit	1 1 1	Inverter module Inverter controller H8A mounting base (option)
0639-4	H8	1. MD880-50M-0639-4-SG 2. HCU-50S 3. H8-quick-kit	1 1 1	Inverter module Inverter controller H8 quick installation kit (option)
0639-4	H8A	1. MD880-50M-0639-4-SG-N 2. HCU-50S 3. H8A-kit	1 1 1	Inverter module Inverter controller H8A mounting base (option)
0757-4	H8	1. MD880-50M-0757-4-SG 2. HCU-50S 3. H8-quick-kit	1 1 1	Inverter module Inverter controller H8 quick installation kit (option)
0757-4	H8A	1. MD880-50M-0757-4-SG-N 2. HCU-50S 3. H8A-kit	1 1 1	Inverter module Inverter controller H8A mounting base (option)

Model MD880-50-...	Frame	Part No.	Quantity	Remarks
0900-4	H8	1. MD880-50M-0900-4-SG 2. HCU-50S 3. H8-quick-kit	1 1 1	Inverter module Inverter controller H8 quick installation kit (option)
0900-4	H8A	1. MD880-50M-0900-4-SG-N 2. HCU-50S 3. H8A-kit	1 1 1	Inverter module Inverter controller H8A mounting base (option)
1213-4	2 x H8	1. MD880-50M-0639-4-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	2 1 1 2	Inverter module Inverter controller H8 quick installation kit (option)
1213-4	2 x H8A	1. MD880-50M-0639-4-SG-N 2. HCU-50S 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
1439-4	2 x H8	1. MD880-50M-0757-4-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	2 1 1 2	Inverter module Inverter controller H8 quick installation kit (option)
1439-4	2 x H8A	1. MD880-50M-0757-4-SG-N 2. HCU-50S 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
1710-4	2 x H8	1. MD880-50M-0900-4-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	2 1 1 2	Inverter module Inverter controller H8 quick installation kit (option)
1710-4	2 x H8A	1. MD880-50M-0900-4-SG-N 2. HCU-50S 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
2158-4	3 x H8	1. MD880-50M-0757-4-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	3 1 1 3	Inverter module Inverter controller H8 quick installation kit (option)
2158-4	3 x H8A	1. MD880-50M-0757-4-SG-N 2. HCU-50S 3. HPCU-40 4. H8A-kit-L	3 1 1 3	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)

Model MD880-50-...	Frame	Part No.	Quantity	Remarks
2565-4	3 x H8	1. MD880-50M-0900-4-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	3 1 1 3	Inverter module Inverter controller H8 quick installation kit (option)
2565-4	3 x H8A	1. MD880-50M-0900-4-SG-N 2. HCU-50S 3. HPCU-40 4. H8A-kit-L	3 1 1 3	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
3420-4	4 x H8	1. MD880-50M-0900-4-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	4 1 1 4	Inverter module Inverter controller H8 quick installation kit (option)
3420-4	4 x H8A	1. MD880-50M-0900-4-SG-N 2. HCU-50S 3. HPCU-40 4. H8A-kit-L	4 1 1 4	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
4275-4	5 x H8	1. MD880-50M-0900-4-SG 2. HCU-50S 3. HPCU-60 4. H8-quick-kit	5 1 1 5	Inverter module Inverter controller H8 quick installation kit (option)
4275-4	5 x H8A	1. MD880-50M-0900-4-SG-N 2. HCU-50S 3. HPCU-60 4. H8A-kit-L	5 1 1 5	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
5130-4	6 x H8	1. MD880-50M-0900-4-SG 2. HCU-50S 3. HPCU-60 4. H8-quick-kit	6 1 1 6	Inverter module Inverter controller H8 quick installation kit (option)
5130-4	6 x H8A	1. MD880-50M-0900-4-SG-N 2. HCU-50S 3. HPCU-60 4. H8A-kit-L	6 1 1 6	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
0062-7	H6	1. MD880-50M-0062-7-SG	1	Inverter module
0082-7	H6	1. MD880-50M-0082-7-SG	1	Inverter module
0099-7	H6	1. MD880-50M-0099-7-SG	1	Inverter module
0125-7	H6	1. MD880-50M-0125-7-SG	1	Inverter module
0144-7	H6	1. MD880-50M-0144-7-SG	1	Inverter module
0192-7	H6	1. MD880-50M-0192-7-SG	1	Inverter module
0217-7	H7	1. MD880-50M-0217-7-SG	1	Inverter module
0270-7	H7	1. MD880-50M-0270-7-SG	1	Inverter module

Model MD880-50-...	Frame	Part No.	Quantity	Remarks
0340-7	H8	1. MD880-50M-0340-7-SG 2. HCU-50S 3. H8-quick-kit	1 1 1	Inverter module Inverter controller H8 quick installation kit (option)
0340-7	H8A	1. MD880-50M-0340-7-SG-N 2. HCU-50S 3. H8A-kit	1 1 1	Inverter module Inverter controller H8A mounting base (option)
0410-7	H8	1. MD880-50M-0410-7-SG 2. HCU-50S 3. H8-quick-kit	1 1 1	Inverter module Inverter controller H8 quick installation kit (option)
0410-7	H8A	1. MD880-50M-0410-7-SG-N 2. HCU-50S 3. H8A-kit	1 1 1	Inverter module Inverter controller H8A mounting base (option)
0530-7	H8	1. MD880-50M-0530-7-SG 2. HCU-50S 3. H8-quick-kit	1 1 1	Inverter module Inverter controller H8 quick installation kit (option)
0530-7	H8A	1. MD880-50M-0530-7-SG-N 2. HCU-50S 3. H8A-kit	1 1 1	Inverter module Inverter controller H8A mounting base (option)
0600-7	H8	1. MD880-50M-0600-7-SG 2. HCU-50S 3. H8-quick-kit	1 1 1	Inverter module Inverter controller H8 quick installation kit (option)
0600-7	H8A	1. MD880-50M-0600-7-SG-N 2. HCU-50S 3. H8A-kit	1 1 1	Inverter module Inverter controller H8A mounting base (option)
0650-7	H8	1. MD880-50M-0650-7-SG 2. HCU-50S 3. H8-quick-kit	1 1 1	Inverter module Inverter controller H8 quick installation kit (option)
0650-7	H8A	1. MD880-50M-0650-7-SG-N 2. HCU-50S 3. H8A-kit	1 1 1	Inverter module Inverter controller H8A mounting base (option)
0721-7	H8	1. MD880-50M-0721-7-SG 2. HCU-50S 3. H8-quick-kit	1 1 1	Inverter module Inverter controller H8 quick installation kit (option)
0721-7	H8A	1. MD880-50M-0721-7-SG-N 2. HCU-50S 3. H8A-kit	1 1 1	Inverter module Inverter controller H8A mounting base (option)

Model MD880-50-...	Frame	Part No.	Quantity	Remarks
0779-7	2 x H8	1. MD880-50M-0410-7-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	2 1 1 2	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
0779-7	2 x H8A	1. MD880-50M-0410-7-SG-N 2. HCU-50S 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
1007-7	2 x H8	1. MD880-50M-0530-7-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	2 1 1 2	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
1007-7	2 x H8A	1. MD880-50M-0530-7-SG-N 2. HCU-50S 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
1140-7	2 x H8	1. MD880-50M-0600-7-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	2 1 1 2	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
1140-7	2 x H8A	1. MD880-50M-0600-7-SG-N 2. HCU-50S 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
1235-7	2 x H8	1. MD880-50M-0650-7-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	2 1 1 2	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
1235-7	2 x H8A	1. MD880-50M-0650-7-SG-N 2. HCU-50S 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
1370-7	2 x H8	1. MD880-50M-0721-7-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	2 1 1 2	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)

Model MD880-50-...	Frame	Part No.	Quantity	Remarks
1370-7	2 x H8A	1. MD880-50M-0721-7-SG-N 2. HCU-50S 3. HPCU-40 4. H8A-kit-L	2 1 1 2	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
1510-7	3 x H8	1. MD880-50M-0530-7-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	3 1 1 3	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
1510-7	3 x H8A	1. MD880-50M-0530-7-SG-N 2. HCU-50S 3. HPCU-40 4. H8A-kit-L	3 1 1 3	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
1710-7	3 x H8	1. MD880-50M-0600-7-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	3 1 1 3	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
1710-7	3 x H8A	1. MD880-50M-0600-7-SG-N 2. HCU-50S 3. HPCU-40 4. H8A-kit-L	3 1 1 3	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
1853-7	3 x H8	1. MD880-50M-0650-7-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	3 1 1 3	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
1853-7	3 x H8A	1. MD880-50M-0650-7-SG-N 2. HCU-50S 3. HPCU-40 4. H8A-kit-L	3 1 1 3	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
2055-7	3 x H8	1. MD880-50M-0721-7-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	3 1 1 3	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
2055-7	3 x H8A	1. MD880-50M-0721-7-SG-N 2. HCU-50S 3. HPCU-40 4. H8A-kit-L	3 1 1 3	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)

Model MD880-50-...	Frame	Part No.	Quantity	Remarks
2280-7	4 x H8	1. MD880-50M-0600-7-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	4 1 1 4	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
2280-7	4 x H8A	1. MD880-50M-0600-7-SG-N 2. HCU-50S 3. HPCU-40 4. H8A-kit-L	4 1 1 4	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
2470-7	4 x H8	1. MD880-50M-0650-7-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	4 1 1 4	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
2470-7	4 x H8A	1. MD880-50M-0650-7-SG-N 2. HCU-50S 3. HPCU-40 4. H8A-kit-L	4 1 1 4	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
2740-7	4 x H8	1. MD880-50M-0721-7-SG 2. HCU-50S 3. HPCU-40 4. H8-quick-kit	4 1 1 4	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
3088-7	5 x H8	1. MD880-50M-0650-7-SG 2. HCU-50S 3. HPCU-60 4. H8-quick-kit	5 1 1 5	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
3088-7	5 x H8A	1. MD880-50M-0650-7-SG-N 2. HCU-50S 3. HPCU-60 4. H8A-kit-L	5 1 1 5	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
3425-7	5 x H8	1. MD880-50M-0721-7-SG 2. HCU-50S 3. HPCU-60 4. H8-quick-kit	5 1 1 5	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
3425-7	5 x H8A	1. MD880-50M-0721-7-SG-N 2. HCU-50S 3. HPCU-60 4. H8A-kit-L	5 1 1 5	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)

Model MD880-50-...	Frame	Part No.	Quantity	Remarks
3705-7	6 x H8	1. MD880-50M-0650-7-SG 2. HCU-50S 3. HPCU-60 4. H8-quick-kit	6 1 1 6	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
3705-7	6 x H8A	1. MD880-50M-0650-7-SG-N 2. HCU-50S 3. HPCU-60 4. H8A-kit-L	6 1 1 6	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
4110-7	6 x H8	1. MD880-50M-0721-7-SG 2. HCU-50S 3. HPCU-60 4. H8-quick-kit	6 1 1 6	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
4110-7	6 x H8A	1. MD880-50M-0721-7-SG-N 2. HCU-50S 3. HPCU-60 4. H8A-kit-L	6 1 1 6	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
4323-7	7 x H8	1. MD880-50M-0650-7-SG 2. HCU-50S 3. HPCU-A0 4. H8-quick-kit	7 1 1 7	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
4323-7	7 x H8A	1. MD880-50M-0650-7-SG-N 2. HCU-50S 3. HPCU-A0 4. H8A-kit-L	7 1 1 7	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
4795-7	7 x H8	1. MD880-50M-0721-7-SG 2. HCU-50S 3. HPCU-A0 4. H8-quick-kit	7 1 1 7	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
4795-7	7 x H8A	1. MD880-50M-0721-7-SG-N 2. HCU-50S 3. HPCU-A0 4. H8A-kit-L	7 1 1 7	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
4940-7	8 x H8	1. MD880-50M-0650-7-SG 2. HCU-50S 3. HPCU-A0 4. H8-quick-kit	8 1 1 8	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)

Model MD880-50-...	Frame	Part No.	Quantity	Remarks
4940-7	8 x H8A	1. MD880-50M-0650-7-SG-N 2. HCU-50S 3. HPCU-A0 4. H8A-kit-L	8 1 1 8	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)
5480-7	8 x H8	1. MD880-50M-0721-7-SG 2. HCU-50S 3. HPCU-A0 4. H8-quick-kit	8 1 1 8	Inverter module Inverter controller Parallel expansion module H8 quick installation kit (option)
5480-7	8 x H8A	1. MD880-50M-0721-7-SG-N 2. HCU-50S 3. HPCU-A0 4. H8A-kit-L	8 1 1 8	Inverter module Inverter controller Parallel expansion module H8A mounting base with reactor (option)

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